Appendix V5-5F

Back River Project: 2013 Wildlife Baseline Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2013 Wildlife Baseline Report

Rescan Environmental Services Ltd., an ERM company
Rescan Building, Fifteenth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

March 2014

BACK RIVER PROJECT
2013 WILDLIFE BASELINE REPORT

March 2014
Project #0194096-0005

Citation:
Rescan. 2014. *Back River Project: 2013 Wildlife Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan Environmental Services Ltd., an ERM company
Vancouver, British Columbia

Executive Summary

Rescan™
an ERM company

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. For 2013, Sabina contracted Rescan Environmental Services (Rescan) to conduct a comprehensive baseline program that covered the geographical area of the Marine Laydown Area (MLA) located on the southern part of Bathurst Inlet, the Goose Property Area, the George Property Area, and connecting winter road alignments.

This report presents the results of the 2013 Wildlife Baseline Program. The objective of the program was to characterize the avian and mammal communities within various study areas around the Marine Laydown Area, as well as to collect supplemental information of select avian and mammal communities surrounding the Goose Property Area and the George Property Area and along the winter road alignments. Field surveys in 2013 focused on raptors, upland breeding birds, waterbirds and marine birds, carnivores and their denning habitat, caribou, and incidental observations of ungulates (muskox and moose). Field inventories were also conducted to collect hair samples from wolverine and grizzly bear as part of a DNA-based population assessment and are presented in a separate report (Rescan 2014a).

A total of 50 bird species, and 11 terrestrial mammals were confirmed to occur within the Project study areas. Of these species, 18 birds (golden eagle, gyrfalcon, rough-legged hawk, peregrine falcon, short-eared owl, American golden-plover, American pipit, American tree sparrow, Harris' sparrow, hoary redpoll, least sandpiper, red-necked phalarope, semipalmated sandpiper, white-crowned sparrow, long-tailed duck, Arctic tern, glaucous gull, and common eider) and two mammals (grizzly bear and wolverine) are identified as species of conservation concern at the territorial or federal level.

Surveys for cliff-nesting raptors were conducted in the focused raptor survey area, located within the larger Regional Study Area (RSA). Surveys were timed in May, June, and July 2013 to locate active nest sites, and to measure occupancy and productivity rates. In total, 73 nest sites were surveyed in occupancy surveys conducted in May and June, 47 of which were occupied by nesting pairs. Two nest sites, one belonging to a common raven and other to a gyrfalcon, were observed to be within 1.5 km of proposed Project infrastructure (haul and access roads) and were located within the Goose PDA. Cliff nest sites were occupied by four species of breeding raptors; gyrfalcons, golden eagles, rough-legged hawks, and peregrine falcons or by common ravens. All 47 occupied nest site were resurveyed during the July productivity survey; evidence of successful breeding or continued breeding was observed at 40% of these nest sites. Three ground-nesting species were also observed incidentally - the northern harrier, snowy owl, and short-eared owl.

Surveys for upland birds were conducted in June, 2013 in a Focused and Reference Survey Area at or near the MLA to characterize the upland bird community and species habitat associations, and to summarize detection rates of nest predators. A total of 18 upland bird species were detected, of which, six are listed as "Sensitive" in Nunavut: American golden-plover, American tree sparrow, Harris's sparrow, hoary redpoll, least sandpiper, semipalmated sandpiper, and white-crowned sparrow. Species richness and abundance were similar between Focused and Reference Areas and within the Focused Survey Area, species richness was similar in areas located within 300 m of the proposed Project infrastructure to those located further. There was also a similar number of species and territories associated with dry habitat types relative to moist to wet habitats, although some species were associated with particular vegetation or habitat types. Nests of five species of upland birds were observed all of which were primarily in the incubation stage. Nest predators were detected at a rate of

0.5 predators per hour within the areas surveyed and were detected more frequently at the focused survey area within the LSA relative to the reference area.

A number of waterbird and marine bird surveys were conducted in 2013, which were timed to coincide with four seasons: spring staging (May), spring pair forming (June), summer brood rearing (July), and fall staging (August). Four aerial waterbirds surveys were conducted at or near the MLA in the Focused and Reference Survey Stratum (spring staging), and in the MLA Focused Survey Stratum (spring pair, summer brood, and fall staging). Three aerial marine bird surveys were conducted within marine habitat surrounding the MLA along the shoreline of Bathurst Inlet (spring pair, summer brood, and fall staging). Ground based surveys were also conducted during the spring and fall within the Goose and George Potential Development Areas (PDAs) at previously known staging areas to confirm use of these areas for staging.

In total, 24 waterbird and marine bird species were recorded during aerial or ground surveys or incidentally in 2013. Species abundance and richness varied temporally and both generally increased over the course of the survey periods (low during spring staging, high during fall staging). Notable staging areas were detected during fall staging surveys at Ekalokhiokvik Lake, west of the MLA PDA as well as several marine areas in southern Bathurst Inlet including a prominent staging area within the marine Local Study Area (LSA), directly adjacent to the MLA PDA. In addition, a key terrestrial staging site was confirmed at a small shallow lake just outside the George Property PDA where large flocks of geese and ducks have been consistently observed during spring staging surveys in previous years. Evidence of breeding was detected during both terrestrial waterbird and marine bird breeding surveys with pairs detected at many small lakes, and along the shoreline of Bathurst Inlet. The majority of breeding pairs detected were of long-tailed duck, a species of conservation concern, as well as red-throated loon along the shoreline of southern Bathurst Inlet. Two broods were detected during breeding surveys; one belonged to a long-tailed duck in terrestrial freshwater habitat and the second detected in marine habitat, belonged to a common eider.

Carnivore den surveys were conducted at the MLA, the Goose Property Area, and along the winter road alignments to identify: a) the number and distribution of existing dens, b) dens that are active, and c) the predominant resident carnivore species utilizing the RSA. In addition, two previously active wolf dens within the RSA were monitored by remote cameras between May and August, 2013. Incidental observations of carnivore and their dens were also collected in 2013 during other baseline field surveys.

A total of 30 carnivore dens belonging to four species (grey wolf, red fox, wolverine, and grizzly bear) were observed during the occupancy and productivity surveys or observed incidentally during other wildlife baseline surveys conducted in 2013. More than half of the dens observed (n = 16) had signs of recent activity, but only two dens, both belonging to red fox, had confirmed occupancy by adults. Of these 16 den sites, three dens were identified as possibly productive during the productivity survey, but no dens were confirmed as productive. In addition, one of the wolf dens monitored in 2013 by remote camera was confirmed to be occupied and contained a successful litter.

The distribution of the Bathurst and Beverly/Ahiak caribou herds near the Project was assessed in a number of ways. Fixed kernel utilization distributions (UDs) and spring migration paths were generated from government caribou collar data from 1996 to 2013 for the Bathurst herd, and from 2001 to 2013 for the Beverly/Ahiak herd. These data were coupled with the analyses of caribou observations captured by 65 remote cameras placed within the RSA. Thirty of these cameras were in place from August, 2012, to August, 2013; thirty five additional cameras were deployed in May, 2013 (30 cameras) and July, 2013 (5 cameras) and recorded data up to the end of August, 2013. In addition, incidental

observations of caribou were collected during various field surveys in 2013 and these data were used to substantiate trends observed in caribou collar and remote camera data.

The combination of data generated from caribou collars, remote cameras, and incidental observations indicates that caribou have a varying likelihood of occurrence within the terrestrial RSA among seasons. Most notable, the likelihood of occurrence appears to be the highest during summer (mid- to late July until late August), with relatively large numbers of caribou that may travel through the RSA. In 2013, the highest number of caribou recorded by remote camera and incidentally occurred during the summer. The results of caribou collar data analyses indicate that the large numbers of caribou present in the RSA during the summer of 2013 were likely Beverly/Ahiak caribou. Numerous annual ranges (defined by 95% kernel UDs) for Beverly/Ahiak caribou from 2001 to 2013 overlapped or encompassed the RSA during summer. In contrast, the annual ranges of Bathurst caribou from 1996 to 2013 had minimal overlap with the RSA during summer; Bathurst caribou appeared to be located to the south and west of the RSA during this seasonal period.

Comparatively, the likelihood that caribou occur within the RSA appears to the lowest during the calving and post-calving periods (early June through mid- to late July), with very minimal numbers of caribou expected to travel through the RSA during this time. Calving and post-calving ranges and associated core use areas were generally located outside of the RSA to the west (Bathurst caribou) and east (Beverly/Ahiak caribou), though these ranges have overlapped the western and eastern margins of the RSA in a number of years, since 1996 for Bathurst caribou and since 2001 for Beverly/Ahiak, respectively. However, the numbers of caribou recorded by remote cameras and incidentally in 2013 were among the lowest during the calving and post-calving periods. The relatively small numbers of caribou recorded within the RSA during the calving and post-calving periods in 2013 highlight the low probability of encountering caribou from either herd within the RSA, despite the overlap in annual kernel UDs.

During other seasonal periods (winter, spring migration, and fall), caribou presence within the RSA may be regular to infrequent and in variable numbers. Caribou were recorded by remote camera and/or incidentally during all three of the aforementioned periods. The overall numbers recorded during the winter, spring migration and fall seasons were higher compared to the calving and post-calving periods, but were lower relative to the summer period. Analysis of caribou collar data indicate that both Bathurst and Beverly/Ahiak caribou may pass through the RSA during spring migration, but that only Beverly/Ahiak caribou are present in areas surrounding the RSA during the winter and fall.

Incidental observations of other mammals, including muskox, moose, and small mammals, were documented during wildlife field inventories in 2013. Four mammal species including muskox, moose, Arctic hare, and ermine were recorded. The most common species incidentally observed were muskox (261 individuals total). The majority (61%) of muskox observations occurred in July and August combined, followed by May and June combined (39%). Groups of muskox recorded incidentally were observed in three general areas in the RSA including 1) in the northern portion of the RSA, near Bathurst Inlet, 2) in the central portion of the RSA near the George Property Area, and 3) in the southern portion of the RSA near the Goose Property Area. Similarities in spatial distribution and group size of muskox observed within these three areas throughout the spring/summer field season suggest that there are likely three herds of muskox that frequent the RSA. A fourth group of muskox was recorded incidentally along the TCWR Winter Road Connector corridor.

Acknowledgements

Rescan™
an ERM company

Acknowledgements

This report was prepared for Sabina Gold and Silver Corp. (Sabina) by Rescan Environmental Services Ltd. (Rescan). Fieldwork was conducted by Andrea Buckman (Ph.D.), Christine Kent (B.A., Dipl. Tech), Christine Rock (M.Sc.), Jason Northcott (M.Sc. R.P.Bio), Julia Shewan (B.Sc.), and Kate Fremlin (B.Sc., R.P.Bio). Extensive field support was kindly provided by Sabina logistics team and camp management, Sabina Environmental Co-ordinators Merle Keefe and Mylaine Mageau as well as Northern Air Support Helicopters, and Det'on Cho Expediting. Fieldwork was conducted with the assistance of Sabina field assistants Merle Keefe, Mylaine Mageau, Audla Buchan, Robert Maksagak, Mark Wasiuta, Colin Matomiak, Lindsay Reid, Tina Cliff, Paul Iblauk, Austin Porter, Doyle Kavanna, AJ Porter, and with additional assistance to locate caribou cameras provided by Cambridge Bay Inuit Elder Clarence Klenkenberg and Cambridge Bay Inuit resident John Kiayogana. Report writing was conducted by Christine Rock, Julia Shewan, and Kate Fremlin and reviewed by Andrea Buckman, Katie Kuker (M.Sc.), Greg Sharam (Ph.D.), and Deborah Muggli (Ph.D., M.Sc., R.P.Bio).

Table of Contents

Rescan™
an ERM company

BACK RIVER PROJECT
2013 WILDLIFE BASELINE REPORT

Table of Contents

Executive Summary i

Acknowledgements v

Table of Contents vii

List of Figures xi

List of Tables xiv

List of Plates xv

List of Appendices xvii

Glossary and Abbreviations xix

1. Introduction 1-1

2. Background Information 2-1

2.1 Applicable Legislation 2-1

2.2 Past Environmental Studies in the Project Area 2-2

3. Study Areas 3-1

4. Species of Conservation Concern 4-1

5. Raptors 5-1

5.1 Introduction 5-1

5.2 Objectives 5-1

5.3 Methods 5-2

5.3.1 Raptor Occupancy Surveys 5-3

5.3.2 Raptor Productivity Surveys 5-3

5.3.3 Raptor Nesting Habitat 5-4

5.3.4 Incidental Observations 5-4

5.4 Results 5-4

5.4.1 Raptor Occupancy Survey 5-5

5.4.2 Raptor Productivity Survey 5-9

5.4.3 Raptor Nesting Habitat 5-13

5.4.3.1 Incidental Detections of Raptors by Observers during Other Baseline Surveys 5-14

5.4.3.2 Incidental Detections of Raptors by Remote Motion-triggered Cameras 5-17

5.5 Discussion 5-19

6. Upland Birds 6-1
6.1 Introduction 6-1
6.2 Objectives 6-1
6.3 Methods 6-1
6.3.1 Study Design 6-1
6.3.1.1 Point Count and PRISM Plot Site Selection 6-2
6.3.1.2 Habitat Associations 6-2
6.3.1.3 PRISM Plot Surveys 6-2
6.3.1.4 Point Count Surveys 6-6
6.3.2 Data Summary and Analysis 6-7
6.3.2.1 PRISM Plot Surveys 6-7
6.3.2.2 Point Count Surveys 6-7
6.3.3 Incidental Observations of Upland Birds 6-7
6.4 Results 6-7
6.4.1 Summary 6-7
6.4.2 Survey Effort 6-8
6.4.3 Relative Abundance and Species Observed 6-8
6.4.3.1 Relative Abundance and Species Observed within PRISM Plots 6-8
6.4.3.2 Relative Abundance and Species Observed during Point Count Surveys 6-10
6.4.3.3 Species of Conservation Concern 6-14
6.4.3.4 Relative Abundance and Species Detected near Proposed Project Infrastructure 6-16
6.4.4 Broad Patterns in Distribution of the Upland Bird Community 6-16
6.4.5 Small Scale Habitat Associations of Species 6-16
6.4.5.1 Species Habitat Associations during PRISM Plot Surveys 6-16
6.4.5.2 Species Habitat Associations during Point Count Surveys 6-22
6.4.6 Nest Productivity and Phenology 6-22
6.4.7 Detections of Nest Predators 6-23
6.4.8 Incidental Observations of Upland Birds 6-24
6.5 Discussion 6-24

7. Waterbirds and Marine Birds 7-1
7.1 Introduction 7-1
7.2 Objectives 7-1
7.3 Methods 7-2
7.3.1 Waterbird Surveys 7-2
7.3.1.1 Aerial Surveys 7-2
7.3.1.2 Ground-based Surveys 7-5
7.3.1.3 Staging Surveys 7-5

7.3.1.4 Breeding Surveys 7-5
7.3.1.5 Data Analysis 7-6
7.3.2 Marine Bird Surveys 7-6
7.3.2.1 Data Analysis 7-11
7.3.3 Incidental Observations of Waterbirds and Marine Birds 7-11
7.4 Results 7-13
7.4.1 Summary 7-13
7.4.2 Waterbird Surveys 7-13
7.4.2.1 Survey Effort and Ice Conditions 7-14
7.4.2.2 Aerial Staging Surveys 7-16
7.4.2.3 Ground-based Staging Surveys 7-18
7.4.2.4 Breeding Surveys 7-23
7.4.3 Marine Bird Surveys 7-30
7.4.3.1 Survey Effort and Ice Condition 7-30
7.4.3.2 Staging Surveys 7-31
7.4.3.3 Breeding Surveys 7-33
7.4.4 Incidental Observations of Waterbirds and Marine Birds 7-34
7.4.4.1 Waterbirds and Marine Birds Observed during Other Baseline Surveys 7-34
7.4.4.2 Waterbirds Observed on Remote Digital Camera 7-47
7.5 Discussion 7-47

8. Carnivore Dens 8-1
8.1 Introduction 8-1
8.1.1 Carnivore Species and Denning Ecology 8-1
8.2 Objectives 8-5
8.3 Methods 8-5
8.3.1 Aerial Den Surveys 8-5
8.3.1.1 Occupancy Surveys 8-5
8.3.1.2 Productivity Surveys 8-6
8.3.2 Wolf Den Monitoring 8-9
8.3.3 Incidental Observations 8-9
8.3.3.1 Carnivore Dens 8-9
8.3.3.2 Observations of Carnivores 8-9
8.4 Results 8-10
8.4.1 Summary 8-10
8.4.2 Aerial Den Surveys 8-10
8.4.2.1 Occupancy Surveys 8-10
8.4.2.2 Productivity Surveys 8-16
8.4.3 Wolf Den Monitoring 8-17
8.4.4 Incidental Observations 8-19
8.4.4.1 Carnivore Dens 8-19

8.4.4.2 Observations of Carnivores 8-19
8.5 Discussion 8-27

9. Caribou 9-1
9.1 Introduction 9-1
9.1.1 Bathurst Caribou 9-1
9.1.2 Beverly and Ahiak Caribou 9-1
9.1.3 Dolphin and Union Caribou 9-2
9.2 Objectives 9-2
9.3 Methods 9-3
9.3.1 Distribution of Collared Caribou 9-3
9.3.1.1 Analysis of Collar Data 9-3
9.3.1.2 Limitations in Collar Data Analyses 9-5
9.3.2 Remote Cameras 9-5
9.3.2.1 Remote Camera Deployment and Study Design 9-6
9.3.2.2 Remote Camera Set-up and Operations 9-6
9.3.2.3 Data Analysis 9-12
9.3.3 Incidental Observations of Caribou 9-13
9.4 Results 9-13
9.4.1 Distribution of Collared Caribou 9-13
9.4.1.1 Summary 9-13
9.4.1.2 Bathurst Caribou 9-14
9.4.1.3 Beverly/Ahiak Caribou 9-22
9.4.2 Remote Cameras 9-43
9.4.2.1 Survey Period and Locations of Remote Cameras 9-43
9.4.2.2 Trends in Caribou Abundance and Distribution Recorded by Remote Camera 9-43
9.4.3 Incidental Observations of Caribou 9-68
9.5 Discussion 9-68
9.5.1 Calving and Post-calving Periods 9-71
9.5.2 Summer Period 9-72
9.5.3 Other Seasonal Periods 9-73
9.5.3.1 Winter 9-73
9.5.3.2 Spring Migration 9-74
9.5.3.3 Fall 9-74

10. Incidental Observations of Mammals 10-1
10.1 Introduction 10-1
10.2 Objectives 10-1
10.3 Methods 10-2
10.3.1 Incidental Observations of Mammals during Field Surveys 10-2
10.3.2 Incidental Observations of Mammals via Remote Camera 10-2

10.4 Results 10-2
10.5 Discussion 10-6

References R-1

List of Figures

FIGURE **PAGE**

Figure 1-1. Back River Project Location 1-2

Figure 3-1. Wildlife Baseline Study Areas, Back River Project, 2013 3-3

Figure 5.4-1. Status of Raptor Nests during Occupancy Surveys, May - June 2013 5-7

Figure 5.4-2. Status of Raptor Nest Sites during Productivity Surveys, July 2013 5-11

Figure 5.4-3. Incidental Observations of Raptors, August 2012 - August 2013 5-15

Figure 6.3-1. PRISM Plot and Point Count Locations for Upland Bird Surveys, 2013 6-3

Figure 6.3-2. Schematic of PRISM Plot and Survey Methodology 6-5

Figure 6.4-1. Species Richness Recorded during PRISM Plot and Point Count Surveys, 2013 6-11

Figure 6.4-2. Abundance and Frequency of Occurrence of Breeding Territories Observed per Species during PRISM Plot and Point Count Surveys, 2013 6-13

Figure 6.4-3. Distribution of Five Species of Conservation Concern during PRISM Plot and Point Count Surveys, 2013 6-15

Figure 6.4-4. Distribution of the Upland Bird Community in Dry and Moist to Wet Habitat during Point Count Surveys, 2013 6-17

Figure 6.4-5. Distribution of the Upland Bird Community in Dry and Moist to Wet Habitats within Focused and Reference Study Areas during Point Count Surveys, 2013 6-18

Figure 6.4-6. Distribution of Upland Bird Community in Dry and Moist to Wet Habitat within Focused and Reference Study Areas during Point Count Surveys, 2013 6-19

Figure 6.4-7. Summary of Upland Bird Small Scale Habitat Associations during PRISM Plot and Point Count Surveys, 2013 6-20

Figure 7.3-1. Waterbird Aerial Survey Strata and Transects for the Spring Staging Survey, 2013 7-3

Figure 7.3-2. Waterbird Aerial Survey Area and Transects for the Spring Pair, Summer Brood, and Fall Staging Surveys, 2013 7-7

Figure 7.3-3. Waterbird Ground Survey Locations, 2013 7-9

Figure 7.3-4. Shoreline Transect for Marine Bird Aerial Surveys, 2013 7-12

Figure 7.4-1. Waterbird Species Detected and Species Abundance and Richness Recorded during Staging Surveys, 2013 7-17

Figure 7.4-2. Distribution of Waterbirds during Aerial Spring Staging Surveys, 2013 7-19

Figure 7.4-3. Distribution of Waterbirds during Aerial Fall Staging Surveys, 2013..... 7-21

Figure 7.4-4. Waterbird Species Detected and Species Abundance and Richness Recorded during Breeding Surveys, 2013..... 7-24

Figure 7.4-5. Distribution of Waterbirds during Aerial Spring Pair Surveys, 2013..... 7-25

Figure 7.4-6. Distribution of Waterbirds during Aerial Summer Brood Surveys, 2013..... 7-27

Figure 7.4-7. Marine Bird Species Detected and Species Abundance and Richness Recorded during Breeding Surveys, 2013..... 7-32

Figure 7.4-8. Distribution of Marine Birds during Aerial Fall Staging Surveys, 2013..... 7-35

Figure 7.4-9. Distribution of Marine Birds during Aerial Spring Pair Surveys, 2013..... 7-37

Figure 7.4-10. Distribution of Marine Birds during Aerial Summer Brood Surveys, 2013..... 7-39

Figure 7.4-11a. Incidental Observations of Waterbirds and Marine Birds, 2013..... 7-41

Figure 7.4-11b. Incidental Observations of Waterbirds and Marine Birds, 2013..... 7-43

Figure 7.4-11c. Incidental Observations of Waterbirds and Marine Birds, 2013..... 7-45

Figure 8.3-1. Carnivore Den Aerial Survey Routes and Wolf Den Monitoring Locations, 2013 8-7

Figure 8.4-1. Carnivore Dens and Locations Observed during Occupancy and Productivity Surveys, 2013..... 8-11

Figure 8.4-2. Incidental Observations of Carnivore Dens and Carnivores, 2013..... 8-21

Figure 8.4-3. Incidental Observations of Female Grizzly Bears with Cubs, 2013..... 8-23

Figure 9.3-1. Caribou Camera Locations and Orientation, August 2012 to August 2013.....9-7

Figure 9.3-2. Caribou Cameras Placed along the TCWR Winter Road Connector, August 2013.....9-9

Figure 9.4-1. Distribution of Collared Bathurst Caribou during Winter (November 1 to April 14), 1996 to 2013..... 9-15

Figure 9.4-2. Spring Migration Paths (April 15 to June 4) of Collared Bathurst Caribou, 1996 to 2013.. 9-17

Figure 9.4-3. Distribution of Collared Bathurst Caribou during Calving (June 5 to June 15), 1996 to 2013..... 9-19

Figure 9.4-4. Distribution of Collared Bathurst Caribou during Post-calving (June 16 to July 20), 1996 to 2013..... 9-23

Figure 9.4-5. Distribution of Collared Bathurst Caribou during Summer (July 21 to August 31), 1996 to 2013..... 9-25

Figure 9.4-6. Distribution of Collared Bathurst Caribou during Fall (September 1 to October 31), 1996 to 2012..... 9-27

Figure 9.4-7. Distribution of Collared Beverly/Ahiak Caribou during Winter (November 1 to April 14), 2001 to 2013 9-29

Figure 9.4-8. Spring Migration (April 15 to June 4) Paths of Collared Beverly/Ahiak Caribou, 2001 to 2013..... 9-31

Figure 9.4-9. Distribution of Collared Beverly/Ahiak Caribou during Calving (June 5 to June 20), 2001 to 2013..... 9-35

Figure 9.4-10. Distribution of Collared Beverly/Ahiak Caribou during Post-calving (June 21 to July 25), 2001 to 2013 9-37

Figure 9.4-11. Distribution of Collared Beverly/Ahiak Caribou during Summer (July 26 to August 31), 2001 to 2013..... 9-39

Figure 9.4-12. Distribution of Collared Beverly/Ahiak Caribou during Fall (September 1 to October 31), 2001 to 2013 9-41

Figure 9.4-13. Survey Period for Cameras 1 through 30, August 2012 to August 2013 9-45

Figure 9.4-14. Survey Period for Cameras 31 through 65, May 2013 to August 2013 9-47

Figure 9.4-15. Number of Caribou Observed and Number of Images with Caribou Recorded from September 2012 to August 2013 9-48

Figure 9.4-16. Total Number of Caribou Recorded by Digital Camera from August 2012 to August 2013..... 9-49

Figure 9.4-17. Temporal Trends in the Number of Caribou Recorded at Remote Cameras, 2012 to 2013..... 9-52

Figure 9.4-18. Number of Caribou Recorded by Digital Camera during Fall (August to October 31, 2012) 9-53

Figure 9.4-19. Number of Caribou Recorded by Digital Camera during Winter (November 1, 2012 to April 14, 2013)..... 9-55

Figure 9.4-20. Number of Caribou Recorded by Digital Camera during Spring Migration (April 15 to June 4, 2013) 9-57

Figure 9.4-21. Number of Caribou Recorded by Digital Camera during Calving (June 5 to June 20, 2013) 9-59

Figure 9.4-22. Number of Caribou Recorded by Digital Camera during Post-calving (June 21 to July 25, 2013) 9-61

Figure 9.4-23. Number of Caribou Recorded by Digital Camera during Summer (July 26 to August, 2013)..... 9-63

Figure 9.4-24. Incidental Observations of Caribou, 2013..... 9-69

Figure 10.4-1. Incidental Observations of Mammals, 2013..... 10-3

List of Tables

TABLE **PAGE**

Table 2.1-1. Relevant Acts or Regulations for Wildlife and Wildlife Habitat 2-1

Table 4-1. Criteria for Assessing the Likelihood of Occurrence in the Wildlife Study Areas 4-1

Table 4-2. Wildlife Species of Conservation Concern Detected in the RSA and MRSA.....4-2

Table 5.4-1. Number and Breeding Status of Raptor Nests on Cliffs Surveyed May 21, 25, 26 or June 19 and 20, 2013 5-5

Table 5.4-2. Number and Breeding Status of Raptor Nests on Cliffs Surveyed July 27, 2013..... 5-10

Table 5.4-3. Average Brood Size of Raptor Nests, July 27, 2013..... 5-13

Table 5.4-4. Summary of Raptor Nesting Habitat, 2013 5-14

Table 5.4-5. Incidental Detections of Raptors during Other Environmental Baseline Field Surveys, 2013 5-17

Table 5.4-6. Raptor Species Observed by Remote Cameras, 2013..... 5-19

Table 6.4-1. Number of Point Counts and PRISM Plots Surveyed at Focused and Reference Survey Areas, 2013 6-8

Table 6.4-2. Upland Birds Counted during PRISM Plot and Point Count Surveys, 2013.....6-9

Table 6.4-3. Territory Counts and Frequency of Occurrence of Upland Birds across all Point Count Surveys, 2013 6-14

Table 6.4-4. Productivity of Nesting Pairs of Upland Birds, 2013..... 6-22

Table 6.4-5. Number of Nest Predators Detected during Point Count and PRISM Surveys, 2013..... 6-23

Table 6.4-6. Upland Birds Observed during Other Field Surveys, 2013 6-24

Table 7.3-1. Brood Class Descriptions and Plumage Development in Young Waterfowl 7-6

Table 7.4-1. Waterbird Species Observed during Terrestrial Aerial Surveys and Incidentally during Marine Aerial Surveys, 2013 7-13

Table 7.4-2. Survey Effort and Amount of Habitat Surveyed during Aerial Terrestrial Waterbird Surveys, 2013..... 7-15

Table 7.4-3. Number of Waterbirds Associated with Each Habitat Type during Terrestrial Aerial Staging Surveys 7-18

Table 7.4-4. Species Observed during Ground-based Staging Surveys 7-18

Table 7.4-5. Number of Waterbirds Associated with Each Habitat Type during Terrestrial Aerial Breeding Surveys 7-29

Table 7.4-6. Marine Bird Species Observed during Marine Aerial Surveys, and Incidentally during Terrestrial Surveys 2013..... 7-29

Table 7.4-7. Survey Effort and Amount of Habitat Surveyed during Aerial Marine Surveys, 2013 7-30

Table 7.4-8. Incidental Observations of Waterbirds and Marine Birds, 2013 7-46

Table 8.3-1. Occupancy and Productivity Den Statuses Used during Aerial Surveys, 2013.....8-6

Table 8.4-1. Carnivore Den Survey Results, 2013..... 8-10

Table 8.4-2. Summary of Survey Effort and Conditions for Carnivore Den Surveys, 2013 8-13

Table 8.4-3. Carnivore Dens Observed during Occupancy and Productivity Surveys, 2013..... 8-13

Table 8.4-4. Incidental Observations of Carnivores during 2013 Baseline Studies..... 8-20

Table 8.4-5. Incidental Observations of Carnivores via Remote Cameras..... 8-26

Table 9.3-1. General Life History Period Dates for Bathurst and Beverly/Ahiak Caribou 9-4

Table 9.4-1. Minimum Number of Caribou Calves Identified at Remote Cameras, 2013 9-65

Table 9.4-2. Total Number of Caribou and Size of Groups Detected by Remote Camera, 2012 to 2013 .. 9-67

Table 9.4-3. Caribou Detections by Habitat Type 9-67

Table 9.4-4. Incidental Observations of Caribou Recorded during Baseline Environmental Studies, 2013..... 9-68

Table 10.4-1. Incidental Observations of Mammals during Field Surveys and via Remote Camera, 2013 10-2

List of Plates

PLATE **PAGE**

Plate 5.3-1. Raptor cliff nesting habitat within the Focused Raptor Survey Area for raptor nests, May 25, 2013. 5-2

Plate 5.4-1. Golden eagle nest with one egg (indicated by red arrows), May 25, 2013. 5-5

Plate 5.4-2. Common raven nest with an incubating adult, May 21, 2013. 5-6

Plate 5.4-3. Gyrfalcon nest with incubating adult, May 21, 2013. 5-6

Plate 5.4-4. Peregrine falcon nest site with four young (3 visible here), July 21, 2013. 5-10

Plate 5.4-5. Golden eagle nest site with two young, July 21, 2013. 5-13

Plate 5.4-6. An occupied stick nest (indicated by red circle) with a large overhang and north-east facing aspect occupied by an incubating golden eagle (not visible), next to one alternate golden eagle nests (indicated by red arrow) at the nest site, May 21, 2013. 5-14

Plate 5.4-7. A dirt ledge (indicated by red arrow) with no overhang and a south facing aspect occupied by peregrine falcon (no raptor visible), June 20, 2013. 5-17

Plate 5.4-8. A bald eagle observed July 11, 2013 at a camera used for remote monitoring of caribou. 5-18

Plate 5.4-9. A gyrfalcon observed April 27, 2013 at a digital camera used to remotely monitor caribou. 5-18

Plate 5.4-10. A golden eagle observed from a digital photo taken by a camera used for remote monitoring of a wolf den, June 28, 2013..... 5-19

Plate 6.4-1. Examples of small scale habitat types in moist to wet habitats (June, 2013). 6-21

Plate 6.4-2. Examples of small scale habitat types in dry habitats (June, 2013). 6-21

Plate 6.4-3. Nests of upland birds observed in PRISM plots, June 14 to 18, 2013. 6-23

Plate 7.4-1. Ice conditions recorded during terrestrial aerial surveys in May and June, 2013. 7-16

Plate 7.4-2. Ice conditions recorded during marine aerial surveys in May and June, 2013. 7-31

Plate 7.4-3. A flock of greater scaup recorded during marine surveys on August 26, 2013..... 7-31

Plate 7.4-4. A greater-white fronted goose observed incidentally on June 20, 2013. 7-47

Plate 8.1-1. Example of suitable denning habitat for wolves and/or foxes on an esker, July 15, 2013. 8-2

Plate 8.1-2. Example of an occupied wolverine den dug into the snow under a rock overhang (March 2012). 8-4

Plate 8.4-1. Wolf tracks (in red rectangle) located near Den 4 [159D], May 23, 2013..... 8-15

Plate 8.4-2. Large den entrance with signs of digging (circled in red) observed at Den 4 [159D], May 23, 2013. 8-15

Plate 8.4-3. Red fox den dug into sandy soil in esker habitat, May 24, 2013..... 8-16

Plate 8.4-4. Left Photo - Red fox den (den 11 [164D]) with scat (circled in red) observed near a den entrance hole, July 15, 2013. Right Photo – Prey remains of an Arctic ground squirrel observed near another den entrance of den 11 [164D], July 15, 2013. 8-17

Plate 8.4-5. Mated pair of wolves observed on June 9, 2013..... 8-18

Plate 8.4-6. First wolf pup observed on July 20, 2013..... 8-18

Plate 8.4-7. Three of four pups observed at the den, July 25, 2013..... 8-19

Plate 8.4-8. Remote camera observations of carnivores, March to July 2013..... 8-25

Plate 9.3-1. Remote camera setup, 2013. 9-11

Plate 9.4-1. Large numbers of caribou recorded at Camera BR_48b, August 2013..... 9-44

Plate 9.4-2. Large numbers of caribou recorded at Camera BR_43b, July 2013. 9-44

Plate 9.4-3. Example of caribou observed during the winter, February 2013. 9-51

Plate 9.4-4. Caribou calf observed by Remote Camera BR_17b, August 2013..... 9-66

Plate 9.4-5. Large groups of caribou with calves at Camera BR_41a, July 2013..... 9-66

Plate 10.4-1. Small group of muskox (n = 15) with two calves (red circles) observed grazing west of the MLA, August 26, 2013..... 10-5

Plate 10.4-2. Group of muskox (n = 12) observed grazing at remote camera 16, July 20, 2013. 10-5

Plate 10.4-3. Solitary cow moose observed along the Western River, May 9, 2013. 10-6

Plate 10.4-4. Group of moose (n = 6) observed along the Western River in tall riparian shrub habitat, May 9, 2013. 10-6

Plate 10.4-5. Solitary bull moose observed at remote camera 9 along Bathurst Inlet, June 27, 2013. 10-6

Plate 10.4-6. Solitary cow moose observed at remote camera 9 along Bathurst Inlet, August 2, 2013. 10-6

Plate 10.4-7. Arctic hare observed near George Property Area, May 10, 2013..... 10-7

Plate 10.4-8. Ermine observed near George Property Area, August 28, 2013. 10-7

List of Appendices

Appendix 4-1. Territorial, Federal, and International Conservation Statuses and Definitions

Appendix 4-2. Potentially Occurring Wildlife Species in the Back River Terrestrial and Marine Study Areas

Appendix 5-1. Codes for Breeding Status during Occupancy Survey, 2013

Appendix 5-2. Codes for Breeding Status during Productivity Survey, 2013

Appendix 5-3. Raptor Occupancy and Productivity Data, 2013

Appendix 5-4. Incidental Observations of Wildlife, 2013

Appendix 6-1. Locations and Habitat Types of PRISM Plots

Appendix 6-2. Locations and Habitat Types of Point Counts Surveys

Appendix 6-3. Detections of Upland Birds and Nests during PRISM Plot Surveys

Appendix 6-4. Detections of Upland Breeding Birds and Nests during Point Count Surveys

Appendix 6-5. Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Appendix 7-1. Waterbird and Marine Bird Survey Details, 2013

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Appendix 8-1. Carnivore Den Occupancy and Productivity Data, 2013

Appendix 8-2. Motion-Triggered Remote Camera Monitoring at Wolf Dens 56 and 57, 2013

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Appendix 9-2. Remote Camera Locations and Habitat Information

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Glossary and Abbreviations

Rescan™
an ERM company

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Avian	Of, relating to, or characteristic of birds
Breeding performance	proportion of occupied nests at which breeding pairs produced young of any age that were alive at the time of the productivity survey
CESCC	Canadian Endangered Species Conservation Council
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - A federal committee of experts that assesses and designates the level of threat to wildlife and vegetation species in Canada
Ecosystem (terrestrial)	A volume of earth-space that is composed of non-living parts (climate, geologic materials, groundwater, and soils) and living or biotic parts, which are all constantly in a state of motion, transformation, and development. No size or scale is inferred.
GIS	Geographical Information System
Glacial-fluvial	Sediments deposited by glacial meltwater that form stratified layers of sand, gravel, and fines
GN DOE	Government of Nunavut Department of Environment
GNWT ENR	Government of the Northwest Territories Department of Environment and Natural Resources
GPS	Global Positioning System
Habitat	Land and water surface used by wildlife. This may include biotic and abiotic aspects such as vegetation, exposed bedrock, water and topography.
Hectare (ha)	10,000 m^2 or 0.01 km^2 or 2.47 acres
IUCN	International Union for Conservation of Nature
LSA	Local Study Area (terrestrial)
Marine Bird	Birds that use marine habitats during breeding and/or migration
marine LSA	marine Local Study Area
marine RSA	marine Regional Study Area
Mean brood size	mean number of nestlings among nest sites where complete counts were conducted
Migration	The regular seasonal or daily movement of animal populations to and from different areas, often considerable distances apart. Migration often occurs in corridors between preferred habitat types

***Migratory Birds Convention Act* (1994b)**	A federal government commitment established in 1917 to protect most migrating birds found in Canada. The Act fulfilled the terms of the Migratory Birds Convention of 1916 between Canada and the US. The Canadian government has the authority to pass and enforce regulations to protect those species of migratory birds that are included in the Convention
MLA	Marine Laydown Area
Nest site	nesting area which may contain several alternate nests, though only one nest is used during a given year
Nesting success	proportion of the total number of occupied nest sites at which at least one young raptor fledged
NLCA	Nunavut Land Claims Agreement
NPC	Nunavut Planning Commission
NU	Nunavut
NWMB	Nunavut Wildlife Management Board
NWT	Northwest Territories
Occupied site	A nest site where a single or pair of adults were observed having territorial behaviour during the nesting season, or where eggs or young were observed or inferred from incubation posture
PDA	Potential Development Area
PRISM	Program for Regional and International Shorebird Monitoring
Productive site	a nest site where at least one nestling was raised to an advanced stage of development (>25 days of age) and was known or assumed to have fledged
Raptor	Birds of prey including hawks, eagles, falcons, and owls. Common raven is considered a functional raptor based on similar nesting preferences to other true raptor species in the Arctic.
RSA	Regional Study Area (terrestrial)
SARA	*Species at Risk Act* (2002) - A Canadian federal statute which is designed to meet one of Canada's commitments under the International Convention on Biological Diversity. The goal of the Act is to protect endangered or threatened organisms and their habitats. It also manages species which are not yet threatened, but whose existence or habitat is in jeopardy.
Slave Geological Province	A geological formation extending from Great Slave Lake to the Coronation Gulf, which lies between Victoria Island and mainland Nunavut
Standard Deviation (SD)	A statistical measure of the spread or variability of a set of data
Standard Error (SE)	A statistical measure of the spread or variability of a set of data
Topography	The configuration of a surface, including its relief and the position of its natural and person-made features
UD	Utilization distribution

Universal Transverse Mercator (UTM)	A mapping system where the standard unit of measure is the metre
Upland Bird	Passerines (with the exception of common raven, which is included as a functional raptor), shorebirds, and ptarmigan.
Waterbird	Umbrella term used to encompass all birds that exclusively use water habitat for foraging, breeding, or staging during the year
Wetland	Sites dominated by hydrophytic vegetation where soils are water-saturated for a sufficient length of time such that excess water and resulting low soil oxygen levels are principal determinants of vegetation and soil development (MacKenzie and Moran 2004)

1. Introduction

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). This report presents the results from the wildlife (Terrestrial and Marine) 2013 baseline program that was completed to support the wildlife portions of the draft Environmental Impact Statement (DEIS; Rescan 2013a).

This report details the desk-based and field inventory studies used to collect baseline data on wildlife within the Project area. These studies included a literature review for existing relevant information on wildlife and wildlife habitats within the area and a desk-based evaluation of the potential presence of species at risk (according to the federal Species at Risk Act). Field studies focused on raptors, upland breeding birds, waterbirds, carnivores and their dens, and caribou monitoring using remote digital cameras.

The overall objective of the 2013 wildlife baseline program was to characterize the avian and mammal communities within various study areas especially around the Marine Laydown Area and winter road corridors as well as areas near the Goose and George Property Areas to support the wildlife portions of the DEIS (Rescan 2013a).

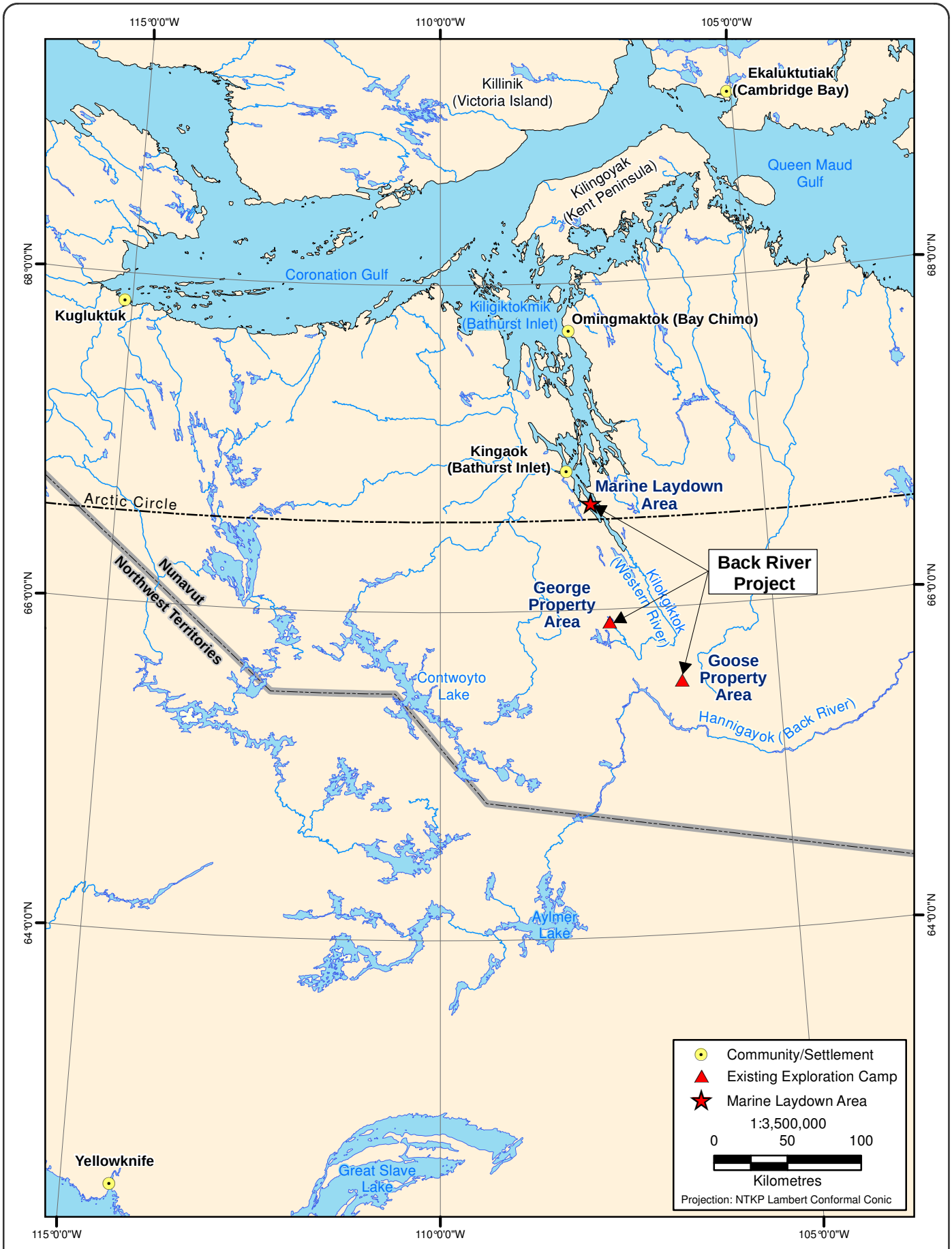


Figure 1-1

Back River Project Location

Sabina GOLD & SILVER CORP.

Rescan an ERM company

2. Background Information

2. Background Information

2.1 APPLICABLE LEGISLATION

Wildlife and wildlife habitat are protected by both federal and territorial legislation, including the Nunavut *Wildlife Act (2003), Nunavut Land Claims Agreement Act (1993a),* Canadian *Wildlife Act* (1994a), the Canada *Migratory Birds Convention Act* (1994b), the Canada *Species at Risk Act* (SARA; 2002), and the Wild Animal and Plant Protection and Regulation (1992b; Table 2.1-1).

Table 2.1-1. Relevant Acts or Regulations for Wildlife and Wildlife Habitat

Act or Regulation	Implications for Management
Nunavut *Wildlife Act* (2003)	• Identifies and defines wildlife management strategies for Nunavut, including strategies for conservation, protection and recovery of species at risk, managing nuisance wildlife, and possession of wildlife. The Act provides interpretation of approved and restricted hunting and related activities, including the possession of wildlife and enforcement that will follow should any of the Act's issued sections and corresponding regulations be contravened. • Pertaining NU *Wildlife Act* Regulations are as follows: Birds of Prey Regulations, Wildlife General Regulations, and Wildlife Licenses and Permits Regulations.
Nunavut Land Claims Agreement Act (1993a)	• Legislation that enforces the Nunavut Land Claims Agreement (NLCA; 1993b). The Nunavut Wildlife Management Board (NWMB) is established under the NLCA with the responsibility to manage wildlife and wildlife habitat in conjunction with the Government of Nunavut Department of Environment (GN DOE). • Within Section 5.2.34 of the NLCA, additional responsibilities for the NWMB are outlined, including the approval of conservation areas, wildlife management zones, wildlife management strategies, species at risk recovery plans, and designation of species of conservation concern and disseminate wildlife management information to appropriate government bodies.
Canada *Wildlife Act* (1994a)	• Identifies and defines wildlife management strategies for Canada, including strategies for managing nuisance wildlife and possession of wildlife. It provides interpretation of approved and restricted hunting and related activities including the possession of wildlife and enforcement that will follow should any of the Acts issued sections and corresponding regulations be contravened.
Canada *Migratory Birds Convention Act* (1994b)	• Prohibits the taking or killing of migratory birds, their nests, and eggs, and the deposition of harmful substances in areas frequented by migratory birds. • Species protected include waterfowl, cranes, rails and coots, shorebirds including gulls and terns, pigeons and doves, insectivorous songbirds (excluding blackbirds), seabirds, loons, grebes, herons, egrets, and bitterns.
Canada *Species at Risk Act* (2002)	• Protects wildlife on federal lands as well as the critical habitat of those species listed on the "List of Wildlife Species at Risk," and protects all SARA-listed migratory birds. • Section 137 amends the *Canadian Environmental Assessment Act* (1992a) to clarify, for greater certainty, that environmental assessments must always consider effects to listed wildlife species, their critical habitat, or the residences of individuals of that species. • Section 79(2) states "the person must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans."

(continued)

Table 2.1-1. Relevant Acts or Regulations for Wildlife and Wildlife Habitat (completed)

Act or Regulation	Implications for Management
Canada Wild Animal and Plant Protection and Regulation (1992b)	• Prohibits the import, export, and interprovincial transportation of species on the "Convention on International Trade in Endangered Species of Wild Fauna and Flora" control list; foreign species whose capture, possession, and export are prohibited or regulated by laws in their country of origin, Canadian species whose capture, possession, and transportation are regulated by provincial or territorial laws; and species whose introduction into Canadian ecosystems could endanger Canadian species.

2.2 PAST ENVIRONMENTAL STUDIES IN THE PROJECT AREA

Over the past decade, several environmental studies have been conducted within and surrounding the Back River Project area. Wildlife studies, including surveys for ungulates, carnivore dens, small mammals, raptors, and waterbirds, were conducted along the proposed road alignment between Contwoyto Lake and Bathurst Inlet and within Bathurst Inlet for the Bathurst Inlet Port and Road (BIPR) Project in 2001 and 2002 (Rescan 2007a). Additional surveys for ungulates and upland breeding birds were conducted in 2007 for the BIPR project (Rescan 2007b, 2007d). Three years of wildlife studies were conducted in the Hackett River Project area approximately 100 km to the west of the Back River Project area, including surveys for ungulates, carnivores dens, small mammals, raptors, waterbirds, and upland breeding birds in 2007, 2008, and 2012 and ungulate surveys in 2010 (Rescan 2008a, 2008b, 2011, 2013c). Wildlife baseline studies were conducted in 2007, 2011, and 2012 directly within and surrounding the Back River Project area (Gartner Lee Ltd. 2008; Rescan 2012, 2013b). Where feasible, the results of these studies are integrated into the current report.

There is a data sharing agreement between the Back River Project (Sabina) and the Hackett River Project (Xstrata) through which all the data collected for the grizzly bear and caribou baseline studies will be jointly shared in order to supplement each project's baseline reporting.

3. Study Areas

3. Study Areas

Wildlife baseline studies in 2013 were conducted within two terrestrial wildlife study areas, a Local Study Area (LSA) and a Regional Study Area, (RSA; Figure 3-1). In the marine environment, two additional study areas were designated: the marine Local Study Area (marine LSA) and the marine Regional Study Area (marine RSA; Figure 3-1).

The terrestrial LSA (hereafter in this report referred to as the LSA) was defined by a combination of sub-watershed boundaries and buffers surrounding proposed Project components, including infrastructure and connecting winter roads. A 1 to 1.5 km buffer was mapped surrounding the outer boundary of the Potential Development Areas (PDAs) associated with the Goose Property Area, George Property Area, and the Marine Laydown Area (MLA). The terrestrial RSA (hereafter referred to as the RSA) encompasses the PDAs, the LSA, and a 35 km buffer on either side of proposed Project infrastructure and winter road corridors between the three Project areas (Goose Property Area, George Property Area, and the MLA). In the marine environment, the marine LSA is defined by a 1 km buffer surrounding the shoreline where the proposed MLA is located, and a 500 m buffer on either side of the proposed winter road (marine portion only). The marine RSA encompasses the marine LSA as well as the marine areas of Bathurst Inlet, from the southern-most tip of the Inlet to approximately 15 km north of Omingmaktok and is approximately 75 km in width.

Within the terrestrial RSA, species-specific study areas were developed to direct the 2013 wildlife baseline studies for the various wildlife groups (Figure 3-1). For raptors, a Focused Raptor Survey Area was established which included the Western River watershed, the Goose PDA, and areas near Bathurst Inlet within 30 km of the proposed MLA. For upland birds, a Focused Upland Bird Survey Area and a Reference Upland Bird Survey Area were established. The Focused Upland Bird Survey Area was situated over the MLA and the Reference Upland Bird Survey Area was placed to the northwest of the Focused Upland Bird Survey Area in an area of similar habitat, but where no infrastructure is planned. Waterbird surveys included two survey strata for the spring staging survey including a Focused Survey Stratum near the MLA and a Reference Survey Stratum in an ecologically similar area south of the Focused Survey Stratum. During the remaining waterbird surveys (spring pair, summer brood, and fall staging surveys), the Focused Survey Stratum was expanded to cover a larger survey area (the MLA Focused Survey Stratum) which encompassed the MLA PDA as well as additional terrestrial habitat further from the proposed development at the MLA. Marine bird surveys were generally conducted within the marine LSA and in marine areas in Bathurst Inlet, south of Kingaok near the MLA. Carnivore den surveys were conducted within the LSA near proposed infrastructure located along the proposed winter road routes and the MLA and Goose Property PDAs, and caribou monitoring studies were conducted within the RSA.

The wildlife study areas are all located within the Southern Arctic Ecozone. Ecozones are broad scale landscape units with similar abiotic and biotic factors including climate, geography, and vegetation (Strong and Zoltai 1989; Environment Canada 2000). The Southern Arctic Ecozone extends across much of the southern portion of continental Nunavut, and is bordered by the Northern Arctic Ecozone to the north. The southern border of the Southern Arctic Ecozone is defined by a lack of full-size trees. Stunted forms of tree species, such as dwarf birch (*Betula nana*), green alder (*Alnus viridis* spp. *crispa*), and many species of willow (*Salix* sp.) grow throughout the ecozone, with stunted white (*Picea glauca)* and black spruce (*P. mariana)* present more towards the south. Much of the area is dominated by sedge fens, cottongrass tussock tundra, and heath. Sparsely vegetated areas, such as the wind-swept crests of eskers, are also common (NRC 2007).

PROJECT # 0194096-0005 GIS # BAC-23-299 December 17 2013

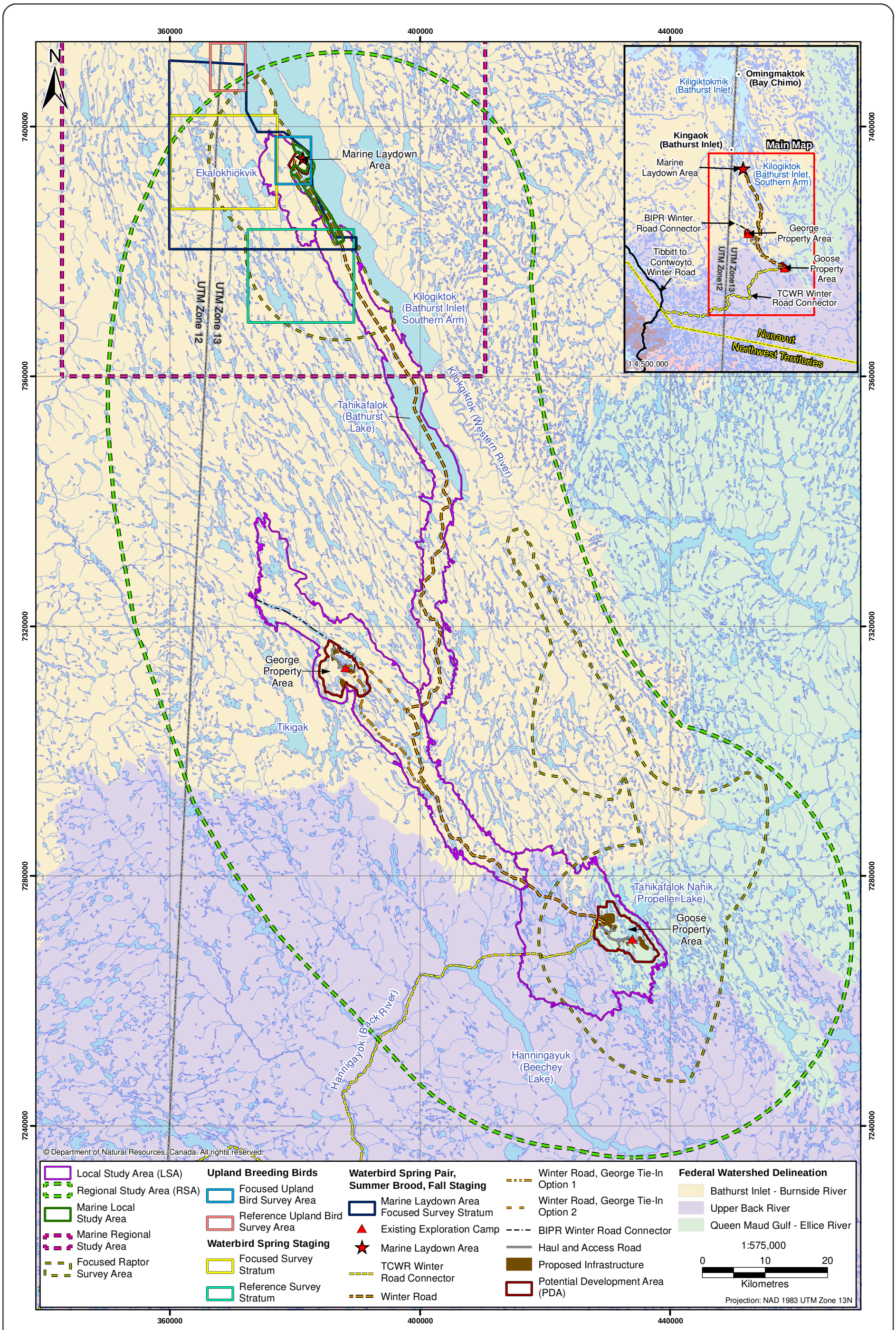


Figure 3-1

Sabina GOLD & SILVER CORP.

Wildlife Baseline Study Areas, Back River Project, 2013

Figure 3-1

Rescan an ERM company

4. Species of Conservation Concern

4. Species of Conservation Concern

A desk-based literature and database search was conducted to develop a list of wildlife species of conservation concern that potentially occur within the RSA and marine RSA. The likelihood of occurrence was based on distribution and habitat requirements according to multiple sources (Sibley 2000; National Geographic Society 2002; Alderfer 2006; F. A. Reid 2006; Richards and White 2008; NatureServe 2011). The likelihood of occurrence was placed into three categories of each potentially occurring species: likely, possible, and unlikely (Table 4-1).

Table 4-1. Criteria for Assessing the Likelihood of Occurrence in the Wildlife Study Areas

Category	Definition and Criteria for Assessment[1]
Likely (L)	Species that are likely to occur. Species in this category have overlapping seasonal ranges with the RSA and/or marine RSA, are known to occur in the Southern Arctic Ecozone, and seasonal habitat requirements are met within the RSA and/or marine RSA.
Possible (P)	Species that possibly occur. Species in this category may or may not have overlapping seasonal ranges with the RSA and/or marine RSA, seasonal habitat requirements may or may not be met within the either study area, but have been detected in Southern Arctic Ecozone or within two ecozones to the north of the in Southern Arctic Ecozone (Northern Arctic, Arctic Ocean). Many migratory bird species can be placed in this category as species are expected to pass over or near the RSA and/or marine RSA during spring and fall migrations, and as such, their presence would be possible but infrequent. In addition, species where the northern edge of their range overlaps within the Southern Arctic Ecozone are placed in this category as their presence would also be possible but infrequent.
Unlikely (U)	Species that are unlikely to occur. Species in this category have seasonal ranges that occur near the RSA and/or marine RSA (within 150 km) and may or may not have been detected in either the Southern Arctic, Northern Arctic, or Arctic Ocean ecozones. However, seasonal habitat requirements are not met within the RSA and/or marine RSA. Species with low population sizes are also placed in this category.

[1] *Likelihood that species occur in the region was based upon range maps and ecological information according to various sources (Sibley 2000; National Geographic Society 2002; Alderfer 2006; F. A. Reid 2006; Richards and White 2008; NatureServe 2011).*

The conservation status of potentially occurring wildlife species was assessed according to territorial (Canadian Endangered Species Conservation Council; CESCC), federal (Committee on the Status of Endangered Wildlife in Canada [COSEWIC]; *Species at Risk Act*), and international (NatureServe; International Union for Conservation of Nature [IUCN]) assessment bodies (Appendix 4-1). Species are ranked under the General Status Programme administered by the Government of Nunavut, Department of Environment. However, these rankings have not yet been reviewed by the NWMB and so remain in draft form. Thus the CESCC designations for Nunavut were used in this report to assess the status of wildlife in the territory (CESCC 2010). Species of conservation concern include species or populations that are: 1) territorially ranked as At Risk, May Be At Risk, or Sensitive, 2) classified as Endangered, Threatened, or Special Concern, as designated by COSEWIC, 3) on Schedule 1 of *SARA*, 4) globally ranked as Imperilled or Vulnerable by NatureServe, or 5) listed as Critically Endangered, Endangered, Vulnerable, or Near Threatened by IUCN.

A total of 108 birds and 45 mammals potentially occur within the RSA and/or marine RSA (Appendix 4-2). Of these species, 49 (37 birds and 13 mammals) are identified as species of conservation concern (Appendix 4-2). Overall, 35 species of conservation concern were considered likely occurring or possibly occurring within the study areas. Twenty of these species (18 birds and 2 mammals) were identified in

the terrestrial RSA and/or marine RSA during studies conducted in 2010, 2011, and 2012, and confirmed in these areas during baseline studies conducted in 2013 (Table 4-2). Dolphin Union caribou, listed as special concern on Schedule 1 of *SARA* were also likely recorded in the northern portion of the terrestrial RSA by remote cameras between September 2012 and April 2013, however due to limitations of species identification by remote camera and lack of collar data for the Dolphin Union herd during this time, it was not possible to verify herd designation.

Table 4-2. Wildlife Species of Conservation Concern Detected in the RSA and MRSA

		Conservation Status[1]				
Common Name	**Scientific Name**	**NU Status**	**COSEWIC**	**SARA**	**Global Rank**	**IUCN Red List**
Birds						
American golden-plover	*Pluvialis dominica*	Sensitive			G5	Least Concern
American pipit	*Anthus rubescens*	Sensitive			G5	Least Concern
American tree sparrow	*Spizella arborea*	Sensitive			G5	Least Concern
Arctic tern	*Sterna paradisaea*	Sensitive			G5	Least Concern
Common eider*	*Somateria mollissima*	Sensitive			G5	Least Concern
Glaucous gull*	*Larus hyperboreus*	Sensitive			G5	Least Concern
Golden eagle	*Aquila chrysaetos*	Sensitive	NAR		G5	Least Concern
Gyrfalcon	*Falco rusticolus*	Sensitive	NAR		G5	Least Concern
Harris's sparrow	*Zonotrichia querula*	Sensitive			G5	Least Concern
Hoary redpoll	*Carduelis hornemanni*	Sensitive			G5	Least Concern
Least sandpiper	*Calidris minutilla*	Sensitive			G5	Least Concern
Long-tailed duck	*Clangula hyemalis*	Sensitive			G5	Least Concern
Peregrine falcon	*Falco peregrinus*	Secure	TH/SC	1/3	G4	Least Concern
Red-necked phalarope	*Phalaropus lobatus*	Sensitive			G4G5	Least Concern
Rough-legged hawk	*Buteo lagopus*	Sensitive	NAR		G5	Least Concern
Semipalmated sandpiper	*Calidris pusilla*	Sensitive			G5	Least Concern
Short-eared owl	*Asio flammeus*	Sensitive	SC	3	G5	Least Concern
White-crowned sparrow	*Zonotrichia leucophrys*	Sensitive			G5	Least Concern
Mammals						
Grizzly bear	*Ursus arctos*	Sensitive	SC		G4	Least Concern
Wolverine	*Gulo gulo*	Secure	SC		G4	Vulnerable
Caribou, Barren-ground (Dolphin and Union population)	*Rangifer tarandus groenlandicus*	Secure	SC	1	G5	Least Concern

[1] *See Appendix 4-1 for Conservation Status definitions.*
[2] *See Table 4-1 for Likelihood of Occurrence definition.*
* *Species that only have the potential to occur within marine areas in Bathurst Inlet and the Arctic ocean.*

5. Raptors

Rescan™
an ERM company

5. Raptors

5.1 INTRODUCTION

Breeding raptors (i.e., eagles, falcons, hawks, and owls) can serve as indicators of the effects of human activities on ecosystem health because they are predators in the upper levels of the food chain and have large home range sizes. These life requisite characteristics render them more sensitive to environmental alterations and disturbances (Steenhof et al. 1999). Legislation for the protection of raptor species prevents destruction and/or disturbance to the individual and their nests under the Nunavut *Wildlife Act* (2003).

Five species of cliff nesting raptors are expected to occur in the Project area: peregrine falcon (*Falco peregrinus tundrius*), gyrfalcon (*Falco rusticolus*), rough-legged hawk (*Buteo lagopus*), golden eagle (*Aquila chrysaetos*), and bald eagle (*Haliaeetus leucocephalus*). Common ravens (*Corvus corvax*) are also included in this baseline study. Common ravens are considered to be 'functional raptors' because they use similar food and breeding resources as cliff-nesting raptors, and construct stick nests that are used by falcon species for nesting (Poole and Bromley 1988a; Poole 2011). Four of these cliff-nesting species are of conservation concern. The golden eagle, gyrfalcon, and rough-legged hawk are listed as Sensitive in Nunavut by the Canadian Endangered Species Conservation Council (CESCC). The peregrine falcon *tundrius* subspecies, while listed as Secure in Nunavut by the CESCC (2010), is federally listed on Schedule 3 as a subspecies of Special Concern under the *Species at Risk Act* (SARA; Government of Canada 2011).

Three species of ground-nesting raptors likely occur in the Project area: snowy owl (*Bubo scandiacus*), short-eared owl (*Asio flammeus*), and northern harrier (*Circus cyaneus*). The short-eared owl is listed as Sensitive in Nunavut, and is also listed on Schedule 1 of *SARA* as a species of Special Concern (CESCC 2010; Government of Canada 2012).

5.2 OBJECTIVES

Surveys were conducted in 2013 to assess the relative abundance, distribution, and breeding productivity of cliff nesting raptor species within the RSA. Specifically, the objectives were to:

- identify the locations of raptor nest sites on cliffs within the RSA, especially nest sites of species of conservation concern;
- identify the locations of raptor nest sites within 1.5 km of the proposed Project infrastructure;
- conduct an occupancy survey to determine the number and spatial distribution of nest sites used by raptors for breeding in 2013;
- conduct a productivity survey to measure breeding performance, productivity, and brood size of nesting pairs;
- derive estimates of relative abundance of cliff-nesting raptors using survey results and incidental observations, including those of ground-nesting species; and
- record incidental observations of all raptor species observed in the RSA, including ground nesting species.

5.3 METHODS

In 2013, raptor survey priorities included re-surveying areas within the RSA that had received limited coverage during 2012 baseline surveys (Rescan 2013b). The Focused Raptor Survey Area for 2013 raptor surveys included the Western River watershed, the Goose PDA, and areas near Bathurst Inlet within 30 km of the proposed MLA. Three additional nest sites approximately 20 km south of the Goose Property Area PDA were re-surveyed in 2013 due to limited survey coverage in that area during 2012 raptor surveys. All suitable cliff habitat within the Focused Raptor Survey Area were searched to determine raptor occupancy at 83 unique nest sites that were previously known to be occupied by raptors (Rescan 2002; Gartner Lee Ltd. 2008; Rescan 2008b, 2012, 2013b) and to locate new raptor nest sites. Raptor occupancy surveys were conducted between late-May and early-June to capture occupancy of early and late nesting raptor species. Productivity surveys were conducted in late-July to maximize the number of raptor species that have fledged young.

Raptor surveys were conducted in cliff nesting habitat (Plate 5.3-1) within the Focused Raptor Survey Area by flying horizontally along cliff faces in a Bell 407 helicopter. If the cliff was greater than 30 m high, two flight passes were taken (one at the top level and one at the lower level) to ensure that no nests were missed. To prevent surprising nesting raptors, cliffs were approached as directly as possible. In suitable nesting habitat, observers searched for signs of raptor use (e.g., stick nests, orange lichen on cliff faces, whitewash [feces], and raptor adults, eggs, or young).

Plate 5.3-1. Raptor cliff nesting habitat within the Focused Raptor Survey Area for raptor nests, May 25, 2013.

At each occupied nest site, surveyors identified the raptor species that were occupying the nest site, and recorded the number of adults present at the nest site, and where possible the contents of the nest (eggs or young). All occupied raptor nest sites were photographed, and where possible, nest contents were also recorded by photograph. Less than one minute was spent at active nests in order to minimize disturbance to birds. The following information was also recorded at active nests and at

nearby, inactive nests within the nest site: UTM coordinates, cliff height, cliff aspect, number and substrate of nearby inactive nests, % overhang, nest substrate and height.

5.3.1 Raptor Occupancy Surveys

A raptor occupancy survey was conducted by helicopter in late-May and early-June, 2013 to identify the location of occupied nest sites within the 2013 Focused Raptor Survey Area. An occupied nest site is defined as a raptor nest where a single adult or pair of adults was observed displaying territorial behaviour during the survey, or where eggs or young were observed (Appendix 5-1; Poole and Bromley 1988b; Steenhof and Newton 2007). The presence of eggs or young was inferred at nests on which adults sat in incubation posture. The locations of new nest sites found during the May and June 2013 survey were geo-referenced using a handheld Garmin GPS Map62s (accuracy 3 to 15 m).

A nest site is defined as a traditional nesting area which may contain several alternate nests, though only one nest is used during a given year (Poole and Bromley 1988a). The database of nests recorded in the RSA in previous years (2002, 2007, 2008, 2011, 2012), were categorized into nest sites by identifying clusters of adjacent nests belonging to the same species found during previous years. For example, if an unoccupied nest site adjacent to an occupied one was subsequently occupied by another pair of the same species the following year, then these two adjacent nest sites were labelled as two distinct nest sites. A nesting territory is a confined locality within the home range of an actual or potential breeding pair, that contains one or more nest sites, defended by the occupying pair, and used to raise young by only one pair of a particular species per year (Newton 1979; Steenhof and Newton 2007). Several years of monitoring data are required to identify which nest sites (i.e., on different cliffs) belong to the same territory. Therefore, data presented in this report refer to nest sites, and not nest territories. However, the database of nest sites probably represents the majority of breeding territories found within the surveyed areas of the RSA, though some portion of nest sites may belong to the same breeding territories.

5.3.2 Raptor Productivity Surveys

A productivity survey was conducted by helicopter in late-July, 2013 to record breeding performance of pairs that had occupied nests in May and June and brood size of successful pairs. Nest sites that were occupied in May or June were re-visited in July to determine productivity (Appendix 5-2). If during July surveys, surveyors observed nest sites that had not been surveyed during the May and June occupancy surveys, breeding productivity was recorded but these data were not used for productivity estimates. However, these data were included in the calculations of mean brood size which is defined as the average number of young at nest sites where complete counts were made.

The productivity survey occurred after the fledging period for common ravens, gyrfalcons, and golden eagles and before young had either fledged or reached 80% of their average age at first flight for rough-legged hawk and peregrine falcons; the age after which nest mortality is minimal prior to first flight (Steenhof 1987). Thus, productivity was not measured for species that were surveyed prior to young being at least 80% of their fledging age (Steenhof and Newton 2007).

Breeding performance for all species was measured as the proportion of occupied nests at which breeding pairs produced young of any age that were assumed or known to be alive at the time of the productivity survey. Brood size was estimated as the average number of young present during the productivity survey, or assumed to have fledged from productive nest sites. Brood size at fledging (the average number of young produced by successful pairs) could not be calculated due to insufficient data. For all species, breeding failure was recorded at nests sites where at least one addled (dead) egg or one dead chick were observed in abandoned nests. Abandoned nests or ledges, or minimal traces of

white wash (feces) at nest sites for rough-legged hawk, golden eagle, and peregrine falcon were used to indicate nest failure, since the survey occurred prior to the fledging period for these species.

Nest success (% productive) is estimated as the proportion of the total number of occupied nest sites at which at least one young raptor fledged (Steenhof and Newton 2007). Nest success was estimated for common raven, gyrfalcon, and golden eagle only, since young of these species had reached 80% of fledging age or had already fledged by the time of the productivity survey. Empty nests of common ravens and gyrfalcons with an abundant accumulation of feces and prey remains were assumed to have fledged. Breeding failure was assumed for empty common raven and gyrfalcon nests where there was no evidence of fledging.

5.3.3 Raptor Nesting Habitat

Data on nest characteristics at nest sites was collected during the May and July surveys, where possible. Habitat data was recorded at all active and alternate nests observed at each nest site. Data was not recorded at all alternate nests observed due to logistical safety concerns or to minimize disturbance to raptors. Features of the nest site recorded include overhang percentage, nest height and aspect, and cliff height. Nest substrate (stick or ledge) was also recorded. For nests that were constructed of stick substrate, surveyors used the size of the nest and the amount of white wash to identify the raptor species that constructed the nests. For ledge nests, surveyors indicated whether nests were on grass or dirt ledges. These data were summarized to describe nest site habitat for each species.

5.3.4 Incidental Observations

Observations of raptors, including ground-nesting raptors, and their nests were geo-referenced when observed incidentally during other wildlife or environmental field inventories.

Incidental observations of raptors were also compiled from images captured by remote motion-triggered cameras placed in the RSA between August 2012 and August 2013 and used for baseline studies conducted for caribou (Chapter 9), and wolf dens (Chapter 8). For each raptor photo, the following data were recorded: date, time of day, species, number of individuals in the frame, and behaviour. The maximum count per species for each 24-hour period was determined from the photo frame with the highest count of individuals. When it was not possible to distinguish individual raptors based on plumage or other characteristics, photos of individual birds taken within the same 24-hour period were considered to be of the same individual.

5.4 RESULTS

In 2013, four of the five cliff-nesting raptor species expected to occur in the study area were observed nesting on cliff ledges during the raptor occupancy and productivity surveys: golden eagle, gyrfalcon, peregrine falcon, and rough-legged hawk. The common raven was also observed nesting on cliff ledges. The fifth raptor species that may nest on cliffs - the bald eagle - was observed incidentally during other environmental baseline surveys conducted in 2013, and recorded on remote motion-triggered cameras, but no evidence of breeding was recorded. Three ground-nesting species were also observed incidentally - the northern harrier, snowy owl, and short-eared owl. Thus, occurrence within the RSA of all five raptor species of conservation concern was confirmed - golden eagle, gyrfalcon, rough-legged hawk, peregrine falcon, and short-eared owl. In the Focused Raptor Survey Area, 64% of all known raptor nest sites surveyed were occupied and evidence of successful breeding or continued breeding was observed at 40% of these nest sites; two nest sites were observed to be within 1.5 km of proposed Project infrastructure and were located near the Goose Property Area.

5.4.1 Raptor Occupancy Survey

A total of 72 raptor nest sites were observed during occupancy surveys in the Focused Raptor Survey Area along the Western River watershed on May 21, 25, and 26, 2013 and in areas near the MLA on June 19 and 20, 2013. One additional nest observed incidentally outside of the 2013 Focused Raptor Survey Area was also included in calculations of occupancy, for a total of 73 nests. Surveyed nest sites were comprised of 44 nest sites that had been occupied by raptors in one or more years previous to 2013 and 29 nest sites found in 2013 (28 occupied nest sites, 1 unoccupied nest site with stick nests).

Results of occupancy surveys indicate that a total of 64% (n = 73) of raptor nests were occupied by four species of raptors (golden eagle, gyrfalcon, peregrine falcon, and rough-legged hawk) and the common raven in May or June 2013 (Table 5.4-1; Appendix 5-3). Occupied nest sites were found in all regions of the 2013 Focused Raptor Survey Area (Figure 5.4-1; Plates 5.4-1 to 5.4-3). Two occupied raptor nest sites (gyrfalcon and common raven) were found within the Goose Property Area PDA, near proposed Project infrastructure. An occupied rough-legged hawk nest site was found incidentally approximately 4 km outside of the George Property Area. No active nest sites were found within the PDA at the MLA.

Table 5.4-1. Number[1] and Breeding Status of Raptor Nests on Cliffs Surveyed May 21, 25, 26 or June 19 and 20, 2013

Species	Occupied					Unoccupied Inactive
	1 Adult Observed	2 Adults Observed	With Eggs	With Young	Total Occupied (May and June)	
Common raven	-	1	7	1	9	-
Gyrfalcon	2	2	5	1	10	-
Golden eagle	2	-	4	-	6	-
Rough-legged Hawk	1	2	6	-	9	-
Peregrine falcon	5	5	3	-	13	-
Total	-	-	-	-	47	26

[1] *All numbers in table columns refer to counts of nest sites.*

Plate 5.4-1. Golden eagle nest with one egg (indicated by red arrows), May 25, 2013.

Plate 5.4-2. Common raven nest with an incubating adult, May 21, 2013.

Plate 5.4-3. Gyrfalcon nest with incubating adult, May 21, 2013.

PROJECT #0194096-0005 GIS # BAC-23-271 December 10 2013

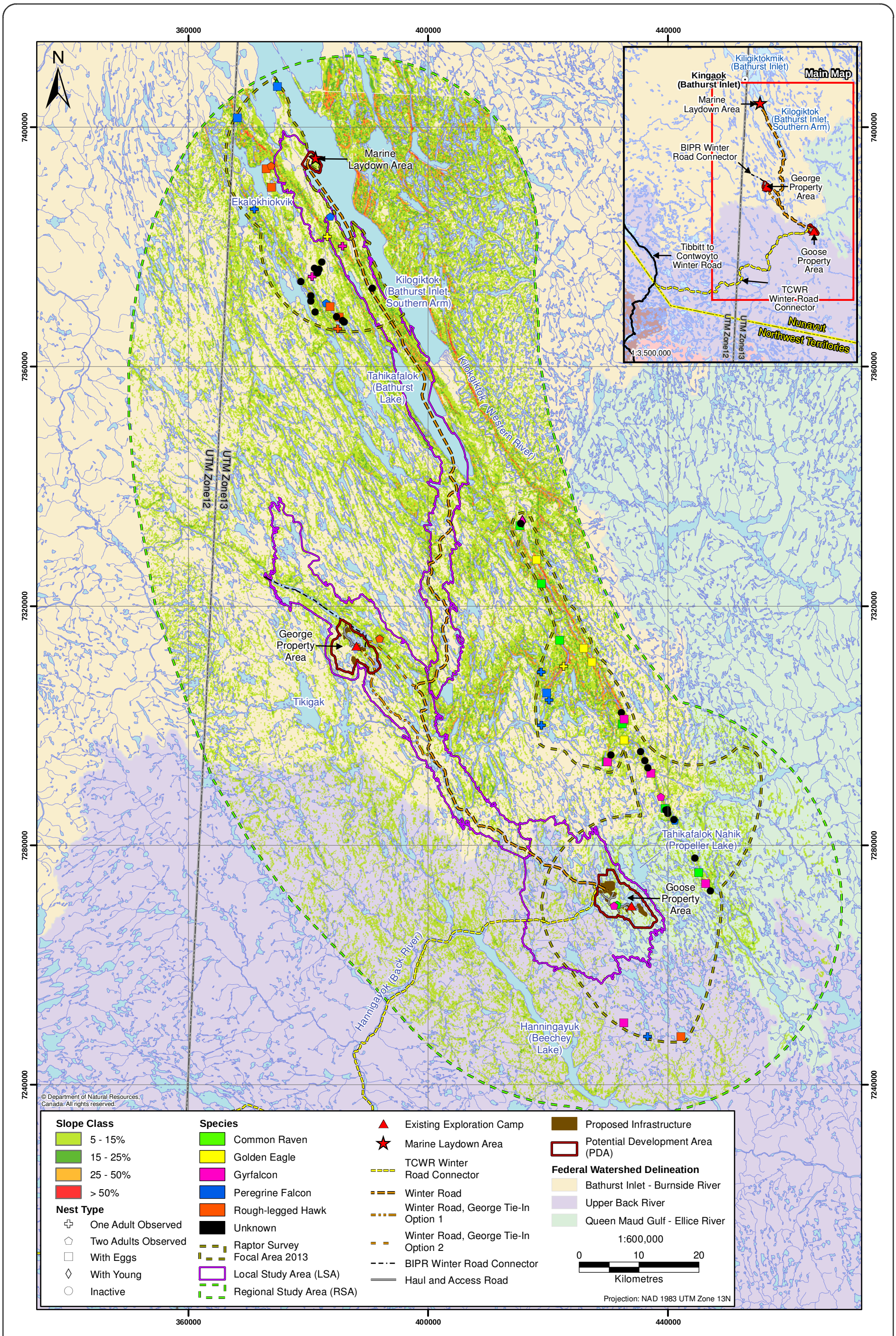


Figure 5.4-1

Sabina GOLD & SILVER CORP.

Status of Raptor Nests during Occupancy Surveys, May - June 2013

Figure 5.4-1

Rescan an ERM company

Of the 43 nest sites occupied by raptors in previous years, 19 (43%) were re-occupied by raptors in 2013. An additional nine nest sites that were within the 2013 Focused Raptor Survey Area and were known to be occupied in previous years (6 nest sites along the Western River and 3 within 30 km of the MLA) were not re-surveyed during 2013 occupancy surveys due to safety concerns or because they had not been occupied within the last two years and were therefore deemed lower priority.

Peregrine falcon was the most frequently observed species (28% of the time) at the 47 occupied nest sites. Occupied nest sites of three other species were found in approximately equal abundance: rough-legged hawk (19%), gyrfalcon (21%), and common raven (19%). Nests of the golden eagle comprised the remaining 13% of the occupied nest sites (Table 5.4-1). Although no bald eagle nest sites were observed during raptor surveys, bald eagles were observed incidentally during other baseline surveys conducted in 2013, and captured on remote motion-triggered cameras placed within the RSA.

For all raptor species except peregrine falcon, at least 50% of the surveyed nesting pairs had initiated egg-laying by the time of the occupancy survey (Table 5.4-1). For peregrine falcons, 23% of surveyed pairs were confirmed to have initiated egg-laying by mid-May or early June – at least one adult bird was observed at 10 of 13 occupied nest sites, although the presence of eggs was not confirmed at these nest sites. During the time of survey, young were observed at the nest sites of two species (common raven and gyrfalcon), accounting for 11% and 10% of occupied nest sites, respectively.

5.4.2 Raptor Productivity Survey

The breeding performance of raptors that occupied nests in late-May or early-June was determined by re-visiting these nests on July 19, 21, or 27, 2013.

During productivity surveys, an additional two occupied nest sites were observed that were identified during occupancy surveys; one nest site within the 2013 Focused Raptor Survey Area was known to be active in previous years, while the other nest site had not been observed in previous years, but was outside of the 2013 raptor survey focus area. Although both nest sites were occupied by rough-legged hawk young, these nest sites were excluded from breeding performance calculations, because their occupancy history in May/June 2013 was unknown. The additional nest that was observed incidentally near the George PDA (outside of the 2013 Focused Raptor Survey Area) was not re-surveyed during the productivity survey, due safety issues.

Evidence of successful breeding or continued breeding was observed at 19 nest sites (40% the 47 occupied nest sites re-surveyed during productivity surveys; Figure 5.4-2; Table 5.4-2; Plates 5.4-4 and 5.4-5; Appendix 5-3). Of the 19 nest sites that had successful breeding or continued breeding, productivity could not be assessed at 13 nest sites (3 rough-legged hawk nest sites and 8 peregrine falcon nest sites) because the young had not reach at least 80% of the average age at first flight.

Nest success was determined for most species that were surveyed for productivity after their fledging period had occurred, or when young were at least 80% of their average age at first flight. Nearly half of common raven (44%, n = 9) and golden eagle (40%, n = 5) pairs successfully produced at least one fledgling, whereas only 22% (n = 9) of gyrfalcon pairs were successful (Table 5.4-2). Breeding performance, measured as the proportion of nest sites occupied in spring at which pairs were raising young in July, was determined for species whose nesting period was not advanced enough at the time of the productivity survey. Breeding performance was 43% for rough-legged hawk (n = 7) and 73% (n = 11) for peregrine falcon (Table 5.4-2).

Table 5.4-2. Number[1] and Breeding Status of Raptor Nests on Cliffs Surveyed July 27, 2013

Species	Total Occupied	Breeding Failure					Breeding Performance				
		Dead Eggs	Dead Young	Assumed Failed	Total Failed	% Failed	Nests With Young	Productive[2]	Assumed Productive[3]	% Productive[4]	% Produced Young
Common raven	9	-	1	4	5	56	-	-	4	44	-
Gyrfalcon	9	-	2	5	7	78	-	-	2	22	-
Golden eagle	5	-	-	3	3	60	-	2	-	40	-
Rough-legged Hawk	7	-	-	4	4	57	3	-	-	-	43
Peregrine falcon	11	-	-	3	3	27	8	-	-	-	73

[1] *All numbers in table columns refer to counts of nest sites.*
[2] *Number of nests in which young were observed to be at least 80% of fledging age based on plumage.*
[3] *Number of empty nests for which fledging was assumed to have occurred based on evidence at the nest (e.g., abundant accumulation of feces and prey remains).*
[4] *Also referred to as nest success.*

Plate 5.4-4. Peregrine falcon nest site with four young (3 visible here), July 21, 2013.

Mean brood size was derived from all nest sites observed during the productivity surveys (including two rough-legged hawk nests that were monitored only during the productivity survey). Mean brood size was greatest for rough-legged hawk (3.6 ± 0.2, n = 5) and peregrine falcon (3.4 ± 0.3, n = 8), and lowest for golden eagles (1.5 ± 0.5, n = 8; Table 5.4-3). Sample sizes were not large enough to derive brood size estimates for common raven or gyrfalcon.

PROJECT #0194096-0005 GIS # BAC-23-270 December 10 2013

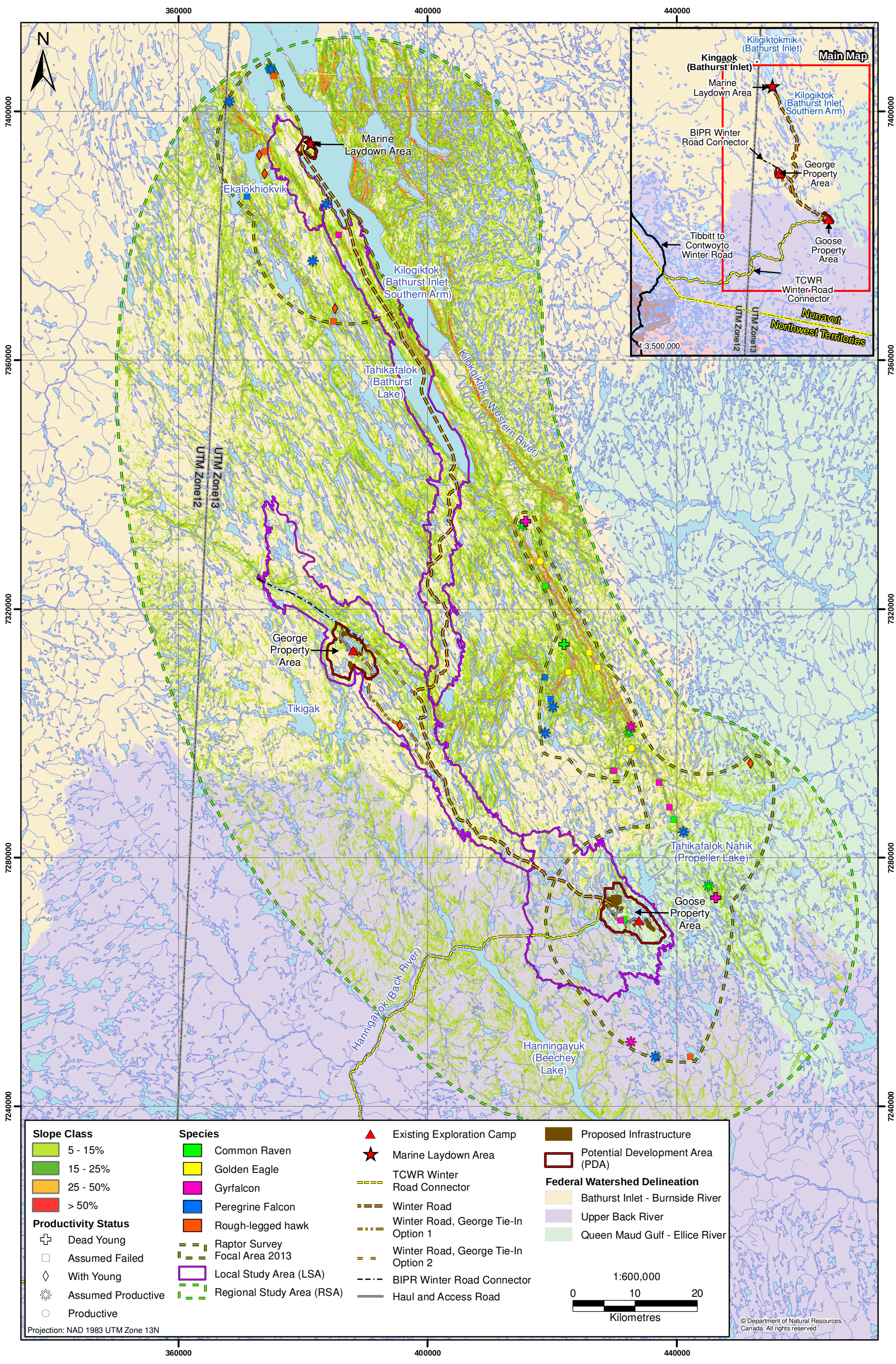


Figure 5.4-2

Sabina GOLD & SILVER CORP.

Status of Raptor Nest Sites during Productivity Surveys, July 2013

Figure 5.4-2

Rescan an ERM company

Plate 5.4-5. Golden eagle nest site with two young, July 21, 2013.

Table 5.4-3. Average Brood Size of Raptor Nests, July 27, 2013

Species	Minimum Count of Young	Maximum Count of Young	Average Brood Size (± SE)	Number of Nests
Golden Eagle	1	2	1.5 ± 0.5	2
Peregrine Falcon	2	4	3.4 ± 0.3	8
Rough-legged Hawk	3	4	3.6 ± 0.2	5

Two raptor nest sites were surveyed within 1.5 km of the Goose Property Area during the July productivity survey. These nest sites, belonging to a common raven and gyrfalcon pair, were assumed to have failed between occupancy surveys on May 21, 2013 and productivity surveys on July 21, 2013. The gyrfalcon nest site was assumed failed because the formerly active nest was filled with down feathers when visited during the productivity survey, suggesting that it had been re-occupied by a goose, since raptors do not use down to line their nest. The common raven nest site was unoccupied when visited during the productivity survey, and did not show signs of recent use (i.e., significant white wash or prey remains).

5.4.3 Raptor Nesting Habitat

All raptor nests were identified in cliff habitat. A higher proportion of nest sites were west facing (33%) compared to all other aspects. Nest heights and cliff heights were generally highest for common ravens, golden eagles, and peregrine falcons and ranged between 5 m and 45 m for nest height, and 7 m and 50 m for cliff height for all species (Table 5.4-4). Falcon and hawk nest sites had less overhang compared to common raven and golden eagles (Table 5.4-4).

Nest substrate type varied between raptor species. All gyrfalcon nests were stick nests (that had been previously used and/or built by eagles or hawks), except for one pair which nested on a dirt ledge. Golden eagles and common raven only nested in their species-specific stick nests (Plate 5.4-6). Peregrine falcons had the largest variety in nest substrate but most were associated with ledges (grassy and dirt; Table 5.4-4, Plate 5.4-7).

Table 5.4-4. Summary of Raptor Nesting Habitat, 2013

Species	No. Nests	Avg. Over Hang (%)	Ave. Nest Height (m)	Avg. Cliff Height (m)	Aspects	Substrate Type*
Common Raven	8	37	18	21.1	N, NE, SE, S, SW, W	RS
Golden Eagle	5	37	13	26	NE, E, W	GS
Gyrfalcon	8	24	12	19	NE, E, SE, SW, W	DL, GS, HS, SN
Peregrine Falcon	11	23	13	20	E, S, SW, W	DL, GL, HS, RS, SN
Rough-legged Hawk	10	21	10	16	NE, E, W	HS, RS

**RS = raven stick; GS = eagle sick; DL = dirt ledge; HS = hawk stick; SN = stick nest (species unknown); GL = grassy ledge.*

Plate 5.4-6. An occupied stick nest (indicated by red circle) with a large overhang and north-east facing aspect occupied by an incubating golden eagle (not visible), next to one alternate golden eagle nests (indicated by red arrow) at the nest site, May 21, 2013.

5.4.3.1 Incidental Detections of Raptors by Observers during Other Baseline Surveys

During other environmental baseline studies conducted in the RSA in 2013, nine species of raptors (59 field observations) were observed incidentally including: bald eagle, common raven, golden eagle, gyrfalcon, northern harrier, peregrine falcon, rough-legged hawk, short-eared owl, and snowy owl (Figure 5.4-3; Table 5.4-5; Appendix 5-4). The most commonly observed species during field surveys were the bald eagle (n = 14). All incidental raptor observations were of raptor individuals rather than nests. A total of three incidental detections of raptors were made within the Goose Property Area (n = 2) or George Property Area (n = 1). Several incidental detections of raptors were made at the northern extent of the RSA, including four raptor observations within the MLA PDA.

PROJECT #0194096-0005 GIS # BAC-23-272 December 10 2013

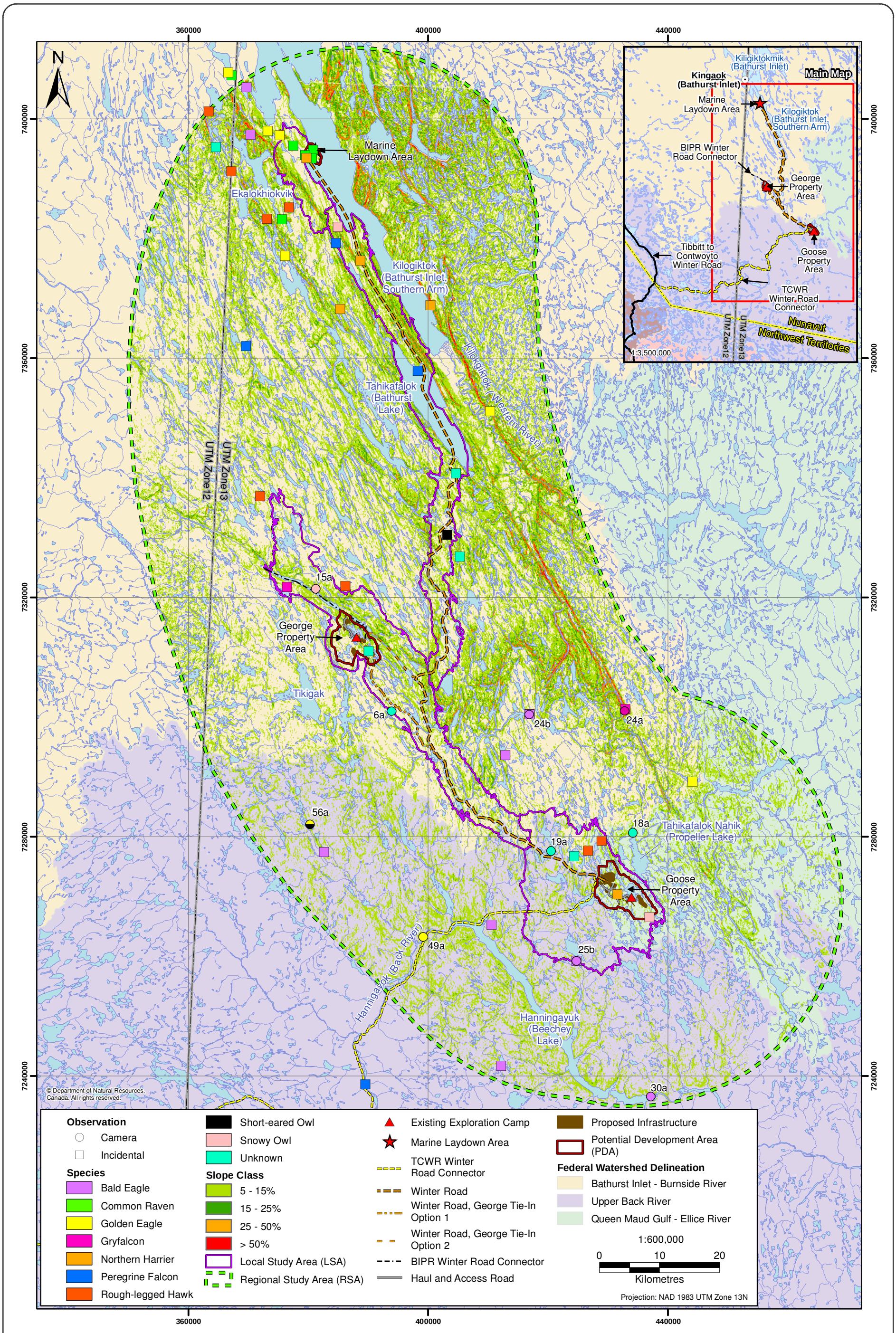


Figure 5.4-3

Sabina GOLD & SILVER CORP.

Incidental Observations of Raptors, August 2012 - August 2013

Figure 5.4-3

Rescan an ERM company

Plate 5.4-7. A dirt ledge (indicated by red arrow) with no overhang and a south facing aspect occupied by peregrine falcon (no raptor visible), June 20, 2013.

Table 5.4-5. Incidental Detections of Raptors during Other Environmental Baseline Field Surveys, 2013

Species	No. Birds Observed
Bald Eagle	14
Common Raven	7
Golden Eagle	7
Gyrfalcon	2
Northern Harrier	5
Peregrine Falcon	4
Rough-legged Hawk	8
Short-eared Owl	1
Snowy Owl	2
Unknown raptor	9
Total	**59**

5.4.3.2 Incidental Detections of Raptors by Remote Motion-triggered Cameras

Photos of raptors captured by remote motion-triggered cameras distributed throughout the RSA between August 2012 and August 2013 were included as incidental observations (Figure 5.4-3; Plates 5.4-8 to 5.4-10). Six images belonging to three raptor species (bald eagle, gyrfalcon, snowy owl) were captured by remote cameras used to monitor caribou in the RSA between August 2012 and April 2013 and seven images belonging to three raptors species (bald eagle, golden eagle, and short-eared owl) were captured by remote cameras used to monitor caribou and wolf dens between May 2013 and August 2013 (Table 5.4-6; Appendix 9-3). No images of raptors were captured on remote cameras that were placed within the Goose and George PDAs or the MLA.

Plate 5.4-8. A bald eagle observed July 11, 2013 at a camera used for remote monitoring of caribou.

Plate 5.4-9. A gyrfalcon observed April 27, 2013 at a digital camera used to remotely monitor caribou.

Plate 5.4-10. A golden eagle observed from a digital photo taken by a camera used for remote monitoring of a wolf den, June 28, 2013.

Table 5.4-6. Raptor Species Observed by Remote Cameras, 2013

Species	No. Recorded by Remote Camera	
	August 2012 – April 2013	May 2013 – August 2013
Bald Eagle	1	3
Golden Eagle	-	2
Gyrfalcon	1	-
Short-eared Owl	-	1
Snowy Owl	1	-
Unknown species	3	1
Total	**6**	**7**

5.5 DISCUSSION

Surveys for cliff-nesting raptors were conducted in the Focused Raptor Survey Area in late-May or early–June to locate and determine the number and spatial distribution of nest sites occupied by raptors along the Western River watershed, 20 km south of the Goose PDA, and within 30 km of the MLA and to indicate the number of nests located within 1.5 km of proposed infrastructure. Nest sites classified as occupied were re-surveyed in July to measure breeding performance, productivity, and brood size of nesting pairs. In total, 73 nest sites were surveyed, 47 of which were occupied by nesting pairs. Cliff nest sites were occupied by either common ravens or four species of breeding raptors; gyrfalcons, golden eagles, rough-legged hawks, and peregrine falcons, all of which are species of special concern. Three species of ground nesting raptors were also recorded incidentally during other baseline studies conducted in the RSA in 2013.

In 2013, a total of 64% of all nest sites surveyed (n = 73) were determined to be occupied by raptors. Baseline work in 2012 that surveyed approximately the same number of nest sites (67) in areas within 30 km of the Goose and George PDAs resulted in similar (59%) occupancy rates (Rescan 2013b). The peregrine falcon was the most predominant species that was observed occupying cliff nest sites (n = 13), and the least common species recorded during occupancy studies was the golden eagle (n = 6). These results are consistent with raptor surveys completed in 2012; peregrine falcons were the most common species observed at occupied nest sites within 30 km of the Goose and George PDAs, and golden eagle and common raven, the least common (Rescan 2013b). During raptor surveys conducted in 2011 within 30 km of the Goose PDA, gyrfalcon were the predominate species observed at nests, while golden eagles were the least common, suggesting that there might be some species-specific changes in raptor abundance year to year, with golden eagles being consistently observed in low numbers (Rescan 2012) Two occupied nest sites (common raven and gyrfalcon) were observed within the Goose Property Area PDA, and were within 1.5 km from proposed Project infrastructure. Studies have shown that nesting raptors have been observed to abandon nests or decrease nest attendance due to disturbance from human activities (Richardson and Miller 1997).

Nearly one half (43%, n = 44) of previously occupied nest sites were re-used by raptors in 2013. This re-use rate of nest sites is similar to occupancy rates of nesting territories observed elsewhere in the Arctic (e.g., 43% at cliff sites within 30 km from the Goose and George Property Areas (Rescan 2013b) (Rescan 2013b); 41% in Alaska, (Bente 2011). Cliff nesting raptors in the Arctic re-use nest sites for decades, centuries, and millennia (Burnham, Burnham, and Newton 2009). Thus, monitoring occupancy rates over time can provide an index of the number of pairs that attempt to breed in a given year (Selas and Kalas 2007) and an index of the breeding population. Either index can be used to measure the health of raptor populations (Steenhof and Newton 2007).

Breeding success (known or assumed), or evidence of continued breeding (e.g., adult and/or live young present at the nest site) was observed at 19 of 47 nest sites that were active during occupancy studies. At the time of productivity survey rough-legged hawk and peregrine falcon young had not advanced sufficiently to determine whether pairs would be successful in fledging at least one young, however young of all other species had reached at least 80% of their average age of fledging (age at which nest mortality is unlikely to occur), allowing for breeding productivity to be inferred. Other studies that assessed raptor productivity in the central Arctic found evidence that mean fledge data for peregrine and rough-legged hawks was in mid-August, later than eagles, ravens, and gyrfalcon (Poole and Bromley 1988a). Common raven and golden eagle nest sites had higher nest success (44% and 40%, respectively) compared to gyrfalcon (22%). Nesting success measures for common raven (50%) and golden eagle (33%) was similar in 2012 during productivity surveys that occurred in late July (50% and 33%, respectively). Although the timing of productivity surveys was too early to assess the nesting success of two raptor species (peregrine falcon and rough-legged hawks), productivity surveys were well timed to capture the known or assumed productivity of the other species of raptors assessed.

Weather can impact hunting availaiblity for nesting pairs, which can have influence feeding rate of young (Cavé 1968). For many Arctic-breeding raptor species, breeding productivity has been found to fluctuate annually with prey availability (reviewed in Mcintyre and Schmidt 2012). For example, breeding productivity of rough-legged hawks in Bathurst Inlet was positively correlated with lemming abundance (Poole and Bromley 1988a). In the current study, the average brood size in July for golden eagle and rough legged hawks was 1.5 ± 0.5 and 3.6 ± 0.2 young, respectively. For peregrine falcons, average brood size was 3.4 ± 0.3 young, although young were not advanced enough at the time of survey to assume they would fledge or fail. Average brood sizes experience in 2013 fall within the expected range for peregrine falcons measured from 1982 to 2009 in Rankin Inlet, Nunavut, (Franke et al. 2010; 1.15 ± 0.62 young fledged per pair of that attempted to breed each year) and assumptions of peregrine

falcon productivity at George and Goose Property Areas in 2012 (1.15 young fledged per occupied nest; Rescan 2013b) suggesting that 2013 was an average year for peregrine falcon productivity.

Habitat information was collected during the nest surveys too determine nest site selection characteristics by raptor species. Overall, raptor nests were generally built on cliffs between 16 m to 26 m high and were west facing. Unlike the other raptor species surveyed, peregrine falcons do not build nests with sticks, but rather use stick nests built by other species (hawks or eagles) or grass and dirt ledges; gyrfalcons on occasion will use similar nesting behavior (Burnham, Burnham, and Newton 2009). The majority of peregrine falcon nests in this study were found on exposed cliff ledges with very little overhang, while those of gyrfalcons were primarily in sheltered stick nests, most of which were likely built by eagles or hawks (Burnham, Burnham, and Newton 2009). Other studies in the central Arctic have found that most gyrfalcon (68%) and raven (87%) nest sites had complete (100%) overhangs, while peregrine falcon nest sites had little overhang (on average 9% overhang; Poole and Bromley 1988a). Overhang is an important habitat characteristic, especially for gyrfalcons that initiate breeding early in the year when weather can limit breeding productivity (reviewed in Cade and Bird 2011). Nest flooding and exposure to cold and wet conditions has caused nest failure for peregrine falcons breeding in Rankin Inlet, suggesting that weather and precipitation can influence productivity at exposed nest sites, particularly at nest sites with little overhang (Franke et al. 2010).

Incidental observations of raptors were compiled from field observations collected during additional baseline studies conducted in the RSA in 2013 and from remote motion-triggered cameras that were placed in the RSA to monitor caribou, and wolf dens. Field personnel recorded 59 raptor individuals and remote motion-triggered cameras recorded images of 13 raptor individuals. While aerial surveys are designed for the detection of cliff-nesting species, incidental sightings of raptors can infer species presence and distribution of ground nesting species. Four of the species detected incidentally were not observed during the occupancy or productivity surveys: the cliff-nesting bald eagle, and the ground-nesting northern harrier, snowy owl, and short-eared owl. The most notable incidental observations were the golden eagle and short-eared owl (two species of special concern).

6. Upland Birds

Rescan™
an ERM company

6. Upland Birds

6.1 INTRODUCTION

Avian species such as upland birds are often selected for use in baseline and monitoring programs because they represent an abundant and diverse group that can be surveyed with relative ease. These attributes facilitate the collection of data that can be analyzed statistically to provide a quantitative measure of avian population. In addition, bird monitoring can provide information on the availability of prey for larger animals that rely on birds as a food source. For the purposes of this report, upland birds are defined as passerines (with the exception of common raven, which is included in the raptor section; Chapter 5), shorebirds, and ptarmigan. Jaegers are discussed as nest predators in this section of the report but are reported in the waterbird and marine chapter of this report (Chapter 7).

6.2 OBJECTIVES

In 2013, baseline studies were designed to describe the upland bird community within the RSA, and at Focused and Reference Survey areas near the MLA PDA. Specifically, the study objectives were to:

- measure the relative abundance, distribution, and species richness of upland birds in a Focused and Reference Survey Area, with emphasis on species of conservation concern;
- within the Focused Survey Area, determine the abundance of upland birds within 300 m of proposed Project infrastructure near the MLA;
- derive estimates of bird abundance in dry versus moist to wet habitat;
- describe habitat associations of frequently-detected species;
- collect data on nest productivity and the timing of breeding; and
- summarize detection rates of nest predators of upland birds.

6.3 METHODS

6.3.1 Study Design

Field surveys for upland birds were conducted at Bathurst Inlet within the known nesting period for upland birds in Nunavut (early June to July). Surveys were conducted at a focused area within and beyond the MLA PDA, and at a reference area, approximately 15 km north of the MLA PDA where vegetation structure was similar to that within the MLA PDA. Within the PDA, two broad marine habitat types were identified for sampling prior to conducting field work: dry and moist to wet. To divide survey areas within the PDA into dry and moist to wet habitat types, available TEM mapping was reviewed. Based on mapping, the majority of the PDA was considered to consist of dry habitat (marine beach/old beach head, and marine tundra habitat), with the exception of habitat to the immediate west of the PDA, which contained marine riparian habitat indicative of a wetter moisture regime.

Two standardized survey methods were used to detect upland birds within the dry and moist to wet marine influenced habitat regimes present at the Focused and Reference Survey areas: The Program for Regional and International Shorebird Monitoring (PRISM) Plot surveys and Point Count surveys. Point count surveys were conducted because the small size of the Focused Survey Area (~ 2 x 2 km) precluded sampling the area with enough PRISM plots to achieve an adequate sample size. However, because detectability of shorebirds is generally higher in PRISM Plots, and to ensure the shorebird community was monitored, PRISM Plots were conducted over the portion of the Focused and Reference Survey areas with wetter habitat (i.e., supports more shorebirds).

6.3.1.1 Point Count and PRISM Plot Site Selection

Potential PRISM Plot and Point Count survey locations were selected using a Geographic Information Systems (GIS) database in ArcGIS 9.1. PRISM Plots (n = 35) that were each 300 m x 400 m in size (12 ha), were placed within the moist to wet habitats at the focused area. Because no previous TEM mapping information was available for the Reference Survey Area, a similarly designed study plot was overlaid at the Reference Survey Area. A random number generator of all 35 PRISM Plots was used to select a total of eight PRISM Plots to survey in the field. Four PRISM Plots were within the focused area and 4 PRISM Plots were within the reference area (Figure 6.3-1). Of the four PRISM Plots selected, two were placed within the PDA at distances greater than 300 m from proposed Project infrastructure near the MLA.

Point Counts (n = 140) were placed in dry habitat within the focused area and were spaced at least 200 m apart to account for the 3.1 hectare survey area per Point Count and to avoid multiple counts of individual birds. Because no previous TEM mapping information was available for the Reference Survey Area, a similarly designed study plot was overlaid at the Reference Survey Area. A random number generator of all 140 plots was used to select 60 Point Count stations to survey in the field. At the Focused Survey Area, Point Counts selected for survey were within the PDA (26) and just beyond the PDA (4). Within the PDA, five of the 26 Point Counts were within 300 m of proposed Project infrastructure near the MLA.

6.3.1.2 Habitat Associations

A team of two qualified surveyors conducted ground based assessments of habitat and weather conditions at each PRISM Plot and Point Count survey location. The habitat within each PRISM Plot and Point Count was classified into broad habitat types (dry vs. moist to wet) within survey boundaries, and classified further into ten small scale habitat classifications: beach, esker, rocky heath, heath hummock, short shrub, tall shrub, riparian willow, hummocky sedge meadow, moist sedge meadow, and wet sedge meadow. The overall percentage of rock and water and type of waterbody present (sedge pool, stream, river, pond, lake, and ocean) were also recorded for each survey. These habitat types were derived from descriptions of vegetation communities to which upland birds have been found to occur (e.g. Latour et al. 2008).

6.3.1.3 PRISM Plot Surveys

PRISM is a comprehensive approach to monitor shorebirds in the United States and Canada. One of the main goals of the program is to monitor population trends to address concerns over apparent declines in many shorebird populations (Bart 2006). Though the PRISM method was developed to monitor shorebirds, the approach can also be used to derive reliable data for the other types of upland birds (Matsuoka, Shaw, and Johnson 2010).

Surveys for upland birds were conducted using standard inventory methods for upland birds in tundra or grassland habitats (Ralph et al. 1993; Environment Canada 2004). A team of two qualified observers conducted surveys following the PRISM protocol outlined by the CWS (CWS 2010). Surveyors accessed PRISM Plot locations via helicopter and navigated to all PRISM plots by foot, to reduce the disturbance to upland birds. Observers systematically surveyed the plot starting from the southwest corner using handheld Garmin GPS Map62s units for navigation (advertised accuracy three to fifteen metres) and took a photo of the habitat available within the plot from each of the four plot corners. The team walked in tandem along north-south transects approximately 25 m from one another. At the end of each 400 m long transect, each observer walked 50 m east to the next transect line, and walked through the plot again. This was repeated until each observer had walked six transect lines, for a total of 12 transect lines per plot (Figure 6.3-2). The average survey time per plot was 1.6 hours (range 1.1 to 2.1 hours).

PROJECT #0194096-0005 GIS # BAC-23-298 December 12 2013

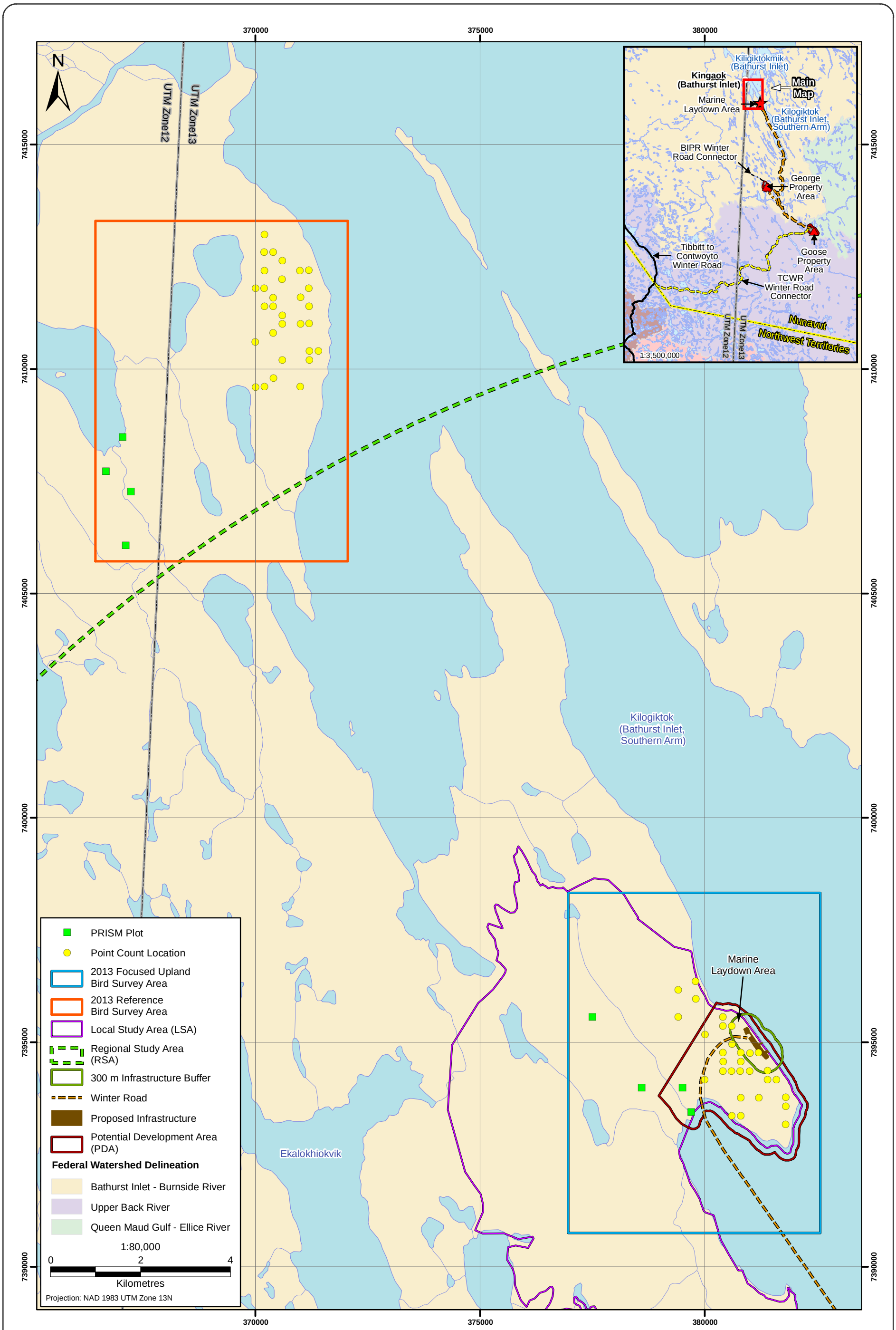


Figure 6.3-1

Sabina GOLD & SILVER CORP.

PRISM Plot and Point Count Locations for Upland Bird Surveys, 2013

Figure 6.3-1

Rescan an ERM company

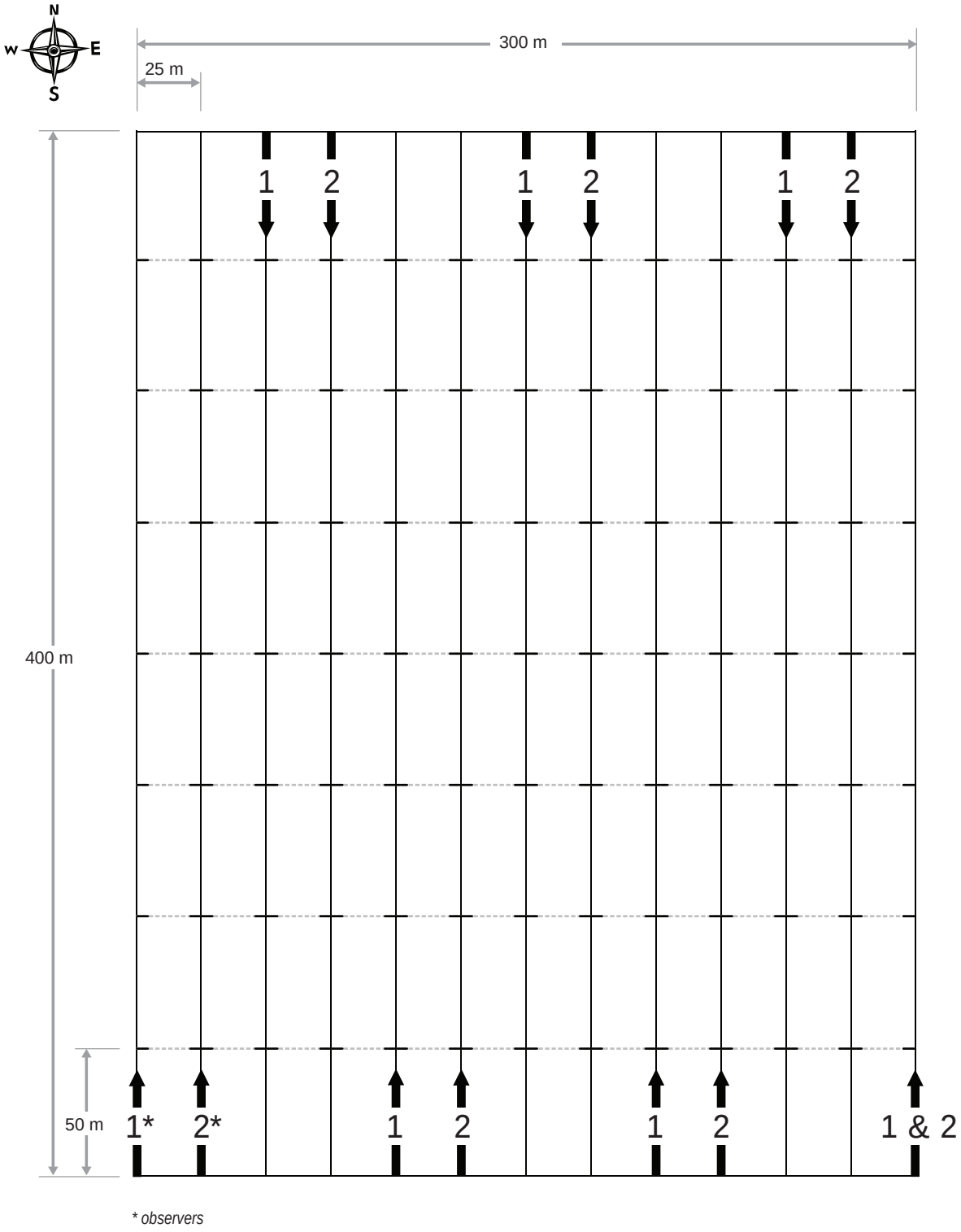


Figure 6.3-2

Schematic of PRISM Plot and Survey Methodology

Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

During each PRISM survey, the team mapped all upland birds within the plot area according to species and when possible, to sex. One observer characterized and mapped the habitat types and prominent small scale habitat features (see Section 6.3.1.2) within each plot area – each territory was judged to be centered within one mapped habitat type. Observers focused on recording the location of active nests as well as using behavioural cues to estimate the location of nest territories within the plot. Nests of upland birds are normally well hidden or camouflaged, making them difficult to find. However, observations of bird behaviour (e.g., rapid flushing from nest sites when incubating females are disturbed) can be used to find nests, or to pinpoint the approximate location of nest sites. Behavioural cues to indicate breeding bird territories included observations of close association and copulation between individuals assumed to be paired, and territorial displays among males. Singing males and territorial displays are the most common ways of identifying territories. Evidence of nesting was noted, including flushing from nests, carrying of nest material and food, alarm-calling, and distraction displays. The locations (UTM) of active nests were geo-referenced using a handheld Garmin GPS Map62s, and nest productivity (number of eggs and/or nestlings) was recorded. Territorial behaviour cues and nests were combined for each species to generate counts of the number of bird territories per PRISM Plot.

Upland birds that flew over, occurred in flocks, or were seen or heard outside PRISM Plots were recorded as 'incidentals' and were not included in upland bird data analyses. Upland birds observed during other baseline environmental work conducted for the Project in 2013 were also reported as 'incidentals' and reported in Appendix 5-4. Detections of nest predators (gulls, ravens, jaegers, and foxes) made during PRISM Plot surveys are reported in Section 6.4.5. Observations of all other bird and mammal species recorded during PRISM surveys are reported as 'incidentals' in respective sections of this report.

6.3.1.4 Point Count Surveys

Point Count surveys were conducted according to approved survey standards for other areas in Canada (RIC 1999). Survey points were visited by surveyors between 730 and 1300 during the summer solstice, when days are at their longest and there are little to no periods of darkness within a 24-hour period. Surveyors accessed Point Count survey locations via helicopter and navigated to all Point Count survey locations by foot, to reduce the disturbance to upland birds. After collecting habitat and weather information, and taking a photo of the habitat in all four cardinal directions from the survey point, surveyors allowed bird activity to settle for two minutes after arrival, and then conducted a five-minute point count. All birds seen or heard during the five-minute period were recorded, as well as their distance and location with respect to the observer. Detections were noted as visual, song, call, or aerial display. Distances were measured using a laser range finder to the nearest meter for birds detected within 30 m. Distances were estimated to the nearest 10 m for birds estimated to be 30 to 80 m away. Each territory was judged to be centred within one mapped habitat type. Birds that were detected flying over stations or that were detected before or after the five minute point count were also recorded as being outside of the survey boundary. The presence of nest predators (gulls, jaegers, raptors, and fox) and flocks of birds seen before, during, or after the surveys were also reported.

Upland birds that were observed incidentally while travelling between survey locations, that flew over, occurred in flocks, or were seen or heard outside Point Counts were Upland birds observed during other baseline environmental work conducted for the Project in 2013 were also reported as 'incidentals' and reported in Appendix 5-4. Detections of nest predators (gulls, ravens, jaegers, and foxes) made during Point Count Surveys are reported in Section 6.4.7. Observations of all other bird and mammal species recorded during Point Count Surveys are reported as 'incidentals' in respective sections of this report.

6.3.2 Data Summary and Analysis

6.3.2.1 PRISM Plot Surveys

To characterize the distribution and species composition of the upland bird community, the total number of species detected (i.e., species richness), total counts of upland bird territories, and the territory counts per hectare were averaged and compared among broad scale habitat type (dry and wet to moist) present within the Focused and Reference Survey areas. To show spatial patterns in the distribution of species of conservation concern, territory counts of species of conservation concern per hectare were averaged for PRISM Plots. The hoary redpoll, a species of conservation concern, was excluded from this analysis because it is difficult to distinguish this species from the common redpoll, which is not a species of conservation concern.

For individual species, relative abundance for each species was measured as the frequency of occurrence: the proportion of PRISM plots with the detection of each species out of the total number of PRISM plots surveyed. In addition, species territory counts per hectare were compared between Focused and Reference Survey areas. Small scale habitat associations (see Section 6.3.1.2) for all species detected were described by tallying the species territory counts and comparing the relative proportion of small scale habitat types in which they occur. These tallies describe the relative habitat associations for species, but may not reflect habitat selection per se, because the tallies reflect the sampling frequency rather than availability of each habitat type.

6.3.2.2 Point Count Surveys

Similar methods were used to characterize the distribution and species composition of the upland bird community as used for PRISM Plot surveys (see Section 6.3.2.1). The distribution of commonly detected species was also quantified by calculating average territory counts within dry and moist to wet plots. In addition to these methods, relative abundance, species richness, and territory counts per hectare within the Focused Survey Area were compared between those which occurred within 300 m of the proposed Project infrastructure near the MLA, and those that were beyond 300 m of the proposed Project infrastructure.

6.3.3 Incidental Observations of Upland Birds

Incidental observations of upland birds were geo-referenced outside of PRISM Plot and Point Count Surveys and opportunistically during other wildlife surveys and baseline studies conducted by other disciplines in the RSA during 2013. Whenever possible, upland birds were identified to the species level, sex, and age (young vs. adult). Incidental data are useful to determine the presence of species in the area, but cannot be used for assessment and monitoring because the observations cannot be standardized by effort. Thus, incidental observations were summarized by not included in any data analyses.

6.4 RESULTS

6.4.1 Summary

In total, 18 species of upland birds were recorded within and outside of PRISM Plot or Point Count surveys, or incidentally in 2013 (Sections 6.4.2 to 6.4.10; Appendix 5-4; Appendices 6-1 to 6-5). This represent 59% (n = 27) of the total number of upland bird species that are likely to breed regularly within the RSA (Appendix 4-2). Species richness was similar at the Focused and Reference Survey areas during Point Counts, but higher at the Reference Survey Area during PRISM Plot surveys. Species abundance was generally similar at Focused and Reference Survey areas. Overall, six confirmed species of conservation concern listed as sensitive in Nunavut were detected, including American golden plover, American tree sparrow, Harris's sparrow, least sandpiper, white-crowned sparrow, and hoary redpoll. Two species of conservation concern were observed within 300 m of the proposed Project infrastructure:

American golden plover and white-crowned sparrow. Both of these species were also detected in the reference area. The most common species observed during PRISM Plot surveys was the savannah sparrow, while Lapland longspur was the most common species observed during Point Count surveys. On average there were a similar number of species and territories associated with the dry habitat type compared to moist to wet habitat type, although most shorebird species were predominantly associated with small scale habitats within the moist to wet habitat type and some songbird species were predominantly associated with small scale habitat within the dry habitat types. Nest predators were detected at a rate of approximately one predator every two hours; the majority of predators were detected in the Focused Survey Area. Nests of five species of upland birds were observed during surveys and average clutch size across these species was 4.13 ± 0.60 eggs per nest.

6.4.2 Survey Effort

Eight PRISM Plots and 60 Point Counts were surveyed from June 13 to June 18, 2013 (Figure 6.3-1; Appendices 6-1 and 6-2). Four PRISM plots and 30 Point Counts were surveyed in the Focused Survey Area and four plots and 30 Point Counts were surveyed in the Reference Survey Area. Within the Focused Survey Area and Reference Survey Area, both dry (n = 10 in Focused and n = 7 in Reference) and moist to wet (n = 22 in Focused and n = 25 in Reference) habitats were surveyed (Table 6.4-1). A total of four additional mixed habitats were also surveyed; two mixed habitats were within the Focused Survey Area and two were in the Reference Survey Area. All PRISM plots surveyed contained moist to wet habitat; Point Counts contained dry, moist to wet, and mixed habitat.

Table 6.4-1. Number of Point Counts and PRISM Plots Surveyed at Focused and Reference Survey Areas, 2013

Survey	Survey Areas	Habitat	Number of Surveys
Point Count	Focused	Moist to Wet	18
		Dry	10
		Total	28
	Reference	Moist to Wet	21
		Dry	7
		Total	**28**
PRISM plots	Focused	Moist to Wet	4
		Dry	0
	Reference	Moist to Wet	4
		Dry	0
		Total	**8**
		Total	**64**

Note: Does not include four mixed plots that were surveyed by point count (two Reference, two Focused Survey Area).

6.4.3 Relative Abundance and Species Observed

6.4.3.1 Relative Abundance and Species Observed within PRISM Plots

A total of 170 individuals and 132 territories belonging to 11 species of upland birds were detected within PRISM Plots (Table 6.4-2; Appendix 6-4). Six individuals detected during PRISM Plot surveys were not included in territory counts because they were observations of groups of birds or lone individuals that did not show signs of territorial behaviour. An additional 44 individuals including 8 species (Wilson's snipe, American robin, American tree sparrow, Harris's sparrow, Lapland longspur, white-crowned sparrow, savannah sparrow, and redpoll species) were counted outside survey boundaries (Table 6.4-2; Appendix 6-5) before during, or after conducting PRISM Plot surveys, and were therefore not included in further analyses.

Table 6.4-2. Upland Birds Counted during PRISM Plot and Point Count Surveys, 2013

			Within Surveys - Territories							Outside Surveys - Individuals		
			PRISM plots			Point Counts						
Group	Species	Scientific Name	Focused Area (N=4)	Reference Area (N=4)	Total (N=8)	Focused Area (N=30)	Reference Area (N=30)	Total (N=60)	Total	PRISM Plots	Point Counts	Total
Ptarmigan	Willow Ptarmigan	*Lagopus lagopus*	-	-	-	-	-	-	0	-	1	0
Total Ptarmigan			-	-	-	-	-	-	0	0	1	1
Shorebird	**American golden plover**	*Pluvialis dominica*	-	-	-	3	2	5	5	-	3	3
	Least Sandpiper	*Calidris minutilla*	1	3	4	-	-	-	4	-	-	
	Semipalmated Plover	*Charadrius semipalmatus*	1	-	1	-	-	-	1	-	2	2
	Semipalmated Sandpiper	*Calidris pusilla*	-	-	-	-	-	-	0	-	1	1
	Wilson's Snipe	*Gallinago delicata*	-	1	1	-	-	-	1	4	1	5
	Unknown Shorebird spp.		-	2	2	-	2	2	4	1	4	5
Total Shorebird			2	6	8	3	4	7	15	5	11	16
Songbird	American Robin	*Turdus migratorius*	-	-	-	-	-	-	0	1	1	2
	American Tree Sparrow	*Spizella arborea*	17	12	29	14	5	19	48	9	15	24
	Harris's sparrow	*Zonotrichia querula*	-	-	-	-	1	1	1	1	-	1
	Horned Lark	*Eremophila alpestris*	-	2	2	8	10	18	20	-	10	10
	Lapland Longspur	*Calcarius lapponicus*	10	16	26	36	40	76	102	5	25	30
	Redpoll Spp.**	*Carduelis* spp.	5	3	8	-	2	2	10	7	42	49
	Savannah Sparrow	*Passerculus sandwichensis*	28	21	49	23	22	45	94	11	19	30
	White-crowned Sparrow	*Zonotrichia leucophrys*	-	9	9	7	4	11	20	4	23	27
	Yellow Warbler	*Setophaga petechia*	-	1	1	-	-	-	1	-	2	2
Total Songbird			60	64	124	88	84	172	296	38	137	175
Total of All Species			**62**	**70**	**132**	**91**	**88**	**179**	**311**	**43**	**149**	**192**

** Species of Conservation Concern shown in bold type.*

*** Hoary ("Sensitive Species") and common redpolls were visually confirmed to be present in the survey areas, but these species are difficult to distinguish by sound. Counts of redpolls were summed across detections for which species identification was and was not confirmed.*

Species richness was lower in the Focused Survey Area relative to the Reference Survey Area, but the abundance of birds (territory counts) was similar between the two areas (Table 6.4-2; Figure 6.4-1). PRISM Plots within the Focused Survey Area supported an average of four species and 15.50 ± 1.66 breeding territories (1.29 breeding pairs per hectare), whereas PRISM Plots within the Reference Survey Area supported an average of six species and 17.50 ± 3.57 territories (1.46 breeding pairs per hectare). The majority of territories detected belonged to songbirds relative to shorebirds (Table 6.4-2). During PRISM surveys, one species (semipalmated plover) was recorded at the Focused Survey Area only, and four species (Wilson's snipe, yellow warbler, white-crowned sparrow, and horned lark) were only recorded at the Reference Survey Area. An unknown sandpiper species was also recorded at the Reference Survey Area.

During PRISM surveys, nine species of songbirds were observed, and five shorebird species (Table 6.4-2). The most common species observed was savannah sparrow (Figure 6.4-2). The number of territories detected per hectare was similar between the Focused Survey Area and Reference Survey Area (1.29 and 1.46, respectively). Three songbird species - Lapland longspur, savannah sparrow, and American tree sparrow - comprised 79% (104 of 132) of all upland bird territories observed. The savannah sparrow was the most abundant and widely distributed species detected across PRISM surveys; it was detected during all PRISM Plot surveys and comprised 37% of all territory counts (Table 6.4-3). Shorebirds comprised only 6% (8 of 132 territories) of all territories detected during PRISM Surveys (Table 6.4-3).

6.4.3.2 Relative Abundance and Species Observed during Point Count Surveys

A total of 200 individuals and 179 territories belonging to nine species of upland birds were observed during Point Count surveys (Table 6.4-2; Appendix 6-4). Five individuals detected during Point Count surveys were not included in territory counts because they were observations of groups of birds or lone individuals that did not show territorial behavioural signs. An additional 149 individuals and 13 additional species (willow ptarmigan, American golden plover, semipalmated plover, semipalmated sandpiper, Wilson's snipe, American robin, American tree sparrow, horned lark, Lapland longspur, savannah sparrow, white-crowned sparrow, yellow warbler, and redpoll species) were counted outside of Point Count survey boundaries (Table 6.4-2; Appendix 6-5), before, during, or after conducting surveys, and were not included in further analyses.

Species richness was similar in the Focused Survey Area relative to the Reference Survey Area (Table 6.4-2; Figure 6.4-1). On average, Point Counts within the Focused Survey Area supported 2.13 ± 0.16 species, and at the Reference Survey Area, supported 2.07 ± 0.17 species. During Point Count surveys, two species (one redpoll spp. and Harris's sparrow) were recorded at the Reference Survey Area only and not at the Focused Survey Area. The majority of territories detected belonged to songbirds relative to shorebirds (Table 6.4-3).

The number of territories detected per hectare was similar between Focused and Reference Survey areas (Table 6.4-2). The Focused Survey Area supported an average of two species and 3.03 ± 0.23 breeding territories (0.98 breeding pairs per hectare) and Reference Survey Area supported an average of two species and 2.93 ± 0.27 territories (0.95 breeding pairs per hectare). The Lapland longspur was the most abundant and widely distributed species detected across Point Count surveys; it occurred across 79% of all Point Counts and comprised 42% of all territory counts (Figure 6.4-2; Table 6.4-3). Shorebirds detected during Point Count surveys were relatively infrequent, comprising only 4% (6 of 166 territories) of all territories detected (Table 6.4-3).

PROJECT #0194096-0005 GIS # BAC-23-296 December 17 2013

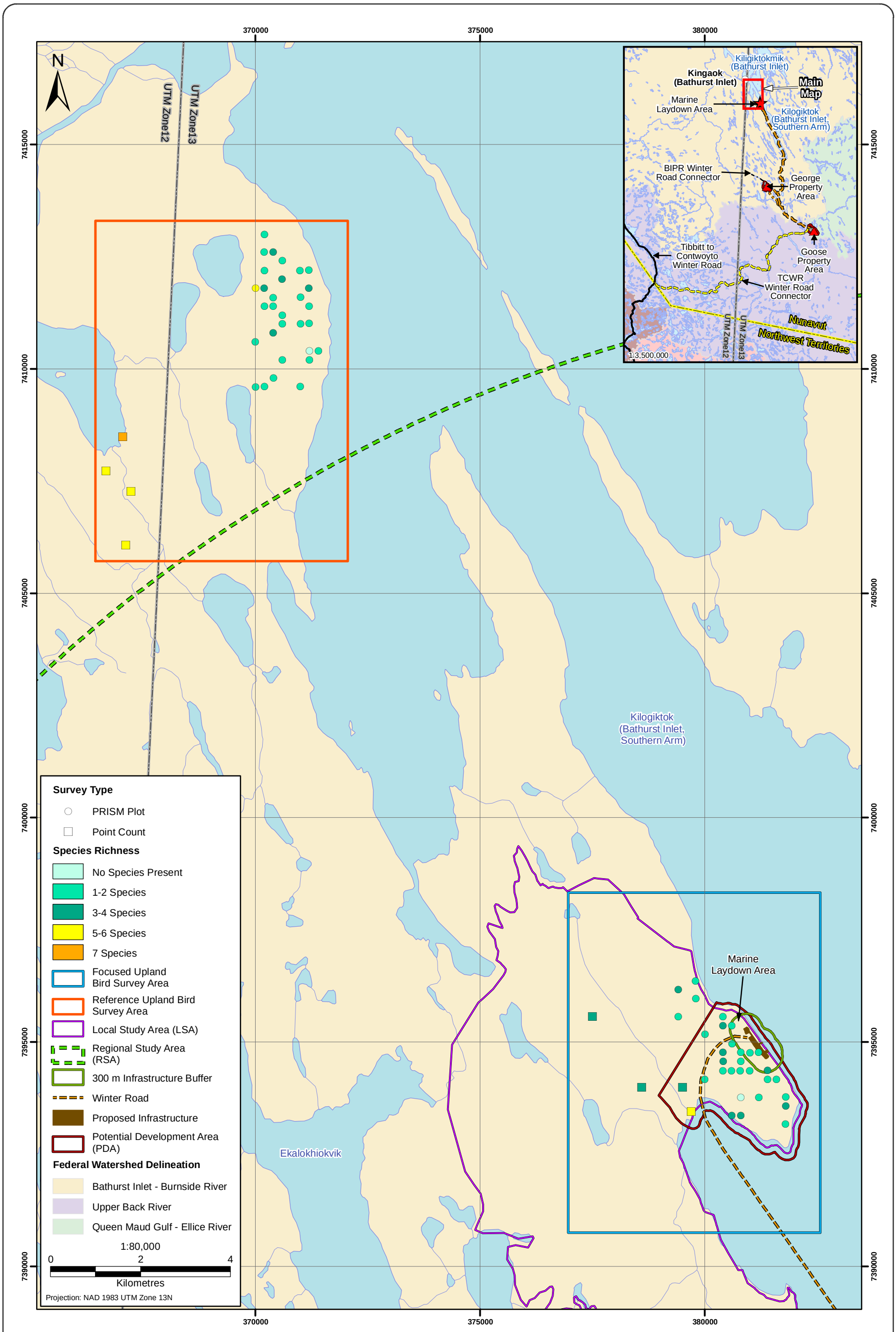


Figure 6.4-1

Sabina GOLD & SILVER CORP.

Species Richness Recorded during PRISM Plot and Point Count Surveys, 2013

Figure 6.4-1

Rescan an ERM company

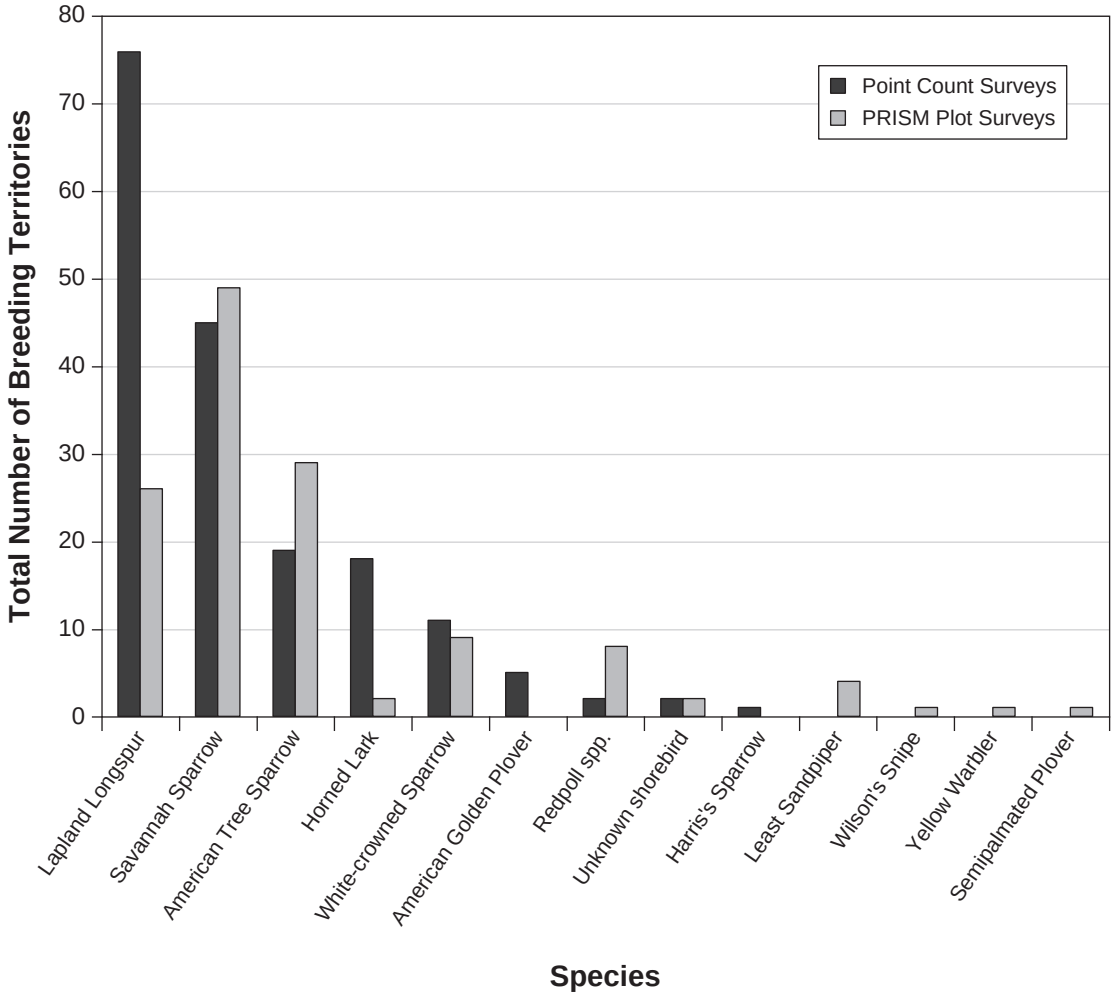


Figure 6.4-2

Abundance and Frequency of Occurrence of Breeding Territories Observed per Species during PRISM Plot and Point Count Surveys, 2013

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists

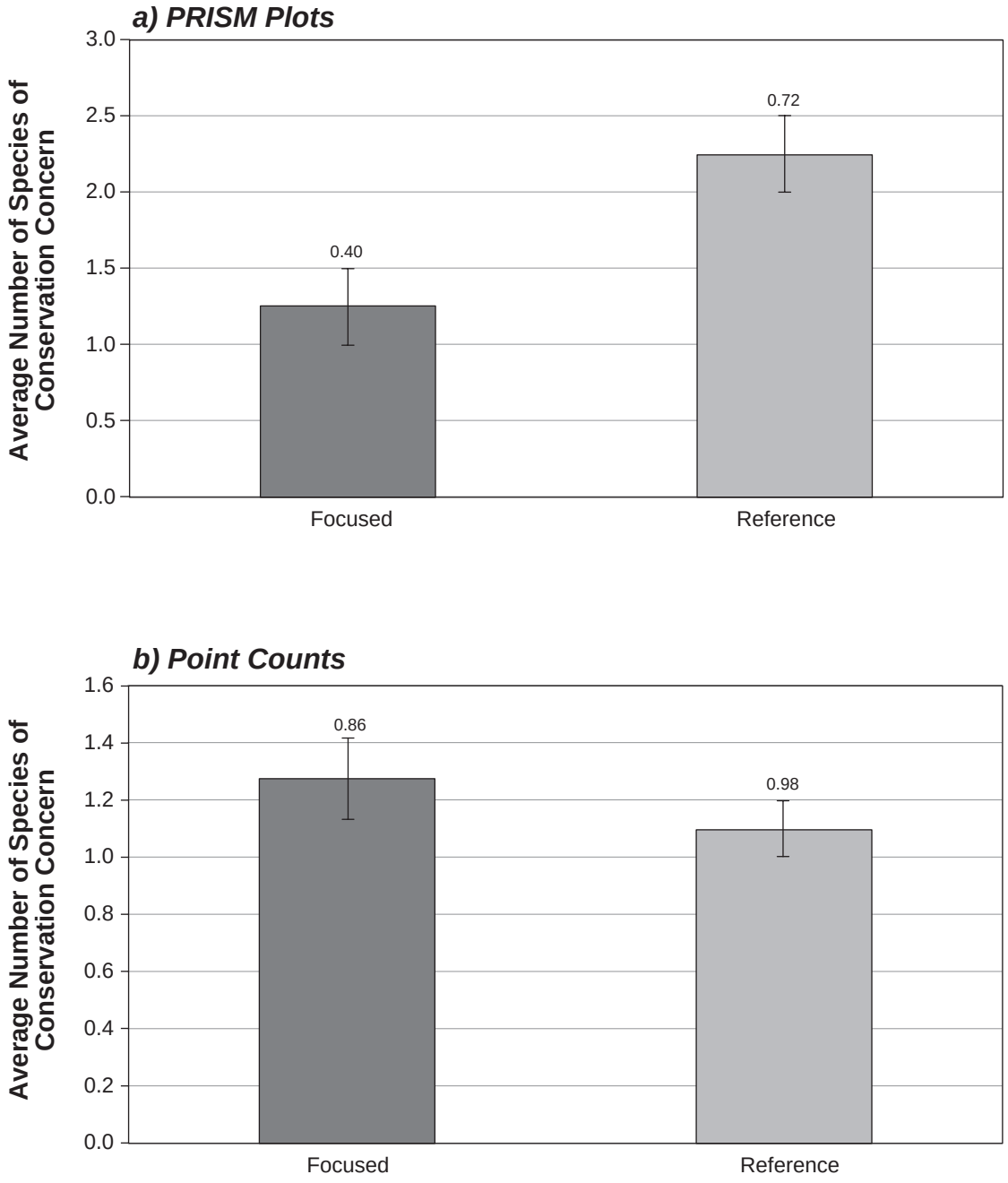
Table 6.4-3. Territory Counts and Frequency of Occurrence of Upland Birds across all Point Count Surveys, 2013

Species	PRISM Plot Surveys (Wet to Moist Habitat Only)			Point Count Surveys			
	Territory Counts (N=8)	Frequency of Occurrence	Percent of Total Territories Counted	Territory Counts (Dry; N=16)	Territory Counts (Moist to Wet; N=40)	Frequency of Occurrence	Percent of Total Territories Counted
Lapland Longspur	**26**	**0.88**	**0.20**	22	47	0.79	**0.42**
Savannah Sparrow	**49**	**1.00**	**0.37**	7	34	0.55	**0.25**
Redpoll spp.*	**8**	**0.50**	**0.06**	0	2	0.04	**0.01**
Horned Lark	**2**	**0.25**	**0.02**	10	8	0.27	**0.11**
American Tree Sparrow	**29**	**0.88**	**0.22**	1	18	0.21	**0.11**
American Golden Plover	**-**	**-**	**-**	2	3	0.09	**0.03**
Least Sandpiper	**4**	**0.50**	**0.03**	0	0	-	**0.00**
Willow Ptarmigan	**-**	**-**	**-**	0	0	-	**0.00**
White-crowned Sparrow	**-**	**0.50**	**0.07**	1	9	0.14	**0.06**
Harris's Sparrow	**-**	**-**	**-**	1	0	0.02	**0.01**
Wilson's Snipe	**1**	**0.13**	**0.01**	0	0	-	**0.00**
Yellow Warbler	**1**	**0.13**	**0.01**	0	0	-	**0.00**
Semipalmated Plover	**1**	**0.13**	**0.01**	0	0	-	**0.00**
Unknown Sandpiper	**2**	**0.25**	**0.02**	0	1	0.02	**0.01**
Total	**132**	**-**	**1.00**	**45**	**121**	**-**	**1.00**

Note: Species of Conservation Concern shown in bold type. Proportion of plots with territories. Fewer counts than those presented in Table 6.4-2 result from exclusion of counts made in four 'mixed' plots and birds that were not identified to species.
** Hoary ("Sensitive Species") and common redpolls were visually confirmed to be present in the survey areas, but these species are difficult to distinguish by sound. Counts of redpolls were summed across detections for which species identification was and was not confirmed.*

6.4.3.3 Species of Conservation Concern

Of the 13 species observed within Point Count and PRISM Plot surveys, six are listed as "Sensitive" in Nunavut by the CESCC (CESCC 2010). These include: American golden-plover, American tree sparrow, Harris' sparrow, hoary redpoll, least sandpiper, and white-crowned sparrow (Table 6.4-2). One additional upland bird species of Conservation Concern (semipalmated sandpiper) was observed incidentally (i.e., outside of the PRISM boundaries). Of the six "Sensitive" species observed, one species was only observed at the Reference Survey Area (Harris's sparrow). The average number of species of conservation concern was less at the Focused Survey Area relative to the Reference Survey Area during PRISM Plot surveys (Figure 6.4-3a), but similar between Focused and Reference Survey areas during Point Count surveys (Figure 6.4-3b).



Notes: *The five species of conservation concern include: American tree sparrow, Harris's sparrow, least sandpiper, semi-palmated sandpiper, and white-crowned sparrow.*
The hoary redpoll (also a species of conservation) was not included as it was indistingishable from the common redpoll (nt a species of conservation concern).
Error bars represent standard error.
Numbers above bars represent number of territories per hectare.

Figure 6.4-3

Distribution of Five Species of Conservation Concern during PRISM Plot and Point Count Surveys, 2013

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists

6.4.3.4 Relative Abundance and Species Detected near Proposed Project Infrastructure

Average species richness was similar at Point Counts within 300 m of the proposed Project infrastructure near the MLA (2.2 ± 0.49 species) and outside of this 300 m buffer (2.4 ± 0.17 species). Two species of conservation concern were observed at Point Counts within the 300 m buffer: American golden plover and white-crowned sparrow. These species were also observed at several Point Count surveys outside of this 300 m buffer.

6.4.4 Broad Patterns in Distribution of the Upland Bird Community

During Point Count surveys, dry habitat on average supported a similar number of upland bird species and territories compared to moist to wet habitat (Table 6.4-2; Figure 6.4-4). On average, observers recorded 0.85 territories per hectare (1.94 ± 0.27 species and 2.65 ± 0.34 bird territories in dry habitats) and 0.89 territories per hectare (2.18 ± 0.13 species and 3.1 ± 0.21 bird territories in wet to moist habitat; Figure 6.4-4). Three songbird species - Lapland longspur, savannah sparrow, and horned lark - comprised 87% (34 of 45) of all counts of upland bird territories in dry habitats (Table 6.4-3; Figure 6.4-5). Territory counts of Lapland longspur, savannah sparrow, American tree sparrow, and horned lark comprised 88% (107 of 121) of all upland bird territories in moist to wet habitats (Table 6.4-3; Figure 6.4-5).

On average, territories of savannah sparrows, American tree sparrows, and white-crowned sparrow were counted more frequently (at least twice as often) in moist to wet habitat relative to dry habitat (Figure 6.4-5). In contrast, territories of horned lark pairs were counted more frequently in dry habitat (Figure 6.4-5). Lapland longspurs were distributed relatively evenly across the moisture regime from dry to wet habitats (Figure 6.4-5).

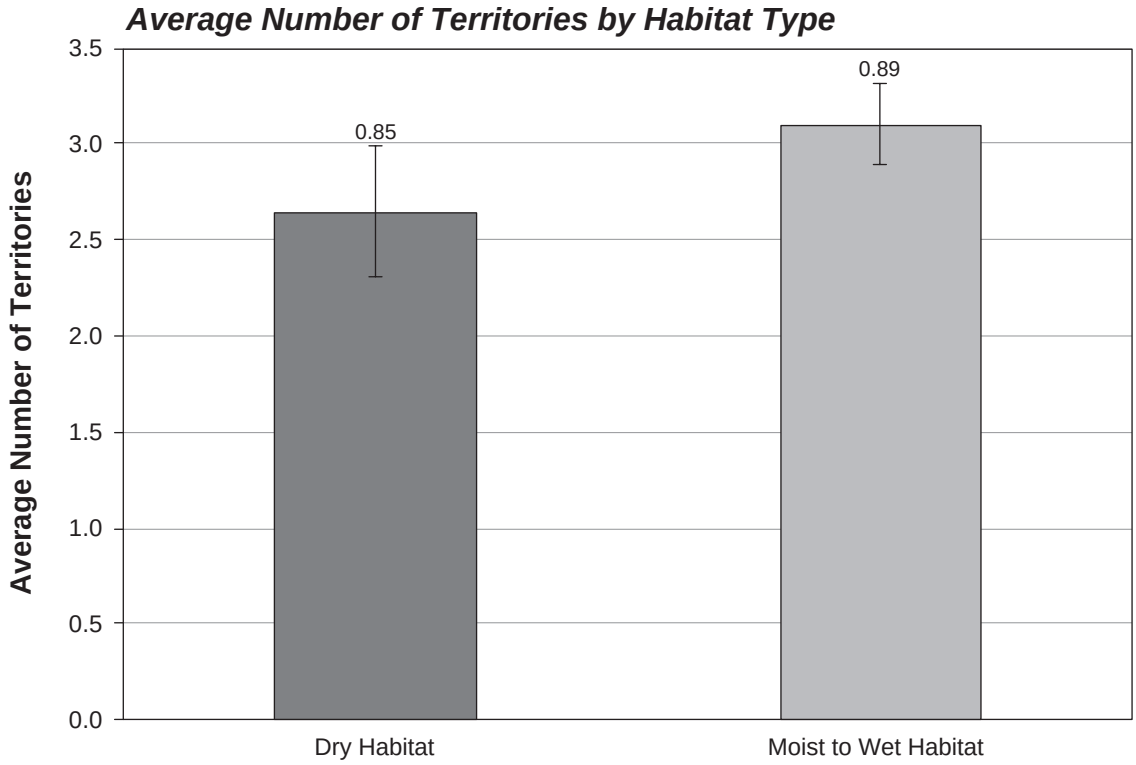
The numbers of territories observed in dry and moist to wet habitat types were similar between Focused and Reference Survey areas (Figure 6.4-6). Dry habitat types at the Focused Survey Area supported 0.67 territories per hectare (1.56 ± 0.24 species and 2.11 ± 0.35 territories) and Reference Survey Area supported 1.04 territories per hectare (2.34 ± 0.42 species and 3.25 ± 0.56 territories; Figure 6.4-6). Moist to wet habitat types at the Focused Survey Area supported 1.13 territories per hectare (average of 2.47 ± 0.18 species and 3.58 ± 0.24 territories) and Reference Survey Area supported 0.84 territories per hectare (1.90 ± 0.19 species and 2.65 ± 0.32 territories; Figure 6.4-6).

A comparison of broad patterns in distribution of the upland bird community could not be made for PRISM surveys, because surveys were conducted in moist to wet habitats only. Two additional species that were observed within PRISM Plot surveys in moist to wet habitat that were not detected in the same habitat type during Point Count surveys; yellow warbler (songbird) and least sandpiper (shorebird; species of conservation concern; Table 6.4-2).

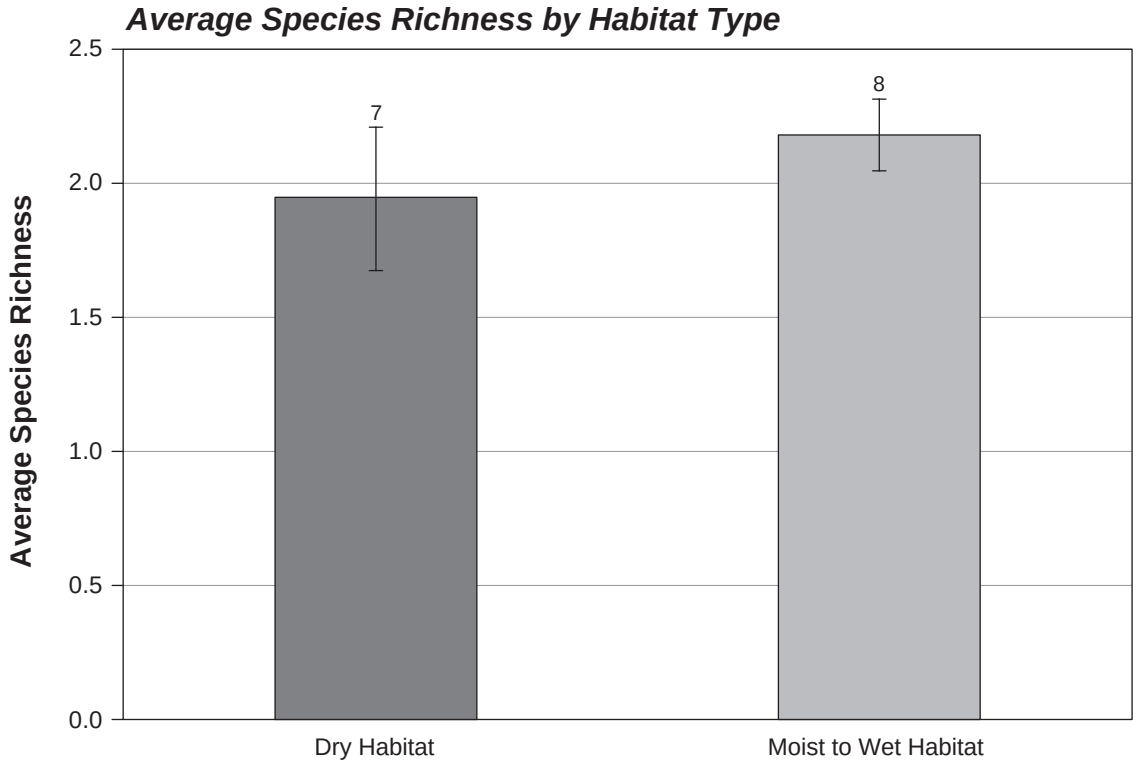
6.4.5 Small Scale Habitat Associations of Species

6.4.5.1 Species Habitat Associations during PRISM Plot Surveys

Several upland bird species were associated with one or more small scale habitat types during PRISM Plot surveys. Six breeding bird species were in one habitat type including: least sandpiper (species of conservation concern), Wilson’s snipe, redpoll species, horned lark, and an unknown sandpiper (Figure 6.4-7a). Least sandpiper, Wilson’s snipe, and an unknown sandpiper species (shorebird species) were associated with moist sedge meadow (Plate 6.4-1); moist sedge meadow is classified broadly as a moist to wet habitat type. Redpoll species were associated with riparian willow, a moist to wet broad scale habitat type. The horned lark and semipalmated plover were both exclusively associated with the dry broad scale habitat type; the horned lark was associated with heath hummock, and the semipalmated plover with beach habitat (Plate 6.4-2).



Notes: Error bar represent standard error of the mean.
Number above bars represent number of territories per hectare.



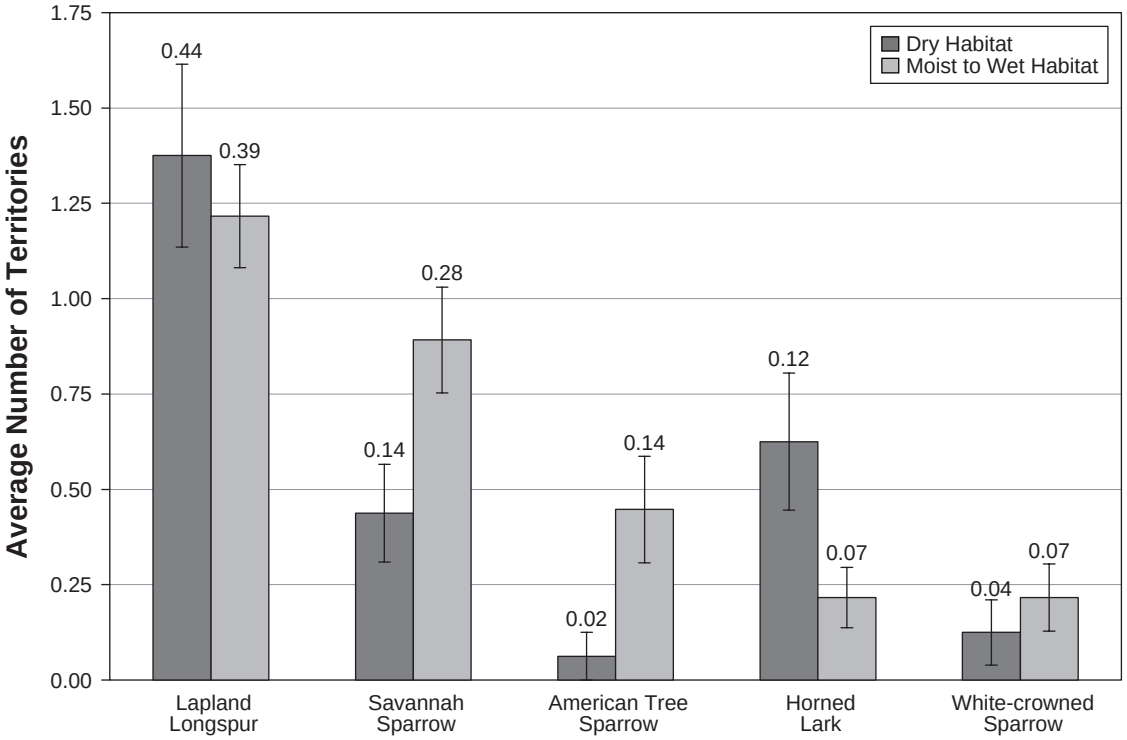
Notes: Error bar represent standard error of the mean.
Number above bars represent total number of species.

Distribution of the Upland Bird Community in Dry and Moist to Wet Habitat during Point Count Surveys, 2013

Figure 6.4-4

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists



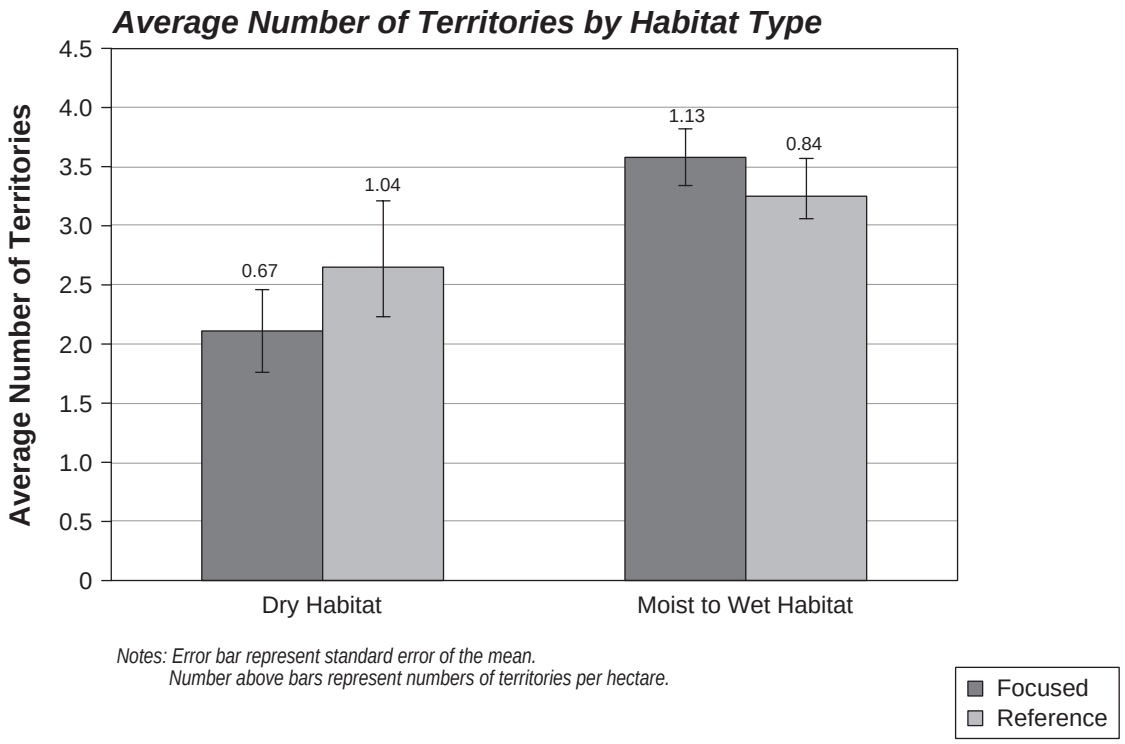
Note: Error bars represent standard error of the mean.
Numbers above bars represent number of territories per hectare.
Only commonly detected (detected in >10% of plots) were included.

Distribution of the Upland Bird Community in Dry and Moist to Wet Habitats within Focused and Reference Study Areas during Point Count Surveys, 2013

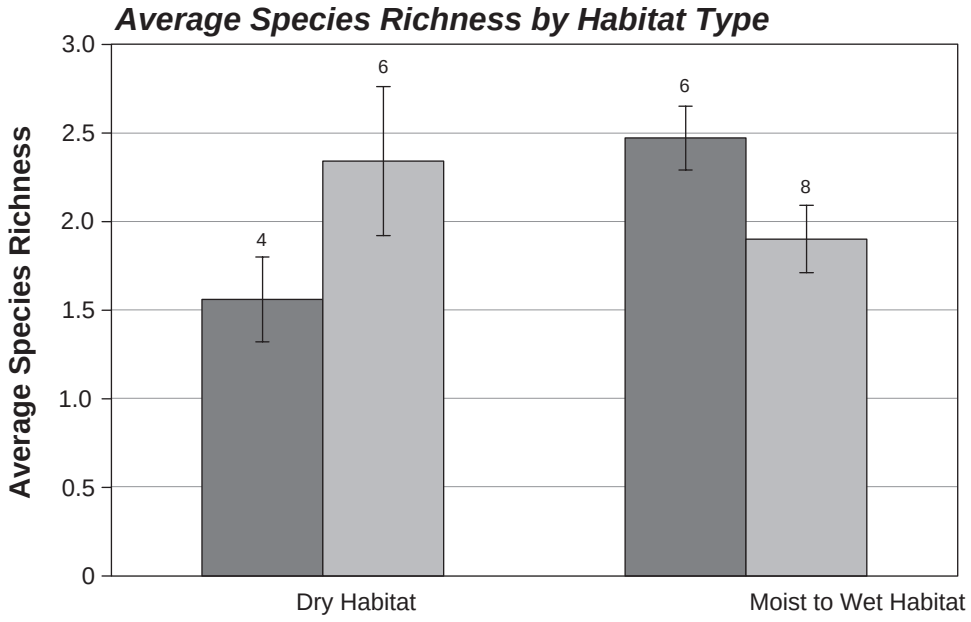
Figure 6.4-5

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists



Notes: Error bar represent standard error of the mean.
Number above bars represent numbers of territories per hectare.



Notes: Error bar represent standard error of the mean.
Number above bars represent total number of species.

Distribution of the Upland Bird Community in Dry and Moist to Wet Habitat within Focused and Reference Study Areas during Point Count Surveys, 2013

Figure 6.4-6

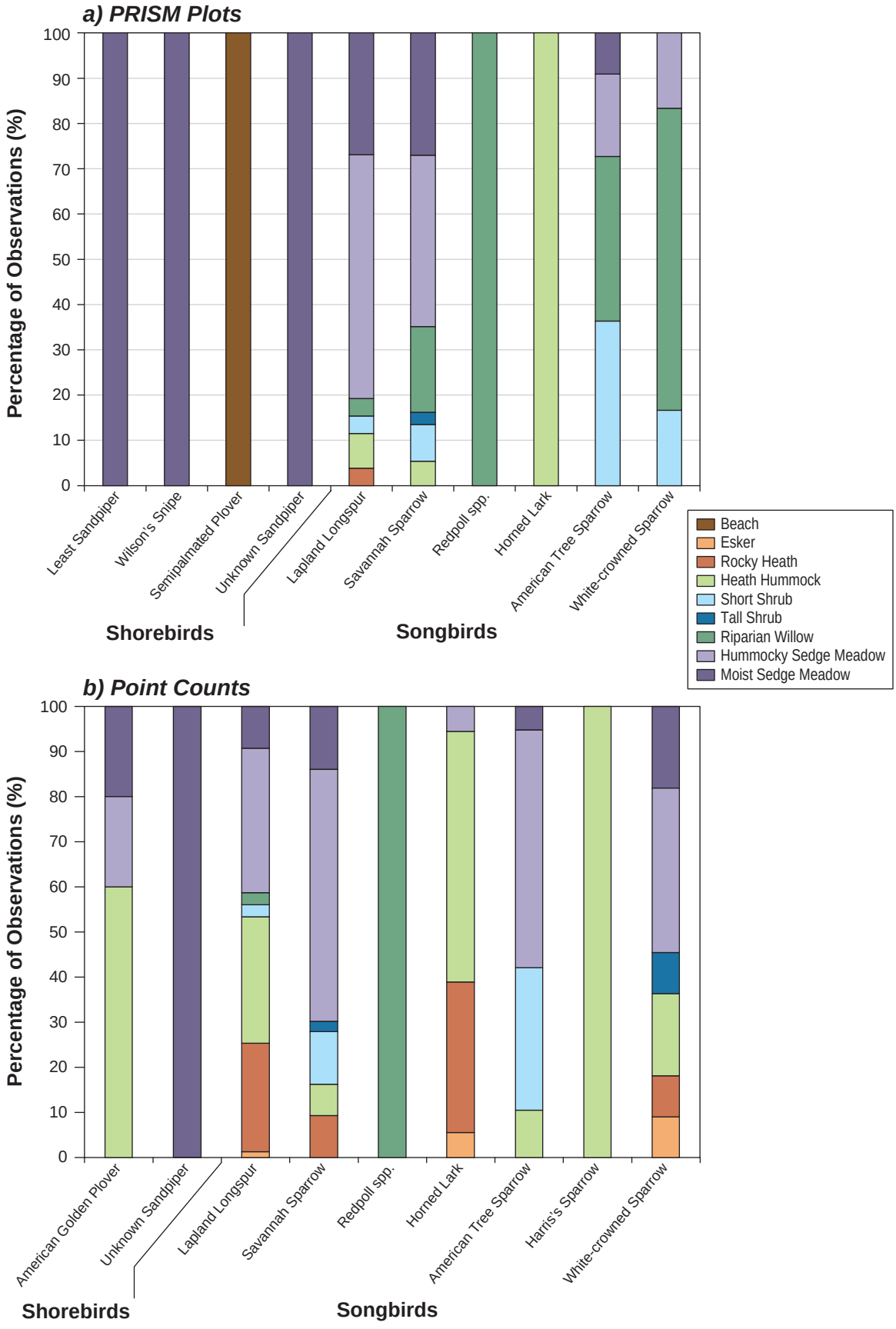


Figure 6.4-7

Summary of Upland Bird Small Scale Habitat Associations during PRISM Plot and Point Count Surveys, 2013

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists

a) Moist to Wet habitat: moist sedge meadow (in forefront), June 15, 2013

b) Moist to Wet habitat: hummocky sedge meadow, June 18, 2013

Plate 6.4-1. Examples of small scale habitat types in moist to wet habitats (June, 2013).

a) Dry habitat: beach (in forefront), June 17, 2013

b) Dry habitat: rocky heath, June 14, 2013

Plate 6.4-2. Examples of small scale habitat types in dry habitats (June, 2013).

Four species of songbirds (Lapland longspur, savannah sparrow, American tree sparrow, and white-crowned sparrow), were associated with multiple small scale habitats (Figure 6.4-7a). American tree sparrow and white-crowned sparrow, two species of conservation concern, were predominantly observed within the moist to wet habitat type; American tree sparrows were mainly observed within short shrub, riparian willow, hummocky sedge meadow, and moist sedge meadow, and white-crowned sparrow was predominantly within riparian willow, short shrub, and hummocky sedge meadow. Lapland longspur and Savannah sparrows were associated with moist to wet and dry habitat types. The majority of Lapland longspurs were associated with hummocky sedge meadow (moist to wet habitat; Plate 6.4-2), as well as other moist to wet habitat types (short shrub, and riparian willow) and dry habitat type (heath hummock and rocky heath). Savannah sparrows were mainly associated with hummocky sedge meadow, a moist to wet habitat type, however, additional observations of Savannah sparrow were in moist sedge meadow, riparian willow, short shrub, tall shrub (moist to wet habitat type), and heath hummock (dry habitat type).

6.4.5.2 Species Habitat Associations during Point Count Surveys

During Point Count surveys, three species of upland birds (shorebirds and songbirds) were only observed within one habitat type: unknown sandpiper species, redpoll species, and heath hummock (Figure 6.4-7b). Unknown sandpipers were observed within moist to wet sedge meadow and redpoll species were associated with riparian willow; these habitats are classified broadly within the moist to wet habitat type. Harris's sparrow (a species of conservation concern) was observed within the heath hummock habitat, a dry habitat type.

Six species of upland birds were associated with multiple small scale habitats during Point Count surveys: American golden plover, Lapland longspur, savannah sparrow, horned lark, American tree sparrow, and white-crowned sparrow (Figure 6.4-7b). The shorebird species, American golden plover (a species of conservation concern), was predominantly observed within the dry habitat type, heath hummock. Other observations of American golden plover were in moist to wet habitat types (hummocky sedge meadow and moist sedge meadow). Songbird species including the Lapland longspur savannah sparrow, and two species of conservation concern (American tree sparrow and white-crowned sparrow) were predominantly observed within hummocky sedge meadow (a moist to wet habitat type), but were also observed within the dry habitat type, heath hummock. With the exception of Lapland longspur, these species were also within esker habitat (a dry habitat type). The horned lark was predominantly observed within the dry habitat type (rocky heath, heath hummock, and esker), although a small percentage (6%), were observed within hummocky sedge meadow, a wet habitat type.

6.4.6 Nest Productivity and Phenology

In total, eight nests belonging to six species – Lapland longspur, savannah sparrow, white-crowned sparrow, semipalmated plover, and redpoll spp. - were found during PRISM Plot (n = 7) and Point Count (n=1) surveys (Table 6.4-4; Plate 6.4-3). Of these eight nest, seven were located within Reference Survey Area and one was within the Focused Survey Area. No nests were located within 300 m of the proposed Project infrastructure near the MLA. Seven of the eight nests found were in the incubation stage and one nest was found empty and had either recently been depredated or had freshly been built. No nests were found in the nestling or fledgling stage. Average clutch size, across all five species of upland birds based on nests that contained at least one egg was 4.13 ± 0.60 eggs per nest (Table 6.4-4). All nests were found between June 13 and June 18, 2013.

Table 6.4-4. Productivity of Nesting Pairs of Upland Birds, 2013

	Egg Stage	
Species	**Number of Nests Found**	**Number of Eggs**
Lapland Longspur	3	5*
Savannah Sparrow	2	4*
White-crowned Sparrow	1	4
Semipalmated Plover	2	2
Redpoll spp.	1	0
Total	**8**	**15**
Average	**NA****	**4.13 ± 0.6**

**Average across all nest sites found per species. **NA = not assessed.*

Least sandpiper nest

Lapland longspur nest

Semipalmated plover nest

White-crowned sparrow nest

Plate 6.4-3. Nests of upland birds observed in PRISM plots, June 14 to 18, 2013.

6.4.7 Detections of Nest Predators

Nine nest predators were detected during surveys, eight of which were detected within the Focused Survey Area. Across a total survey time of approximately 18 hours (average of 1.60 hours per PRISM plot and 5 min per Point Count), the detection rate of nest predators was 0.50 per hour, or about one predator every two hours. The most frequently detected nest predator recorded during Point Count surveys was the glaucous gull, and during PRISM Plot surveys, the common raven (Table 6.4-5). In all cases, predators were observed while in fast or soaring flight. Within the Focused Survey Area, predators were recorded at two Point Count surveys within 300 m of proposed Project infrastructure near the MLA. An additional nest predator, the red fox, was recorded in the Focused Survey Area while surveyors were travelling on foot to a Point Counts, but was not included in the predator detection rate because it was not present at the time of survey.

Table 6.4-5. Number of Nest Predators Detected during Point Count and PRISM Surveys, 2013

Predator Species	Point Count		PRISM Plot		Total
	Focused	Reference	Focused	Reference	
Common Raven	2	-	2	1	**5**
Glaucous Gull	3	-	1	-	**4**
Total	**5**	**0**	**3**	**1**	**9**

6.4.8 Incidental Observations of Upland Birds

During other field surveys conducted in 2013, field staff incidentally observed 77 individuals belonging to six species of upland birds (Table 6.4-6; Appendix 5-4). Two species observed incidentally were not detected during upland bird surveys: dark-eyed junco, and an unknown species of phalarope (Table 6.4-6). The most common incidentally observed upland bird species was the ptarmigan.

Table 6.4-6. Upland Birds Observed during Other Field Surveys, 2013

Species	Scientific Name	No. Observed
Willow Ptarmigan	*Lagopus lagopus*	5
Unknown Ptarmigan	*Lagopus*	59
Semipalmated Plover	*Charadrius semipalmatus*	1
Unknown Phalarope		1
Unknown Sandpiper		6
Horned Lark	*Eremophila alpestris*	1
Dark-eyed Junco	*Junco hyemalis*	2
Redpoll spp.**	*Carduelis spp.*	1
White-crowned sparrow	*Zonotrichia leucophrys*	1
Total		**77**

6.5 DISCUSSION

Surveys for upland birds were conducted in June, 2013 in a Focused and Reference Survey Area near the MLA at Bathurst Inlet to characterize the upland bird community and species habitat associations, and to summarize detection rates of nest predator. A total of 18 upland bird species were detected, of which, six are listed as species of conservation concern in Nunavut: American golden-plover, American tree sparrow, Harris' sparrow, hoary redpoll, least sandpiper, semipalmated sandpiper, and white-crowned sparrow. Species richness and abundance was similar between Focused and Reference Survey areas. Within the Focused Survey Area, species richness was similar in areas located within 300 m of the proposed Project infrastructure near the MLA to those located further and two species of conservation concern (American golden plover and white-crowned sparrow) were located within 300 m of the proposed Project infrastructure. There was generally a similar number of species and territories associated with dry habitat types relative to moist to wet habitats, although most shorebird species were associated with the small scale habitat features of the moist to wet habitat type. Nests of five species of upland birds were observed all of which were primarily in the incubation stage. Nest predators were detected more frequently at the Focused Survey Area relative to the reference area.

The total number of species observed during 2013 surveys (n = 16) near Bathurst Inlet was lower than the total number observed during 2012 surveys at the George and Goose Property areas and the MLA; 20 species (Rescan 2013b). Four species were detected during surveys conducted in 2012, but not detected in 2013: red-necked phalarope (a species of conservation concern), pectoral sandpiper, stilt sandpiper, American pipit, and rock ptarmigan. One additional songbird (Harris's sparrow) and shorebird (least sandpiper), both species of conservation concern, were recorded in 2013. On average, species richness recorded in 2013 (9 species) near the Focused Survey Area was lower than that observed in 2012 (10 species) in the same general area. Differences in species richness were mainly due to fewer shorebirds being observed in 2013.

Relatively high densities of breeding territories of two songbird species were observed during surveys conducted in 2013, the most abundant of which were Lapland longspur followed by savannah sparrow.

These results parallel findings in other studies, which together show that across the Arctic the upland bird community is dominated by the Lapland longspur, along with a small group of other species which varies regionally (Liebezeit, White, and Zack 2011; Smith et al. 2005; Latour et al. 2005; EDI 2012).

Songbirds were detected more often than shorebirds and accounted for 97% of all upland bird observations made. This finding is consistent with 2012 surveys that found songbirds were five times more likely to be detected than shorebirds (Rescan 2013b). Unlike upland bird surveys conducted in other areas within the RSA, very few ptarmigan have been recorded near Bathurst Inlet in either 2012 (Rescan 2013) or 2013. While the differences found in this study probably reflect 'true' differences in abundance among these bird groups, it is also possible that the differences reflect lower detectability of shorebirds and ptarmigan using Point Count surveys. Male songbirds sing frequently during the breeding season, and so are relatively easy to detect. In contrast, shorebirds and ptarmigan usually vocalize and move only when nests are threatened.

Detections of upland birds recorded in this study during Point Count and PRISM Plot surveys were higher than those observed on Baffin Island in lowland habitat using Point Counts (EDI 2012). However, the number of upland bird territories detected in moist to wet habitat in the 2013 surveys were similar to those detected near the George and Goose Properties in 2012 (1.13 pairs counted per hectare in lowland habitat; Rescan 2013b). The number of upland bird territories detected per hectare was also similar to two other upland bird studies conducted in the Arctic using survey methods similar to PRISM Plots (Liebezeit, White, and Zack 2011) and in wetland habitat in the Canadian high Arctic (Latour, Machtans, and Beyersbergen 2005).

The moist to wet habitat type supported on average the same number of upland birds, and approximately the same number of breeding territories per hectares relative to the dry habitat type. Shorebird species, except the American golden plover and semipalmated plover, were recorded more often in moist to wet habitat. This result is similar to the findings of other studies showing the preference of shorebird species for nesting in lowland wet sedge marshes and meadows (Latour, Machtans, and Beyersbergen 2005; Brown et al. 2007; Ashenhurst and Hannon 2008; Liebezeit, White, and Zack 2011). Because wetlands are used by many insect species for breeding, moist to wet habitats likely support higher availability of insects, which are the primary food sources of upland birds. These patterns in the distribution of upland birds suggest that a relatively greater contribution of moist to wet habitat to the whole community, although some species show preferences for drier habitat types, such as the American golden plover and horned lark. Thus, both habitat types are likely necessary to support the full diversity and abundance of the upland bird community.

The results of this study suggest that most upland bird females were egg-laying or incubating eggs by the third week of June. Average clutch size for five species of upland birds was 4.13 ± 0.60 eggs per nest and no nestlings were observed in any nests. In 2012, baseline studies on upland birds were conducted within a similar period (June 6 to June 27; Rescan 2013b). Results from 2012 suggested that most upland bird females had finished egg-laying and had initiated incubation by the second week of June (Rescan 2013b) compared to 2013, which suggests a slightly later date of laying and incubation (by the third week of June). The timing of migrant arrival, egg initiation, and egg hatching is synchronized with the emergence of insects in the spring and has been shown to be influenced by environmental changes like habitat disturbances and seasonal variability in weather, especially when these occur over the long term due to climate change. In the Arctic, breeding productivity has been found to be negatively impacted by climate change, which has caused variability in the timing of insect emergence (Both et al. 2010). Thus, estimates of nest success, clutch size, the number of nestlings and fledglings, and the timing of reproductive events like egg-laying and incubation, can provide valuable information that can be useful in monitoring disturbances to birds over time.

Common raven and glaucous gull were the two species of nest predators observed during 2013 surveys. The detection rate of nest predators was 0.50 per hour with the majority (88%) of all predators observed at the focused survey area, suggesting that a greater number of predators may use this area. Nest predator detection rates in 2013 were similar to those recorded in 2012, although a greater number of nest predator species were observed in 2012. Literature suggests that lower nesting success from higher rates of nest predation by fox, gulls, jaegers, and the common raven may occur as a result of industrial activities attracting these predators near development sites in search of food, and shelter (Liebezeit et al. 2009).

7. Waterbirds and Marine Birds

Rescan™
an ERM company

7. Waterbirds and Marine Birds

7.1 INTRODUCTION

The lakes and wetlands of Nunavut support a large number of waterbirds, some of which are summer residents and others, transient migrants. Migratory species depend on northern habitats for a continued existence across the continent. Migratory waterbirds and marine birds receive protection under the federal *Migratory Birds Convention Act* (1994b), which includes regulations that prohibit the killing, capturing, injuring, taking, or disturbing of migratory birds, or the damaging, destroying, removing, or disturbing of nests (Canadian Wildlife Service 1991). Identifying species of conservation concern is imperative to meet the obligations of the *Species At Risk Act* (SARA; 2002), which protects threatened and endangered species and their habitats. In Nunavut, several species of waterbird and marine bird are listed as sensitive and are likely to occur in the Back River Project terrestrial wildlife RSA and marine wildlife RSA including: long-tailed duck, Arctic tern, glaucous gull, Thayer's gull, common eider, and king eider.

Waterbirds are defined as birds that primarily forage within waterbodies, and use these habitats throughout the breeding and migration periods. Marine birds are defined as birds that use marine habitats during breeding and/or migration. Shorebirds, though dependant on freshwater or marine habitat for foraging or during migration, are considered to be an upland breeding bird (Chapter 6). The Arctic waterbird and marine bird community includes a diverse assemblage of species, such as waterfowl (geese, swans, and ducks), auks, gulls, and loons. Some waterbird species, such as greater scaup, also use marine habitats during some portion of the breeding season. Therefore, there is some overlap in species between the waterbird and marine bird groups. There are 49 species of waterbird and marine bird species that could potentially occur within the RSA (Appendix 4-2).

The presence of waterbirds is an indication of the availability of functional habitat. Lake attributes such as size, shape, food resources such as fish and aquatic invertebrates, and emergent vegetation structure and composition are important for waterbird nesting territories, transient staging, and protection from predators (Hoyer and Canfield 1994; Sovada, Anthony, and Batt 2001). Different species of waterbirds may use differing lake habitats during different breeding and staging phases (Nummi and Poysa 1993). In addition, for any one species, lakes used for staging and courting may represent different habitat features than lakes used by waterbirds with broods (Nummi and Poysa 1993). Thus, an understanding of habitat use during multiple life-requisite stages (e.g., staging and breeding) can provide insight into important habitat features for each waterbird species.

For many waterbird and marine bird species, marine habitats are important for staging purposes, either during the spring prior to nesting, or following nesting in the late summer and fall. For other species, such as eiders, marine habitats are important throughout the staging and nesting periods. Bathurst Inlet may be used for staging purposes by locally breeding waterbirds and marine birds, in addition to migrants who breed further north. For example, the Queen Maud Gulf Migratory Bird Sanctuary is approximately 200 km east-northeast of Bathurst Inlet. The sanctuary is an important bird area with about 60 goose colonies and more than 12 species of waterbirds that breed within the sanctuary. Thus, some of the species that breed in the sanctuary could use Bathurst Inlet as a staging area prior to fall migration.

7.2 OBJECTIVES

Baseline studies were primarily designed to investigate the presence and distribution of waterbird and marine bird communities at the proposed Marine Laydown Area (MLA) at Bathurst Inlet. Specifically, the study objectives were to:

- characterize diversity, distribution, and seasonal extent of use in terrestrial and marine habitats surrounding the proposed MLA;
- identify important habitats (e.g., breeding or staging sites); and
- identify species of conservation concern in the area.

A second objective was to confirm staging by waterbirds at known staging sites within the Goose Property and George Property PDAs.

7.3 METHODS

Aerial surveys for waterbirds and marine birds were conducted in 2013; surveys were conducted using a Bell 206 helicopter with one pilot, two biologist observers, and an additional person to record data during some surveys.

Ground-based and aerial surveys for waterbirds were also conducted in 2013 at several terrestrial waterbodies within the Goose Property and George Property PDAs that were known to be used by waterbirds as staging areas in previous years. Ground surveys were conducted with the use of high-power spotting scope, one to two qualified biologist observers, and an additional person to record data.

7.3.1 Waterbird Surveys

7.3.1.1 Aerial Surveys

In 2013, a total of four aerial surveys for waterbirds were conducted within and surrounding the MLA according to established protocols described by the Canadian Wildlife Service (CWS) and the United States Fish and Wildlife Service (USFWS; CWS and USFWS 1987). Survey dates were selected to: a) assess the extent of habitat use by migrating birds (staging surveys conducted in spring and fall), and b) collect evidence of breeding and reproduction (breeding surveys) by documenting the presence of breeding pairs (spring pair survey) and young birds (summer brood survey).

Aerial surveys were flown by helicopter at speeds of 40 km/hour (faster over land) and at an altitude of approximately 30 to 50 m. Data were collected by two observers – for some surveys an additional person was present, where available, to record data. One observer sat next to the pilot on the left side of the aircraft, and the second observer sat behind the pilot on the right side facing forward and the data recorder sat directly behind the first observer on the left side facing forward. Observers searched lake surfaces and wetlands for waterbirds and/or waterbird broods. Whenever waterbirds were observed they were identified to the species level and by gender, when possible. Additionally, habitat information and coordinates of the observations were recorded using a handheld Garmin GPS Map62s. Habitat was categorized into five types of terrestrial habitat: lake, pond, river, wetland, and heath tundra. Any waterbirds that were observed in marine habitats were assigned a habitat type of ‘marine’.

During the first spring survey, aerial surveys were conducted at the reconnaissance level at Bathurst Inlet, west of the MLA PDA (Focused Survey Stratum) and in an ecologically similar area to the south (Reference Survey Stratum; Figure 7.3-1). These survey strata consisted of eight transects each arranged latitudinally. Transect lines were 16 km long, and spaced 2 km apart. The survey strata were placed in areas where each transect line maximized the survey coverage of waterbodies near the MLA, and such that each 16 km transect would not contain any marine habitat. As a result, the Focused Survey Stratum did not extend over the proposed MLA (Figure 7.3-1). Marine habitats were surveyed separately from terrestrial habitats (Section 7.3.2).

PROJECT # 0194096-0005 *GIS #* BAC-23-267 *December 12 2013*

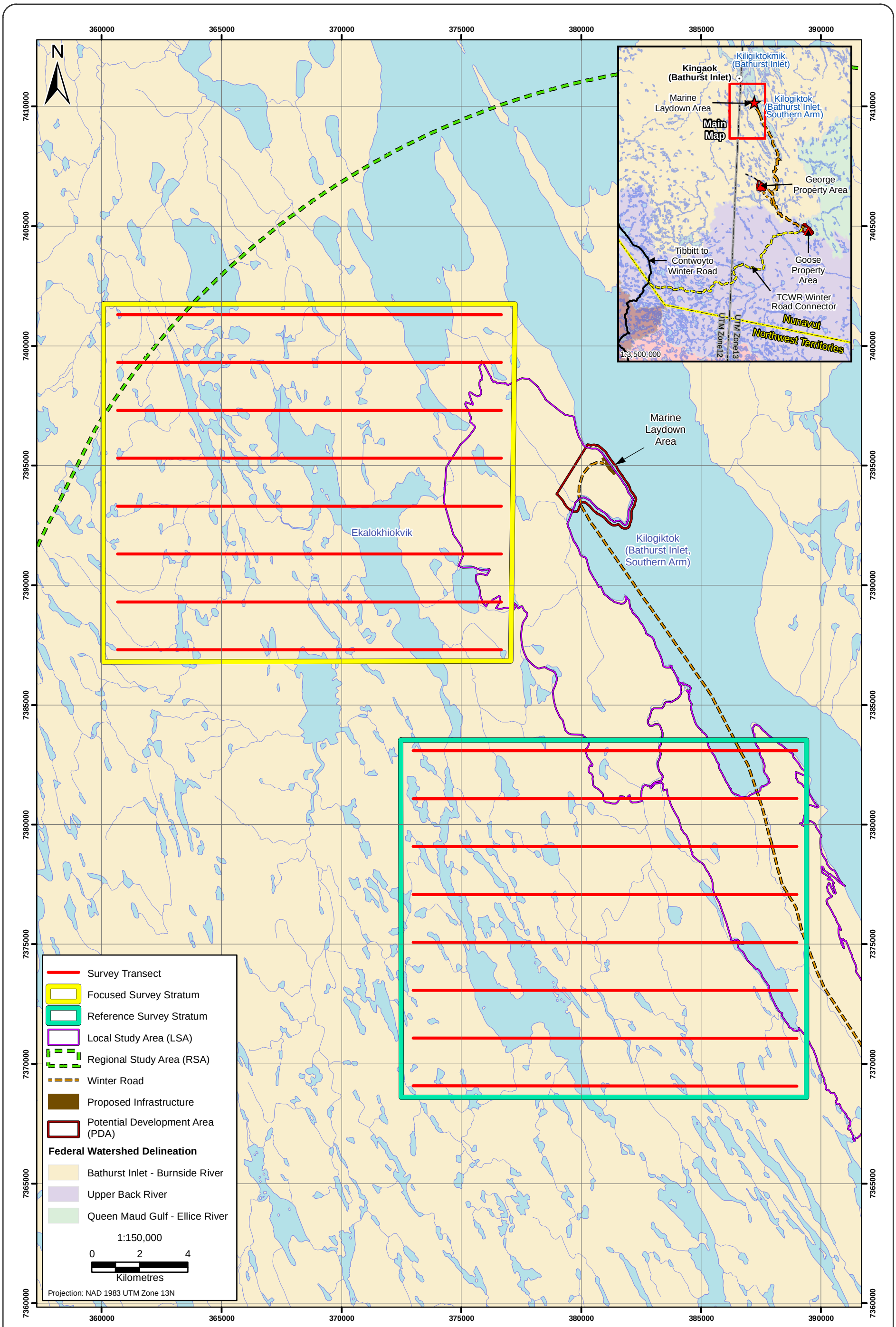


Figure 7.3-1

Sabina GOLD & SILVER CORP.

Waterbird Aerial Survey Strata and Transects for the Spring Staging Survey, 2013

Figure 7.3-1

Rescan an ERM company

Following the spring staging survey, the Focused Survey Stratum was expanded to include the MLA and areas to the north and south of the original Focused survey Stratum (the MLA Focused Survey Stratum; Figure 7.3-2). This survey stratum consisted of one transect line roughly centred over the proposed MLA, and 14 additional transect lines, seven to the north, and seven to the south of the MLA. Transect lines were spaced 2 km apart and extended up to a maximum of 25 km to the west of the MLA along the western shores of Bathurst Inlet (Figure 7.3-2). Expanding the survey coverage beyond the Focused Survey Stratum surveyed during spring staging surveys allowed for survey effort to encompass the MLA, as well as increase the coverage of the waterbodies further from the proposed development at the MLA. Transect lines within the MLA survey area were flown once during each survey period subsequent to spring staging (spring pair, summer brood, and fall staging). The aircraft followed transect lines using an onboard Garmin global positioning system (GPS) during all aerial surveys.

7.3.1.2 Ground-based Surveys

In addition to aerial surveys conducted for waterbirds in the Focused, Reference, and MLA Focused Survey strata, several freshwater lakes located near the Goose and George Property PDAs known to serve as staging areas in previous years, were resurveyed from the ground in 2013 during spring and fall staging period to verify whether these staging areas were used consistently from year to year during staging periods (Figure 7.3-3). Survey locations were selected based on results from the 2011 and 2012 wildlife baseline studies (Rescan 2012, 2013b) where large flocks of waterbirds have been observed near or within the Goose and George Property PDAs. At these staging sites, a shoreline with good visibility was selected for surveys and waterbirds were observed using a spotting scope. All waterbirds present in the known staging waterbody were recorded. Habitat and spatial information (e.g., GPS coordinate and waterbody size) were also collected at each site.

7.3.1.3 Staging Surveys

Two aerial staging surveys were conducted in 2013: a spring staging survey conducted in late May and a fall staging survey conducted in late August. The spring staging survey was flown at the Focused and Reference Survey strata, while the fall staging area was flown within the MLA Focused Survey Stratum. For both staging surveys, observers identified waterbirds within 400 m on either side of the aircraft using binoculars. Observations of birds at greater distances from the aircraft were noted separately. The behaviour of the birds, e.g., flying, was also noted at the time of observation.

7.3.1.4 Breeding Surveys

Two aerial surveys were conducted in the larger single survey strata during the breeding period in 2013: a spring pair survey conducted in the courting (pre-egg-laying) period in June and a summer brood survey conducted in mid-July after the egg-hatching period. The aerial survey methodology used for breeding surveys was similar to that used for staging surveys with two exceptions. Firstly, observers identified waterbirds within 200 m on either side of the aircraft rather than 400 m. Birds observed greater than 200 m from the aircraft noted separately as “off transect” observations. Secondly, observers focused on recording evidence of breeding using physical or behavioural cues. During the pair survey, observers noted whether male and females were paired as behavioural evidence of breeding. For sexually dimorphic species (i.e., where males and females look different), wherever a male and female were observed in close proximity they were considered to be a pair; in species where sexes look alike, the same distinction was made when only two individuals were observed in close proximity.

During the summer brood survey, observers recorded the presence of broods and also estimated the age of the young birds using a simplified brood class system adapted from a more detailed classification system (Table 7.3-1). Detailed brood class cannot be reliably ascertained during aerial surveys. Although

brood classes were developed specifically for ducks, geese, and swans, they can also be applied to some non-waterfowl species, such as loons, as plumage development is similar in these species.

Table 7.3-1. Brood Class Descriptions and Plumage Development in Young Waterfowl

Simplified Brood Class	Detailed Brood Class*	Description
I	IA	Young are covered in bright down, neck and tail not prominent; 1 to 7 days of age
	IB	Young are covered in fading down, neck and tail not prominent; 8 to 13 days of age
	IC	Young are downed-covered, but colour faded, body elongated; 14 to 18 days of age
II	IIA	First feathers appear, replacing down on sides and tail; 19 to 27 days of age
	IIB	Over half of body covered with feathers; 28 to 42 days of age
	IIC	Small amount of down remains, among feathers of back; 28 to 42 days of age
III	III	Fully feathered but incapable of flight; 43 to 55 days of age, flying at 56 to 60 days of age

Source: Bellrose (1980) and Gollop and Marshall (1954).

7.3.1.5 Data Analysis

Waterbird data were analyzed and summarized according to abundance and species richness within the Focused and Reference Survey strata for spring staging, and within the MLA Focused Survey Stratum for all subsequent survey periods. Abundance is a count of the individuals seen and species richness is the total number of species observed. For analysis purposes, only data that were collected on transect were used in calculations. This included all observations of waterbirds within 400 m of either side of the aircraft during aerial staging surveys and within 200 m during aerial breeding surveys. Birds beyond the focal area for the survey, as well as birds that were flying at the time of observation, were included as "off transect" observations.

Any birds that were recorded within marine habtiats were included as incidental observations; these incidental observations are summarized in results of the marine bird surveys (Section 7.4.3).

Habitat associations of waterbirds were investigated by totaling the number of waterbirds observed within the five broad terrestrial habitat types: pond, river, lake, wetland, or heath tundra. For this analysis, only birds recorded on transect within terrestrial habitat types were included, as the habitat where the waterbird was observed could be confirmed. Beyond the transect survey area, it becomes more challenging to classify the habitat that the bird is associated with because of the greater distance from the observer. In addition, flying birds are not associated with a particular habitat, and thus were also excluded from the analysis of habitat associations.

7.3.2 Marine Bird Surveys

A total of four aerial surveys for marine birds were scheduled within the marine LSA and in areas surrounding the MLA in 2013. Dates for marine surveys aligned with those for waterbirds (Section 7.3.1) in order to collect baseline information for marine bird presence and relative abundance during staging and breeding periods. However, little to no open water was present within Bathurst Inlet during the spring staging period. Therefore, the spring staging survey was cancelled due to unfavourable conditions for recording marine birds using Bathurst Inlet at this time.

PROJECT # 0194096-0005 *GIS #* BAC-23-269 *December 12 2013*

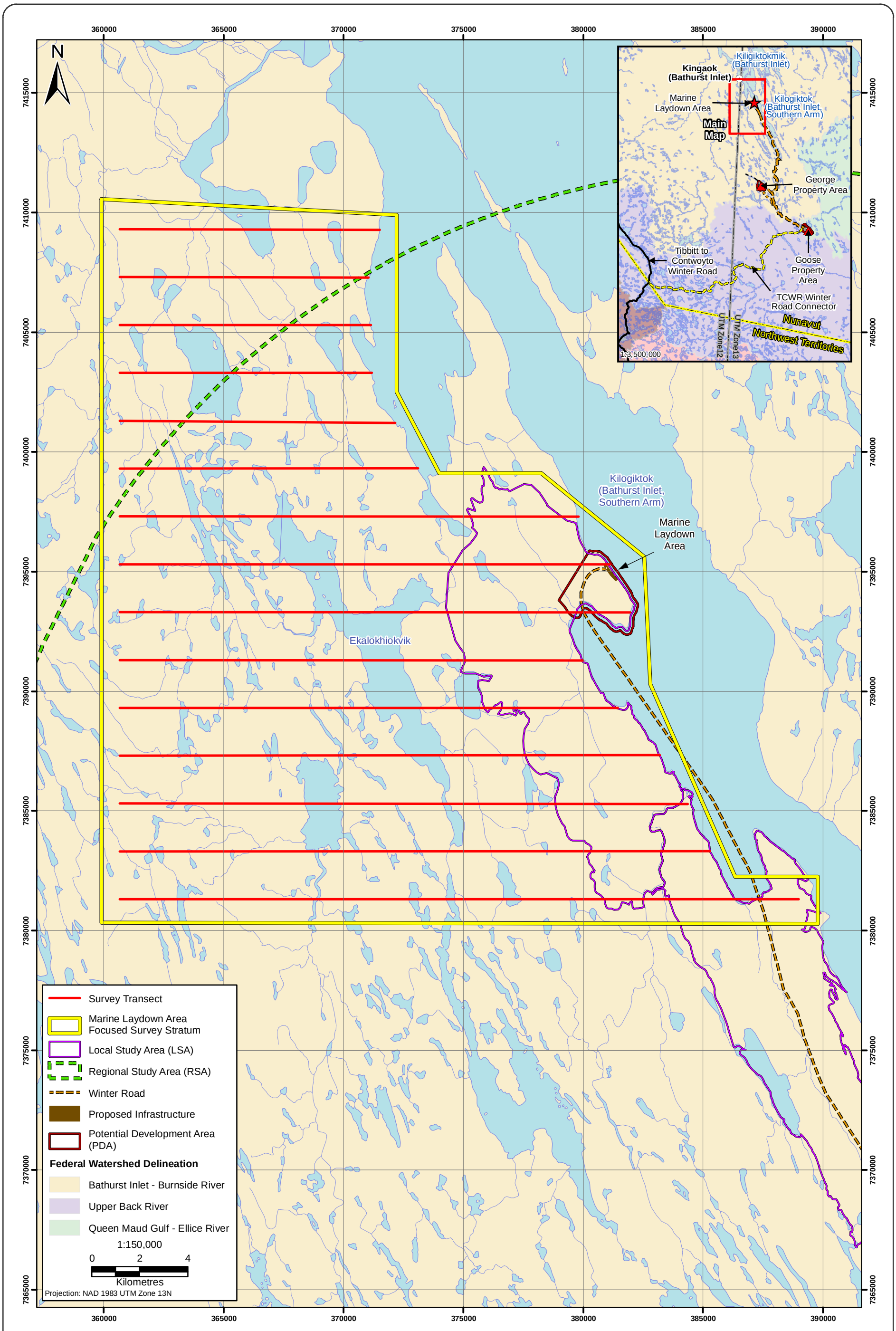


Figure 7.3-2

Sabina GOLD & SILVER CORP.

Waterbird Aerial Survey Area and Transects for the Spring Pair, Summer Brood, and Fall Staging Surveys, 2013

Figure 7.3-2

Rescan an ERM company

PROJECT #0194096-0005 GIS # BAC-23-285 December 17 2013

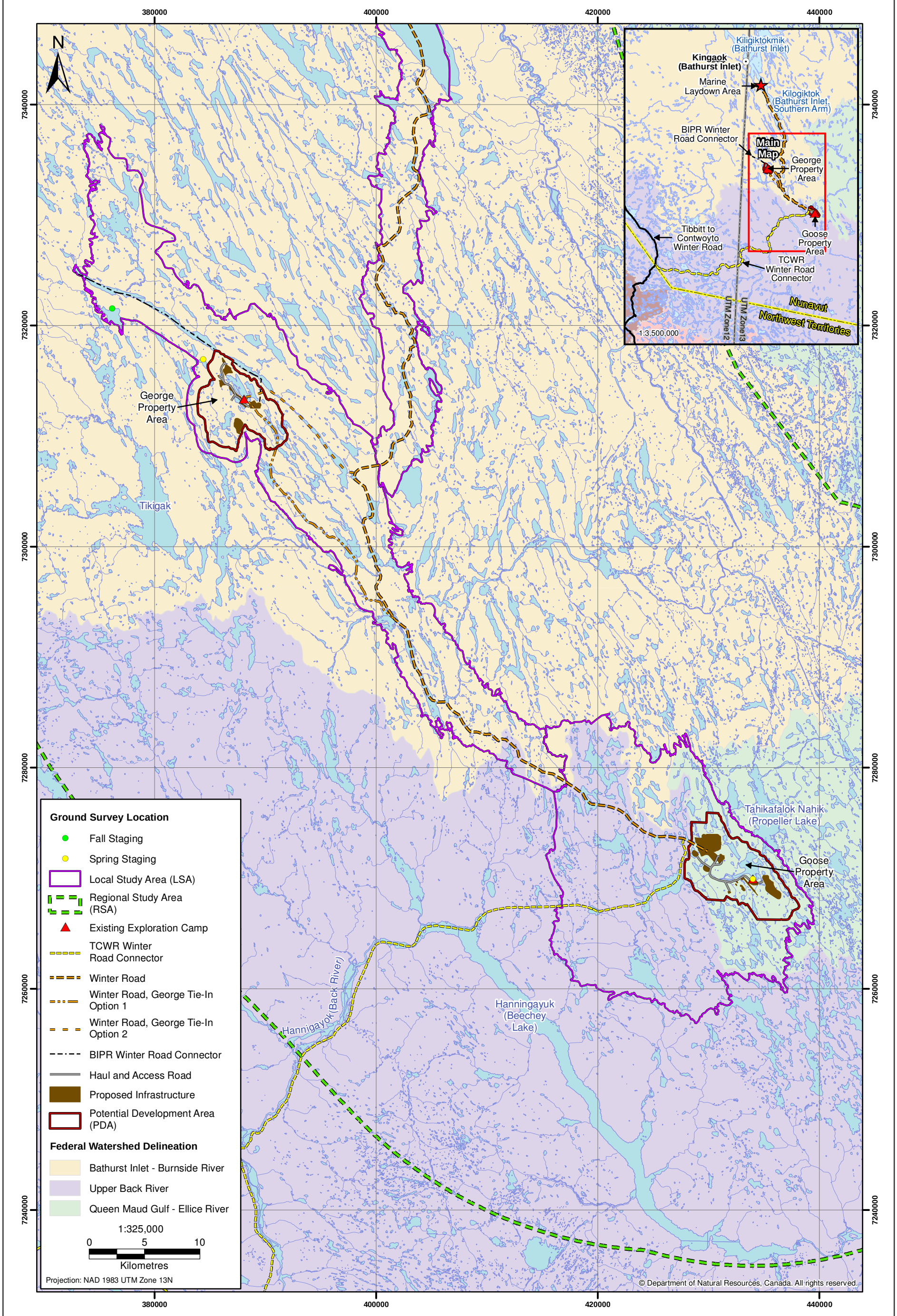


Figure 7.3-3

Sabina GOLD & SILVER CORP.

Waterbird Ground Survey Locations, 2013

Figure 7.3-3

Rescan an ERM company

The remaining three aerial surveys (spring pair, summer brood, and fall staging) were conducted along a single shoreline transect extending from Young Point (north of the MLA but south of Kingaok), past the MLA along the western shoreline to the confluence at the Western River, and back up the eastern shoreline to roughly the same latitude as Young Point (Figure 7.3-4). Flight altitude during all three aerial marine bird surveys was approximately 50 m (164 ft) at a flight speed of 40 km/hour. Data were collected by two biologist observers, and for some surveys an additional person was present to record data. One observer sat next to the pilot on the left side of the aircraft. The second observer sat, facing forward directly, either behind the first observer on the left side or behind the pilot on the right side of the aircraft. The position of the second observer in the aircraft was dependent on how far from the shoreline the aircraft flew, which varied based on safety concerns. The second observer sat behind the first observer when the aircraft flew directly along the shoreline; this method was used during all surveys except the fall staging survey. During the fall staging survey, the aircraft flew approximately 400 m from the shoreline and the second observer sat on the right side and recorded marine birds on that side of the aircraft along the shoreline.

Observers searched an area of approximately 400 m from the shoreline for marine birds. Whenever a marine bird or waterbird was observed, the species, number of individuals, and behaviour were recorded, as well as the location of the sighting using a handheld Garmin GPS Map62s. All habitat information for marine species was recorded as "marine" unless birds were observed on the shore in which case was recorded as being in rivers, riparian, creeks, ponds, estuaries, or heath tundra.

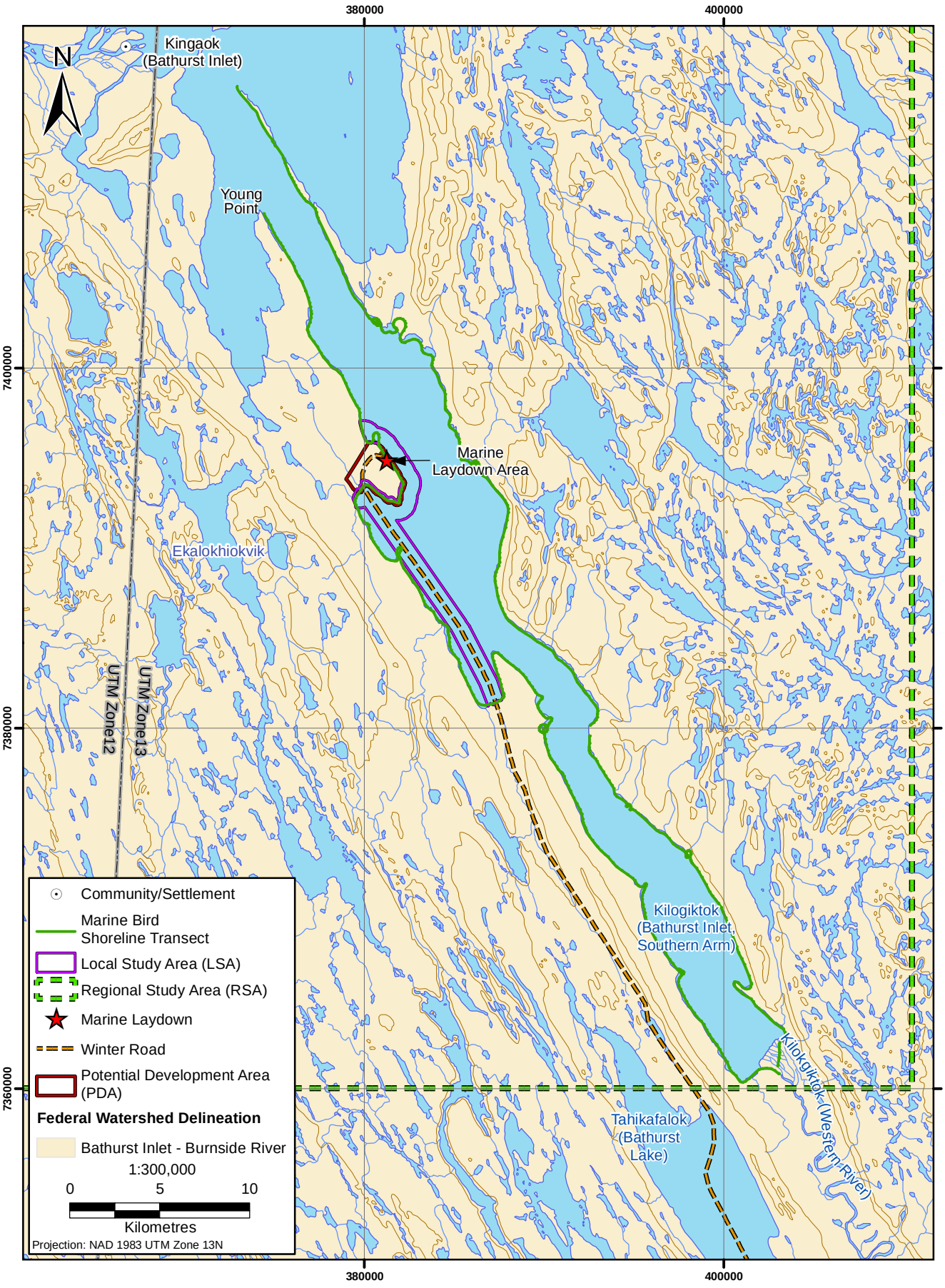
7.3.2.1 Data Analysis

Marine bird data were analyzed and summarized according to abundance and species richness across all surveys. For analysis purposes, only data that were collected on transect were used in calculations. This included all observations of marine birds within the 400 m area along the shoreline of Bathurst Inlet. Birds beyond the focal area for the survey (further than 400 m from the shoreline) as well as any birds that were flying at the time of observation, were defined as "off transect" observations.

Any individuals recorded within terrestrial habitat (in rivers, riparian, creeks, ponds, estuaries, or heath tundra) were defined as incidental observations; these incidental observations are summarized in results of the terrestrial waterbird surveys (Section 7.4.2).

7.3.3 Incidental Observations of Waterbirds and Marine Birds

Incidental observations of waterbirds were geo-referenced before and after waterbird or marine bird aerial surveys and opportunistically during other wildlife surveys and baseline studies conducted by other disciplines in the RSA during 2013. In addition, incidental observations of waterbirds were compiled from images captures by remote motion-triggered cameras placed in the RSA between March 2013 and August 2013 and used for baseline studies conducted for caribou (Chapter 9). Whenever possible, waterbirds and marine birds were identified to the species level, sex, and age (young vs. adult), and habitat type identified. Incidental data are useful to determine the presence of species in the area, but cannot be used for assessment and monitoring because the observations cannot be standardized by effort. Thus, incidental observations were summarized by not included in any data analyses.



Sabina GOLD & SILVER CORP.

Shoreline Transect for Marine Bird Aerial Surveys, 2013

Figure 7.3-4

Rescan an ERM company

7.4 RESULTS

7.4.1 Summary

In total, 24 waterbird and marine bird species were recorded during aerial or ground surveys or incidentally in 2013 (Sections 7.4.2 to 7.4.5; Appendices 5-4, 7-1, and 7-2). This represents 40% (n = 49) of the waterbird and marine bird species that potentially occur within the RSA (Appendix 4-2). Species abundance and richness varied temporally and both generally increased over the course of the survey periods. Overall, four confirmed species of conservation concern listed as sensitive in Nunavut were detected, including long-tailed duck, Arctic tern, common eider, and glaucous gull. The most common species observed during aerial surveys were, long-tailed duck (species of conservation concern), Canada goose, greater scaup, and red-breasted merganser.

One notable terrestrial staging area located at Ekalokhiokvik Lake (the largest lake in the survey area) was detected during aerial surveys which supported high abundance and diversity of waterbirds. In addition, a key terrestrial staging site was confirmed at a small shallow lake just outside the George Property PDA. In southern Bathurst Inlet, the most notable staging area detected occurred along the marine shoreline adjacent to the MLA PDA, as well as a prominent staging area near the confluence with the Western River.

Evidence of breeding was relatively low in the waterbird and marine bird survey areas. Several pairs of long-tailed ducks (species of conservation concern) were observed in freshwater lakes outside of the MLA PDA during waterbird pair surveys. Pairs of long-tailed ducks and loons were also detected within marine habitat during marine bird surveys. Direct evidence of breeding was only documented for long-tailed ducks and common eider, two species of conservation concern, although additional broods were observed incidentally (Section 7.4.4). No broods were observed within the MLA PDA or LSA.

7.4.2 Waterbird Surveys

A total of 12 species and 697 individuals of waterbirds were observed during the four waterbird surveys conducted in the Focused and Reference survey strata (spring staging), and in the MLA Focused Survey Stratum (spring pair, summer brood, and fall staging; Table 7.4-1). Of the 697 individuals recorded, 483 were observed on transect. In addition, 8 species and 288 individuals were recorded incidentally within terrestrial habitats during marine bird surveys (Table 7.4-1). One additional species of waterbird; the American green-winged teal, was observed incidentally within terrestrial waterbodies during marine bird surveys, but not during waterbird surveys. The American wigeon was recorded during ground surveys in the spring staging period, but was not recorded during any other survey.

Table 7.4-1. Waterbird Species Observed during Terrestrial Aerial Surveys and Incidentally during Marine Aerial Surveys, 2013

		Spring Staging		Spring Pair			Summer Brood			Fall Staging			Total	Total
Species	Scientific Name	On	Off	On	Off	Inc.	On	Off	Inc.	On	Off	Inc.	on/off	with Inc.
Geese and Swans														
Canada Goose	*Branta canadensis*	-	-	16	-	62	-	37	95	-	36	13	89	259
Greater White-fronted Goose	*Anser albifrons*	17	17	-	-	-	-	-	-	-	-	-	34	34
Snow Goose	*Chen caerulescens*	-	-	-	-	-	-	-	-	20	4	-	20	20
Tundra Swan	*Cygnus columbianus*	-	-	7	-	1	11	3	1	23	-	2	48	48
Unknown Goose		20	-	-	-	-	6	-	-		-16	-	42	42

(continued)

Table 7.4-1. Waterbird Species Observed during Terrestrial Aerial Surveys and Incidentally during Marine Aerial Surveys, 2013 (completed)

Species	Scientific Name	Spring Staging		Spring Pair			Summer Brood			Fall Staging			Total on/off	Total with Inc.
		On	Off	On	Off	Inc.	On	Off	Inc.	On	Off	Inc.		
Dabbling Duck														
Northern Pintail	*Anas acuta*	2	-	7	-	4	7	-	18	45	3	-	64	86
American Green-winged Teal	*Anas crecca*	-	-	-	-	3	-	-	1	-	-	-	-	4
Unknown Duck		-	-	-	-	-	18	5	-	3	16	-	42	42
Diving Duck														
Greater Scaup	*Aythya marila*	-	-	5	-	-	13	-	36	106	62	-	186	222
*Long-tailed Duck	*Clangula hyemalis*	-	-	27	1	-	17	-	-	-	-	-	45	45
Red-breasted Merganser	*Mergus serrator*	-	-	6	-	-	3	3	1	57	-	-	69	70
Unknown Diver		-	-	-	-	-	6	8	-	5	-	-	19	19
Loons														
Pacific Loon	*Gavia pacifica*	-	-	1	-	-	4	-	-	-	-	-	5	5
Red-throated Loon	*Gavia stellata*	-	-	2	-	-	6	-	1	9	-		17	18
Unknown Loon		-	-	-	-	-	4	-	-	-	-	-	4	4
Gulls														
*Glaucous Gull	*Larus hyperboreus*	-	1	-	-	1	-	-	29	1	-	-	2	32
Herring Gull	*Larus argentatus*	1	2	-	-	-	-	-	-	-	-	-	3	3
Unknown Gull		-	-	-	-	-	-	-	14	-	-	6	0	20
Unknown Waterbird		-	-	-	-	-	-	-	-	8	-	-	8	8
Total		**41**	**20**	**71**	**1**	**71**	**95**	**56**	**196**	**277**	**137**	**21**	**697**	**981**

**Species of conservation concern*
On = Observed on transect
Off = Observed off transect or flying

7.4.2.1 Survey Effort and Ice Conditions

Despite different areas being surveyed for spring and fall staging, survey effort between the two staging surveys was similar (Table 7.4-2; Appendix 7-1). Although the amount of time spent surveying during spring staging within the Focused and Reference Survey strata was approximately an hour less than the time spent surveying in the MLA Focused Survey Stratum during fall staging (Table 7.4-2), the total amount of water covered during surveys was similar between the combined spring staging surveys (Focused and Reference Survey strata; 46 km), and the fall staging survey in the MLA Focused Survey Stratum (38 km). Survey effort was also similar cross the MLA Focused Survey Stratum between the two breeding surveys (spring pair and summer brood surveys). A total of 144 minutes was used to survey during the spring pair survey, and a total of 209 minutes during the summer brood survey (Appendix 7-1).

Ice cover varied between the four waterbird surveys. A large amount of ice cover was present during the spring staging survey in May (Plate 7.4-1). Therefore, the amount of water available for use during the spring staging survey was disproportionately smaller than that available during the breeding surveys and fall staging survey. Ice was present on terrestrial lakes during the spring pair survey in June, while no ice was encountered during the summer brood survey. Ice cover was variable during June, ranging from roughly 70 to 80% ice cover on large waterbodies to 0% ice cover on small waterbodies (Plate 7.4-1). Therefore, the amount of water habitat available for use was lower during the spring pair survey compared to the summer brood survey. No ice was present on waterbodies or on Bathurst Inlet during brood or fall staging surveys.

Table 7.4-2. Survey Effort and Amount of Habitat Surveyed during Aerial Terrestrial Waterbird Surveys, 2013

		Focused Survey Stratum			Reference Survey Stratum			MLA Focused Survey Stratum		
Survey	Date	Survey Effort (minutes)	Length of Transects (km)	Kilometers of Water Flown (km)	Survey Effort (minutes)	Length of Transects (km)	Kilometers of Water Flown (km)	Survey Effort (minutes)	Length of Transects (km)	Kilometers of Water Flown (km)
Spring Staging	May 23-24, 2013	67	128	27	61	128	19	-	-	-
Spring Pair	June 18, 2013	-	-	-	-	-	-	144	266	38
Summer Brood	June 20, 2013	-	-	-	-	-	-	209	266	38
Fall Staging	26-Aug-13	-	-	-	-	-	-	189	266	38

Spring Staging (May 23, 2013)

Spring Pair (June 13, 2013)

Plate 7.4-1. Ice conditions recorded during terrestrial aerial surveys in May and June, 2013.

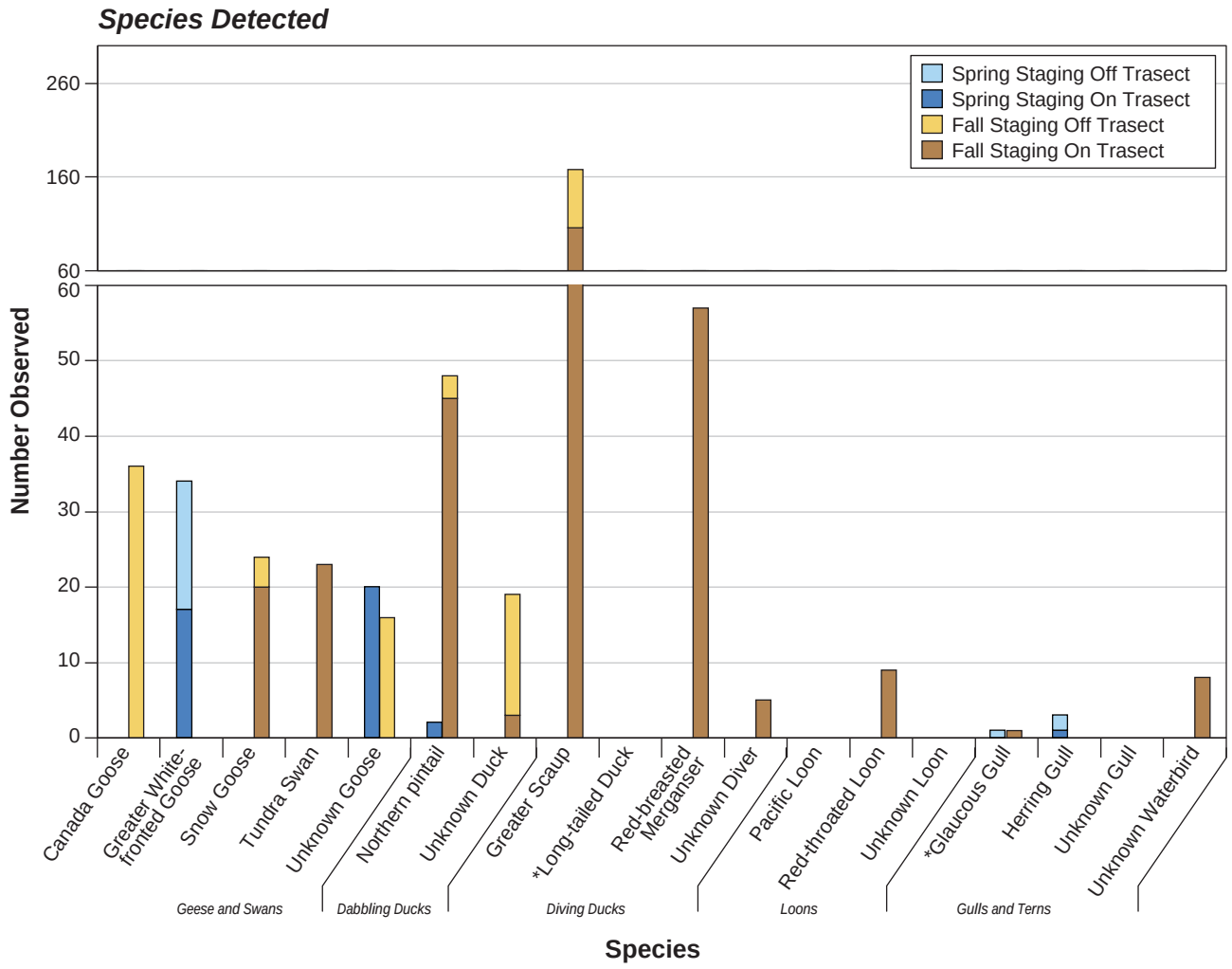
7.4.2.2 Aerial Staging Surveys

A spring staging survey was conducted within the Focused and Reference Survey strata on May 23 and 24, 2013, respectively. A second staging survey was conducted during the fall migration period on August 26, 2013 within the MLA Focused Survey Stratum. A total of 9 species and 317 individuals were detected on transect during staging surveys with an additional 157 individuals belonging to seven species recorded off-transect (Figure 7.4-1; Table 7.4-1). Waterbird abundance and species richness was higher in fall (277 individuals, 7 species) relative to spring (40 individuals, 3 species; Figure 7.4-1) and this trend was observed across most species groups. A greater diversity and abundance of geese species were recorded during fall staging surveys, although one species of goose, the greater white-fronted goose, was observed during the spring staging, but not the fall staging survey (Figure 7.4-1).

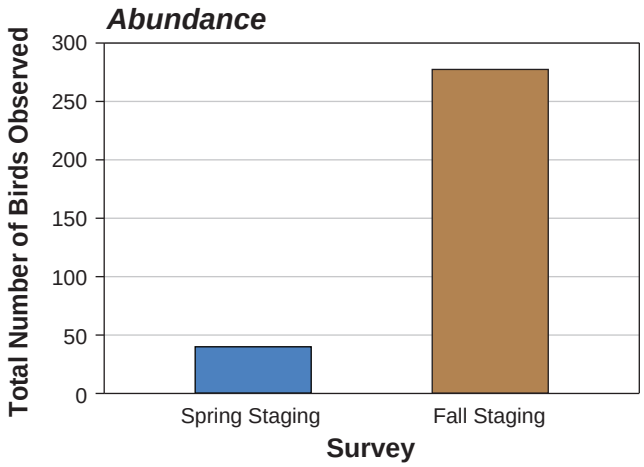
One species of conservation concern was observed during staging surveys: glaucous gull. Glaucous gulls are listed as Sensitive in Nunavut and were observed on transect during fall staging surveys, and off transect during spring staging surveys. Glaucous gulls were relatively rare during staging surveys, but when present, were observed near lakes.

During the spring staging surveys, waterbird abundance and species diversity was relatively low (40 individuals, 3 species; Figure 7.4-1). Greater white-fronted geese were observed most frequently (Figure 7.4-2). All waterbird observations were outside of the LSA, with the exception of flocks of greater-white fronted and unknown geese.

In the fall, few waterbirds were recorded within the LSA, and no waterbirds were recorded within the MLA PDA (Figure 7.4-3). Small flocks (<25 individuals) belonging to four species of waterbirds were seen within the LSA. However, the majority of flocks of waterbirds observed during the fall survey were seen to the west of the LSA. Abundance of waterbirds were also higher outside of the LSA (Figure 7.4-1), and many species were observed in large flocks. Greater scaup were the most commonly detected species (n = 168) recorded during fall staging surveys consisting of 39% of on transect observations followed by red-breasted merganser (Table 7.4-1; Figures 7.4-1 and 7.4-4).



*Note: *Species of conservation concern.*



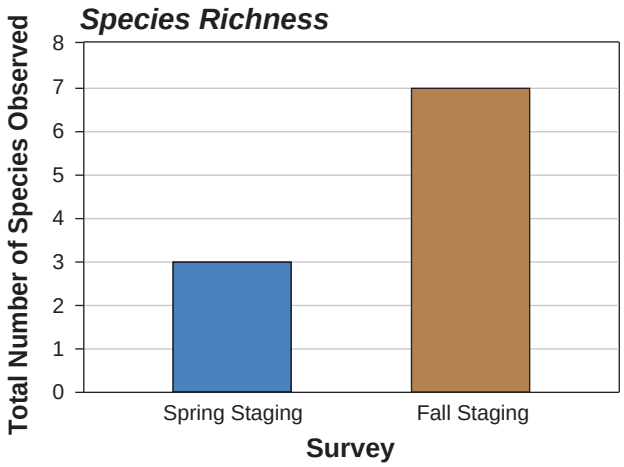


Figure 7.4-1

Waterbird Species Detected and Species Abundance and Richness Recorded during Staging Surveys, 2013

Several lakes in the survey area supported flocks of waterbirds, although Ekalokhiokvik Lake (the largest lake in the survey stratum), supported the highest abundance and diversity of waterbirds during the fall survey. In addition to geese, flocks of greater scaup and red-breasted mergansers were recorded in this area during the fall survey. The majority (91%) of all waterbirds observed on transect during spring and fall staging surveys were recorded in lakes (n = 415; Table 7.4-3). Geese and Swans were also observed in wetland habitat during spring staging surveys only.

Table 7.4-3. Number of Waterbirds Associated with Each Habitat Type during Terrestrial Aerial Staging Surveys

	Geese/Swan		Dabbling Ducks		Diving Ducks		Loons		Gulls/Terns		Total	
Habitat	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall	Spring	Fall
Lake	1	68	2	67		230		9	1	1	**4**	**375**
Wetland	36	-	-	-	-	-	-		-	-	**36**	**-**

Note: Table includes only ON transect individuals seen where habitat was assessed.

7.4.2.3 Ground-based Staging Surveys

A total of three waterbodies were surveyed from the ground in 2013 (Figure 7.4-3; Appendix 7-2). Two waterbodies were surveyed during the spring staging period and one waterbody was surveyed during the fall staging period. Each ground survey was conducted for a 20 min period.

A total of nine species and 429 individuals were detected during ground based staging surveys at previously identified staging areas near or at the Goose and George Property PDAs (Table 7.4-4; Appendix 7-2). A greater number of waterbirds were detected during spring surveys relative to fall surveys (427 individuals and two individuals, respectively). Species richness was higher during spring staging surveys (eight species vs. one species) and observations included one species that was not detected during other surveys (American wigeon). No observations of species of conservation concern were made during any ground survey.

Table 7.4-4. Species Observed during Ground-based Staging Surveys

Species	Scientific Name	Spring Staging	Fall Staging	Total
Geese and Swans				
Canada Goose	*Branta canadensis*	57	-	57
Greater White-fronted Goose	*Anser albifrons*	31	-	-
Snow Goose	*Chen caerulescens*	70	-	-
Dabbling Duck				
Northern Pintail	*Anas acuta*	243	-	-
American Green-winged Teal	*Anas crecca*	3	-	-
American Wigeon	*Anas americana*	1	-	-
Diving Duck				
Greater Scaup	*Aythya marila*	14	-	-
*Long-tailed Duck	*Clangula hyemalis*	8	-	-
Loons				
Red-throated Loon	*Gavia stellata*	-	2	2
Total		**427**	**2**	**429**

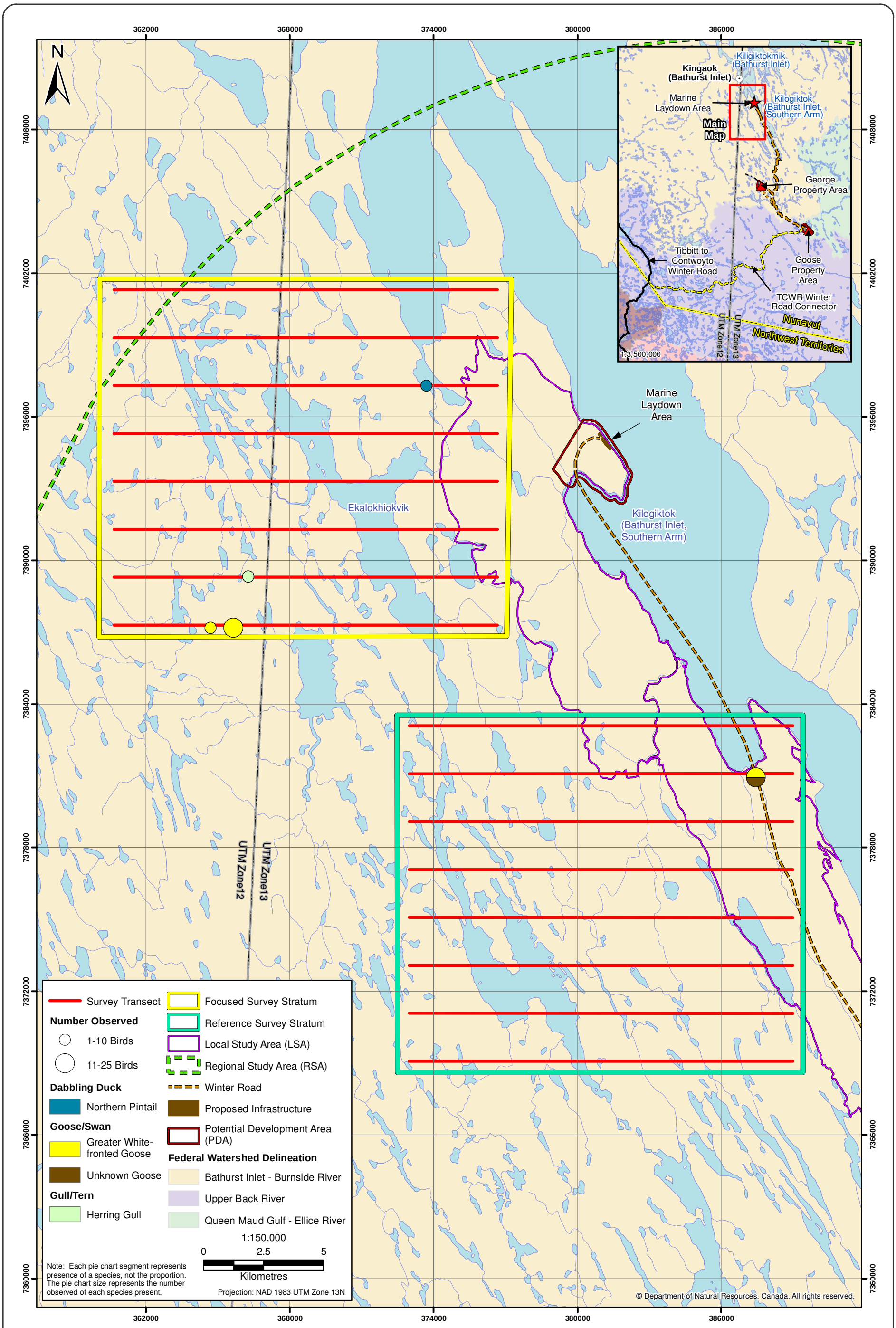


Figure 7.4-2

Sabina GOLD & SILVER CORP.

Distribution of Waterbirds during Aerial Spring Staging Surveys, 2013

Figure 7.4-2

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-279 December 12 2013

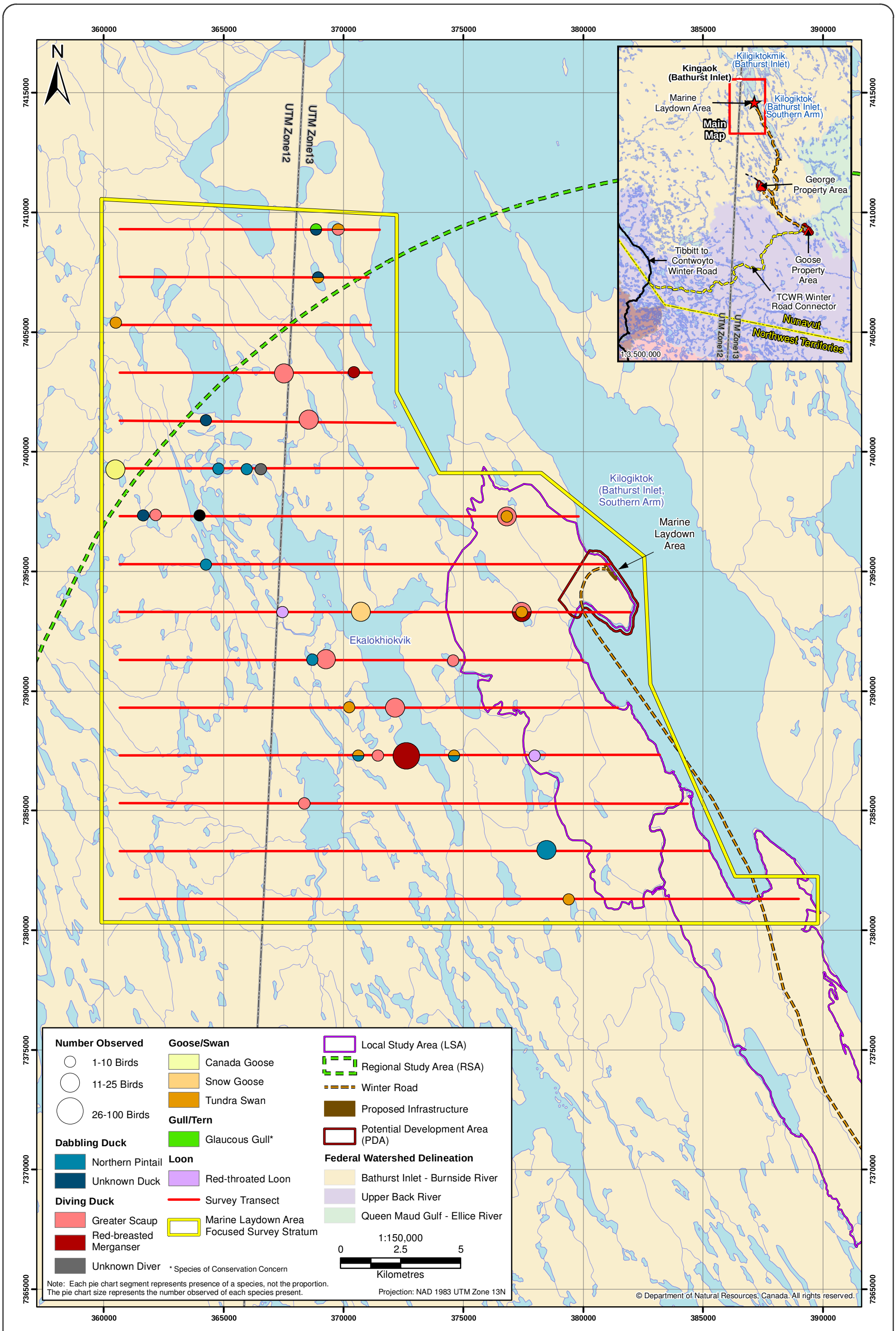


Figure 7.4-3

Sabina GOLD & SILVER CORP.

Distribution of Waterbirds during Aerial Fall Staging Surveys, 2013

Figure 7.4-3

Rescan an ERM company

The majority (99%) of ground observations of waterbirds were made during the spring staging survey period at the ground survey location immediately north west of the George Property PDA. A wide diversity of waterbird groups and species were detected using this lake, including geese (Canada goose, greater white-fronted, and snow goose), dabbling ducks (northern pintail, American wigeon, and American green-winged teal), and diving ducks (greater scaup). Large flocks of snow geese (> 25 individuals), as well as flocks of northern pintail (> 10 individuals) were also observed.

7.4.2.4 Breeding Surveys

Two aerial breeding surveys were conducted in the MLA Focused Survey Stratum: a spring pair survey conducted on June 18, 2013 to document the presence of breeding pairs; and a summer brood survey conducted on July 20, 2013 to document reproduction and the presence of young birds.

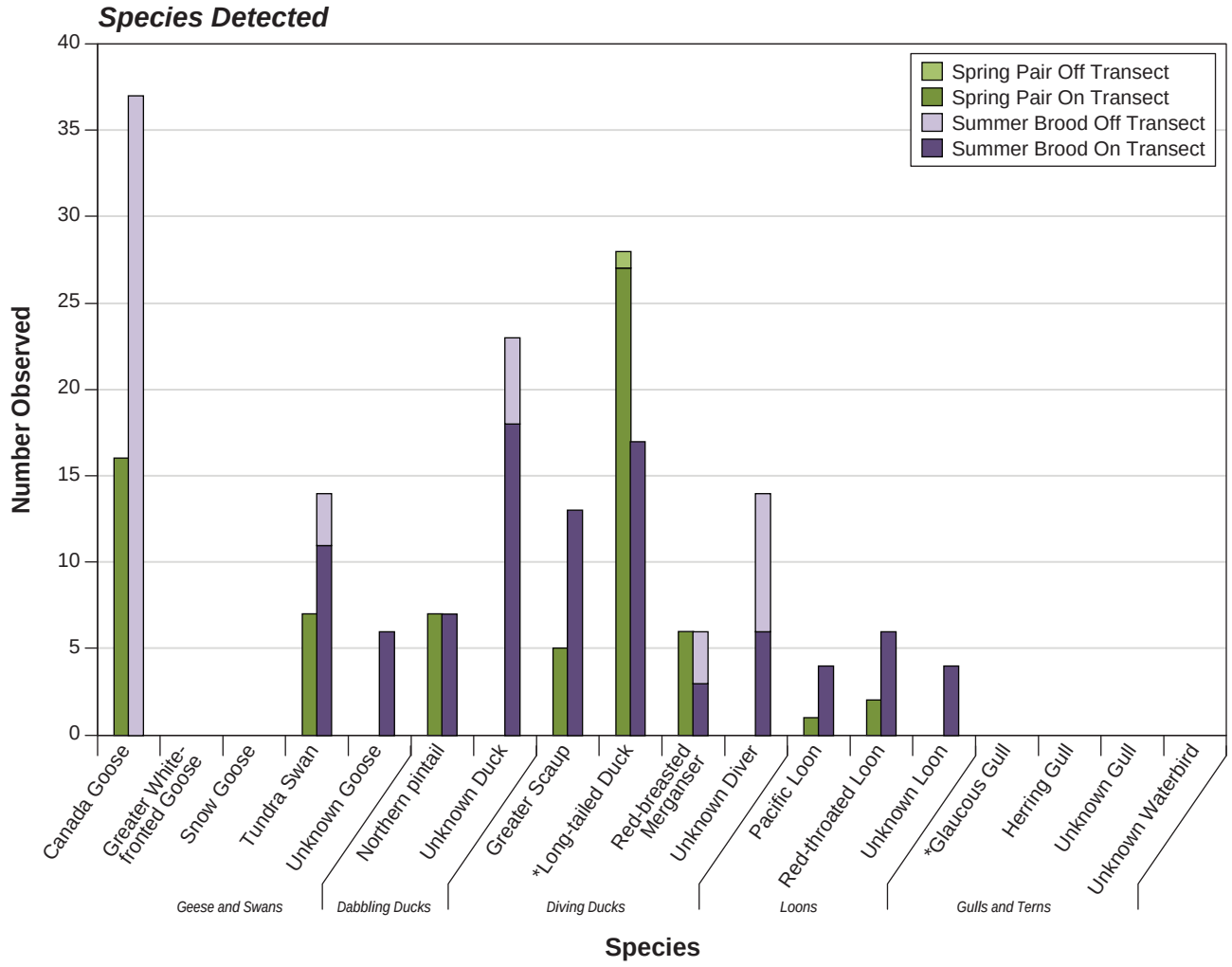
A total of 8 species and 166 individuals were detected on transect during breeding surveys with an additional 57 individuals belonging to four species recorded off transect (Table 7.4-1; Figure 7.4-4). Waterbird abundance was higher during the summer brood survey (95 individuals) relative to the spring pair survey (71 individuals; Table 7.4-1; Figure 7.4-5). Species richness was similar between the spring brood survey (8 species) relative to the spring pair survey (7 species; Figure 7.4-4). The most widely distributed waterbird group during breeding surveys was represented by diving ducks followed by geese/swans.

One species of conservation concern was observed during spring pair and summer brood surveys: long-tailed duck. Long-tailed duck is listed as Sensitive in Nunavut and was the most commonly detected species (n = 168) recorded during pair and brood surveys consisting of 27% of on transect observations (Table 7.4-1; Figures 7.4-5 and 7.4-6). Six pairs of long-tailed ducks were observed on transect during spring pair surveys. A large number of unknown ducks and unknown diving ducks were observed during the summer brood survey (Figure 7.4-5), which may also include long-tailed ducks. Long-tailed duck pairs and one brood were observed during breeding surveys; both species are of conservation concern.

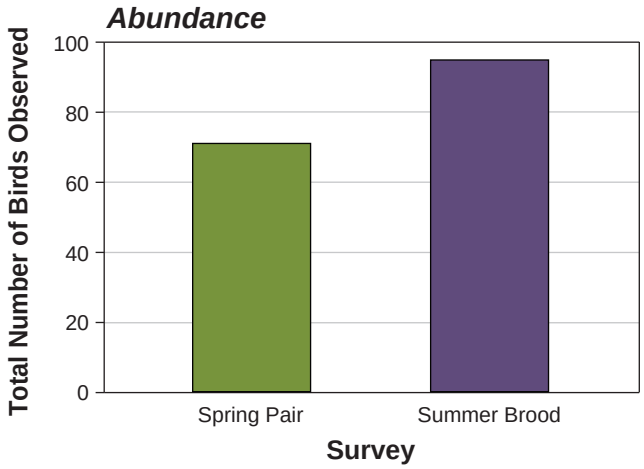
Evidence of breeding was detected more frequently during spring pair surveys than during brood surveys. A total of 11 pairs were detected during spring pair surveys, but only one brood was detected during summer brood surveys. The brood was not described in terms of its estimated brood class. Most observed pairs recorded during the breeding surveys were of long-tailed ducks with the exception of one pair of red-breasted merganser, one pair of red-throated loon and two pairs of tundra swans. The brood recorded during the brood survey was a long-tailed duck brood (Figure 7.4-5 and 7.4-6).

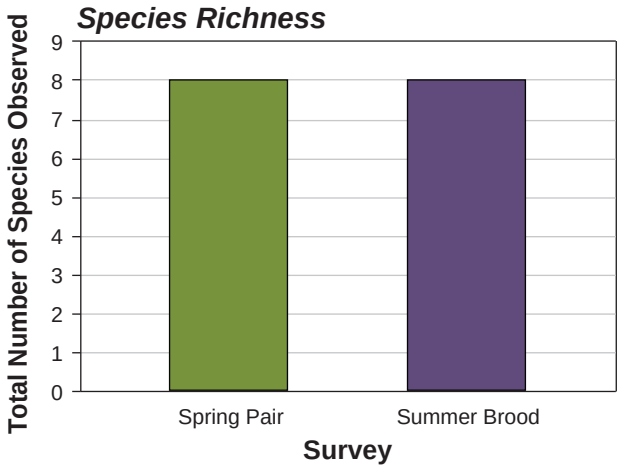
During breeding surveys, few waterbirds were recorded on transect within the LSA, and no waterbirds were recorded within the MLA PDA. Compared to areas to the west of the LSA, and north of the LSA, where small to medium flocks of eight species of waterbirds were recorded, only four species of waterbirds were seen within the LSA during brood surveys (Figure 7.4-6). Of these observations, two pairs of long-tailed ducks were observed within the LSA during spring pair surveys; no brood were observed within the LSA during summer brood surveys (Figure 7.4-5).

Most observations of waterbird species during the breeding surveys were detected on large lakes (Table 7.4-5). During the spring pair surveys, the majority of geese and swans were observed in lakes (80%, n = 40), with some geese and swans observed in rivers, creeks and wetlands. All dabbling ducks, diving ducks, and loons were observed in lakes during spring pair surveys; diving ducks were additionally observed in rivers. All observations of paired waterbirds were recorded in lakes, with the exception of tundra swan pairs, which were recorded in rivers and creeks (Table 7.4-6; Appendix 7-2). During the summer brood survey, geese, diving ducks, and loons were observed on lakes (100%, 82%, and 86% respectively), or in ponds. Although most observations of dabbling ducks during the summer brood surveys were in lakes (64%), a relatively high proportion of dabbling duck observations were also in ponds (36%), compared with other waterbird species. The one brood detection was on a pond (Figure 7.4-5; Appendix 7-2).



*Note: *Species of conservation concern.*





Sabina GOLD & SILVER CORP.

Waterbird Species Detected and Species Abundance and Richness Recorded during Breeding Surveys, 2013

Figure 7.4-4

Rescan Engineers & Scientists

PROJECT # 0194096-0005 *GIS #* BAC-23-282 *December 12 2013*

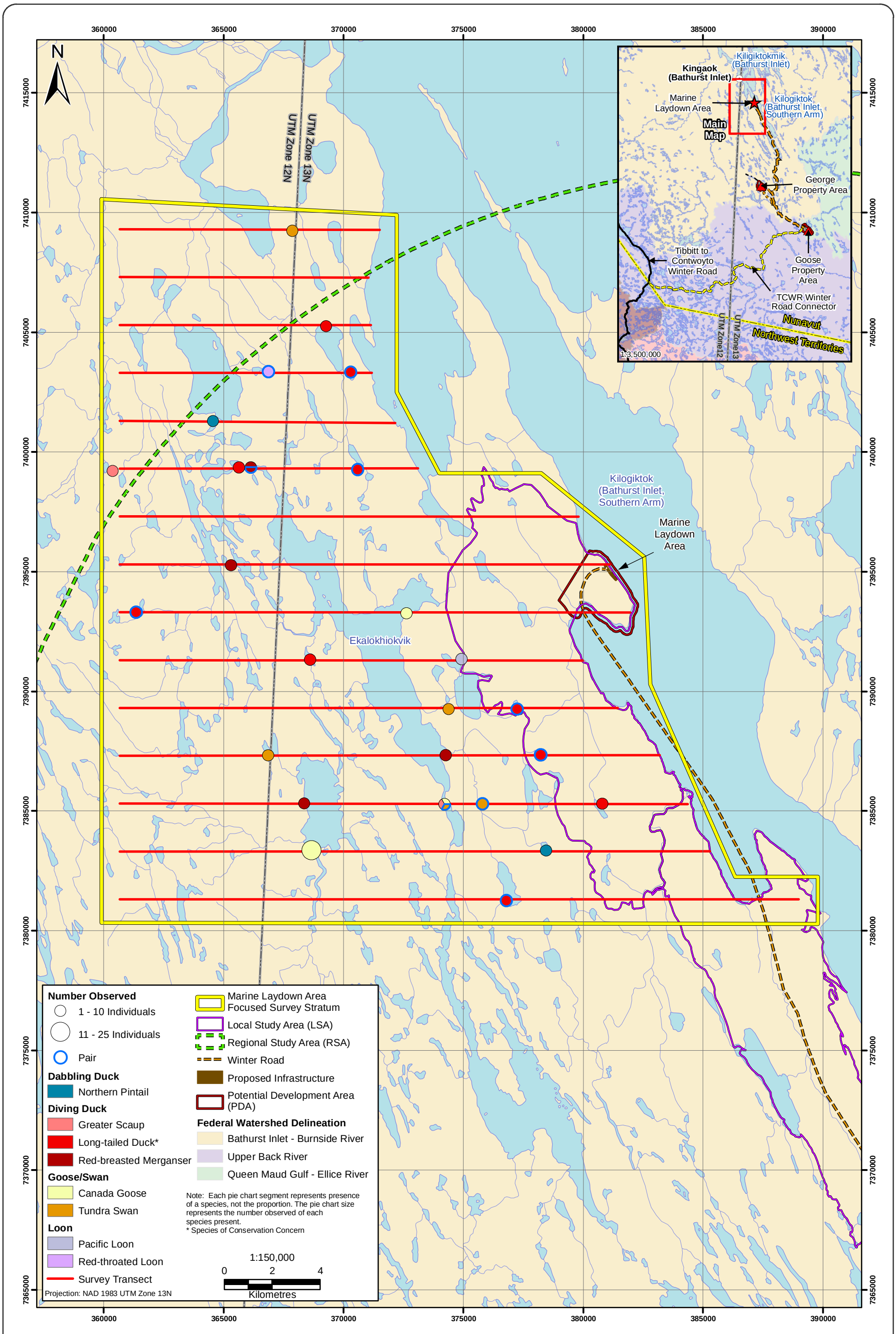


Figure 7.4-5

Sabina GOLD & SILVER CORP.

Distribution of Waterbirds during Aerial Spring Pair Surveys, 2013

Figure 7.4-5

Rescan an ERM company

PROJECT # 0194096-0005 *GIS #* BAC-23-283 *December 12 2013*

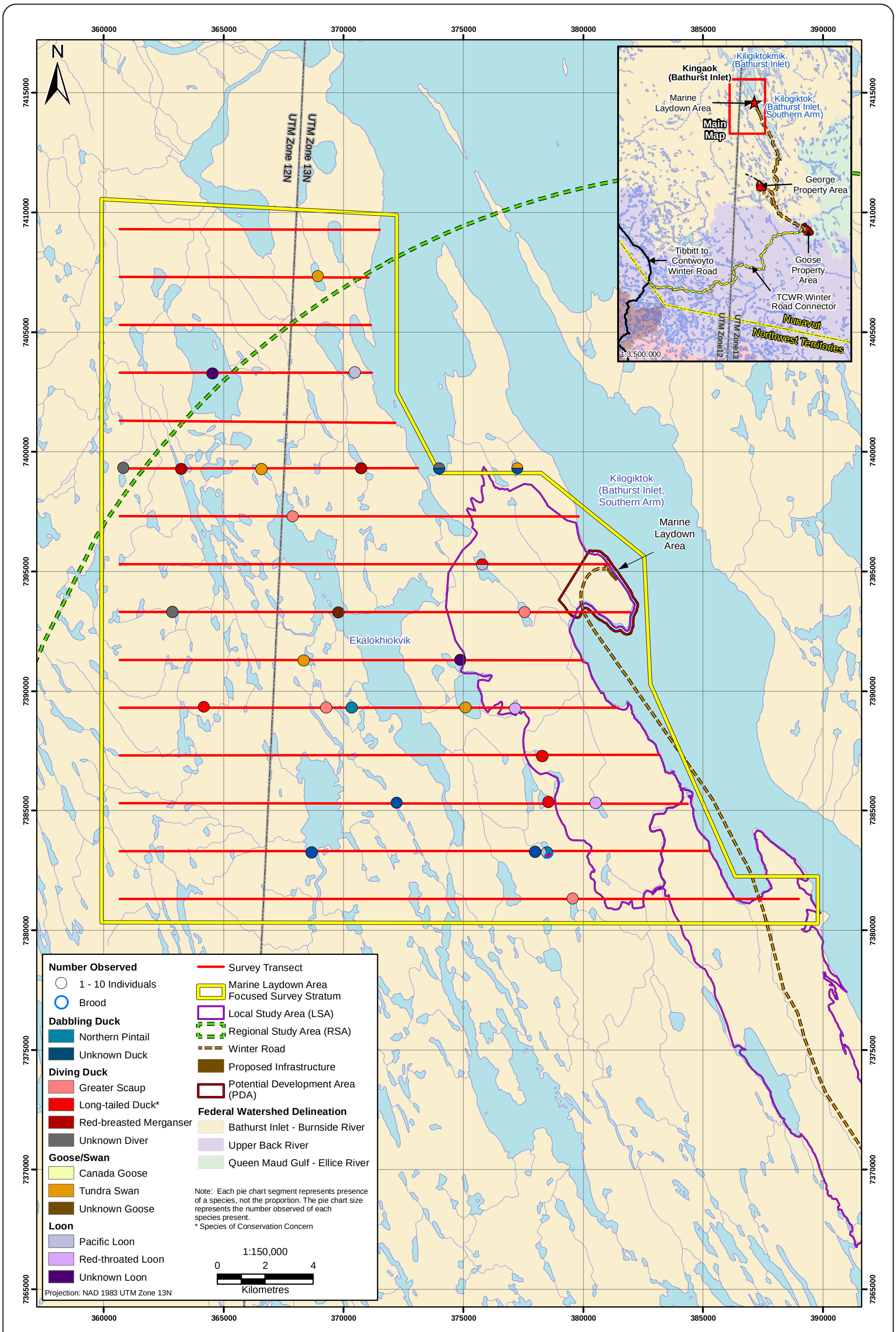


Figure 7.4-6

Sabina GOLD & SILVER CORP.

Distribution of Waterbirds during Aerial Summer Brood Surveys, 2013

Figure 7.4-6

Rescan an ERM company

Table 7.4-5. Number of Waterbirds Associated with Each Habitat Type during Terrestrial Aerial Breeding Surveys

Habitat	Geese/Swans		Dabbling Ducks		Diving Ducks		Loons		Total	
	Pair	Brood	Pair	Brood	Pair	Brood	Pair	Brood	Pair	Brood
Lake	15	17	7	16	35	32	3	12	**60**	**77**
Pond	-	-	-	9		-7	-	2	**-**	**18**
River	5	-	-	-	4	-	-	-	**9**	**-**
Creek	2	-	-	-	-	-	-	-	**2**	**-**
Wetland	1	-	-	-	-	-	-	-	**1**	**-**

Note: Table includes only ON transect individuals seen where habitat was assessed.

Table 7.4-6. Marine Bird Species Observed during Marine Aerial Surveys, and Incidentally during Terrestrial Surveys 2013

Species	Scientific Name	Spring Staging			Spring Pair			Summer Brood			Fall Staging			Total On/Off	Total with Incidentals
		On	Off	Inc.	On	Off	Inc.	On	Off	Inc.	On	Off	Inc.		
Geese and Swans															
Canada Goose	*Branta canadensis*	-	-	-	265	-	112	509	-	-	119	-	48	893	1053
Greater White-fronted Goose	*Anser albifrons*	-	-	-	2	-	-	7	-	-	-	-	-	9	9
Brant Goose	*Branta bernicla*	-	-	-	-		-	-	-	-	24		-	24	24
Tundra Swan	*Cygnus columbianus*	-	-	2	-	-	-	-	-	-	-	-	-	-	2
Dabbling Duck															
Northern Pintail	*Anas acuta*	-	-	-	27	-	-	1	-	5	13	-	-	41	46
Northern Shoveler	*Anas clypeata*	-	-	-	3	-	-	-	-	-	28	-	-	31	31
Mallard	*Anas platyrhynchos*	-	-	-	-	-	-	3	-	-	-	-	-	3	3
Unknown Duck		-	-	-	4	-	-	5	-	66	-	-	-	9	75
Diving Duck/Sea Ducks															
*Common Eider	*Somateria mollissima*	-	-	-	30	-	-	3	-	-	-	-	-	33	33
Surf Scoter	*Melanitta perspicillata*	-	-	-	-	-	-	4	-	-	-	-	-	4	4
Greater Scaup	*Aythya marila*	-	-	-	66	-	31	242	-	40	981	-	363	1,289	1723
*Long-tailed Duck	*Clangula hyemalis*	-	-	-	41	-	-	1	-	-	-	-	16	42	58
Red-breasted Merganser	*Mergus serrator*	-	-	-	82	51	16	32	-	23	131	-	33	296	368
Unknown Diver		-	-	-	-	-	-	18	-	-	-	-	-	18	18
Loons															
Pacific Loon	*Gavia pacifica*	-	-	-	11	1	-	-	-	1	4	-	-	16	17
Red-throated Loon	*Gavia stellata*	-	-	-	28	6	-	3	-	2	16	-	-	53	55
Yellow-billed Loon	*Gavia adamsii*	-	-	-	2	-	-	4	-	-	8	-	-	14	14
Unknown Loon		-	-	-	-	-	-	-	-	-	16	-	1	16	17

(continued)

Table 7.4-6. Marine Bird Species Observed during Marine Aerial Surveys, and Incidentally during Terrestrial Surveys, 2013 (completed)

Species	Scientific Name	Spring Staging			Spring Pair			Summer Brood			Fall Staging			Total On/Off	Total with Incidentals
		On	Off	Inc.	On	Off	Inc.	On	Off	Inc.	On	Off	Inc.		
Gulls/Terns															
*Glaucous Gull	*Larus hyperboreus*	-	-	-	11	3	18	85	-	-	-	29	2	128	148
Herring Gull	*Larus argentatus*	-	-	-	2	-	-	65	-	-	-	4	-	71	71
Unknown Gull		-	-	-	-	-	-	-	1	-	2	9	-	11	11
Unknown Waterbird		-	-	-	-	-	-	-	-	-	10	-	-	-	10
Total					**574**	**61**	177	**982**	**0**	138	**1,352**	**42**	463	**3,001**	**3,789**

** Species of conservation concern.*
On = Observed on transect.
Off = Birds observed greater than 500 m from shoreline or flying.

7.4.3 Marine Bird Surveys

A total of 16 species and 3,001 individuals were observed during the three marine bird surveys conducted along the shoreline of Bathurst Inlet (Table 7.4-6). Of the 3,001 individuals recorded, 2,908 were observed on transect. In addition, 10 species, totaling 780 individual birds, were recorded incidentally within marine habitats during terrestrial waterbird surveys (Table 7.4-6).

7.4.3.1 Survey Effort and Ice Condition

Two staging surveys were scheduled during 2013, including a spring staging survey in May and a fall staging survey in August. However, ice cover on Bathurst Inlet was nearly 100% during the May survey period (Plate 7.4-2), making the conditions unsuitable for recording marine bird use. A spring staging survey was not conducted at Bathurst Inlet in 2013. Incidental observations of marine birds were noted during reconnaissance flights over Bathurst Inlet to assess and record ice conditions. The fall staging survey was conducted over the course of 124 min on August 26, 2013 (Table 7.4-7). Bathurst Inlet was ice free during fall staging surveys. Survey effort was 123 minutes during the spring survey and 160 minutes during the survey conducted in the summer (Table 7.4-7; Appendix 7-1). Although ice had retreated by approximately 100-200 m from the shoreline, ice cover was present across the remainder of Bathurst Inlet during spring pair surveys (Plate 7.4-2). Therefore, the amount of water habitat available for use was lower during the spring pair survey compared to the summer brood survey. There was no ice cover on Bathurst Inlet during the summer brood surveys or fall staging surveys.

Table 7.4-7. Survey Effort and Amount of Habitat Surveyed during Aerial Marine Surveys, 2013

Survey	Date	Shoreline Survey Strata Survey Effort (Minutes)
Spring Staging	-	-
Spring Pair	June 19, 2013	123
Summer Brood	July 20, 2013	160
Fall Staging	26-Aug-13	124

Spring Staging (May 25, 2013)

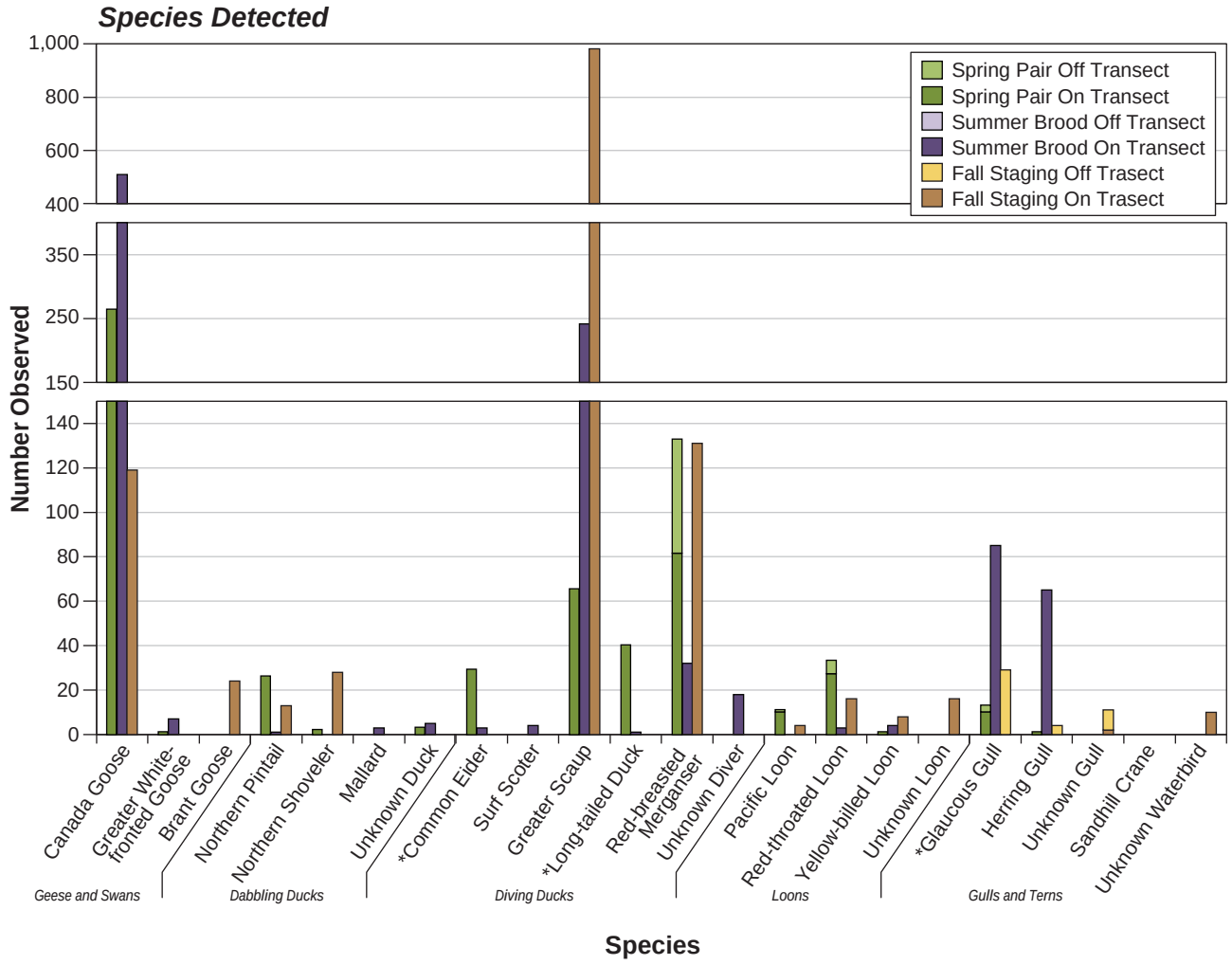
Spring Pair (June 13, 2013)

Plate 7.4-2. Ice conditions recorded during marine aerial surveys in May and June, 2013.

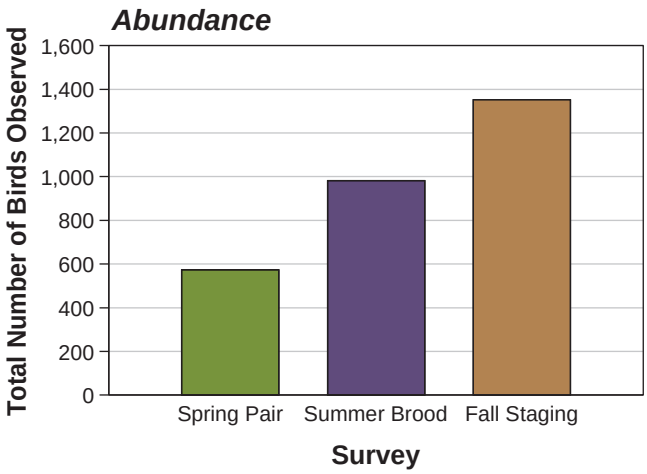
7.4.3.2 Staging Surveys

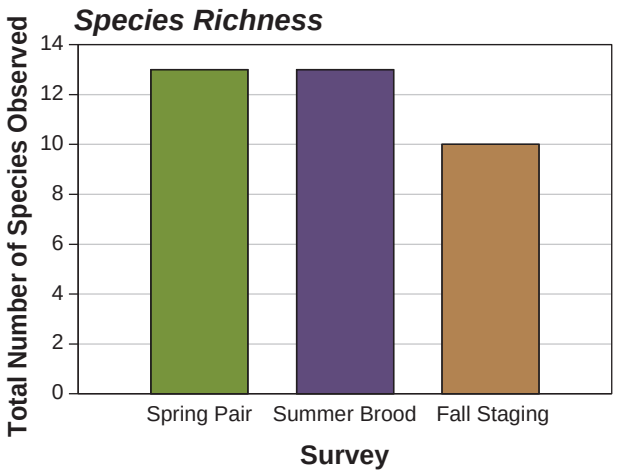
A fall staging survey was conducted in the southern portion of Bathurst Inlet (south of Kingaok) on August 26, 2013. A total of 10 species and 1,352 individuals of marine birds were detected on transect during fall staging surveys (Table 7.4-6; Figure 7.4-7). An additional 42 individuals belonging to two species were recorded off transect (Table 7.4-6). Of the two geese species observed during the fall staging survey, the brant goose was not observed during any other survey period or survey stratum. Greater scaup were the species in greatest abundance and distribution during the fall staging survey, comprising 73% of all on transect observations of marine birds (Plate 7.4-3).

Plate 7.4-3. A flock of greater scaup recorded during marine surveys on August 26, 2013.



*Note: *Species of conservation concern.*





Marine Bird Species Detected and Species Abundance and Richness Recorded during Breeding Surveys, 2013

Figure 7.4-7

No species of conservation concern were observed on or off transect during fall staging surveys conducted in marine habitat (Table 7.4-6). Two species of conservation concern were detected within marine habitat during terrestrial bird surveys: long-tailed duck, and glaucous gull (Table 7.4-6). Both species were detected in low numbers, comprising only 4% (n = 463) of the total observations of marine birds recorded incidentally during terrestrial bird surveys.

During fall staging surveys, marine birds were evenly spaced across the shoreline transect, and several observations were within the marine LSA and in the marine habitat directly beside the MLA PDA (Figure 7.4-8). Four species of marine birds were detected near the shoreline of the MLA PDA including greater white-fronted goose, greater scaup, red-breasted merganser, and yellow-billed loon. An additional two species of marine birds were observed within the marine LSA including the northern shoveler (a dabbling duck species), and the pacific loon. Two flocks of greater scaup (> 100 individuals) were observed near the shoreline adjacent to the MLA PDA and several flocks (> 26 individuals) of greater scaup and Canada geese were observed within the marine LSA.

Large flocks of diving ducks were also observed along the marine transect outside of the marine LSA (Figure 7.4-8). The largest flocks observed were of diving duck species including greater scaup, and red-breasted merganser. Flocks of greater scaup were estimated to be as large as 500 individuals. Flocks of red-breasted mergansers (>11 individuals) were observed at the northern end of the marine shoreline transect, and at the southern end of Bathurst Inlet, close to the confluence with the Western River. With the exception of two large flocks of geese (greater-white fronted goose and brant goose), few flocks of geese were observed during the marine fall staging survey.

7.4.3.3 Breeding Surveys

Two marine shoreline surveys were conducted during the breeding period in 2013, including a survey on June 19, corresponding to the pair forming period, and another on July 20, during the period when summer broods are anticipated to be observed. A total of 15 species and 1,556 individuals were detected on transect during breeding surveys with an additional 103 individuals belonging to seven species recorded off transect (Table 7.4-6; Figure 7.4-7). Marine bird abundance was higher during the summer brood survey (982 individuals) relative to the spring pair survey (574 individuals; Table 7.4-6). Species richness was similar between the spring brood survey (eight species) and the spring pair survey (13 species; Figure 7.4-7). Three species were observed during the breeding, which were not detected during other marine bird survey periods or during any period of the waterbird survey: mallard, common eider, and surf scoter. Canada geese were the most commonly detected species during the spring pair surveys, and greater scaup were the most commonly observed species during summer brood surveys.

Three species of conservation concern were observed during spring pair and summer brood surveys: common eider, long-tailed duck, and glaucous gull. Long-tailed ducks were the most widely distributed species of conservation concern, and were recorded throughout the entire marine shoreline transect. Of the three species of conservation concern, long-tailed ducks were the only species observed in pairs during spring pair surveys, and a common eider brood was detected during the summer brood survey; the brood was not classified into an age class.

Evidence of breeding was detected more frequently during spring pair surveys than during brood surveys. A total of 30 pairs were detected during spring pair surveys, but only one brood was detected on transect during summer brood surveys (Figures 7.4-9 and 7.4-10). Long-tailed ducks and Pacific loons were the most commonly observed species that occurred in pairs. The common eider brood was observed at the northern most extent of the shoreline transect.

During both breeding surveys, marine birds were recorded within the marine LSA, but were detected adjacent to the MLA PDA during the spring pair survey only (Figure 7.4-9). Several species of marine birds were observed within the MLA PDA during spring pair surveys, including two species of conservation concern, long-tailed duck and glaucous gull. Both species of conservation concern were observed to be paired. A flock of Canada geese (>26 individuals) were also observed near the shoreline adjacent to the MLA PDA during spring pair surveys. Similar sized flocks of Canada geese were observed within the marine LSA during summer brood survey.

7.4.4 Incidental Observations of Waterbirds and Marine Birds

During other field surveys conducted in 2013, 17 species of waterbird and marine birds, were observed incidentally by field staff (3,997 individual birds) or by remote motion-triggered cameras (20 detections of 68 individual birds) placed on the tundra in the RSA (Figures 7.4-11a, 7.4-11b, and 7.4-11c; Table 7.4-8; Appendix 5-4). Four species observed incidentally were not detected during the waterbird and marine bird aerial or ground surveys, including Arctic tern (a species of conservation concern), sandhill crane, black scoter, and long-tailed jaeger (Table 7.4-8). An unknown species of jaeger were also observed incidentally. The four additional species that were detected incidentally were observed primarily within the southern extent of the RSA (Figure 7.4-11b). Canada goose was the most commonly detected species, accounting for 45% of all incidental observations (n = 3,997 individuals).

7.4.4.1 Waterbirds and Marine Birds Observed during Other Baseline Surveys

The most commonly observed group of waterbirds and marine birds during breeding bird surveys and other wildlife baseline surveys were geese; Canada goose (n = 1,721) and greater white-fronted goose (n = 633; Plate 7.4-4; Table 7.4-8). A large number of northern pintail, a species of dabbling duck, were also observed during other baseline surveys conducted in the RSA (n = 221).

Two species of conservation concern were observed during breeding bird surveys and other baseline surveys; Arctic tern and glaucous gull. Arctic tern was recorded south of the George Property PDA (Figure 7.4-11b). The glaucous gull was detected across much of the marine RSA (Figure 7.4-11a).

Breeding was confirmed for two species including northern pintail and snow goose during other baseline surveys. Additional evidence of broods was observed for flocks of northern pintail, an unknown diving duck, and an unknown species of duck that were in flight of off transect during aerial waterbird and marine bird surveys in July, and for an unknown species of gull in August (Figures 7.4-11a and 7.4-11b). One of the northern pintail broods observed during off transect and in marine habitat during waterbird surveys was aged as class II (Table 7.3-1; Figure 7.4-11a).

Incidental observations of flocks of geese (> 25 individuals) made in the RSA, predominately in May and August. Flocks of several species of geese, dabbling and diving ducks, and gulls were also concentrated south of the marine LSA, near the confluence with the Western River (Figure 7.4-11a). Several flocks of waterbirds and marine birds were observed in this area included greater white-fronted goose, Canada goose, American green-winged teal, northern pintail, and greater scaup.

Additional incidental observations of flocks of waterbird and marine birds were also made southwest of the RSA along the TCWR Connector. Most detections outside of the RSA were of large flocks of geese (Canada goose, greater white-fronted goose, and snow goose) during the fall staging period (August). Glaucous gull, a species of conservation concern, was also observed in this area.

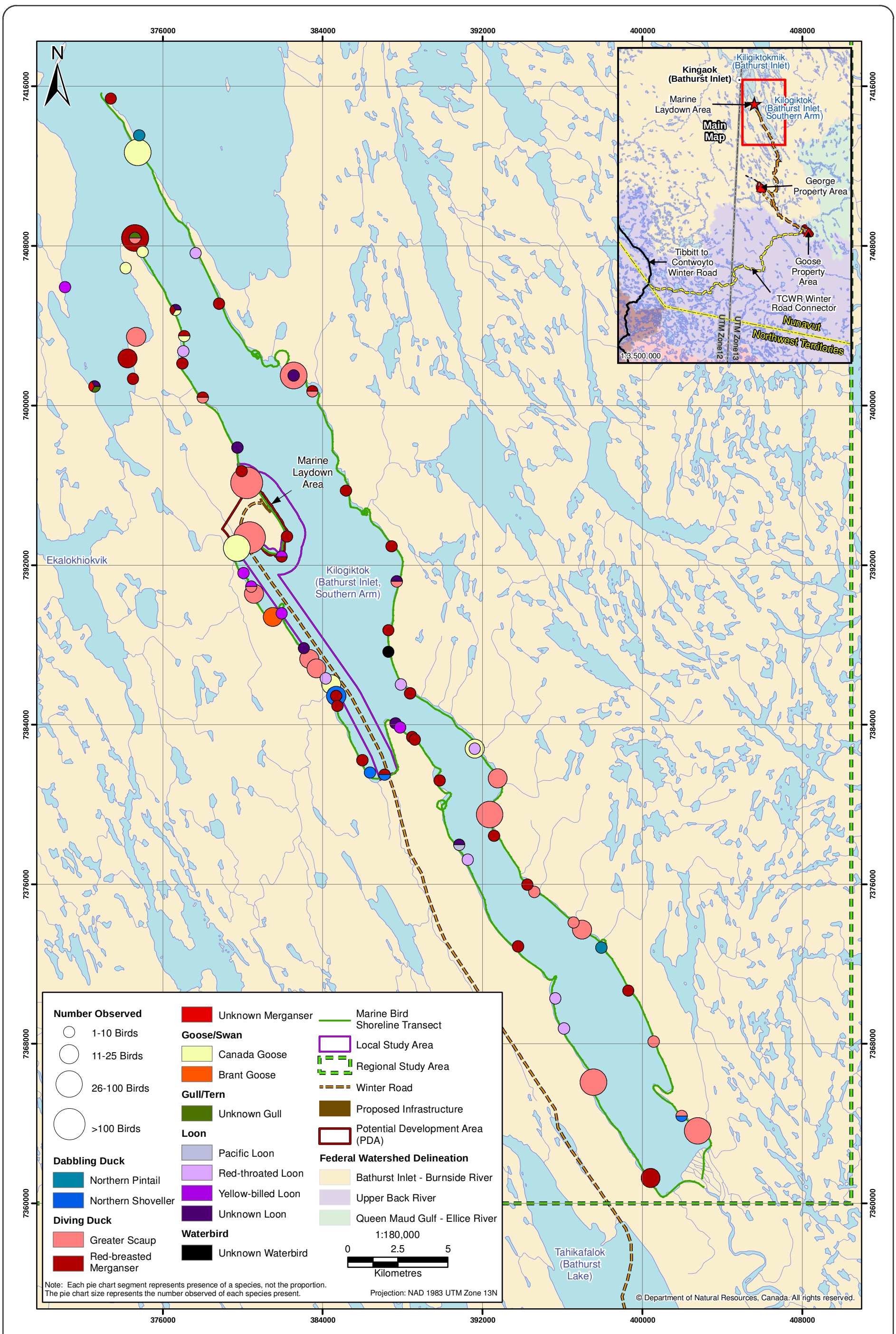


Figure 7.4-8

Sabina GOLD & SILVER CORP.

Distribution of Marine Birds during Aerial Fall Staging Surveys, 2013

Figure 7.4-8

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-284 December 12 2013

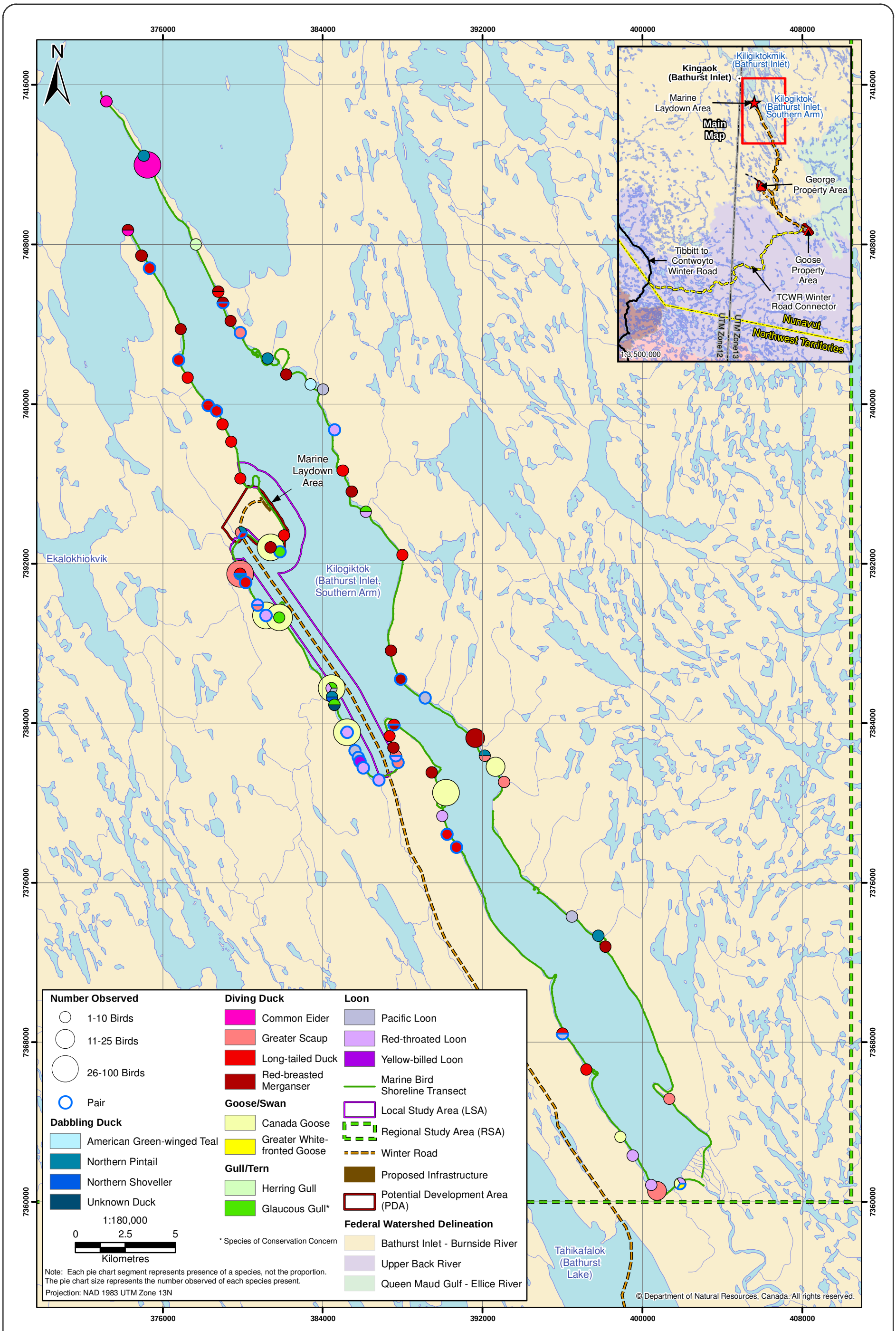


Figure 7.4-9

Sabina GOLD & SILVER CORP.

Distribution of Marine Birds during Aerial Spring Pair Surveys, 2013

Figure 7.4-9

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-286 December 13 2013

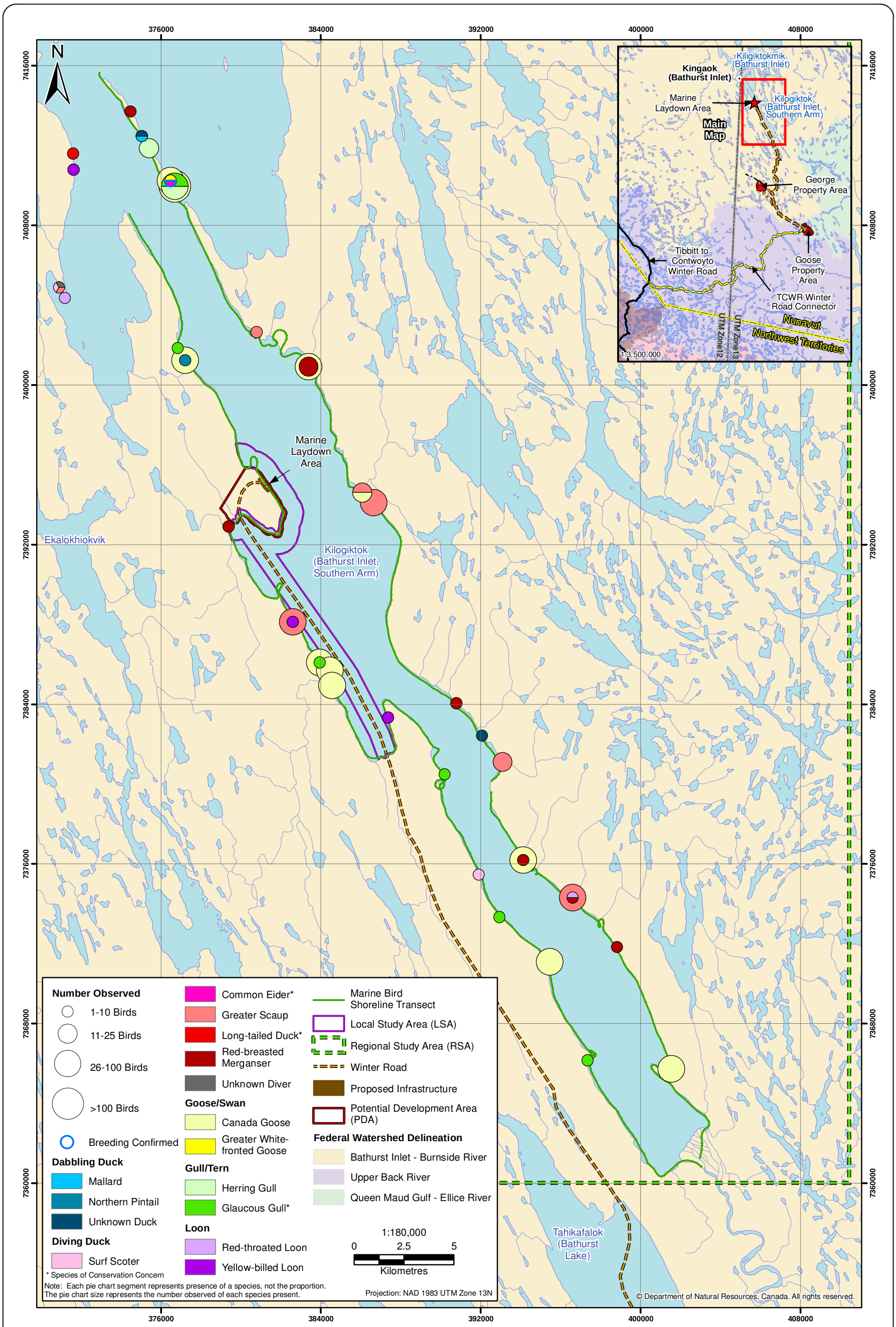


Figure 7.4-10

Sabina GOLD & SILVER CORP.

Distribution of Marine Birds during Aerial Summer Brood Surveys, 2013

Figure 7.4-10

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-288a December 12 2013

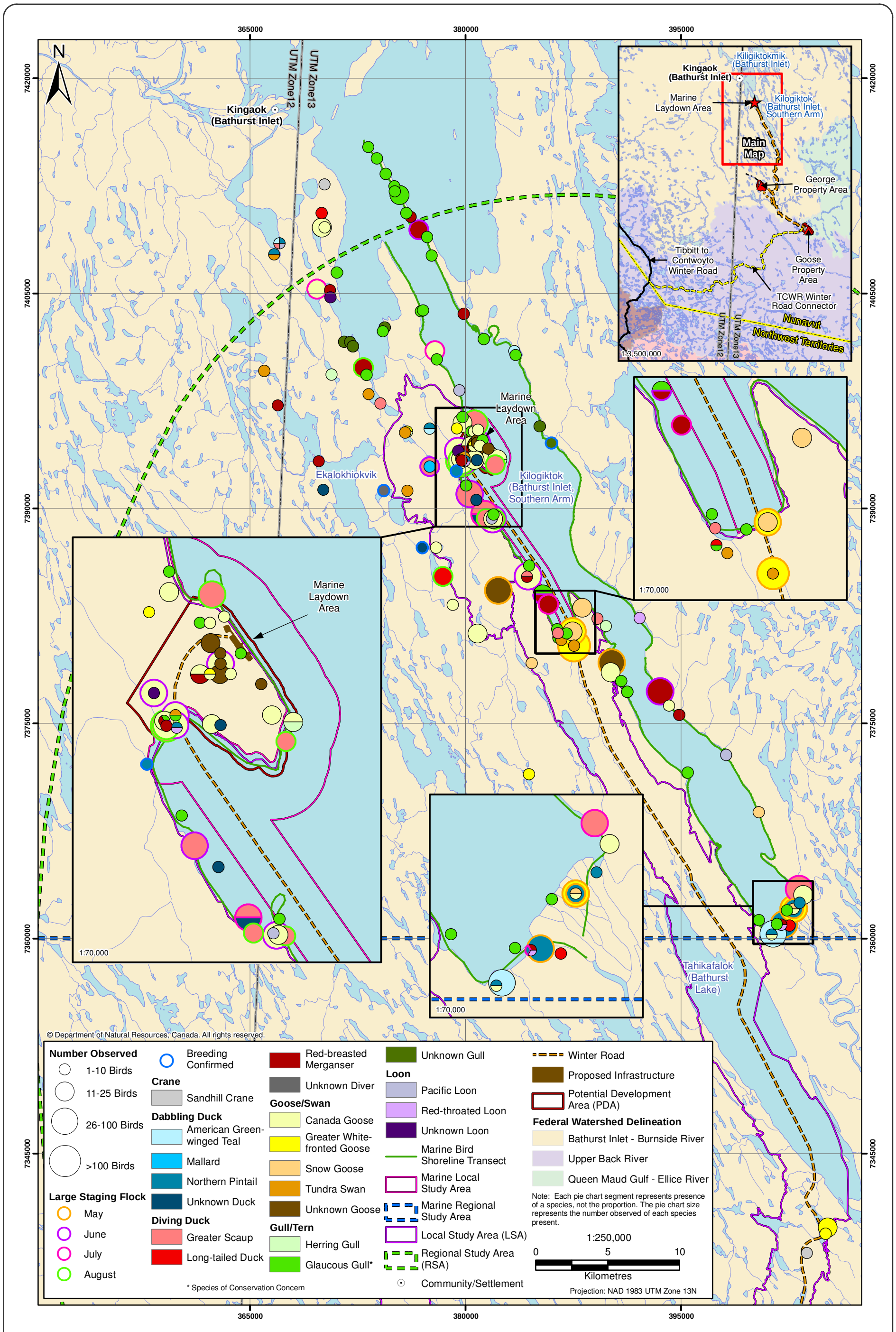


Figure 7.4-11a

Sabina GOLD & SILVER CORP.

Incidental Observations of Waterbirds and Marine Birds, 2013

Figure 7.4-11a

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-288b December 18 2013

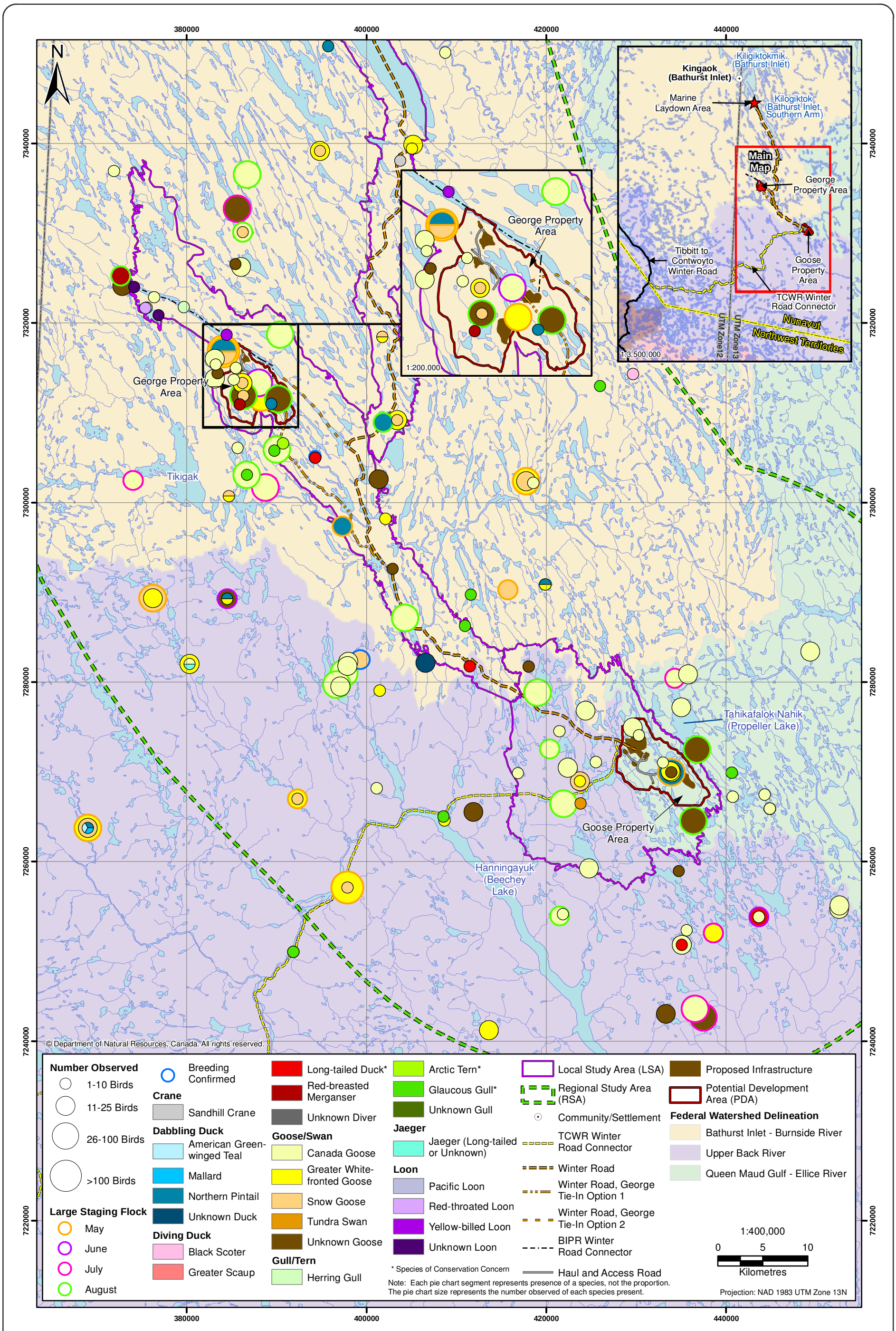


Figure 7.4-11b

Sabina GOLD & SILVER CORP.

Incidental Observations of Waterbirds and Marine Birds, 2013

Figure 7.4-11b

Rescan an ERM company

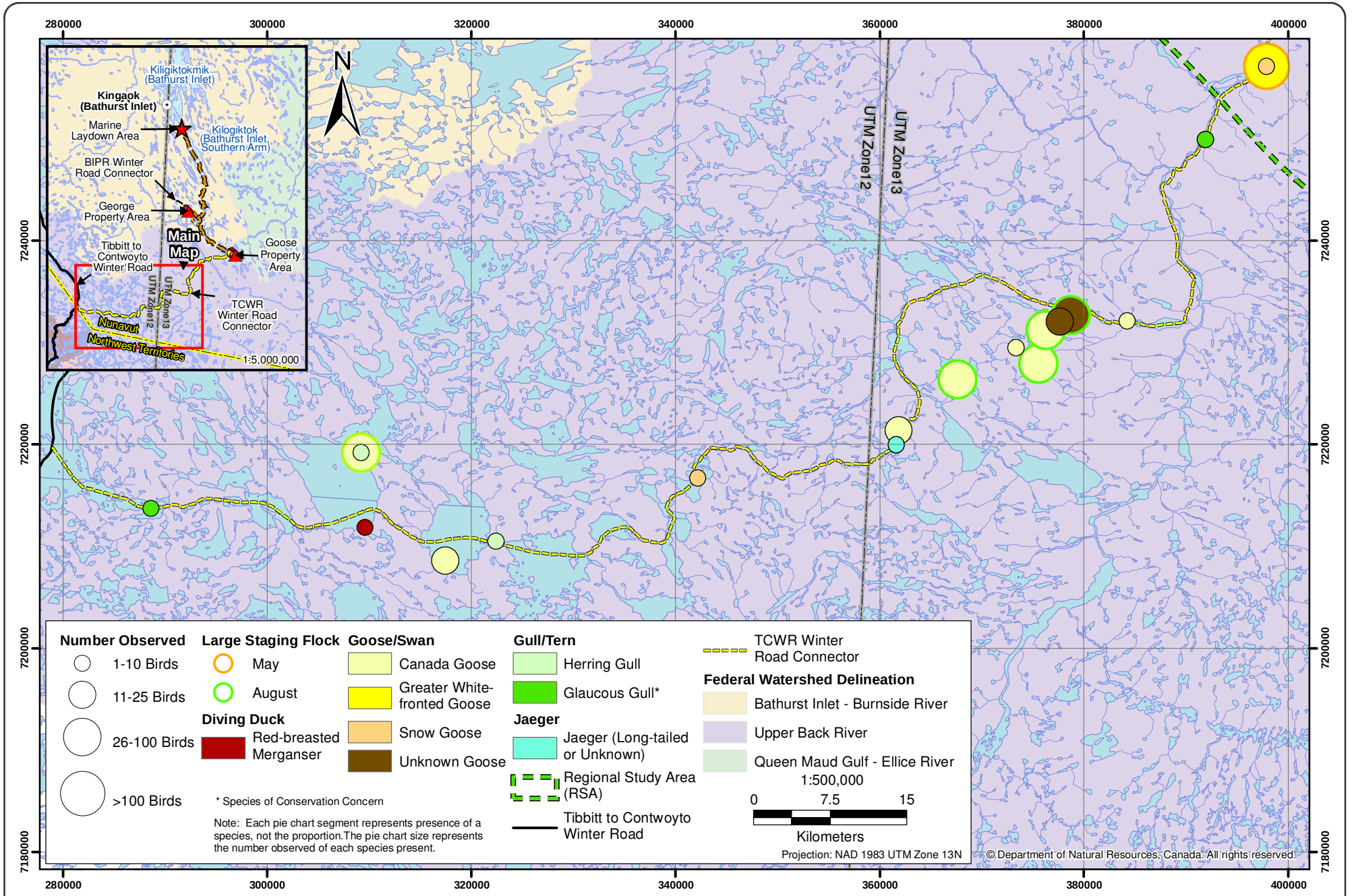


Figure 7.4-11c

Sabina GOLD & SILVER CORP.

Incidental Observations of Waterbirds and Marine Birds, 2013

Figure 7.4-11c

Rescan an ERM company

Table 7.4-8. Incidental Observations of Waterbirds and Marine Birds, 2013

Group	Species	Scientific Name	No. of Waterbirds or Marine Birds Observed			
			Breeding Bird Surveys	Other Baseline Surveys	Remote Camera Surveys	Total
Geese and Swans	Canada Goose	*Branta canadensis*	187	1,534	7	**1,728**
	Greater-white Fronted Goose	*Anser albifrons*	8	783	48	**839**
	Snow Goose	*Chen caerulescens*		312		**312**
	Tundra Swan	*Cygnus columbianus*	1	6		**7**
	Unknown Goose		54	634		**688**
Dabbling Ducks	American Green-winged Teal	*Anas carolinensis*	2	1		**3**
	Northern Pintail	*Anas acuta*	8	203	10	**221**
	Mallard	*Anas platyrhynchos*		4		**4**
	Unknown Duck		1			**1**
Diving Ducks	Greater Scaup	*Aythya marila*	2	14		**16**
	*Long-tailed Duck	*Clangula hyemalis*	11	70		**81**
	Red-breasted Merganser	*Mergus serrator*	15	30		**45**
	Black Scoter	*Melanitta americana*		1		**1**
Loons	Pacific Loon	*Gavia pacifica*	2	2		**4**
	Red-throated Loon	*Gavia stellata*		1		**1**
	Yellow-billed Loon	*Gavia adamsii*		1		**1**
	Unknown Loon	*Gavia sp.*	6	2		**8**
Gulls and Terns	*Arctic Tern	*Sterna paradisaea*		1		**1**
	*Glaucous Gull	*Larus argentatus*	4	15		**19**
	Herring Gull	*Larus hyperboreus*		7		**7**
	Unknown Gull			3		**3**
Jaegers	Long-tailed Jaeger	*Stercorarius longicaudus*			3	**3**
	Unknown Jaeger	*Stercorarius sp.*		2		**2**
Crane	Sandhill Crane	*Grus canadensis*	1	1		**2**
Total			**302**	**3,627**	**68**	**3,997**

Several waterbird and marine birds were observed incidentally within the MLA PDA and LSA in marine and terrestrial habitat (Figure 7.4-11a), and within the PDA at the George Property Area (Figure 7.4-11b). The majority of incidental observations of flocks of birds near the MLA were within the MLA PDA and clustered at the northern and southern extent of the marine LSA in May and August. Within the MLA PDA, several flocks of Canada geese and unidentified geese, and one flock of red-breasted mergansers were observed within terrestrial habitat. Diving ducks (greater scaup and red-breasted mergansers) were recorded within the shoreline of the MLA PDA, in marine habitat. Glaucous gull (species of concern) was also recorded flying over terrestrial and marine habitats within the MLA PDA. Within the George Property PDA, several large flocks of geese were observed, in addition to smaller flocks of diving and dabbling ducks.

Plate 7.4-4. A greater-white fronted goose observed incidentally on June 20, 2013.

7.4.4.2 Waterbirds Observed on Remote Digital Camera

Images of waterbirds were recorded at a camera set up to monitor wolves for the den baseline studies and at a camera set up to monitor caribou (Figure 7.4-11b). A total of four species and 68 waterbirds were recorded at these cameras between May and August 2013 (Table 7.4-8). Some individuals may be double counted, as they may have been observed on more than one occasion at the same camera. The majority of waterbird photos taken by the remote cameras were recorded in June (Appendix 9-3). The most commonly observed species was the greater-white fronted goose, particularly in May and June (Table 7.4-8). Long-tailed jaegers were also observed frequently in August, at one camera.

7.5 DISCUSSION

Four waterbird surveys and three marine bird surveys were conducted at and surrounding the MLA to document species presence, abundance, and distribution during staging and breeding periods. Overall, 4,770 individuals belonging to 19 waterbird and/or marine bird species were observed during these surveys and 429 individuals of nine species were observed during ground surveys at the Goose and George Property PDAs or incidentally during other baseline studies. Of these, four species of conservation concern (listed as Sensitive in Nunavut) were detected included long-tailed duck, common eider, glaucous gull, and Arctic tern. Notable staging areas were detected during fall staging surveys at Ekalokhiokvik Lake, west of the MLA PDA as well as several marine areas in southern Bathurst Inlet including a prominent staging area within the marine LSA, directly adjacent to the MLA PDA. Evidence of breeding was detected during both terrestrial waterbird and marine bird breeding surveys with pairs detected at many small lakes, and along the shoreline of Bathurst Inlet. The majority of breeding pairs detected were of long-tailed duck, a species of conservation concern, as well as red-throated loon along the shoreline of southern Bathurst Inlet. Two broods were detected during breeding surveys, one belonging to long-tailed duck in terrestrial freshwater habitat and the second detected in marine habitat, belonged to common eider, also a species of conservation concern.

In 2013, abundance of waterbirds and marine birds was lowest during the spring surveys and increased during each subsequent survey with the highest abundance of waterbirds and marine birds occurring during the fall staging survey. This trend is consistent with other waterbird baseline studies that have been conducted in areas surrounding the George and Goose Property PDAs in 2012 (Rescan 2013b). However, in past years, significantly more waterbirds were observed during the staging surveys at terrestrial areas near the George and Goose Properties compared to the number of waterbirds recorded during 2013 surveys in the terrestrial areas near Bathurst Inlet and the MLA. Terrestrial areas surveyed in 2013 were not previously surveyed for waterbirds, thus is it not clear whether the terrestrial areas near the MLA generally support a lower abundance of waterbirds, or whether 2013 was a particularly hard year for waterbird in that area. During 2013 spring staging surveys, there was a significant amount of ice cover present at both the terrestrial and marine areas near Bathurst Inlet, which may have reduced the availability of habitat for waterbirds and marine birds.

In the fall of 2013, the marine areas of Bathurst Inlet supported a higher overall abundance of waterbirds and marine birds relative to fall 2012. Waterbirds and marine birds typically congregate at fall staging sites prior to southward migration, though these are typically smaller congregations than those that occur during spring migration (Dickson and Gilchrist 2002).The reason for a higher abundance being observed within marine habitat at Bathurst Inlet in 2013 compared to 2012 is unknown. However, if nesting success of waterbirds and marine birds was lower in 2013 due to later ice thawing, then failed breeders might have congregating earlier at staging areas in larger numbers at the time of the 2013 surveys. Snow and ice has been shown to impact waterfowl distribution during the spring and fall staging periods in other areas of the Central Arctic (McLaren and Alliston 1985).

Species richness of waterbirds and marine birds varied temporally with season. In terrestrial areas, waterbird species richness was lowest during the spring surveys and generally increased during each subsequent survey. In contrast, species richness remained consistent (10-11 species) across survey periods in 2012, with the exception of the summer brood period, when 14 species were observed. However, in 2012, surveys were conducted near the George and Goose Property PDA and not in the terrestrial areas near Bathurst Inlet. It is possible that fewer species were observed during the 2013 spring surveys in the areas near Bathurst Inlet because the presence of ice in these areas may have reduced the value of terrestrial habitat for nesting waterbirds, and fewer species utilized this habitat, as a result. During the fall, a greater number of species were observed along the shoreline of Bathurst Inlet during 2013 marine surveys (range 10 to 12 species) compared to 2012 (range two to seven species), further suggesting that species that would normally be breeding inland in terrestrial habitat may have been observed congregating earlier and in greater abundance in marine habitat along the southern shoreline of Bathurst Inlet compared to past years.

Several notable waterbird and marine bird staging areas were identified during the 2013 waterbird and marine bird surveys. One terrestrial staging area at Ekalokhiokvik Lake, to the west of the MLA (the largest lake in the survey area) was identified during the fall waterbird survey. In addition, a key terrestrial staging site was confirmed at a small shallow lake just outside the George Property PDA where large flocks of geese and ducks have been consistently observed during spring staging surveys in previous years (Rescan 2013b). Within marine habitat, several staging areas were identified in the marine LSA, the most notable along the marine shoreline directly adjacent to the MLA PDA where flocks of waterbirds have been detected in previous years (Rescan 2013b). However, in comparison to 2012 surveys, several additional staging areas were identified along the southern shores of Bathurst Inlet in 2013, with the second most prominent area detected near the confluence with the Western River. Additional staging areas observed in 2013 mainly consisted of flocks of greater scaup indicating that this area may be used by this species for protection from predators during the moulting phase prior to fall migration. Male greater scaup typically migrate prior to females and young during the fall migration (NAS 2013).

Spatial and temporal differences in waterbird and marine bird habitat use were detected during staging surveys. Similar to surveys conducted in 2012 (Rescan 2013b), in 2013, more staging areas were detected during the fall relative to spring surveys, and fall staging areas supported more individuals than spring staging areas. However, fewer staging areas were detected during the 2013 spring staging surveys relative to 2012 spring staging surveys. In 2013, ice cover on terrestrial and marine waterbodies during the spring staging period likely limited the habitat available. At this time, open lakes and outflows of major river drainages, such as the Burnside River outflow at Kingaok and the Western River outflow at the base of Bathurst Inlet (Rescan 2014b) may serve as important areas for staging birds. Although few staging areas were identified during the 2013 spring staging surveys, incidental observations of waterbirds and marine birds suggest that the marine habitat directly adjacent to the MLA PDA, and at the southern end of Bathurst Inlet, near the confluence of the Western River are also important during spring staging, when these areas open up during the annual thaw. These observations are supported by local Traditional Knowledge. Large numbers of waterbirds observed during ground surveys conducted near the George and Goose Property PDAs during the 2013 spring staging period, further suggest that waterbirds rely on earlier thawing waterbodies during the early spring. Additionally, more waterbirds were observed within wetland habitat during spring staging compared to other survey periods. Wetland habitat is likely more assessable to waterbirds in early spring, when large bodies of water are covered in ice.

Evidence of breeding was relatively low in the areas surveyed for waterbirds and marine birds in 2013. Paired individuals were more frequently detected than broods. Similar to 2012, pairs of long-tailed ducks (a species of conservation concern) were most frequently observed within terrestrial waterbodies (Rescan 2013b). Pairs of long-tailed ducks, Pacific loon, and red-throated loon were also observed in marine habitat during spring pair surveys conducted in 2013. Observations of paired individuals indicate that these species may be breeding in areas near Bathurst Inlet and using these waterbodies for courting and/or resting. During breeding surveys, direct evidence of breeding was only documented for two species: the long-tailed ducks and common eider, both of which are species of conservation concern. The long-tailed duck brood was observed on a lake during terrestrial waterbird surveys, and the common eider brood was observed within marine habitat north of the MLA PDA, along the shoreline of Bathurst Inlet. Direct evidence of breeding is difficult to document because survey methods, predation on young or eggs, and young being well hidden and not visible during the summer brood surveys, may reduce the likelihood of locating nests or broods of waterbird species, particularly for long-tailed duck and Pacific loon, which typically nest on small islands within lakes. Breeding was also confirmed incidentally for two additional species (northern pintail and snow goose), as well as an unknown diver, and an unknown species of gull during other baseline surveys conducted near the MLA. In 2012, few broods were recorded during waterbird surveys, and no broods were recorded during marine bird surveys (Rescan 2013b). Combined, the results from 2012 and 2013 suggest that although detections are low, several species waterbird and marine birds likely breed within the waterbodies and marine habitat near Bathurst Inlet.

8. Carnivore Dens

Rescan™
an ERM company

8. Carnivore Dens

8.1 INTRODUCTION

This section presents the results of carnivore den baseline studies and carnivore observations during 2013. These studies were conducted to identify carnivore species inhabiting the terrestrial Regional Study Area (RSA; Figure 3-1), and to determine the distribution and status (e.g., active, abandoned) of their dens.

Carnivore dens are protected in Nunavut under the *Wildlife Act* (2003) as stated in section 73(b), no person shall, unless authorized by a license, break into, destroy, or damage any abode of a bear, fox, beaver, muskrat, weasel, wolf, or wolverine.

8.1.1 Carnivore Species and Denning Ecology

The predominant mammalian carnivores that occur on the tundra within the terrestrial RSA are grey wolves (*Canis lupus*), including three subspecies (Chambers et al. 2012): occidentalis (northern timber wolf), *nubilus* (plains wolf), and *arctos* subspecies (Arctic wolf), Arctic foxes (*Vulpes lagopus*), red foxes (*Vulpes vulpes*), grizzly bears (*Ursus arctos)*, and wolverines (*Gulo gulo*). Dens belonging to these species are known to occur in the Kitikmeot Region and have previously been documented in the terrestrial RSA (Rescan 2007c, 2008a, 2008b, 2012, 2013b).

A brief description of resident carnivore species that inhabit the terrestrial RSA and the typical characteristics of their dens is provided below.

Grey Wolves

Grey wolf populations in the Arctic and northern Canada are considered secure, and are designated as Not at Risk by COSEWIC (Government of Canada 2013). Arctic wolves are hunted and trapped primarily by Inuit and other native people but the species is not threatened (Mech 2013).

Wolves are known to occur within the terrestrial RSA and have been documented in the terrestrial RSA during baseline studies conducted in 2011 and 2012 (Rescan 2013b). Wolves are the predominant predators of barren-ground caribou and rely primarily on adequate ungulate densities to maintain wolf population size (Walton et al. 2001; Paquette and Ludwig 2003). Alternative prey, such as birds and small mammals, can sustain wolves during periods of low ungulate availability (Mech 2007).

During the spring, wolves follow the caribou herds north of the treeline and choose den sites south of the Bathurst herd calving grounds. This strategy likely optimizes the availability of caribou and alternative food resources for rearing pups (D. C. Heard and Williams 1992). Wolf pups are typically born in mid- to late-May and usually leave the natal den in early-August, but do not leave their summer range until October. As predators of migratory caribou, wolves within the wildlife terrestrial RSA have larger home ranges and exhibit fewer territorial behaviours than wolves in other parts of North America (Walton et al. 2001). Wolf dens are known to occur in close proximity to caribou migration routes, and the reproductive success of wolves has been shown to decrease as the distance of wolf dens to caribou migration routes increases (Frame, Cluff, and Hik 2008).

Wolves require specific habitat features that allow them to dig denning structures. In the tundra environment, eskers and other glacial deposits provide the best habitat for den sites (Mueller 1995; Rescan 1995; Golder 1998; Walton et al. 2001; Cluff, Walton, and Paquet 2002; McLoughlin et al. 2004). Dens may also occur in other areas that are easy to excavate such as mounds of glacial-fluvial sediment or along lake banks. Dens are focal points of wolf activity during the summer, and there is

evidence that individual wolves exhibit fidelity to den sites (Cluff, Walton, and Paquet 2002), returning and using the same areas in successive years (Walton et al. 2001).

Foxes

Arctic fox and red fox populations in the Arctic are both considered stable and listed as 'Least Concern' by the IUCN. Arctic foxes and red foxes both occur within the RSA and were documented during baseline studies conducted in 2011, and 2012 (Rescan 2012, 2013b). Annual density fluctuations of foxes are often related to prey availability, particularly lemmings (D. G. Reid, Krebs, and Kenney 1997; Angerbjörn, Tannerfeldt, and Erlinge 1999; Feldhamer, Thompson, and Chapman 2003). There is often a lag effect observed between the abundances of foxes and rodents, with the peak fox population following the peak rodent population by one to two years.

Red fox kits are typically born in March through May and Arctic fox kits are born from late-May to early-June. Both fox species are habitat generalists that use earthen dens primarily for reproduction and cover during bad weather events (Eberhardt, Garrott, and Hanson 1983). Fox dens are most often found in esker habitat because the substrate is suitable for digging the dens and food resources such as berries, fish, and small mammals are often associated with or near this landscape feature (Plate 8.1-1), although they may also occur in open tundra, talus slopes, rock outcrops, and under boulder piles. Dens are generally built in mounds, close to streams, in locations with low snow cover, and where ground temperatures and depths of loose soil are high (Smits, Smith, and Slough 1988; Szor, Berteaux, and Gauthier 2008). Similar to wolf dens, fox dens are usually located on steep slopes with a southerly aspect, and in sandy soils (Smits, Smith, and Slough 1988; Szor, Berteaux, and Gauthier 2008). Foxes may dig many dens, but those used for reproduction tend to be in areas with sufficient food resources and far from other dens (Szor, Berteaux, and Gauthier 2008). Foxes show strong den fidelity returning to the same sites in successive years (Cypher 2003). This fidelity is exhibited by breeding adults even when rodent availability is low (Strand et al. 2000; Feldhamer, Thompson, and Chapman 2003).

Plate 8.1-1. Example of suitable denning habitat for wolves and/or foxes on an esker, July 15, 2013.

As denning habitat tends to be generally limited to select areas near or on eskers, carnivore species, such as red foxes and Arctic foxes, will often interact and compete with each other for den locations. Red foxes have been documented to intrude on the breeding dens of Arctic foxes resulting in den abandonment; this intrusion process is also potentially contributing to a range retraction of the Arctic fox from the southern Arctic and has been identified as a possible threat to the Arctic fox population (Frafjord 2003; Rodnikova et al. 2011). Productive Arctic fox dens tend to be larger complexes with more entrances compared to unproductive dens; productive dens are also typically situated further from red fox dens (Frafjord 2003).

Grizzly Bears

Grizzly bears are listed as a species of "Special Concern" (COSEWIC 2012b); but are not yet listed under SARA. In the NWT and Nunavut, the Canadian Endangered Species Conservation Council lists grizzly bears as Sensitive (CESCC 2010).

Grizzly bears are known to occur within the terrestrial RSA, as they have been documented during baseline studies conducted in 2011 and 2012 (Rescan 2012, 2013b). The barren-ground grizzly bear population in Canada's central Arctic is near the northern- and eastern-most extent of their North American range. They are characterized by relatively low density in an area of low vegetative productivity and high seasonality (i.e,. the monthly variability in evapotranspiration – the movement of water to the air from the soil, waterbodies, and/or plants; Ferguson and McLoughlin 2000; McLoughlin, Ferguson, and Messier 2000). Although grizzly bear den sites are widely distributed throughout the Slave Geological Province (McLoughlin et al. 2003), the locations of dens tend to be clustered (Banci and Moore 1997) and bears tend to den in the same denning areas year after year (LeFranc Jr et al. 1987).

Grizzly bears typically begin denning in the Arctic during the last two weeks of October and emerge by the first week of May (McLoughlin, Cluff, and Messier 2002). The West Kitikmeot Slave Society funded research on grizzly bear denning ecology in the general region where the Project is located (McLoughlin et al. 2002). A total of 56 grizzly bear den sites were visited, Most of which (60%) were located in heath tundra and heath-boulder habitats, with the majority of remaining dens in riparian tall shrub and birch seep habitats (McLoughlin et al. 2002). Although eskers accounted for only seven of 56 den sites studied, this habitat type was selected more than expected, given its low availability in the central Arctic.

Research suggests that grizzly bear den sites most commonly face a more southerly aspect (H. V. Reynolds, Curatalo, and Quimby 1976; Banci and Moore 1997; McLoughlin, Cluff, and Messier 2002). The benefit of a southern exposure may be insulation (i.e., warmth) at emergence in the spring (and possibly at denning in the fall) or the accumulation of an insulating layer of snow that would result from the prevailing northerly winds. The substrates of grizzly bear den sites are often well-drained and contain a large amount of sand and coarse material, including cobble and boulder sized stones. The structural integrity of den sites is maintained through root mats from dwarf birch and other shrubby vegetation located in the ceilings of dens. However, grizzly bear dens often do not last long after they are vacated, with the majority partially or completely collapsed by mid-summer (McLoughlin, Cluff, and Messier 2002). Thus, it appears that bears usually dig new dens each year.

Wolverine

Wolverines, in the western Arctic population, are federally listed as "Special Concern" (COSEWIC 2012a) and in Nunavut and Northwest Territories are listed as "Secure" and "Sensitive," respectively (CESCC 2010). Wolverines have been documented in the terrestrial RSA during previous baseline studies conducted in 2010, 2011, and 2012 (Rescan 2011, 2012, 2013b).

Wolverines use two types of dens for reproduction – natal dens, where the young are born, and maternal dens, where the mother may move the kits if the conditions at the natal den are no longer suitable (Magoun and Copeland 1998). It is not clear why a mother may shift from a natal den to a maternal den; however, human disturbance and warming temperatures above freezing, which decreases snow pack, have been shown to be contributing factors to den abandonment (Magoun and Copeland 1998; May et al. 2012). Distinguishing between the two den types is difficult as both types of dens will be similar in structure and appearance. In addition, determining initiation of denning and the birthing of kits requires consistent tracking of females, which is time consuming and expensive (Magoun and Copeland 1998). The birth of wolverine kits occurs earlier than other northern non-hibernating carnivores (i.e., wolves and foxes). The peak period for birthing is from February through mid-March (Magoun and Copeland 1998; Inman et al. 2012).

Rocky outcrops and wind hardened snowdrifts are commonly used sites for wolverine reproductive dens in tundra and alpine areas (Plate 8.1-2; Magoun and Copeland 1998). Typically, wolverine dens are built under at least 1 – 5 m of snow and consist of long, complex snow tunnels that lead down to boulder fields, rock overhangs, or large cracks in rocks, which are large enough to allow kits to move around and provide additional protection from predators (Magoun and Copeland 1998; Inman et al. 2012; May et al. 2012). Wolverines will often use the same den site or general location (within 1 – 2 km of the original den site) in multiple years (Lee and Niptanatiak 1996; Magoun and Copeland 1998). Wolverine den sites are strongly correlated with deep, persistent snow packs from March to May, so there is growing concern that climate change will cause a decline in deep snow cover reducing the availability of suitable denning sites and thus reducing wolverine reproductive success (Servheen and Cross 2010).

Plate 8.1-2. Example of an occupied wolverine den dug into the snow under a rock overhang (March 2012).

Prey remains are commonly found at wolverine dens. Their primary food source is caribou supplemented with a variety of other species, such as large mammals (muskox or moose), carnivores (wolverine, red fox, Arctic fox, and ermine), small mammals (lemmings, voles, Arctic ground squirrels,

and hares), marine mammals, and fish (Mulders 2000). Wolverine reproduction has been shown to be limited by winter food availability, especially of ungulate carrion, and dependent on adequate security cover (i.e., dens) for kits in winter (Banci 1994; Persson 2005).

8.2 OBJECTIVES

The objectives of the carnivore den surveys conducted in 2013 were to:

- Determine the location, number and status of wolf and fox dens in focal areas of the terrestrial RSA;
- Identify whether any carnivore dens were observed within 1.5 km of proposed infrastructure;
- Determine the status and productivity, and timing of activity of previously active fox and wolf dens in the terrestrial RSA; and
- Summarize incidental observations of carnivore and their dens within the terrestrial RSA to document the presence of carnivore species occurring in the RSA.

8.3 METHODS

Two types of surveys were conducted for carnivore dens in the wildlife terrestrial RSA: 1) aerial surveys for dens to determine occupancy and productivity; and 2) remote motion-triggered camera monitoring at two wolf dens known to be active in 2012 to document wolf activity and productivity. In addition, incidental observations of carnivores and their dens that occurred in the terrestrial RSA were also recorded.

8.3.1 Aerial Den Surveys

Aerial carnivore den occupancy and productivity surveys were conducted in 2013 to determine occupancy and productivity at den sites located near proposed Project infrastructure. Aerial surveys were conducted using a Bell 407 helicopter to identify carnivore dens within the terrestrial RSA along the proposed road alignments and near the MLA and Goose Property Area PDA. Surveys were flown at an altitude of 50 to 100 m above the terrain and at ground speeds between 30 to 80 km/h to minimize disturbance to carnivores in the area but to maintain an effective height and speed for observers to effectively find dens and signs of activity (i.e., animals, scat, tracks, or prey remains). To minimize the potential for disturbances caused by low-level helicopter flights to migrating caribou, pilots increased altitude to 300 m when caribou were observed.

Aerial surveys for carnivore dens are primarily targeted at detecting wolf and fox dens as grizzly bears and wolverines have typically vacated their den sites during the timing of the carnivore den surveys. Thus, only incidental recordings of grizzly bear and wolverine dens were recorded during these surveys or other baseline studies when observed.

8.3.1.1 Occupancy Surveys

Carnivore den occupancy surveys were conducted late-May through mid-June, 2013 to locate dens within focal areas in the terrestrial RSA, to determine the occupancy status of these dens (occupied confirmed, occupied possible, or unoccupied; Table 8.3-1), and to identify which species were using each den. Dens with possible or confirmed occupancy were added to a regional den database and given a unique identifier. Text referring to specific dens is reported by the 2013 den number with the unique database identifier immediately following in square brackets (e.g., Den 4 [159D]).

Table 8.3-1. Occupancy and Productivity Den Statuses Used during Aerial Surveys, 2013

Survey	Status	Code	Observation
Occupancy	Occupied Confirmed	OC	1) Adult observed at den site
	Possibly Occupied	OP	1) Adult observed within 500 m of den site, and/or 2) Recent tracks at den, and/or 3) Recent digging, scat or prey remains at den
	Unoccupied	UO	1) Den holes present but no evidence of use
Productivity	Productive Confirmed	PC	1) At least one pup observed, and/or 2) Pup tracks observed at den site
	Possibly Productive	PP	1) Recent scat and bones at den in July
	Unproductive	UP	2) No recent evidence of use at OP or OC site

Aerial surveys were conducted in focal areas located within the LSA, including the winter road routes, the Goose Property Area, and the MLA. Surveys along the winter road routes (excluding the TCWR Winter Road Connector) were conducted along three transects: one along the centreline, and one transect on either side of the centreline at a distance of 1 km (Winter Road Survey Route; Figure 8.3-1). Surveys within the Goose Property Area and the MLA were conducted in a 3 km by 3 km area located over proposed infrastructure areas. Surveys within these 3 km by 3 km areas were conducted along seven transects spaced at a distance of 0.5 km apart (Focused (3 km x 3 km) Survey Route; Figure 8.3-1). An additional focused survey route (3 km by 3 km area; 7 transects) was situated roughly 15 km south of the MLA (Figure 8.3-1). Aerial surveys were also conducted within two focal reference areas located within the terrestrial RSA; each focal reference area measured 15 km by 15 km and surveys were conducted along 15 transects spaced at a distance of 1 km apart (Reference (15 x 15 km) Survey Route; Figure 8.3-1).

Den site locations were geo-referenced using as were classified as ‘occupied confirmed’ (OC) based on observations of at least one adult at the den site, and were classified as ‘possibly occupied (OP) if an adult was observed within 500 m of the den site, and/or signs of recent use such as fresh excavations, tracks, prey remains, or scat were present. Dens were classified as ‘unoccupied’ (UO) when no animals were present and no recent signs of use were found. Dens classified as OC or OP were considered ‘active’, and those classified as UO were considered ‘inactive’. When dens were found to have individuals present and species were positively identified, the helicopter immediately left the area to minimize disturbance to the animals.

8.3.1.2 Productivity Surveys

Productivity surveys were conducted in mid-July, 2013 at dens confirmed to be occupied or possibly occupied during the 2013 occupancy survey, and at den sites incidentally observed during other 2013 environmental baseline surveys conducted prior to mid-July, 2013. Dens were classified as either ‘productive confirmed’ (PC) if pups or kits were observed at the den site and/or if pup or kit tracks were observed. When neither adults nor young were observed, a ground survey was conducted to assess the status of the den. A den was classified as ‘possibly productive’ (PP) if recent prey remains, tracks, or scat were found near the den during ground surveys, since carnivores bring food back to the den to feed their young. Dens were classified as ‘unproductive’ (UP) if there were no recent signs of use at den sites that were previously categorized as OP or OC during occupancy surveys. In order to minimize disturbance at active or OC dens, a detailed productivity assessment across multiple visits was not conducted.

PROJECT #0194096-0005 GIS # BAC-23-276 December 20 2013

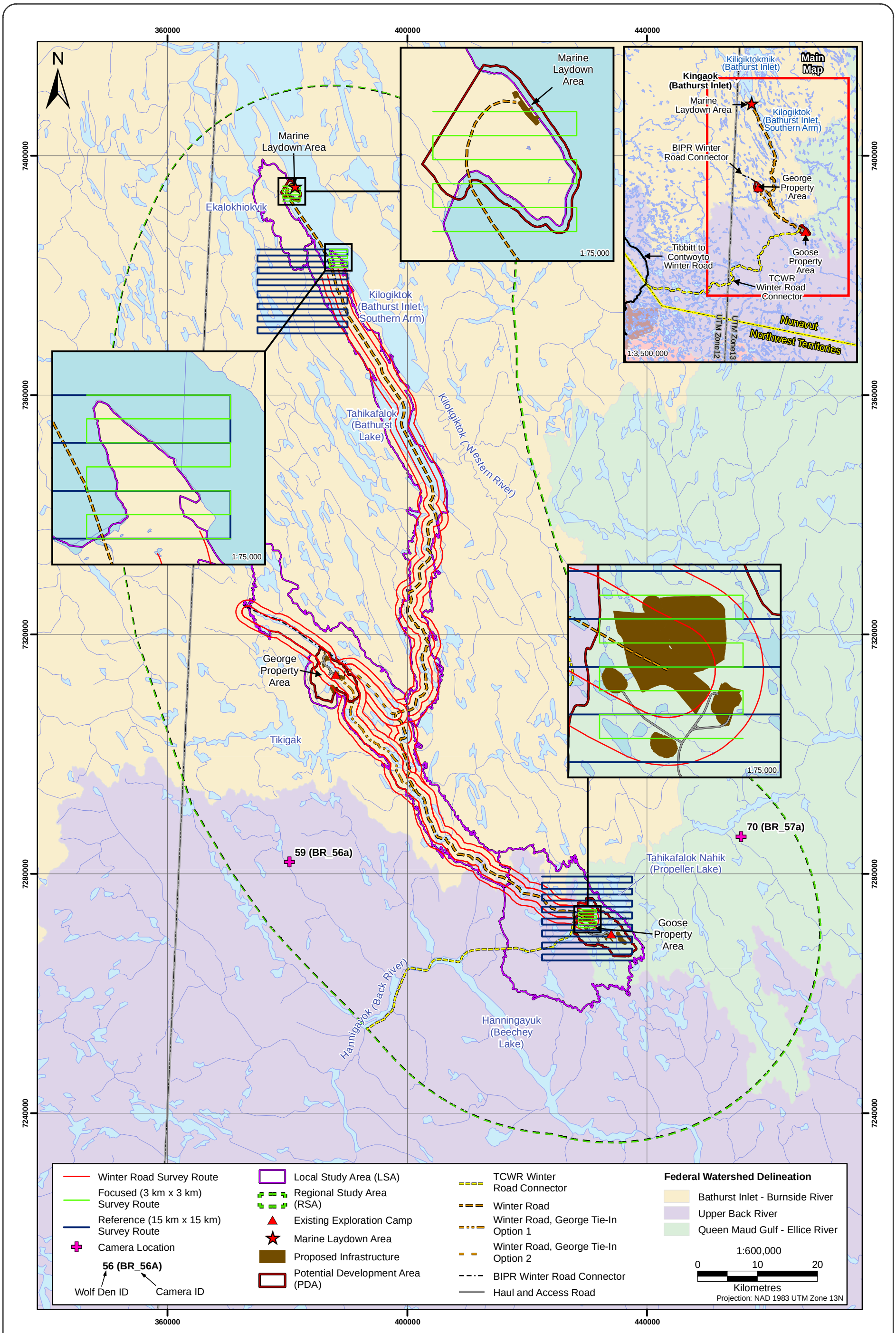


Figure 8.3-1

Sabina GOLD & SILVER CORP.

Carnivore Den Aerial Survey Routes and Wolf Den Monitoring Locations, 2013

Figure 8.3-1

Rescan an ERM company

8.3.2 Wolf Den Monitoring

Remote digital cameras were installed in early-May at the locations of two wolf dens that had confirmed occupancy and/or possible productivity during carnivore den baseline studies conducted in 2012 (Figure 8.3-1). Cameras were set up prior to potential whelping activities (typically in the last two weeks of May) at the den sites to reduce disturbance. The primary objective of the camera monitoring was to document when adult wolves arrived at the den site, when pups first appeared, the number of pups observed, and when the den was abandoned.

Camera memory cards were programmed to record a timed photo every 10 minutes and motion-triggered photos were programmed to record 10 photos after a trigger event with a 10 second delay between each photo. Camera memory cards were collected at the end of August when wolves were assumed to no longer be using the den site.

For each photo in which wolves were present the following data were recorded: camera number, type of photo (motion or timed), photo number, date, time of day, species, number of animals in the frame, behaviour, and any additional relevant information. When photos were taken by successive triggers, the photos produced by the second and subsequent triggers were recorded as part of the same series if the photos were taken less than 5 minutes apart. The following data was determined from the images recorded by these cameras when wolves were present: 1) date of first appearance of adults; 2) identification of individual adults (if possible); 3) date of first appearance of pups; 4) total number of individual pups recorded; and 5) date of last appearance of all individuals. Other incidental wildlife were recorded when present.

8.3.3 Incidental Observations

8.3.3.1 Carnivore Dens

Incidental observations of carnivore dens with and without young were recorded during other wildlife field inventories in 2013 and during other environmental baseline studies conducted in the terrestrial RSA during 2013. This is typically how grizzly bear and wolverine dens are observed and documented.

8.3.3.2 Observations of Carnivores

Incidental observations of carnivores were documented during other wildlife baseline studies and by field staff in other disciplines during other environmental baseline studies conducted in the terrestrial RSA in 2013. Date, species, number of individuals, sex, age, behaviour, location, and habitat were documented whenever possible.

Incidental observations of carnivores were also recorded by remote motion-triggered cameras used to supplement the caribou baseline studies (Chapter 9). Remote cameras for the caribou baseline studies recorded observations from late-May through late–August, 2013. Only motion-triggered photos were analyzed and recorded. Data recorded from the camera photos included: camera number, type of photo (motion or triggered), photo number, date, time of day, species, number of animals in the frame, behaviour, and any additional relevant information. All observation data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as carnivores may spend more than 5 minutes at a site. If photo series were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were of a unique animal. Observations of carnivores were considered a duplicate if it was not possible to tell individuals apart within the 24-hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series.

8.4 RESULTS

8.4.1 Summary

A total of 26 dens were observed during carnivore den surveys conducted in 2013 in the focal carnivore den survey areas, 16 of which had signs of recent activity and were classified as either occupied confirmed or possibly occupied (Table 8.4-1; Appendix 8-1). Fourteen of the carnivore dens identified in the occupancy survey and one den observed incidentally in late-June were re-surveyed during the productivity survey. The dens of two carnivore species were identified – grey wolf and red fox. Twenty-three dens were located within the focal survey area along the potential winter road corridors, the majority of which occurred in esker or glacial-fluvial habitats. One wolverine den was incidentally observed near the Goose Property Area and was confirmed to be occupied in March and April of 2013. This den was located less than 1.5 km from the Goose Lake exploration camp.

Table 8.4-1. Carnivore Den Survey Results, 2013

		Carnivore Den Status					
		Occupancy Survey			Productivity Survey		
Species	No. Dens Observed	Occupied Confirmed	Possibly Occupied	Unoccu-pied	Productive Confirmed	Possibly Productive	Unpro-ductive
Grey Wolf	2	0	2	0	0	0	1
Fox spp.	5	0	5	0	0	2	3
Red Fox	2[1]	2	0	0	0	1	1
Wolverine	1[2]	0	0	0	0	0	0
Unknown Species	17	0	7	10	0	0	7
Total	**27**	**2**	**14**	**10**	**0**	**3**	**12**

[1] *One red fox den was not surveyed during the occupancy survey but was surveyed during the productivity survey.*
[2] *This wolverine den was observed incidentally and confirmed to be occupied during other 2013 wildlife baseline surveys.*

8.4.2 Aerial Den Surveys

Two carnivore den surveys (an occupancy and productivity survey) were completed in 2013. The occupancy survey was conducted from May 23 to May 26 and on June 1, 2013 and an additional occupancy survey was completed on June 19, and June 20, 2013 to survey additional areas at the MLA (3 km by 3 km). The productivity survey was conducted on July 15, 2013 at occupied dens or dens that had evidence of recent use during occupancy surveys. The total survey effort comprised 21.1 hours and 1,529 km of transect lines flown for the occupancy survey and 5.5 hours and 658 km of transect lines flown for the productivity survey (Figure 8.3-1; Table 8.4-2).

8.4.2.1 Occupancy Surveys

A total of 25 dens were observed during carnivore den occupancy surveys conducted in 2013, one of which was classified with confirmed occupancy with one adult observed at the den site, and 14 which were classified as possibly occupied, as signs of recent activity (tracks, scat, and/or prey remains) were observed (Figure 8.4-1; Table 8.4-3; Appendix 8-1). No grizzly bear or wolverine dens were observed during the occupancy surveys; however, recent tracks and signs of digging were observed at two locations during the surveys (Figure 8.4-1).

PROJECT #0194096-0005 GIS # BAC-23-273 December 20 2013

Carnivore Dens and Locations Observed during Occupancy and Productivity Surveys, 2013

Figure 8.4-1

Sabina GOLD & SILVER CORP

Rescan an ERM company

Figure 8.4-1

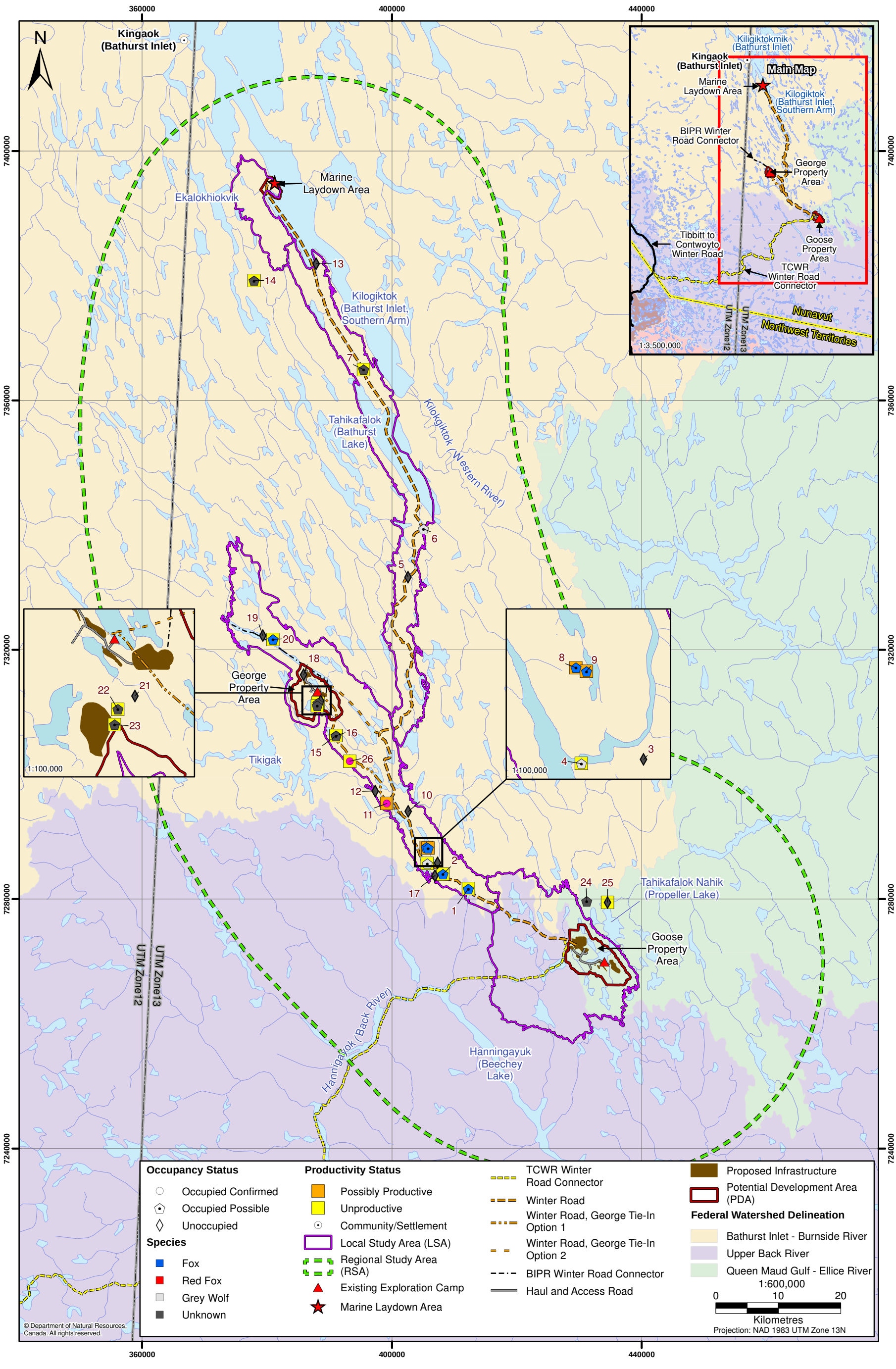


Table 8.4-2. Summary of Survey Effort and Conditions for Carnivore Den Surveys, 2013

Survey	Date	Survey Area	Survey Effort		Temperature (°C)	Weather	Wind Speed (km/h)	Lighting
			Time (h)	Distance Flown (km)				
Occupancy	23-May-13	Bathurst Inlet - Winter Road Alignment – N	3	356	7	Cloudy	5-10	Bright
	23-May-13	Bathurst Inlet - Winter Road Alignment – S	1.9		7	Cloudy	5	Bright
	24-May-13	Bathurst Inlet - Winter Road Alignment – N	3	534	2	Clear	5	Bright
	24-May-13	Bathurst Inlet - MLA - 3 km by 3 km	0.4		11	Partly Cloudy	10-15	Bright/Flat
	24-May-13	Bathurst Inlet - MLA - 15 km by 15 km	4		10	Partly Cloudy	10-15	Bright/Flat
	25-May-13	Road Alignment Between George and Goose Property Areas - S	1	84	11	Partly Cloudy	10-15	Bright
	26-May-13	Road Alignment Between George and Goose Property Areas – N and S	4.2	229	2	Cloudy	20	Flat
	1-Jun-13	Goose PDA - 3 km by 3 km	0.4	25	20	Clear	5-10	Bright
	1-Jun-13	Goose PDA - 15 km by 15 km	2.3	253	20	Clear	5-10	Bright
	19-Jun-13	Bathurst Inlet - MLA – 3 km by 3 km	0.5	22	20	Partly Cloudy	5	Bright/ Flat
	20-Jun-13	Bathurst Inlet - MLA expanded - 3 km by 3 km	0.5	26	16	Partly Cloudy	40-60	Bright
Productivity[1]	15-Jul-13	Road Alignment Between George and Goose Property Areas - N	5.5	680	13	Cloudy	5-10	Bright
Total Effort			**26.7**	**1,985**				

[1]Only dens that were classified as confirmed occupied or possibly occupied during the occupancy survey were revisited during the productivity survey; thus, survey effort during the productivity survey was much less than that during the occupancy surveys.

Table 8.4-3. Carnivore Dens Observed during Occupancy and Productivity Surveys, 2013

2013 Den #	Unique Den ID[1]	Date	Occupancy Status	Productivity Status	Species	No. Adults Observed
1	157D	23-May-13	Possibly Occupied	Unproductive	Fox spp.	-
2	158D	23-May-13	Possibly Occupied	Unproductive	Fox spp.	-
3		23-May-13	Unoccupied	-	Unknown	-
4	159D	23-May-13	Possibly Occupied	Unproductive	Grey Wolf	-
5		23-May-13	Unoccupied	-	Unknown	-
6	160D	23-May-13	Possibly Occupied	-	Grey Wolf	-
7	161D	23-May-13	Possibly Occupied	Unproductive	Unknown	-
8	162D	24-May-13	Possibly Occupied	Possibly Productive	Fox spp.	
9	163D	24-May-13	Possibly Occupied	Possibly Productive	Fox spp.	-

(continued)

Table 8.4-3. Carnivore Dens Observed During Occupancy and Productivity Surveys, 2013 (completed)

2013 Den #	Unique Den ID[1]	Date	Occupancy Status	Productivity Status	Species	No. Adults Observed
10		24-May-13	Unoccupied	-	Unknown	-
11	164D	24-May-13	Occupied Confirmed	Possibly Productive	Red Fox	1
12		24-May-13	Unoccupied	-	Unknown	-
13		24-May-13	Unoccupied	-	Unknown	-
14	165D	24-May-13	Possibly Occupied	Unproductive	Unknown	-
15	166D	25-May-13	Possibly Occupied	Unproductive	Unknown	-
16	167D	25-May-13	Possibly Occupied	Unproductive	Unknown	-
17		25-May-13	Unoccupied	-	Unknown	-
18	107D	26-May-13	Unoccupied	-	Unknown	-
19		26-May-13	Unoccupied	-	Unknown	-
20	168D	26-May-13	Possibly Occupied	Unproductive	Fox spp.	-
21	98D	26-May-13	Unoccupied	-	Unknown	-
22	169D	26-May-13	Possibly Occupied	Unproductive	Unknown	-
23	94D	26-May-13	Possibly Occupied	Unproductive	Unknown	-
24	170D	1-Jun-13	Possibly Occupied	-	Unknown	-
25		1-Jun-13	Unoccupied	Unproductive	Unknown	-
26[2]	89D	23-Jun-13	Occupied Confirmed	Unproductive	Red Fox	1

[1] Only dens that were possibly occupied or confirmed to be occupied in 2013, or dens identified in previous years have an ID number in the database.
[2] This den was observed incidentally after the occupancy surveys occurred but was surveyed during the productivity surveys.

Grey Wolf

Two dens were identified as grey wolf dens (dens 4 [159D] and 6 [160D]) and classified as possibly occupied since wolf tracks, signs of digging, and large den entrance holes (30 to 55 cm) were present (Plates 8.4-1 and 8.4-2). However, no animals were observed at these dens. Den 4 [159D] was dug into glacial fluvial habitat in gravelly soil with a north facing aspect and den 6 [160D] was dug into esker habitat in sandy soil with a southeast facing aspect.

Fox

One den was identified as a red fox den (den 11 [164D]) and classified as occupied confirmed with one adult observed. This den had five entrance holes ranging in size from 15 to 55 cm and was dug into esker habitat in sandy soil beside a lake (Plate 8.4-3).

Five additional dens were identified as fox dens but were not identified to the species level as no animals were observed near these dens. All five dens were classified as possibly occupied as fox tracks, bones, and/or scat were present at these dens.

Unknown Carnivore Species

Accurate species identifications were not determined for a total of 17 dens due to a lack of any defining species characteristics and/or signs at the dens at the time of the survey (Table 8.4-3). Seven of these unknown dens were classified as possibly occupied due to observations of digging, undefined tracks, old scat, and/or prey remains, and the other 10 dens were classified as unoccupied. The majority of unknown carnivore dens were situated on esker habitat in sandy soil at the top of a slope.

Plate 8.4-1. Wolf tracks (in red rectangle) located near Den 4 [159D], May 23, 2013.

Plate 8.4-2. Large den entrance with signs of digging (circled in red) observed at Den 4 [159D], May 23, 2013.

Plate 8.4-3. Red fox den dug into sandy soil in esker habitat, May 24, 2013.

8.4.2.2 Productivity Surveys

Productivity surveys were conducted at carnivore dens identified as confirmed occupied or possibly occupied during occupancy surveys or which were observed incidentally and were occupied prior to productivity surveys. A total of 15 dens were surveyed during the 2013 carnivore den productivity survey, of which 14 were surveyed during the occupancy survey, and one den which was found incidentally on June 23, 2013 in esker habitat and had confirmed occupancy with one adult present. Of the fifteen dens surveyed during productivity surveys, three were classified as possibly productive with signs of recent activity, such as bones, scat, and tracks, observed at the den sites (Table 8.4-3; Figure 8.4-1; Appendix 8-1). No grizzly bear or wolverine dens were observed during the carnivore den productivity surveys.

Grey Wolf

One grey wolf den (den 4 [159D]), classified as possibly occupied during the occupancy survey, was resurveyed during the productivity survey and was classified as unproductive since no signs of recent activity were evident.

Fox

Two red fox dens (dens 11 and 26 [164D and 89D, respectively]) previously classified as confirmed occupied were surveyed during the productivity surveys. Den 11 [164D] was classified as possibly productive as recent scat, prey remains, and bones were observed (Plate 8.4-4). Den 26 [89D] was classified as unproductive as no signs of recent activity were evident.

A total of five dens (dens 1, 2, 8, 9, and 20 [157D, 158D, 162D, 163D, and 168D, respectively]), identified as fox dens but not identified to species, were classified as possibly occupied during the occupancy surveys and surveyed during the productivity surveys. Two fox dens (dens 8 and 9 [162D and

163D, respectively]) were classified as possibly productive as recent tracks, scat, and bones were observed at the den sites. The other three dens (dens 1, 2, and 20 [157D, 158D, and 168D, respectively]) were classified as unproductive as no signs of recent activity were observed.

Plate 8.4-4. Left Photo - Red fox den (den 11 [164D]) with scat (circled in red) observed near a den entrance hole, July 15, 2013. Right Photo – Prey remains of an Arctic ground squirrel observed near another den entrance of den 11 [164D], July 15, 2013.

Unknown Carnivore Species

A total of seven dens classified as possibly occupied during the occupancy survey were surveyed during the productivity surveys and classified as unproductive since no signs of recent activity were observed.

8.4.3 Wolf Den Monitoring

Two cameras were placed in early May at wolf dens that were classified with confirmed occupancy and possible productivity during 2012 baseline studies (Rescan 2013b) to determine: 1) whether these dens would be reoccupied in 2013, 2) the timing of first occupancy, 3) the overall productivity, and 4) the timing of den abandonment (Appendix 8-2). Camera 56 was installed on May 1, 2013 at den 59D located approximately 30 km southwest of the George Property Area, and camera 57 was installed on May 7, 2013 at den 70D located approximately 45 km northeast of the Goose Property Area (Figure 8.3-1). Recent wolf tracks, urine, and scat were observed at both camera locations during installation indicating that the den sites were possibly visited by wolves prior to camera installation.

The grey wolf den (den 59D) located at camera 56 had confirmed occupancy and confirmed productivity with observations of adults and pups. A pair of wolves was first recorded at the den site on May 21, 2013, and the same pair was subsequently observed together on May 28, and June 9, 2013 (Plate 8.4-5). A single pup was first observed on July 20, 2013 (Plate 8.4-6). A total of four pups were recorded at the den site on July 21, 2013 (Plate 8.4-7). Typical behaviours and interactions recorded by camera at the den included: walking, defecating, playing, begging, and feeding. The den site was confirmed to be still active on August 24, 2013 when the camera monitoring was concluded for 2013, as pups were observed at the den by field staff at the time of camera card collection.

The grey wolf den (den 70D) located at camera 57 was unoccupied and unproductive during the time of camera monitoring in 2013 (from May 7 to August 24) as no adults or pups were recorded at the den by camera 57 between these dates. However, wolf tracks and scat were observed near this den at the time of camera set up on May 7, 2013.

Plate 8.4-5. Mated pair of wolves observed on June 9, 2013.

Plate 8.4-6. First wolf pup observed on July 20, 2013.

Plate 8.4-7. Three of four pups observed at the den, July 25, 2013.

8.4.4 Incidental Observations

8.4.4.1 Carnivore Dens

A total of three dens were observed incidentally during other 2013 wildlife baseline surveys, two of which were identified as grizzly bear dens, and the other was a wolverine den (Figure 8.4-2). Both of the grizzly bear dens were observed in the fall either during waterbird surveys or during ferry flights between the Goose Camp and the waterbird survey locations and were both located outside of the LSA, one north of the George Property Area, and the second southwest of the MLA. The wolverine den was observed in late-March 2013 near the "Goose Neck" of Goose Lake during the installation of DNA posts for the 2013 wolverine DNA program (Figure 8.4-2). The wolverine den was confirmed occupied with one adult and one juvenile, both of which were observed on the Goose Property Area. Many wolverine tracks belonging to adult and juvenile wolverine were also visible in the snow leading to the den entrance, and on several occasions, an adult wolverine was observed at the den site.

One additional possible den belonging to a fox was recorded in April, during the wolverine DNA surveys, the location of which was near the shoreline of Bathurst Inlet south of the MLA. The helicopter pilot observed a fox running towards a ridge near the shoreline of Bathurst Inlet and burrowing into the ground. However, no actual den was sighted, although the helicopter did not approach too closely to avoid disturbance to the animal.

8.4.4.2 Observations of Carnivores

<u>Incidental Observations of Carnivores during Field Surveys</u>

Four carnivore species including grey wolf, red fox, grizzly bear, and wolverine (n = 80 observations) were observed incidentally during baseline field surveys conducted in 2013 (Figure 8.4-2; Table 8.4-4; Appendix 5-4). Wolves and grizzly bears were the most commonly observed carnivores during baseline

studies conducted in 2013. Incidental observations of carnivores occurred throughout the terrestrial RSA typically near large lakes, rivers or eskers. Most incidental observations of carnivores occurred within 10 km of the exploration camps or proposed Project infrastructure, likely due to the higher number of people in these areas recording sightings (Figure 8.4-2).

Table 8.4-4. Incidental Observations of Carnivores during 2013 Baseline Studies

Species	No. of Observations
Grey Wolf	45
Grizzly Bear	34 (20 Adults; 14 Cubs/Juveniles)
Red Fox	13
Wolverine	7 (6 Adults; 1 Juvenile)
Total	**80**

Wolves were typically observed near large lakes, rivers, or eskers (Figure 8.4-2). Incidental observations of note included: an adult wolf guarding a caribou carcass located less than 15 km east of George Property Area along the winter road alignment in late-May 2013, a small pack of six wolves running along the Western River in early June 2013, a pair of wolves following a herd of caribou near the northwest end of Beechey Lake in late August 2013, and a pair of wolves eating a caribou carcass approximately 500 m from the ice runway at the Goose Property Area in March 2013.

There were eight incidental carnivore observations during baseline field surveys conducted in 2013 that supported evidence of productivity; all of which were of grizzly bears. There were six observations of female grizzly bears with cubs and two observations of juvenile bears (Figure 8.4-3). A total of five female grizzly bears, 10 cubs (born in 2012 or 2013), and 4 juveniles were observed incidentally by field staff; the other 15 adult bears observed were not identified to sex (Table 8.4-4). Most of these incidental observations of female grizzly bears with cubs in 2013 occurred near large lakes, rivers, or eskers (Figure 8.4-3). Large concentrations of female bears with cubs occurred in the central portion of the terrestrial RSA within 20 km of the LSA (Figure 8.4-3).

Carnivores Observed via Remote Cameras

A total of 65 remote motion-triggered cameras were placed on the tundra for caribou surveys during the 2013 wildlife baseline studies (see Chapter 9). Five carnivore species including grey wolf, red fox, Arctic fox, grizzly bear, and wolverine were detected during remote camera monitoring studies for caribou in fall/winter 2012/2013 and spring/summer 2013 (Plate 8.4-8). Remote digital images of carnivores were recorded at 48 of the 65 (74%) remote camera stations set up for the caribou baseline studies and two wolf den monitoring stations (Figure 8.4-2). A total of 342 carnivore observations were detected at these camera stations between August 2012 and August 2013 (Table 8.4-5). Some individuals detected may have been repeated observations at the same camera or multiple cameras. The highest number of detections recorded in fall and winter of 2012 was during September, and the highest numbers of detections recorded in 2013 were recorded in June, July, and August. Grizzly bears and wolves were the most commonly observed carnivores on remote cameras, particularly in June, July, and August 2013. Wolverine activity was primarily observed in March, April, and May 2013 and declined in subsequent months; whereas, grizzly bear and wolf activity increased or remained consistent over the six months from March to August 2013.

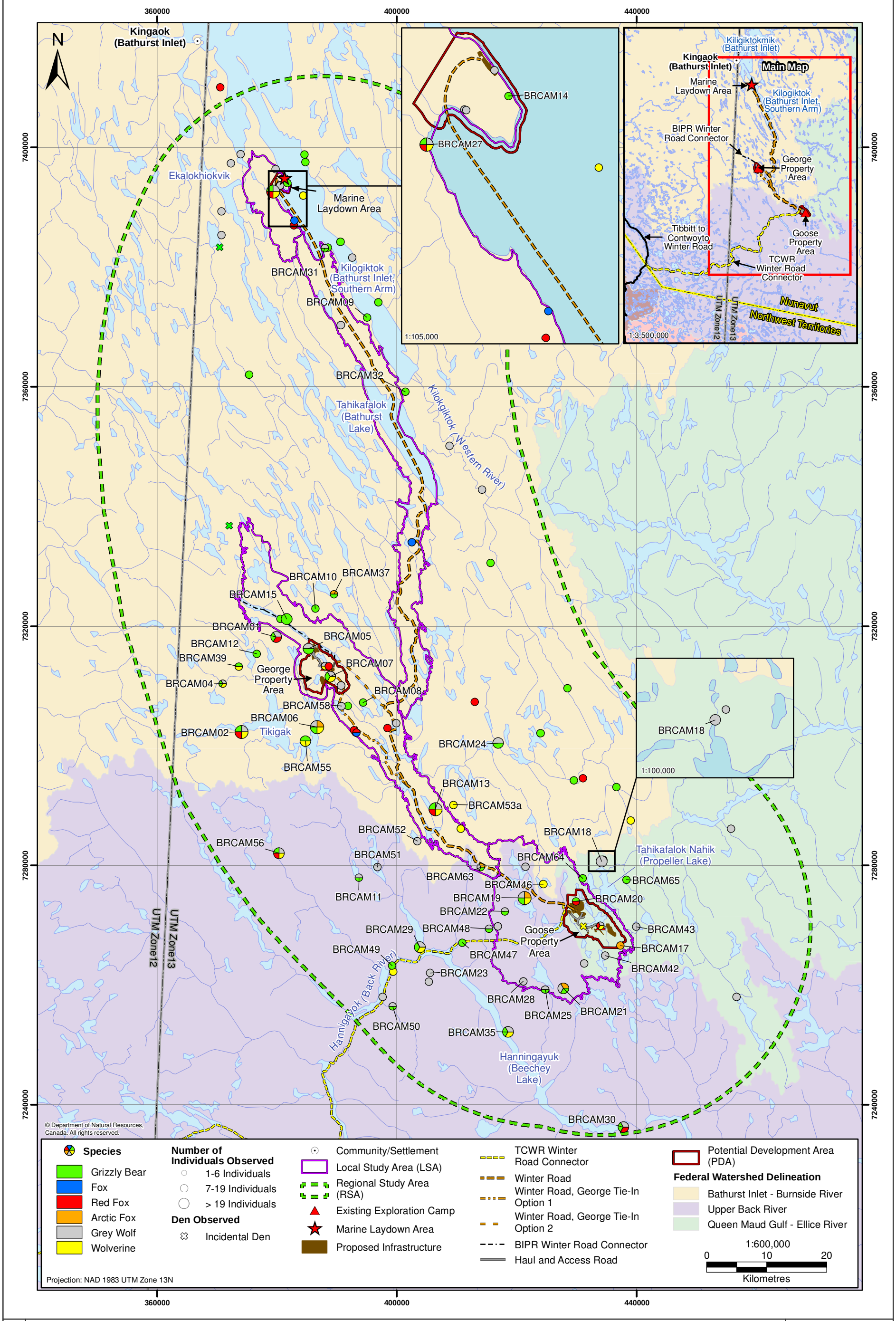


Figure 8.4-2

Sabina GOLD & SILVER CORP.

Incidental Observations of Carnivore Dens and Carnivores, 2013

Figure 8.4-2

Rescan an ERM company

PROJECT #0194096-0005 GIS # BAC-23-275 December 18 2013

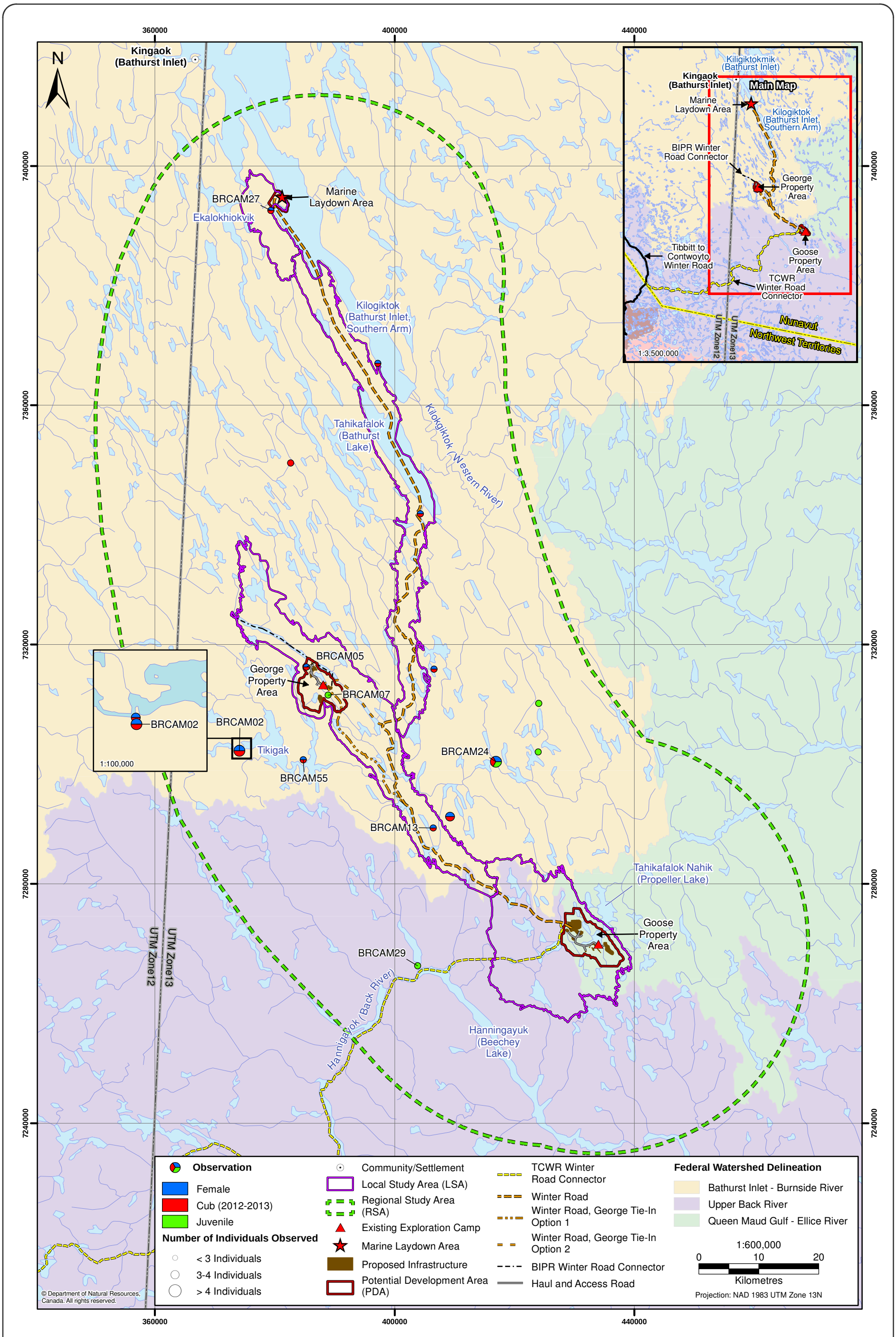


Figure 8.4-3

Sabina GOLD & SILVER CORP

Incidental Observations of Female Grizzly Bears with Cubs, 2013

Figure 8.4-3

Rescan an ERM company

a) Adult wolf

b) Adult wolverine

c) Female grizzly bear with cub born in 2013

d) Female grizzly bear with cub born in 2010

e) Adult red fox

f) Adult Arctic fox

Plate 8.4-8. Remote camera observations of carnivores, March to July 2013.

Table 8.4-5. Incidental Observations of Carnivores via Remote Cameras

	No. of Animal Detections												
	2012					2013							
Species	August	September	October	November	December	February	March	April	May	June	July	August	Total
Arctic Fox	1	-	-	-	2	-	4	5	-	1	-	1	14
Grey Wolf	6	14	4	3	-	7	2	3	18	20	14	35	126
Grizzly Bear	9	22	4	-	-	-	-	-	11	22	39	40	147
Red Fox	-	2	1	-	-	-	3	7	2	1	2	2	20
Wolverine	1	-	2	-	-	-	5	14	7	2	3	1	35
Total	**17**	**38**	**11**	**3**	**2**	**7**	**14**	**29**	**38**	**46**	**58**	**79**	**342**

A total of eight cameras (cameras 2, 5, 7, 13, 24, 27, 29, and 55) had 12 detections of female grizzly bears with cubs and/or two juvenile grizzly bears (Figure 8.4-3). A total of 13 female grizzly bears and 16 cubs were observed at eight of the cameras located in the terrestrial RSA between September 2012 and August 2013. However, no grizzly bears (including observations of lone adults) were recorded by cameras from October 21, 2012 to May 19, 2013. Most of the images of grizzly bear cubs were from cameras located near eskers or large lakes and rivers. The cameras with the greatest number of female bears with cubs detected were cameras 2 and 24 (Figure 8.4-3). Other than grizzly bear cubs, there were no other images of carnivores with young recorded by the 65 remote motion-triggered cameras in the terrestrial RSA.

8.5 DISCUSSION

Carnivore den baseline studies were conducted in targeted areas of the terrestrial RSA to identify: a) the number and distribution of existing dens, b) dens that are active, and c) the predominant resident carnivore species utilizing the terrestrial RSA. A total of 30 carnivore dens belonging to four species (grey wolf, red fox, wolverine, and grizzly bear) were observed during the occupancy and productivity surveys or observed incidentally during other wildlife baseline surveys conducted in 2013. More than half of the dens observed (n = 16) had signs of recent activity, but only two dens had confirmed occupancy. Of these, three dens were identified as possibly productive, but no dens were confirmed as productive. Of the two known previously active wolf dens monitored throughout the spring and summer by motion-triggered camera, only one was confirmed to be occupied and produced a successful litter.

The majority of dens were located along the winter road route between Goose Property and George Property PDAs, particularly closer to the George Property Area. This was an area with a greater amount of esker habitat, where dens are often found, relative to other areas surveyed. The two dens that had confirmed occupancy (dens 11 and 26 [164D and 89D, respectively]) both belonged to red fox and were located in this area. Den 26 [89D] was identified during 2012 surveys, but den 11 [164D] was a new den found in 2013. In addition, an occupied wolverine den was observed near the Goose Property Area PDA. This den was an occupied wolverine den in 2012. Wolverines have been documented using the same den site or general location in multiple years (Lee and Niptanatiak 1996; Magoun and Copeland 1998). While the majority of dens observed had inconclusive occupancy or were unoccupied in 2013, these dens may still be used in subsequent years by the same species or other species. Dens have been estimated to be utilized for up to 300 years with multiple entrances often being added in successive years until the den collapses due to natural processes (Smits, Smith, and Slough 1988). The same den will often be used by multiple generations of the same species or other species (Frafjord 2003). In fact, some dens have been documented to be used by both Arctic foxes and wolves simultaneously in the same season (Hendrickson et al. 2005).

Only three dens in the targeted aerial survey area were classified as potentially productive during productivity surveys as recent tracks, prey remains, and scat were observed at the den. All of these dens belonged to fox species and were located within 10 km of one another along the winter road route between the Goose and George Property PDAs. One of the wolf dens monitored by remote camera and located approximately 35 km southwest of the George Property Area was confirmed to be productive, with pups observed at the site, and the wolverine den located near the Goose Property Area was also confirmed to be productive, as a juvenile and adult had been observed near the den as well as near the Goose Property Area. However, since the peak period of wolverine birthing occurs from February to mid-March (Magoun and Copeland 1998; Inman et al. 2012), it is likely that the juvenile observed outside the den near Goose Lake camp in March 2013 was a kit born in 2012. Productivity of carnivore species in the Arctic may be dependent on several factors, including body condition of adult females, available food resources, and climate (Tarroux, Berteaux, and Bety 2010; Inman et al. 2012). For example, wolverine den sites are strongly correlated with deep, persistent snow packs from March

to May, so there is growing concern that climate change will cause a decline in deep snow cover reducing the availability of suitable denning sites and thus reducing wolverine reproductive success (Servheen and Cross 2010).

Although confirmed occupancy and productivity was low at most of the dens observed during the aerial surveys, the aerial den surveys were timed relatively well to detect occupied wolf and fox dens. The remote camera monitoring study conducted at the two wolf dens indicate that wolf and fox species should have been present at the time of occupancy surveys (in late-May and early June). However, many areas of the tundra were still frozen at the end of May when surveys were conducted, as the thaw during spring of 2013 was somewhat later than in previous years. The aerial productivity survey was also timed relatively well to detect wolf pups or fox kits at occupied or possibly occupied dens indicated by the recent prey remains that were found at the occupied red fox den (den 11 [164D]) even though no pups were observed during productivity surveys. Wolf pups were first observed at a wolf den monitored by remote camera only five days after the aerial productivity survey was conducted.

Of the two wolf dens that were active in 2012 and monitored in 2013 by remote digital camera, only one den (Den 59D) was active during the monitoring period between early-May and late-August in 2013. Evidence from research suggests that wolves exhibit fidelity to den sites (Cluff, Walton, and Paquet 2002) and often return to the same areas in subsequent years (Fuller 1989; Walton et al. 2001). Thus, it is possible that the wolves observed by remote camera in 2013 are the same pair observed in 2012. The timing of denning occupancy observed in this study (mid-May) was consistent with that reported in the literature (Anthony, Barten, and Seiser 2000). Four wolf pups were observed at Den 59D in mid-July. This finding is also consistent with research on the timing of pup emergence from dens (Angerbjörn et al. 1995; Strand et al. 2000). Den 59D was still active at the end of the camera monitoring period (late-August) indicating that early survival of the wolf pups was successful, and that pups have a greater chance of surviving their first year (Mech 1995). Pup survival in summer is generally dependent on food availability (Fuller 1989; D. C. Heard and Williams 1992). It is not know why Den 70D was not occupied in 2013, even though wolf tracks and scat were observed at the den site in early-May. However, reasons for den abandonment reported in the literature include disturbance, death of adults, and prey availability shifts (Mech 1995; Theuerkauf, Rouys, and Jedrzeiewski 2003). Climate change may have significant impacts on Arctic wolves by indirectly affecting the trophic food chain of vegetation to herbivores to predators (Mech 2004). For example, a wolf study on Ellesmere Island in the Eureka area documented that a summer snow event covered the vegetation in 1997 and 2000 and drastically reduced the numbers of muskox and hares to the point that they could no longer support the local wolf pack (Mech 2004). As a result of the low numbers of prey, the local wolf pack stopped reproducing in the Eureka area until 2006 when pups were observed again (Mech 2004, 2006).

No other wolf dens with confirmed occupancy were found in the terrestrial RSA in 2013. However, survey effort was focused on focal portions of the terrestrial RSA along the winter roads, the Goose Property PDA, and the MLA PDA; thus, it is possible that additional active wolf dens occurred in the terrestrial RSA, but were not detected. Wolf distribution studies have shown that wolf dens are frequently found closer to the tree line than on the tundra and that most wolves do not den near caribou calving grounds (D. C. Heard and Williams 1992; Frame, Cluff, and Hik 2008). There may be two adaptive reasons why wolves may preferentially den near the tree line; first, caribou are generally more available near the tree line for a greater proportion of the denning period than on the tundra, and second, caribou are usually abundant near the tree line in September when the nutritional demands of the wolf pups are highest (D. C. Heard and Williams 1992).

The large number of incidental observations of carnivores, some within 1 to 26 km of den sites, indicates the terrestrial RSA may be a reproductively successful area frequently used by carnivores although no incidental observations of young carnivores other than grizzly bear were detected in the

terrestrial RSA. There were 16 incidental observations of grizzly bear cubs detected in the terrestrial RSA in 2013. Grizzly bear dens have been observed in the RSA in 2007 were located within a 20 km radius of George Lake and shallowly dug into moderately sloped, heath tundra habitat and had root mats of heather and dwarf birch shrubs at the den entrances (Gartner Lee Ltd. 2008). In 2012, two additional grizzly bear dens were situated along the Western River corridor in sandy glacial fluvial habitat with southerly aspects (Rescan 2013b). Incidental grizzly bear dens observed in 2013 occurred in the western portion of the terrestrial RSA approximately 40 km east of the grizzly bear dens observed in 2012. While it was not possible to determine the productivity of these dens, or whether these dens belonged to females with cubs, or male bears, it is likely that this area is a consistently productive area for grizzly bears as some of the incidental observations of bears with cubs occurred in nearby areas in early-spring shortly after bears would have emerged from their dens.

9. Caribou

Rescan™
an ERM company

9. Caribou

9.1 INTRODUCTION

Three barren-ground caribou herds have been identified whose ranges overlap the area of the Project, the Bathurst herd, the Beverly herd (also known as the Ahiak herd), and the Dolphin and Union herd (Rescan 2013b). The Dolphin and Union herd, named for the Dolphin and Union Strait, is considered to be a genetically distinct population of barren-ground caribou (*R. t. groenlandicus x pearyi*).

9.1.1 Bathurst Caribou

The Bathurst caribou herd is named after Bathurst Inlet, where this herd has historically calved. The Bathurst herd moves yearly between calving grounds on the tundra and the wintering range in the boreal forest. In the 1980s, the Bathurst herd was one of the largest migratory herds in Arctic Canada, estimated at approximately 450,000 animals in 1986 (D.C. Heard and Williams 1991; Boulanger et al. 2011). But like some other North American caribou herds, the Bathurst herd has declined (Vors and Boyce 2009; Boulanger et al. 2011), with an estimated population of 31,900 animals in 2009 (GNWT ENR 2013a). The data, based on calving ground surveys of breeding females, suggest an average annual population decline of about 6% per year from 1986 to 2006 (Boulanger et al. 2004; Gunn et al. 2005).

Boulanger et al. (2011) proposed that the population has likely declined due to decreased calf survival, and concomitant reductions in female fecundity, and hunting. Annual monitoring of calf survival indicates that mean winter calf survival and calf-cow ratios for the Bathurst herd were declined by almost 50% in 2001-2004 compared with 1985-1996 (Gunn, Boulanger, and Williams 2005). Like other caribou herds, the size of the Bathurst herd has fluctuated with a periodicity between 40 and 70 years, likely dependent on weather and forage availability, which affect female fecundity and calf survival (Zalatan, Gunn, and Henry 2006; Beaulieu 2012). While initial declines in the Bathurst caribou numbers may have been a consequence of natural population cycles, biologists have proposed that relatively high winter mortality rates of females to hunting probably resulted in accelerated declines, especially between 2006 and 2009 (Adamczewski et al. 2009; Boulanger et al. 2011). Since 2006, assessments of caribou body condition, pregnancy rates, and cow-calf ratios suggest improvements in breeding productivity, and the population appears to be stabilizing or increasing slightly (Adamczewski et al. 2009).

9.1.2 Beverly and Ahiak Caribou

The Beverly and Ahiak herds were recognized as distinct herds in the 1980s (Gunn and D'Hont 2002). The calving grounds of the Ahiak herd extended over 31,000 km^2 on the coast of the western Queen Maud Gulf, west of the Perry River in the Ahiak region. These are the largest calving grounds of any mainland barren-ground caribou herd in Nunavut and the Northwest Territories (D. Johnson, Nagy, and Williams 2008). The Beverly herd calved to the south of the Ahiak herd near Beverly and Garry lakes. Work by Nagy et al. (2011) has revealed that over many years, beginning sometime prior to 2002, the Beverly herd has joined the Ahiak herd in the western Queen Maud Gulf calving area (Campbell et al. 2012). This combined herd is currently referred to as the Beverly herd by the Government of Nunavut (Campbell et al. 2012). Other technical reports produced in the Government of Northwest Territories, where the Beverly and Ahiak herds overwinter, may still refer to these caribou as two separate herds. For the purposes of this baseline, the combined herd described by Campbell et al. (2012) is referred to as Beverly/Ahiak caribou.

Based on aerial surveys of the calving grounds along the Queen Maud Gulf, the Ahiak herd increased from between 40,000 and 60,000 animals in 1986 to roughly 200,000 animals in 1996 (Gunn, Fournier,

and Nishi 2000). In 2006, 123,000 Ahiak caribou (mostly female) were estimated on the calving grounds in the Queen Maud Gulf, suggesting that the Ahiak population increased again from 1996 to 2006 (Gunn, Russell, and Eamer 2011). Aerial surveys conducted in the Queen Maud Gulf in June 2011 resulted in an estimated population size of 124,189 (± 13,996) caribou, of which 52,825 (± 2,638) were breeding females (Campbell et al. 2012).

The Beverly herd increased from approximately 164,000 individuals in 1982 to over 275,000 individuals in 1994, based on calving ground counts near the Garry Lake area (GNWT ENR 2011b). No further calving ground surveys have been conducted for the Beverly herd since 1994, and thus no current population estimates are available. However, multiple calving ground delineation surveys in the traditional calving grounds of the Beverly herd (e.g., Garry Lake area) conducted in the mid to late 2000s recorded few females and very few calves, suggestive of a declining population (Adamczewski et al. 2009).

The above fluctuations in the population of Beverly and Ahiak caribou has likely been a result of the gradual shift of the Beverly herd to the Ahiak calving grounds, as evidenced by the distribution of collared caribou (Gunn, Russell, and Eamer 2011; Nagy et al. 2011). However, as a whole, it is likely that the Beverly herd has declined in abundance from its former numbers in the mid 1990's (Campbell et al. 2012).

9.1.3 Dolphin and Union Caribou

Dolphin and Union caribou are named after the Dolphin and Union strait on which they migrate during their annual spring and fall migrations between the mainland and Victoria Island. The herd is federally listed as "Special Concern" on Schedule 1 of SARA (COSEWIC 2004). Major threats to this herd have been identified as climate change, and winter shipping activity along the herd's migration route (COSEWIC 2004). During migration, the caribou require ice thick enough to support their weight as they cross the Coronation Gulf, Dease Strait, and the Queen Maud Gulf (COSEWIC 2004).

In the early 1900s, the Dolphin and Union caribou herd was estimated at 100,000 animals (COSEWIC 2004). Overhunting and possibly also rain-on-snow events caused a population decline between 1900 and 1920 to the point where caribou were not observed migrating between Victoria Island and the mainland after about 1930 (Gunn 2005). Beginning in the 1970s, the herd size increased, and in the late 1980s caribou resumed migration between Victoria Island and the mainland (Gunn et al. 1997). In spring 1993, approximately 7,200 Dolphin and Union caribou were counted on the mainland prior to migrating over the ice in spring (Gunn et al. 1997). In 1997, the Dolphin and Union herd was estimated at 28,000 ± 3,350 animals (Nishi and Gunn 2004), about one-third of its historic size. A population estimate of 28,000 ± 2,500 in 2007 suggests the population size is stable, though still only a third of its historic size (M. Dumond, GN , unpublished data, cited from Poole et al. 2010; COSEWIC 2004). Inuit TK parallels these findings; Dolphin and Union caribou were rarely observed in the 1950s, but observations had become regular by the 1990s (KIA 2012).

9.2 OBJECTIVES

The overall objective of caribou baseline studies for the Project in 2013 was to describe the seasonal distribution and abundance of caribou within the terrestrial RSA. Specifically, the objectives were to:

- describe the seasonal distribution and movement patterns using data collected from GPS- and satellite-collared caribou in relation to the terrestrial RSA; and
- describe the spatial, temporal, and seasonal distribution and abundance of caribou recorded on remote cameras located within the terrestrial RSA.

In addition, incidental observations of caribou were recorded during the other environmental baseline studies conducted in the terrestrial RSA in 2013 to document the presence of caribou in the RSA.

9.3 METHODS

Aboriginal communities and government agencies have raised concerns over the potential effects of conducting repeated small-scale aerial surveys on caribou populations and in particular, the possible effect of cumulative disturbance on the Bathurst herd. In order to minimize disturbance to caribou, alternative methods were used in lieu of traditional aerial surveys to assess the movement patterns and distribution of caribou through the RSA. These alternative methods included: a) the analysis of existing, caribou collar data for the Bathurst and Beverly/Ahiak herds from the NWT Government, b) the use of remote cameras to document caribou presence, and c) recording incidental observations of caribou during field surveys.

9.3.1 Distribution of Collared Caribou

Collaring programs for several caribou herds in the Canadian Arctic have been established by the Government of Northwest Territories, Department of Environment and Natural Resources (GNWT ENR) and Government of Nunavut, Department of Environment (GN DOE). Collars are fitted on female caribou, usually during the winter. A collaring program for the Bathurst herd has been in place since 1996 (GNWT ENR 2010). The number of collars that can be placed on Bathurst herd female caribou is restricted to 20 operating collars per year. Collaring programs for the Ahiak herd began in 2001, and for the Beverly herd in 2006. Collars were first placed on caribou from the Dolphin and Union herd in 1987; no collars on Dolphin and Union caribou have been functioning since 2006. The data generated from these programs allow researchers to investigate seasonal trends in habitat use as well as track real time movement patterns of caribou herds.

9.3.1.1 Analysis of Collar Data

Caribou collar data from the Bathurst and Beverly/Ahiak herds were obtained from the GNWT ENR Wildlife Management Information System (WMIS). Collar data was acquired from 1996 to the end of September 2013 for the Bathurst herd and from 2001 to the end of 2013 for the Beverly/Ahiak herd (GNWT ENR, *unpublished data*). As the Dolphin and Union herd has a minimal chance to interact with habitat in the RSA, determined previously during baseline studies conducted in the RSA (Rescan 2013b), no analysis of collar data was conducted for this herd.

The distribution of the Bathurst and Beverly/Ahiak herds relative to the RSA, based on collar data, was analyzed in two ways: fixed kernel density estimation to identify herd ranges and areas of concentrated use, and the generation of migration paths to assess potential travel corridors used by caribou herds. The number of collared females included in these analyses is summarized in Appendix 9-1.

Fixed kernel density estimations and migration paths were generated annually within general life history periods for the Bathurst and Beverly/Ahiak herds, as presented in Table 9.3-1. These stages are loosely defined by higher or lower movement rates for migrations vs. winter and summer ranges (C. J. Johnson et al. 2005). The start and end dates of peak calving recorded for Bathurst and Beverly/Ahaik caribou across the years were used to define the calving period; the peak of calving refers to the day when 50% of the caribou have calved. The weaning of calves was used to define the end of post-calving period; calves are typically weaned three to five weeks after they are born (Russell, Kofinas, and Griffith 2002). It is acknowledged that these life history stages vary seasonally, particularly dates defining calving and post-calving; thus, a wider spread in dates is used here than in more recent studies (e.g., Flanders et al. 2009).

Table 9.3-1. General Life History Period Dates for Bathurst and Beverly/Ahiak Caribou

Life History Period	Bathurst	Beverly/Ahiak
Winter	November 1 to April 14	November 1 to April 14
Spring Migration	April 15 to June 4	April 15 to June 4
Calving	June 5 to June 15	June 5 to June 20
Post-calving	June 16 to July 20	June 21 to July 25
Summer	July 21 to August 31	July 26 to August 31
Fall (Migration and Rut)	September 1 to October 31	September 1 to October 31

Fixed Kernel Density Estimation

Fixed kernel density estimators were used to contextualize the spatial distribution of collared caribou relative to the RSA during the winter, calving, post-calving, summer, and fall periods (Table 9.3-1). The spring migration period was assessed with the use of spring migration paths (see below).

The kernel density estimator is a non-parametric method that produces a probability distribution that estimates the likelihood of finding an animal at any particular location within its home range (Worton 1989). This method is a useful tool for ecologists to interpret wildlife habitat use as recorded by collars placed on animals, such as very high frequency (VHF), satellite, or GPS- collars. The probability distribution produced through kernel methods provides an estimate for an animal's true utilization distribution, which is described as an individual's relative use of space or the relative amount of time that an animal spends in any place (Seaman and Powell 1996).

Kernel density distributions, henceforth referred to as kernel utilization distributions (UDs), were generated using the adehabitatHR package in R (2009). All estimations were generated using a fixed search radius, also referred to as the bandwidth, to generate the density values for data points and grid cells. Following this analyses, the kernel UDs contained within 50% and 95% volume contours, henceforth referred to as 50% and 95% kernel UDs, respectively, were calculated.

The 50% kernel UD encompasses the smallest area within which 50% of the overall density of the utilization distribution can be contained. In an ecological sense, it depicts the area within which there is a 50% likelihood of finding a collared caribou location across the entire distribution of collar location points (i.e., the area where collared caribou spend 50% of their time; Hemson et al. 2005). The 50% volume contour was used to delimit the "core use" area, as this area appears to be used intensively based on the distribution of location points. The 95% kernel UD encompasses the areas surrounding the core use areas, and delimits the area within which there is a 95% likelihood of finding collared caribou. Selecting the 95% kernel UD eliminates location data point outliers that do not represent a consistent pattern of habitat use for the species (e.g., Powell 2000). Therefore, the 95% kernel UD is an estimate of the "range" of collared caribou.

All collar data were analyzed annually within the specified life history periods (winter, calving, post-calving, summer, and fall). Winter is a life history period that spans two calendar years (i.e., the end of one year and the beginning of the next; Table 9.3-1). To generate annual kernel UDs for the winter, collar data from two calendar years were used in the analysis (e.g., collar data from November 1, 1996 to April 14, 1997). Therefore, the results of these kernel density estimations are referred to as distribution of caribou during the winter of year one – year two (e.g., winter of 1996 – 1997).

Spring Migration Paths

Kernel distributions were considered to be inappropriate for the spring migration period, as this event is linear in nature and is undertaken at a rapid pace relative to other life history periods, including the fall migration. Therefore, the spring migration was mapped using annual movement paths for individual collared caribou, which were generated using the Points to Line tool for ArcGIS 10.1.

9.3.1.2 Limitations in Collar Data Analyses

There are some limitations in the comparability of annual kernel UDs because the type of collar data has varied among years. Up until 2008, all collars deployed on Bathurst and Beverly caribou were satellite collars, which typically provided one location every one to five days (depending on programming and season) with each location having an associated error of between 150 and 1,000 m depending upon the location class (C. J. Johnson and Gillingham 2005). Beginning in 2008, GPS collars with satellite uplink were deployed, resulting in three to six locations provided daily with much greater location accuracy (generally <15-25 m). Therefore, location data is more extensive and accurate from 2008 onwards relative to data from earlier years.

In addition, prior to 2006 the number of caribou collared and the number of collars that continued to function after deployment was low for both herds (less than 15 collars for Bathurst and less than 10 collars for Beverly/Ahiak). After 2006, the number of collars generally increased to 20 collars deployed per year, or more in the case of caribou from the Beverly/Ahiak herd. Therefore, kernel UDs have larger sample sizes of caribou locations from 2006 onwards for both herds, reflecting the larger number of females collared.

To control for differences among annual datasets as a result of differences in collar type and data collection, the number of locations per female per day was reduced to one in any dataset where there were more than one location per female per day (e.g., 2008 - 2013).

Fixed kernel distributions and spring migration paths also do not represent the entire distribution of Bathurst and Beverly/Ahiak caribou. The data used to generate kernel distributions and migration paths are based only on data from collared females, and the number of females collared has varied between years. However, as females are the only herd members that travel from wintering grounds to calving grounds, and back again, using collar data from females provides a reasonable estimation of areas used by the whole herd (winter, summer, and fall) while highlighting areas of particular importance to calving females (calving and post-calving). Pregnant females migrate to calving grounds in the spring more quickly than yearlings and males which take advantage of succulent spring and summer vegetation as it emerges across the tundra (GNWT ENR 2010). Females and their newly born young typically reunite with the rest of the herd following calving through the late summer, when they travel to rutting areas, and then return to wintering grounds.

9.3.2 Remote Cameras

Reconyx PC800 Professional digital cameras were used to monitor the presence of caribou within the RSA. Remote digital cameras are a reliable method for examining ungulate migratory timing and habitat associations (Cutler and Swann 1999; Noel et al. 2006), particularly on the tundra given the landscape's short vegetation (animals are not obscured by tall vegetation) and topographic features such as eskers and river crossings that direct caribou movement through the landscape.

9.3.2.1 Remote Camera Deployment and Study Design

The locations of remote cameras within the survey period (August 2012 to August 2013) are shown in Figures 9.3-1 and 9.3-2. A total of 65 cameras have been deployed in the RSA between 2012 and 2013 to record spatial and temporal trends in caribou presence within the RSA (Figure 9.3-1). Thirty cameras were deployed in the RSA at the end of May, 2012, and have been operating since. Observations of caribou captured by these cameras for the period of May to late August, 2012, are presented in Rescan (Rescan 2013b). The present report includes caribou observational data from these thirty cameras for the period between late August, 2012, and late August, 2013. Thirty-five additional cameras were deployed in the RSA in 2013, including 30 cameras in early May and five in late July. All image data from these 35 additional cameras are included in the present report across the operating periods for each camera.

In addition to the 65 cameras placed within the RSA, 25 cameras were located along the proposed Tibbett to Contwoyto Lake Winter Road (TCWR) Connector in late August, 2013 (Figure 9.3-2). As these cameras were placed out at the end of the survey period (see above), no image data is available for these cameras to include in the present report.

The study design for the placement of the 30 remote cameras in May, 2012, was to locate cameras within habitat types that may be important for caribou (e.g., eskers, river crossings) as well as near potential infrastructure areas. These thirty cameras were left on the tundra overwinter to collect data on winter use of the RSA by caribou. The study design was modified in 2013, and the location of several of the thirty original cameras within the RSA was adjusted in early May, 2013, and additional cameras were added (see above). The change in the survey design reflected the improved knowledge of caribou movements through the area from Traditional Knowledge or from the Government of Northwest Territories caribou collar data. Cameras were re-positioned along a grid between the George and Goose Property Areas within habitats identified, using Traditional Knowledge from Inuit Elders, as being important crossings or foraging areas for caribou, or within areas where a number of collared caribou have been recorded passing through.

Each camera was given a unique identifier in order to track changes in locations of cameras throughout the survey period. The unique identifier consisted of the camera number (e.g., BR_01) and a location suffix (e.g., a). The thirty cameras set out in May, 2012 were given the unique identifiers BR_01a through BR_30a. Additional cameras set out in 2013 were given identifiers relating to when they were deployed, which included BR_31a through BR_60a (May), BR_61a though BR_65a (July), and BR_66a through BR_90a (August). When cameras were moved to a different location, the unique identifier was adjusted by changing the location suffix, e.g., BR_01b (Figures 9.3-1 and 9.3-2).

9.3.2.2 Remote Camera Set-up and Operations

Remote cameras were set up using materials and equipment to maximize the durability and performance of the remote cameras. Cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a wooden tripod, which was secured with rocks to prevent it from being knocked over when encountered by wildlife. Cameras were also covered with a plywood cap to reduce rain and snow infiltration, and in some cases, the plywood cap was covered with bird spikes to deter birds from nesting on the platforms (Plate 9.3-1). Energizer® Lithium batteries were used to maintain camera performance at low-temperatures over the winter.

PROJECT #0194096-0005 GIS # BAC-23-289 December 23 2013

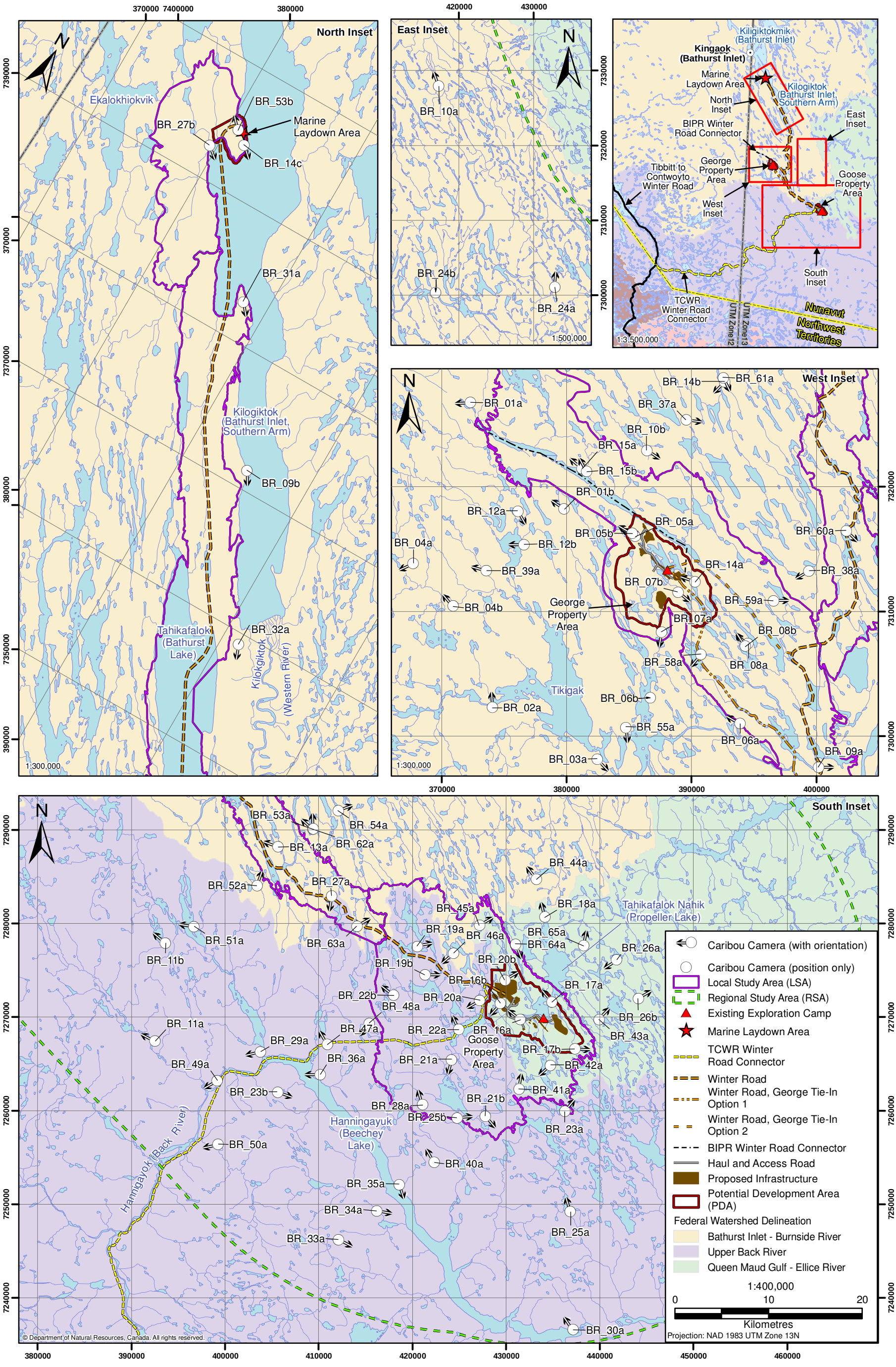


Figure 9.3-1

Sabina GOLD & SILVER CORP.

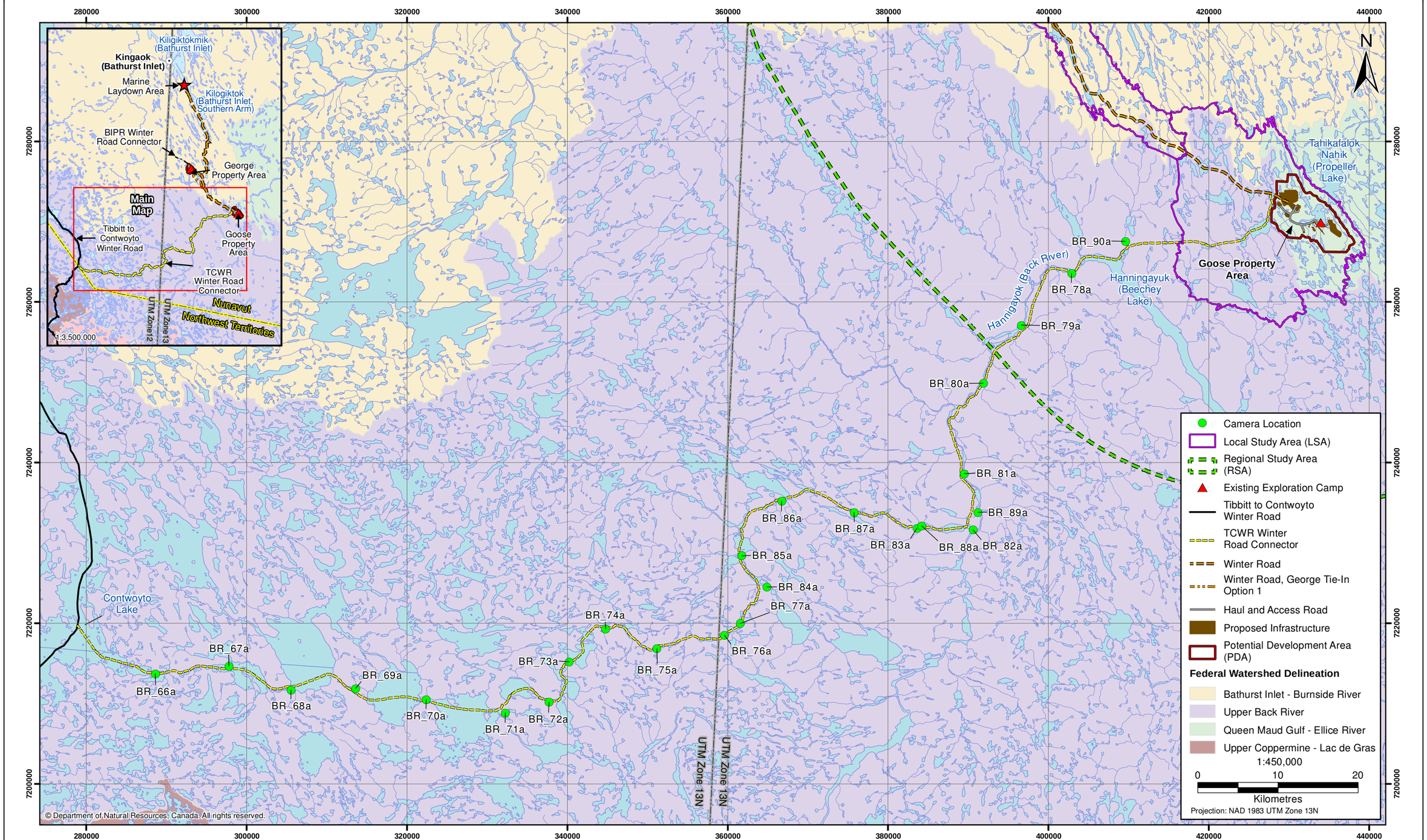
Caribou Camera Locations and Orientation, August 2012 to August 2013

Figure 9.3-1

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-292

December 23, 2013



© Department of Natural Resources, Canada. All rights reserved.

Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.3-2

Caribou Cameras Placed along the TCWR Winter Road Connector, August 2013

a) Installing the security enclosure, July 2013

b) Constructed tripod and support rocks, July 2013

c) Mounting bird spikes to plywood cap, May 2013

Plate 9.3-1. Remote camera setup, 2013.

Remote cameras were programed to take two types of photos: timed photographs and motion-triggered photographs. Timed photographs were taken at set intervals throughout the day (every 30 minutes during the survey period) and motion-triggered photos were automatically taken whenever there was movement detected by the infrared spectrum in front of the camera. Based on the remote camera trigger specifications (field of view) and evidence collected during the 2012 remote camera studies (Rescan 2013b), the motion trigger range of the remote cameras is approximately 25 to 30 m, depending on the size of animal moving through the camera's field of view. During each motion triggered event, cameras were programmed to take a set of 10 photos at 1-second intervals. If there was motion in front of the camera following the initial set of triggered photographs, the cameras were programmed to immediately start a second triggered set of 10 photos upon re-triggering. The cameras automatically recorded, on each image, the photo type (i.e., time [T] or motion [M]), as well as a number of other details including the camera number, date, time, temperature, and, for motion-triggered photos, number of triggered photos taken (i.e., 1/10 - 10/10).

Remote cameras were visited periodically throughout the survey period to ensure that cameras were operating properly and to check the amount of data located on memory cards and the battery level. Memory cards and batteries were exchanged wherever necessary to prevent the memory cards from filling up between checks, as well as to ensure an adequate battery level for camera operation between checks. Memory cards were retrieved and replaced at the end of August, 2013, and all cameras were left on the tundra in their respective locations to overwinter.

9.3.2.3 Data Analysis

Evaluating Number of Caribou Recorded at Remote Cameras

Each camera's photo-set over the entire survey period was scanned for caribou and other wildlife observations using either Reconyx software or a PC photo viewing software. The type of photo that was assessed differed during the survey period. Both timed and motion-triggered photos were assessed for the period from August 2012 to May 2013. Only motion-triggered photos were assessed for the period from May to August, 2013.

The difference in how timed and motion-triggered photo types were analyzed during the survey period is not expected to affect the overall patterns of detection of caribou by remote cameras. It is anticipated that most caribou are accounted for on motion-triggered photos, based on the results from remote camera studies in 2012 (Rescan 2013b). Approximately 90% of the total caribou recorded on the thirty cameras placed within the RSA over the spring and summer of 2012 were accounted for on motion-triggered photos (Rescan 2013). Thus, the number of caribou that may only be accounted for on timed photos is relatively small (10%). Hence, assessing motion-triggered photos only for the period from May through August, 2013 is not expected to affect the overall evaluation of spatial, temporal, and seasonal trends in caribou abundance recorded by remote cameras within the RSA from August 2012 to August 2013.

For each photo that included a wildlife observation, the following data were recorded: date, time (including start and end times for motion-triggered photo sets), photo type (i.e., timed or motion-triggered), photo number (including start and end photo numbers for M-triggered photo sets), number of photos, number of triggers, species, number of animals, and their behaviour (i.e., resting, foraging, traveling). All photo observations of caribou and other wildlife were checked by a second observer to ensure that the number of individuals was recorded accurately.

The total number of caribou recorded on timed photographs was calculated by recording the number of individuals visible within each photograph. Individual caribou that were recorded 30 minutes apart in timed photos were considered different individuals, unless behaviour suggested that they were the same individual (e.g., caribou resting on the tundra). The same distinction was made for larger groups of individuals if their behaviour was similar between timed photographs separated by 30 minutes.

The total number of caribou recorded on motion-triggered photos was calculated differently based on the number of individuals visible within each photograph. For small numbers of caribou observed by motion-triggered photos, the exact number of individuals could be easily determined by counting individuals across the set of triggered photographs. For large numbers of caribou, the number of individuals was estimated over entire M-triggered photo sets, and total observed for that time period of triggered photos was the highest number of individuals detected within one of the photos.

Spatial and Temporal Trends in Caribou Abundance

The temporal and spatial distribution of caribou recorded at remote cameras was assessed by summarizing the numbers of caribou recorded by camera at each location (spatial trends) and by week (temporal trends).

Spatial and temporal trends in caribou abundance at cameras were also pooled by seasonal periods for Bathurst and Beverly/Ahiak caribou according to Table 9.3-1. As there is a small variation in the dates of these two seasonal periods between these two herds, the dates for the post-calving and summer periods for the camera analysis were adjusted based on which caribou herd was more likely to be present within the RSA at that time. Analysis of caribou camera and collar data from baseline studies

conducted in the RSA in 2012 (Rescan 2013b) suggested that Bathurst caribou may travel through the west side of the RSA during the post-calving period, whereas Beverly/Ahiak caribou are more likely to be present in the RSA during the summer period. Considering these results, the post-calving period for the camera analysis is considered to be June 16 to July 25, while the summer period is considered to be July 26 to August 31. However, the beginning of the post-calving period includes six days (June 16 to June 21) considered to be the end of the calving period for Beverly/Ahaik herd, while the end of the post-calving period includes six days (July 20 to July 25) considered to the beginning of the summer period for Bathurst caribou (Table 9.3-1). This amount of overlap between periods is relatively small, and thus, was not expected to affect the analysis of trends by seasonal period.

Group size of caribou recorded by remote cameras was also analyzed spatially and temporally. Group size was assessed by comparing the total number of individuals recorded per camera to the total number of independent photo observations containing caribou per camera. Large groups of caribou were characterized by larger total numbers of individuals (> 100 caribou), in association with a small number of photos with caribou (e.g., a group of 150 caribou counted over a set of 10 motion-trigger photographs; 150 caribou to one "independent" photo observation). Moderate sized groups of caribou (50 – 100 individuals) were also characterized by larger total numbers of individuals, but in association with a slightly larger number of independent photo observations (e.g., a group of 75 caribou that were recorded across three, consecutive sets of motion-triggered photos ; 75 caribou to 3 "independent" photo observations). Small groups of caribou were considered to be those less than 50 individuals, and were characterized by a smaller total number of individuals, in association with a larger number of photos containing caribou or photos containing one individual.

Detections by Habitat

Remote cameras deployed in 2012 and 2013 were placed in several types of habitat. Some habitats were selected based on their potential use for travelling, such as major and minor river crossings, eskers, or pinch points created by large lakes that may direct caribou movement. Other habitats were selected based on their potential use for foraging, such as vegetated tundra ecosystems or wetlands.

The total number of caribou recorded by cameras within habitat types was calculated to provide a qualitative summary of habitat use by caribou during the survey period. As the deployment periods for cameras varied during the survey period, the total detections of caribou by habitat type cannot be used quantitatively to describe the relative importance of certain habitats to caribou.

9.3.3 Incidental Observations of Caribou

Incidental observations of caribou were recorded during other wildlife field inventories and other baseline environmental studies conducted in 2013. The number of individuals, location and date of observation, behaviour of animals, and gender (where possible) was recorded for each incidental observation.

9.4 RESULTS

9.4.1 Distribution of Collared Caribou

9.4.1.1 Summary

Annual fixed kernel utilization distributions (UDs) for collared Bathurst and Beverly/Ahiak caribou indicate that both herds use habitat in the RSA. Annual seasonal ranges for Beverly/Ahiak caribou overlap with the RSA in all seasons. Most notably, collared Beverly/Ahiak caribou were consistently present within the RSA during the summer. Collared Bathurst caribou were mostly present in the western portion of the RSA during the post-calving period, where they migrate in a south-east direction

past the George Property Area. In all other seasons, there was minimal overlap in Bathurst caribou seasonal ranges within the RSA across the years.

Annual movement paths for collared caribou indicate that Bathurst caribou have infrequently migrated through the RSA on their way to their calving grounds. Beverly/Ahiak caribou, on the other hand, have passed through the eastern portion of the RSA on their way to the calving grounds in a number of years since 2001.

9.4.1.2 Bathurst Caribou

Winter

Collared Bathurst caribou generally do not winter near the RSA, based on data from 1996 to 2013 (Figure 9.4-1). Annual core use areas (50% kernel UD) and winter ranges (95% kernel UD) have not overlapped the RSA in any year, except for the winter of 2012 - 2013 (November 2012 to April 2013), where the overall winter range overlapped the southern tip of the RSA (Figure 9.4-1).

In general, annual core use areas and overall winter ranges for Bathurst caribou have varied across the landscape since collars were first placed on the herd. Bathurst caribou have wintered as far south as northern Saskatchewan (near the border between Northwest Territories and Saskatchewan) early in the collar deployment period (1997 – 1998, 1999 – 2000; 2000 - 2001) and have also wintered as far west as Great Bear Lake in some recent years (2002 – 2003; 2006 – 2007; 2007 – 2008). Despite the variability in the areas used by collared Bathurst caribou, nearly all of the core use areas and winter ranges occur below the treeline (Figure 9.4-1).

The highest degree of overlap in the annual core use areas and winter ranges has occurred near the community of Wekweètì (Wekweti). Winter core use areas and winter ranges have overlapped this region more than nine times out of the last seventeen winters, including the most recent winter of 2012 – 2013 (Figure 9.4-1).

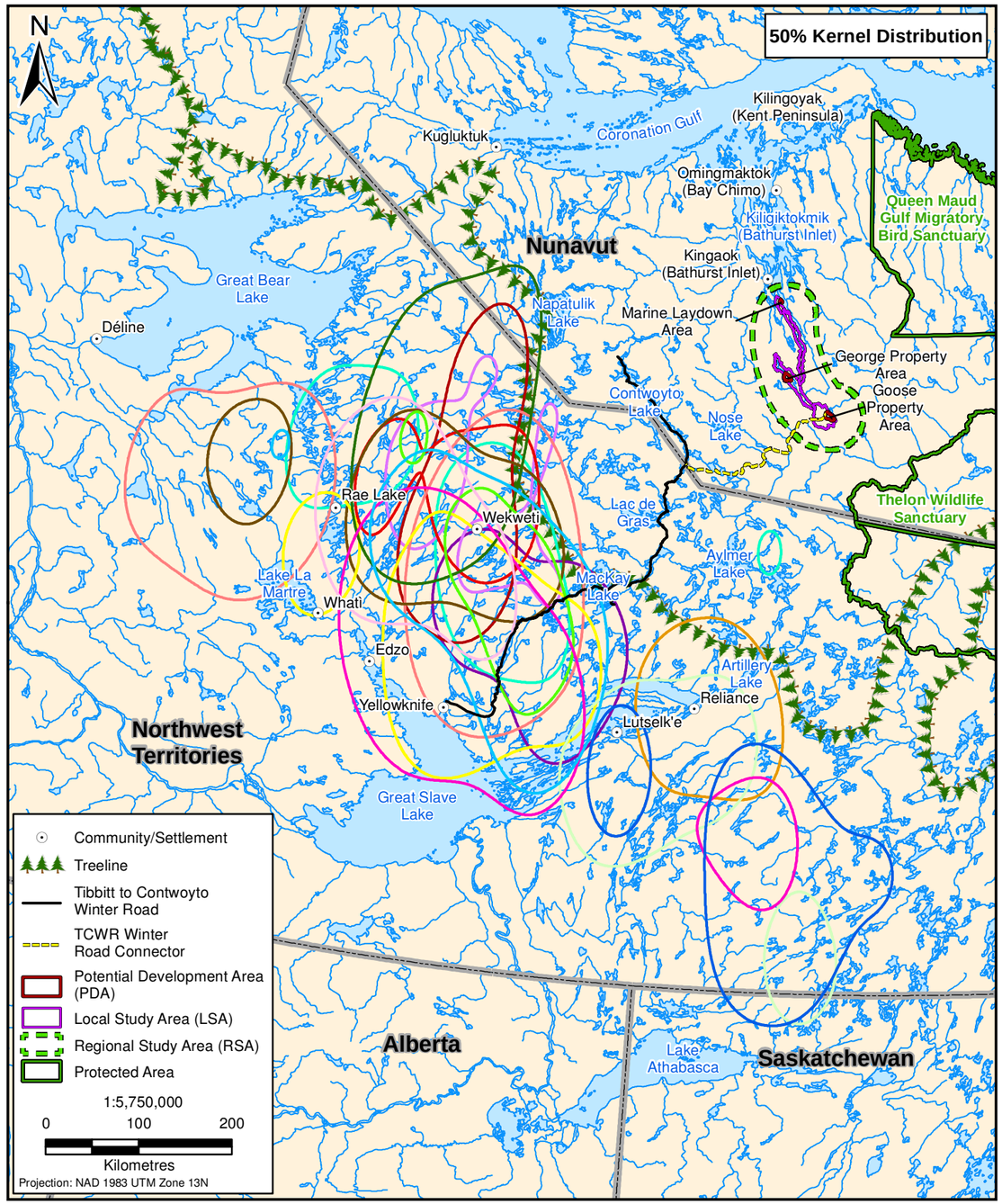
Spring Migration

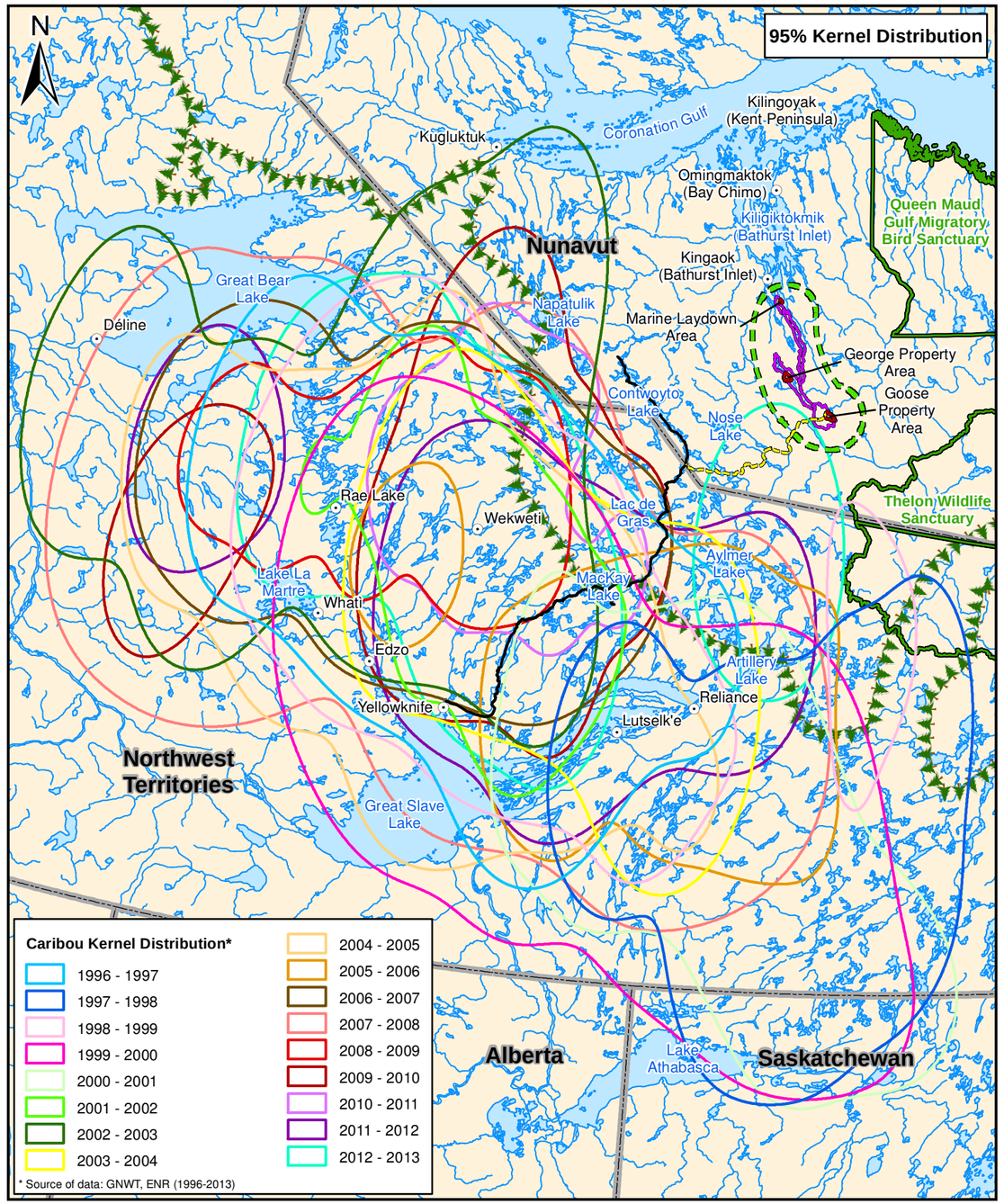
Collared Bathurst caribou generally do not migrate through the RSA on their way to their current calving grounds. Only eight of over 250 spring migration routes generated from collar data from 1996 to 2013 have passed through the RSA (Figure 9.4-2). Caribou that migrated through the RSA were primarily those that overwintered on the east side of Great Slave Lake and move in roughly a northward direction through the RSA towards their calving grounds.

Collared Bathurst caribou migrate in a northwest to a northeast direction to the calving grounds in the spring, the directionality of which depended on where the female overwintered (Figure 9.4-2). Females that overwintered to the west of Great Slave Lake generally moved in a northeast direction towards the calving grounds, while females that wintered to the east of Great Slave Lake traveled either directly north or northwest during the spring migration. Migration paths indicate that, for the most part, collared females make very direct migrations from their wintering grounds to their calving grounds.

Calving

Bathurst caribou generally calve to the northwest of the RSA. The distribution of Bathurst caribou overlapped the RSA during the calving period in only one year since 1996. A small isolated calving range (95% kernel UD) overlapped the northern RSA in 2001. However, the larger, main calving area in 2001 occurred outside of the RSA to the northwest (Figure 9.4-3).





Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-1

Distribution of Collared Bathurst Caribou during Winter (November 1 to April 14), 1996 to 2013

PROJECT #0194096-0005 GIS # BAC-23-293b December 06 2013

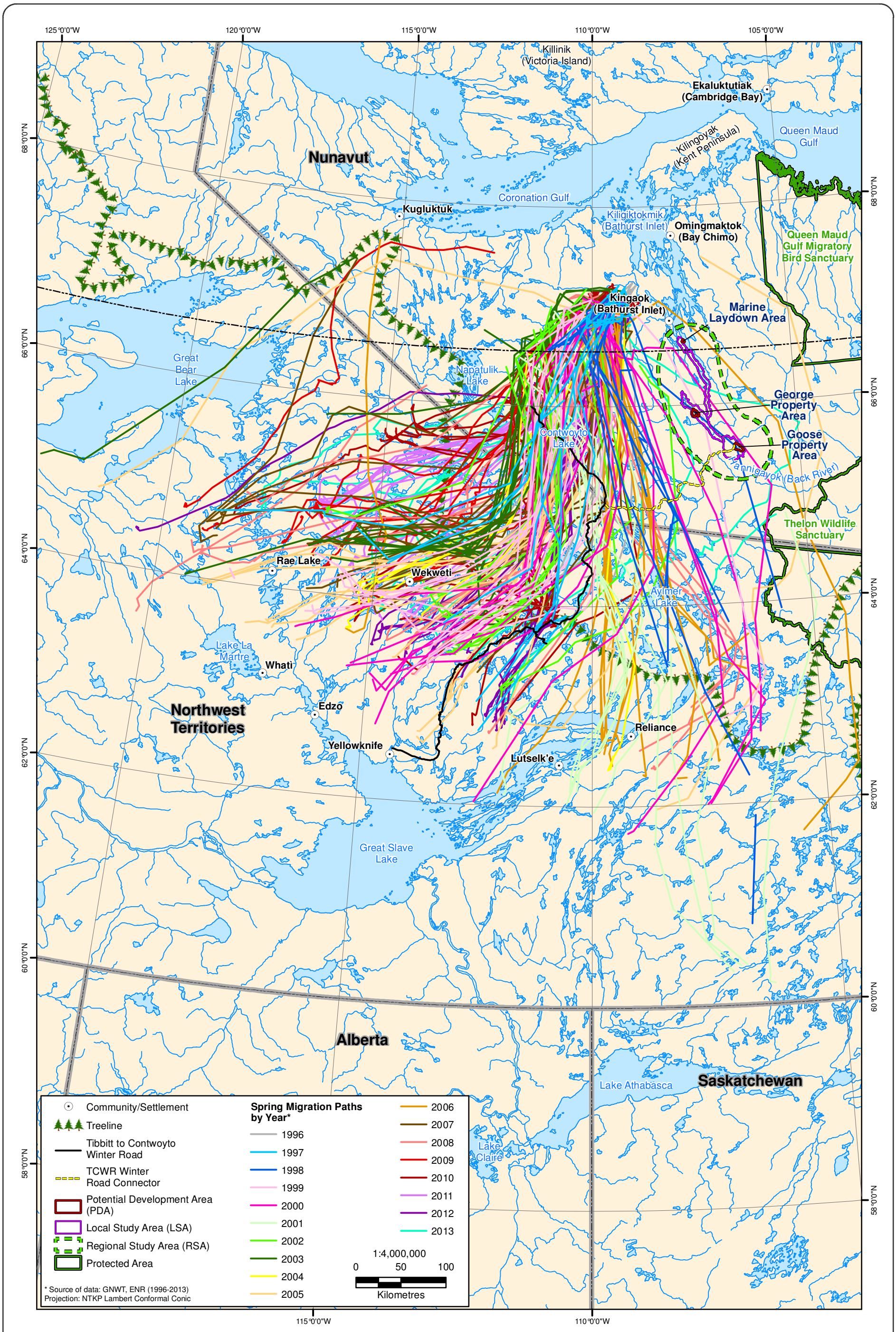


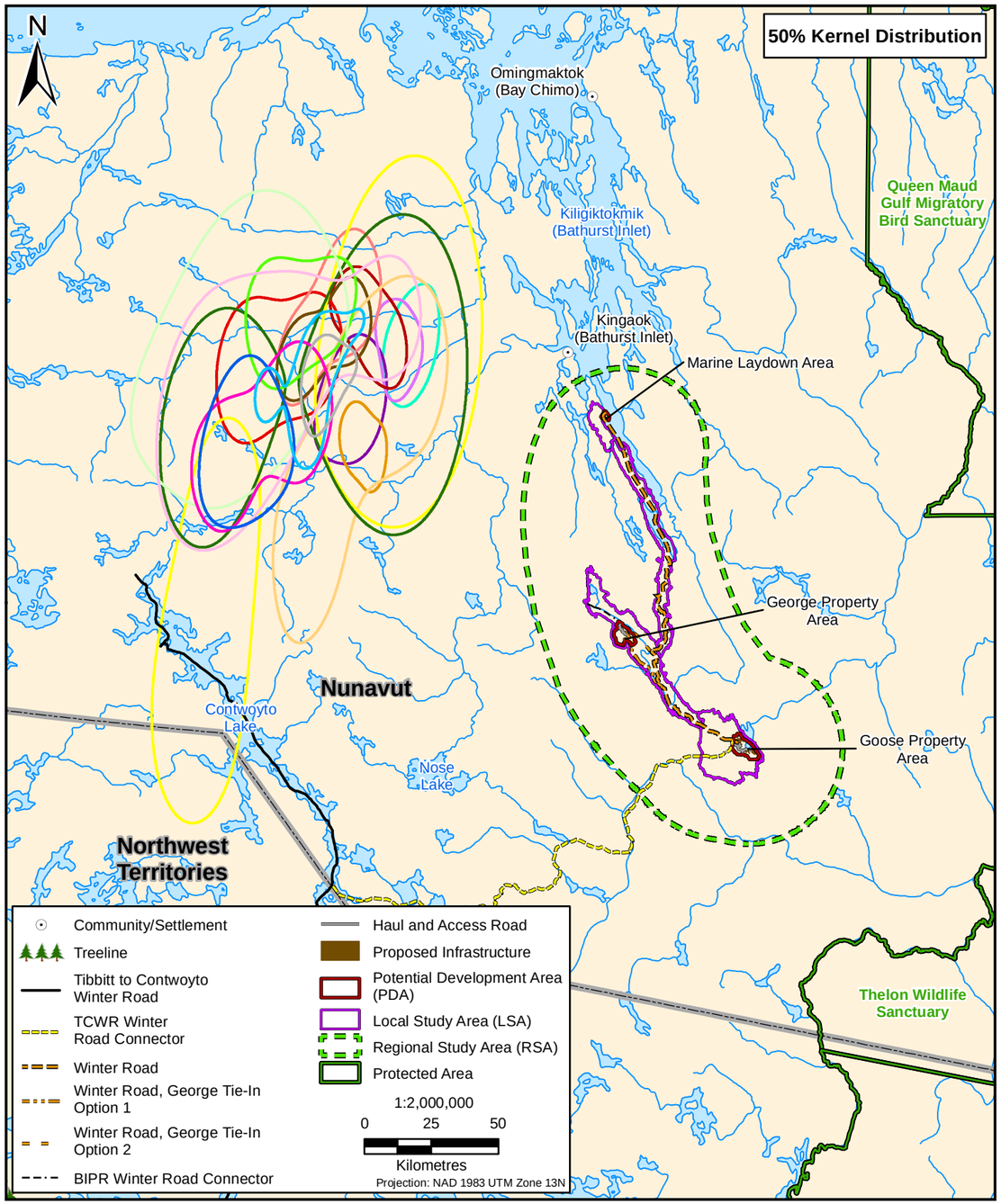
Figure 9.4-2

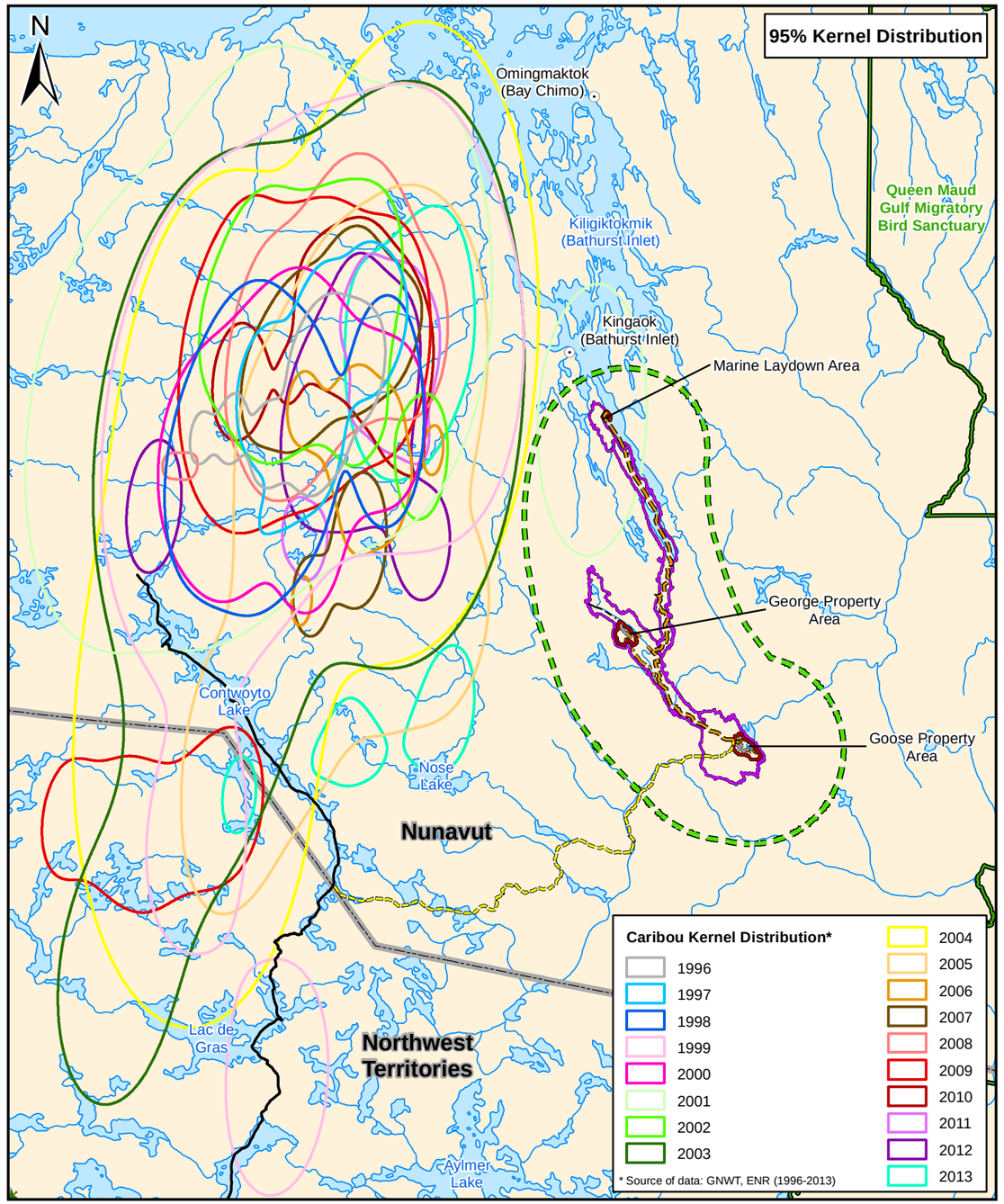
Sabina GOLD & SILVER CORP.

Spring Migration Paths (April 15 to June 4) of Collared Bathurst Caribou, 1996 to 2013

Figure 9.4-2

Rescan an ERM company





Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-3

Distribution of Collared Bathurst Caribou during Calving (June 5 to June 15), 1996 to 2013

Core use areas and overall ranges during calving show a high degree of overlap across years. Additionally, there appears to be little spatial variation in the main calving areas (Figure 9.4-3). Since 1996, Bathurst caribou have calved to the west of Bathurst Inlet near the Burnside, Hood, and James Rivers.

Core use areas and calving ranges extended southwest into the Northwest Territories in some years, including in 2003, 2004, 2005, 2009, 2011, and most recently, in 2013. The extent of the core use and calving ranges in these six years could be influenced by two factors. Firstly, a fixed spread of dates was used to assess caribou distribution during calving. However, the peak of calving does shift between years and may have been later in the aforementioned years. Therefore, some females may have still been travelling during the assigned calving period, which would cause kernel UDs to stretch to the southwest. Alternatively, some females may not have calved during these six years and thus did not travel to the calving grounds as rapidly as pregnant females.

Post-calving

Fixed kernel utilization distributions during the post-calving period show that the collared Bathurst caribou have used habitat in the RSA, particularly along the western edge of the RSA, in years since 1996. Core use areas for post-calving Bathurst caribou overlapped the very western edge of the RSA in seven of the last eighteen post-calving periods, the most recent being in 2008. Annual post-calving ranges (95% kernel UDs) have overlapped the RSA in most years except for in 1996 and 1997, and most recently, in 2013 (Figure 9.4-4).

The shape and extend of the annual post-calving kernel UDs suggest that collared caribou tend to generally use the same areas each year. Most 50% and 95% kernel UDs overlapped the current calving grounds in the north and stretched to the south and southeast. In some cases, kernel UDs also curved back west towards Contwoyto Lake, resulting in a backwards C configuration (e.g., 2006; Figure 9.4-4). Therefore, it appears that collared Bathurst caribou disperse south to southeast from their calving grounds, and may travel past the George Property Area. These data agree with local knowledge from the George Camp, which report groups of caribou passing by the camp during the post-calving period. The number of caribou observed and reported was highly variable from year to year.

Summer

During summer, collared Bathurst caribou generally shift southwest from areas occupied during post-calving and away from the RSA. Summer core use areas in all years since 1996 have been located to the southwest of the RSA, and annual summer ranges overlapped the RSA in four years in the late 1990s and early 2000s (1997, 1998, 1999, 2001; Figure 9.4-5).

The distribution of summer core use areas was variable across years. The area with the highest degree of overlap in annual summer core use areas across all years occurred in the Contwoyto Lake and Lac de Gras areas (Figure 9.4-5). An interesting trend in the distribution of summer core use areas was that in some neighbouring years, these areas were spatially segregated from one another. For example, in 1997 and 2000, collared Bathurst caribou summered principally to the west of their post-calving areas near the treeline. In the two subsequent years (1998 and 2001), collared Bathurst caribou were found to the south of their post-calving areas near Alymer Lake and Lac de Gras during the summer.

Annual summer ranges had larger degrees of overlap between years as compared to core use areas (Figure 9.4-5). The majority of all annual summer ranges overlapped the area between Contwoyto Lake and Lac de Gras. From this area of overlap, kernels UDs stretched in all directions to the north, east, south, and west, but were most commonly elongated to the south and west towards the treeline.

Fall

Annual kernel UDs during the fall (which also includes both the fall migration and the fall rut) indicate that collared Bathurst caribou are distributed in areas to the southwest of the RSA during this period (Figure 9.4-6). Since 1996, no fall core use areas have overlapped the RSA, and annual fall ranges overlapped the RSA in three years in the late 1990's (1997, 1998, 1999; Figure 9.4-5).

Annual fall core use areas were spread out over a large geographic area, and included habitat both above and below the treeline. Areas with higher amounts of overlap in annual core use areas occurred between Lac de Gras and MacKay Lake (Figure 9.4-6).

Annual fall ranges for collared Bathurst caribou indicate a similar distribution to core use areas, and spanned a large geographic area from habitats used during the summer, south to the shores of Great Slave Lake. Higher overlap across years was mapped around Lac de Gras and MacKay Lake.

9.4.1.3 Beverly/Ahiak Caribou

Winter

Collared Beverly/Ahiak caribou have wintered in areas surrounding the RSA from 2001 to 2012. Annual winter core use areas overlapped the RSA in the winters of 2001 – 2002 (November 2001 to April 2002) and 2003 – 2004. Annual winter ranges (95% kernel UDs) overlapped the RSA during seven of the last thirteen winters, most recently in the winter of 2010 – 2011 (Figure 9.4-7).

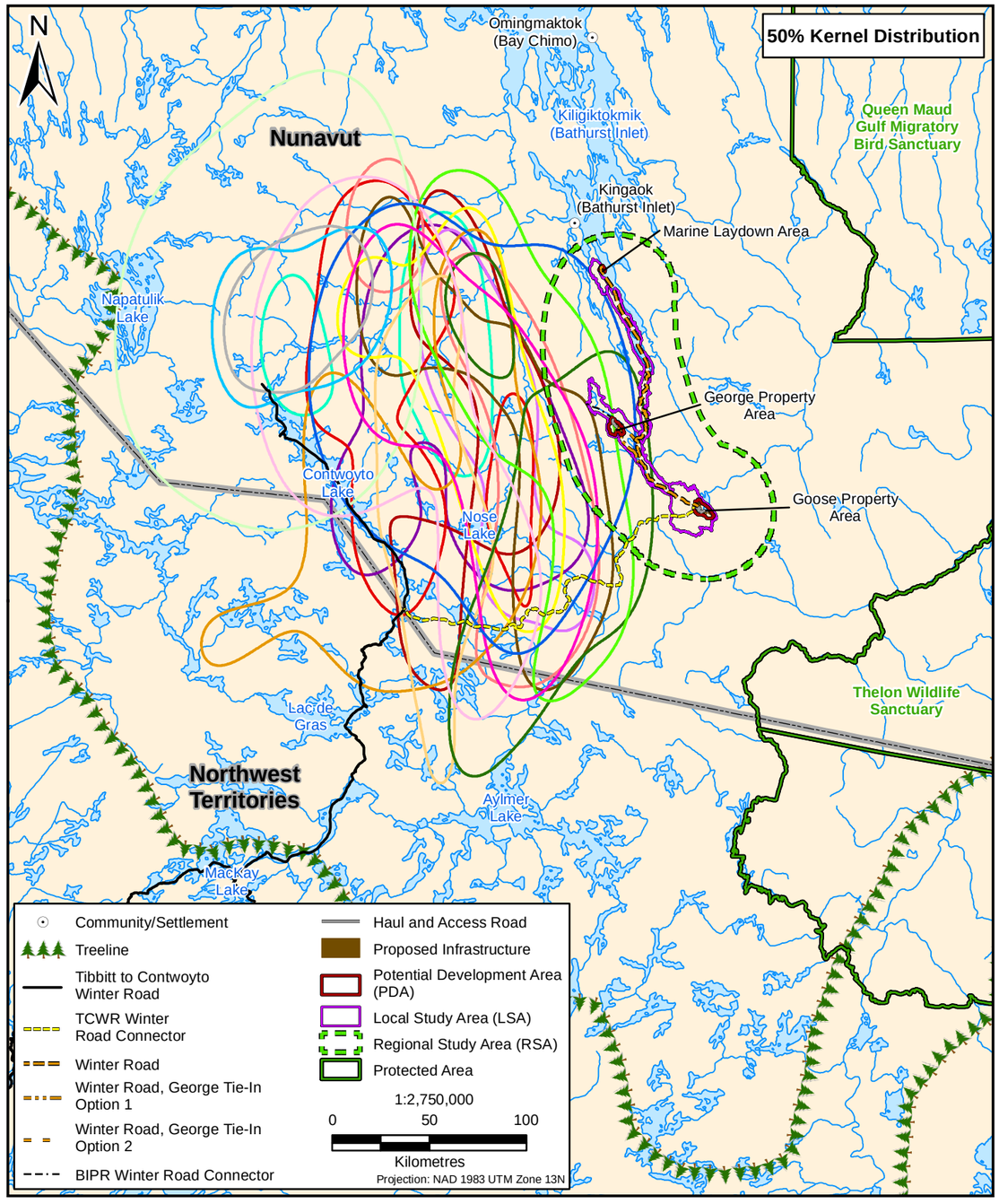
The distribution of winter core use areas varied greatly across the years. The area with the highest amount of overlap in annual core use areas occurred along the border of the Northwest Territories and Saskatchewan. Several trends in the distribution of core use areas were noted. In some winters, such as the winters of 2003 – 2004, 2004 – 2005, 2008 – 2009, 2010 – 2011, several separate core use areas occurred, suggesting that there were spatially segregated groups of wintering Beverly/Ahiak caribou present across the landscape. In addition, during some winters, core use areas occurred above the treeline, though the majority of the core use areas occurred below the treeline in most years. The core use area from the most recent winter (2012 – 2013) extended almost entirely above the treeline to the east of the RSA (Figure 9.4-7).

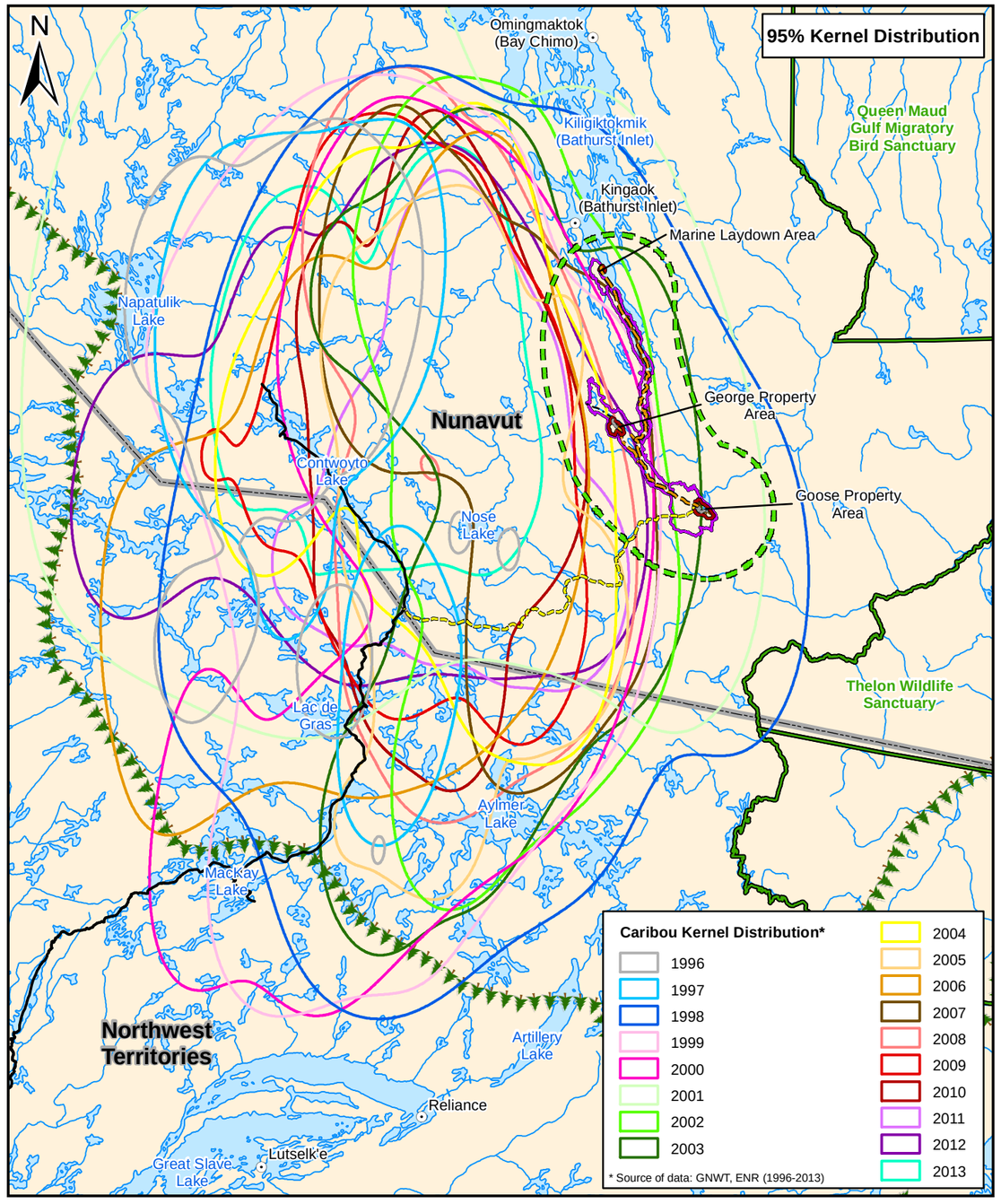
The annual winter ranges of collared Beverly/Ahiak caribou are broadly distributed, spanning a large geographic area from the coasts of Nunavut south to northern Saskatchewan and Manitoba (Figure 9.4-7). Similar to the patterns in the distribution of winter core use areas, annual winter ranges overlapped the most in the southern Northwest Territories and northern Saskatchewan. Additionally, winter ranges were mapped above and below the treeline.

Spring Migration

Collared Beverly/Ahiak caribou have frequently been recorded passing through the RSA, particularly the southern portion of the RSA, during spring migration. Roughly 22 collared caribou have travelled through the RSA since 2001, most of which (n = 6) travelled through the RSA during the spring migration of 2008 (Figure 9.4-8).

The spring migration route for collared Beverly/Ahiak caribou generally passes to the east of Bathurst Inlet generally in a northerly direction from wintering grounds (Figure 9.4-8). The main body of migrating Beverly/Ahiak caribou appear to begin their migration from below the treeline to the east of Great Slave Lake; however, several collared females since 2001 have overwintered to the west of Great Slave Lake (presumably with Bathurst caribou) or have wintered on the tundra near Bathurst Inlet. These females travel in a more northeast to easterly direction than the main body. Similar to collared Bathurst caribou, collared Beverly/Ahiak females moved in a direct manor towards the calving ground.

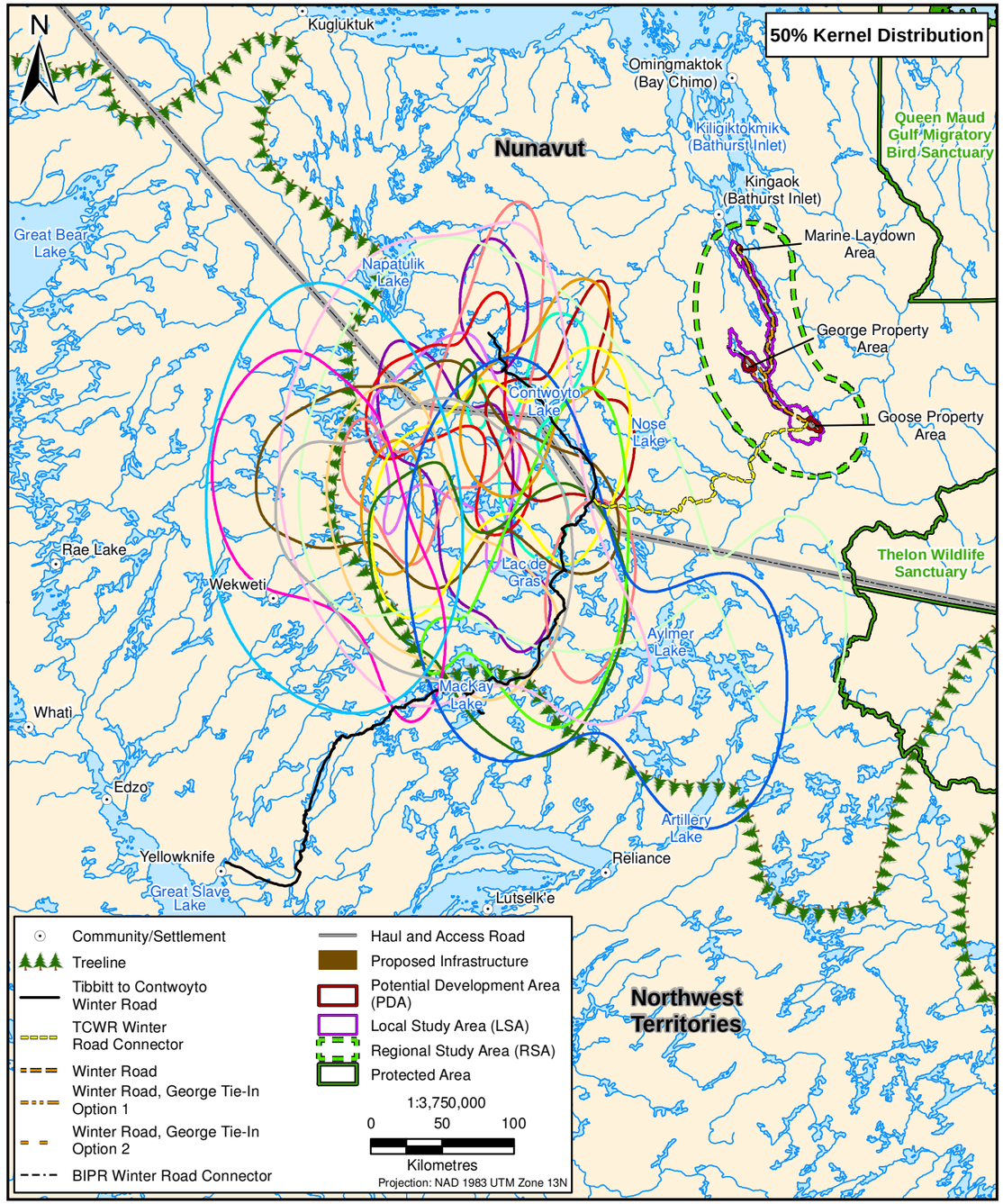


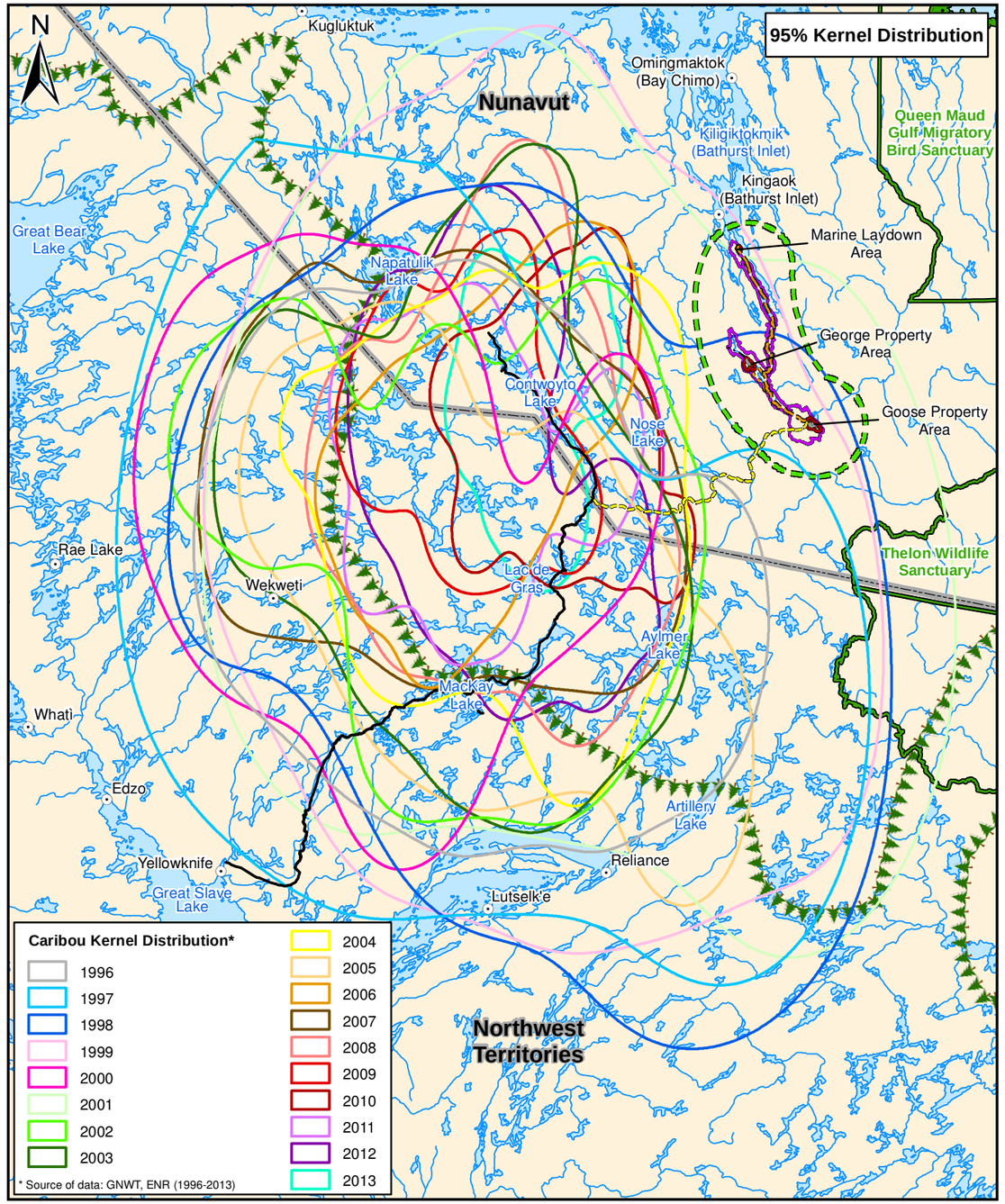


Sabina GOLD & SILVER CORP. Rescan an ERM company

Figure 9.4-4

Distribution of Collared Bathurst Caribou during Post-calving (June 16 to July 20), 1996 to 2013



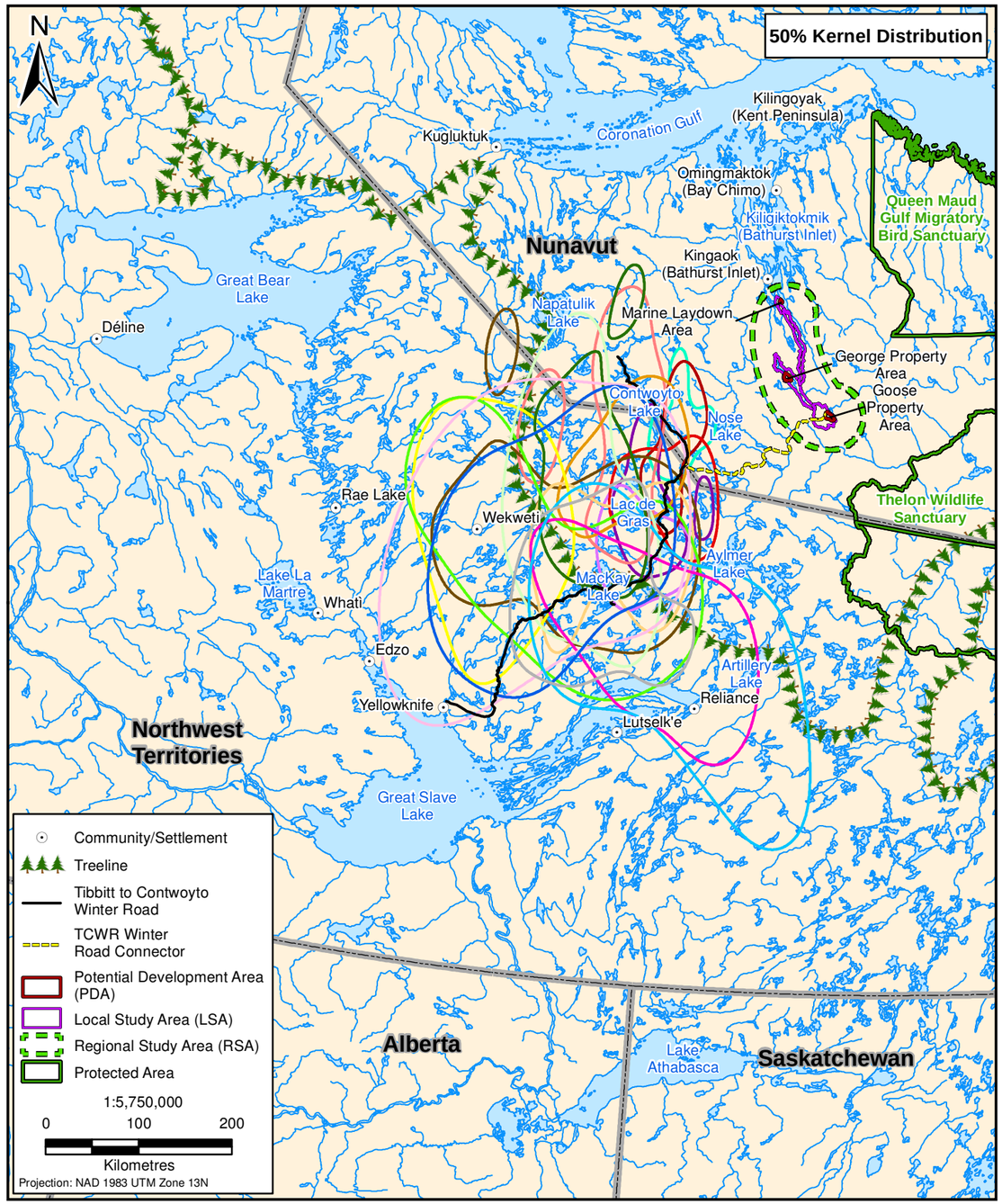


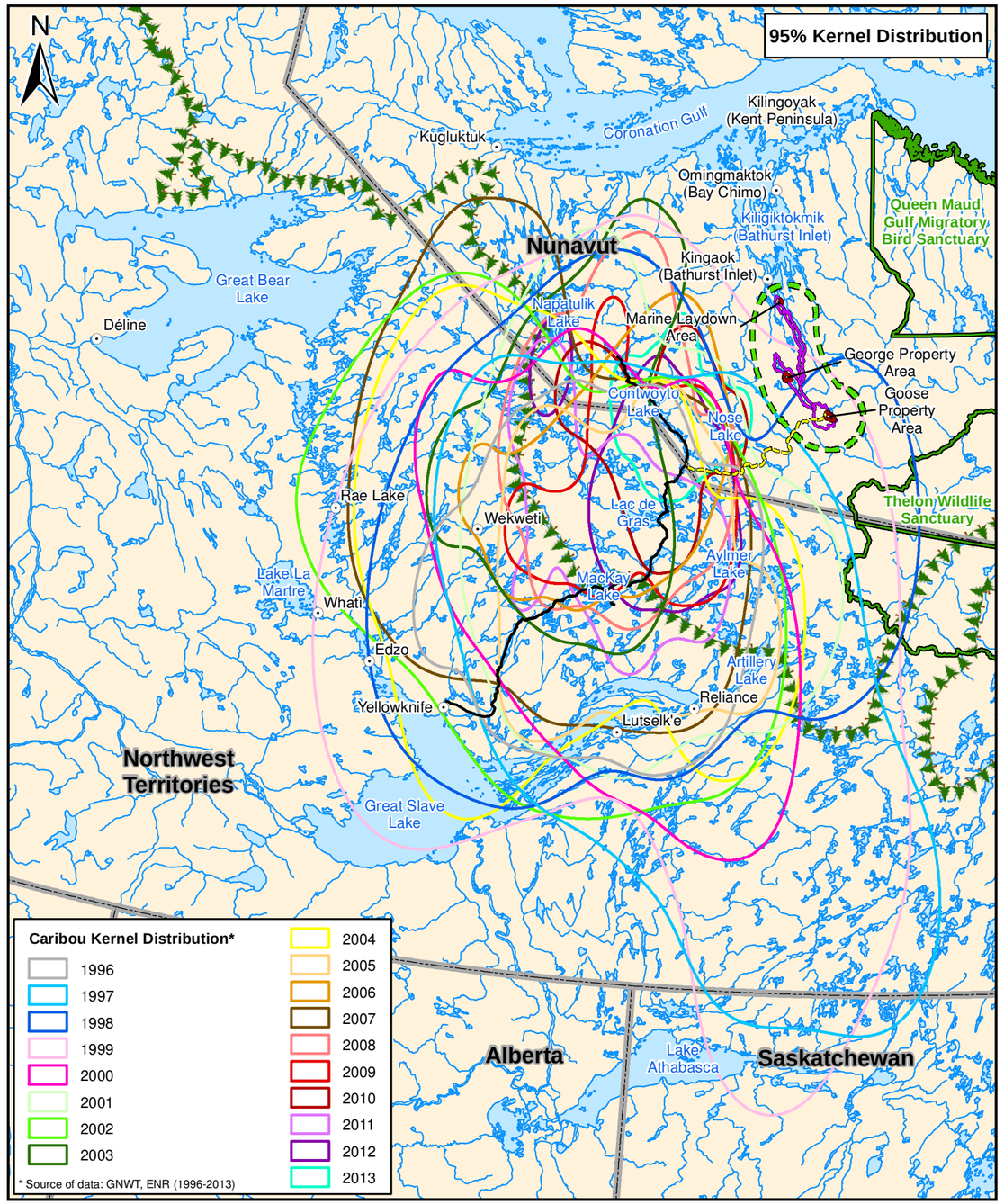
Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-5

Distribution of Collared Bathurst Caribou during Summer (July 21 to August 31), 1996 to 2013

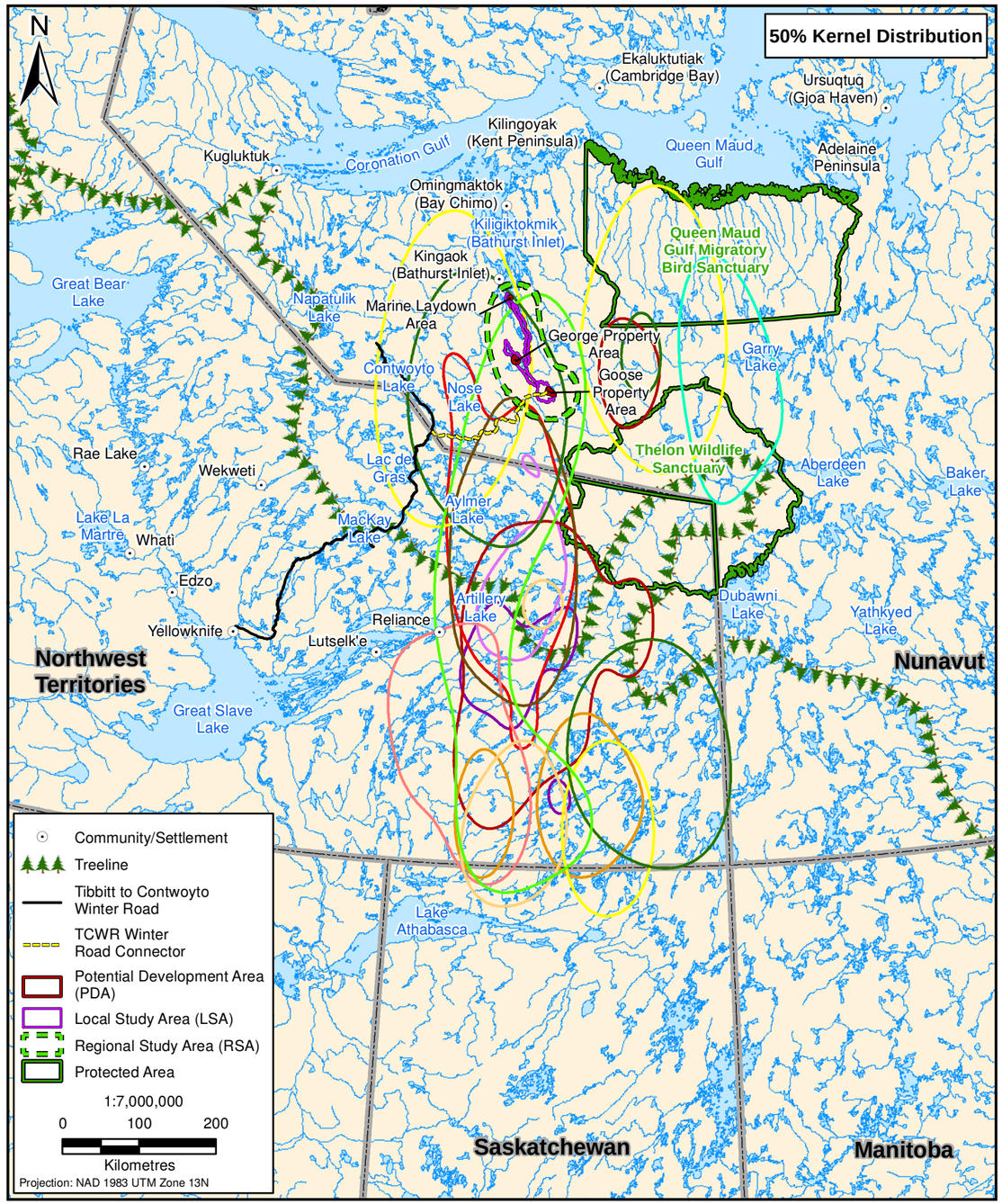


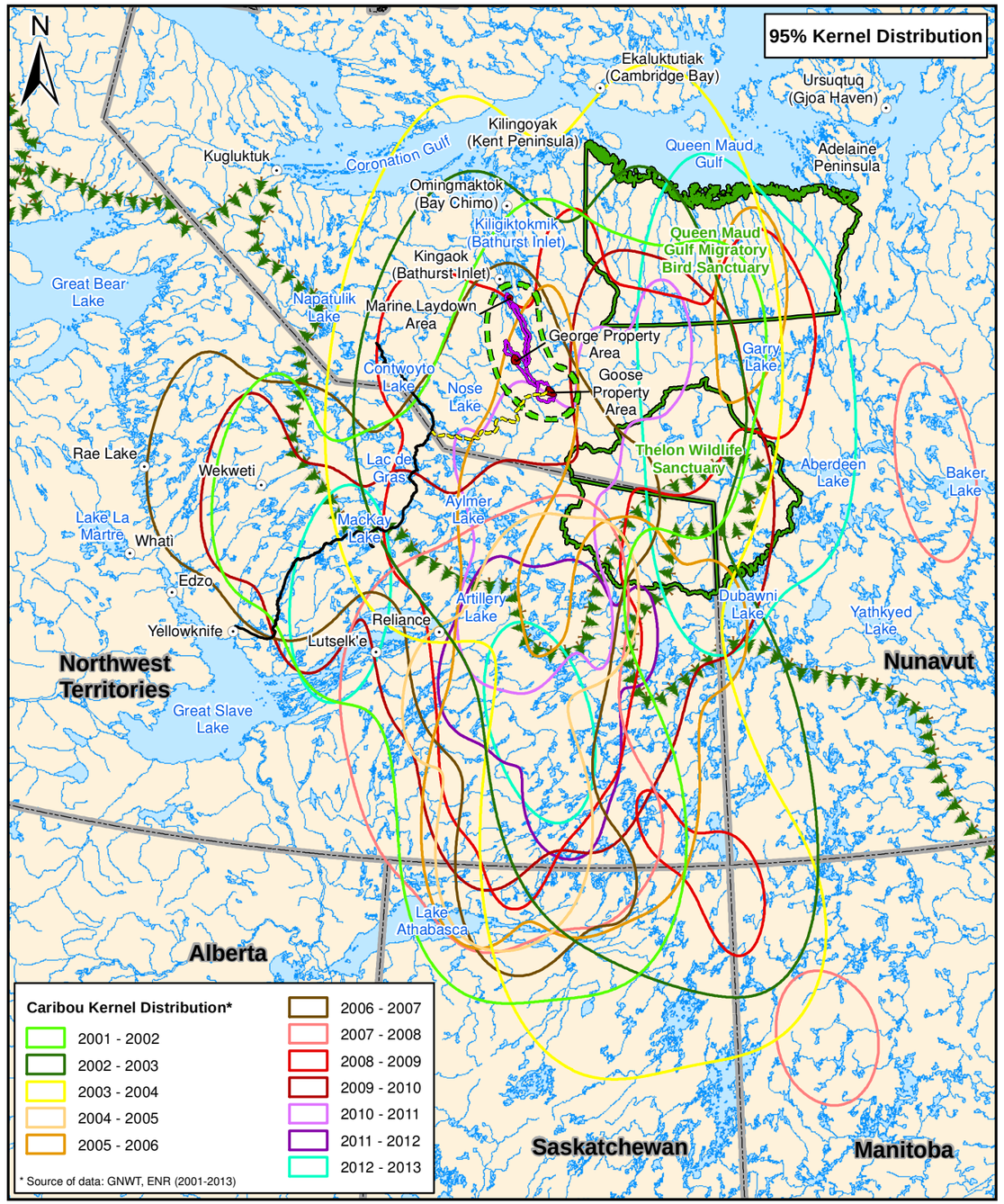


Sabina GOLD & SILVER CORP. Rescan an ERM company

Figure 9.4-6

Distribution of Collared Bathurst Caribou during Fall (September 1 to October 31), 1996 to 2012





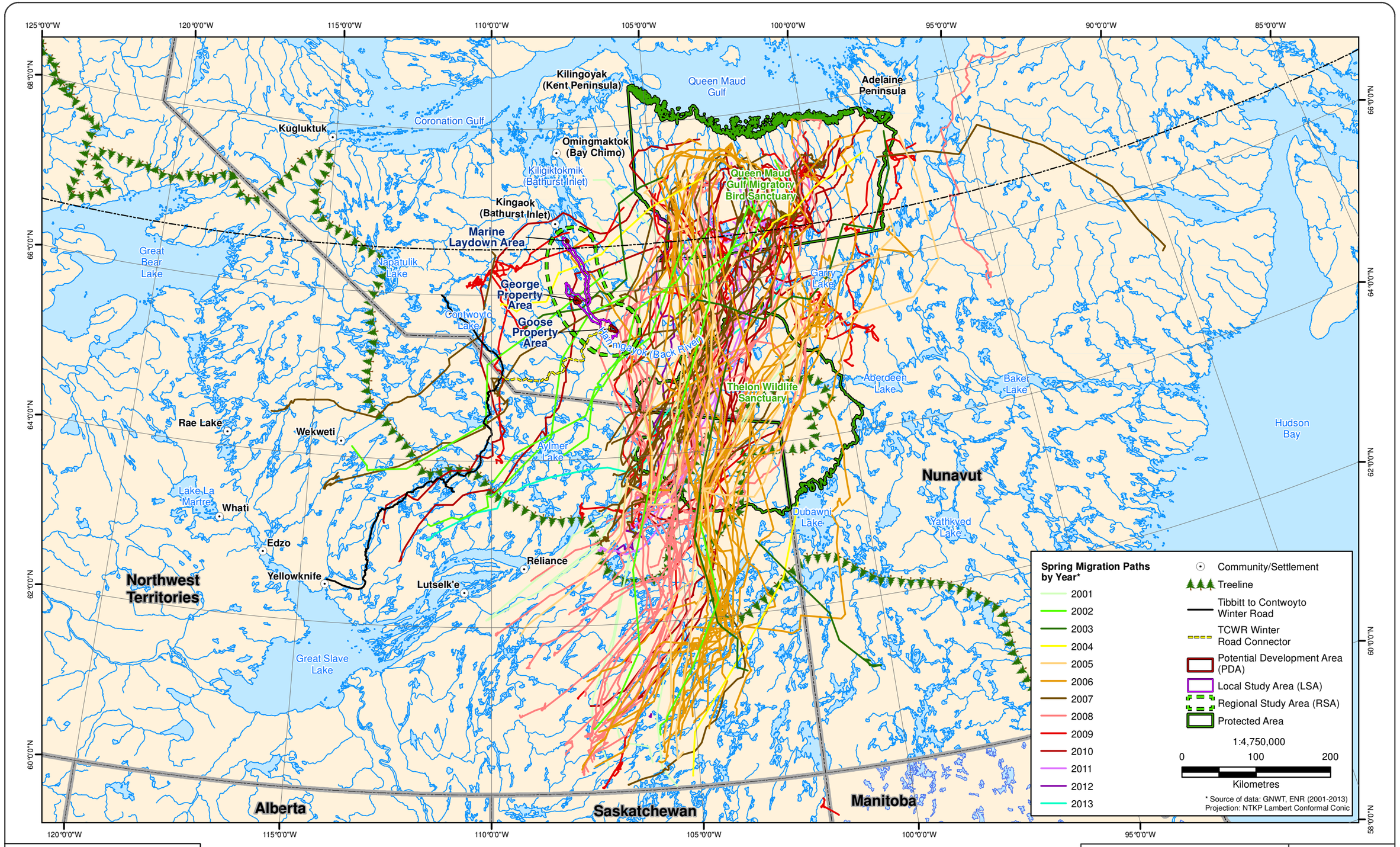
Sabina GOLD & SILVER CORP. Rescan an ERM company

Figure 9.4-7

Distribution of Collared Beverly/Ahiak Caribou during Winter (November 1 to April 14), 2001 to 2013

PROJECT # 0194096-0005 GIS # BAC-23-295e

December 10, 2013



Sabina Gold & Silver Corp

Rescan an ERM company

Figure 9.4-8

Spring Migration (April 15 to June 4) Paths of Collared Beverly/Ahiak Caribou, 2001 to 2013

Calving

Beverly/Ahiak caribou calve to the east of the RSA. The distribution of Beverly/Ahiak caribou overlapped the RSA during the calving period in only five of the last 13 years. The core use area for calving Beverly/Ahiak caribou in 2001 slightly overlapped the eastern edge of the RSA. Very small portions of the annual calving range (95% kernel UD) overlapped the eastern RSA in 2001, 2002, 2003, 2008, and 2009 (Figure 9.4-9).

The annual core use areas for collared Beverly/Ahiak caribou during calving span a large geographic area from the east side of Bathurst Inlet west to the Adelaine Peninsula. The highest amount of overlap occurred within the Queen Maud Gulf Migratory Bird Sanctuary (Figure 9.4-9). However, there were a number of separated core use areas within individual years, such as in 2003, 2004, 2006, 2010, 2012, and most recently in 2013. Separation in core use areas occurred within the Queen Maud Gulf Migratory Bird Sanctuary, where individual kernel UDs were split to the east and west sides of the Sanctuary (e.g., 2003, 2010, 2012). Separation also occurred to the north and south in some years, where individual kernel UDs occurred within the Queen Maud Gulf Migratory Bird Sanctuary and to the south near Garry Lake (e.g., 2004, 2006). The Garry Lake area is the former, traditional calving grounds for Beverly caribou.

Annual calving ranges for Beverly/Ahiak caribou show similar spatial trends to the distribution of calving core use areas. In general, calving ranges encompass the Queen Maud Gulf Migratory Bird Sanctuary across all years. Similar to the annual calving core use areas, many annual calving ranges extended south to the Garry Lake area, the former calving grounds for Beverly caribou.

Some annual calving ranges for Beverly/Ahiak caribou extend north across the Queen Maud Gulf to the southeastern tip of Victoria Island. However, Beverly/Ahiak caribou have not been reported on Victoria Island in any year since 2001, based on annual ranges (which include calving areas) developed by the Government of Northwest Territories and Government of Nunavut (e.g., Nagy et al. 2011; Campbell et al. 2012; GNWT ENR 2013b). This spatial distribution is influenced only by the analysis techniques used when generating range polygons in R (Section 9.3.1: Fixed Kernel Density Estimation). The high number of locations of females within the Queen Maud Gulf Migratory Bird Sanctuary across years likely caused range polygons to extend further northwards.

Post-calving

Collared Beverly/Ahiak caribou are generally found to the east of the RSA during post-calving. In 2006, the western extent of the core use area during post-calving for Beverly/Ahiak caribou overlapped the southern RSA, while the western extents post-calving ranges for Beverly/Ahiak caribou overlapped larger portions of the RSA in the mid to late 2000's (2005, 2006, 2008, 2009, 2010) and most recently, in 2013 (Figure 9.4-10).

The post-calving core use areas for Beverly/Ahiak caribou were located in similar areas utilized for calving in the Queen Maud Gulf Migratory Bird Sanctuary. Between the calving and post-calving periods, the core use areas generally spread southwards, though the greatest degree of overlap within post-calving core use areas still occurred within the Queen Maud Gulf Migratory Bird Sanctuary (Figure 9.4-10). Core use areas also extended east towards the Adelaine Peninsula in a number of years, including 2003, 2004, 2005, 2006, 2010, 2012, and recently in 2013.

Annual post-calving ranges for Beverly/Ahiak caribou indicated a high degree of overlap across all years since 2001. In addition, all annual post-calving ranges encompassed the Queen Maud Gulf Migratory Bird Sanctuary (Figure 9.4-10). Annual post-calving ranges also spread south and east from calving areas, similar to that observed in the spatial distribution of core use areas between the calving and post-calving periods.

In several years, post-calving ranges covered large areas that extended northwards to Victoria Island and up the community of Taloyoak. Again, these spatial distributions are a function of the analysis process in R. Beverly/Ahiak caribou have not been documented on Victoria Island during post-calving, and generally are not found north of Taloyoak during post-calving (Nagy et al. 2011; Campbell et al. 2012; GNWT ENR 2013b).

Summer

During summer, collared Beverly/Ahiak caribou generally spread to the southwest of their post-calving range towards the RSA. Annual core use areas have overlapped a portion of the RSA, particularly the southern portion of the RSA, in all years since 2001, and the western extents of their annual summer ranges have nearly encompassed the RSA since 2001 (Figure 9.4-11).

The distribution of summer core use areas was somewhat variable across years. The area with the highest degree of overlap in annual summer core use areas occurred near the Goose Property Area in the southern portion of the RSA (Figure 9.4-11). Separate summer core use areas occurred to the east of post-calving areas, including around Garry Lake, Aberdeen Lake, and Baker Lake.

Annual summer ranges encompassed areas in the Queen Maud Gulf Migratory Bird Sanctuary used during calving and post-calving periods, but extended much further to the south to areas within and surrounding the Thelon Wildlife Sanctuary (Figure 9.4-11). The areas between Queen Maud Gulf Migratory Bird Sanctuary and the Thelon Wildlife Sanctuary had the highest degree of overlap between annual summer ranges. Summer ranges also extended eastwards, similar to that observed in the distribution of summer core use areas (see above).

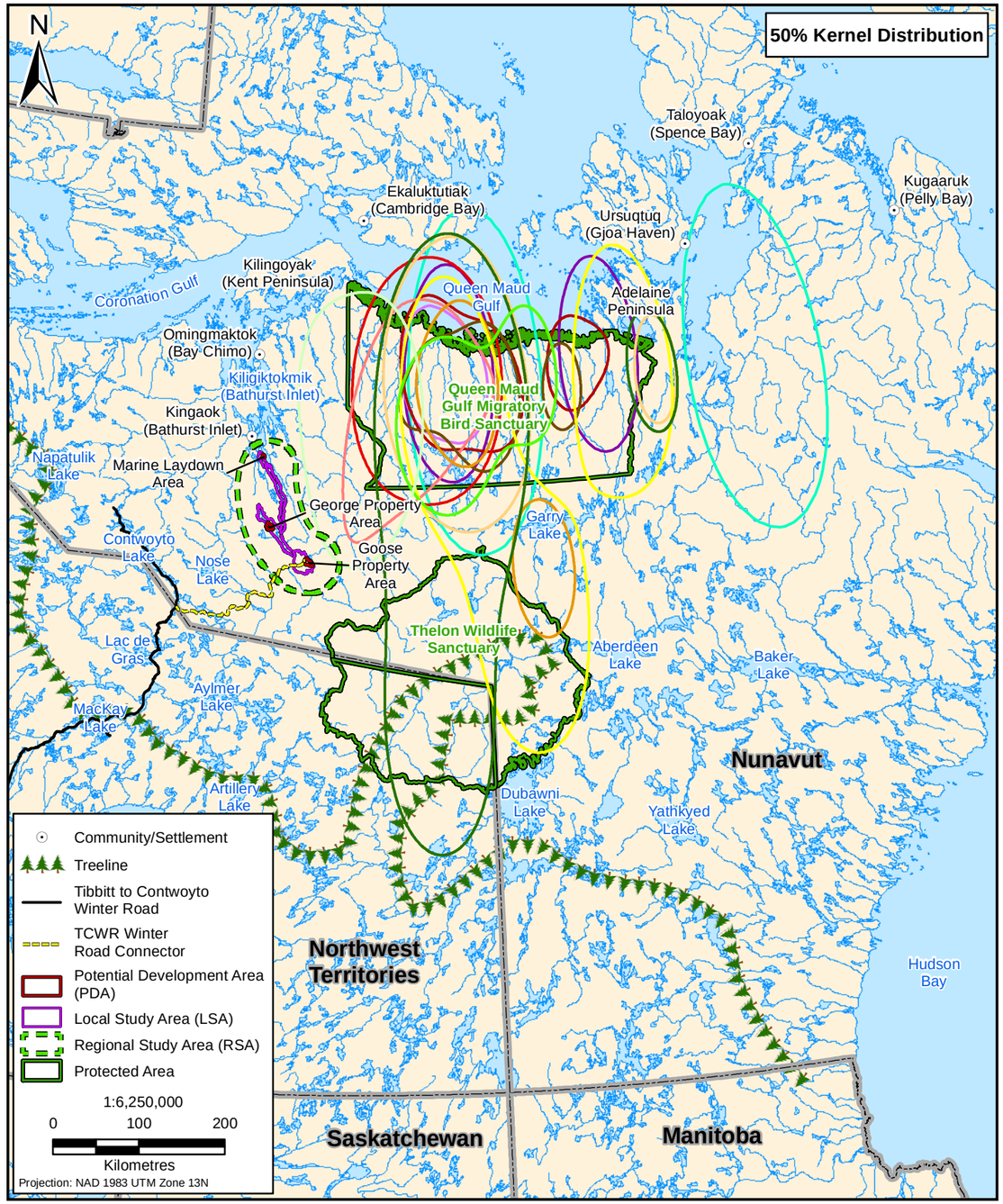
Summer ranges in several years extended north to Victoria Island and up the community of Taloyoak. These spatial distributions are a function of the analysis process in R. Beverly/Ahiak caribou have not been documented on Victoria Island during summer, and are not expected to travel farther north than Taloyoak during the summer (Nagy et al. 2011; Campbell et al. 2012; GNWT ENR 2013b).

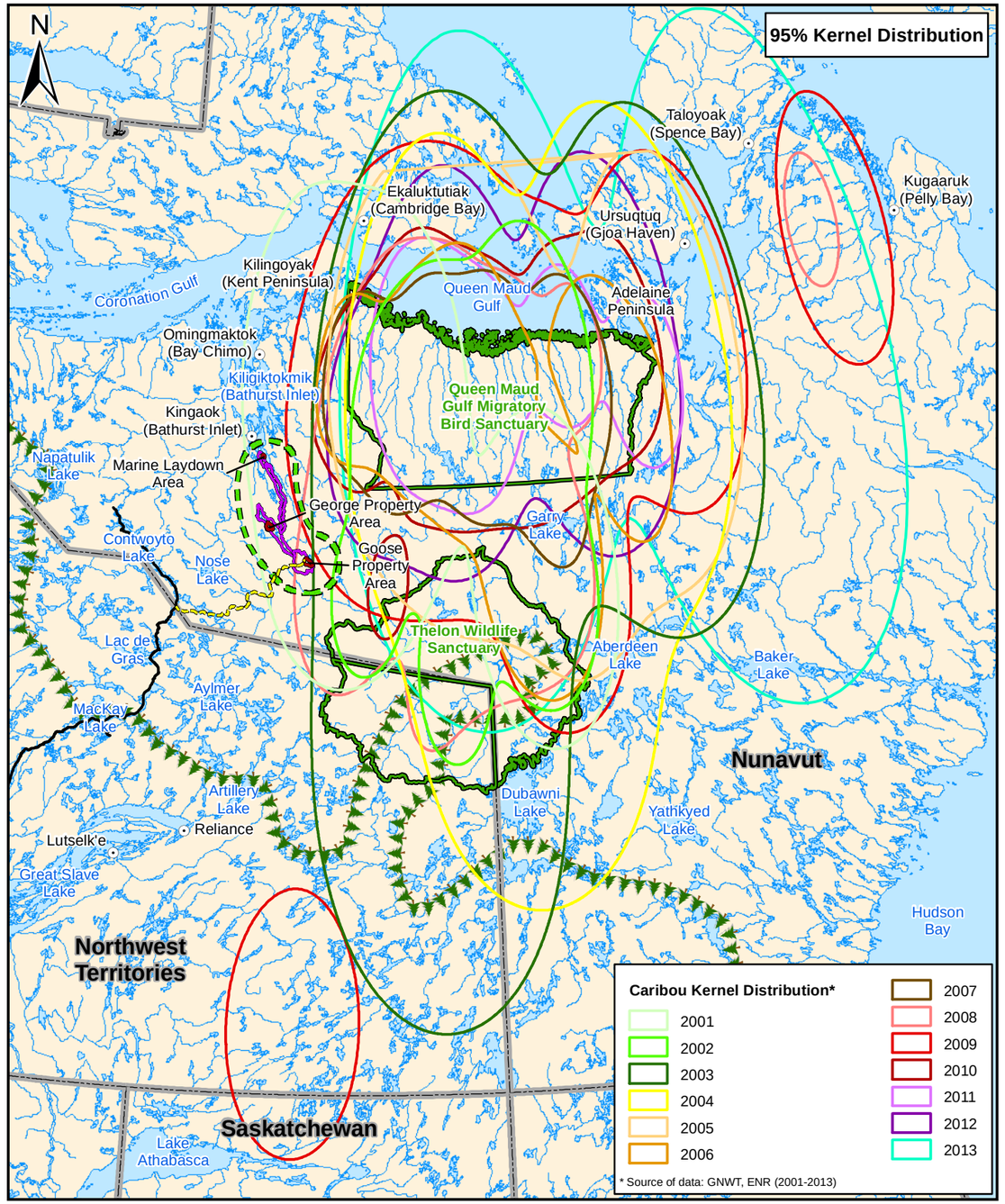
Fall

Annual kernel UDs during the fall (which also includes both the fall migration and the fall rut) indicate that collared Beverly/Ahiak caribou are generally distributed to the east and south during this period (Figure 9.4-6). Fall core use areas have overlapped the RSA in the 2000's (2003, 2006, 2008), and more recently, in 2010 and 2013. Northern extents of the annual fall ranges overlapped the RSA in most of the last thirteen years, including most recently in 2013 (Figure 9.4-12).

Core use areas during the fall were highly variable across years. The area with the highest degree of overlap in annual core use areas occurred within the Thelon Wildlife Sanctuary. However, many 50% kernel UDs extended to the north, east, south, and west of the Thelon Wildlife Sanctuary, or occurred as separate core use areas (Figure 9.4-12). These spatial trends suggest that there may be multiple areas, besides habitat within the Thelon Wildlife Sanctuary, that are used during the fall by separate groups of Beverly/Ahiak caribou.

The distribution of annual fall ranges for Beverly/Ahiak caribou were extensive and spanned habitat from the northern coasts of mainland Nunavut to the southern Northwest Territories (Figure 9.4-12). Similar to the distribution of fall core use areas, annual fall ranges had the most overlap within the Thelon Wildlife Sanctuary but generally extended in all directions from the Sanctuary.



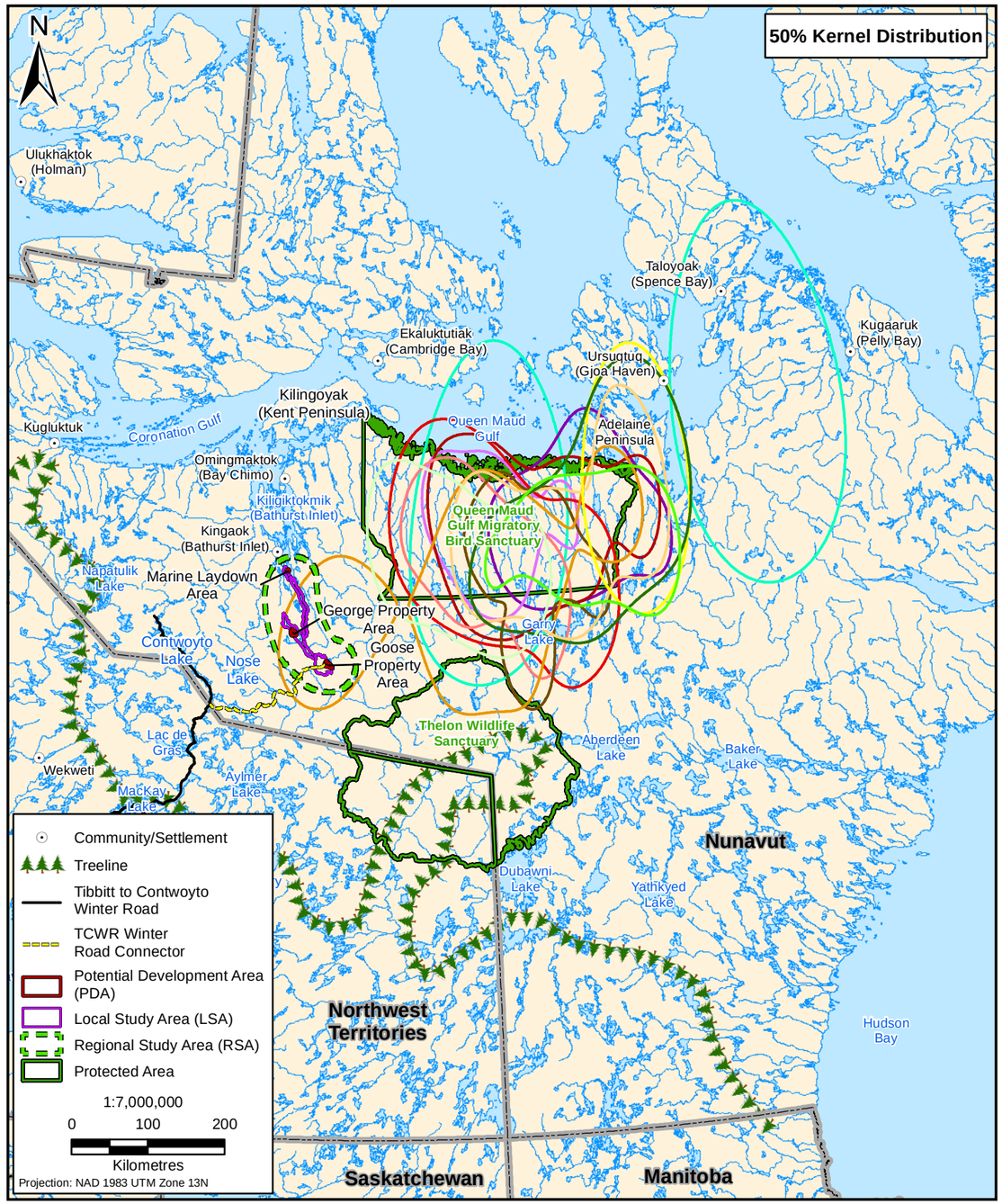


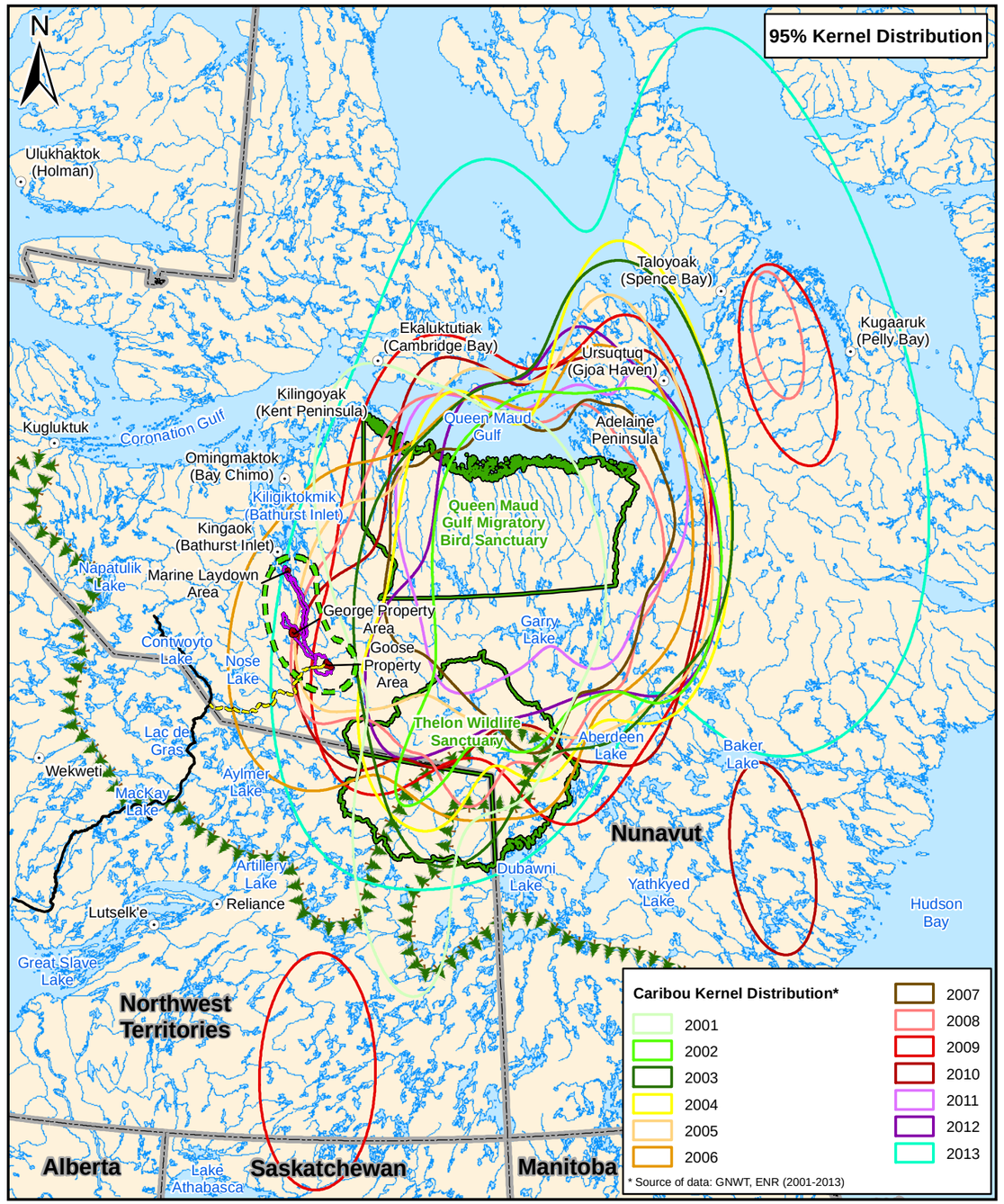
Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-9

Distribution of Collared Beverly/Ahiak Caribou during Calving (June 5 to June 20), 2001 to 2013



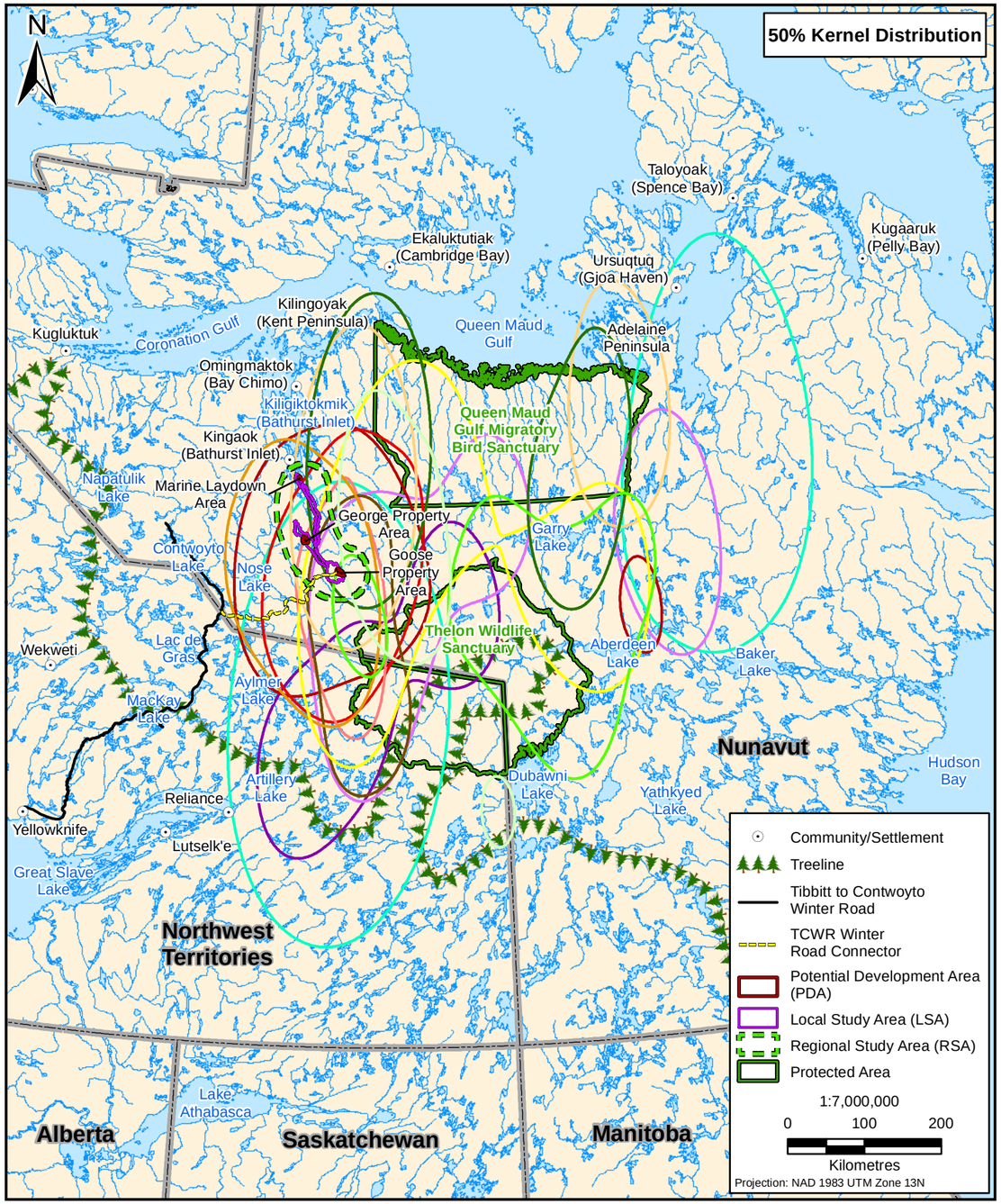


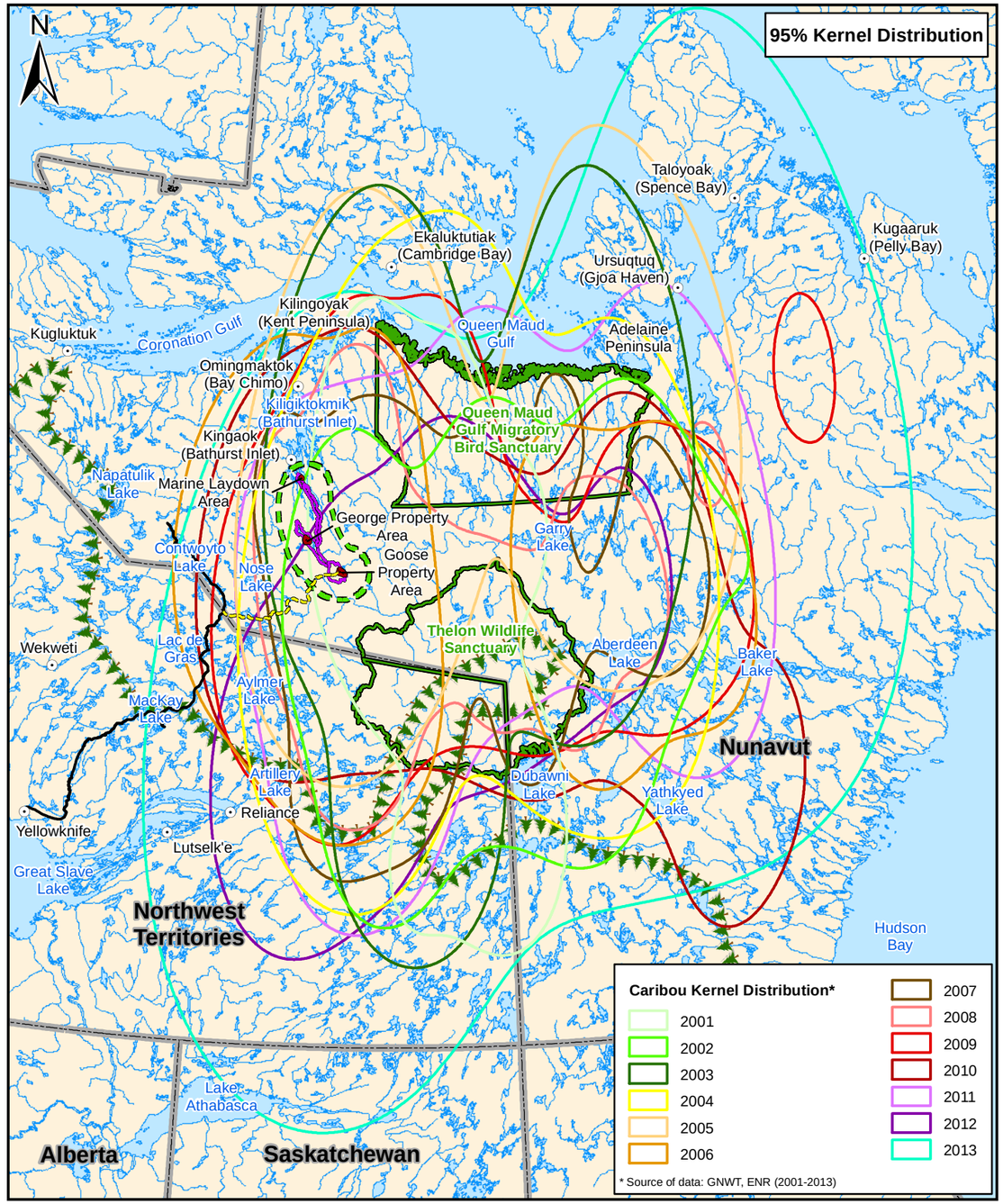
Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-10

Distribution of Collared Beverly/Ahiak Caribou during Post-calving (June 21 to July 25), 2001 to 2013



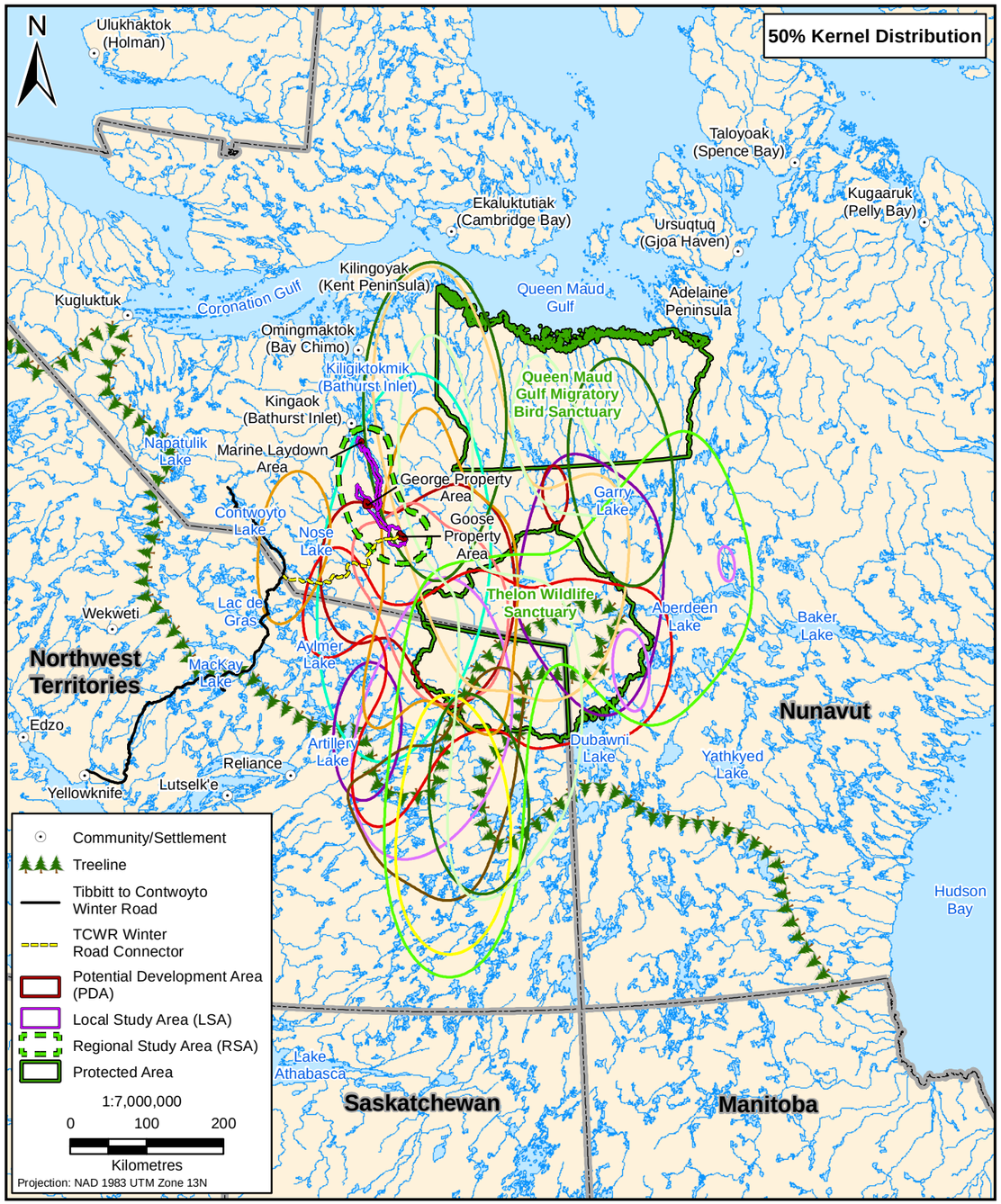


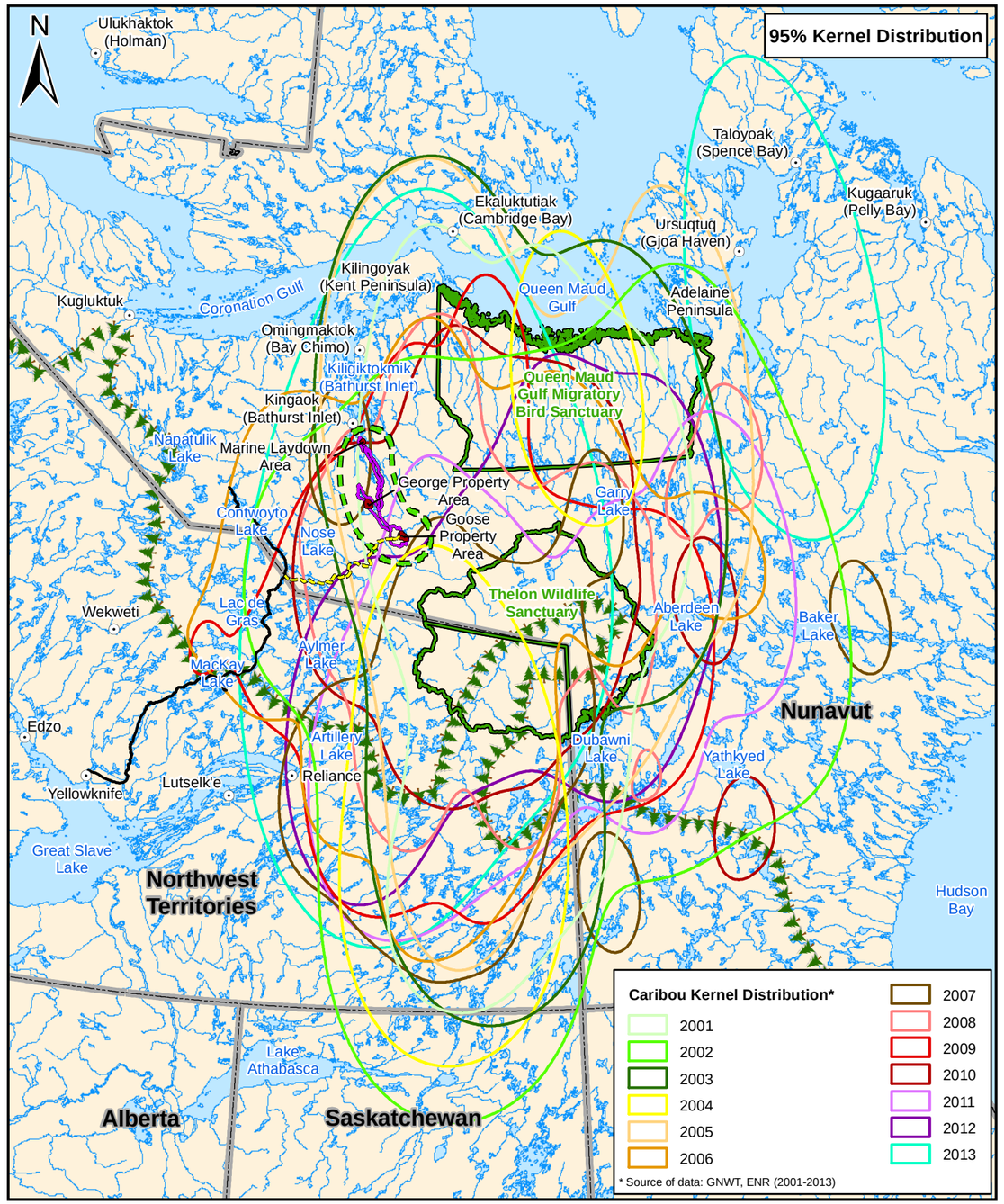
Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-11

Distribution of Collared Beverly/Ahiak Caribou during Summer (July 26 to August 31), 2001 to 2013





Sabina GOLD & SILVER CORP.

Rescan an ERM company

Figure 9.4-12

Distribution of Collared Beverly/Ahiak Caribou during Fall (September 1 to October 31), 2001 to 2013

Similar to other seasons, the extent of fall ranges in some years spanned north to Victoria Island and up the community of Taloyoak. These spatial distributions are a function of the analysis process in R. Beverly/Ahiak caribou have not been documented on Victoria Island during the fall, and are not expected to travel farther north than Taloyoak during the fall (Nagy et al. 2011; Campbell et al. 2012; GNWT ENR 2013b).

9.4.2 Remote Cameras

9.4.2.1 Survey Period and Locations of Remote Cameras

The survey period for all remote cameras spanned from late August, 2012, to late August, 2013. Specifically, the survey period for Cameras 1 to 30 spanned from August 24, 2012, to August 26, 2013, the survey period for Cameras 31 to 60 spanned from May 7, 2013 to August 26, 2013, and the survey period for Cameras 61 to 65 spanned from July 27, 2013 to August 24, 2013 (Figure 9.4-13 and 9.4-14; Appendix 9-2).

Of the thirty cameras deployed in the RSA in 2012, seven cameras remained at the original location over the entire survey period (Cameras BR_02a, BR_03a, BR_13a, BR_18a, BR_28a, BR_29a, and BR_30a; Figure 9.4-13). The remaining 23 cameras were moved during the survey period. Two cameras were moved on September 19 and 20, 2012, to monitor caribou near the proposed MLA at Bathurst Inlet (Cameras BR_09b and BR_27b; Figures 9.3-1 and 9.4-13). Twenty-one cameras were moved from May 7 through 13, 2013 and on June 1 and 19, 2013 (Figures 9.3-1 and 9.4-13). These cameras were repositioned reflecting the changes to the study design described in Section 9.3.2.1.

Of the 30 additional cameras deployed in May, 2013, the majority remained in the same location throughout the entire survey period (Figure 9.4-14). One camera, BR_53b, was moved on June 19 to monitor for caribou at the proposed MLA.

The five cameras deployed in July, 2013, remained at that location for the entire survey period (Figure 9.4-14).

9.4.2.2 Trends in Caribou Abundance and Distribution Recorded by Remote Camera

Overall Abundance

A total of 2,732 caribou were recorded by remote cameras positioned in the RSA between August, 2012, and August, 2013 (Appendix 9-3). Nine caribou were recorded at the end of August, 2012. These individuals have been excluded from subsequent analyses because these observations were recorded at the very end of August and the very end of the summer period for caribou in the RSA. Therefore, they cannot be used to compare abundance and distribution of caribou within August of 2012 or within the summer of 2012 relative to other periods in 2012 and 2013 due to the low number of days that cameras were recording within that time period (6 to 8 days). The results of the remote camera study conducted in 2012 are presented in the 2012 wildlife baseline (Rescan 2013b), which includes results for the summer of 2012 up to the August 24. Therefore, the total number of caribou used in following analyses totals 2,723 individuals.

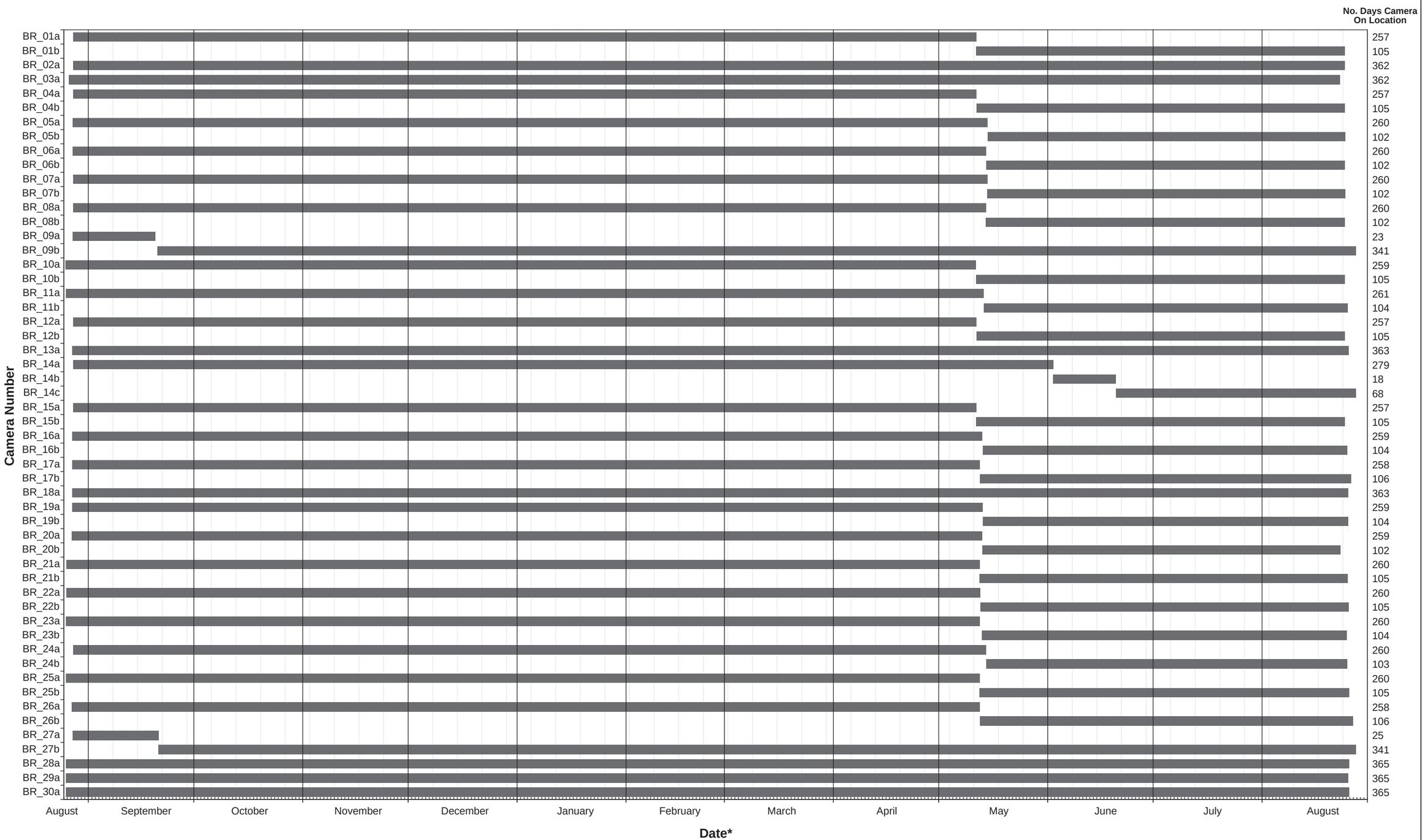
Spatial Trends

The highest numbers of caribou counted during the survey period were recorded by remote cameras surrounding the Goose Property Area. In contrast, low numbers of caribou were recorded by remote cameras surrounding the George Property Area and no caribou were recorded by remote cameras surrounding the MLA (Figure 9.4-15).

The largest number of caribou were recorded at BR_48a (n = 351), followed by BR_43a (n = 320), BR_41a (n = 294), BR_52a (n = 240), and BR_17b (n = 180; Figure 9.4-16; Plates 9.4-1 and 9.4-2). Each of these cameras were located within 5 to 15 km of the Goose Property Area (Figure 9.4-15).

Plate 9.4-1. Large numbers of caribou recorded at Camera BR_48b, August 2013.

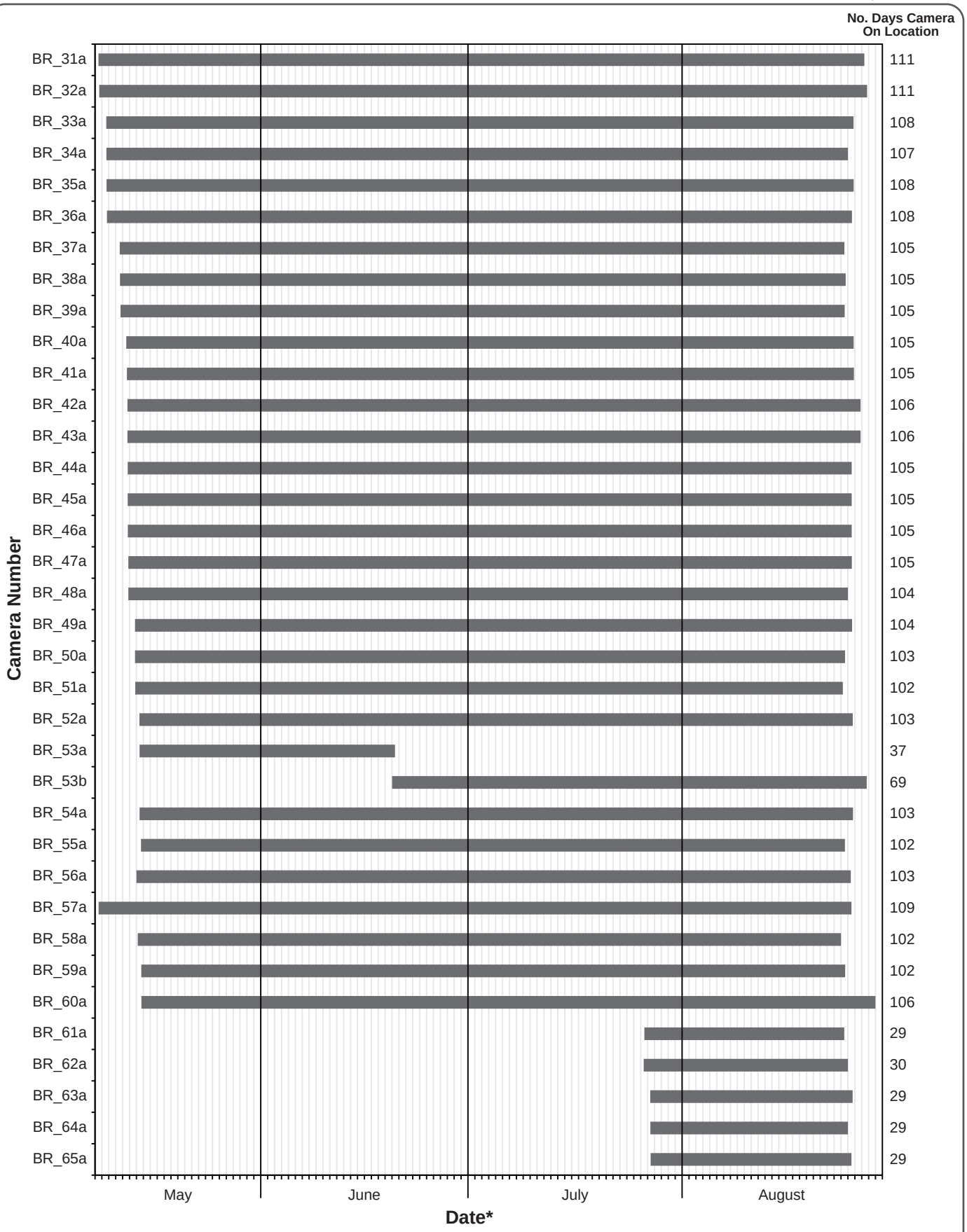
Plate 9.4-2. Large numbers of caribou recorded at Camera BR_43b, July 2013.



Note: * Describes the dates when the camera was deployed at the beginning of the survey period (August 2012) and when image information was collected for the last time from the camera at the end of the survey period (August 2013). In some cases, cameras were moved within the survey period, these cameras are denoted by the suffix of 'b', or 'c', which describes the second and third location of those parcticular camera, respectively. Refer to Figure 9.3-1 for the locations of all cameras within the survey period.

Figure 9.4-13

Survey Period for Cameras 1 through 30, August 2012 and August 2013



*Note: * Describes the dates when the camera was deployed (May 2013) and when image information was collected for the last time from the camera at the end of the survey period (August 2013). In some cases, cameras were moved, these cameras are denoted by the suffix of 'b', which describes the second location of those parcticular cameras. Refer to Figure 9.3-1 for the locations of all cameras within the survey period.*

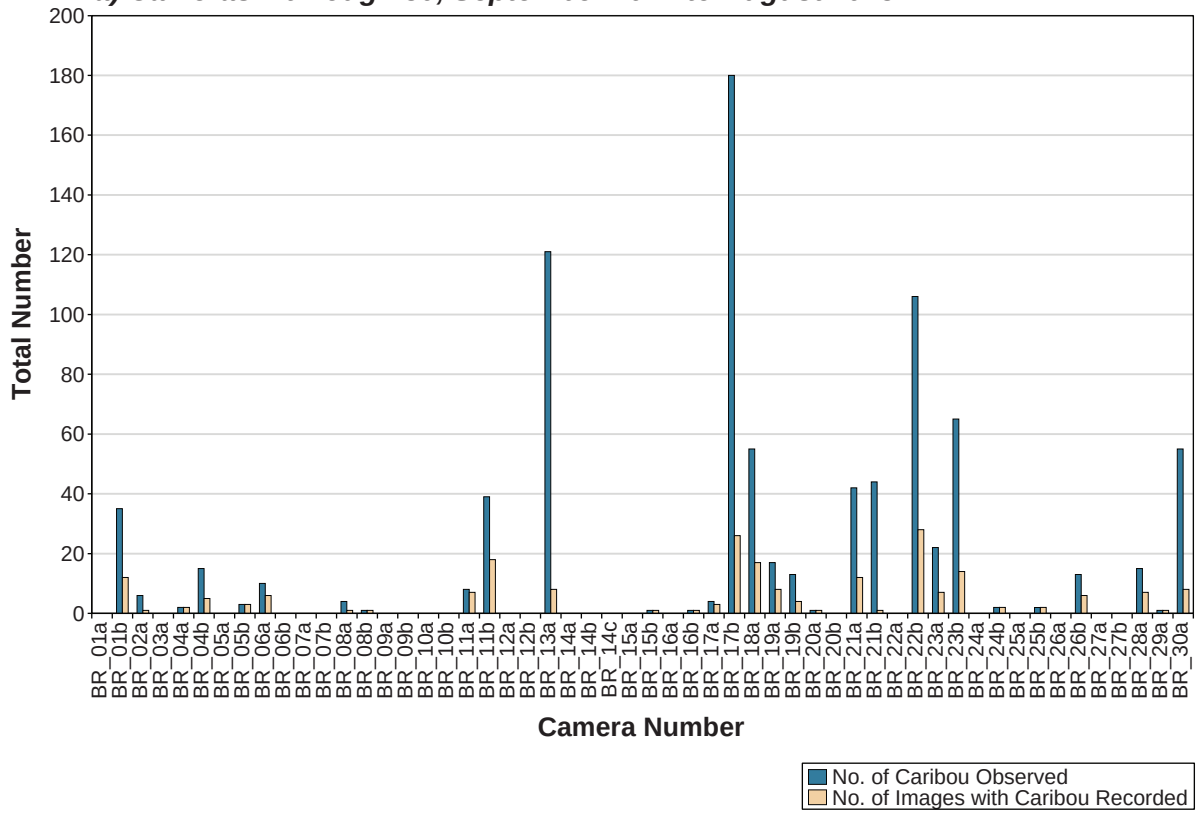
Figure 9.4-14

Survey Period for Cameras 31 through 65, May 2013 and August 2013

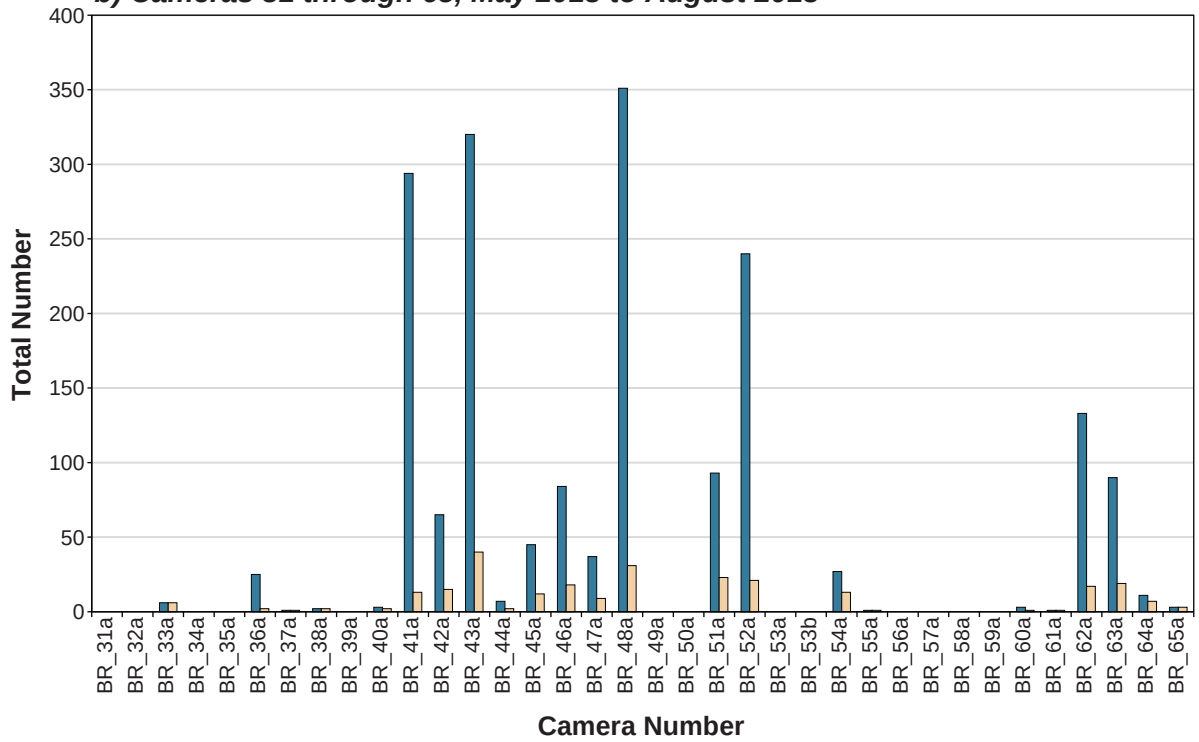
Sabina GOLD & SILVER CORP.

Rescan an ERM company

a) Cameras 1 through 30, September 2012 to August 2013



b) Cameras 31 through 65, May 2013 to August 2013



Number of Caribou Observed and Number of Images with Caribou Recorded from September, 2012 to August, 2013

Figure 9.4-15

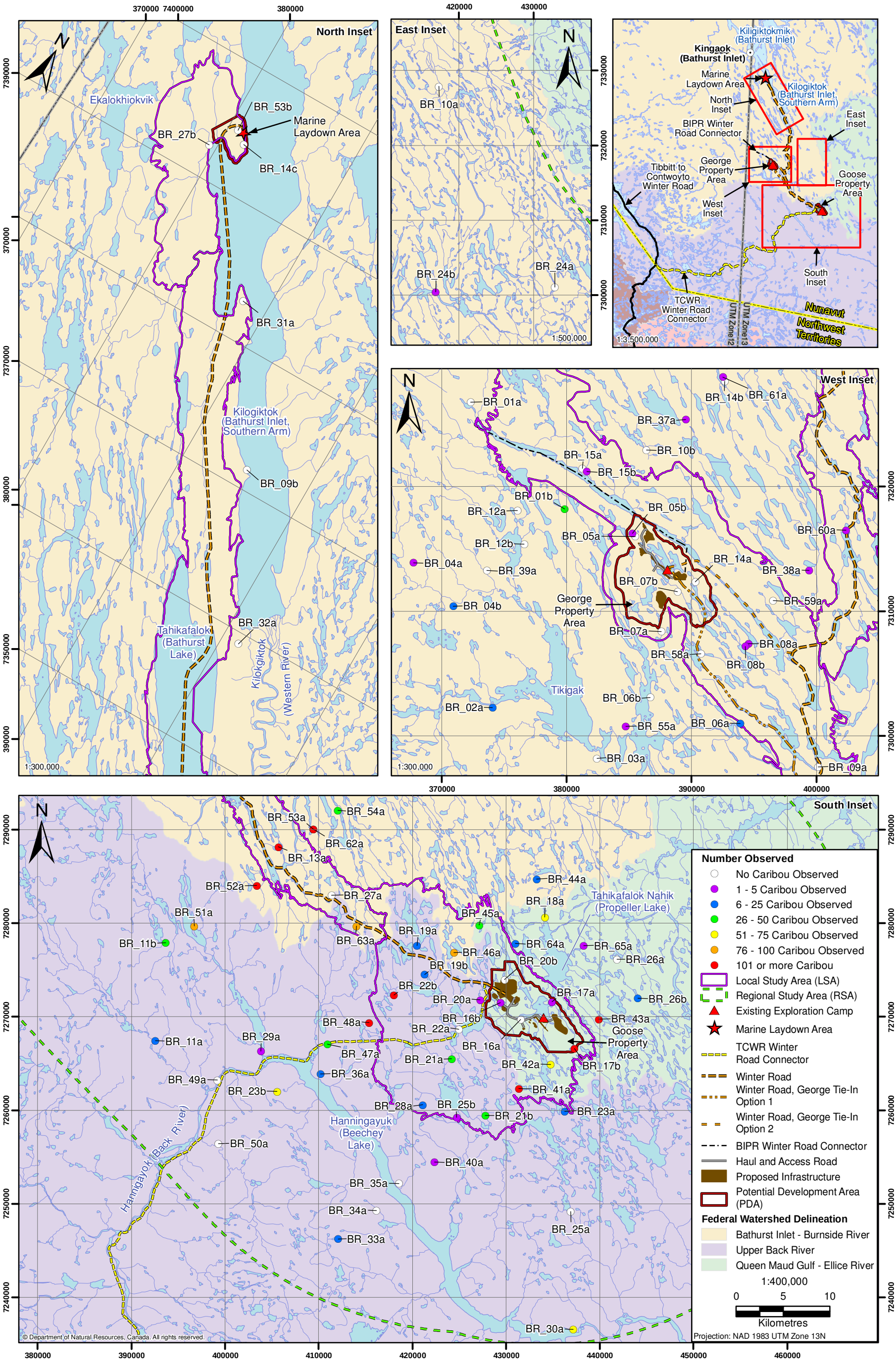


Figure 9.4-16

Sabina GOLD & SILVER CORP.

Total Number of Caribou Recorded by Digital Camera from August 2012 to August 2013

Figure 9.4-16

Rescan an ERM company

Temporal Trends

Caribou were detected in varying numbers throughout the survey period (Figure 9.4-17). The highest number of caribou was recorded during a four week period spanning the last two weeks of July and the first two weeks of August (Figure 9.4-17). Within this four week period, a total of 2,267 caribou were detected, roughly 83% of the total number of caribou recorded across the entire survey period.

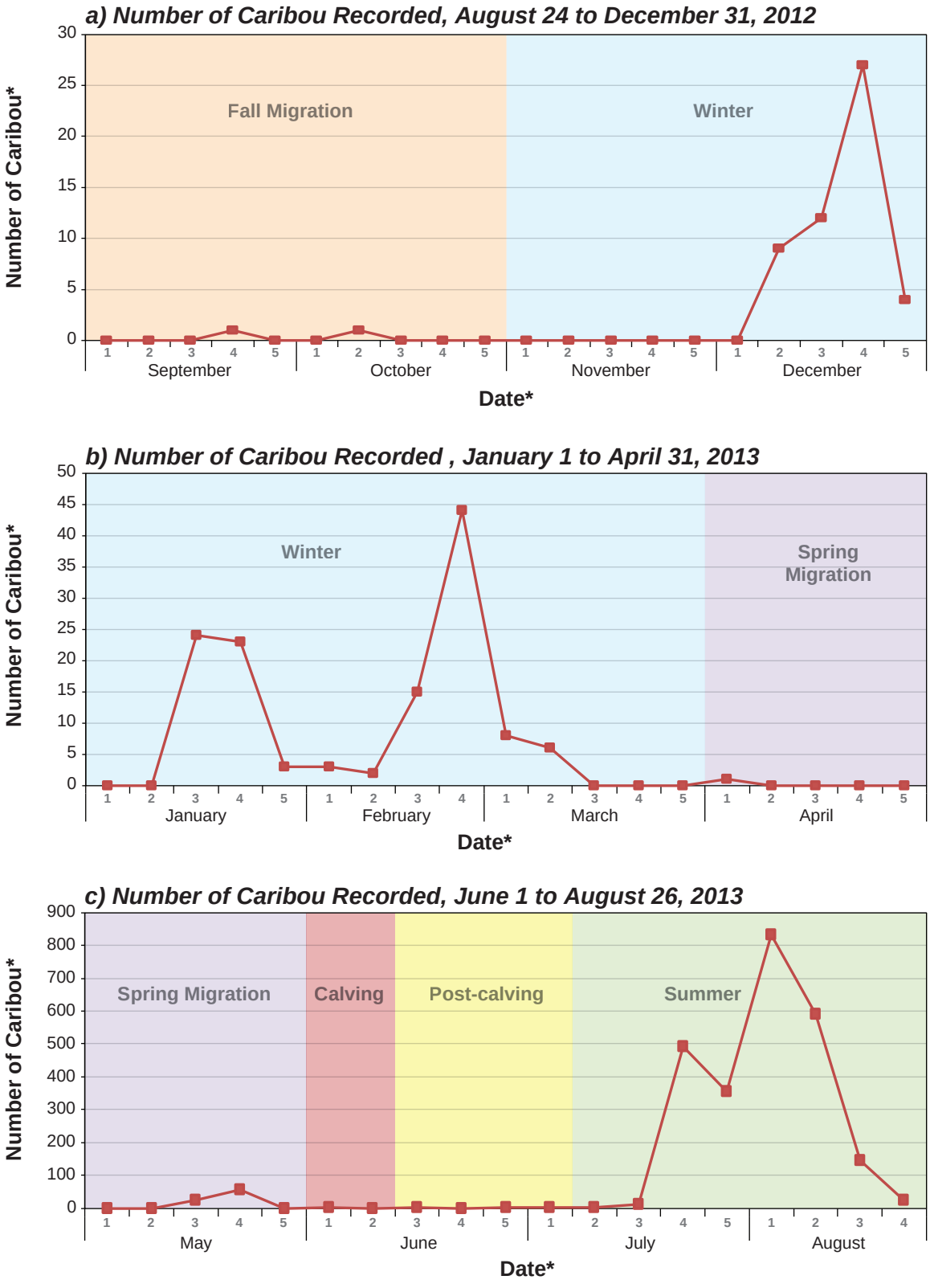
Several smaller peaks in caribou numbers were also recorded across the survey period. In the third and fourth weeks of May, a total of 25 and 56 caribou were recorded, respectively. Over the winter, small peaks in caribou numbers occurred during the last week of February (n = 44), the fourth week of December (n = 27), and the third and fourth weeks of January (n = 24 and 23, respectively; Plate 9.4-3).

Plate 9.4-3. Example of caribou observed during the winter, February 2013.

By comparison, caribou were detected in very low numbers (n < 2) early in the survey period (September through November, 2012), as well as in April in early May, and through the late spring and early summer from June through early July.

Seasonal Trends

Caribou were observed at remote cameras within the RSA during every seasonal period (Figures 9.4-18 to 9.4-23). The highest numbers of caribou (n = 2,415) were recorded during the summer period. Spatially, the majority of these caribou (66%) were recorded at seven cameras, each of which recorded more than 100 caribou, including Cameras BR_13a (n = 114), BR_17b (n = 162), BR_41a (n = 292), BR43a (n = 319), and BR_48a (n = 350), BR_52a (n = 240), and BR_62a (n = 133; Figure 9.4-23). All seven cameras were located within 5 to 35 km surrounding the Goose Property Area. Five of these cameras, Cameras BR_17b, BR_41a, BR_43a, BR_48a and BR_52a, also had the highest cumulative detections of caribou across the entire survey period (see Spatial Trends).



*Note: * Date represents the month and corresponding week numbers within the month (i.e., Week 1 in September presents data from September 1 - 7).*
** Scale of Number of Caribou is different between graphs.*

Figure 9.4-17

Temporal Trends in the Number of Caribou Recorded at Remote Cameras, 2012 to 2013

Sabina GOLD & SILVER CORP.

Rescan Engineers & Scientists

PROJECT # 0194096-0005 GIS # BAC-23-290a December 23 2013

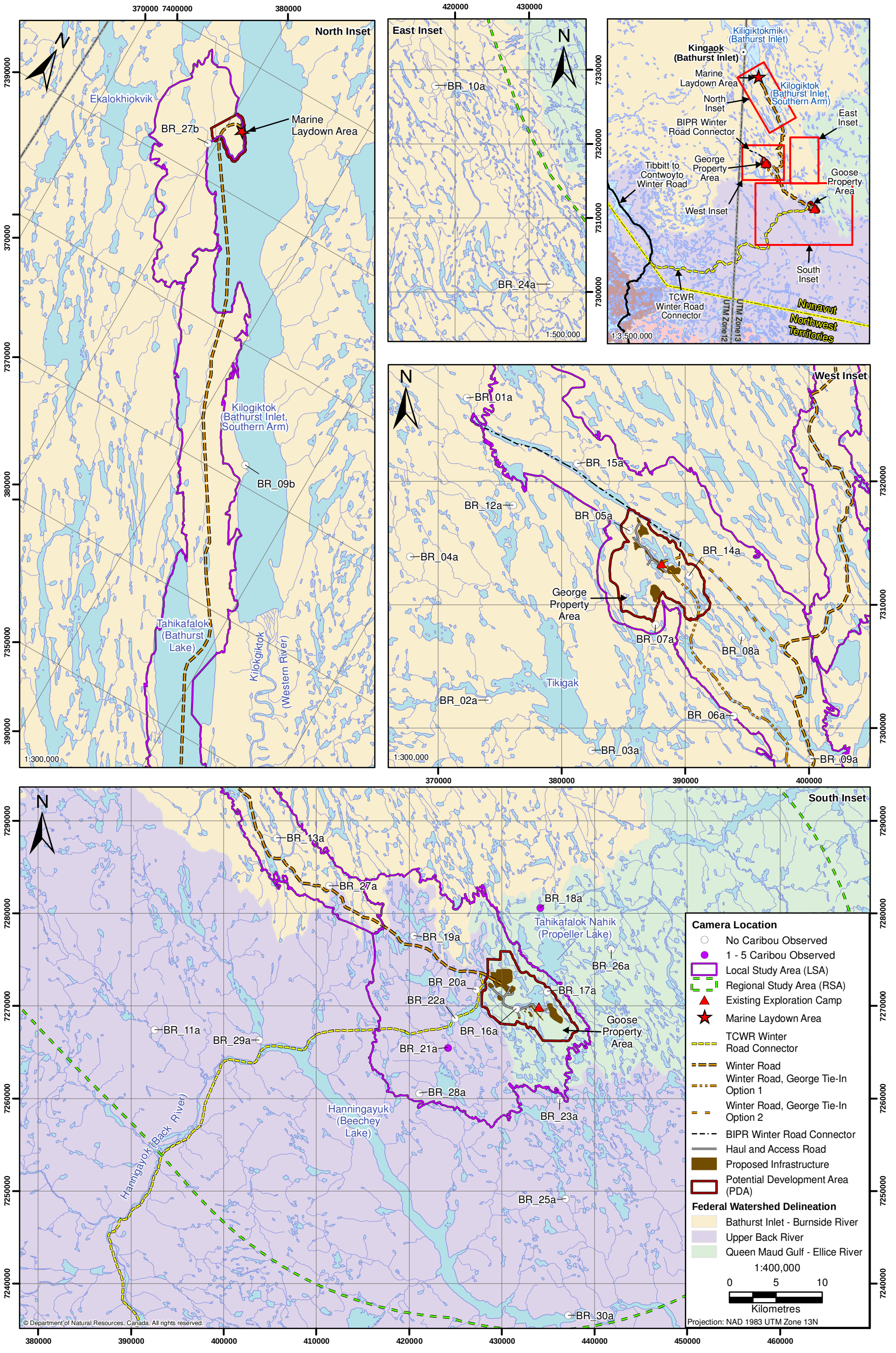


Figure 9.4-18

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Fall (September 1 to October 31, 2012)

Figure 9.4-18

Rescan an ERM company

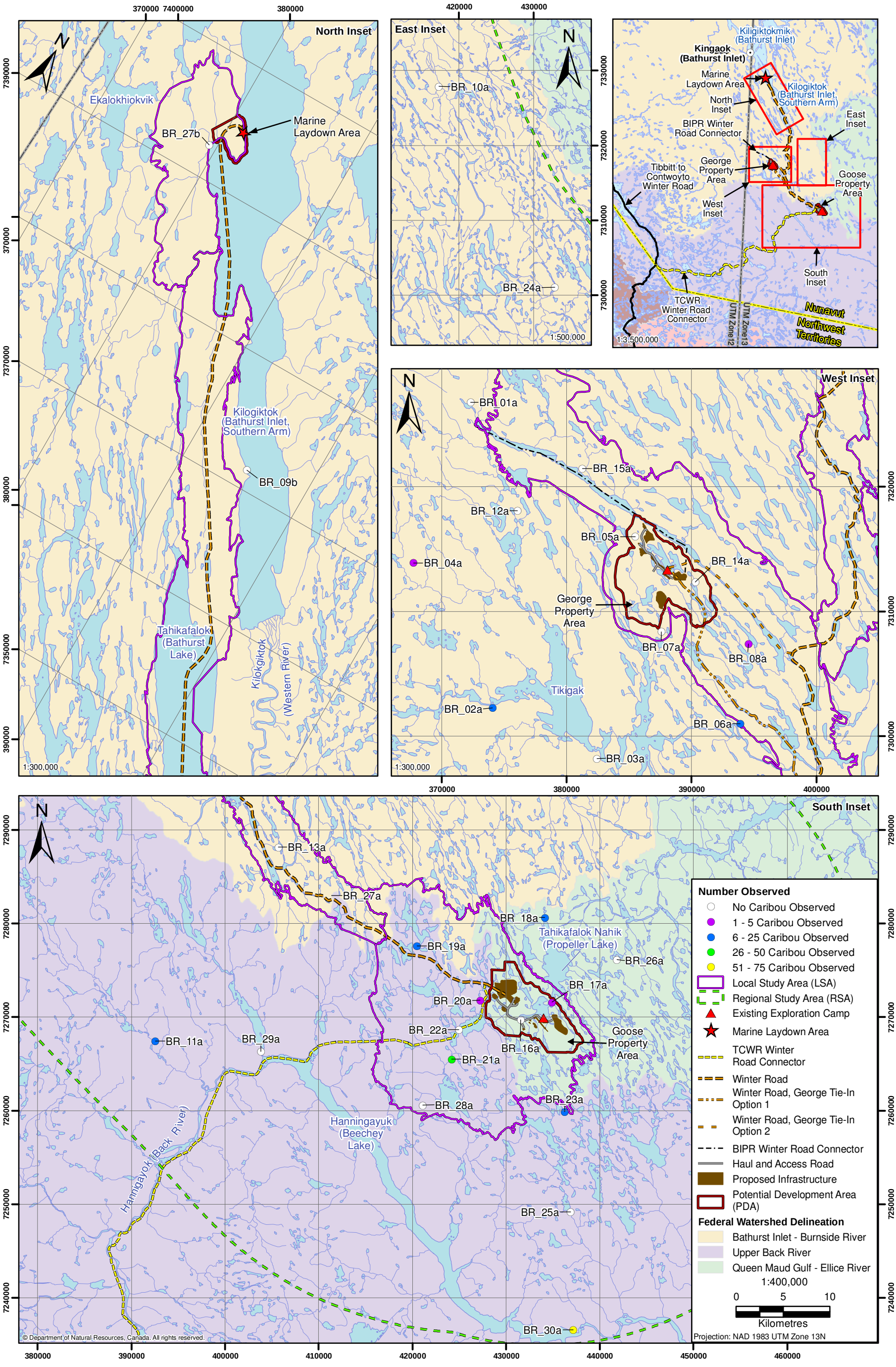


Figure 9.4-19

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Winter (November 1, 2012 to April 14, 2013)

Figure 9.4-19

Rescan an ERM company

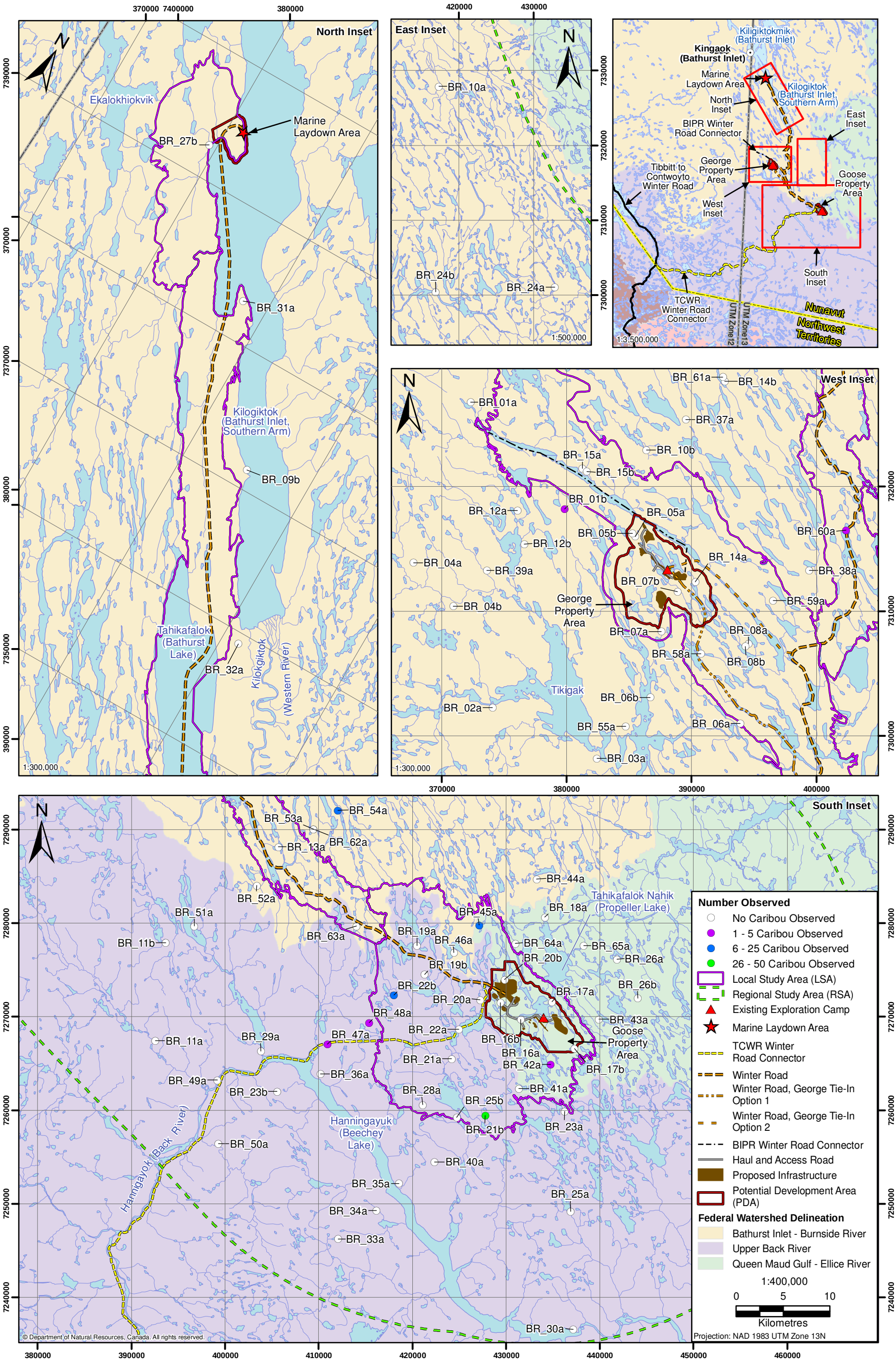


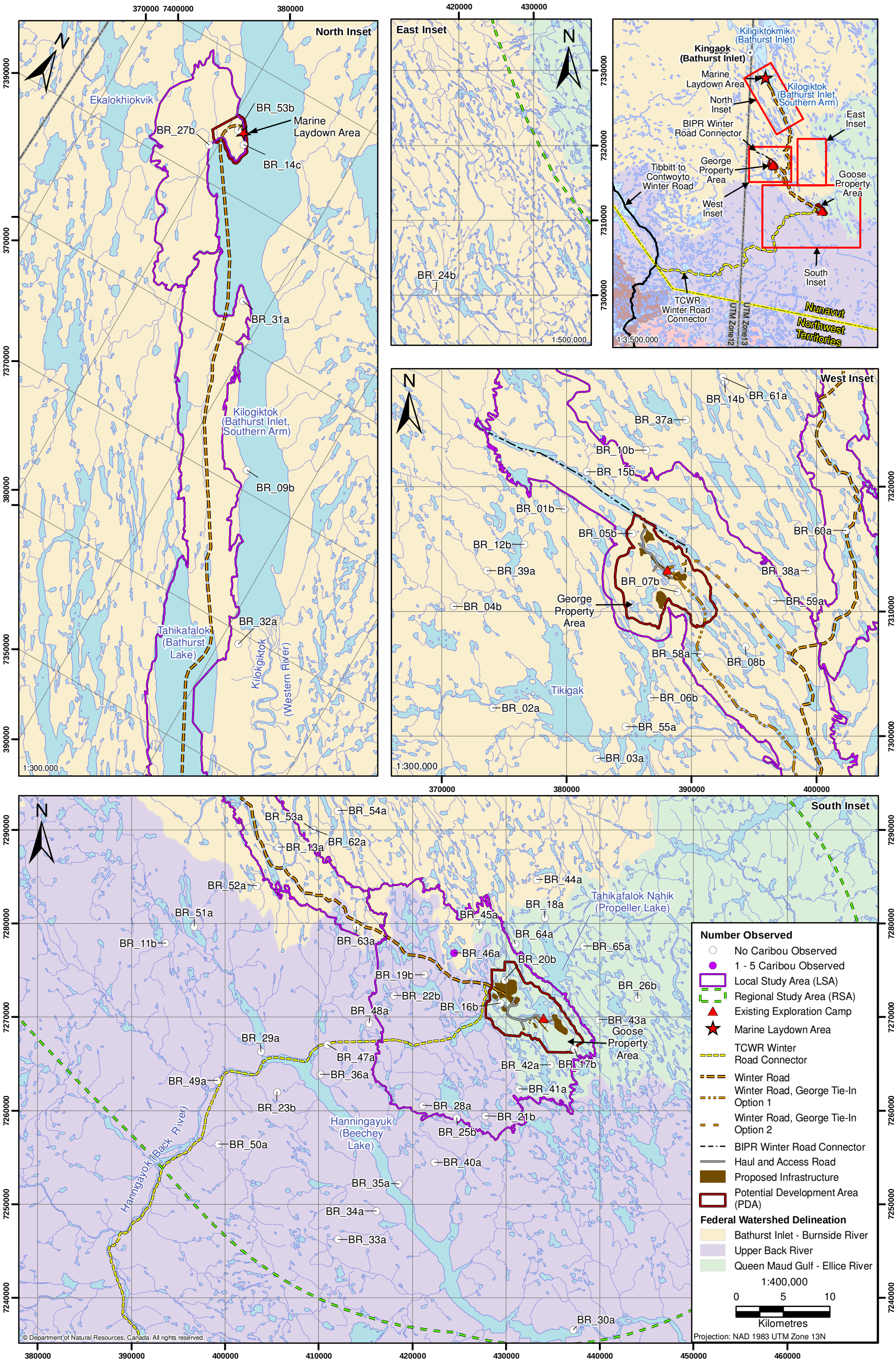
Figure 9.4-20

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Spring Migration (April 15 to June 4, 2013)

Figure 9.4-20

Rescan an ERM company



© Department of Natural Resources, Canada. All rights reserved.

Figure 9.4-21

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Calving (June 5 to June 20, 2013)

Figure 9.4-21

Rescan an ERM company

PROJECT #0194096-0005 GIS # BAC-23-290e December 20 2013

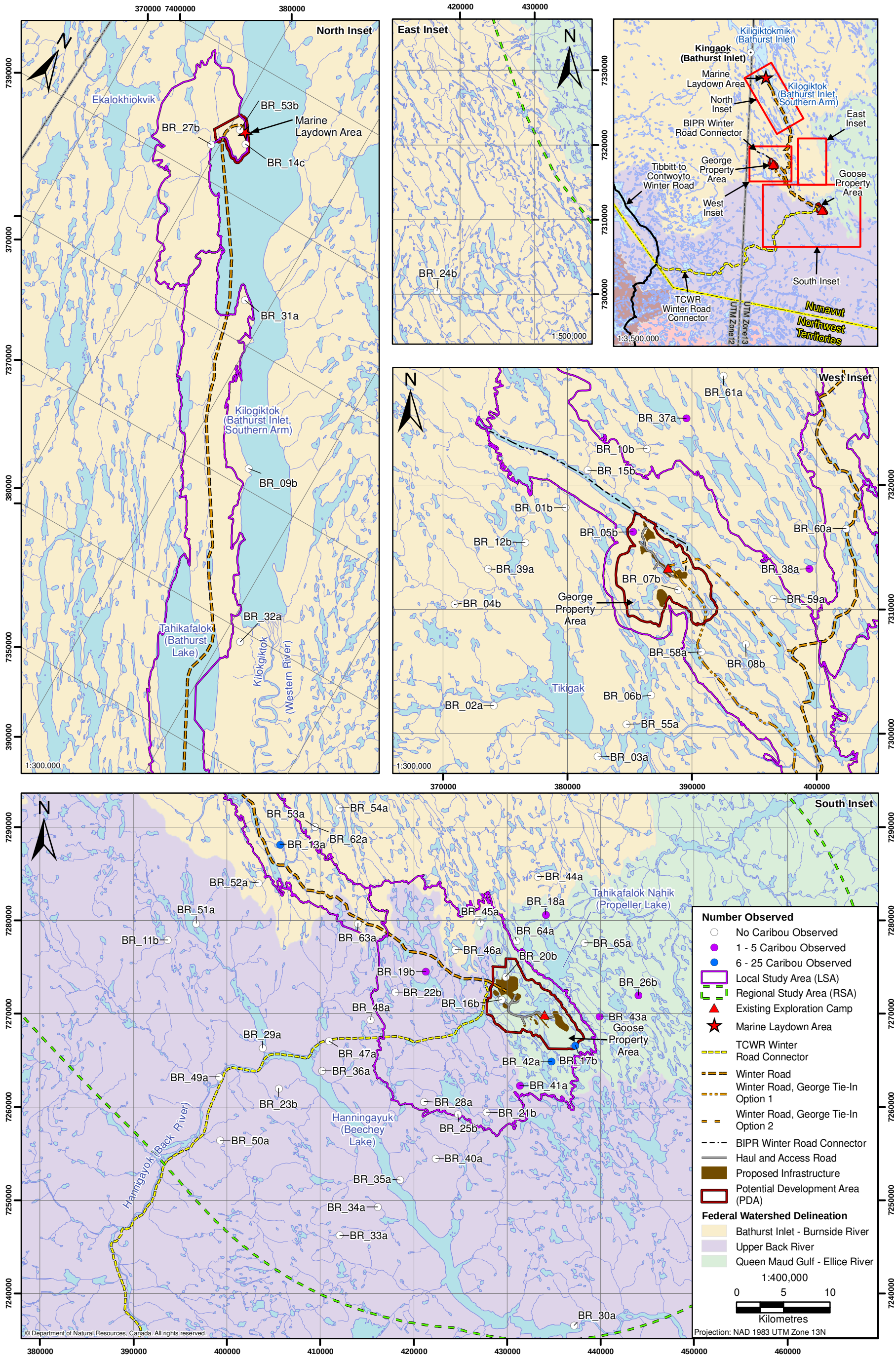


Figure 9.4-22

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Post-Calving (June 21 to July 25, 2013)

Figure 9.4-22

Rescan an ERM company

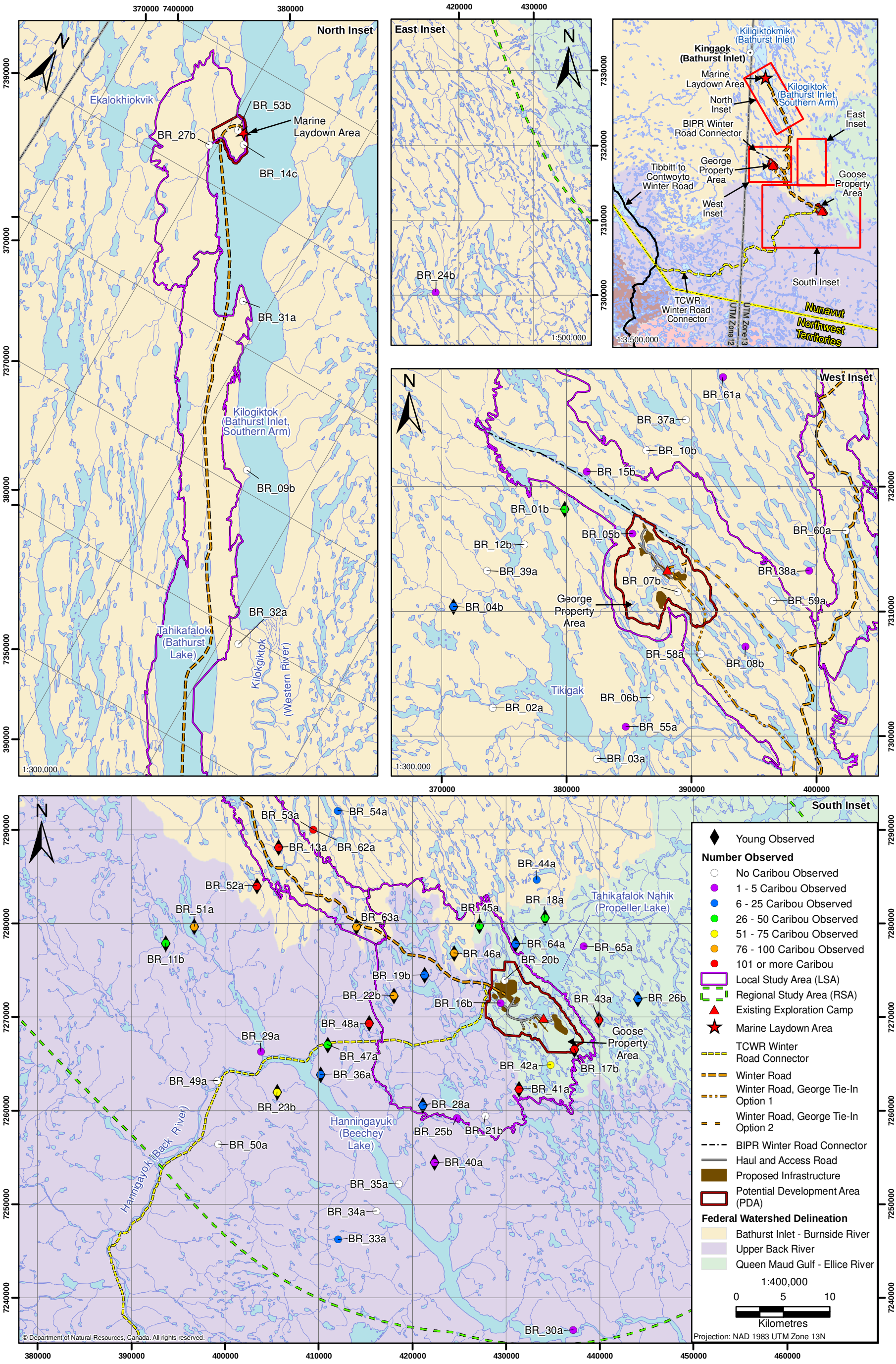


Figure 9.4-23

Sabina GOLD & SILVER CORP.

Number of Caribou Recorded by Digital Camera during Summer (July 26 to August, 2013)

Figure 9.4-23

Rescan an ERM company

Caribou were detected in moderate numbers during other seasonal periods, including the winter and spring migration periods (Figures 9.4-19 and 9.4-20). Similar to the spatial trends observed during summer, the majority of caribou recorded during winter and spring migration were detected by cameras located within 35 km of the Goose Property Area. During the winter, Camera BR_30a, located at the southern tip of Beechey Lake roughly 35 km to the south of the Goose Property Area, had the highest number of caribou recorded (n = 51), followed Camera BR_21a located roughly 5 km to the west of the Goose Property Area (n = 41; Figure 9.4-19). During the spring migration, the largest number of caribou (n = 44) were recorded at Camera BR_21b, located roughly 7 km to the south of the Goose Property Area.

Caribou calves born in 2013 were positively identified on images recorded by several cameras during the survey period (Table 9.4-1; Plate 9.4-4). The majority of calves were recorded on images during the summer period, with a minimum of 209 individuals counted. As caribou calves are much smaller than adults, they can easily be missed on images, particularly when large numbers of caribou are passing by the camera. Thus, the numbers of caribou calves counted represent the minimum number that may be present. In several instances, caribou calves were recorded in association with large numbers of individuals, including those detected at Cameras BR_17b, BR_41a, and BR_52a (Appendix 9-3; Plate 9.4-5). These observations confirm the presence of post-calving groups of females.

Table 9.4-1. Minimum Number of Caribou Calves Identified at Remote Cameras, 2013

	Minimum Number of Calves Counted		
Camera No.	Post-calving	Summer	Total
BR_01b		1	1
BR_04b		2	2
BR_11b		7	7
BR_13a		1	1
BR_17b	2	9	11
BR_18a		2	2
BR_19a		1	1
BR_19b		2	2
BR_22a		1	1
BR_22b		13	13
BR_23b		2	2
BR_26b		3	3
BR_28a		5	5
BR_36a		5	5
BR_40a		1	1
BR_41a		31	31
BR_42a	2		2
BR_43a		62	62
BR_45a		6	6
BR_46a		5	5
BR_47a		10	10
BR_48a		3	3
BR_51a		5	5
BR_52a		12	12
BR_63a		19	19
BR_64a		1	1
Total	**4**	**209**	**213**

Plate 9.4-4. Caribou calf observed by Remote Camera BR_17b, August 2013.

Plate 9.4-5. Large groups of caribou with calves at Camera BR_41a, July 2013.

Relative Size of Caribou Groups

Across all seasonal periods, the majority of caribou detected by remote camera were observed in small groups of 50 individuals or less. Caribou in large to moderate to sized groups were only recorded during the summer (Table 9.4-2).

Table 9.4-2. Total Number of Caribou and Size of Groups Detected by Remote Camera, 2012 to 2013

Seasonal Period	No. Caribou	No. Small Groups (< 50)	No. Moderate Groups (50 - 100)	No. Large Groups (> 100)
Fall Migration	2	2	0	0
Winter	181	61	0	0
Spring Migration	81	10	0	0
Calving	2	1	0	0
Post-calving	42	24	0	0
Summer	2,415	367	6	3
Total	**2,723**	**465**	**6**	**3**

Large groups of caribou were recorded at BR_13a (111 Individuals on August 10, 2013), BR_41a (218 individuals on July 28, 2013), and BR_52a (135 individuals on August 10, 2013; Figure 9.4-23). The large total number of caribou detected in relation to the small number of photos containing caribou confirmed that caribou were observed in large groups at these locations (Figure 9.4-15).

Moderate sized groups of caribou (50 – 100 individuals) were recorded at Cameras BR_17b, BR_43a, BR_46a, BR_48a, and BR_62a from July 29 and August 9, 2013 (Figures 9.4-15 and 9.4-23).

Detections By Habitat

Cameras were located within seven broad types of habitat and/or landform classifications: Esker, River Crossing, Heath Tundra, Rocky Tundra, Marine Shoreline, Wetland, and Tundra/Freshwater. The largest number of caribou (n = 1,082) were recorded at cameras that were located in the Tundra/Freshwater habitat type (Table 9.4-3). These cameras were either placed near a lake shoreline that may contain suitable forage for caribou or at a pinch point between two lakes where caribou movement may be directed. Many of these Tundra/Freshwater locations were identified by Traditional Knowledge and the assistance of Inuit Elders as areas that may be used by caribou.

Table 9.4-3. Caribou Detections by Habitat Type

Habitat/Landform Type	No. of Cameras within Habitat/ Landform Type	No. of Caribou Observed
Esker	15	239
Heath Tundra	24	771
Marine Shoreline	3	0
River Crossing	13	360
Rocky Tundra	17	271
Tundra/Freshwater	14	1,082
Wetland	2	0

Cameras located in the Heath Tundra habitat type also recorded high numbers of caribou (n = 771). These locations were selected for their potential use for foraging, and were typically located in areas containing a variety of shrubby and herbaceous vegetation.

The sample size of remote cameras located within the various habitat and landform types were not equal, with higher numbers in Heath Tundra (n = 24), and very low numbers in marine ecosystems (n = 3) and wetlands (n = 2). Therefore, detections by habitat do not necessarily quantify the relative importance of each habitat and landform type to caribou.

9.4.3 Incidental Observations of Caribou

Incidental observations of caribou were recorded in March and from May through August, 2013 (Table 9.4-4; Appendix 5-4). A total of 713 individuals were recorded across this period.

Table 9.4-4. Incidental Observations of Caribou Recorded during Baseline Environmental Studies, 2013

Season	Winter	Spring Migration		Calving	Post-calving		Summer		
No. of Caribou / Month	March	May	June	June	June	July	July	August	Total
Male		4			1	1		22	**28**
Female		2	2	3	1			1	**9**
Young				1		1		54	**56**
Unknown Gender/Age	1	120		17	13	11	3	455	**620**
Total per Season	**1**	**128**		**21**	**28**		**535**		**713**

Of the total caribou observed incidentally, the vast majority 87% (620 individuals) of caribou were of unknown gender and age. Gender and age was not verified in many cases to avoid prolonged disturbance to caribou at the time of observation. For the remaining caribou observed, 28 were verified as male, 9 as female, and 56 as young of the year (i.e., calves). The majority of calves were recorded during the summer season (August), with very few recorded earlier (Table 9.4-4).

The highest numbers of caribou observed incidentally were recorded in the summer period (n = 535 individuals, 75% of total), followed by spring migration period (n = 128 individuals, 18% of total; Table 9.4-4).

The largest groups of caribou recorded incidentally were observed near Beechey Lake (Figure 9.4-24). A group of 100 individuals were recorded near the south tip of the lake on August 24, 2013 and another group of 100 individuals were observed near the north tip on August 27, 2013 (Figure 9.4-24; Appendix 5-4). Another moderately large group of caribou (approximately 75 individuals) was recorded to the southwest of the Beechey Lake on August 25, 2013 (Figure 9.4-24).

9.5 DISCUSSION

The analysis of the distribution of caribou within the RSA using multiple techniques, including caribou collar data, remote camera data, and incidental data, provided a seasonal and spatial context in the trends in the number of caribou within the RSA. Most notable, is the likelihood of encountering caribou within the RSA appears to the lowest during the calving and subsequent post-calving period (early June through mid- to late July), whereas the likelihood is the highest during the summer period (late July through August). The trends within these periods (calving and post-calving, and summer) are substantiated by caribou data collected in 2012 for the Project (Rescan 2013b). During all other seasonal periods (spring migration, fall, and winter), caribou have moderate probabilities of occurring in the RSA, but use is expected to vary across years.

PROJECT #0194096-0005 GIS # BAC-23-297 December 10 2013

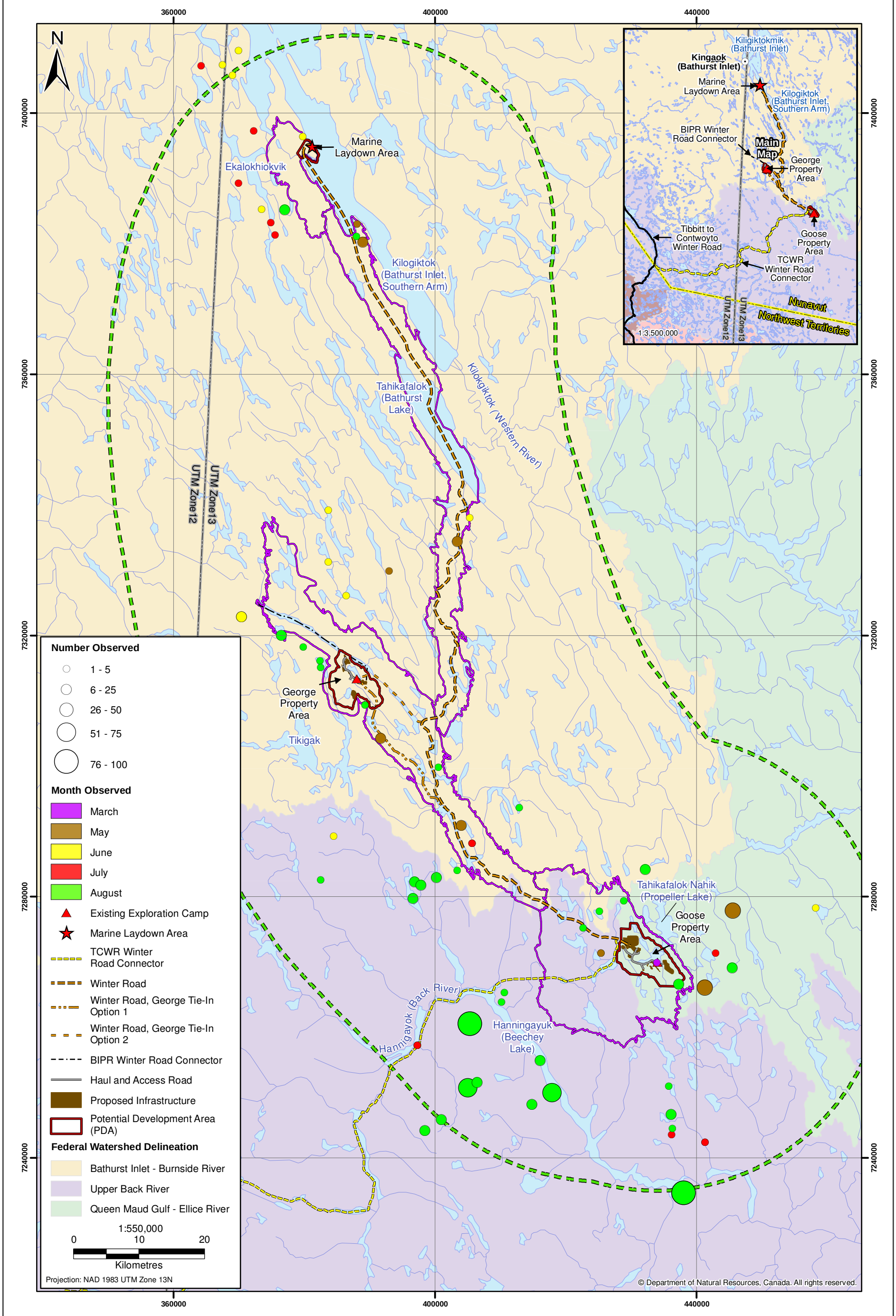


Figure 9.4-24

Sabina GOLD & SILVER CORP.

Incidental Observations of Caribou, 2013

Figure 9.4-24

Rescan an ERM company

9.5.1 Calving and Post-calving Periods

Based on the analysis of caribou collar data, remote camera data, and incidental observations in the RSA, little evidence exists to suggest that caribou are present in large numbers in the RSA during the calving and post-calving periods, which generally occurs from early and mid-June to late July for both Bathurst and Beverly/Ahiak caribou (Table 9.3-1).

Annual core use areas and calving ranges for both the Bathurst and Beverly/Ahaik caribou herds were generally located outside of the RSA. For Bathurst caribou, areas used during calving (50% and 95% kernel UDs) were located to the northwest of the RSA and had no overlap with the RSA since 1996, except for a minimal amount of overlap with the western RSA in 2001. For Beverly/Ahiak caribou, calving areas (50% and 95% kernel UDs) were located to the east of the RSA, and there was minimal overlap with the RSA in the areas used during calving in the early and late 2000s (2001, 2002, 2003, 2008, and 2009), and no overlap has occurred since.

During the post-calving period, annual post-calving ranges (95% kernel UDs) for both the Bathurst and Beverly/Ahaik caribou herds had overlapped the RSA in a number of years, including recently in 2013 for both herds. However, most of the annual post-calving ranges for these two herds were located outside of the RSA. The RSA is located on the very western edge of the post-calving range for Beverly/Ahiak caribou, and on the eastern edge of the post-calving range for Bathurst caribou (Figures 9.4-4 and 9.4-10). The spatial distribution of post-calving ranges relative to the RSA is mirrored by the distribution of core use areas. Annual core use areas (50% kernel UDS) occurred outside of the RSA in all years except for one for Beverly/Ahiak caribou (2006), and core use areas for Bathurst caribou had very minimal overlap with the western edge of the RSA in seven of the last eighteen years.

Trends in caribou numbers recorded by remote camera during the calving and post-calving periods further refine the trends observed in the distribution of collared caribou within the RSA. Remote cameras recorded very few caribou (2 individuals) during the calving period in 2013. Similarly, no caribou were recorded by remote cameras within the RSA during the calving period in 2012 (Rescan 2013b). The number of caribou recorded by remote camera was also very low during the post-calving period in 2013 (n = 42 individuals), and similar trends were observed in 2012 at remote cameras placed within the RSA (< 30 individuals recorded; Rescan 2013b). The relatively small numbers of caribou recorded by remote cameras within the RSA during the calving and post-calving periods of 2012 and 2013 highlight the low probability of encountering caribou from either herd within the RSA, despite the overlap in annual kernel UDs.

Incidental observations of caribou recorded during the calving and post-calving periods in 2012 and 2013 corroborate trends observed by remote cameras. Incidental observations of caribou during the calving period were also among the lowest observed of any season period in 2012 (n = 35 individuals) and 2013 (n = 21 individuals). During post-calving, one caribou was recorded incidentally in 2012 (Rescan 2013b) and less than 30 were observed in 2013.

The combination of three types of data (collar, remote camera, and incidental) suggests that caribou calving and post-calving does not generally occur within the RSA, despite the overlap in kernel UDs generated for the Bathurst and Beverly/Ahiak herds within some areas of the RSA in a few previous years. In addition, calving is not expected to occur within the RSA in future years based on the trends observed from these data; however, shifts in calving grounds have occurred for most caribou herds which could affect the likelihood of encountering calving caribou within the RSA.

The calving ground of Bathurst caribou has gradually shifted from the western side of Bathurst Inlet (in the 1950s) to the eastern side (1960s to mid-1980s) and in recent years (the late 1990s) has shifted

back to the western side (Sutherland and Gunn 1996; Thorpe et al. 2001; Gunn and D'Hont 2002). Over the last 16 years, calving has been concentrated on the west side of Bathurst Inlet well to the northwest of the RSA (Figure 9.4-3).

The Ahiak and Beverly herds, when they were considered separate herds, have also shown a periodic shift in calving areas used over the years. In the mid-1980s, Ahiak caribou calved in a concentrated areas on the eastern edge of the Queen Maud Gulf Migratory Bird Sanctuary, since then, the distribution of caribou calving in the area has expanded along the entire edge of the Queen Maud Gulf from the Kent Peninsula in the west to the Adelaine Peninsula in the east (Gunn, Fournier, and Nishi 2000; Gunn and D'Hont 2002). The larger spread is thought to be a result of immigration of Beverly caribou from their former, traditional calving grounds to the south in the Beverly and Garry Lakes area (occupied in the 1980s and 1990s) to the western Queen Maud Gulf sometime in the early 2000s. As a result, Ahiak caribou shifted further to the east in the Queen Maud Gulf. Evidence of these shifts is portrayed in the distribution of annual core use area and overall ranges of Beverly/Ahiak caribou during the calving period. Separate core use areas were mapped in the western and eastern portions of the Queen Maud Gulf Migratory Bird Sanctuary, as well as to the south in the Garry Lake area in a number of years including 2003, 2004, 2006, 2010, 2012, and most recently in 2013.

Shifts in calving grounds may be a result from the overall habitat selection of females at this time. During calving, females appear to select habitat that is suboptimal in terms of forage quality (Griffith, Gunn, and Russel 2001). This habitat selection may be an artefact of predator aversion (e.g., good sightlines for detecting predators). Conversely, access to high quality forage is likely the key driver of habitat selection in the post-calving period (Witter et al. 2012), as females need to acquire adequate nutrient reserves for lactation, which provides all nutrient intake for calves until about three weeks of age when calves begin foraging on their own. Calf body condition at birth and in the first few weeks of life, and thus calf survival, are highly dependent on female nutritional status (reviewed in Couturier et al. 2009). Studies in Alaska show that female caribou with calves select areas with a high density of sedge meadows during the post-calving period, where they forage on highly nutritious *Eriophorum* spp. (cotton grass) and *Carex aquatilis* (Wilson et al. 2012).

9.5.2 Summer Period

During the summer period, caribou collar data, remote camera data, and incidental data indicate that caribou are present in the RSA at this time, and potentially in the largest numbers compared to all other seasonal periods.

Annual core use areas and overall ranges of Beverly/Ahaik caribou overlapped the RSA to a large degree, or completely encompassed the RSA during the summer. These summer kernel UDs (50% and 95%) were generally the only polygons to have this degree of overlap with the RSA in comparison to any of the other seasonal ranges generated for the Beverly/Ahiak caribou since 2001 (Figures 9.4-1 to 9.4-12). Further, since 1996, no kernel UDs generated for the Bathurst herd have had a similar amount of overlap with the RSA during any season.

The trends in collar data during the summer are corroborated in the numbers of caribou recorded by remote cameras located within the RSA. The highest numbers of caribou were recorded during the summer period, particularly during the last two weeks of July and the first two weeks of August (Figure 9.4-17). Similar trends in the seasonal number of caribou recorded by remote cameras within the RSA were observed during 2012, with high numbers of caribou (200 individuals or more) recorded in late July and early August (Rescan 2013b). The high number of caribou recorded during the summer of 2012 and 2013 highlight the probability of encountering caribou from the Beverly/Ahiak herd.

Incidental observations of caribou further substantiate the trends observed during the summer through collar and remote camera data. The numbers of caribou recorded incidentally in 2013 had the highest peak in the summer period, where approximately 535 individuals were recorded. By comparison, less than 130 were recorded incidentally from March through July (Table 9.4-4). Similar results were recorded in 2012, where the largest numbers of caribou recorded incidentally (n = 593 individuals) were detected in July (within the summer period).

The combination of three types of data (collar, remote camera, and incidental) indicates that the southern RSA is part of the main summering area for Beverly/Ahiak caribou. In general, core use areas for Beverly/Ahiak caribou overlapped the southern RSA. Further, the highest numbers of caribou recorded by remote cameras within the RSA in 2012 and 2013 during the summer occurred in the southern RSA near the Goose Property Area (Figure 9.4-23; Rescan 2013b). In addition, the largest numbers of caribou recorded incidentally in 2012 and 2013 during the summer were also recorded in the southern RSA surrounding the Goose Property Area, particularly between the Goose Property Area and Beechey Lake (Figure 9.4-24; Rescan 2013b). Thus, larger numbers of caribou can be expected to occur in the RSA during the summer across years.

The summer period is an important period for females and their calves. During the summer months, females must acquire adequate forage to store enough nutrient resources to survive, and to maintain pregnancy throughout the winter (Helle and Tarvainen 1984; Colman et al. 2003). Thus, access to high quality forage during the summer is not only important to calf survival through the summer and fall, but also to the survival of females and yearlings in the subsequent winter, and to the ability of females to birth healthy calves in the subsequent spring (White 1983; Couturier et al. 2009). This link between forage quality and calf condition has been studied for the Bathurst herd. In years with poor plant biomass availability during the summer, the overwinter survival of calves the following winter is reduced and the growth rate of the herd declines or is negative (Chen et al. submitted).

9.5.3 Other Seasonal Periods

The combination of the analysis of caribou collar data, remote camera data, and incidental data indicate that caribou are present within the RSA in variable numbers during other seasonal periods, including over the winter and during spring migration and the fall.

9.5.3.1 Winter

The presence of caribou within the RSA during the winter appears to vary by caribou herd, based on analysis collar and remote camera. The annual winter ranges and associated core use of Bathurst caribou and Beverly/Ahiak caribou have had periodic overlap with the RSA over the years. In particular, Beverly/Ahiak caribou have had the most interaction with the RSA relative to Bathurst caribou. Core use areas and overall ranges for Beverly/Ahiak caribou over winter were extensive, spanning areas above and below the treeline, and overlapped the RSA in two (50% kernel UDs) to seven (95% kernel UDs) of the last thirteen winters. In contrast, Bathurst caribou were generally located well to the south of the RSA below the treeline during winter, and in only one year, the winter range (95% kernel UD) overlapped the southern RSA (winter of 2012 – 2013). Data collected from remote cameras in the RSA corroborate the presence of caribou during the winter, with small peaks in caribou numbers (< 50 individuals) recorded in late December, in mid- to late January, and again in late February (Figure 9.4-17).

Wintering areas are the most variable of the seasonal life history stages, showing the least degree of overlap in areas of use among years (D'Hont et al. 2009). This trend is influenced by the availability of forage, primarily arboreal lichens, and snow depth (D'Hont et al. 2009). Daily movement rates for caribou are lowest during the winter (Gunn et al. 2008), suggesting that caribou select areas with good food availability and generally exploit those areas for the duration of the winter. This trend is clearly supported by the distribution of the annual kernel UDs developed for Bathurst and Beverly/Ahiak

caribou, as these kernel UDs are widely distributed and overlapped little among years (Figures 9.4-1 and 9.4-7). Therefore, the presence of Bathurst and Beverly/Ahiak caribou, predominately Beverly/Ahiak caribou, within the RSA during winter can be expected but numbers may vary across years.

9.5.3.2 Spring Migration

During spring migration, both Bathurst and Beverly/Ahiak caribou have been recorded passing through the RSA. Migration routes generated from collar data indicate that caribou from the Beverly/Ahiak herd more commonly pass through the RSA during spring migration compared to Bathurst caribou. However, the vast majority of collared females travel to the west (Bathurst caribou) and east (Beverly/Ahiak caribou) of the RSA. Variable numbers of caribou have been recorded by remote camera and incidentally during spring migration. A small peak in caribou numbers recorded by remote cameras (n = 81 individuals) occurred during the third and fourth week of May in 2013; remote cameras were not operating during the spring migration period in 2012. The number of caribou recorded incidentally during spring migration was very low in 2012 (n = 6 individuals; Rescan 2013b), whereas the numbers recorded incidentally in 2013 were the second highest recorded across any season (n = 128 individuals).

Caribou collar, remote camera, and incidental data do indicate the passage of caribou through the RSA during the spring migration. During the spring, pregnant females lead the northward migration to calving grounds. Past research and TK suggest that pregnant females exhibit a "determined" attitude during spring migration, moving rapidly and directly toward the calving grounds (Dogrib Treaty 11 Council 2001; Gunn, Dragon, and Boulanger 2002; Gunn et al. 2008). Such homing tendencies for calving grounds have been shown in previous years with both Ahiak and Bathurst caribou (Gunn et al. 2008). Therefore, caribou migrating through the RSA during the spring can occur, but overall numbers are expected to vary across years because the strong and rapid migratory behaviour of caribou during this time.

9.5.3.3 Fall

The presence of caribou within the RSA during the fall appears to vary by caribou herd, based on analysis collar and remote camera. Fall core use areas and overall ranges for Bathurst caribou generally occurred to the southwest of the RSA, and the fall range overlapped the southern RSA only in the late 1990s. Beverly/Ahiak caribou were generally distributed to the east and south of the RSA during the fall, though the northern extends of the core use areas and overall fall ranges have overlapped the RSA many times (> 5) in the last 13 years. Trends in caribou numbers as recorded by remote cameras indicated that very low numbers of caribou (<2 individuals detected) were present in the RSA during the fall of 2012, though these numbers only represent one year of data and should be interpreted with caution.

The variable trends in presence the caribou within the RSA may be influenced by the location of rutting grounds, which are used in October. For Bathurst caribou, the areas around Lac De Gras have been highlighted as an area that has been occupied by rutting caribou (GNWT ENR 2010). Beverly/Ahiak caribou migrate south and south-east towards the Thelon Game Sanctuary in the fall, located on the NWT/Nunavut border east of Great Slave Lake, where the rut occurs (Gunn, Fournier, and Nishi 2000). Analysis of collar data in the current report supports these rutting distributions, with high overlap in annual core use areas and overall fall ranges around Lac de Gras for Bathurst caribou and in the eastern Thelon Wildlife Sanctuary for Beverly/Ahiak caribou (Figures 9.4-6 and 9.4-12). Thus, as the rutting grounds for Bathurst caribou are located well outside the RSA to the southwest, they have a lower probability of occurring within the RSA during the fall. Conversely, the rutting grounds for Beverly/Ahiak caribou are located just to the south of the RSA, and it is therefore more probable that Beverly/Ahiak caribou can be present in the RSA at this time.

10. Incidental Observations of Mammals

Rescan™
an ERM company

10. Incidental Observations of Mammals

10.1 INTRODUCTION

Incidental observations of wildlife were recorded during the wildlife baseline studies conducted in the terrestrial RSA in 2013. This section summarizes the incidental observations of muskox (*Ovibos moschatus*), moose (*Alces americanus*), and small mammals recorded within the RSA. Incidental observations of caribou are reported in Chapter 9, and incidental observations of carnivores are reported in Chapter 8. Incidental observations of birds including raptors, upland birds and waterbirds are reported in Chapters 5, 6, and 7. Baseline surveys were not directly conducted for muskox, moose or small mammals but their incidental observations are valuable in understanding the species present and their distribution within the RSA.

Muskox are considered Secure in Nunavut (Wild Species 2005). Muskox are expected to occur within the RSA and are a dominant ungulate species of the Arctic. Their distribution encompasses the RSA and much of the adjacent northern expanse of Nunavut (Nunavut Development Corporation 2010). They have relatively small home ranges of 27 to 70 km^2 in the winter and slightly larger (223 km^2 on average) ranges during the summer (P. E. Reynolds 1998). Muskox can thrive in cold conditions and feed on willow and tundra grasses commonly found throughout the region (GN DOE 2006), and have previously been documented in the RSA (Rescan 2011, 2012, 2013b). Muskox have been harvested as Inuit subsistence food for centuries and their fur, known as qiviut, is valuable for clothing and bedding (Nunavut Development Corporation 2010).

Moose do not have a conservation status within Nunavut or Canada and are considered Secure (Wild Species 2005). Moose are expected to occur within the RSA but are infrequent relative to other ungulate species. Moose distribution is at its peripheral edge across the RSA (GNWT ENR 2011a). Suitable riparian shrub forage and cover habitat does exist within the RSA, however, the tundra landscape is dominated by other ecosystem types such as hummocky low shrub, floodplain, and bedrock. Moose have previously been observed in low density in the northern portion of the RSA, specifically along the Western River (Rescan 2013b). Moose are typically found below treeline and prefer a mix of deciduous and conifer stands throughout the year (GNWT ENR 2011a). Moose are a valued food source for resident and non-resident hunters.

Small mammals often play a keystone role in Arctic ecosystems (Krebs 1996; Carrière 1999), and are a major prey source for foxes, wolves, raptors, and other carnivores that occur in the RSA. Population fluctuations in small mammals often influence similar fluctuations in predator populations (Krebs 1996; Boonstra, Krebs, and Stenseth 1998; Angerbjörn, Tannerfeldt, and Erlinge 1999). A number of small mammal species are likely to occur or have been documented in the RSA including Arctic hare (*Lepus arcticus*), ermine (*Mustela ermine*), least weasel (*Mustela nivalis*), collared lemming (*Dicrostonyx torquatus*), brown lemming (*Lemmus trimucronatus*), tundra vole (*Microtus oeconomus*), meadow vole (*Microtus pennsylvanicus*), red-backed vole (*Myodes rutilus*), Arctic ground squirrel (*Urocitellus parryii*), and shrews (Sorex spp.: Rescan 2008b; Rescan 2012, 2013b). All of these small mammal species are considered Secure in Nunavut (Wild Species 2005).

10.2 OBJECTIVES

The objective of recording incidental observations of mammals was to document the presence and distribution of muskox, moose, and small mammal species in the RSA.

10.3 METHODS

Incidental observations of mammals were recorded 1) during field surveys conducted in the RSA in 2013 and 2) by remote motion-triggered cameras placed on the tundra to monitor caribou, wolverine, and wolf dens between August, 2012 and August, 2013.

10.3.1 Incidental Observations of Mammals during Field Surveys

Incidental observations of muskox, moose, and small mammals were recorded during wildlife field surveys conducted in the RSA in 2013, and during other environmental field surveys conducted in the RSA in 2013. Date, location, species, number of individuals, gender, and habitat were documented whenever possible.

10.3.2 Incidental Observations of Mammals via Remote Camera

Incidental observations of moose, muskox, and small mammals were also recorded by remote cameras used to supplement the caribou baseline studies (Chapter 9). Remote cameras for the caribou baseline studies recorded observations from late August 2012 to August 2013 (Section 9.3.2.1). Both motion-triggered and timed photos between late August, 2012 and early May, 2013 were analyzed and recorded, but only motion-triggered photos from early May 2013 to late August 2013 were analyzed and recorded.

For each photo in which moose, muskox, or small mammals were present the following data were recorded: camera number, type of photo (timed or motion-triggered), photo number, date, time of day, species, number of animals in the frame, behaviour, and any additional relevant information. When photos were taken by successive motion-triggers, the photos produced by the second and subsequent motion-triggers were recorded as part of the same series if the photos were taken less than 5 minutes apart. All data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as moose and muskox may spend more than 5 minutes at a site. If photo series were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were of a unique animal. Observations of moose, muskox, or small mammals were considered a duplicate if it was not possible to tell individuals apart within the 24-hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series.

10.4 RESULTS

A total of four species of mammals, including muskox, moose, Arctic hare, and ermine were incidentally observed during 2013 baseline field surveys and/or recorded via remote motion-triggered camera (Figure 10.4-1; Table 10.4-1; Appendix 5-4). The most common species incidentally observed were muskox and moose. The majority (61%) of muskox observations occurred in July and August followed by May and June (39%) and over 50% of the moose observations occurred in May with very few observations during the rest of the year. Muskox were observed more frequently than moose and in greater numbers.

Table 10.4-1. Incidental Observations of Mammals during Field Surveys and via Remote Camera, 2013

Species	March	May	June	July	August	Total
Arctic Hare	-	7	-	3	1	11
Ermine	-	-	-	-	1	1
Moose	1	8	2	-	3	14
Muskox	-	51	51	77	82	261
Subtotal	**1**	**66**	**53**	**80**	**87**	**287**

PROJECT #0194096-0005 GIS # BAC-23-277 December 16 2013

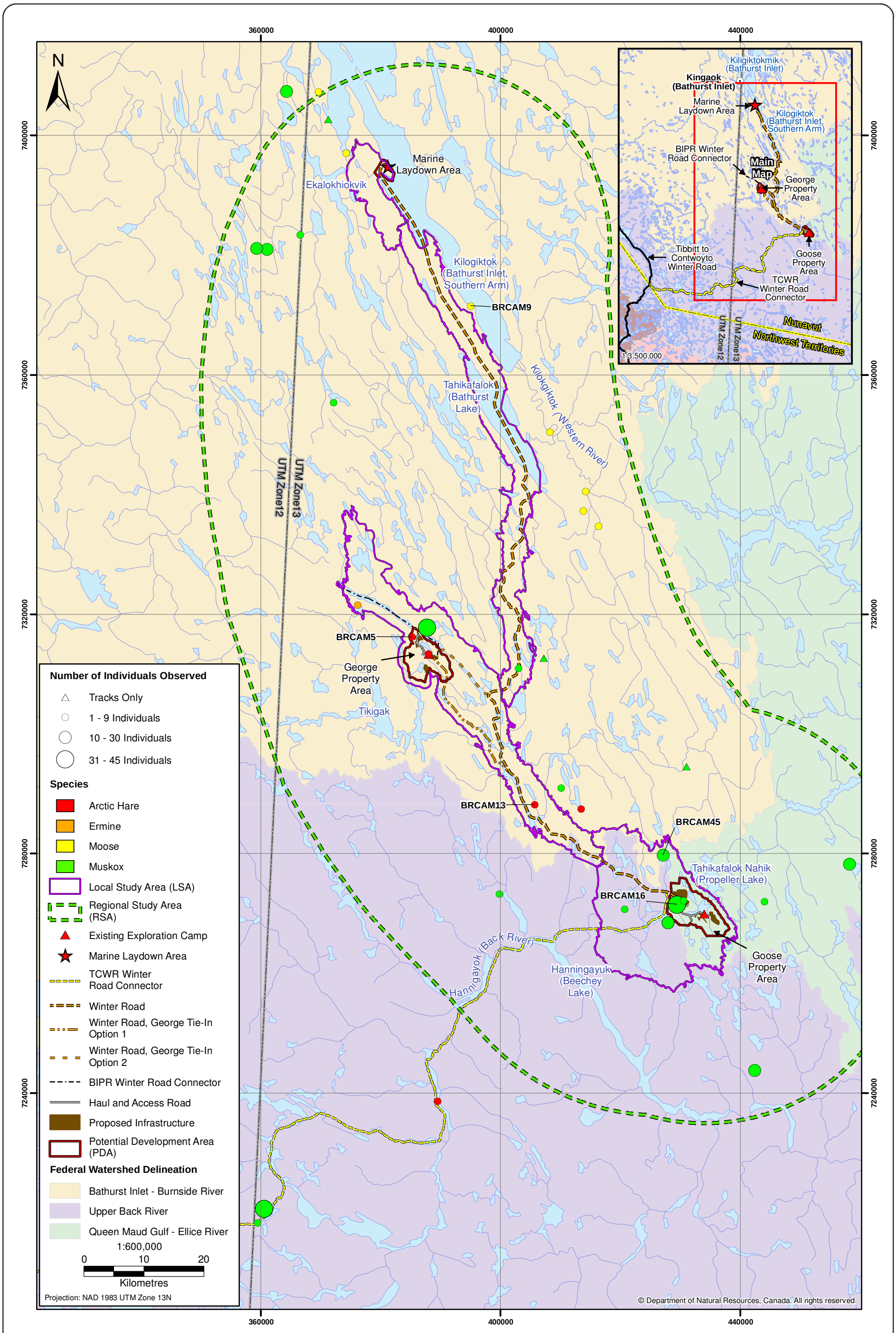


Figure 10.4-1

Sabina GOLD & SILVER CORP.

Incidental Observations of Mammals, 2013

Figure10.4-1

Rescan an ERM company

Eighteen observations of muskox groups or individuals were observed between early May and late August, 2013, and muskox tracks were observed in March 2013 during wolverine surveys. Eight of the incidental observations of muskox consisted of detections of one or two individuals, seven observations were of muskox groups consisting of 10 to 19 individuals, and two observations were of muskox groups with greater than 40 individuals. One to two calves were detected on three occasions in groups of muskox documented in July and August. One large group with 45 individuals was detected outside the RSA along the TCWR winter road connector in August; however, the majority of muskox observations were within the LSA (Figure 10.4-1). Two groups with at least 15 individuals including one to two calves were detected in the northern portion of the RSA (Plate 10.4-1). These two groups are most likely two separate observations of the same group due to similarities in group sizes and spatial distribution.

Small groups (9 to 14 individuals) of muskox were also detected incidentally at remote cameras 16 and 45 on four occasions between June and August 2013. Calves and gender of individuals could not be distinguished in the remote camera photos. The groups of muskox detected at camera 16 and 45 were typically grazing in tussock-shrub habitat adjacent to small lakes. These observations could potentially be of the same group detected multiple times as they had similar numbers of individuals counted at both cameras on the four occasions they were observed, and both cameras were located within 10 km of each other in the LSA (Figure 10.4-1; Plate 10.4-2).

Plate 10.4-1. Small group of muskox (n = 15) with two calves (red circles) observed grazing west of the MLA, August 26, 2013.

Plate 10.4-2. Group of muskox (n = 12) observed grazing at remote camera 16, July 20, 2013.

Moose were observed incidentally by field staff on four occasions along the northern portion of the Western River and on two occasions on the west side of the southern portion of Bathurst Inlet, and were detected at remote camera 9 on the west side of Bathurst Inlet, south of the MLA, on two occasions. Moose observed by field staff along the Western River and the western side of Bathurst Inlet occurred in tall riparian shrub habitat and occurred as single individuals (Plate 10.4-3) with the exception of one small group (n = 6) of moose observed in early-May (Plate 10.4-4) and one pair of moose observed in late-August. The two observations of moose (one bull in June and one cow in August) detected by a remote camera (camera 9) along Bathurst Inlet were in beach habitat with tall grass and shrubs (Plates 10.4-5 and 10.4-6).

Of the small mammals detected in the RSA, Arctic hare were primarily observed in May (Plate 10.4-7) and one observation of an ermine occurred in late August (Plate 10.4-8). The small mammal observations were typically in rocky-heath tundra or esker habitat in the LSA within 10 km of the George Property Area (Figure 10.4-1).

Plate 10.4-3. Solitary cow moose observed along the Western River, May 9, 2013.

Plate 10.4-4. Group of moose (n = 6) observed along the Western River in tall riparian shrub habitat, May 9, 2013.

Plate 10.4-5. Solitary bull moose observed at remote camera 9 along Bathurst Inlet, June 27, 2013.

Plate 10.4-6. Solitary cow moose observed at remote camera 9 along Bathurst Inlet, August 2, 2013.

10.5 DISCUSSION

Incidental observations of muskox, moose, and small mammals were recorded to document the presence and distribution of these species in the RSA. Four mammal species including Arctic hare, ermine, moose, and muskox, were observed incidentally in 2013. None of these species are species of conservation concern. Of the four mammal species recorded incidentally in the RSA, muskox were most frequently observed, followed by moose, and small mammals.

Both moose and muskox have been observed in the RSA previously - moose have been observed in 2012, and muskox have been observed in 2010, 2011, and 2012. Incidental observations in 2013 confirm that both these ungulate species have suitable early-spring, and summer foraging habitat within the RSA (Rescan 2012, 2013b). The timing of incidental observations coincides with the wildlife baseline field surveys, which were most often conducted in the spring and the summer so the number of observations collected during those seasons is reflective of surveyor effort and not seasonal abundance.

Plate 10.4-7. Arctic hare observed near George Property Area, May 10, 2013.

Plate 10.4-8. Ermine observed near George Property Area, August 28, 2013.

Groups of muskox consisting of between 7 and 45 individuals were observed during 2013 baseline studies in three general areas in the RSA including 1) in the northern portion of the RSA, near Bathurst Inlet, 2) in the central portion of the RSA near the George Property Area, and 3) in the southern portion of the RSA near Goose Property Area. Similarities in spatial distribution and group size of muskox observed within these three areas throughout the spring/summer field season suggest that there are likely three herds of muskox that frequent the RSA. Muskox herds typically consist of approximately 15 individuals (GN DOE 2006), although herd size tends to be larger in the winter (average of 28 individuals) relative to the summer (average of 12 individuals; Gunn and Fournier 2000)(average of 12 individuals; Gunn and Fournier 2000). Daily distance movements of muskox average approximately 2.6 km/day during the summer and are approximately half that distance during the winter (Reynolds 1998). Observations of groups of muskox recorded during the 2013 baseline studies are consistent with the locations where incidental sightings of groups of muskox were made in 2011 and 2012 (Rescan 2012, 2013b) and during aerial surveys conducted for ungulates in the RSA in 2010 (Rescan 2011). An additional group of muskox (n = 45) was observed during field studies conducted in 2013 southwest of the RSA along the TCWR connector, suggesting a fourth herd of muskox likely occurs in this area.

Although field surveys were not conducted during the winter (October through February), and muskox were not recorded by remote motion-triggered cameras left on the tundra in the RSA over winter, muskox tracks were observed in March suggesting that muskox use the RSA during the winter and early-spring, during the calving season which occurs from April to May (P. E. Reynolds 1998; NPC 2012). Overall, site fidelity is higher in the winter for areas that provide suitable winter forage conditions (D. C. Heard, Williams, and Melton 1996; NPC 2012). Muskox may be more sensitive to disturbance in late-winter as cow:calf displacement from winter range into areas of deeper snow may potentially increase mortality due to a greater expenditure of energy to locate food and a higher risk to predation (P. E. Reynolds 1998). Calves were recorded in the group of muskox observed near Bathurst Inlet and the large group of muskox observed near the TCWR connector road, southwest of the RSA. However, these observations were noted in July and August, suggesting that they were young of the year, and no sub-adults were recorded in any of the groups observed.

Moose were primarily observed along the northern portion of the Western River, and the western side of the southern portion of Bathurst Inlet between March and August, consistent with observations in 2012, indicating that these areas have high quality moose forage and cover habitat throughout most of the year. The Western River may be used as a travel corridor as moose have been documented moving

between tributary valleys, river islands, sandbars, along other river corridors such as the Mackenzie River (Jingfors, Bullion, and Case 1987). Radio-collared moose have also migrated along river valleys between the Arctic National Wildlife Refuge in Alaska and the Old Crow Flats in the Yukon travelling distances up to 196 km (Mauer 1998). Migratory behaviour in moose is apparently learned, as young individuals follow the movement patterns of their mothers, both in terms of seasonal home ranges and migration routes (Sweanor and Sandegren 1989). As a result, migratory movements often follow traditional routes, using the same migration corridor every year, but patterns of migration may vary from year to year, depending on extent and duration of snowfall (Bowyer, Ballenberghe, and Kie 2003). Moose have not been observed in other parts of the RSA, indicating that there may be less forage and cover habitat available in these areas.

There were very few observations of small mammals during baseline studies conducted in 2013; however, most observations occurred within the LSA, most likely due to a greater number of field crews working in these areas and reporting observations. In addition, small mammals are generally reclusive and their small size can limit detectability. Nevertheless, there is suitable habitat within the LSA and RSA to support many species of small mammals. For example, voles, lemmings, and shrews generally prefer wetter habitats with dwarf shrubs, such as tussock- or sedge-meadows, to provide sufficient cover and forage in the spring and summer. These habitats also tend to have deep snow cover in the winter providing thermal insulation and cover. Arctic ground squirrels generally prefer drier habitats with loose, sandy soil in which to dig burrows, and are often associated with esker habitat and/or abandoned wolf and fox dens. Arctic hares also generally prefer drier habitats, such as rocky heath tundra, and areas without deep snow cover. Weasels can often be found in both drier habitats, such as boulder fields or rocky heath tundra, and wetter habitats. They typically choose to den in dry, rocky areas but hunt for prey (e.g., small birds, voles, and lemmings) in the wetter habitats.

References

References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

1992a. *Canadian Environmental Assessment Act* SC. C. C. 37.

1992b. *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*, C. 52.

1993a. *Nunavut Land Claims Agreement Act*, C. 29.

1993b. *Nunavut Land Claims Agreement. Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada. May 25, 1993. Iqaluit, NT.*

1994a. *Canada Wildlife Act*, RS. C. 23. s. 2(F).

1994b. *Migratory Birds Convention Act*, SC. C. 22.

2002. *Species at Risk Act*, C. c.29, S-15.3.

2003. *Wildlife Act*, SNu. C. 26.

Adamczewski, J., J. Boulanger, B. Croft, H. D. Cluff, B. Elkin, J. Nishi, A. Kelly, A. D'Hont, and C. Nicolson. 2009. *Decline in the Bathurst Caribou Herd 2006-2009: A Technical Evaluation of Field Data and Modeling - DRAFT*. http://www.wrrb.ca/sites/default/files/public_registry/Technical%20Report%20of%20Bathurst%20herd%2017%20Dec%2009.pdf (accessed July 2012).

Alderfer, J. 2006. *Complete Birds of North America*. Washington, DC: National Geographic Society.

Angerbjörn, A., M. Tannerfeldt, A. Bjärvall, M. Ericson, J. From, and E. Noren. 1995. Dynamics of the Arctic fox population in Sweden. *Annales Zoologici Fennici*, 32: 55-68.

Angerbjörn, A., M. Tannerfeldt, and S. Erlinge. 1999. Predator-Prey Relationships: Arctic Foxes and Lemmings. *Journal of Animal Ecology*, 68 (1): 34-49.

Anthony, R. M., N. L. Barten, and P. E. Seiser. 2000. Foods of Arctic Foxes (Alopex lagopus) during Winter and Spring in Western Alaska. *Journal of Mammalogy*, 81 (3): 820-28.

Ashenhurst, A. R. and S. J. Hannon. 2008. Effects of seismic lines on the abundance of breeding birds in the Kendall Island Bird Sanctuary, Northwest Territories, Canada. *Arctic*, 61 (2): 190-98.

Banci, V. 1994. Wolverine. In *The Scientific Basis for Conserving Forest Carnivores: American marten, fisher, lynx, and wolverine in the Western United States*. Ed. L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski. 99-127. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 184. General Technical Report RM- 254.

Banci, V. and S. Moore. 1997. *1996 Wildlife Studies*. Prepared for BHP Diamonds Inc by Rescan Environmental Services Ltd: Yellowknife, NT.

Bart, J. 2006. The Program for Regional and International Shorebird Monitoring (PRISM) in North America. In *Waterbirds around the world*. Ed. C. A. G. G.C. Boere, D.A. Stroud. 701-04. Edinburgh, UK.: TSO Scotland Ltd.

Beaulieu, D. 2012. Dene traditional knowledge about caribou cycles in the Northwest Territories. *Rangifer*, 20: 59-67.

Bellrose, F. C. 1980. *The Ducks, Geese and Swans of North America*. Philadelphia, PA: Stackpole Books.

Bente, P. J. 2011. Abundance and multi-year occupancy of Gyrfalcons *Falco rusticolus* on the Seward Peninsula, Alaska. In *Gyrfalcons and Ptarmigan in a Changing World, Volume 1*. Ed. R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov. 296-306. Boise, Idaho: The Peregrine Fund.

Boonstra, R., C. J. Krebs, and N. C. Stenseth. 1998. Populations cycles in small mammals: the problems of explaining the low phase. *Ecology*, 79: 1479-88.

Both, C., C. A. M. van Turnhout, R. G. Bijlsma, H. Siepel, A. J. van Strien, and R. P. B. Foppen. 2010. Avian population consequences of climate change are most severe for long-distance migrants in seasonal habitats. *Proceedings of the Royal Society B-Biological Sciences*, 277 (1685): 1259-66.

Boulanger, J., A. Gunn, J. Adamczewski, and B. Croft. 2011. A Data-Driven Demographic Model to Explore the Decline of the Bathurst Caribou Herd. *Journal of Wildlife Management*, 75 (4): 883-96.

Boulanger, J., K. Poole, B. Fournier, J. Wierzchowski, T. Gaines, and A. Gunn. 2004. *Assessment of the Bathurst caribou movements and distribution in the Slave Geological Province*. NWT Resources, Wildlife and Economic Development. Manuscript Report No. 158: Yellowknife, NT.

Bowyer, R. T., V. V. Ballenberghe, and J. G. Kie. 2003. Moose. In *Wild Mammal of North America; Biology, Management and Conservation*. Ed. G. A. Feldhamer, B. Thompson, and J. Chapman. 931-64. Baltimore, Marylan: Johns Hopkins University Press.

Brown, S., J. Bart, R. B. Lanctot, J. A. Johnson, S. Kendall, D. Payer, and J. Johnson. 2007. Shorebird abundance and distribution on the coastal plain of the Arctic National Wildlife Refuge. p1-14. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Burnham, K. K., W. A. Burnham, and I. Newton. 2009. Gyrfalcon Falco rusticolus post-glacial colonization and extreme long-term use of nest-sites in Greenland. *Ibis*, 151: 514-22.

Cade, T. J. and D. N. Bird. 2011. Seasonal changes in diet of Gyrfalcons nesting at Ellesmere Island and other high Arctic locations. In *Gyrfalcons and Ptarmigan in a Changing World*. Ed. R. T. Watson, T. J. Cade, M. Fuller, G. Hunt, and E. Potapov. Boise, Idaho: The Peregrine Fund.

Campbell, M., J. Boulanger, D. S. Lee, M. Dumond, and J. McPherson. 2012. *Calving ground abundance estimates of the Beverly and Ahiak subpopulations of barren-ground caribou (Rangifer tarandus groenlandicus) - June 2011*. Department of Environment, Government of Nunavut: Arviat, Nunavut.

Canadian Wildlife Service. 1991. *Birds Protected in Canada Under the Migratory Birds Convention Act*.

Carrière, S. 1999. *Small Mammal Survey in the Northwest Territories*. Report No. 115. Wildlife and Fisheries Department of Resources, Wildlife and Economic Development, Government of Northwest Territories: Yellowknife, NWT.

Cavé, A. J. 1968. The breeding of the kestrel *Falco tinnunculus L.*, in the reclaimed area Oostelijk Flevoland. *Netherlands Journal of Zoology*, 18: 313-407.

CESCC. 2010. *Wild Species 2010: The General Status of Species in Canada*. Canadian Endangered Species Conservation Council. http://www.wildspecies.ca/searchtool.cfm?lang=e (accessed November 2011).

Chambers, S. M., S. R. Fain, B. Fazio, and M. Amaral. 2012. An Account of the Taxonomy of North American Wolves from Morphological and Genetic Analyses. *North American Fauna*, 77: 1-67.

Chen, W., L. White, J. Z. Adamczewski, B. Croft, D. E. Russell, A. Gunn, K. Garner, J. S. Pellissey, K. Clark, I. Olthof, R. Latifovic, G. L. Finstad, and R. G. White. submitted. Remotely sensed summer range indicators and their impacts on Bathurst caribou productivity. *Ecological Indicators*:

Cluff, H. D., L. R. Walton, and P. C. Paquet. 2002. *Movements and habitat use of wolves denning in the central Arctic, Northwest Territories and Nunavut, Canada*. Final report to the West Kitikmeot/Slave Study Society: Yellowknife, NT.

Colman, J. E., C. Pedersen, D. O. Hjermann, O. Holand, S. R. Moe, and E. Reimers. 2003. Do wild reindeer exhibit grazing compensation during insect harassment? *J Wildl Manag*, 67 (1): 11-19.

COSEWIC. 2004. *COSEWIC assessment and update status report on the Peary caribou (Rangifer tarandus pearyi) and the barren-ground caribou (Rangifer tarandus groenlandicus) (Dolphin and Union population) in Canada*. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

COSEWIC. 2012a. Canadian Wildlife Species at Risk. October 2012.

COSEWIC. 2012b. *COSEWIC assessment and update status report on the Grizzly Bear Ursus arctos in Canada*. 91. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

Couturier, S., S. D. Côté, R. D. Otto, R. B. Weladji, and J. Huot. 2009. Variation in Calf Body Mass in Migratory Caribou: The Role of Habitat, Climate, and Movements. *Journal of Mammalogy*, 90 (2): 442-52.

Cutler, T. L. and D. E. Swann. 1999. Using remote photography in wildlife ecology: a review. *Wildlife Society Bulletin*, 27 (3): 571-81.

CWS. 2010. *Arctic Program for Regional and International Shorebird Monitoring (Arctic PRISM)*. Survey Protocol Produced by the Canadian Wildlife Service. April 2010:

CWS and USFWS. 1987. *Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys in North America; revised*. United States Fish and Wildlife Service and Canadian Wildlife Service. Unpublished report.:

Cypher, B. 2003. Foxes (Vulpes species, Urocyon species, and Alopex lagopus). In *Wild Mammals of North America: Biology, Management, and Conservation*. Ed. G. A. Feldhamer, B. C. Thompson, and J. A. Chapman. 511-46. Baltimore, Maryland: Johns Hopkins University Press.

D'Hont, A., A. Gunn, J. Nagy, R. Popko, and A. Veitch. 2009. *Barren-ground Caribou Distribution in Late Winter 2004, Central NWT*. Department of Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 191: Yellowknife, NT.

Dickson, D. L. and H. G. Gilchrist. 2002. Status of marine birds of the southeastern Beaufort Sea. *Arctic*, 55: 46-58.

Dogrib Treaty 11 Council. 2001. *Caribou Migration and the State of Their Habitat. Final Report*. Prepared for West Kitikmeot Slave Study Society: Yellowknife, NT.

Eberhardt, L. E., R. A. Garrott, and W. C. Hanson. 1983. Den use by arctic foxes in northern Alaska. *Journal of Mammalogy*, 64: 97-102.

EDI, E. D. I. 2012. *Mary River Project Bird Baseline Report*. EDI Environmental Dynamics Inc.: Whitehorse, Yukon.

Environment Canada. 2000. *Terrestrial Ecozones and Ecoregions of Canada*. Environment Canada. www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taishdwe.cfm. (accessed November, 2011).

Environment Canada. 2004. *Protocol for Conducting Breeding Bird Surveys*. National Wildlife Research Centre. Canadian Wildlife Service: Ottawa, Ontario.

Feldhamer, G. A., B. C. Thompson, and J. Chapman. 2003. *Wild mammals of North America: biology, management, and conservation. Second Edition*. Baltimore, MD: John Hopkins University Press.

Ferguson, S. H. and P. D. McLoughlin. 2000. Effect of energy availability, seasonality, and geographic range on brown bear life history. *Ecography*, 23: 193-200.

Flanders, D., A. Gunn, P. Cizek, and D. Gladders. 2009. *Caribou Landscape Vulnerability Mapping Bathurst Inlet Port and Road*. Submitted to the Nunavut Impact Review Board as Part of the CARC Technical Presentation by the Canadian Arctic Resources Committee:

Frafjord, K. 2003. Ecology and use of Arctic fox *Alopex lagopus* dens in Norway: tradition overtaken by interspecific competition? *Biological Conservation*, 111: 445-53.

Frame, P. F., H. D. Cluff, and D. S. Hik. 2008. Wolf reproduction in response to caribou migration and industrial development on the central barrens of mainland Canada. *Arctic*, 61 (2): 134-42.

Franke, A., M. A. Setterington, G. S. Court, and D. Birkholz. 2010. Long-term trends of persistent organochlorine pollutants, occupancy and reproductive success in Peregrine falcons (*Falco peregrinus tundrius*) breeding near Rankin Inlet, Nunavut, Canada. *Arctic*, 63 (4): 442-50.

Fuller, T. K. 1989. Denning behaviour of wolves in north-central Minnesota. *American Midland Naturalist*, 121 (1): 184-88.

Gartner Lee Ltd. 2008. *Field Report - Back River Project: Wildlife and Wildlife Habitat*. Prepared for Dundee Precious Metals Inc. by Gartner Lee Limited: Burnaby, BC.

GN DOE. 2006. *Wildlife Fact Sheets Muskox Ovibos moschatus*. Government of Nunavut, Department of Environment. http://www.gov.nu.ca/env/muskox.pdf (accessed Januray 2013).

GNWT ENR. 2010. *NWT Barren-ground Caribou (Rangifer taradus groenlandicus). Government of the Northwest Territories Department of Environment and Natural Resources.* http://www.enr.gov.nt.ca/_live/pages/wpPages/caribou_information.aspx (accessed

GNWT ENR. 2011a. *NWT Species Monitoring Infobase v. 2011.* http://www.nwtspeciesatrisk.ca/tiki/tiki-index.php?page=Infobase (accessed November, 2011).

GNWT ENR. 2011b. *Our Wildlife: Beverly Caribou Herd*. Government of the Northwest Territories Department of Environment and Natural Resources. http://www.enr.gov.nt.ca/_live/pages/wpPages/Beverly_herd.aspx (accessed January 2012).

GNWT ENR. 2013a. *Our Wildlife: Bathurst Caribou Herd*. Government of the Northwest Territories Department of Environment and Natural Resources. http://www.enr.gov.nt.ca/_live/pages/wpPages/Bathurst_Caribou_Herd.aspx (accessed November 2013).

GNWT ENR. 2013b. *Our Wildlife: Beverly - Ahiak Caribou Herd*. Government of the Northwest Territories Department of Environment and Natural Resources. http://www.enr.gov.nt.ca/_live/pages/wpPages/Beverly-Ahiak.aspx (accessed November 2013).

Golder. 1998. *1997 Wildlife Monitoring Program - construction phase. NWT Diamonds Project, BHP.* Unpublished Report to BHP Diamonds Inc. by Golder Associates Ltd: Yellowknife, NT.

Gollop, J. B. and W. H. Marshall. 1954. A guide for aging duck broods in the field. 14 pp. http://www.npwrc.usgs.gov/resource/birds/ageduck/index.htm (accessed November, 2010).

Government of Canada. 2011. *Species at Risk Public Registry: Species Profile - Peregrine Falcon tundrius subspecies*. http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=289 (accessed January 2012).

Government of Canada. 2012. *Species at Risk Public Registry*. Environment Canada. www.sararegistry.gc.ca (accessed December 2012).

Government of Canada. 2013. *Species at Risk Public Registry, Species Profile, Northern Grey Wolf*. http://www.sararegistry.gc.ca/species/speciesDetails_e.cfm?sid=613 (accessed 19 November 2013).

Griffith, B., A. Gunn, and D. Russel. 2001. *Bathurst Caribou Calving Ground Studies: Influence of Nutrition and Human Activity on Calving Ground Location; and Influence of Parasites on Calving Ground Location. Final Report*. Prepared for West Kitikmeot Slave Study Society: Yellowknife, NT.

Gunn, A. 2005. *The Decline of Caribou on Northwest Victoria Island 1980-93*. Department of Environment and Natural Resources, Government of the Northwest Territories. File Report No. 133: Yellowknife, NT

Gunn, A., J. Boulanger, and J. Williams. 2005. *Calf Survival and Adult Sex Ratio in the Bathurst Herd of Barren-ground Caribou 2001 - 2004*. Department of Environment and Natural Resources, Government of the Northwest Territories. Manuscript No. 163: Yellowknife, NT.

Gunn, A., A. Buchan, B. Fournier, and J. Nishi. 1997. *Victoria Island Caribou Migrations across Dolphin and Union Strait and Coronation Gulf from the Mainland Coast, 1976-94*. Department of Environment and Resources, Wildlife and Economic Development, Government of the Northwest Territories. Manuscript Report No. 94: Yellowknife, NT.

Gunn, A. and A. D'Hont. 2002. *Extent of Calving for the Bathurst and Ahiak Caribou Herds June 2002*. Department of Resources, Wildlife and Economic Development. Manuscript Report No. 149: Yellowknife, NT.

Gunn, A., A. D'Hont, J. Williams, and J. Boulanger. 2008. *Satellite Collaring in the Bathurst Herd of Barren-ground Caribou 1996-2005*. Department of Environment and Natural Resources, Government of the Northwest Territories. Unpublished Manuscript Report: Yellowknife, NT.

Gunn, A., J. Dragon, and J. Boulanger. 2002. *Seasonal Movements of Satellite-Collared Caribou from the Bathurst Herd*. Final report prepared for the West Kitikmeot Slave Study Society: Yellowknife, NT.

Gunn, A. and B. Fournier. 2000. *Calf survival and seasonal migrations of a mainland muskox population*. File Report No.124. Department of Resources, Wildlife and Economic Development, Government of the Northwest Territories: Yellowknife, NT.

Gunn, A., B. Fournier, and J. Nishi. 2000. *Abundance and Distribution of the Queen Maud Gulf Caribou Herd, 1986 - 98*. Manuscript Report No. 126. Yellowknife, NT: Department of Resources, Wildlife and Economic Development.

Gunn, A., J. Nishi, J. Boulanger, and J. Williams. 2005. *An Estimate of Breeding Females in the Bathurst Herd of Barren-ground caribou, June 2003*. Department of Environment and Natural Resources, Government of the Northwest Territories. Manuscript Report No. 164: Yellowknife, NT.

Gunn, A., D. Russell, and J. Eamer. 2011. *Northern caribou population trends in Canada*. Canadian Biodiversity: Ecosystem Status and Trends 2010, Technical Thematic Report No. 10. Canadian Councils of Resource Ministers: Ottawa, ON.

Heard, D. C. and T. M. Williams. 1991. *Bathurst calving ground survey June 1986*. Department of Renewable Resources, Government of the Northwest Territories. Draft Report: Yellowknife, NT.

Heard, D. C. and T. M. Williams. 1992. Distribution of Wolf Dens on Migratory Caribou Ranges in the Northwest Territories, Canada. *Canadian Journal of Zoology*, 70 (8): 1504-10.

Heard, D. C., T. M. Williams, and D. A. Melton. 1996. The relationship between food intake and predation risk in migratory caribou and implications to caribou and wolf population dynamics. *Rangifer Special Issue*, 9: 37-44.

Helle, T. and L. Tarvainen. 1984. Effects of insect harassment on weight gain and survival in reindeer calves. *Rangifer*, 4: 24-27.

Hemson, G., P. Johnson, A. South, R. Kenward, R. Ripley, and D. McDonald. 2005. Are Kernels the Mustard? Data from Global Positioning System (GPS) Collars Suggests Problems for Kernel Home-Range Analyses with Least-Squares Cross-Validation. *Journal of Animal Ecology*, 74 (3): 455-63.

Hendrickson, C., G. Samelius, R. T. Alisauskas, and S. Lariviere. 2005. Simultaneous den use by Arctic foxes and wolves at a den site in Nunavut, Canada. *Arctic*, 58 (4): 418-20.

Hoyer, M. V. and D. E. J. Canfield. 1994. Bird abundance and species richness on Florida lakes: influence of trophic status, lake morphology, and aquatic macrophytes. *Hydrobiologia*, 297/280: 107-19.

Inman, R. M., A. J. Magoun, J. Persson, and J. Mattisson. 2012. The wolverine's niche: linking reproductive chronology, caching, competition, and climate. *Journal of Mammology*, 93 (3): 634-44.

Jingfors, K., R. Bullion, and R. Case. 1987 *Abundance and Population Composition of Moose Along the Mackenzie River, November 1984*. File Report No. 70. Department of Renewable Resources, Government of the Northwest Territories: Inuvik, NT.

Johnson, C. J., M. S. Boyce, R. L. Case, H. D. Cluff, R. J. Gau, A. Gunn, and R. Mulders. 2005. Cumulative effects of human developments on arctic wildlife. *Wildlife Monographs*, 160: 1-36.

Johnson, C. J. and M. P. Gillingham. 2005. An evaluation of mapped species distribution models used for conservation planning. *Environ Conservat*, 32 (2): 117-28.

Johnson, D., J. Nagy, and J. Williams. 2008. *Calving Ground Surveys of the Ahiak Herd of Barren Ground Caribou June 2006 - 2008*. Government of the Northwest Territories, Department of Environment and Natural Resources: Yellowknife, NT.

KIA. 2012. *Inuit Traditional Knowledge of Sabina Gold & Silver Corp., Back River (Hannigayok) Project, Naonaiyaotit Traditional Knowledge Project (NTKP)*. Prepared for Sabina Gold & Silver Corp. by Kitikmeot Inuit Association: Kugluktuk, NU.

Krebs, C. J. 1996. Population cycles revisited. *Journal of Mammalogy*, 77: 8-24.

Latour, P. B., J. Leger, J. E. Hines, M. L. Mallory, D. L. Mulders, H. G. Gilchrist, P. A. Smith, and D. L. Dickson. 2008. *Key Migratory Bird Terrestrial Habitat Sites in the Northwest Territories and Nunavut*. Canadian Wildlife Service Occasional Paper Number 114. Canadian Wildlife Service: Ottawa, ON.

Latour, P. B., C. S. Machtans, and G. W. Beyersbergen. 2005. Shorebird and passerine abundance and habitat use at a High Arctic breeding site: Creswell Bay, Nunavut. *Arctic*, 58 (1): 55-65.

Lee, J. and A. Niptanatiak. 1996. Observation of repeated use of a wolverine, *Gulo gulo*, den on the tundra of the Northwest Territories. *Canadian Field Naturalist*, 110: 349-50.

LeFranc Jr, M. N., M. B. Moss, K. A. Patnode, and W. C. Sugg III. 1987. *Grizzly Bear Compendium*. Washington, DC: Interagency Grizzly Bear Committee.

Liebezeit, J. R., S. J. Kendall, S. Brown, C. B. Johnson, P. Martin, T. L. McDonald, D. C. Payer, C. L. Rea, B. Streever, A. M. Wildman, and S. Zack. 2009. Influence of human development and predators on nest survival of tundra birds, Arctic Coastal Plain, Alaska. *Ecological Applications*, 19 (6): 1628-44.

Liebezeit, J. R., G. C. White, and S. Zack. 2011. Breeding ecology of birds at Teshekpuk Lake: A key habitat site on the Arctic coastal plain of Alaska. *Arctic*, 64 (1): 32-44.

MacKenzie, W. H. and J. R. Moran. 2004. *Wetlands of British Columbia. Land Management Handbook 52*. BC Ministry of Forests:

Magoun, A. J. and J. P. Copeland. 1998. Characteristics of wolverine reproductive den sites. *The Journal of Wildlife Management*, 62: 1313-20.

Matsuoka, S. M., D. Shaw, and J. A. Johnson. 2010. Estimating the abundance of nesting rusty blackbirds in relation to wetland habitats in Alaska. *Condor*, 112: 825-33.

Mauer, F. J. 1998. Moose migration: Northeastern Alaska to Northwestern Yukon Territory, Canada. *Alces*, 34 (1): 75-81.

May, R., L. Gorini, J. van Dijk, H. Broseth, J. D. C. Linnell, and A. Landa. 2012. Habitat characteristics associated with wolverine den sites in Norwegian multiple-use landscapes. *Journal of Zoology*, 287 (3): 195-204.

Mcintyre, C. L. and J. H. Schmidt. 2012. Ecological and environmental correlates of territory occupancy and breeding performance of migratory Golden Eagles *Aquila chrysaetos* in interior Alaska. *Ibis*, 154: 124-35.

McLaren, M. A. and W. G. Alliston. 1985. Effects of Ice and Snow on Waterfowl Distribution in the Central Canadian Arctic Islands. *Arctic*, 38 (1): 43-82.

McLoughlin, P. D., R. L. Case, R. J. Gau, H. D. Cluff, R. Mulders, and F. Messier. 2002. Hierarchical habitat selection by barren-ground grizzly bears in the central Canadian Arctic. p102-08. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

McLoughlin, P. D., H. D. Cluff, R. J. Gau, R. Mulders, R. L. Case, and F. Messier. 2003. Effect of spatial differences in habitat on home ranges of grizzly bears. *Ecoscience*, 10 (1): 11-16.

McLoughlin, P. D., H. D. Cluff, and F. Messier. 2002. Denning ecology of barren-ground grizzly bears in the central Arctic. *Journal of Mammalogy*, 83 (1): 188-98.

McLoughlin, P. D., S. H. Ferguson, and F. Messier. 2000. Intraspecific variation in home range overlap with habitat quality: a comparison among brown bear populations. *Evolutionary Ecology*, 14: 39-60.

McLoughlin, P. D., L. R. Walton, H. D. Cluff, P. C. Paquet, and M. A. Ramsay. 2004. Hierarchical Habitat Selection by Tundra Wolves. *Journal of Mammalogy*, 85 (3): 576-80.

Mech, L. D. 1995. A ten-year history of the demography and productivity of an Arctic wolf pack. *Arctic*, 48 (4): 329-32.

Mech, L. D. 2004. *Is climate change affecting wolf populations in the High Arctic?* Paper 71. USGS Northern Prairie Wildlife Research Center: Jamestown, North Dakota, USA.

Mech, L. D. 2006. *Wolves of the High Arctic - Research on the Arctic Wolves of Ellesmere Island, Blog Archive - Ellesmere Island Journal & Field Notes, October 31, 2006*. http://internationalwolfcenter.blogspot.ca/search?updated-min=2006-01-01T00:00:00-06:00&updated-max=2007-01-01T00:00:00-06:00&max-results=16 (accessed 21 November 2013).

Mech, L. D. 2007. Annual Arctic wolf pack size related to Arctic hare numbers. *Arctic*, 60 (3): 309-11.

Mech, L. D. 2013. *Pole to Pole Campaign, Arctic Species Factsheets, Arctic Wolf* http://www.poletopolecampaign.org/wp-content/uploads/2013/08/Factsheet-Arctic-wolf.pdf (accessed 19 November 2013).

Mueller, F. P. 1995. *Tundra esker systems and denning by grizzly bears, wolves, foxes, and ground squirrels in the central arctic, Northwest Territories*. Unpublished Manuscript, Department of Renewable Resources, Government of the Northwest Territories, File Report No. 115: Yellowknife, Northwest Territories.

Mulders, R. 2000. *Wolverine Ecology, Distribution, and Productivity in the Slave Geological Province*.

Nagy, J. A., D. L. Johnson, N. C. Larter, M. W. Campbell, A. E. Derocher, A. Kelly, M. Dumond, D. Allaire, and B. Croft. 2011. Subpopulation structure of caribou (Rangifer tarandus L.) in Arctic and Subarctic Canada. *Ecological Applications*, 21 (2334-2348):

NAS. 2013. *Greater Scaup Aythya marila*. Presented at National Audubon Society Inc., New York, NY.

National Geographic Society. 2002. *Field guide to the birds of North America*. 4th ed. Washington, DC: National Geographic Society.

NatureServe. 2011. *NatureServe Explorer. An online encyclopedia of life [web application]. Version 7.1*. Arlington, Virginia: NatureServe. www.natureserve.org/explorer (accessed Novemeber 2011).

Newton, I. 1979. *Population Ecology of Raptors*. Vermillion, South Dakota, USA: Buteo Books.

Nishi, J. and A. Gunn. 2004. *An Estimation of Herd Size for the Migratory Dolphin and Union Caribou Herd During the Rut (17 - 22 October 1997)*. Department of Environment and Resources, Wildlife and Economic Development. Government of the Northwest Territories. File Report No. 13: Yellowknife, NT.

Noel, L. E., M. K. Butcher, M. A. Cronin, and B. Streever. 2006. Assessment of effects of an oil pipeline on Caribou, Rangifer tarandus granti, use of riparian habitats in arctic Alaska, 2001-2003. *Canadian Field-Naturalist*, 120 (3): 323-30.

NPC. 2012. *Nunavut Land Use Plan: Draft - 2011/2012*. Nunavut Planning Commission: Cambridge Bay, NU.

NRC. 2007. *Forest Ecosystems of Canada*. Natural Resources Canada. http//ecosys.cfl.scf.rncan.gc.ca/classification/classif08-eng.asp (accessed October, 2010).

Nummi, P. and H. Poysa. 1993. Habitat associations of ducks during different phases of the breeding season. *Ecography*, 16 (4): 319-28.

Nunavut Development Corporation. 2010. *Nunavut Muskox*. http://www.nunavutmuskox.ca/ (accessed January 2013).

Paquette, C. and N. Ludwig. 2003. Gray Wolf. In *Wild Mammals of North America Biology, Management, and Conservation*. Ed. G. A. Feldhamer, B. C. Thompson, and J. A. Chapman. 482-510. Baltimore, MA: The Johns Hopkins University Press.

Persson, J. 2005. Female wolverine (*Gulo gulo*) reproduction: reproductive costs and winter food availability. *Canadian Journal of Zoology*, 83: 1453-59.

Poole, K. G. 2011. *Update on the Northwest Territories/Nunavut raptor database, January 2011*. Department of Environment Government of Nunavut and Department of Environment and Natural Resources Government of the Northwest Territories:

Poole, K. G. and R. G. Bromley. 1988a. Interrelationships within a raptor guild in the central Canadian Arctic. *Canadian Jounal of Zoology*, 66: 2275 - 82.

Poole, K. G. and R. G. Bromley. 1988b. Natural history of the Gyrfalcon in the central Canadian Arctic. *Arctic*, 41: 31-38.

Powell, R. A. 2000. Animal Home Ranges and Territories and Home Range Estimators. In *Research techniques in animal ecology: controversies and consequences*. Ed. L. Boitani and T. K. Fuller. New York, NY: Columbia University Press.

R Core Team. 2009. *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing.

Ralph, C. J., G. R. Geupel, P. Pyle, T. E. Martin, and D. E. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. US Forest Service Pacific Southwest Research Station General Technical Report PSW-GTR-144:

Reid, D. G., C. J. Krebs, and A. J. Kenney. 1997. Patterns of Predation on Noncyclic Lemmings. *Ecological Monographs*, 67 (1): 89-108.

Reid, F. A. 2006. *Mammals of North America*. 4 ed. New York, NY: Houghton Mifflin Company.

Rescan. 1995. *Baseline study updates: Ecological Mapping; Eskers, Carnivores and Dens*. Prepared for BHP Diamonds Inc. by Rescan Environmental Services Ltd.: Vancouver BC and Yellowknife NT.

Rescan. 2002. *Bathurst Inlet Port and Road Project: Wildlife Baseline Studies, 2001-2002*. Prepared for BIPR Joint Venture Ltd. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2007a. *2001-02 Wildlife Baseline Studies*. Prepared for the Bathurst Inlet Port and Road Project by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2007b. *Bathurst Inlet Port and Road Caribou and Muskox Baseline Study*. Prepared for the Bathurst Inlet Port and Road Project by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2007c. *Bathurst Inlet Port and Road Project: Wildlife Baseline Studies, 2001-2002*. Prepared for BIPR Joint Venture Ltd. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2007d. *BIPR Songbird and Shorebird Baseline Study*. Prepared for the Bathurst Inlet Port and Road Project by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2008a. *Hackett River Project: 2007 Wildlife Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd. March, 2008.:

Rescan. 2008b. *Hackett River Project: 2008 Wildlife Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd. November 2008.:

Rescan. 2011. *Back River and Hackett River Projects: 2010 Caribou and Muskox Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, British Columbia.

Rescan. 2012. *Back River Project: Wildlife Baseline Report 2011*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013a. *The Back River Project: Draft Environmental Impact Statement*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company: Vancouver, BC.

Rescan. 2013b. *Back River Project: Wildlife Baseline Report 2012*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013c. *Hackett River Project: Wildlife Baseline Report 2012*. Prepared for Xstrata Zine Canada by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2014a. *Back River Project Grizzly Bear and Wolverine DNA Report, 2013*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Ltd: Vancouver, BC (In Prep).

Rescan. 2014b. *Back River Project: Wildlife Baseline Report 2013*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC (In Prep).

Reynolds, H. V., J. A. Curatalo, and R. Quimby. 1976. Denning ecology of grizzly bears. in north-eastern Alaska. In *Bears, their biology and management*. Ed. M. R. Pelton, J. W. Lentfer, and G. W. Folk. 403-09. Morges, Switzerland: International Union for the Conservation of Nature and Natural Resources.

Reynolds, P. E. 1998. Dynamics and range expansion of a re-established muskox population. *Journal of Wildlife Management*, 62: 734-44.

RIC. 1999. *Inventory Methods for Forest and Grassland Songbirds. Standards for Components of British Columbia's Biodiversity No.15. Version 2*. Prepared by Ministry of Environment, Lands and Parks, Resources Inventory Branch for Terrestrial Ecosystem Task Force, Resources Inventory Committee (RIC): Victoria, BC.

Richards, J. and T. White. 2008. *Birds of Nunavut: A Checklist*. Yellowknife, NT.

Richardson, C. T. and C. K. Miller. 1997. Recommendations for Protecting Raptors from Human Disturbance: A Review. *Wildlife Society Bulletin*, 25 (3): 634-38.

Rodnikova, A., R. A. Ims, A. Sokolov, G. Skogstad, V. Sokolov, V. Shtro, and E. Fuglei. 2011. Red fox takeover of Arctic fox breeding den: an observation from Yamal Peninsula, Russia. *Polar Biology*, 34: 1609-14.

Russell, D. E., G. Kofinas, and B. Griffith. 2002. *Barren-Ground Caribou Calving Ground Workshop Report of Proceedings*. Canadian Wildlife Service. Technical Report Series Number 390.: Ottawa, Ontario.

Seaman, D. E. and R. A. Powell. 1996. An evaluation of the accuracy of kernel density estimators for home range analysis. p2075-85. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Selas, V. and J. A. Kalas. 2007. Territory occupancy rate of goshawk and gyrfalcon: no evidence of delayed numerical response to grouse numbers. *Oecologia*, 153: 555-61.

Servheen, C. and M. Cross. 2010. *Climate Change Impacts on Grizzly Bears And Wolverines in the Northern U.S. and Transboundary Rockies: Strategies for Conservation*. Workshop Summary Report: September 13-15, 2010. U.S. Fish and Wildlife Service & Wildlife Conservation Society: Fernie, BC.

Sibley, D. A. 2000. *The Sibley Guide to Birds*. New York: National Audubon Society. Chanticleer Press, Inc.

Smits, C. M. M., C. A. S. Smith, and B. G. Slough. 1988. Physical characteristics of Arctic fox (Alopex lagopus) dens in northern Yukon Territory, Canada. *Arctic*, 41 (1): 12-16.

Sovada, M. A., R. M. Anthony, and B. D. J. Batt. 2001. Predation of waterfowl in Arctic tundra and Prairie breeding areas: a review. *Wildlife Society Bulletin*, 29 (1): 6-15.

Steenhof, K. 1987. Assessing raptor reproductive success and productivity. In *Raptor management techniques manual*. Ed. B. A. Giron Pendleton, B. A. Millsap, K. W. Cline, and D. M. Bird. 157-70. Washington, DC: National Wildlife Federation.

Steenhof, K., M. N. Kochert, L. B. Carpenter, and R. N. Lehman. 1999. Long-term Prairie Falcon population changes in relation to prey abundance, weather, land uses and habitat conditions. p28-41. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Steenhof, K. and I. Newton. 2007. Assessing nesting success and productivity. In *Raptor research and management techniques*. Ed. D. M. Bird and K. L. Bildstein. 181-91. Surrey, BC: Hancock House.

Strand, O., A. Landa, J. D. C. Linnell, B. Zimmermann, and T. Skogland. 2000. Social Organization and Parental Behavior in the Arctic Fox. *Journal of Mammalogy*, 81 (1): 223-33.

Strong, W. and S. C. Zoltai. 1989. *Ecoclimatic regions of Canada: first approximation*. Ecoregions Working Group of the Canada Committee on Ecological Land Classification. Ecological Land Classification and Sustainable Development Branch, Canadian Wildlife Service, Environment Canada: Ottawa, ON.

Sutherland, M. and A. Gunn. 1996. *Bathurst calving ground surveys, 1965-1996*. Department of Environment and Resources, Wildlife and Economic Development, Government of the Northwest Territories. File Report No. 118.: Yellowknife, NT.

Sweanor, P. Y. and F. Sandegren. 1989. Winter-Range Philopatry of Seasonally Migratory Moose. *Journal of Applied Ecology*, 26: 25-33.

Szor, G., D. Berteaux, and G. Gauthier. 2008. Finding the right home: distribution of food resources and terrain characteristics influence selection of denning sites and reproductive dens in arctic foxes. *Polar Biology*, 31: 351-62.

Tarroux, A., D. Berteaux, and J. Bety. 2010. Northern nomads: ability for extensive movements in adult arctic foxes. *Polar Biology*, 33 (8): 1021-26.

Theuerkauf, J., S. Rouys, and W. Jedrzeiewski. 2003. Selection of den, rendezvous, and resting sites by wolves in the Bialowieza Forest, Poland. *Canadian Jounal of Zoology*, 81 (1): 163-67.

Thorpe, N. L., N. Eyegetok, N. Hakongak, and Qitirmuit Elders. 2001. *The Tuktu and Nogak Project: a caribou chronicle*. Final Report of the West Kitikmeot Slave/Study Society: Yellowknife, NT.

Vors, L. S. and M. S. Boyce. 2009. Global declines of caribou and reindeer. *Global Change Biology*, 15 (11): 2626-33.

Walton, L. R., H. D. Cluff, P. C. Paquet, and M. A. Ramsay. 2001. Movement patterns of barren-ground wolves in the Central Canadian Arctic. *Journal of Mammalogy*, 82 (3): 867-76.

White, R. G. 1983. Foraging patterns and their multiplier effects on productivity of northern ungulates. *Oikos*, 40: 377-84.

Wild Species. 2005. http://www.wildspecies.ca/wildspecies2005/search.cfm?lang=e&sec=9 (Wild Species 2005 The General Status of Species in Canada: General Status Search Tool accessed

Wilson, R. R., A. K. Prichard, L. S. Parrett, B. T. Person, G. M. Carroll, M. A. Smith, C. L. Rea, and D. A. Yokel. 2012. Summer Resource Selection and Identification of Important Habitat Prior to Industrial Development for the Teshekpuk Caribou Herd in Northern Alaska. *Plos One*, 7 (11):

Witter, L. A., C. J. Johnson, B. Croft, A. Gunn, and M. P. Gillingham. 2012. Behavioural trade-offs in response to external stimuli: time allocation of an Arctic ungulate during varying intensities of harassment by parasitic flies. *Journal of Animal Ecology*, 81: 284-95.

Worton, B. J. 1989. Kernel Methods for Estimating the Utilization Distribution in Home-Range Studies. p164-68. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Zalatan, R., A. Gunn, and G. H. R. Henry. 2006. Long-term abundance patterns of barren-ground caribou using trampling scars on roots of Picea mariana in the Northwest Territories, Canada. *Arctic, Antarctic and Alpine Research*, 38: 624-30.

Appendix 4-1

Territorial, Federal, and International Conservation Statuses and Definitions

Rescan™
an ERM company

Appendix 4-1. Territorial, Federal, and International Conservation Statuses and Definitions

CESCC Conservation Statuses and Definitions (for Nunavut)

Rank	General Status	Definition
0.2	Extinct	Species that are extirpated worldwide (i.e., they no longer exist anywhere).
0.1	Extirpated	Species that are no longer present in a given geographic area, but occur in other areas.
1	At Risk	Species for which a formal assessment (i.e., COSEWIC, Nunavut assessment body) has been completed and that were determined to be at risk of extirpation or extinction.
2	May Be At Risk	Species that may be at risk of extirpation or extinction and are therefore candidates for a detailed risk assessment by COSEWIC or the Nunavut assessment body.
3	Sensitive	Species that are not believed to be at risk of immediate extirpation or extinction but may require special attention or protection to prevent them from becoming at risk.
4	Secure	Species that are not believed to belong in the categories Extinct, Extirpated, At Risk, May Be At Risk, Sensitive, Accidental or Exotic.
5	Undetermined	Species for which insufficient data, information, or knowledge is available with which to reliably evaluate their general status.
6	Not accessed	Species that are known or believed to be present regularly in the geographic area in Canada to which the rank applies, but have not yet been assessed by the general status program.
7	Exotic	Species that have been moved beyond their natural range as a result of human activity.
8	Accidental/Vagrant	Species occurring infrequently and unpredictably, outside their usual range.

Source: CESCC (2011).

Federal Conservation Statuses and Definitions

COSEWIC		
Status		Definition
E:	Endangered	A species facing imminent extirpation or extinction
T:	Threatened	A species that is likely to become endangered if limiting factors are not reversed
SC:	Special Concern	A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events
NAR:	Not at Risk	A species that has been evaluated and found not to be at risk
DD:	Data Deficient	A species for which there is insufficient scientific information to support status designation
SARA		
Schedule		Definition
1:		Protected under SARA as of proclamation in June 2003. These species were assessed by COSEWIC using the revised assessment criteria. The list classifies the species as either being extirpated, endangered, threatened, or a special concern.
2 and 3:		Assessed prior to October 1999 and require re-assessment using the revised criteria, after which the Governor in Council may, on the recommendation of the Minister, add the species to the Federal List of Wildlife Species at Risk.

Source: COSEWIC (2010); Government of Canada (2010a).

International Conservation Statuses and Definitions

NatureServe (global rank)		
Rank		Definition
G#G#:	Range Rank	A numeric range rank (e.g., G2G3) is used to indicate the range of uncertainty about the status of the species or community
G2:	Imperilled	At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors
G3:	Vulnerable	At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors
G4:	Apparently Secure	Uncommon but not rare; some cause for long-term concern due to declines or other factors
G5:	Secure	Common; widespread, and abundant
T:	Infraspecific Taxon (trinomial)	The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank; e.g., the global rank of a critically imperilled subspecies of an otherwise widespread and common species would be G5T1
IUCN		
Category		Definition
EX:	Extinct	Species where there is no reasonable doubt that the last individual has died
EW:	Extinct in the Wild	Species only known to survive in cultivation, in captivity, or as a naturalized population (or populations) well outside the past range
CR:	Critically Endangered	Species considered to be facing an extremely high risk of extinction in the wild, with high population declines over the last 10 years and extremely small ranges and population size
EN:	Endangered	Species considered to be facing an extremely high risk of extinction in the wild, with moderate to high population declines over the last 10 years and small ranges and population size
VU:	Vulnerable	Species considered to be facing an extremely high risk of extinction in the wild, with moderate population declines over the last 10 years and small to moderate ranges and population size
NT:	Near Threatened	Species that has been evaluated and does not currently qualify for Critically Endangered, Endangered, or Vulnerable categories, but is close to qualifying for or is likely to qualify for a threatened category (CR, EN, or VU) in the near future
LC:	Least Concern	Species that has been evaluated and does not qualify for any of the above categories and is widespread and abundant
DD:	Data Deficient	Species for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status
NE:	Not Evaluated	Species that has not yet been evaluated against the IUCN criteria

Source: IUCN (2001); NatureServe (2011b).

Appendix 4-2

Potentially Occurring Wildlife Species in the Back River Terrestrial and Marine Study Areas

Rescan™
an ERM company

Appendix 4-2. Potentially Occurring Wildlife Species in the the Back River Terrestrial and Marine Study Areas

Common Name	Scientific Name	Group	Likelihood of Occurrence	Detected during Baseline Studies	Presence Relative to Study Area	Proposed Project			Conservation Status				
						Southern Arctic	Northern Arctic	Arctic Ocean	Terr. Rank	COSEWIC	SARA	Global Rank	IUCN Red List
Birds													
Yellow-billed loon	*Gavia adamsii*	Waterbird	L	Y	Breeder	X	X		Secure	NAR		G4	Least Concern
Pacific loon	*Gavia pacifica*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Red-throated loon	*Gavia stellata*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Greater white-fronted goose	*Anser albifrons*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Canada goose	*Branta canadensis*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Cackling goose	*Branta hutchinsii*	Waterbird	L	N	Seasonal Migrant	X	X		Secure			G5	Least Concern
Tundra swan	*Cygnus columbianus*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Northern pintail	*Anas acuta*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Common eider	*Somateria mollissima*	Marine Bird/Seabird	L	Y	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
King eider	*Somateria spectabilis*	Marine Bird/Seabird	L	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Black (American) scoter	*Melanitta americana*	Waterbird	L	Y	Seasonal Migrant	X			Undetermined			G5	Least Concern
White-winged scoter	*Melanitta fusca*	Waterbird	L	N	Breeder	X			Undetermined			G5	Least Concern
Surf scoter	*Melanitta perspicillata*	Waterbird	L	Y	Breeder				Undetermined			G5	Least Concern
Long-tailed duck	*Clangula hyemalis*	Waterbird	L	Y	Breeder	X	X		Sensitive			G5	Least Concern
Red-breasted merganser	*Mergus serrator*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Golden eagle	*Aquila chrysaetos*	Raptor	L	Y	Breeder	X			Sensitive	NAR		G5	Least Concern
Rough-legged hawk	*Buteo lagopus*	Raptor	L	Y	Breeder	X	X		Sensitive	NAR		G5	Least Concern
Northern harrier	*Circus cyaneus*	Raptor	L	Y	Breeder	X			Undetermined	NAR		G5	Least Concern
Peregrine falcon	*Falco peregrinus*	Raptor	L	Y	Breeder	X	X		Secure	TH/SC	1/3	G4	Least Concern
Gyrfalcon	*Falco rusticolus*	Raptor	L	Y	Resident	X	X		Sensitive	NAR		G5	Least Concern
Willow ptarmigan	*Lagopus lagopus*	Upland Breeding Bird	L	Y	Resident	X	X		Secure			G5	Least Concern
Rock ptarmigan	*Lagopus muta*	Upland Breeding Bird	L	N	Resident	X	X		Secure			G5	Least Concern
Sandhill crane	*Grus canadensis*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
American golden plover	*Pluvialis dominica*	Shorebird	L	Y	Breeder	X	X		Sensitive			G5	Least Concern
Semipalmated plover	*Charadrius semipalmatus*	Shorebird	L	Y	Breeder				Secure			G5	Least Concern
Least sandpiper	*Calidris minutilla*	Shorebird	L	Y	Breeder	X			Sensitive			G5	Least Concern
Baird's sandpiper	*Calidris bairdii*	Shorebird	L	N	Breeder	X	X		Secure			G5	Least Concern
Semipalmated sandpiper	*Calidris pusilla*	Shorebird	L	Y	Breeder	X	X		Sensitive			G5	Least Concern
White-rumped sandpiper	*Calidris fuscicollis*	Shorebird	L	N	Breeder/Seasonal Migrant	X	X		Secure			G5	Least Concern
Pectoral sandpiper	*Calidris melanotos*	Shorebird	L	N	Breeder/Seasonal Migrant	X	X		Secure			G5	Least Concern
Red-necked phalarope	*Phalaropus lobatus*	Shorebird	L	N	Breeder	X	X		Sensitive			G4G5	Least Concern
Wilson's snipe	*Gallinago delicata*	Shorebird	L	Y	Breeder	X			Undetermined			G5	Least Concern
Long-tailed jaeger	*Stercorarius longicaudus*	Marine Bird/Seabird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Parasitic jaeger	*Stercorarius parasiticus*	Marine Bird/Seabird	L	N	Breeder	X	X		Secure			G5	Least Concern
Herring gull	*Larus argentatus*	Waterbird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Glaucous gull	*Larus hyperboreus*	Waterbird	L	Y	Breeder	X	X		Sensitive			G5	Least Concern
Arctic tern	*Sterna paradisaea*	Marine Bird/Seabird	L	Y	Breeder	X	X		Sensitive			G5	Least Concern
Short-eared owl	*Asio flammeus*	Raptor	L	Y	Breeder	X			Sensitive	SC	3	G5	Least Concern
Snowy owl	*Nyctea scandiaca*	Raptor	L	Y	Seasonal Migrant	X	X		Secure	NAR		G5	Least Concern
Common raven	*Corvus corax*	Raptor	L	Y	Resident	X	X		Secure			G5	Least Concern
Horned lark	*Eremophila alpestris*	Upland Breeding Bird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Gray-cheeked thrush	*Catharus minimus*	Upland Breeding Bird	L	N	Breeder	X			Undetermined			G5	Least Concern
American pipit	*Anthus rubescens*	Upland Breeding Bird	L	N	Breeder	X	X		Sensitive			G5	Least Concern
American tree sparrow	*Spizella arborea*	Upland Breeding Bird	L	Y	Breeder	X			Sensitive			G5	Least Concern
Savannah sparrow	*Passerculus sandwichensis*	Upland Breeding Bird	L	Y	Breeder	X			Secure			G5	Least Concern
White-crowned sparrow	*Zonotrichia leucophrys*	Upland Breeding Bird	L	Y	Breeder	X			Sensitive			G5	Least Concern
Harris's sparrow	*Zonotrichia querula*	Upland Breeding Bird	L	Y	Breeder	X			Sensitive			G5	Least Concern
Lapland longspur	*Calcarius lapponicus*	Upland Breeding Bird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Smith's longspur	*Calcarius pictus*	Upland Breeding Bird	L	N	Breeder	X			Secure			G5	Least Concern
Snow bunting	*Plectrophenax nivalis*	Upland Breeding Bird	L	N	Breeder	X	X		Sensitive			G5	Least Concern
Common redpoll	*Carduelis flammea*	Upland Breeding Bird	L	Y	Breeder	X	X		Secure			G5	Least Concern
Hoary redpoll	*Carduelis hornemanni*	Upland Breeding Bird	L	Y	Breeder/Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Common loon	*Gavia immer*	Waterbird	P	N	Breeder	X	X		Secure	NAR		G5	Least Concern
Horned grebe	*Podiceps auritus*	Waterbird	P	N	Breeder	X			Undetermined	SC		G5	Least Concern

Appendix 4-2. Potentially Occurring Wildlife Species in the the Back River Terrestrial and Marine Study Areas

Common Name	Scientific Name	Group	Likelihood of Occurrence	Detected during Baseline Studies	Presence Relative to Study Area	Proposed Project			Conservation Status				
						Southern Arctic	Northern Arctic	Arctic Ocean	Terr. Rank	COSEWIC	SARA	Global Rank	IUCN Red List
Birds *(cont.)*													
Brant	*Branta bernicla*	Waterbird	P	Y	Seasonal Migrant	X	X		Secure			G5	Least Concern
Snow goose	*Chen caerulescens*	Waterbird	P	Y	Seasonal Migrant	X	X		Secure			G5	Least Concern
Ross's goose	*Chen rosii*	Waterbird	P	N	Seasonal Migrant	X			Secure			G4	Least Concern
Mallard	*Anas platyrhynchos*	Waterbird	P	Y	Breeder	X			Undetermined			G5	Least Concern
Gadwall	*Anas strepera*	Waterbird	P	N	Breeder				Accidental			G5	Least Concern
Northern Shoveler	*Anas clypeata*	Waterbird	P	Y	Breeder	X			Undetermined			G5	Least Concern
American green-winged teal	*Anas crecca*	Waterbird	P	Y	Breeder	X			Undetermined			G5	Least Concern
Blue-winged teal	*Anas discors*	Waterbird	P	N	Breeder				Accidental			G5	Least Concern
Greater scaup	*Aythya marila*	Waterbird	P	Y	Breeder	X			Secure			G5	Least Concern
Common goldeneye	*Bucephala clangula*	Waterbird	P	N	Breeder				Undetermined			G5	Least Concern
Bald eagle	*Haliaeetus leucocephalus*	Raptor	P	Y	Breeder	X			Undetermined	NAR		G5	Least Concern
Black-bellied plover	*Pluvialis squatarola*	Shorebird	P	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Lesser yellowlegs	*Tringa flavipes*	Shorebird	P	N	Breeder	X			Undetermined			G5	Least Concern
Whimbrel	*Numenius phaeopus*	Shorebird	P	N	Seasonal Migrant	X			Sensitive			G5	Least Concern
Hudsonian godwit	*Limosa haemastica*	Shorebird	P	N	Seasonal Migrant	X			Undetermined			G4	Least Concern
Ruddy turnstone	*Arenaria interpres*	Shorebird	P	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Red knot	*Calidris canutus*	Shorebird	P	N	Seasonal Migrant	X	X		At Risk	EN/SC		G4	Least Concern
Sanderling	*Calidris alba*	Shorebird	P	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Dunlin	*Calidris alpina*	Shorebird	P	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Stilt sandpiper	*Calidris himantopus*	Shorebird	P	N	Seasonal Migrant	X			Secure			G5	Least Concern
Buff-breasted sandpiper	*Tryngites subruficollis*	Shorebird	P	N	Seasonal Migrant	X			Sensitive			G4	Near threatened
Long-billed dowitcher	*Limnodromus scolopaceus*	Shorebird	P	N	Seasonal Migrant	X			not ranked			G5	Least Concern
Red phalarope	*Phalaropus fulicaria*	Shorebird	P	N	Seasonal Migrant	X	X		Sensitive			G5	Least Concern
Pomarine jaeger	*Stercorarius pomarinus*	Marine Bird/Seabird	P	N	Seasonal Migrant	X	X		Secure			G5	Least Concern
Mew gull	*Larus canus*	Waterbird	P	N	Breeder	X			Undetermined			G5	Least Concern
Thayer's gull	*Larus thayeri*	Waterbird	P	N	Breeder		X		Sensitive			G5	Least Concern
Sabine's gull	*Xema sabini*	Waterbird	P	N	Breeder	X	X		Secure			G5	Least Concern
Thick-billed murre	*Uria lomvia*	Marine Bird/Seabird	P	N	Breeder	X	X		Secure			G5	Least Concern
American robin	*Turdus migratorius*	Upland Breeding Bird	P	Y	Breeder	X			Secure			G5	Least Concern
Cliff swallow	*Petrochelidon phyrrhonota*	Upland Breeding Bird	P	N	Breeder	X			Undetermined			G5	Least Concern
Yellow warbler	*Setophaga petechia*	Upland Breeding Bird	P	Y	Breeder	X			Undetermined			G5	Least Concern
Lincoln's sparrow	*Melospiza lincolnii*	Upland Breeding Bird	P	N	Breeder				Undetermined			G5	Least Concern
Red-necked grebe	*Podiceps grisegena*	Waterbird	U	N	Breeder	X			Accidental	NAR		G5	Least Concern
Northern fulmar	*Fulmarus glacialis*	Marine Bird/Seabird	U	N	Seasonal Migrant		X		Sensitive			G5	Least Concern
American wigeon	*Anas americana*	Waterbird	U	Y	Breeder				Undetermined			G5	Least Concern
Lesser scaup	*Aythya affinis*	Waterbird	U	N	Breeder				Undetermined			G5	Least Concern
Bufflehead	*Bucephala albeola*	Waterbird	U	N	Breeder				Undetermined			G5	Least Concern
Eskimo curlew	*Numenius borealis*	Shorebird	U	N	Seasonal Migrant	X			At Risk	EN	1	GH	Critically endangered
Purple sandpiper	*Calidris maritima*	Shorebird	U	N	Seasonal Migrant		X		Secure			G5	Least Concern
Ross's gull	*Rhodostethia rosea*	Waterbird	U	N	Breeder	X	X		At Risk	TH	1	G3G4	Least Concern
Iceland gull	*Larus glaucoides*	Waterbird	U	N	Seasonal Migrant		X		Secure			G5	Least Concern
Ivory gull	*Pagophila eburnea*	Waterbird	U	N	Seasonal Migrant		X		At Risk	EN	1	G5	Near threatened
Black-legged kittiwake	*Rissa tridactyla*	Waterbird	U	N	Breeder		X		Secure			G5	Least Concern
Dovekie	*Alle alle*	Marine Bird/Seabird	U	N	Breeder	X	X		Sensitive			G5	Least Concern
Black guillemot	*Cepphus grylle*	Marine Bird/Seabird	U	N	Breeder	X	X		Secure			G5	Least Concern
Great horned owl	*Bubo virginianus*	Raptor	U	N	Resident	X			Undetermined			G5	Least Concern
Northern hawk owl	*Surnia ulula*	Raptor	U	N	Resident	X			Undetermined	NAR		G5	Least Concern
Northern shrike	*Lanius excubitor*	Upland Breeding Bird	U	N	Breeder	X			Undetermined			G5	Least Concern
Bohemian waxwing	*Bombycilla garrulus*	Upland Breeding Bird	U	N	Breeder	X			Accidental			G5	Least Concern
Northern wheatear	*Oenanthe oenanthe*	Upland Breeding Bird	U	N	Seasonal Migrant		X		Sensitive			G5	Least Concern
European starling	*Sturnus vulgaris*	Upland Breeding Bird	U	N	Breeder	X			Exotic			G5	Least Concern
Orange-crowned warbler	*Oreothlypis celata*	Upland Breeding Bird	U	N	Breeder				Accidental			G5	Least Concern
Blackpoll warbler	*Setophaga striata*	Upland Breeding Bird	U	N	Breeder	X			Undetermined			G5	Least Concern
Wilson's warbler	*Cardellina pusilla*	Upland Breeding Bird	U	N	Vagrant	X			Undetermined			G5	Least Concern

Appendix 4-2. Potentially Occurring Wildlife Species in the the Back River Terrestrial and Marine Study Areas

Common Name	Scientific Name	Group	Likelihood of Occurrence	Detected during Baseline Studies	Presence Relative to Study Area	Proposed Project			Conservation Status				
						Southern Arctic	Northern Arctic	Arctic Ocean	Terr. Rank	COSEWIC	SARA	Global Rank	IUCN Red List
Birds *(cont.)*													
Rusty blackbird	*Euphagus carolinus*	Upland Breeding Bird	U	N	Breeder	X			Undetermined	SC	1	G4	Least Concern
Dark-eyed junco	*Junco hymemalis*	Upland Breeding Bird	P	Y	Breeder/Seasonal Migrant	X			Undetermined	NAR		G5	Least Concern
Mammals													
Grey wolf	*Canis lupus*	Carnivore	L	Y	Resident	X	X		Secure	NAR		G4	Least Concern
Wolverine	*Gulo gulo*	Carnivore	L	Y	Resident	X	X		Secure	SC		G4	Vulnerable
Grizzly bear	*Ursus arctos*	Carnivore	L	Y	Resident	X	X		Sensitive	SC		G4	Least Concern
Arctic fox	*Vulpes lagopus*	Carnivore	L	Y	Resident	X	X		Secure			G5	Least Concern
Red fox	*Vulpes vulpes*	Carnivore	L	Y	Resident	X	X		Secure			G5	Least Concern
Ermine	*Mustela erminea*	Furbearer	L	Y	Resident	X	X		Secure			G5	Least Concern
Nearctic collared lemming	*Dicrostonyx groenlandicus (Dicrostonyx kilangmiutak)*	Small mammal	L	N	Resident	X	X		Secure			G5	Least Concern
Nearctic brown lemming	*Lemmus trimucronatus*	Small mammal	L	N	Resident	X	X		Secure			G5	Least Concern
Arctic hare	*Lepus arcticus*	Small mammal	L	Y	Resident	X	X		Secure			G5	Least Concern
Root vole (Tundra vole)	*Microtus oeconomus*	Small mammal	L	N	Resident	X			Undetermined			G5	Least Concern
Meadow vole	*Microtus pennsylvanicus*	Small mammal	L	N	Resident	X			Secure			G5	Least Concern
Taiga vole (Chestnut-cheeked vole)	*Microtus xanthognathus*	Small mammal	L	N	Resident	X			not ranked			G5	Least Concern
Northern red-backed vole	*Myodes rutilus*	Small mammal	L	N	Resident	X	X		Secure			G5	Least Concern
Barren ground shrew	*Sorex ugyunak*	Small mammal	L	N	Resident	X			Undetermined			G5	Least Concern
Arctic ground squirrel	*Spermophilus parryii*	Small mammal	L	Y	Resident	X	X		Secure			G5	Least Concern
Muskox	*Ovibos moschatus*	Ungulate	L	Y	Resident	X	X		Secure			G4	Least Concern
Barrenground caribou (except Dolphin-union population)	*Rangifer tarandus groenlandicus*	Ungulate	L	Y	Resident/Seasonal Migrant	X			Secure			G5TNR	Least Concern
Bearded seal	*Erignathus barbatus*	Marine Mammal	L	N	Resident			X	Undetermined	NAR		G4G5	Least Concern
Ringed seal	*Pusa hispida*	Marine Mammal	L	Y	Resident			X	Secure	NAR		G5	Least Concern
Least weasel	*Mustela nivalis*	Furbearer	P	N	Resident	X			Secure			G5	Least Concern
American mink	*Neovison vison*	Furbearer	P	N	Resident	X			Undetermined			G5	Least Concern
Richardson's collared lemming	*Dicrostonyx richardsoni*	Small mammal	P	N	Resident	X	X		Secure			G4?	Least Concern
Arctic shrew	*Sorex arcticus*	Small mammal	P	N	Resident	X			not ranked			G5	Least Concern
Moose	*Alces americanus*	Ungulate	P	Y	Resident	X			Secure			G5	Least Concern
Barrenground caribou (Dolphin union population)	*Rangifer tarandus groenlandicus x pearyi (R. t. pearyi x groenlandicus)*	Ungulate	P	N	Seasonal Migrant	X	X		not ranked	SC	1	G5TNR	not ranked
Beluga	*Delphinapterus leucas*	Marine Mammal	P	N	Seasonal Migrant			X	Sensitive/Secure			G4	Vulnerable
Narwhal	*Monodon monoceros*	Marine Mammal	P	N	Seasonal Migrant				Sensitive	SC		G4	Data Deficient
Polar bear	*Ursus maritimus*	Carnivore	U	N	Resident	X	X		Sensitive	SC	1	G3	Vulnerable
Beaver	*Castor canadensis*	Furbearer	U	N	Resident	X			Undetermined			G5	Least Concern
North American river otter	*Lontra canadensis*	Furbearer	U	N	Resident	X			Sensitive			G5	Least Concern
Canadian lynx	*Lynx canadensis*	Furbearer	U	N	Resident	X			Undetermined	NAR		G5	Least Concern
American marten	*Martes americana*	Furbearer	U	N	Resident	X			Secure			G5	Least Concern
Snowshoe hare	*Lepus americanus*	Small mammal	U	N	Resident	X			Sensitive			G5	Least Concern
Tundra shrew	*Sorex tundrensis*	Small mammal	U	N	Resident	X			not ranked			G5	Least Concern
Peary caribou	*Rangifer tarandus pearyi*	Ungulate	U	N	Seasonal Migrant		X		not ranked	EN	1	G5TNR	Endangered
Bowhead whale	*Balaena mysticetus*	Marine Mammal	U	N	Seasonal Migrant			X	Sensitive	SC	1/2	G3TNR	Least Concern
Walrus	*Odobenus rosmarus*	Marine Mammal	U	N	Seasonal Migrant			X	Sensitive	SC		G4TNR	Least Concern
Harp seal	*Phoca groenlandica*	Marine Mammal	U	N	Seasonal Migrant			X	Secure			G5	Least Concern
Little brown myotis	*Myotis lucifugus*	Bat	U	N	Breeder				Sensitive	EN		G5	Least Concern
Long-legged myotis	*Myotis volans*	Bat	U	N	Breeder				not ranked			G5	Least Concern
Western long-eared myotis	*Myotis evotis*	Bat	U	N	Breeder				not ranked			G5	Least Concern
Eastern red bat	*Lasiurus borealis*	Bat	U	N	Seasonal Migrant				Undetermined			G5	Least Concern
Hoary bat	*Lasiurus cinereus*	Bat	U	N	Breeder				Undetermined			G5	Least Concern
Northern myotis	*Myotis septentrionalis*	Bat	U	N	Breeder				not ranked	EN		G4	Least Concern

Appendix 5-1

Codes for Breeding Status during Occupancy Survey, 2013

Rescan™
an ERM company

Appendix 5-1. Codes for Breeding Status during Occupancy Survey, 2013

Evidence of Breeding	Occupancy	Code	Definition	Required Observations
Increasing Evidence of Breeding	Occupied Breeding	OB	A raptor nest at which a breeding pair is laying or incubating eggs, or, attending young.	1) an adult in incubation posture on a nest, OR, 2) egg(s) or live chick(s) in the nest and at least one attending adult.
	Occupied Pair	O2	A raptor nest site at which a raptor pair was observed, but no nest with eggs or young was observed. Either nest was not detected, or, female had not yet begun egg-laying. Important to check for recent nest construction for stick nesters as a recently-constructed but empty nest indicates egg-laying has not begun yet. The latter is more likely for peregrine falcons. Observations of young (and their age) during the productivity survey will determine whether the nest was not detected, or whether egg-laying had not yet begun.	1) Two raptors of the same species observed in relatively close proximity at or near a nest site, AND, 2) Nest with eggs or young was not observed, AND OPTIONALLY: 3) A newly-constructed nest or newly-refurbished nest.
	Occupied One Adult	O1	A raptor nest site at which only one adult was observed, no nest with eggs or young was observed, but other evidence of breeding was observed. Other evidence of breeding supports that the site is occupied by a pair, but that the other pair member was likely hunting (or was present but not detected).	1) One raptor adult, AND, 2) Nest with eggs or young was not observed, AND, 3) Fresh (reddish bits) prey remains (indicates courtship feeding), and for stick nesters, a recently-constructed stick nest (has green vegetation).
	Possible Attempt	PA	A raptor nest site at which no adults but recent signs of raptors attempting to breed were observed. Raptors do not initiate incubation until the penultimate eggs is laid. Therefore, observations of an egg without attending adults may mean the female is in the process of egg-laying. One or both adults may have been present, but were not detected, or both may have been absent from the site. Alternatively, these observations may represent a failed breeding attempt. There is no way to know without re-visiting the nest.	1) No adults, AND, and at least one of: 2) Egg(s) in nest, 3) Recently-constructed or recently-refurbished nest.
No Evidence of Breeding	Unoccupied One Adult	U1	A raptor nest site at which only one adult was observed, and no other evidence of breeding was observed. No other evidence of breeding suggests that the lone adult is a non-breeding 'floater', and thus this nest site should not be classified as 'occupied' (unless proven otherwise during productivity survey).	1) One raptor adult, AND, 2) Nest with eggs or young was not observed, AND, 3) No fresh (reddish bits) prey remains (indicates courtship feeding), or for stick nesters, no recently-constructed stick nests (no green vegetation).
	Unoccupied Inactive	UIA	A raptor nest site at which no adults and no recent evidence of breeding were observed.	1) No adults, AND, 2) No fresh signs (reddish prey remains, no green vegetation on nests). Additional observations: - Old nests – flat, sticks loose, brown vegetation - Fallen down nests - Snow covering the nest site

Appendix 5-2

Codes for Breeding Status during Productivity Survey, 2013

Rescan™
an ERM company

Appendix 5-2. Codes for Breeding Status during Productivity Survey, 2013

Relative Certainty of Breeding Productivity	Productivity Status	Code	Definition	Required Observations
Confirmed	Breeding	B	The nest of a breeding pair of raptors that has produced at least one live chick of any age	At least one live chick in nest, or at least one fledgling near nest.
	Productive	P	The nest of a breeding pair of raptors that has produced at least one live chick (80% fledging age).	At least one live chick in nest, or at least one fledgling near nest.
	Failed	F	The nest of a breeding pair of raptors that failed to produce live chicks.	1) No attending adults, AND one of: 2) Egg(s) and/or dead chick(s) in nest that was productive during occupancy survey, OR, 3) Empty nest of any species except gyrfalcons and common ravens that was productive during the occupancy survey.
Assumed	Empty, Assumed Fledged	EAP	A empty gyrfalcon or common raven nest that was productive during the occupancy survey at which signs of fledging were observed during the productivity survey. Fledging must be possible based on time since observations made during the occupancy survey.	1) An empty nest that contained live eggs or chicks during the occupancy survey, AND: 2) Fledging is possible based on timing, AND, 3) Abundant accumulation of poop and prey remains around and in nest. **For gyrfalcon and common raven only.
	Empty, Assumed Failed	EAF	A empty gyrfalcon or common raven nest that was productive during the occupancy survey at which fledging was not possible, or at which it was but there were no signs of fledging.	1) An empty nest that contained live eggs or chicks during the occupancy survey, AND, 2) Fledging is not possible based on timing, OR, 3) Fledging is possible based on timing, but low accumulation of poop and prey remains around and in nest. **For gyrfalcon and common raven only.
	Assumed Failed	AF	A raptor nest site at which adult raptors and signs of breeding were observed during the occupancy survey but nests were not found ('occupied pair', 'occupied one adult'), at which no signs of successful breeding were observed during the productivity survey.	1) No attending adults, AND, 2) No live or dead eggs or chicks observed (any newly-constructed nests checked and found empty). **For 'occupied pair', and 'occupied one adult' nest sites only.
	Possible Attempt, Assumed Failed	PAF	A raptor nest site at which no adults but signs of attempted breeding were observed during the occupancy survey ('possible attempt') for which no signs of successful breeding were observed during the productivity survey.	1) No attending adults, AND, 2) No live or dead eggs or chicks observed (any newly-constructed nests checked and found empty).
Confirmed Non-Breeding	Unoccupied, Non-Breeder	UNB	A raptor nest site at which one adult raptor was observed during the occupancy survey but no other signs of breeding ('unoccupied adult') at which no signs of breeding were observed during the productivity survey.	Confirmation of no signs of breeding.

Appendix 5-3

Raptor Occupancy and Productivity Data, 2013

Rescan™
an ERM company

Appendix 5-3. Raptor Occupancy and Productivity Data, 2013

				Occupancy Survey - 2013							Occupancy Survey - 2013							Nest Habitat					HistoricalNest Site Occupancy and Productivity										
Nest Site	Nest ID	LAT_N83	LONG_N83	Date	Species Code	Species Common Name	Occupancy Status	No. Adults Present	No. Eggs Present	No. Young Present	Date	Species	Status	Adults Present	Dead Eggs Present	Dead Young Present	Live Young Present	Substrate	Overhang (%)	Nest Ht (m)	Cliff Ht (m)	Aspect	Nest Site	2002 Species	2002 Status	2007 Species	2007 Status	2008 Species	2008 Status	2011 Species	2011 Status	2012 Species	2012 Status
4	19	65.54632816	-106.4825312	21-May-13	CORA	Common Raven	O2	2			21-Jul-13	CORA	AF					RS	20	6	12	N	4			PEFA	OB			GYRF	OB		
5	wpt1-2013	65.5445500	-106.4932300	21-May-13	GYRF	Gyrfalcon	O2	2			21-Jul-13	GYRF	EAF					SN	0	5	7	SW											
6	20	65.57015958	-106.1463897	21-May-13	UNK	Unknown	UIA				27-Jul-13		UIA					HS	0	12	16	E				PEFA	OB				PEFA	O2
7	24	65.58041075	-106.1647354	21-May-13	GYRF	Gyrfalcon	OB	2	YES		27-Jul-13	GYRF	F			1		GS	0	14	20	W				GOEA	OB			GYRF	O2	RLHA	OB
8	WPT2-2013;G01	65.5965200	-106.1904800	21-May-13	CORA	Common Raven	OB	1	Yes		27-Jul-13	CORA	EAP					RS	5	7	14	W											
10	300	65.61823625	-106.2046865	21-May-13	UNK	Unknown	UIA				27-Jul-13		UIA					GL	0	5	20	W										PEFA	O2
12	50	65.67386049	-106.2814147	21-May-13	PEFA	Peregrine Falcon	O2	2			21-Jul-13	PEFA	B	1			4						12			PEFA	O1			PEFA	O1	PEFA	O2
13	51	65.67540787	-106.2842508	21-May-13	UNK	Unknown	UIA				27-Jul-13		UIA					HS	100	8	12	E								RLHA	O2		UIA
14	54	65.68477194	-106.306294	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA					HS	0	7	10	E				RLHA	OB						UIA
15	55	65.68961343	-106.3140351	21-May-13	UNK	Unknown	UIA				27-Jul-13		UIA					HS												RLHA	O2		UIA
16	56	65.68990471	-106.3089561	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA					DL	50	10	14	SW				PEFA	OB						
17	G04	65.6915600	-106.3171800	21-May-13	CORA	Common Raven	OB	0	4		21-Jul-13	CORA	EAF					RS	50	17	20	NNE										PEFA	O2
26	74	65.74406815	-106.3718857	21-May-13	GYRF	Gyrfalcon	OB	2	Yes		21-Jul-13	GYRF	EAF					GS	100	20	35	E	26			PEFA	O1			GYRF	OB	GYRF	OB
26	77	65.75232608	-106.3828977	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA						0	0	0	E		PEFA	OB	PEFA	O2						
27	78	65.7598557	-106.5294042	21-May-13	GYRF	Gyrfalcon	OB	2	4		21-Jul-13	GYRF	EAF																				UIA
27	303	65.77030127	-106.5168089	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA					SN	30	30	37	NW										GYRF	O1
28	WPT012-2013	65.7598600	-106.5344800	21-May-13	CORA	Common Raven	OB	1	2		21-Jul-13	CORA	EAF					RS	0	17	25	SW											
30	80	65.7629887	-106.394374	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA					GS	0	7	12	E				GOEA	OB						
33	88	65.77431652	-106.0515317	not checked	UNK	Unknown	UNK				27-Jul-13	RLHA	B	0			4																
34	90	65.77608675	-106.409228	21-May-13	UNK	Unknown	UIA				21-Jul-13		UIA					SN												GYRF	OB		UIA
35	92	65.79310262	-106.4709965	21-May-13	GOEA	Golden Eagle	OB	1	Yes		21-Jul-13	GOEA	P	0			2	GS	75	14	35	NE					UIA			GOEA	OB	GOEA	OB
41	305	65.81142	-106.77444	26-May-13	PEFA	Peregrine Falcon	O1	1			21-Jul-13	PEFA	B	1			3	GL	0	10	15	W											
43	307	65.82436655	-106.4720163	25-May-13	GYRF	Gyrfalcon	OB	1	3		19-Jul-13	GYRF	EAP					SN	50	12	24	NE									GYRF	OB	OB
45	309	65.83375446	-106.4830412	25-May-13	UNK	Unknown	UIA				19-Jul-13		UIA					RS	50	20	30	NE									CORA	OB	
45	28-2013	65.8171200	-106.4785900	25-May	CORA	Common Raven	OB	1	YES		19-Jul-13	CORA	EAP	1				RS	70	8	15	N											
48	310	65.84973331	-106.7489198	26-May-13	PEFA	Peregrine Falcon	O1	1			21-Jul-13	PEFA	B	2	1		2	DL	0	12	24	E											
52	312	65.86034582	-106.7587169	26-May-13	PEFA	Peregrine Falcon	OB	1	4		21-Jul-13	PEFA	AF	1				SN	20	8	25	W											
54	315	65.8916773	-106.7803968	26-May	PEFA	Peregrine Falcon	O1	1			21-Jul-13	PEFA	UNB	2				DL	8	15	20	SW											
56	316	65.90099983	-106.698209	26-May-13	GOEA	Golden Eagle	O1	1			21-Jul-13	GOEA	UNB					GS	100	20	35	W											
67	134	65.93332792	-107.3750953	25-May-13	RLHA	Rough-legged Hawk	O2	2				RLHA	not checked					RS	100	8	12	W					UIA					CORA	OB
68	134	65.93332792	-107.3750953	25-May-13	PEFA	Peregrine Falcon	O2	2				PEFA	not checked					RS	100	8	12	W	68				UIA						
72	322	65.94043901	-106.7154468	26-May-13	CORA	Common Raven	OB	1	Yes		27-Jul-13	CORA	F			1		RS	100	25	40	SE											UIA
91	328	66.05937773	-106.8087298	25-May-13	GOEA	Golden Eagle	OB	1	Yes		19-Jul-13	GOEA	P	1			1	GS	100	740	850	W											UIA
106	292	66.11015257	-106.8744812	25-May-13	CORA	Common Raven	OB	1	YES		19-Jul-13	CORA	EAP																				
107	50-2013	66.1164600	-106.8649700	25-May	GYRF	Gyrfalcon	OB	2	0	2	19-Jul-13	GYRF	F			1		DL	0	9	13	SE										GYRF	OB
107	289	66.11315834	-106.8715815	21-May	UNK	Unknown	UIA																										
142	218	66.39461388	-107.5759982	26-May-13	RLHA	Rough-legged Hawk	O1	1			27-Jul-13	RLHA	UNB					HS	0	5	8	W					UIA						
143	221	66.40570357	-107.5535635	26-May-13	UNK	Unknown	UIA				27-Jul-13							HS	0	5	8	W				RLHA	OB						
144	224	66.41337725	-107.5726852	26-May-13	RLHA	Rough-legged Hawk	OB	1	Yes		19-Jul-13	RLHA	B	1			3	HS	75	5	12	SW		RLHA	OB		UIA						
144	225	66.41350611	-107.5827879	26-May-13	UNK	Unknown	UIA											HS	0	6	8	SW				RLHA	OB						
145	222	66.40599196	-107.5528374	26-May-13	UNK	Unknown	UIA											DL	0	7	8	SE		PEFA	OB		UIA						
145	223	66.40777944	-107.5588005	26-May-13	UNK	Unknown	UIA																										
146	226	66.41928233	-107.663208	26-May-13	UNK	Unknown	UIA				27-Jul-13							HS						RLHA	OB								
147	229	66.42793979	-107.6077529	25-May-13	RLHA	Rough-legged Hawk	OB	1	1			RLHA	not checked					HS	0	12	17	SE		RLHA	OB	RLHA	OB						
148	231	66.4332475	-107.6233016	25-May-13	PEFA	Peregrine Falcon	O2	2				PEFA	not checked					HS	0	14	16	SW	148	PEFA	OB	PEFA	O1						
149	233	66.43502398	-107.6802957	25-May-13	UNK	Unknown	UIA											HS	80	10	14	W		PEFA	OB		UIA						
149	235	66.44303036	-107.6817171	25-May-13	UNK	Unknown	UIA											GL	0	10	12	SW				PEFA	OB						
150	238	66.4583867	-107.4532285	25-May-13	UNK	Unknown	UIA											GS	0	30	60	S				GOEA	OB						
151	240	66.46349388	-107.720722	25-May-13	UNK	Unknown	UIA											SN	0	6	12	E		PEFA	OB	PEFA	O2	PEFA	O2				
152	241	66.47150663	-107.6799452	25-May-13	GYRF	Gyrfalcon	O1	1			19-Jul-13	GYRF	not checked															GYRF	O1				
152	249	66.4845304	-107.6717246	25-May-13	UNK	Unknown	UIA				19-Jul-13																						
153	244	66.48047575	-107.6594247	25-May-13	PEFA	Peregrine Falcon	O2				27-Jul-13	PEFA	B	2			3	GL					153	PEFA	O1		UIA						
153	242	66.47763666	-107.6616612	25-May-13	UNK	Unknown	UIA				27-Jul-13							GL										PEFA	O1				
154	248	66.48361025	-107.6544884	25-May-13	UNK	Unknown	UIA				19-Jul-13							HS	100	12	20	N		RLHA	OB	RLHA	OB						
155	243	66.47968845	-107.6609131	25-May-13	UNK	Unknown	UIA				19-Jul-13							HS	0	5	15	N		RLHA	OB	RLHA	OB			RLHA	O1		
156	250	66.49436	-107.64532	25-May-13	UNK	Unknown	UIA				19-Jul-13		UIA					HS	0	5	6	NW				RLHA	OB						
157	254	66.51945899	-107.5711725	25-May-13	GYRF	Gyrfalcon	O1	1			27-Jul-13	GYRF	UNB					HS	0	6	10	E											
158	258	66.53254003	-107.6290701	25-May-13	GOEA	Golden Eagle	O1	1				GOEA	not checked					GS	0	18	30	W				GOEA	OB						
159	263	66.56301452	-107.6205916	25-May-13	PEFA	Peregrine Falcon	O2	2			19-Jul-13	PEFA	B	2			4	RS	100	10	14	S		CORA	B	PEFA	OB						
161	264	66.56912453	-107.9075905	25-May-13	PEFA	Peregrine Falcon	O1	1			19-Jul-13	PEFA	UNB					DL	10	13	17	E											

Appendix 5-3. Raptor Occupancy and Productivity Data, 2013

				Occupancy Survey - 2013							Occupancy Survey - 2013							Nest Habitat					HistoricalNest Site Occupancy and Productivity											
Nest Site	Nest ID	LAT_N83	LONG_N83	Date	Species Code	Species Common Name	Occupancy Status	No. Adults Present	No. Eggs Present	No. Young Present	Date	Species	Status	Adults Present	Dead Eggs Present	Dead Young Present	Live Young Present	Substrate	Overhang (%)	Nest Ht (m)	Cliff Ht (m)	Aspect	Nest Site	2002 Species	2002 Status	2007 Species	2007 Status	2008 Species	2008 Status	2011 Species	2011 Status	2012 Species	2012 Status
162	'4-2013; 15 2013I	65.3495700	-106.3624100	26-May	PEFA	Peregrine Falcon	O1	1			21-Jul-13	PEFA	B	1			3	GL	10	20	22	S											
163	77-2013	65.3506500	-106.2429400	26-May	RLHA	Rough-legged Hawk	OB	2	1		21-Jul-13	RLHA	AF					HS	8	8	25	S											
164	70-2014	65.3695300	-106.4479700	26-May	GYRF	Gyrfalcon	OB	1	Yes		21-Jul-13	GYRF	EAP					SN	40	20	37	SE											
165	WPT007-2013	65.7088300	-106.3326000	21-May-13	GYRF	Gyrfalcon	O2	2			21-Jul-13	GYRF	EAF					SN	5	6	9	NE											
167	wpt16-2013	65.8163600	-107.2846900	not checked	UNK	Unknown	UNK				15-Jul-13	RLHA	B	1			3	HS	0	20	30	W											
170	33-2013	65.9082100	-106.5957100	25-May	GOEA	Golden Eagle	OB	1	YES		19-Jul-13	GOEA	AF					GS	10	8	12	E											
171	36-2013	65.9291500	-106.6264800	25-May	GOEA	Golden Eagle	OB	0	1		19-Jul-13	GOEA	AF					GS	0	7	18	E											
172	43-2013	66.0239700	-106.7891300	25-May	CORA	Common Raven	OB	2	YES		19-Jul-13	CORA	EAF					RS	40	15	33	S											
174	205-2013	66.6030600	-107.8479700	20-Jun	RLHA	Rough-legged Hawk	OB	1	3		19-Jul-13	RLHA	B	0			4	HS	0	7	7	E											
175	211-1	66.6299500	-107.8705800	20-Jun	RLHA	Rough-legged Hawk	OB	1	Yes		19-Jul-13	RLHA	B	0			4	HS	0	11	16	SW											
176	212-1	66.6348500	-107.8530700	20-Jun	RLHA	Rough-legged Hawk	O2	2			19-Jul-13	RLHA	AF					HS	30	17	19	N											
177	218-1	66.7044300	-107.9877400	20-Jun	PEFA	Peregrine Falcon	OB	1	Yes		19-Jul-13	PEFA	B	1			4	DL	0	16	30	S											
178	97-2013	66.7450800	-107.8306000	19-Jun	RLHA	Rough-legged Hawk	OB	2	Yes		19-Jul-13	RLHA	AF					HS	0	10	18	W											
179	101-2013	66.7537800	-107.8420600	19-Jun	PEFA	Peregrine Falcon	OB	1	4		19-Jul-13	PEFA	B	1			4	HS	0	15	30	W											
180	103-2013	66.7559200	-107.8443900	19-Jun	CORA	Common Raven	OB	0	0	3	19-Jul-13	CORA	EAP					RS	10	45	50	W											

Appendix 5-4

Incidental Observations of Wildlife, 2013

Rescan™
an ERM company

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Carnivores													
wolverine DNA survey	19-Mar-13	13	433922	7269928	Wolverine	*Gulo gulo*	GUGU				1	1	
wolverine DNA survey	20-Mar-13	13	433922	7269928	Grey wolf	*Canis lupus*	CALU				2	2	
wolverine DNA survey	20-Mar-13	13	398399	7302906	Red fox	*Vulpes vulpes*	VUVU				1	1	
wolverine DNA survey	23-Mar-13	13	431012	7294564	Red fox	*Vulpes vulpes*	VUVU				1	1	
wolverine DNA survey	23-Mar-13	13	413017	7307304	Red fox	*Vulpes vulpes*	VUVU				1	1	
wolverine DNA survey	29-Mar-13	13	433922	7269928	Red fox	*Vulpes vulpes*	VUVU				1	1	
remote camera survey	7-May-13	13	382844	7386953	Red fox	*Vulpes vulpes*	VUVU				1	1	
remote camera survey	9-May-13	13	388646	7313312	Red fox	*Vulpes vulpes*	VUVU				1	1	
remote camera survey	9-May-13	13	433922	7269928	Wolverine	*Gulo gulo*	GUGU				1	1	
remote camera survey	10-May-13	13	409241	7291261	Grizzly bear	*Ursus arctos*	URAR		1	2		3	
remote camera survey	13-May-13	13	380286	7282194	Red fox	*Vulpes vulpes*	VUVU				1	1	
remote camera survey	13-May-13	13	388030	7313325	Wolverine	*Gulo gulo*	GUGU				1	1	
remote camera survey	13-May-13	13	388030	7313325	Grey wolf	*Canis lupus*	CALU				2	2	
remote camera survey	13-May-13	13	380331	7282017	Red fox	*Vulpes vulpes*	VUVU				1	1	
remote camera survey	7-May-13	13	455771	7286111	Grey wolf	*Canis lupus*	CALU				2	2	
wolverine DNA survey	26-Apr-13	13	384391	7391933	Wolverine	*Gulo gulo*	GUGU				1	1	
raptor occupancy survey	25-May-13	13	428445	7309641	Grizzly bear	*Ursus arctos*	URAR				1	1	
raptor occupancy survey	25-May-13	13	415635	7330540	Grizzly bear	*Ursus arctos*	URAR				1	1	
raptor/den occupancy survey	26-May-13	13	424050	7310192	Grizzly bear	*Ursus arctos*	URAR				2	2	
den occupancy survey	23-May-13	13	399897	7303734	Grey wolf	Canis lupus	CALU				1	1	
grizzly bear DNA survey	23-May-13	13	434449	7280931	Grey wolf	*Canis lupus*	CALU				1	1	
raptor occupancy survey	21-May-13	13	439022	7287485	Wolverine	*Gulo gulo*	GUGU				1	1	
raptor occupancy survey	21-May-13	13	436609	7293060	Grizzly bear	*Ursus arctos*	URAR				1	1	
den occupancy survey	26-May-13	13	390679	7310095	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	27-May-13	13	392836	7302582	Red fox	*Vulpes vulpes*	VUVU				1	1	
grizzly bear DNA survey	28-May-13	13	408786	7350108	Grey wolf	*Canis lupus*	CALU				6	6	
grizzly bear DNA survey	29-May-13	13	406572	7315895	Grizzly bear	*Ursus arctos*	URAR		1	1		2	
grizzly bear DNA survey	30-May-13	13	382627	7350376	Grizzly bear	*Ursus arctos*	URAR			2		2	
waterbird spring staging survey	23-May-13	13	388518	7383225	Grizzly bear	*Ursus arctos*	URAR				1	1	
grizzly bear DNA survey	11-Jun-13	13	393252	7302146	Unknown Fox	*Vulpes spp.*	UNVU				1	1	
breeding bird survey	18-Jun-13	13	370537	7410038	Red fox	*Vulpes vulpes*	VUVU				1	1	
waterbird spring pair survey	19-Jun-13	13	396877	7374075	Grizzly bear	*Ursus arctos*	URAR				1	1	
waterbird spring pair survey	19-Jun-13	13	384733	7397538	Grizzly bear	*Ursus arctos*	URAR				1	1	
den occupancy survey	19-Jun-13	13	381353	7394780	Grey wolf	*Canis lupus*	CALU				1	1	Nest
breeding bird survey	14-Jun-13	13	379795	7396371	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	11-Jun-13	13	423950	7302072	Grizzly bear	*Ursus arctos*	URAR				2	2	
grizzly bear DNA survey	11-Jun-13	13	370403	7322840	Caribou	*Rangifer tarandus*	RATA				7	7	
breeding bird survey	14-Jun-13	13	373913	7398848	Grey wolf	*Canis lupus*	CALU				3	3	
archeology survey	30-Jun-13	13	429500	7294200	Grizzly bear	*Ursus arctos*	URAR				1	1	
archeology survey	28-Jun-13	13	402500	7334000	Unknown Fox	*Vulpes spp.*	UNVU				1	1	
grizzly bear DNA survey	11-Jun-13	13	393252	7302146	Red fox	*Vulpes vulpes*	VUVU				1	1	
grizzly bear DNA survey	4-Aug-13	13	374075	7302457	Grizzly bear	*Ursus arctos*	URAR		1	2		3	
grizzly bear DNA survey	1-Jul-13	13	390646	7370313	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	2-Jul-13	13	388030	7313325	Grey wolf	*Canis lupus*	CALU				2	2	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Carnivores **(cont'd)**													
grizzly bear DNA survey	23-Jul-13	13	380520	7393612	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	23-Jul-13	13	380467	7393632	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	23-Jul-13	13	375333	7362004	Grizzly bear	*Ursus arctos*	URAR				1	1	2 Nests
grizzly bear DNA survey	24-Jul-13	13	404273	7341880	Grizzly bear	*Ursus arctos*	URAR		1	1		2	
grizzly bear DNA survey	24-Jul-13	13	414212	7342812	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	26-Jul-13	13	456705	7258040	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird brood survey	20-Jul-13	13	372298	7397301	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird brood survey	20-Jul-13	13	370745	7389287	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird brood survey	20-Jul-13	13	370736	7385301	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird brood survey	20-Jul-13	13	390607	7384206	Grizzly bear	*Ursus arctos*	URAR				1	1	
waterbird brood survey	20-Jul-13	13	384598	7398809	Grizzly bear	*Ursus arctos*	URAR				1	1	
grizzly bear DNA survey	15-Jul-13	13	391807	7306659	Grizzly bear	*Ursus arctos*	URAR				1	1	
camp observation	22-Jul-13	13	387992	7313363	Grey wolf	*Canis lupus*	CALU				1	1	
remote camera survey	24-Aug-13	13	399371	7262231	Wolverine	*Gulo gulo*	GUGU				1	1	
waterbird fall staging survey	26-Aug-13	13	421455	7279753	Grey wolf	*Canis lupus*	CALU				1	1	
remote camera survey	25-Aug-13	13	410644	7286118	Wolverine	*Gulo gulo*	GUGU				1	1	
remote camera survey	25-Aug-13	13	431231	7263611	Grey wolf	*Canis lupus*	CALU				4	4	
remote camera survey	27-Aug-13	13	397619	7258016	Grey wolf	*Canis lupus*	CALU				2	2	
remote camera survey	28-Aug-13	13	405333	7260540	Grey wolf	*Canis lupus*	CALU				3	3	
remote camera survey	28-Aug-13	13	416868	7269826	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird fall staging survey	26-Aug-13	13	397205	7367015	Grizzly bear	*Ursus arctos*	URAR		1	2		3	
waterbird fall staging survey	26-Aug-13	12	630498	7401128	Grey wolf	*Canis lupus*	CALU				1	1	
waterbird fall staging survey	28-Aug-13	13	380588	7321202	Grizzly bear	*Ursus arctos*	URAR				1	1	
remote camera survey	24-Aug-13	13	380331	7282017	Grey wolf	*Canis lupus*	CALU			1		1	
waterbird fall staging survey	26-Aug-13	13	392539	7381576	Grey wolf	*Canis lupus*	CALU				1	1	
grizzly bear DNA survey	11-Jul-13	13	372032	7336807	Grizzly bear	*Ursus arctos*	URAR					n/a	den
waterbird fall staging survey	26-Aug-13	12	626143	7406701	Grizzly bear	*Ursus arctos*	URAR				1	1	den
waterbird fall staging survey	26-Aug-13	13	370454	7383325	Grizzly bear	*Ursus arctos*	URAR					n/a	den
Raptors													
wolverine DNA survey	25-Mar-13	13	384934	7381927	Snowy owl	*Nyctea scandiaca*	SNOW				1	1	
remote camera survey	11-May-13	13	436894	7266587	Snowy owl	*Nyctea scandiaca*	SNOW				1	1	
den occupancy survey	23-May-13	13	403138	7330470	Short-eared owl	Asio flammeus	SEOW				1	1	
remote camera survey	13-May-13	13	432933	7301331	Gyrfalcon	*Falco rusticolus*	GYFA				1	1	
raptor occupancy survey	25-May-13	13	400412	7368806	Northern harrier	*Circus cyaneus*	NOHA		1			1	
raptor/den occupancy survey	26-May-13	13	385344	7368234	Northern harrier	*Circus cyaneus*	NOHA	1				1	
den occupancy survey	24-May-13	13	398288	7357870	Peregrine falcon	*Falco peregrinus*	PEFA				1	1	
den occupancy survey	24-May-13	13	384619	7379223	Peregrine falcon	*Falco peregrinus*	PEFA				1	1	
den occupancy survey	24-May-13	13	376127	7377171	Golden eagle	*Aquila chrysaetos*	GOEA				1	1	
den occupancy survey	24-May-13	13	388652	7376304	Northern harrier	*Circus cyaneus*	NOHA				1	1	
grizzly bear DNA survey	27-May-13	13	428941	7279384	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
grizzly bear DNA survey	29-May-13	13	431605	7270431	Northern harrier	*Circus cyaneus*	NOHA	1				1	
grizzly bear DNA survey	30-May-13	13	405275	7326832	Unknown Falcon	*Falco spp.*	UNFA				1	1	
grizzly bear DNA survey	21-Jun-13	13	369565	7361973	Peregrine falcon	*Falco peregrinus*	PEFA				1	1	
grizzly bear DNA survey	22-Jun-13	13	426688	7277702	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Raptors **(cont'd)**													
grizzly bear DNA survey	22-Jun-13	13	444081	7289159	Golden eagle	*Aquila chrysaetos*	GOEA				1	1	
grizzly bear DNA survey	22-Jun-13	13	412136	7241746	Bald eagle	*Haliaeetus leucocephalus*	BAEA				2	2	
breeding bird survey	13-Jun-13	13	380798	7394775	Common raven	*Corvus corax*	CORA				1	1	
breeding bird survey	14-Jun-13	13	380600	7393370	Common raven	*Corvus corax*	CORA				1	1	
breeding bird survey	13-Jun-13	13	379500	7394000	Common raven	*Corvus corax*	CORA				1	1	
breeding bird survey	13-Jun-13	13	377500	7395575	Common raven	*Corvus corax*	CORA				1	1	
breeding bird survey	14-Jun-13	12	631400	7407200	Common raven	*Corvus corax*	CORA				1	1	
breeding bird survey	14-Jun-13	12	630800	7407600	Golden eagle	*Aquila chrysaetos*	GOEA				1	1	
breeding bird survey	17-Jun-13	13	379700	7393450	Northern harrier	*Circus cyaneus*	NOHA				1	1	
archeology survey	27-Jun-13	13	404600	7340700	Unknown Falcon	*Falco spp.*	UNFA				1-2	1-2	
archeology survey	27-Jun-13	13	404600	7340700	Unknown Hawk		UNHA				1-2	1-2	
grizzly bear DNA survey	11-Jul-13	13	382626	7277424	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
grizzly bear DNA survey	1-Jul-13	13	371951	7336915	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
grizzly bear DNA survey	11-Jul-13	13	386184	7321947	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
grizzly bear DNA survey	24-Jul-13	13	410313	7351152	Golden eagle	*Aquila chrysaetos*	GOEA				1	1	
waterbird brood survey	20-Jul-13	13	369661	7405300	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
waterbird brood survey	20-Jul-13	12	628166	7400854	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
waterbird brood survey	20-Jul-13	13	375211	7397292	Golden eagle	*Aquila chrysaetos*	GOEA				2	2	
waterbird brood survey	20-Jul-13	13	373070	7383293	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
waterbird brood survey	20-Jul-13	13	370002	7416426	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
waterbird brood survey	20-Jul-13	13	373240	7397974	Golden eagle	*Aquila chrysaetos*	GOEA				1	1	
remote camera survey	24-Jul-13	13	416893	7300436	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
remote camera survey	22-Jul-13	13	424738	7259240	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
grizzly bear DNA survey	11-Jul-13	13	382626	7277424	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
remote camera survey	24-Aug-13	13	424385	7276805	Unknown Falcon	*Falco spp.*	UNFA				1	1	
waterbird fall staging survey	26-Aug-13	13	389516	7238662	Peregrine falcon	*Falco peregrinus*	PEFA				1	1	
remote camera survey	24-Aug-13	13	416893	7300436	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
remote camera survey	24-Aug-13	13	412873	7293658	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
waterbird fall staging survey	26-Aug-13	13	410589	7265306	Bald eagle	*Haliaeetus leucocephalus*	BAEA				2	2	
waterbird fall staging survey	26-Aug-13	13	370329	7397321	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
waterbird fall staging survey	26-Aug-13	12	629917	7395031	Unknown Raptor		UNRA				2	2	
waterbird fall staging survey	26-Aug-13	13	367160	7391293	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
waterbird fall staging survey	26-Aug-13	13	376783	7385238	Rough-legged hawk	*Buteo lagopus*	RLHA				1	1	
waterbird fall staging survey	26-Aug-13	13	375609	7383271	Common raven	*Corvus corax*	CORA				2	2	
waterbird fall staging survey	28-Aug-13	13	390092	7311041	Unknown Hawk		UNHA				1	1	
waterbird fall staging survey	28-Aug-13	13	376406	7321754	Gyrfalcon	*Falco rusticolus*	GYFA				1	1	
remote camera survey	23-Aug-13	13	416893	7300436	Bald eagle	*Haliaeetus leucocephalus*	BAEA				1	1	
Caribou													
wolverine DNA survey	20-Mar-13	13	433922	7269928	Caribou	*Rangifer tarandus*	RATA				1	1	
remote camera survey	7-May-13	13	392987	7329873	Caribou	*Rangifer tarandus*	RATA				3	3	
den occupancy survey	23-May-13	13	403430	7334425	Caribou	*Rangifer tarandus*	RATA				35	35	
den occupancy survey	24-May-13	13	404047	7290919	Caribou	*Rangifer tarandus*	RATA				45	45	
den occupancy survey	24-May-13	13	389012	7380268	Caribou	*Rangifer tarandus*	RATA	2			5	7	
den occupancy survey	25-May-13	13	391741	7304263	Caribou	*Rangifer tarandus*	RATA				12	12	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Caribou **(cont'd)**													
den occupancy survey	1-Jun-13	13	425430	7271379	Caribou	*Rangifer tarandus*	RATA				12	12	
grizzly bear DNA survey	22-May-13	13	445539	7277902	Caribou	*Rangifer tarandus*	RATA				8	8	
grizzly bear DNA survey	22-May-13	13	441244	7266132	Caribou	*Rangifer tarandus*	RATA	1				1	
grizzly bear DNA survey	28-May-13	13	388126	7383075	Caribou	*Rangifer tarandus*	RATA	1				1	
grizzly bear DNA survey	31-May-13	13	396728	7279757	Caribou	*Rangifer tarandus*	RATA		2			2	
grizzly bear DNA survey	31-May-13	13	425430	7271379	Caribou	*Rangifer tarandus*	RATA		2			2	
grizzly bear DNA survey	11-Jun-13	13	383701	7339136	Caribou	*Rangifer tarandus*	RATA		2			2	
grizzly bear DNA survey	12-Jun-13	13	458227	7278308	Caribou	*Rangifer tarandus*	RATA				7	7	
grizzly bear DNA survey	14-Jun-13	13	386441	7326058	Caribou	*Rangifer tarandus*	RATA		1	1		2	
grizzly bear DNA survey	12-Jun-13	13	397363	7257265	Caribou	*Rangifer tarandus*	RATA				4	4	
grizzly bear DNA survey	21-Jun-13	13	405294	7338004	Caribou	*Rangifer tarandus*	RATA				2	2	
grizzly bear DNA survey	23-Jun-13	13	384525	7289284	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird spring pair survey	18-Jun-13	12	631670	7407322	Caribou	*Rangifer tarandus*	RATA				3	3	
waterbird spring pair survey	18-Jun-13	13	373487	7385295	Caribou	*Rangifer tarandus*	RATA	1	1			2	
breeding bird survey	14-Jun-13	13	379795	7396371	Caribou	*Rangifer tarandus*	RATA				3	3	
breeding bird survey	18-Jun-13	13	370005	7409595	Caribou	*Rangifer tarandus*	RATA				1	1	
grizzly bear DNA survey	11-Jun-13	13	370403	7322840	Caribou	*Rangifer tarandus*	RATA				4	4	
breeding bird survey	14-Jun-13	13	369051	7405792	Caribou	*Rangifer tarandus*	RATA				2	2	
waterbird spring pair survey	19-Jun-13	13	383683	7331230	Caribou	*Rangifer tarandus*	RATA				3	3	
grizzly bear DNA survey	25-Jul-13	13	405677	7288194	Caribou	*Rangifer tarandus*	RATA				1	1	
grizzly bear DNA survey	26-Jul-13	13	397324	7257295	Caribou	*Rangifer tarandus*	RATA	1				1	
grizzly bear DNA survey	26-Jul-13	13	441288	7242371	Caribou	*Rangifer tarandus*	RATA				1	1	
grizzly bear DNA survey	27-Jul-13	13	436167	7243569	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird brood survey	20-Jul-13	12	628457	7406904	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird brood survey	20-Jul-13	13	372298	7397301	Caribou	*Rangifer tarandus*	RATA			1	1	2	
waterbird brood survey	20-Jul-13	13	370003	7389273	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird brood survey	20-Jul-13	13	374893	7383260	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird brood survey	20-Jul-13	13	375542	7381341	Caribou	*Rangifer tarandus*	RATA				2	2	
remote camera survey	22-Jul-13	13	442925	7271363	Caribou	*Rangifer tarandus*	RATA				1	1	
grizzly bear DNA survey	25-Jul-13	13	405677	7288194	Caribou	*Rangifer tarandus*	RATA				2	2	
grizzly bear DNA survey	26-Jul-13	13	397324	7257295	Caribou	*Rangifer tarandus*	RATA				1	1	
grizzly bear DNA survey	26-Jul-13	13	441288	7242371	Caribou	*Rangifer tarandus*	RATA				1	1	
remote camera survey	24-Aug-13	13	379856	7318198	Caribou	*Rangifer tarandus*	RATA				5	5	
remote camera survey	24-Aug-13	13	382551	7282581	Caribou	*Rangifer tarandus*	RATA				4	4	
remote camera survey	24-Aug-13	13	389311	7309363	Caribou	*Rangifer tarandus*	RATA				3	3	
remote camera survey	24-Aug-13	13	432186	7284159	Caribou	*Rangifer tarandus*	RATA				8	8	
remote camera survey	24-Aug-13	13	422675	7275239	Caribou	*Rangifer tarandus*	RATA				4	4	
remote camera survey	24-Aug-13	13	396726	7279788	Caribou	*Rangifer tarandus*	RATA			1	2	3	
remote camera survey	24-Aug-13	13	396707	7279732	Caribou	*Rangifer tarandus*	RATA				7	7	
remote camera survey	24-Aug-13	13	396910	7282300	Caribou	*Rangifer tarandus*	RATA				10	10	
remote camera survey	24-Aug-13	13	397897	7281797	Caribou	*Rangifer tarandus*	RATA				7	7	
waterbird fall staging survey	26-Aug-13	13	425176	7277771	Caribou	*Rangifer tarandus*	RATA			1	11	12	
waterbird fall staging survey	26-Aug-13	13	388032	7381149	Caribou	*Rangifer tarandus*	RATA	1	1			2	
remote camera survey	24-Aug-13	13	400260	7282929	Caribou	*Rangifer tarandus*	RATA				1	1	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
***Caribou* (cont'd)**													
remote camera survey	24-Aug-13	13	400564	7299839	Caribou	*Rangifer tarandus*	RATA				2	2	
remote camera survey	24-Aug-13	13	412873	7293658	Caribou	*Rangifer tarandus*	RATA			6	11	17	
remote camera survey	24-Aug-13	13	435777	7250969	Caribou	*Rangifer tarandus*	RATA				5	5	
remote camera survey	24-Aug-13	13	436107	7246615	Caribou	*Rangifer tarandus*	RATA	20		30	50	100	
remote camera survey	24-Aug-13	13	436329	7244463	Caribou	*Rangifer tarandus*	RATA				16	16	
remote camera survey	24-Aug-13	13	438055	7234609	Caribou	*Rangifer tarandus*	RATA				60	60	
remote camera survey	24-Aug-13	13	414868	7248153	Caribou	*Rangifer tarandus*	RATA				1	1	
remote camera survey	24-Aug-13	13	417899	7249995	Caribou	*Rangifer tarandus*	RATA				2	2	
remote camera survey	25-Aug-13	13	405014	7250744	Caribou	*Rangifer tarandus*	RATA			15	60	75	
remote camera survey	25-Aug-13	13	401034	7245830	Caribou	*Rangifer tarandus*	RATA				10	10	
remote camera survey	25-Aug-13	13	398485	7244143	Caribou	*Rangifer tarandus*	RATA				13	13	
remote camera survey	25-Aug-13	13	406455	7251507	Caribou	*Rangifer tarandus*	RATA				6	6	
remote camera survey	25-Aug-13	13	445474	7269097	Caribou	*Rangifer tarandus*	RATA				8	8	
remote camera survey	27-Aug-13	13	410589	7265306	Caribou	*Rangifer tarandus*	RATA				8	8	
remote camera survey	27-Aug-13	13	416124	7254931	Caribou	*Rangifer tarandus*	RATA				1	1	
remote camera survey	27-Aug-13	13	405333	7260540	Caribou	*Rangifer tarandus*	RATA				2	2	
remote camera survey	28-Aug-13	13	428927	7279375	Caribou	*Rangifer tarandus*	RATA				7	7	
waterbird fall staging survey	26-Aug-13	13	377022	7385221	Caribou	*Rangifer tarandus*	RATA				1	1	
waterbird fall staging survey	28-Aug-13	13	382452	7316087	Caribou	*Rangifer tarandus*	RATA				15	15	
waterbird fall staging survey	28-Aug-13	13	382525	7315074	Caribou	*Rangifer tarandus*	RATA				100	100	
waterbird fall staging survey	28-Aug-13	13	376505	7320009	Caribou	*Rangifer tarandus*	RATA				2	2	
remote camera survey	24-Aug-13	13	403395	7284052	Caribou	*Rangifer tarandus*	RATA			1	3	4	
remote camera survey	24-Aug-13	13	410208	7263865	Caribou	*Rangifer tarandus*	RATA	1			1	2	
remote camera survey	25-Aug-13	13	437276	7266585	Caribou	*Rangifer tarandus*	RATA				9	9	
Upland Breeding Birds													
wolverine DNA survey	28-Mar-13	13	374245	7397072	Unknown Ptarmigan	*Lagopus spp.*	UNPT				30	30	
wolverine DNA survey	30-Mar-13	13	372270	7388465	Unknown Ptarmigan	*Lagopus spp.*	UNPT				25	25	
camp observation	20-May-13	13	433922	7269928	Horned lark	*Eremophila alpestris*	HOLA				1	1	
camp observation	21-May-13	13	433922	7269928	Willow ptarmigan	*Lagopus lagopus*	WIPT				2	2	
camp observation	24-May-13	13	433922	7269928	White-crowned sparrow	*Zonotrichia leucophrys*	WCSP				1	1	
camp observation	26-May-13	13	433922	7269928	Dark-eyed junco	*Junco hymemalis*	DEJU	1	1		2	2	
breeding bird survey	14-Jun-13	13	380407	7394571	Willow ptarmigan	*Lagopus lagopus*	WIPT				1	1	
breeding bird survey	15-Jun-13	13	370197	7411798	Common redpoll	*Carduelis flammea*	CORE				1	1	
grizzly bear DNA survey	1-Jul-13	13	408786	7350108	Unknown Ptarmigan	*Lagopus spp.*	UNPT				1	1	
grizzly bear DNA survey	11-Jul-13	13	395778	7350813	Willow ptarmigan	*Lagopus lagopus*	WIPT		1			1	
waterbird brood survey	20-Jul-13	13	379944	7393315	Unknown Sandpiper		UNSA				6	6	
grizzly bear DNA survey	11-Jul-13	13	395778	7350813	Willow ptarmigan	*Lagopus lagopus*	WIPT		1			1	
remote camera survey	23-Aug-13	13	394327	7307178	Unknown Ptarmigan	*Lagopus spp.*	UNPT				3	3	
waterbird pair survey	19-Jun-13	13	376790	7402202	Unknown Phalarope	*Phalaropus spp.*	UNPH				1	1	
camp observation	19-Jun-13	13	388133	7313319	Semipalmated plover	*Charadrius semipalmatus*	SEPL		1			1	nest
Waterbirds													
raptor occupancy survey	25-May-13	13	402559	7360897	Long-tailed duck	*Clangula hyemalis*	LTDU	1				1	
raptor occupancy survey	25-May-13	13	402165	7360994	Northern pintail	*Anas acuta*	NOPI	25	25			50	
raptor occupancy survey	25-May-13	13	402848	7362069	Snow goose	*Chen caerulescens*	SNGO				8	8	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
raptor occupancy survey	25-May-13	13	402848	7362069	Greater white-fronted goose	*Anser albifrons*	GWFG				100	100	
raptor occupancy survey	25-May-13	13	402848	7362069	Northern pintail	*Anas acuta*	NOPI				20-25	20-25	
raptor occupancy survey	25-May-13	13	402848	7362069	Canada goose	*Branta canadensis*	CAGO				2	2	
raptor occupancy survey	25-May-13	13	400412	7368806	Snow goose	*Chen caerulescens*	SNGO				1	1	
raptor occupancy survey	25-May-13	13	384104	7316833	Snow goose	*Chen caerulescens*	SNGO				70	70	
raptor occupancy survey	25-May-13	13	384104	7316833	Greater white-fronted goose	*Anser albifrons*	GWFG				100-150	100-150	
raptor occupancy survey	25-May-13	13	384104	7316833	Northern pintail	*Anas acuta*	NOPI				40	40	
raptor/den occupancy survey	26-May-13	13	417789	7302383	Greater white-fronted goose	*Anser albifrons*	GWFG				50	50	
raptor/den occupancy survey	26-May-13	13	417789	7302383	Snow goose	*Chen caerulescens*	SNGO				20	20	
den occupancy survey	23-May-13	13	387552	7380431	Greater white-fronted goose	*Anser albifrons*	GWFG				120	120	
den occupancy survey	23-May-13	13	387552	7380431	Tundra swan	*Cygnus columbianus*	TUSW				2	2	
den occupancy survey	23-May-13	13	405215	7339845	Greater white-fronted goose	*Anser albifrons*	GWFG				17	17	
den occupancy survey	23-May-13	13	403427	7309185	Greater white-fronted goose	*Anser albifrons*	GWFG				12	12	
den occupancy survey	23-May-13	13	403427	7309185	Snow goose	*Chen caerulescens*	SNGO				2	2	
den occupancy survey	23-May-13	13	401361	7302603	Unknown Goose		UNGO				22	22	
den occupancy survey	24-May-13	13	397327	7297360	Northern pintail	*Anas acuta*	NOPI	18	1			19	
den occupancy survey	24-May-13	13	387450	7381435	Greater white-fronted goose	*Anser albifrons*	GWFG				50	50	
den occupancy survey	24-May-13	13	387450	7381435	Snow goose	*Chen caerulescens*	SNGO				20	20	
den occupancy survey	24-May-13	13	382289	7384288	Unknown Goose		UNGO				50	50	
den occupancy survey	24-May-13	13	390178	7379255	Unknown Goose		UNGO				35	35	
den occupancy survey	24-May-13	13	384619	7379223	Greater white-fronted goose	*Anser albifrons*	GWFG				10	10	
den occupancy survey	26-May-13	13	372860	7324123	Unknown Goose		UNGO				20	20	
den occupancy survey	26-May-13	13	386225	7313321	Greater white-fronted goose	*Anser albifrons*	GWFG				12	12	
den occupancy survey	26-May-13	13	386225	7313321	Snow goose	*Chen caerulescens*	SNGO				4	4	
den occupancy survey	26-May-13	13	388341	7311693	Greater white-fronted goose	*Anser albifrons*	GWFG				35	35	
den occupancy survey	26-May-13	13	389449	7310993	Northern pintail	*Anas acuta*	NOPI	2	2			4	
raptor occupancy survey	25-May-13	13	425982	7312972	Glaucous gull	*Larus hyperboreus*	GLGU				2	2	
grizzly bear DNA survey	23-May-13	13	397886	7257093	Snow goose	*Chen caerulescens*	SNGO				6	6	
grizzly bear DNA survey	23-May-13	13	397886	7257093	Greater white-fronted goose	*Anser albifrons*	GWFG				150-200	150-200	
grizzly bear DNA survey	23-May-13	13	423749	7268928	Snow goose	*Chen caerulescens*	SNGO				20	20	
grizzly bear DNA survey	23-May-13	13	423749	7268928	Greater white-fronted goose	*Anser albifrons*	GWFG				6	6	
camp observation	20-May-13	13	433922	7269928	Greater white-fronted goose	*Anser albifrons*	GWFG				12	12	
camp observation	20-May-13	13	433922	7269928	Northern pintail	*Anas acuta*	NOPI				35	35	
camp observation	23-May-13	13	433922	7269928	Unknown Goose		UNGO	3	3			6	
grizzly bear DNA survey	27-May-13	13	384725	7300716	Snow goose	*Chen caerulescens*	SNGO				10	10	
grizzly bear DNA survey	27-May-13	13	384725	7300716	Greater white-fronted goose	*Anser albifrons*	GWFG				8	8	
grizzly bear DNA survey	27-May-13	13	384525	7289284	Greater white-fronted goose	*Anser albifrons*	GWFG				2	2	
grizzly bear DNA survey	27-May-13	13	384525	7289284	Northern pintail	*Anas acuta*	NOPI				2	2	
grizzly bear DNA survey	27-May-13	13	408704	7264558	Greater white-fronted goose	*Anser albifrons*	GWFG				8	8	
grizzly bear DNA survey	27-May-13	13	401143	7268160	Canada goose	*Branta canadensis*	CAGO				2	2	
grizzly bear DNA survey	27-May-13	13	392354	7266959	Snow goose	*Chen caerulescens*	SNGO				8	8	
grizzly bear DNA survey	27-May-13	13	392354	7266959	Greater white-fronted goose	*Anser albifrons*	GWFG				25	25	
grizzly bear DNA survey	27-May-13	13	369045	7263741	Snow goose	*Chen caerulescens*	SNGO				15	15	
grizzly bear DNA survey	27-May-13	13	369045	7263741	Greater white-fronted goose	*Anser albifrons*	GWFG				30	30	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
grizzly bear DNA survey	28-May-13	13	402118	7298194	Greater white-fronted goose	*Anser albifrons*	GWFG				10	10	
grizzly bear DNA survey	28-May-13	13	403761	7338075	Sandhill crane	*Grus canadensis*	SACR				1	1	
grizzly bear DNA survey	29-May-13	13	419909	7290882	Herring gull	*Larus argentatus*	HEGU				2	2	
grizzly bear DNA survey	29-May-13	13	376252	7289346	Snow goose	*Chen caerulescens*	SNGO				40	40	
grizzly bear DNA survey	29-May-13	13	376252	7289346	Greater white-fronted goose	*Anser albifrons*	GWFG				20	20	
grizzly bear DNA survey	30-May-13	13	384433	7371456	Greater white-fronted goose	*Anser albifrons*	GWFG				2	2	
grizzly bear DNA survey	30-May-13	13	394864	7339148	Greater white-fronted goose	*Anser albifrons*	GWFG				22	22	
grizzly bear DNA survey	30-May-13	13	394864	7339148	Snow goose	*Chen caerulescens*	SNGO				6	6	
grizzly bear DNA survey	30-May-13	13	401774	7318436	Greater white-fronted goose	*Anser albifrons*	GWFG				8	8	
grizzly bear DNA survey	30-May-13	13	401774	7318436	Snow goose	*Chen caerulescens*	SNGO				2	2	
grizzly bear DNA survey	30-May-13	13	415751	7290287	Snow goose	*Chen caerulescens*	SNGO				25	25	
den occupancy survey	23-May-13	13	405067	7339419	Greater white-fronted goose	*Anser albifrons*	GWFG				4	4	
grizzly bear DNA survey	30-May-13	13	419909	7290882	Greater white-fronted goose	*Anser albifrons*	GWFG				2	2	
grizzly bear DNA survey	30-May-13	13	419909	7290882	Northern pintail	*Anas acuta*	NOPI				2	2	
grizzly bear DNA survey	11-Jun-13	13	395778	7350813	Northern pintail	*Anas acuta*	NOPI	1				1	
grizzly bear DNA survey	11-Jun-13	13	408786	7350108	Canada goose	*Branta canadensis*	CAGO				7	7	
grizzly bear DNA survey	11-Jun-13	13	429660	7314312	Black (American) scoter	*Melanitta americana*	BLSC				1	1	
grizzly bear DNA survey	11-Jun-13	13	418583	7302192	Canada goose	*Branta canadensis*	CAGO				7	7	
grizzly bear DNA survey	12-Jun-13	13	458227	7278308	Northern pintail	*Anas acuta*	NOPI	1				1	
grizzly bear DNA survey	12-Jun-13	13	444871	7265882	Long-tailed duck	*Clangula hyemalis*	LTDU		1			1	
grizzly bear DNA survey	12-Jun-13	13	444871	7265882	Long-tailed duck	*Clangula hyemalis*	LTDU	8				8	
grizzly bear DNA survey	12-Jun-13	13	443655	7253834	Canada goose	*Branta canadensis*	CAGO				7	7	
grizzly bear DNA survey	12-Jun-13	13	443655	7253834	Long-tailed duck	*Clangula hyemalis*	LTDU	6	6		13	25	
camp observation	19-Jun-13	13	388030	7313325	Canada goose	*Branta canadensis*	CAGO				45	45	
grizzly bear DNA survey	12-Jun-13	13	435092	7250712	Long-tailed duck	*Clangula hyemalis*	LTDU	1				1	
grizzly bear DNA survey	22-Jun-13	13	396728	7279757	Unknown Goose		UNGO				54	54	
grizzly bear DNA survey	22-Jun-13	13	444288	7267449	Canada goose	*Branta canadensis*	CAGO				8	8	
grizzly bear DNA survey	22-Jun-13	13	452582	7254708	Canada goose	*Branta canadensis*	CAGO				14	14	
grizzly bear DNA survey	22-Jun-13	13	433320	7243031	Unknown Goose		UNGO				12	12	
grizzly bear DNA survey	23-Jun-13	13	384525	7289284	Unknown Goose		UNGO				25	25	
grizzly bear DNA survey	23-Jun-13	13	369045	7263741	Northern pintail	*Anas acuta*	NOPI	1	1			2	
grizzly bear DNA survey	23-Jun-13	13	369045	7263741	Green-winged teal	*Anas crecca*	GWTE	1				1	
grizzly bear DNA survey	23-Jun-13	13	369045	7263741	Mallard	*Anas platyrhynchos*	MALL	1	1			2	
den occupancy survey	20-Jun-13	13	377507	7392926	Mallard	*Anas platyrhynchos*	MALL	1	1			2	
den occupancy survey	20-Jun-13	13	377507	7392926	Greater scaup	*Aythya marila*	GRSC	3	11			14	
den occupancy survey	20-Jun-13	13	381834	7389300	Pacific loon	*Gavia pacifica*	PALO	1	1			2	
breeding bird survey	14-Jun-13	13	380592	7394368	Canada goose	*Branta canadensis*	CAGO				9	9	
breeding bird survey	14-Jun-13	13	380592	7394368	Greater white-fronted goose	*Anser albifrons*	GWFG				7	7	
breeding bird survey	13-Jun-13	13	380399	7395371	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
breeding bird survey	13-Jun-13	13	380595	7395369	Canada goose	*Branta canadensis*	CAGO				1	1	
breeding bird survey	13-Jun-13	13	380605	7394974	Unknown Goose		UNGO				18	18	
breeding bird survey	13-Jun-13	13	380798	7394775	Unknown Goose		UNGO				1	1	
breeding bird survey	13-Jun-13	13	380801	7394573	Unknown Goose		UNGO				10	10	
breeding bird survey	13-Jun-13	13	380801	7394573	Canada goose	*Branta canadensis*	CAGO				48	48	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
breeding bird survey	13-Jun-13	13	381194	7394774	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
breeding bird survey	13-Jun-13	13	381000	7394372	Canada goose	*Branta canadensis*	CAGO				1	1	
breeding bird survey	13-Jun-13	13	381596	7394175	Unknown Goose		UNGO				10	10	
breeding bird survey	13-Jun-13	13	381803	7393568	Canada goose	*Branta canadensis*	CAGO				20	20	
breeding bird survey	14-Jun-13	13	379795	7396371	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
breeding bird survey	14-Jun-13	13	379797	7395972	Canada goose	*Branta canadensis*	CAGO				14	14	
breeding bird survey	14-Jun-13	13	379797	7395972	Canada goose	*Branta canadensis*	CAGO				5	5	
breeding bird survey	14-Jun-13	13	379405	7395579	Greater white-fronted goose	*Anser albifrons*	GWFG				1	1	
breeding bird survey	14-Jun-13	13	380401	7394367	Canada goose	*Branta canadensis*	CAGO				14	14	
breeding bird survey	14-Jun-13	13	380401	7394367	Red-breasted merganser	*Mergus serrator*	RBME	8	3			11	
breeding bird survey	14-Jun-13	13	380790	7394371	Unknown Goose		UNGO				15	15	
breeding bird survey	14-Jun-13	13	380801	7393367	Unknown Duck		UNDU				1	1	
breeding bird survey	15-Jun-13	13	370195	7412604	Sandhill crane	*Grus canadensis*	SACR				1	1	
breeding bird survey	15-Jun-13	13	369996	7410599	Long-tailed duck	*Clangula hyemalis*	LTDU				1	1	
breeding bird survey	18-Jun-13	13	370203	7409601	Canada goose	*Branta canadensis*	CAGO				10	10	
breeding bird survey	18-Jun-13	13	370005	7409595	Canada goose	*Branta canadensis*	CAGO				10	10	
breeding bird survey	18-Jun-13	13	370005	7409595	Canada goose	*Branta canadensis*	CAGO				20	20	
breeding bird survey	13-Jun-13	13	379500	7394000	Canada goose	*Branta canadensis*	CAGO				38	38	
breeding bird survey	13-Jun-13	13	379500	7394000	Canada goose	*Branta canadensis*	CAGO				2	2	
breeding bird survey	13-Jun-13	13	379500	7394000	Unknown Loon	*Gavia spp.*	UNLO				6	6	
breeding bird survey	13-Jun-13	13	377500	7395575	Green-winged teal	*Anas crecca*	GWTE	1				1	
breeding bird survey	13-Jun-13	13	377500	7395575	Northern pintail	*Anas acuta*	NOPI	1				1	
breeding bird survey	13-Jun-13	12	631100	7408400	Northern pintail	*Anas acuta*	NOPI	5	1			6	
breeding bird survey	13-Jun-13	12	631100	7408400	Green-winged teal	*Anas crecca*	GWTE	1				1	
breeding bird survey	13-Jun-13	12	631100	7408400	Pacific loon	*Gavia pacifica*	PALO	1	1			2	
breeding bird survey	13-Jun-13	12	631100	7408400	Greater scaup	*Aythya marila*	GRSC	1	1			2	
breeding bird survey	14-Jun-13	12	630800	7407600	Tundra swan	*Cygnus columbianus*	TUSW				1	1	
breeding bird survey	14-Jun-13	12	630800	7407600	Northern pintail	*Anas acuta*	NOPI				1	1	
breeding bird survey	17-Jun-13	13	379700	7393450	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
breeding bird survey	17-Jun-13	13	379700	7393450	Long-tailed duck	*Clangula hyemalis*	LTDU	10				10	
breeding bird survey	17-Jun-13	13	379700	7393450	Canada goose	*Branta canadensis*	CAGO				12	12	
breeding bird survey	17-Jun-13	13	379700	7393450	Red-breasted merganser	*Mergus serrator*	RBME				4	4	
grizzly bear DNA survey	11-Jun-13	13	429920	7321995	Canada goose	*Branta canadensis*	CAGO				20	20	
grizzly bear DNA survey	12-Jun-13	13	401479	7279065	Greater white-fronted goose	*Anser albifrons*	GWFG				7	7	
grizzly bear DNA survey	11-Jul-13	13	371951	7336915	Canada goose	*Branta canadensis*	CAGO				3	3	
grizzly bear DNA survey	13-Jul-13	13	444871	7265882	Canada goose	*Branta canadensis*	CAGO				10	10	
grizzly bear DNA survey	25-Jul-13	13	374075	7302457	Canada goose	*Branta canadensis*	CAGO				25	25	
grizzly bear DNA survey	3-Jul-13	13	440766	7267197	Canada goose	*Branta canadensis*	CAGO				1	1	
grizzly bear DNA survey	3-Jul-13	13	444871	7265882	Greater white-fronted goose	*Anser albifrons*	GWFG				2	2	
grizzly bear DNA survey	3-Jul-13	13	456943	7257825	Greater white-fronted goose	*Anser albifrons*	GWFG				1	1	
grizzly bear DNA survey	3-Jul-13	13	452614	7255095	Canada goose	*Branta canadensis*	CAGO				20	20	
grizzly bear DNA survey	3-Jul-13	13	438624	7252038	Greater white-fronted goose	*Anser albifrons*	GWFG				25	25	
grizzly bear DNA survey	3-Jul-13	13	435092	7250712	Canada goose	*Branta canadensis*	CAGO				15	15	
grizzly bear DNA survey	3-Jul-13	13	413645	7241211	Greater white-fronted goose	*Anser albifrons*	GWFG				15	15	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
grizzly bear DNA survey	3-Jul-13	13	437505	7242646	Unknown Goose		UNGO				100	100	
grizzly bear DNA survey	23-Jul-13	13	411629	7289745	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
grizzly bear DNA survey	23-Jul-13	13	385442	7326552	Unknown Goose		UNGO				9	9	
grizzly bear DNA survey	23-Jul-13	13	385634	7332723	Unknown Goose		UNGO				50	50	
grizzly bear DNA survey	26-Jul-13	13	423824	7266459	Tundra swan	*Cygnus columbianus*	TUSW				1	1	
waterbird brood survey	20-Jul-13	13	388122	7383081	Snow goose	*Chen caerulescens*	SNGO				15	15	
remote camera survey	21-Jul-13	13	390754	7306589	Arctic tern	*Sterna paradisaea*	ARTE				1	1	
remote camera survey	22-Jul-13	13	434297	7280436	Canada goose	*Branta canadensis*	CAGO				25	25	
grizzly bear DNA survey	25-Jul-13	13	374075	7302457	Canada goose	*Branta canadensis*	CAGO				25	25	
remote camera survey	16-Jul-13	13	390105	7378588	Canada goose	*Branta canadensis*	CAGO				23	23	
remote camera survey	16-Jul-13	13	380630	7393389	Canada goose	*Branta canadensis*	CAGO				20	20	
grizzly bear DNA survey	13-Jul-13	13	388785	7301681	Canada goose	*Branta canadensis*	CAGO				30	30	
raptor productivity survey	19-Jul-13	12	630904	7399438	Tundra swan	*Cygnus columbianus*	TUSW				3	3	
raptor productivity survey	19-Jul-13	12	632067	7397142	Red-breasted merganser	*Mergus serrator*	RBME	2				2	
raptor productivity survey	19-Jul-13	13	377865	7400999	Canada goose	*Branta canadensis*	CAGO				25	25	
grizzly bear DNA survey	11-Jul-13	13	371951	7336915	Canada goose	*Branta canadensis*	CAGO				3	3	
grizzly bear DNA survey	13-Jul-13	13	444871	7265882	Canada goose	*Branta canadensis*	CAGO				10	10	
grizzly bear DNA survey	13-Jul-13	13	436567	7243574	Canada goose	*Branta canadensis*	CAGO				50	50	
remote camera survey	23-Aug-13	13	394296	7305114	Northern pintail	*Anas acuta*	NOPI			2	2	4	
remote camera survey	23-Aug-13	13	394330	7304989	Long-tailed duck	*Clangula hyemalis*	LTDU			8	1	9	
remote camera survey	23-Aug-13	13	389777	7305774	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	23-Aug-13	13	390046	7305901	Canada goose	*Branta canadensis*	CAGO				50	50	
remote camera survey	23-Aug-13	13	390422	7318698	Canada goose	*Branta canadensis*	CAGO				50	50	
remote camera survey	24-Aug-13	13	386741	7303091	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	24-Aug-13	13	385686	7306089	Canada goose	*Branta canadensis*	CAGO				10	10	
remote camera survey	24-Aug-13	13	385505	7314990	Canada goose	*Branta canadensis*	CAGO				2	2	
remote camera survey	24-Aug-13	13	385255	7313694	Canada goose	*Branta canadensis*	CAGO				8	8	
remote camera survey	24-Aug-13	13	430312	7274037	Canada goose	*Branta canadensis*	CAGO				6	6	
remote camera survey	24-Aug-13	13	429620	7274930	Canada goose	*Branta canadensis*	CAGO				13	13	
remote camera survey	24-Aug-13	13	424385	7276805	Canada goose	*Branta canadensis*	CAGO				15	15	
remote camera survey	24-Aug-13	13	421459	7274506	Canada goose	*Branta canadensis*	CAGO				5	5	
remote camera survey	24-Aug-13	13	420402	7272524	Canada goose	*Branta canadensis*	CAGO				25	25	
remote camera survey	24-Aug-13	13	432994	7271008	Canada goose	*Branta canadensis*	CAGO				3	3	
remote camera survey	24-Aug-13	13	419043	7278844	Canada goose	*Branta canadensis*	CAGO				60	60	
remote camera survey	24-Aug-13	13	411502	7281769	Long-tailed duck	*Clangula hyemalis*	LTDU				2	2	
remote camera survey	24-Aug-13	13	406572	7282161	Unknown Goose		UNGO				13	13	
remote camera survey	24-Aug-13	13	399297	7282517	Snow goose	*Chen caerulescens*	SNGO			2	17	19	
remote camera survey	24-Aug-13	13	397516	7280992	Canada goose	*Branta canadensis*	CAGO				30	30	
remote camera survey	24-Aug-13	13	397109	7279511	Canada goose	*Branta canadensis*	CAGO				12	12	
remote camera survey	24-Aug-13	13	396707	7279732	Canada goose	*Branta canadensis*	CAGO				28	28	
remote camera survey	24-Aug-13	13	397998	7282270	Canada goose	*Branta canadensis*	CAGO				12	12	
remote camera survey	24-Aug-13	13	397897	7281797	Canada goose	*Branta canadensis*	CAGO				20	20	
waterbird fall staging survey	26-Aug-13	13	418083	7281737	Unknown Goose		UNGO				8	8	
waterbird fall staging survey	26-Aug-13	13	410978	7286273	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
waterbird fall staging survey	26-Aug-13	13	386454	7380985	Long-tailed duck	*Clangula hyemalis*	LTDU				3	3	
waterbird fall staging survey	26-Aug-13	13	386454	7380985	Glaucous gull	*Larus hyperboreus*	GLGU				2	2	
remote camera survey	24-Aug-13	13	404304	7287159	Canada goose	*Branta canadensis*	CAGO				30	30	
remote camera survey	24-Aug-13	13	402930	7292629	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	24-Aug-13	13	434752	7258922	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	24-Aug-13	13	435632	7252333	Canada goose	*Branta canadensis*	CAGO				6	6	
remote camera survey	24-Aug-13	13	437999	7236855	Unknown Gull	*Larus spp.*	UNGU				3	3	
remote camera survey	24-Aug-13	13	436298	7236784	Long-tailed duck	*Clangula hyemalis*	LTDU				20	20	
remote camera survey	24-Aug-13	13	421498	7253935	Canada goose	*Branta canadensis*	CAGO				25	25	
remote camera survey	24-Aug-13	13	421862	7254132	Canada goose	*Branta canadensis*	CAGO				8	8	
remote camera survey	24-Aug-13	13	424743	7259225	Canada goose	*Branta canadensis*	CAGO				18	18	
remote camera survey	25-Aug-13	13	375542	7227928	Canada goose	*Branta canadensis*	CAGO			20	20	40	
remote camera survey	25-Aug-13	12	591562	7214488	Canada goose	*Branta canadensis*	CAGO				50	50	
remote camera survey	25-Aug-13	12	591562	7214488	Herring gull	*Larus argentatus*	HEGU				1	1	
remote camera survey	25-Aug-13	12	592636	7207205	Red-breasted merganser	*Mergus serrator*	RBME				9	9	
remote camera survey	25-Aug-13	12	600783	7204718	Canada goose	*Branta canadensis*	CAGO				13	13	
remote camera survey	25-Aug-13	12	624634	7215129	Snow goose	*Chen caerulescens*	SNGO				7	7	
remote camera survey	25-Aug-13	13	361824	7221388	Canada goose	*Branta canadensis*	CAGO				20	20	
remote camera survey	25-Aug-13	13	367598	7226374	Canada goose	*Branta canadensis*	CAGO				100	100	
remote camera survey	25-Aug-13	13	373345	7229481	Canada goose	*Branta canadensis*	CAGO				8	8	
remote camera survey	25-Aug-13	13	376257	7231206	Canada goose	*Branta canadensis*	CAGO				100	100	
remote camera survey	25-Aug-13	13	377640	7232053	Unknown Goose		UNGO				14	14	
remote camera survey	25-Aug-13	13	378702	7232689	Unknown Goose		UNGO				30	30	
remote camera survey	25-Aug-13	13	440670	7269885	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	25-Aug-13	13	436376	7264520	Unknown Goose		UNGO				50	50	
remote camera survey	25-Aug-13	13	386079	7326228	Canada goose	*Branta canadensis*	CAGO				20	20	
remote camera survey	25-Aug-13	13	386266	7330105	Snow goose	*Chen caerulescens*	SNGO				6	6	
remote camera survey	25-Aug-13	13	386266	7330105	Canada goose	*Branta canadensis*	CAGO				25	25	
remote camera survey	25-Aug-13	13	386749	7336536	Canada goose	*Branta canadensis*	CAGO				100	100	
remote camera survey	27-Aug-13	13	421929	7266422	Canada goose	*Branta canadensis*	CAGO				50	50	
remote camera survey	27-Aug-13	13	411907	7265504	Unknown Goose		UNGO				20	20	
remote camera survey	27-Aug-13	13	408574	7265004	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	28-Aug-13	13	425527	7271065	Canada goose	*Branta canadensis*	CAGO				5	5	
remote camera survey	28-Aug-13	13	422392	7270432	Canada goose	*Branta canadensis*	CAGO				16	16	
remote camera survey	28-Aug-13	13	416868	7269826	Canada goose	*Branta canadensis*	CAGO				10	10	
camp observation	28-Aug-13	13	433830	7270049	Greater white-fronted goose	*Anser albifrons*	GWFG				18	18	
remote camera survey	28-Aug-13	13	436789	7272464	Unknown Goose		UNGO				40	40	
remote camera survey	28-Aug-13	13	401867	7308931	Northern pintail	*Anas acuta*	NOPI				18	18	
remote camera survey	28-Aug-13	13	390224	7311529	Canada goose	*Branta canadensis*	CAGO				30	30	
remote camera survey	28-Aug-13	12	605562	7207075	Herring gull	*Larus argentatus*	HEGU				1	1	
remote camera survey	28-Aug-13	13	361585	7219973	Unknown Jaeger	*Stercorarius spp.*	UNJA				1	1	
remote camera survey	28-Aug-13	13	391893	7249926	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	23-Aug-13	13	386705	7303087	Canada goose	*Branta canadensis*	CAGO				40	40	
remote camera survey	24-Aug-13	13	384210	7232115	Canada goose	*Branta canadensis*	CAGO				7	7	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Waterbirds **(cont'd)**													
remote camera survey	24-Aug-13	13	449364	7283405	Canada goose	*Branta canadensis*	CAGO				16	16	
remote camera survey	24-Aug-13	13	435053	7277171	Canada goose	*Branta canadensis*	CAGO				12	12	
remote camera survey	24-Aug-13	13	435788	7280871	Canada goose	*Branta canadensis*	CAGO				2	2	
remote camera survey	25-Aug-13	12	571607	7207089	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
remote camera survey	25-Aug-13	12	605562	7207075	Herring gull	*Larus argentatus*	HEGU				1	1	
remote camera survey	25-Aug-13	13	361585	7219973	Unknown Jaeger	*Stercorarius spp.*	UNJA				1	1	
remote camera survey	27-Aug-13	13	391893	7249926	Glaucous gull	*Larus hyperboreus*	GLGU				1	1	
Other													
wolverine DNA survey	28-Mar-13	13	374245	7397072	Moose	*Alces americanus*	ALAM				1	1	
remote camera survey	9-May-13	13	413810	7337280	Moose	*Alces americanus*	ALAM				1	1	
remote camera survey	9-May-13	13	414207	7340490	Moose	*Alces americanus*	ALAM				6	6	
remote camera survey	10-May-13	13	413483	7287484	Arctic hare	*Lepus arcticus*	LEAR				1	1	
remote camera survey	12-May-13	13	388030	7313325	Arctic hare	*Lepus arcticus*	LEAR				5	5	
wolverine DNA survey	27-Apr-13	13	379581	7398298	Unknown Seal		UNSE				1	1	
raptor occupancy survey	25-May-13	13	416381	7334713	Moose	*Alces americanus*	ALAM				1	1	
waterbird spring staging survey	23-May-13	13	388139	7383942	Unknown Seal		UNSE				1	1	
breeding bird survey	13-Jun-13	13	381805	7393776	Unknown Seal		UNSE				6	6	
breeding bird survey	13-Jun-13	13	381803	7393568	Unknown Seal		UNSE				3	3	
grizzly bear DNA survey	11-Jun-13	13	408248	7350428	Moose	*Alces americanus*	ALAM		1			1	
aquatic survey	19-Jul-13	13	381604	7394679	Ringed Seal	*Pusa hispida*	PUHI				1	1	
aquatic survey	20-Jul-13	13	381173	7395382	Unknown Seal		UNSE				1	1	
waterbird fall staging survey	26-Aug-13	13	389516	7238662	Arctic hare	*Lepus arcticus*	LEAR				1	1	
waterbird fall staging survey	26-Aug-13	13	373402	7415380	Ringed Seal	*Pusa hispida*	PUHI				1	1	
waterbird fall staging survey	26-Aug-13	13	369613	7407302	Moose	*Alces americanus*	ALAM				2	2	
waterbird fall staging survey	28-Aug-13	13	376189	7321531	Ermine	*Mustela erminea*	MUER				1	1	
grizzly bear DNA survey	23-May-13	13	419651	7267830	Unknown Mammal							n/a	den
wolverine DNA survey	23-Mar-13	13	430987	7294539	Muskox	*Ovibos moschatus*	OVMO					n/a	tracks
wolverine DNA survey	25-Mar-13	13	407216	7312686	Muskox	*Ovibos moschatus*	OVMO					n/a	tracks
wolverine DNA survey	28-Mar-13	13	371229	7402672	Muskox	*Ovibos moschatus*	OVMO					n/a	tracks
remote camera survey	13-May-13	13	387780	7317805	Muskox	*Ovibos moschatus*	OVMO				41	41	
remote camera survey	11-May-13	13	444060	7271980	Muskox	*Ovibos moschatus*	OVMO				2	2	
den occupancy survey	26-May-13	13	410112	7290985	Muskox	*Ovibos moschatus*	OVMO				1	1	
grizzly bear DNA survey	27-May-13	13	420756	7270769	Muskox	*Ovibos moschatus*	OVMO				7	7	
waterbird spring pair survey	18-Jun-13	12	628452	7407009	Muskox	*Ovibos moschatus*	OVMO				19	19	
waterbird spring pair survey	18-Jun-13	12	633012	7383376	Muskox	*Ovibos moschatus*	OVMO				1	1	
grizzly bear DNA survey	12-Jun-13	13	399802	7273249	Muskox	*Ovibos moschatus*	OVMO				1	1	
grizzly bear DNA survey	12-Jun-13	13	442410	7243836	Muskox	*Ovibos moschatus*	OVMO				19	19	
archeology survey	28-Jun-13	13	403000	7311000	Muskox	*Ovibos moschatus*	OVMO				2	2	
grizzly bear DNA survey	4-Aug-13	13	458227	7278308	Muskox	*Ovibos moschatus*	OVMO				10	10	
grizzly bear DNA survey	2-Jul-13	13	430533	7272115	Muskox	*Ovibos moschatus*	OVMO				2	2	
grizzly bear DNA survey	11-Jul-13	13	372146	7355359	Muskox	*Ovibos moschatus*	OVMO				2	2	
grizzly bear DNA survey	22-Jul-13	13	427941	7268471	Muskox	*Ovibos moschatus*	OVMO				16	16	
waterbird brood survey	20-Jul-13	12	627781	7380443	Muskox	*Ovibos moschatus*	OVMO			2	13	15	

Appendix 5-4. Incidental Observations of Wildlife, 2013

Survey/Source	Date	Zone	Easting	Northing	Common Name	Scientific Name	Species Code	No. Observed					Sign Only?
								Male	Female	Young	Unknown	Total	
Other **(cont'd)**													
remote camera survey	21-Jul-13	13	427941	7268471	Muskox	*Ovibos moschatus*	OVMO				16	16	
remote camera survey	25-Aug-13	13	360542	7220652	Muskox	*Ovibos moschatus*	OVMO			2	43	45	
remote camera survey	25-Aug-13	13	359468	7218330	Muskox	*Ovibos moschatus*	OVMO				1	1	
waterbird fall staging survey	26-Aug-13	12	626001	7380443	Muskox	*Ovibos moschatus*	OVMO			1	14	15	

Appendix 6-1

Locations and Habitat Types of PRISM Plots

Rescan™
an ERM company

Appendix 6-1. Locations and Habitat Types of PRISM Plots

Survey Date	Plot ID	Zone	Southwest Corner		Region	Study Area	Habitat Type	% Contiguous Wetland	% Permanent Water	% Rock
			Easting	Northing						
13-Jun-13	PM 19	13	379500	7394000	Bathurst Inlet	Focused	Wet to Moist	100	0	0
13-Jun-13	PM 35	13	377500	7395575	Bathurst Inlet	Focused	Wet to Moist	100	15	0
15-Jun-13	REF PM 02	12	631400	7406000	Bathurst Inlet	Reference	Wet to Moist	80	7	1
15-Jun-13	REF PM 29	12	631100	7408400	Bathurst Inlet	Reference	Wet to Moist	70	15	0
14-Jun-13	REF PM 05	12	631400	7407200	Bathurst Inlet	Reference	Wet to Moist	100	0	0
14-Jun-13	REF PM 31	12	630800	7407600	Bathurst Inlet	Reference	Wet to Moist	100	10	0
17-Jun-13	PM 0A	13	379700	7393450	Bathurst Inlet	Focused	Wet to Moist	70	25	1
17-Jun-13	PM 16	13	378600	7394000	Bathurst Inlet	Focused	Wet to Moist	100	0	0

Appendix 6-2

Locations and Habitat Types of Point Counts Surveys

Rescan™
an ERM company

Appendix 6-2. Locations and Habitat Types of Point Counts

Survey Date	Point Count ID	Zone	Southwest Corner Easting	Southwest Corner Northing	Region	Study Area	Habitat Type	% Contiguous Wetland	% Permanent Water	% Rock
13-Jun-13	PC 04	13	380402	7395571	Bathurst Inlet	Focused	Wet to Moist	80	5	
13-Jun-13	PC 06	13	380399	7395371	Bathurst Inlet	Focused	Wet to Moist	60		5
13-Jun-13	PC 07	13	380595	7395369	Bathurst Inlet	Focused	Wet to Moist	80		
13-Jun-13	PC 13	13	380605	7394974	Bathurst Inlet	Focused	Dry		1	
13-Jun-13	PC 17	13	380798	7394775	Bathurst Inlet	Focused	Dry	15		5
17-Jun-13	PC 18	13	381001	7394770	Bathurst Inlet	Focused	Dry			
13-Jun-13	PC 19	13	381194	7394774	Bathurst Inlet	Focused	Wet to Moist	90		
13-Jun-13	PC 21	13	380801	7394573	Bathurst Inlet	Focused	Wet to Moist	80		
13-Jun-13	PC 25	13	381000	7394372	Bathurst Inlet	Focused	Wet to Moist	70		
13-Jun-13	PC 27	13	381394	7394374	Bathurst Inlet	Focused	Wet to Moist	65		
13-Jun-13	PC 30	13	381396	7394173	Bathurst Inlet	Focused	Dry	80		
13-Jun-13	PC 31	13	381596	7394175	Bathurst Inlet	Focused	Wet to Moist	80		
13-Jun-13	PC 39	13	381805	7393776	Bathurst Inlet	Focused	Mixed	50		
13-Jun-13	PC 42	13	381803	7393568	Bathurst Inlet	Focused	Wet to Moist	80	10	
13-Jun-13	PC 47	13	381799	7393171	Bathurst Inlet	Focused	Dry	10		1
14-Jun-13	PC 51	13	379795	7396371	Bathurst Inlet	Focused	Mixed	50	5	10
14-Jun-13	PC 53	13	379405	7396177	Bathurst Inlet	Focused	Wet to Moist	100		
14-Jun-13	PC 60	13	379797	7395972	Bathurst Inlet	Focused	Wet to Moist	100		
14-Jun-13	PC 69	13	379405	7395579	Bathurst Inlet	Focused	Dry	20		
14-Jun-13	PC 82	13	380002	7395178	Bathurst Inlet	Focused	Wet to Moist	100		
14-Jun-13	PC 94	13	380404	7394779	Bathurst Inlet	Focused	Wet to Moist	100		
14-Jun-13	PC 99	13	380407	7394571	Bathurst Inlet	Focused	Wet to Moist	70		
14-Jun-13	PC103	13	380401	7394367	Bathurst Inlet	Focused	Wet to Moist	70		
14-Jun-13	PC 104	13	380592	7394368	Bathurst Inlet	Focused	Dry	10		5
14-Jun-13	PC 105	13	380790	7394371	Bathurst Inlet	Focused	Wet to Moist	100		
13-Jun-13	PC 106	13	379992	7394175	Bathurst Inlet	Focused	Wet to Moist	100		
14-Jun-13	PC 120	13	380801	7393769	Bathurst Inlet	Focused	Dry	30		
14-Jun-13	PC 122	13	381199	7393767	Bathurst Inlet	Focused	Dry			20
14-Jun-13	PC 129	13	380600	7393370	Bathurst Inlet	Focused	Wet to Moist	90		
14-Jun-13	PC 130	13	380801	7393367	Bathurst Inlet	Focused	Wet to Moist	90		
18-Jun-13	REF PC 01	13	370005	7409595	Bathurst Inlet	Reference	Wet to Moist	100		
15-Jun-13	REF PC 06	13	369996	7410599	Bathurst Inlet	Reference	Wet to Moist	60		
15-Jun-13	REF PC 12	13	370004	7411796	Bathurst Inlet	Reference	Dry	5		
18-Jun-13	REF PC 19	13	370203	7409601	Bathurst Inlet	Reference	Wet to Moist	40		
15-Jun-13	REF PC 28	13	370204	7411406	Bathurst Inlet	Reference	Dry	40		10
15-Jun-13	REF PC 30	13	370197	7411798	Bathurst Inlet	Reference	Wet to Moist	100		
15-Jun-13	REF PC 32	13	370202	7412200	Bathurst Inlet	Reference	Mixed	50		10
15-Jun-13	REF PC 34	13	370195	7412604	Bathurst Inlet	Reference	Wet to Moist	95		
15-Jun-13	REF PC 36	13	370202	7413003	Bathurst Inlet	Reference	Wet to Moist	45		
18-Jun-13	REF PC 38	13	370402	7409803	Bathurst Inlet	Reference	Dry	35		
15-Jun-13	REF PC 43	13	370395	7410805	Bathurst Inlet	Reference	Dry	30		30
15-Jun-13	REF PC 46	13	370399	7411403	Bathurst Inlet	Reference	Wet to Moist	100		
15-Jun-13	REF PC 47	13	370396	7411597	Bathurst Inlet	Reference	Wet to Moist	100		
15-Jun-13	REF PC 52	13	370398	7412607	Bathurst Inlet	Reference	Wet to Moist	60		
18-Jun-13	REF PC 58	13	370597	7410201	Bathurst Inlet	Reference	Dry	10		25
15-Jun-13	REF PC 62	13	370600	7410997	Bathurst Inlet	Reference	Wet to Moist	30		5
15-Jun-13	REF PC 63	13	370602	7411195	Bathurst Inlet	Reference	Wet to Moist	80		
15-Jun-13	REF PC 67	13	370593	7412004	Bathurst Inlet	Reference	Mixed	50		5
15-Jun-13	REF PC 69	13	370597	7412411	Bathurst Inlet	Reference	Dry			5
18-Jun-13	REF PC 91	13	371000	7409603	Bathurst Inlet	Reference	Dry	5		15
17-Jun-13	REF PC 98	13	371005	7411001	Bathurst Inlet	Reference	Wet to Moist	50		
17-Jun-13	REF PC 101	13	371004	7411602	Bathurst Inlet	Reference	Dry	25		
17-Jun-13	REF PC 104	13	370993	7412199	Bathurst Inlet	Reference	Wet to Moist	75		25
18-Jun-13	REF PC 112	13	371200	7410200	Bathurst Inlet	Reference	Wet to Moist	80		
18-Jun-13	REF PC 113	13	371201	7410398	Bathurst Inlet	Reference	Wet to Moist	65		5
17-Jun-13	REF PC 116	13	371198	7411013	Bathurst Inlet	Reference	Wet to Moist	60		
17-Jun-13	REF PC 118	13	371196	7411404	Bathurst Inlet	Reference	Wet to Moist	80		
17-Jun-13	REF PC 120	13	371192	7411803	Bathurst Inlet	Reference	Wet to Moist	90		
17-Jun-13	REF PC 122	13	371193	7412201	Bathurst Inlet	Reference	Wet to Moist	100		
18-Jun-13	REF PC 131	13	371406	7410404	Bathurst Inlet	Reference	Wet to Moist	55		5

Appendix 6-3

Detections of Upland Birds and Nests during PRISM Plot Surveys

Rescan™
an ERM company

Appendix 6-3. Detections of Upland Birds and Nests during PRISM Plot Surveys

Data ID	Plot ID	Species	Species Code	Number of Territories	Habitat Type	Male	Female	Unknown Sex	Eggs	Young	Comments
1	PM 19	Savannah Sparrow	SAVS	2	Riparian Willow	2	2				singing; visually detected
2	PM 19	Savannah Sparrow	SAVS	3	Hummock Sedge Meadow	3					singing; visually detected; male may have departed plot
3	PM 19	Savannah Sparrow	SAVS	1	Riparian Willow	1					singing
4	PM 19	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				visually detected
5	PM 19	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow			1			chipping; visually detected; one indiv. chasing pair
7	PM 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1				visually detected
8	PM 19	Lapland Longspur	LALO	2	Hummock Sedge Meadow	1					singing; visually detected
9	PM 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					singing; aerial disply; visually detected
10	PM 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					calling; visually detected
11	PM 19	American Tree Sparrow	ATSP	1	Riparian Willow	1	1				visually detected
12	PM 19	American Tree Sparrow	ATSP	1	Riparian Willow	1					singing; visually detected
13	PM 19	American Tree Sparrow	ATSP	1	Low Shrub	1	1				visually detected
18	PM 35	Savannah Sparrow	SAVS	2	Riparian Willow	1					singing; visually detected
19	PM 35	Savannah Sparrow	SAVS	2	Hummock Sedge Meadow	1	1				singing and calling; visually detected; 2 adjacent territories
20	PM 35	Savannah Sparrow	SAVS	3	Tall Shrub	1	1				singing; visually detected; 2 adjacent territories
21	PM 35	Savannah Sparrow	SAVS	3	Hummock Sedge Meadow	1					singing; no visual
22	PM 35	American Tree Sparrow	ATSP	2	Riparian Willow	1	1				singing; visually detected
23	PM 35	American Tree Sparrow	ATSP	2	Riparian Willow	1					singing; no visual
24	PM 35	American Tree Sparrow	ATSP	2	Riparian Willow	1	1				visually detected; 1 pair dispute with SAVS pair
25	PM 35	Hoary Redpoll	HORE	1	Riparian Willow			1			visually detected; silent
26	PM 35	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					singing; no visual
27	PM 35	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1				singing; visually detected
35	REF PM 2	Horned Lark	HOLA	1	Mesic Tundra			1			calling; visually detected
36	REF PM 2	Common Redpoll	CORE	1	Riparian Willow			1			calling; visually detected
37	REF PM 2	White-crowned Sparrow	WCSP	1	Riparian Willow	1					singing
38	REF PM 2	Savannah Sparrow	SAVS	1	Riparian Willow	1					singing; visually detected
39	REF PM 2	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				singing and calling; visually detected
40	REF PM 2	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1				singing and calling; aerial display; visually detected
41	REF PM 2	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1				calling; visually detected; moving around plot
42	REF PM 2	Lapland Longspur	LALO	1	Moist Sedge Meadow	1	1		6		calling; flushed; female moving around plot
43	REF PM 2	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					calling; visually detected
44	REF PM 2	Least Sandpiper	LESA	1	Moist Sedge Meadow			1			flushed; no nest found
54	REF PM 29	Savannah Sparrow	SAVS	1	Riparian Willow	1	1				singing and calling; visually detected
55	REF PM 29	Savannah Sparrow	SAVS	1	Riparian Willow	1					singing; visually detected
56	REF PM 29	Savannah Sparrow	SAVS	1	Riparian Willow	1					singing and calling
57	REF PM 29	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1					singing; visually detected
58	REF PM 29	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1	1				singing; visually detected
59	REF PM 29	Lapland Longspur	LALO	1	Riparian Willow	1					calling; visually detected
60	REF PM 29	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					calling; visually detected
61	REF PM 29	Lapland Longspur	LALO	1	Mesic Tundra	1	1				singing and calling; visually detected
62	REF PM 29	Lapland Longspur	LALO	1	Mesic Tundra	1					singing and calling
63	REF PM 29	Common Redpoll	CORE	1	Riparian Willow	1	1				calling; visually detected
64	REF PM 29	Common Redpoll	CORE	1	Riparian Willow			1			visually detected
65	REF PM 29	American Tree Sparrow	ATSP	2	Riparian Willow	2					singing and calling; male in taller alder near edge of pool
66	REF PM 29	American Tree Sparrow	ATSP	2	Riparian Willow	2					singing; visually detected; at edge of plot
67	REF PM 29	American Tree Sparrow	ATSP	1	Moist Sedge Meadow	1					singing and calling

Appendix 6-3. Detections of Upland Birds and Nests during PRISM Plot Surveys

Data ID	Plot ID	Species	Species Code	Number of Territories	Habitat Type	Male	Female	Unknown Sex	Eggs	Young	Comments
68	REF PM 29	White-crowned Sparrow	WCSP	1	Riparian Willow	1	1				visually detected
69	REF PM 29	White-crowned Sparrow	WCSP	2	Moist Sedge Meadow	2					singing; visually detected
70	REF PM 29	White-crowned Sparrow	WCSP	1	Riparian Willow	1	1		5		singing; visually detected; flushed
71	REF PM 29	White-crowned Sparrow	WCSP	1	Riparian Willow	1					singing and calling; at edge of plot
72	REF PM 29	Least or Semipalmated Sandpiper	LESA/SESA	1	Moist Sedge Meadow	1	1				visually detected; flushed and flew away
73	REF PM 29	Least Sandpiper	LESA	1	Moist Sedge Meadow		1		4		aerial display; flushed
74	REF PM 29	Least Sandpiper	LESA	1	Moist Sedge Meadow			1			visually detected; flushed; no nest found
75	REF PM 29	Horned Lark	HOLA	1	Mesic Tundra			1			visually detected; silent
80	REF PM 5	Savannah Sparrow	SAVS	3	Moist Sedge Meadow	3					singing and calling; territorial dispute
81	REF PM 5	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				visually detected
82	REF PM 5	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1	1				singing and calling; visually detected
83	REF PM 5	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1					singing; visually detected; adjacent boundary with another male
84	REF PM 5	Lapland Longspur	LALO	1	Dry Heath Tundra	1					calling; visually detected
85	REF PM 5	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					singing; visually detected
86	REF PM 5	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					singing and calling
87	REF PM 5	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1		4		singing and calling; flushed
88	REF PM 5	White-crowned Sparrow	WCSP	1	Hummock Sedge Meadow	1	1				singing; visually detected
89	REF PM 5	American Tree Sparrow	ATSP	1	Moist Sedge Meadow	1					singing and calling
90	REF PM 5	Least or Semipalmated Sandpiper	LESA/SESA	1	Moist Sedge Meadow			1			calling; visually detected; flew off plot while doing flight call
96	REF PM 31	Wilson's Snipe	WISN	1	Moist Sedge Meadow			1			flushed
97	REF PM 31	Savannah Sparrow	SAVS	1	Low Shrub	1	1				singing and chipping; visually detected
98	REF PM 31	Savannah Sparrow	SAVS	1	Low Shrub	1					singing; visually detected
99	REF PM 31	Savannah Sparrow	SAVS	2	Moist Sedge Meadow	1					singing and calling
101	REF PM 31	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1	1				calling; visually detected
102	REF PM 31	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				singing and calling
103	REF PM 31	Savannah Sparrow	SAVS	1	Moist Sedge Meadow		1		4		flushed
104	REF PM 31	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1	1				singing and calling; detected copulating
105	REF PM 31	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow			1			silent; visually detected
106	REF PM 31	American Tree Sparrow	ATSP	3	Hummock Sedge Meadow	3					singing; visually detected; male moved north
107	REF PM 31	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	1					singing and calling
108	REF PM 31	American Tree Sparrow	ATSP	1	Riparian Willow	1	1				singing, chipping, and calling
109	REF PM 31	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					calling; visually detected
110	REF PM 31	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1	1				visually detected
111	REF PM 31	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					singing and calling; visually detected
112	REF PM 31	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					singing; visually detected
113	REF PM 31	White-crowned Sparrow	WCSP	1	Low Shrub	1	1				singing and calling; visually detected
114	REF PM 31	White-crowned Sparrow	WCSP	1	Moist Sedge Meadow	1					singing; visually detected
115	REF PM 31	Yellow Warbler	YEWA	1	Tall Shrub	1					singing and calling
122	PM A	Hoary Redpoll	HORE	1	Moist Sedge Meadow	1	1				calling; visually detected
123	PM A	Hoary Redpoll	HORE	1	Low Shrub	1	1				visually detected
124	PM A	Hoary Redpoll	HORE	1	Low Shrub	1	1				calling; visually detected
125	PM A	Common Redpoll	CORE	1	Low Shrub	1	1				singing; visually detected
126	PM A	American Tree Sparrow	ATSP	1	Low Shrub	1	1				singing and calling; visually detected
127	PM A	American Tree Sparrow	ATSP	1	Low Shrub	1	1				singing and calling; visually detected
128	PM A	American Tree Sparrow	ATSP	1	Low Shrub	1					singing and calling
129	PM A	American Tree Sparrow	ATSP	1	Low Shrub	1	1				singing; visually detected

Appendix 6-3. Detections of Upland Birds and Nests during PRISM Plot Surveys

Data ID	Plot ID	Species	Species Code	Number of Territories	Habitat Type	Male	Female	Unknown Sex	Eggs	Young	Comments
131	PM A	American Tree Sparrow	ATSP	1	Low Shrub	1	1				singing and calling
132	PM A	Savannah Sparrow	SAVS	1	Mesic Tundra	1	1				visually detected
133	PM A	Savannah Sparrow	SAVS	1	Low Shrub	1					singing; visually detected
134	PM A	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1	1				singing; visually detected; flushed; male left territory, no nest found
135	PM A	Savannah Sparrow	SAVS	1	Mesic Tundra	1	1				singing; visually detected
136	PM A	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	1					singing; visually detected
137	PM A	Least Sandpiper	LESA	1	Moist Sedge Meadow	1	1				visually detected; flushed
138	PM A	Semipalmated Sandpiper	SEPL	1	Beach	1	1		2		visually detected; flushed; located nest
143	PM 16	American Tree Sparrow	ATSP	1	Low Shrub	1					singing and calling
144	PM 16	American Tree Sparrow	ATSP	1	Low Shrub	1	1				singing and calling; visually detected; at plot boundary
145	PM 16	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	1					singing; visually detected
146	PM 16	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1					singing; visually detected
147	PM 16	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				visually detected; flew towards adjacent territory
148	PM 16	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1					singing and calling
149	PM 16	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1					singing and calling
150	PM 16	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	1	1				singing; visually detected
151	PM 16	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					singing; visually detected
152	PM 16	Lapland Longspur	LALO	1	Moist Sedge Meadow	1					calling; quiet due to wind
153	PM 16	Lapland Longspur	LALO	1	Hummock Sedge Meadow	1					calling

Appendix 6-4

Detections of Upland Breeding Birds and Nests during Point Count Surveys

Rescan™
an ERM company

Appendix 6-4. Detections of Upland Breeding Birds and Nests during Point Count Surveys

Data ID	Point Count ID	Species	Species Code	Number of Territories	Habitat Type	Distance First Detected	Male	Female	Unknown Sex	Eggs	Young	Comments
1	PC 04	Savannah Sparrow	SAVS	1	Low Shrub	TS	1					singing
9	PC 04	Savannah Sparrow	SAVS	1	Low Shrub	TS	1					singing
10	PC 04	Lapland Longspur	LALO	1	Low Shrub	TS	1	1				singing; visually detected
12	PC 06	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
13	PC 06	American Tree Sparrow	ATSP	1	Mesic Tundra	TL	1					singing
14	PC 06	White-crowned Sparrow	WCSP	1	Mesic Tundra	TL	1					singing
15	PC 06	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
21	PC 07	Savannah Sparrow	SAVS	1	Mesic Tundra	TL	1					singing
22	PC 07	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
23	PC 07	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
31	PC 13	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing; aerial display, visually detected
32	PC 13	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing; visually detected
33	PC 13	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing; aerial display, visually detected
38	PC 17	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
39	PC 17	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing
41	PC 17	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing
43	PC 21	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
44	PC 21	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
45	PC 21	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
47	PC 19	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
48	PC 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing; aerial display; visually detected
49	PC 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
54	PC 25	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing
55	PC 25	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
58	PC 27	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing and calling
59	PC 27	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing and visually detected
60	PC 27	White-crowned Sparrow	WCSP	1	Tall Shrub	RS	1					singing and visually detected
61	PC 27	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing and visually detected
62	PC 27	White-crowned Sparrow	WCSP	1	Hummock Sedge Meadow	WB	1					singing
63	PC 30	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
64	PC 30	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
65	PC 30	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing
68	PC 31	American Golden-Plover	AMGP	1	Moist Sedge Meadow	WC			1			calling; visually detected
69	PC 31	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing and visually detected
75	PC 39	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					visually detected; on sandy ridgeline
76	PC 39	Lapland Longspur	LALO	1	Esker	ES	1					singing
77	PC 39	White-crowned Sparrow	WCSP	1	Esker	ES	1					singing
80	PC 42	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1					singing
81	PC 42	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing
82	PC 42	Lapland Longspur	LALO	1	Low Shrub	TS	1					singing
86	PC 47	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing; aerial display
91	PC 47	Savannah Sparrow	SAVS	1	Mesic Tundra	TL	1					singing
92	PC 106	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1					singing; visually detected
93	PC 106	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
94	PC 106	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
95	PC 106	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
100	REF PC 43	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					calling; visually detected
101	REF PC 43	Horned Lark	HOLA	1	Esker	ES	1					singing; visually detected
102	REF PC 43	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
103	REF PC 43	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
107	PC 51	Savannah Sparrow	SAVS	1	Tall Shrub	RS	1					singing; visually detected
113	PC 53	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
114	PC 53	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing

Appendix 6-4. Detections of Upland Breeding Birds and Nests during Point Count Surveys

Data ID	Point Count ID	Species	Species Code	Number of Territories	Habitat Type	Distance First Detected	Male	Female	Unknown Sex	Eggs	Young	Comments
115	PC 53	White-crowned Sparrow	WCSP	1	Moist Sedge Meadow	WC	1					singing
116	PC 53	White-crowned Sparrow	WCSP	1	Hummock Sedge Meadow	WB	1					singing
117	PC 53	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
123	PC 60	Savannah Sparrow	SAVS	1			1					singing
124	PC 60	Savannah Sparrow	SAVS	1			1					singing
125	PC 60	Lapland Longspur	LALO	1			1					singing; visually detected
130	PC 69	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
131	PC 69	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
137	PC 82	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing
138	PC 82	Savannah Sparrow	SAVS	1	Low Shrub	TS	1					singing
139	PC 82	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing
140	PC 82	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing; visually detected
146	PC 94	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
147	PC 94	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1	1				singing; visually detected
149	PC 94	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
151	PC 94	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
153	PC 94	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing; visually detected
154	PC 99	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					calling; visually detected
155	PC 99	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1					singing; visually detected
156	PC 99	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
157	PC 99	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
158	PC 99	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
161	PC 103	Savannah Sparrow	SAVS	1	Dry Heath Tundra	TH	1					singing
162	PC 103	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
164	PC 103	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
167	PC 104	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
169	PC 105	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
170	PC 105	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing; visually detected
176	PC 122	Lapland Longspur	LALO	1	Dry Heath Tundra	TH			2			calling; visually detected
177	PC 122	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing
188	PC 130	White-crowned Sparrow	WCSP	1	Hummock Sedge Meadow	WB	1	1				singing and calling; visually detected
189	PC 130	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
190	PC 130	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
191	PC 130	Lapland Longspur	LALO	1	Riparian Willow	TS+	1					visually detected
196	PC 129	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
197	PC 129	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1	1				singing; visually detected
199	PC 129	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
200	PC 129	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
201	PC 129	American Tree Sparrow	ATSP	1	Hummock Sedge Meadow	WB	1					singing
202	REF PC 63	Horned Lark	HOLA	1	Mesic Tundra	TL	1	1				singing; visually detected
204	REF PC 63	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing; aerial display, calling; flew north to 25m
205	REF PC 63	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing; visually detected; flew west to 50m
208	REF PC 63	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing
209	REF PC 62	Lapland Longspur	LALO	1	Mesic Tundra	TL	1	1				singing; aerial display; visually detected
211	REF PC 62	American Golden-Plover	AMGP	1	Hummock Sedge Meadow	WB	1	1				visually detected
216	REF PC 46	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1	1				aerial display; visually detected; flew to within few metres of observer
218	REF PC 46	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
219	REF PC 46	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing; flew south to 75m
222	REF PC 28	Savannah Sparrow	SAVS	1	Dry Heath Tundra	TH	1					singing
223	REF PC 28	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing; aerial display; visually detected
224	REF PC 28	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing; aerial display; calling; visually detected; flew west to 25m
225	REF PC 28	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing; visually detected; flew southwest to 25m
228	REF PC 47	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing; flew west and west within 75-100m of where first seen

Appendix 6-4. Detections of Upland Breeding Birds and Nests during Point Count Surveys

Data ID	Point Count ID	Species	Species Code	Number of Territories	Habitat Type	Distance First Detected	Male	Female	Unknown Sex	Eggs	Young	Comments
229	REF PC 47	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
230	REF PC 47	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
235	REF PC 30	Common Redpoll	CORE	1	Hummock Sedge Meadow	WB			1			calling
237	REF PC 30	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing; first detected off plot, flew into plot <25m away from obs during PC
238	REF PC 30	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing; first detected off plot, flew into plot within 75m of observer during PC
239	REF PC 30	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
241	REF PC 30	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					calling
242	REF PC 12	White-crowned Sparrow	WCSP	1	Mesic Tundra	TL	1	1				visually detected
244	REF PC 12	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
245	REF PC 12	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
246	REF PC 12	Horned Lark	HOLA	1	Mesic Tundra	TL	1					singing; first detected off plot, flew into plot 25m from obs. during point count
247	REF PC 12	Harris's Sparrow	HASP	1	Mesic Tundra	TL	1					singing; first detected off plot, flew into plot 75m from obs during PC
249	REF PC 12	Savannah Sparrow	SAVS	1	Mesic Tundra	TL	1					singing
250	REF PC 36	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing
251	REF PC 36	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
252	REF PC 36	Horned Lark	HOLA	1	Hummock Sedge Meadow	WB	1	1				singing and calling; visually detected; first detected off plot, flew into plot 25m from obs. during point count
258	REF PC 52	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing and calling
259	REF PC 52	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing; aerial display; visually detected
260	REF PC 52	American Golden-Plover	AMGP	1	Mesic Tundra	TL			1			visually detected
261	REF PC 52	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing
262	REF PC 52	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing
263	REF PC 34	Unknown Sandpiper	UNSA	1	Moist Sedge Meadow	WC	1	1				calling; visually detected; first detected off plot, flew into plot 25m from obs. during point count
265	REF PC 34	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1	1				aerial display; calling; visually detected
267	REF PC 34	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					singing; aerial display; visually detected; flew into territory of adjacent male
268	REF PC 34	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing
270	REF PC 69	Lapland Longspur	LALO	1	Dry Heath Tundra	TH			1			calling
271	REF PC 69	Savannah Sparrow	SAVS	1	Dry Heath Tundra	TH	1					singing
273	REF PC 69	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
274	REF PC 69	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
275	REF PC 32	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
277	REF PC 32	Lapland Longspur	LALO	1	Mesic Tundra	TL	1	1				visually detected; 2 males seen together
278	REF PC 32	Lapland Longspur	LALO	1	Mesic Tundra	TL	1					visually detected
279	REF PC 32	Savannah Sparrow	SAVS	1	Dry Heath Tundra	TH	1					singing
280	REF PC 32	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1					singing
281	REF PC 67	Unknown Sandpiper	UNSA	1	Moist Sedge Meadow	WC	1	1				calling; visually detected
283	REF PC 67	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
284	REF PC 67	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB			1			calling; flew <25m away from obs
285	REF PC 67	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing
287	REF PC 06	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
288	REF PC 06	White-crowned Sparrow	WCSP	1	Hummock Sedge Meadow	WB	1					singing
289	REF PC 06	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
292	REF PC 104	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
293	REF PC 104	Lapland Longspur	LALO	1	Riparian Willow	TS+	1					singing; visually detected
294	REF PC 104	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
295	REF PC 104	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					calling; visually detected
297	REF PC 122	Lapland Longspur	LALO	1	Dry Heath Tundra	TH	1					singing
300	REF PC 120	Lapland Longspur	LALO	1	Moist Sedge Meadow	WC	1	1				singing; visually detected
302	REF PC 120	White-crowned Sparrow	WCSP	1	Moist Sedge Meadow	WC	1					singing
303	REF PC 120	Redpoll	REDP	1	Riparian Willow	TS+	1	1				visually detected
305	REF PC 120	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1					singing

Appendix 6-4. Detections of Upland Breeding Birds and Nests during Point Count Surveys

Data ID	Point Count ID	Species	Species Code	Number of Territories	Habitat Type	Distance First Detected	Male	Female	Unknown Sex	Eggs	Young	Comments
308	REF PC 101	Horned Lark	HOLA	1	Mesic Tundra	TL	1	1				singing; visually detected
316	REF PC 118	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB	1	1				visually detected
320	REF PC 116	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1					singing
321	REF PC 116	American Tree Sparrow	ATSP	1	Mesic Tundra	TL	1					singing
325	REF PC 98	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1	1				singing; flushed; visually detected
328	PC 18	American Golden-Plover	AMGP	1	Mesic Tundra	TL			1			visually detected; broken wing display
329	PC 18	American Golden-Plover	AMGP	1	Mesic Tundra	TL	1	1				calling; visually detected
331	PC 18	Lapland Longspur	LALO	1	Mesic Tundra	TL			1			calling
333	REF PC 58	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
334	REF PC 58	Lapland Longspur	LALO	1	Dry Heath Tundra	TH			1			calling
335	REF PC 38	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing
336	REF PC 38	Savannah Sparrow	SAVS	1	Hummock Sedge Meadow	WB	1					singing
338	REF PC 19	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB			1			calling
339	REF PC 1	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing
340	REF PC 1	Savannah Sparrow	SAVS	1	Low Shrub	TS	1					singing
343	REF PC 91	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing
344	REF PC 91	Horned Lark	HOLA	1	Dry Heath Tundra	TH	1					singing
345	REF PC 91	White-crowned Sparrow	WCSP	1	Dry Heath Tundra	TH	1					singing
347	REF PC 112	Savannah Sparrow	SAVS	1	Low Shrub	TS	1					singing
348	REF PC 112	American Tree Sparrow	ATSP	1	Low Shrub	TS	1					singing
349	REF PC 112	American Tree Sparrow	ATSP	1	Moist Sedge Meadow	WC	1					singing
352	REF PC 131	Lapland Longspur	LALO	1	Hummock Sedge Meadow	WB			1			calling
353	REF PC 131	Savannah Sparrow	SAVS	1	Moist Sedge Meadow	WC	1					singing

Appendix 6-5

Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Rescan™
an ERM company

Appendix 6-5. Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Data ID	Survey	Plot ID	Species	Code	Male	Female	Unknown Sex
2	Point Count	PC 04	White-crowned Sparrow	WCSP	1		
3	Point Count	PC 04	Lapland Longspur	LALO	1		
4	Point Count	PC 04	American Tree Sparrow	ATSP			1
5	Point Count	PC 04	Redpoll	REDP			1
6	Point Count	PC 04	Semipalmated Sandpiper	SESA	1	1	
7	Point Count	PC 04	Semipalmated Plover	SEPL	1	1	
16	Point Count	PC 06	Wilson's Snipe	WISN			1
17	Point Count	PC 06	Savannah Sparrow	SAVS			1
18	Point Count	PC 06	White-crowned Sparrow	WCSP			1
19	Point Count	PC 06	Redpoll	REDP			1
20	Point Count	PC 06	Redpoll	REDP			1
24	Point Count	PC 07	Redpoll	REDP	1		
25	Point Count	PC 07	White-crowned Sparrow	WCSP	1		
26	Point Count	PC 07	American Tree Sparrow	ATSP	1		
27	Point Count	PC 07	Lapland Longspur	LALO	1		
28	Point Count	PC 07	Redpoll	REDP			1
29	Point Count	PC 07	Savannah Sparrow	SAVS			1
30	Point Count	PC 07	Horned Lark	HOLA	1		
34	Point Count	PC 13	American Golden-Plover	AMGP			1
35	Point Count	PC 13	White-crowned Sparrow	WCSP	1		
36	Point Count	PC 13	Lapland Longspur	LALO	2		
37	Point Count	PC 13	Redpoll	REDP			1
40	Point Count	PC 17	American Golden-Plover	AMGP			3
42	Point Count	PC 17	Redpoll	REDP			1
46	Point Count	PC 21	Redpoll	REDP			1
50	Point Count	PC 19	Lapland Longspur	LALO	1		
51	Point Count	PC 19	Horned Lark	HOLA	1		
52	Point Count	PC 19	White-crowned Sparrow	WCSP	1		
53	Point Count	PC 19	Redpoll	REDP			1
56	Point Count	PC 25	Redpoll	REDP			2
57	Point Count	PC 25	Horned Lark	HOLA	1		
66	Point Count	PC 30	Unknown Sandpiper	UNSA			1
67	Point Count	PC 30	Redpoll	REDP			1
70	Point Count	PC 31	Lapland Longspur	LALO	1		
71	Point Count	PC 31	Horned Lark	HOLA	1		
72	Point Count	PC 31	Savannah Sparrow	SAVS	1		
73	Point Count	PC 31	Savannah Sparrow	SAVS	1		
74	Point Count	PC 31	Redpoll	REDP			2
78	Point Count	PC 39	Unknown Sandpiper	UNSA			1
79	Point Count	PC 39	Redpoll	REDP			1
83	Point Count	PC 42	Savannah Sparrow	SAVS	1		
84	Point Count	PC 42	White-crowned Sparrow	WCSP	1		
85	Point Count	PC 42	Redpoll	REDP			1
87	Point Count	PC 47	Savannah Sparrow	SAVS			1
88	Point Count	PC 47	American Tree Sparrow	ATSP			1
89	Point Count	PC 47	White-crowned Sparrow	WCSP			1
90	Point Count	PC 47	White-crowned Sparrow	WCSP			1
96	Point Count	PC 106	Lapland Longspur	LALO			1
97	Point Count	PC 106	Willow Ptarmagin	WIPT			1
98	Point Count	PC 106	Redpoll	REDP			1
104	Point Count	REF PC 43	Unknown Sandpiper	UNSA			1
105	Point Count	REF PC 43	Redpoll	REDP			1
108	Point Count	PC 51	Lapland Longspur	LALO	1	1	

Appendix 6-5. Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Data ID	Survey	Plot ID	Species	Code	Male	Female	Unknown Sex
109	Point Count	PC 51	Lapland Longspur	LALO		1	
110	Point Count	PC 51	American Tree Sparrow	ATSP	1		
111	Point Count	PC 51	White-crowned Sparrow	WCSP	1		
112	Point Count	PC 51	American Tree Sparrow	ATSP	1		
118	Point Count	PC 53	Lapland Longspur	LALO			1
119	Point Count	PC 53	American Robin	AMRO			1
120	Point Count	PC 53	American Tree Sparrow	ATSP			1
121	Point Count	PC 53	Yellow Warbler	YEWA			1
122	Point Count	PC 53	Redpoll	REDP			1
126	Point Count	PC 60	American Tree Sparrow	ATSP	1		
127	Point Count	PC 60	Horned Lark	HOLA	1		
128	Point Count	PC 60	American Tree Sparrow	ATSP			1
129	Point Count	PC 60	Redpoll	REDP			1
132	Point Count	PC 69	Savannah Sparrow	SAVS	1		
133	Point Count	PC 69	Savannah Sparrow	SAVS	1		
134	Point Count	PC 69	American Tree Sparrow	ATSP	1		
135	Point Count	PC 69	Redpoll	REDP			1
136	Point Count	PC 69	White-crowned Sparrow	WCSP			1
141	Point Count	PC 82	Lapland Longspur	LALO	1		
142	Point Count	PC 82	White-crowned Sparrow	WCSP	1		
143	Point Count	PC 82	Lapland Longspur	LALO	1		
144	Point Count	PC 82	Redpoll	REDP			1
145	Point Count	PC 82	Savannah Sparrow	SAVS			1
150	Point Count	PC 94	White-crowned Sparrow	WCSP	1		
152	Point Count	PC 94	American Tree Sparrow	ATSP	1		
159	Point Count	PC 99	White-crowned Sparrow	WCSP	1		
160	Point Count	PC 99	Redpoll	REDP			1
163	Point Count	PC 103	Lapland Longspur	LALO	1		
165	Point Count	PC 103	Lapland Longspur	LALO			1
168	Point Count	PC 104	Redpoll	REDP			1
171	Point Count	PC 105	Lapland Longspur	LALO	1		
172	Point Count	PC 105	Horned Lark	HOLA	1		
173	Point Count	PC 105	American Golden-Plover	AMGP			2
174	Point Count	PC 105	Lapland Longspur	LALO			1
175	Point Count	PC 105	Redpoll	REDP			1
179	Point Count	PC 122	Lapland Longspur	LALO	1		
180	Point Count	PC 122	Savannah Sparrow	SAVS	1		
181	Point Count	PC 122	White-crowned Sparrow	WCSP	1		
182	Point Count	PC 122	Semipalmated Plover	SEPL			1
183	Point Count	PC 122	Redpoll	REDP			1
184	Point Count	PC 120	Savannah Sparrow	SAVS	1		
185	Point Count	PC 120	Lapland Longspur	LALO	1		
186	Point Count	PC 120	Redpoll	REDP			1
192	Point Count	PC 130	Lapland Longspur	LALO	1		
193	Point Count	PC 130	Savannah Sparrow	SAVS	1		
194	Point Count	PC 130	White-crowned Sparrow	WCSP	1		
195	Point Count	PC 130	Redpoll	REDP			1
206	Point Count	REF PC 63	American Tree Sparrow	ATSP	1		
207	Point Count	REF PC 63	Redpoll	REDP			1
213	Point Count	REF PC 62	Lapland Longspur	LALO	s		
214	Point Count	REF PC 62	Horned Lark	HOLA	s		
215	Point Count	REF PC 62	Redpoll	REDP			1
220	Point Count	REF PC 46	White-crowned Sparrow	WCSP	1		

Appendix 6-5. Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Data ID	Survey	Plot ID	Species	Code	Male	Female	Unknown Sex
221	Point Count	REF PC 46	Lapland Longspur	LALO			1
231	Point Count	REF PC 47	Lapland Longspur	LALO	1		
232	Point Count	REF PC 47	American Tree Sparrow	ATSP	1		
233	Point Count	REF PC 47	White-crowned Sparrow	WCSP	1		
234	Point Count	REF PC 47	Redpoll	REDP			1
236	Point Count	REF PC 30	Common Redpoll	CORE			1
240	Point Count	REF PC 30	Savannah Sparrow	SAVS	1		
248	Point Count	REF PC 12	Lapland Longspur	LALO			1
254	Point Count	REF PC 36	Lapland Longspur	LALO	1		
255	Point Count	REF PC 36	Savannah Sparrow	SAVS	1		
256	Point Count	REF PC 36	Horned Lark	HOLA	1		
257	Point Count	REF PC 36	Redpoll	REDP			1
286	Point Count	REF PC 67	Unknown Sandpiper	UNSA			2
290	Point Count	REF PC 06	Redpoll	REDP			1
291	Point Count	REF PC 06	White-crowned Sparrow	WCSP	1		
296	Point Count	REF PC 104	Redpoll	REDP			1
298	Point Count	REF PC 122	White-crowned Sparrow	WCSP	1		
299	Point Count	REF PC 122	Redpoll	REDP			1
306	Point Count	REF PC 120	Horned Lark	HOLA	1		
307	Point Count	REF PC 120	Redpoll	REDP			1
310	Point Count	REF PC 101	American Tree Sparrow	ATSP	1		
311	Point Count	REF PC 101	American Tree Sparrow	ATSP	1		
312	Point Count	REF PC 101	White-crowned Sparrow	WCSP	1		
313	Point Count	REF PC 101	Savannah Sparrow	SAVS	1		
314	Point Count	REF PC 101	Lapland Longspur	LALO	1		
315	Point Count	REF PC 101	Redpoll	REDP			1
318	Point Count	REF PC 118	Horned Lark	HOLA	1		
319	Point Count	REF PC 118	Redpoll	REDP			1
322	Point Count	REF PC 116	Savannah Sparrow	SAVS	1		
323	Point Count	REF PC 116	Yellow Warbler	YEWA	1		
324	Point Count	REF PC 116	Redpoll	REDP			1
327	Point Count	REF PC 98	Redpoll	REDP			1
332	Point Count	PC 18	American Tree Sparrow	ATSP	1		
337	Point Count	REF PC 38	White-crowned Sparrow	WCSP	1		
341	Point Count	REF PC 01	Savannah Sparrow	SAVS	1		
342	Point Count	REF PC 01	Redpoll	REDP			2
346	Point Count	REF PC 91	Redpoll	REDP			1
350	Point Count	REF PC 112	White-crowned Sparrow	WCSP	1		
351	Point Count	REF PC 113	Redpoll	REDP	1		
354	Point Count	REF PC 131	White-crowned Sparrow	WCSP			1
14	PRISM	PM 19	Lapland Longspur	LALO	2		
15	PRISM	PM 19	American Tree Sparrow	ATSP	2		
16	PRISM	PM 19	Wilson's Snipe	WISN	2		2
17	PRISM	PM 19	Redpoll spp.	REDP			1
28	PRISM	PM 35	Savannah Sparrow	SAVS	1		
29	PRISM	PM 35	White-crowned Sparrow	WCSP	1		
30	PRISM	PM 35	American Tree Sparrow	ATSP	1		
31	PRISM	PM 35	Lapland Longspur	LALO	1		
32	PRISM	PM 35	American Tree Sparrow	ATSP	2		
33	PRISM	PM 35	Unknown Sandpiper	UNSA			1
34	PRISM	PM 35	Redpoll spp.	REDP			2
45	PRISM	REF PM 2	Savannah Sparrow	SAVS			1
46	PRISM	REF PM 2	Savannah Sparrow	SAVS	2		

Appendix 6-5. Detections of Upland Birds Outside of Point Count and PRISM Plot Surveys

Data ID	Survey	Plot ID	Species	Code	Male	Female	Unknown Sex
47	PRISM	REF PM 2	American Tree Sparrow	ATSP	1		
48	PRISM	REF PM 2	White-crowned Sparrow	WCSP	2		
49	PRISM	REF PM 2	American Robin	AMRO	1		
50	PRISM	REF PM 2	Lapland Longspur	LALO	1		
51	PRISM	REF PM 2	Lapland Longspur	LALO	1		
52	PRISM	REF PM 2	Savannah Sparrow	SAVS	1		
53	PRISM	REF PM 2	Redpoll spp.	REDP			1
76	PRISM	REF PM 29	American Tree Sparrow	ATSP	1		
77	PRISM	REF PM 29	Savannah Sparrow	SAVS			1
78	PRISM	REF PM 29	Redpoll spp.	REDP			1
79	PRISM	REF PM 29	Wilson's Snipe	WISN			1
91	PRISM	REF PM 5	Savannah Sparrow	SAVS	2		
92	PRISM	REF PM 5	White-crowned Sparrow	WCSP	2		
93	PRISM	REF PM 5	American Tree Sparrow	ATSP	1		
94	PRISM	REF PM 5	Lapland Longspur	LALO	1		
95	PRISM	REF PM 5	Redpoll spp.	REDP			2
116	PRISM	REF PM 31	Least or Semipalmated Sandpiper	LESA/SESA			1
117	PRISM	REF PM 31	Savannah Sparrow	SAVS	2		
118	PRISM	REF PM 31	American Tree Sparrow	ATSP	1		
119	PRISM	REF PM 31	Harris's Sparrow	HASP	1		
120	PRISM	REF PM 31	White-crowned Sparrow	WCSP			2
121	PRISM	REF PM 31	Redpoll spp.	REDP			1
139	PRISM	PM A	Wilson's Snipe	WISN	1		
140	PRISM	PM A	American Tree Sparrow	ATSP	2		
141	PRISM	PM A	Savannah Sparrow	SAVS	1		
142	PRISM	PM A	Redpoll spp.	REDP			1
154	PRISM	PM 16	Savannah Sparrow	SAVS	1		
155	PRISM	PM 16	American Tree Sparrow	ATSP	2		
156	PRISM	PM 16	Savannah Sparrow	SAVS	1	1	

Appendix 7-1

Waterbird and Marine Bird Survey Details, 2013

Rescan™
an ERM company

Appendix 7-1. Waterbird and Marine Bird Survey Details, 2013

Survey Type	Survey Period	Date	Region	Survey Strata	Start	End	Total Survey Time (min)	Temp. (°C)	Cloud Cover (%)	Wind (km/hr)	Lighting
Aerial	Spring Staging	23-May-13	Bathurst Inlet	Reference	17:30	16:50	61	7	10	10	bright
Aerial	Spring Staging	24-May-13	Bathurst Inlet	Focused	12:11	13:40	67	4	10	10-15	bright
Ground	Spring Staging	26-May-13	George PDA	Reference	9:59	10:37	38	1	100	15-20	flat
Ground	Spring Staging	30-May-13	Goose PDA	Reference	16:15	16:50	35	6-8	75		flat
Aerial	Spring Pair	18-Jun-13	Bathurst Inlet	MLA Focused	13:19	16:58	144	5-7	40-90	15-20	flat
Aerial	Spring Pair	19-Jun-13	Bathurst Inlet	Shoreline	12:53	15:47	123	18	50	15	patchy
Aerial	Summer Brood	20-Jul-13	Bathurst Inlet	MLA Focused	9:10	13:46	209	12	100	5	flat
Aerial	Summer Brood	20-Jul-13	Bathurst Inlet	Shoreline	14:17	17:40	160	16	65	10	variable
Aerial	Fall Staging	26-Aug-13	Bathurst Inlet	MLA Focused	9:36	14:08	189	5	90	4-8	7.4-14.8
Aerial	Fall Staging	26-Aug-13	Bathurst Inlet	Shoreline	14:18	16:51	124	10	90	6	11
Ground	Fall Staging	28-Aug-13	George PDA	Focused	16:14	17:57	76	8	90	5-10	9.3-18.5

Appendix 7-2

Waterbird and Marine Bird Observation Data, 2013

Rescan™
an ERM company

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
23-May-13	Aerial	Spring Staging	Bathurst Inlet	Reference	2	365	13 W	387438	7380926	Greater White-fronted Goose	*Anser albifrons*	GWFG			16					16	RS		FLH
23-May-13	Aerial	Spring Staging	Bathurst Inlet	Reference	2	365	13 W	387438	7380926	Unknown Goose		UNGO			20					20	RS		
23-May-13	Aerial	Spring Staging	Bathurst Inlet	Reference	2	366	13 W	386667	7380830	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK		PR
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	2	384	13 W	373108	7399316	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	2	385	13 W	370678	7399343	Herring Gull	*Larus argentatus*	HEGU			1					1	LK	Large	FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	3	386	13 W	373704	7397301	Northern Pintail	*Anas acuta*	NOPI			2					2	LK	Large	RE
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	4	387	13 W	375933	7395360	Greater White-fronted Goose	*Anser albifrons*	GWFG			2					2	LK	Large	FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	4	387	13 W	375933	7395360	Herring Gull	*Larus argentatus*	HEGU			1					1	LK	Large	FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	7	388	12 W	632169	7389252	Herring Gull	*Larus argentatus*	HEGU			1					1	LK	Medium	FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	8	389	12 W	631753	7387063	Greater White-fronted Goose	*Anser albifrons*	GWFG			15					15	LK	Medium	FLY
24-May-13	Aerial	Spring Staging	Bathurst Inlet	Focused	8	390	12 W	630802	7386965	Greater White-fronted Goose	*Anser albifrons*	GWFG			1					1	LK	Medium	FLY
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	20	15						35	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Canada Goose	*Branta canadensis*	CAGO			20					20	LK	Large	DA; OT
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Greater Scaup	*Aythya marila*	GRSC	7	7						14	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	20	15						35	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	18	15						33	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	20	15						35	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	20	15						35	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	American Wigeon	*Anas americana*	AMWI	1							1	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	American Green-winged Teal	*Anas crecca*	AGWT	3							3	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	15	15						30	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	15	15						30	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Canada Goose	*Branta canadensis*	CAGO			15					15	LK	Large	DA; OT
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Long-tailed Duck	*Clangula hyemalis*	LTDU	4	4						8	LK	Large	OT
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Canada Goose	*Branta canadensis*	CAGO			20					20	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Northern Pintail	*Anas acuta*	NOPI	8							8	LK	Large	DA
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Greater White-fronted Goose	*Anser albifrons*	GWFG			31					31	LK	Large	
26-May-13	Ground	Spring Staging	George PDA	Focused			13 W	384409	7316945	Snow Goose	*Chen caerulescens*	SNGO			70					70	LK	Large	
30-May-13	Ground	Spring Staging	Goose PDA	Focused			13W	433922	7269928	Greater White-fronted Goose	*Anser albifrons*	GWFG			13					13	PO		DA; FLH
30-May-13	Ground	Spring Staging	Goose PDA	Focused			13W	433922	7269928	Canada Goose	*Branta canadensis*	CAGO			2					2	PO		DA; OT
30-May-13	Ground	Spring Staging	Goose PDA	Focused			13W	433922	7269928	Northern Pintail	*Anas acuta*	NOPI			2					2	WT		FLY; RE
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	1		12 W	631843	7409218	Tundra Swan	*Cygnus columbianus*	TUSW		1		N				1	WT		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	3		13 W	369283	7405253	Long-tailed Duck	*Clangula hyemalis*	LTDU		7		N				7	LK		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	3		13 W	370573	7405222	Red-breasted Merganser	*Mergus serrator*	RBME	2			N				2	SH		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	4		13 W	370300	7403332	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	4		12 W	631420	7403274	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	LK-M		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	5		12 W	629307	7400997	Northern Pintail	*Anas acuta*	NOPI		1		N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	6		13 W	370594	7399264	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-M		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	6		12 W	631069	7399225	Red-breasted Merganser	*Mergus serrator*	RBME	1	1		Y				2	LK-M		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	6		12 W	630575	7399169	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	6		12 W	625354	7398519	Greater Scaup	*Aythya marila*	GRSC	1	1		N				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	8		12 W	630642	7395078	Long-tailed Duck	*Clangula hyemalis*	LTDU			1	N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	8		12 W	630642	7395078	Red-breasted Merganser	*Mergus serrator*	RBME	2			N				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	9		12 W	626891	7392743	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	9		13 W	372633	7393263	Canada Goose	*Branta canadensis*	CAGO			1	N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	9		13 W	379914	7393368	Canada Goose	*Branta canadensis*	CAGO			32	N				32	SH		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	OT		13 W	380294	7391011	Greater Scaup	*Aythya marila*	GRSC	30	1		N				31	SH		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	10		13 W	374927	7391353	Pacific Loon	*Gavia pacifica*	PALO			1	N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	10		13 W	368618	7391326	Long-tailed Duck	*Clangula hyemalis*	LTDU	2	1		N				3	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	11		13 W	374388	7389256	Tundra Swan	*Cygnus columbianus*	TUSW			1	N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	11		13 W	377256	7389258	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	11		13 W	381892	7389263	Canada Goose	*Branta canadensis*	CAGO			40	N				40	SH		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	12		13 W	378232	7387341	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	12		13 W	374269	7387323	Red-breasted Merganser	*Mergus serrator*	RBME	1			N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	12		12 W	632947	7387309	Tundra Swan	*Cygnus columbianus*	TUSW			1	N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	368368	7385314	Red-breasted Merganser	*Mergus serrator*	RBME	1			N				1	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	374221	7385283	Canada Goose	*Branta canadensis*	CAGO			3	N				3	RI-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	374221	7385283	Greater Scaup	*Aythya marila*	GRSC	3	1		N				4	RI-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	374221	7385283	Tundra Swan	*Cygnus columbianus*	TUSW	1	1		Y				2	RI-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	375809	7385293	Tundra Swan	*Cygnus columbianus*	TUSW	1	1		Y				2	CR-M		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	13		13 W	380796	7385302	Long-tailed Duck	*Clangula hyemalis*	LTDU	2	1		N				3	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	OT		13 W	384361	7385286	Canada Goose	*Branta canadensis*	CAGO			40	N				40	SH		

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	OT		13 W	385384	7384005	Red-breasted Merganser	*Mergus serrator*	RBME	12	2		N				14	OC		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	OT		13 W	385384	7384005	Glaucous Gull	*Larus hyperboreus*	GLGU			13	N				13	OC		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	14		13 W	378451	7383341	Northern Pintail	*Anas acuta*	NOPI	5	1		N				6	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	14		13 W	368678	7383360	Canada Goose	*Branta canadensis*	CAGO			12	N				12	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	15		13 W	376803	7381257	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	LK-L		
18-Jun-13	Aerial	Spring Pair	Bathurst Inlet	MLA Focused	15		13 W	387034	7381293	Glaucous Gull	*Larus hyperboreus*	GLGU			5	N				5	OC		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		106	13 W	374263	7408709	Red-breasted Merganser	*Mergus serrator*	RBME	3			N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		106	13 W	374263	7408709	Common Eider	*Somateria mollissima*	COEI	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		107	13 W	374940	7407427	Red-breasted Merganser	*Mergus serrator*	RBME	1			N				1	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		108	13 W	375334	7406801	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		109	13 W	376898	7403751	Red-breasted Merganser	*Mergus serrator*	RBME	2			N				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		109	13 W	376898	7403751	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		110	13 W	376790	7402202	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		111	13 W	377242	7401317	Long-tailed Duck	*Clangula hyemalis*	LTDU	2	1		N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		114	13 W	378271	7399921	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		115	13 W	378690	7399653	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		117	13 W	378989	7398981	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		119	13 W	379425	7398113	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		121	13 W	379881	7396267	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		123	13 W	380872	7395490	Canada Goose	*Branta canadensis*	CAGO			4	N				4	TU		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		124	13 W	382075	7393413	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		125	13 W	381869	7392594	Glaucous Gull	*Larus hyperboreus*	GLGU			2	N				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		126	13 W	381400	7392812	Canada Goose	*Branta canadensis*	CAGO			47	N				47	SH		RE
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		126	13 W	381400	7392812	Red-breasted Merganser	*Mergus serrator*	RBME	3			N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Tundra Swan	*Cygnus columbianus*	TUSW			1	N				1	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	American green-winged Teal	*Anas crecca*	GWTE			2	Y				2	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Canada Goose	*Branta canadensis*	CAGO			49	N				49	TU		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Northern Pintail	*Anas acuta*	NOPI	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		127	13 W	379921	7393560	Greater Scaup	*Aythya marila*	GRSC	1	2		N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		129	13 W	379878	7391487	Greater Scaup	*Aythya marila*	GRSC			30	N				30	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		129	13 W	379878	7391487	Long-tailed Duck	*Clangula hyemalis*	LTDU	3	2		N				5	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		129	13 W	379878	7391487	Northern Pintail	*Anas acuta*	NOPI	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		130	13 W	380149	7391060	Greater Scaup	*Aythya marila*	GRSC	2			N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		130	13 W	380149	7391060	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		132	13 W	380750	7389919	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		132	13 W	380750	7389919	Greater Scaup	*Aythya marila*	GRSC	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		133	13 W	381173	7389397	Canada Goose	*Branta canadensis*	CAGO			27	N				27	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		133	13 W	381173	7389397	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		134	13 W	381834	7389300	Canada Goose	*Branta canadensis*	CAGO			28	N				28	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		134	13 W	381834	7389300	Glaucous Gull	*Larus hyperboreus*	GLGU			2	N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		135	13 W	384455	7385758	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		135	13 W	384455	7385758	Canada Goose	*Branta canadensis*	CAGO			24	N				24	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		135	13 W	384455	7385758	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		135	13 W	384455	7385758	Pacific Loon	*Gavia pacifica*	PALO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		136	13 W	384477	7385314	Northern Shoveler	*Anas clypeata*	NOSH	3			N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		136	13 W	384477	7385314	Northern Pintail	*Anas acuta*	NOPI	8			N				8	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		137	13 W	384602	7384921	Glaucous Gull	*Larus hyperboreus*	GLGU			5	N				5	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		137	13 W	384602	7384921	Unknown Duck		UNDU			4	N				4	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		138	13 W	385225	7383535	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		138	13 W	385225	7383535	Canada Goose	*Branta canadensis*	CAGO			40	N				40	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		139	13 W	385610	7382609	Pacific Loon	*Gavia pacifica*	PALO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		140	13 W	385777	7382274	Pacific Loon	*Gavia pacifica*	PALO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		141	13 W	385867	7382072	Yellow-billed Loon	*Gavia adamsii*	YBLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		142	13 W	386033	7381748	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		143	13 W	386814	7381144	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		144	13 W	387773	7382017	Greater Scaup	*Aythya marila*	GRSC	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		145	13 W	387664	7382350	Red-throated Loon	*Gavia stellata*	RTLO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		145	13 W	387664	7382350	Greater Scaup	*Aythya marila*	GRSC	2			N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		146	13 W	387541	7382764	Red-breasted Merganser	*Mergus serrator*	RBME	4	2		Y				6	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		147	13 W	387352	7383346	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		FLH

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		148	13 W	387568	7383908	Red-breasted Merganser	*Mergus serrator*	RBME	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		148	13 W	387568	7383908	Long-tailed Duck	*Clangula hyemalis*	LTDU		1		N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		149	13 W	389461	7381522	Red-breasted Merganser	*Mergus serrator*	RBME	6			N				6	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		150	13 W	390178	7380506	Canada Goose	*Branta canadensis*	CAGO			37	N				37	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		151	13 W	389983	7379332	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		152	13 W	390232	7378418	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		153	13 W	390705	7377770	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		154	13 W	395996	7368429	Pacific Loon	*Gavia pacifica*	PALO	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		154	13 W	395996	7368429	Long-tailed Duck	*Clangula hyemalis*	LTDU		1		N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		155	13 W	397193	7366635	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		156	13 W	398905	7363257	Canada Goose	*Branta canadensis*	CAGO			5	N				5	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		157	13 W	399520	7362319	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		158	13 W	400446	7360845	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		159	13 W	400740	7360548	Greater Scaup	*Aythya marila*	GRSC	11			N				11	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		160	13 W	401305	7360270	Northern Pintail	*Anas acuta*	NOPI	4			N				4	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		160	13 W	401305	7360270	Canada Goose	*Branta canadensis*	CAGO	4			N				4	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		161	13 W	401891	7360914	Greater White-fronted Goose	*Anser albifrons*	GWFG			2	Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		161	13 W	401891	7360914	Canada Goose	*Branta canadensis*	CAGO			10	N				10	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		161	13 W	401891	7360914	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		162	13 W	401356	7365158	Greater Scaup	*Aythya marila*	GRSC	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		163	13 W	398156	7372791	Red-breasted Merganser	*Mergus serrator*	RBME	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		163	13 W	398156	7372791	Pacific Loon	*Gavia pacifica*	PALO	1			N				1	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		164	13 W	397798	7373337	Northern Pintail	*Anas acuta*	NOPI	9			N				9	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		166	13 W	396468	7374301	Pacific Loon	*Gavia pacifica*	PALO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		167	13 W	394883	7375591	Red-breasted Merganser	*Mergus serrator*	RBME	1	1		Y				2	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		168	13 W	394172	7376244	Canada Goose	*Branta canadensis*	CAGO			5	N				5	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		169	13 W	393554	7377255	Red-breasted Merganser	*Mergus serrator*	RBME	27			N				27	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		170	13 W	393085	7381038	Greater Scaup	*Aythya marila*	GRSC	1	1	3	N				5	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		170	13 W	393085	7381038	Red-throated Loon	*Gavia stellata*	RTLO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		171	13 W	392663	7381806	Canada Goose	*Branta canadensis*	CAGO			15	N				15	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		172	13 W	392119	7382363	Northern Pintail	*Anas acuta*	NOPI	2			N				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		172	13 W	392119	7382363	Greater Scaup	*Aythya marila*	GRSC	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		172	13 W	392119	7382363	Red-throated Loon	*Gavia stellata*	RTLO	1	5		N				6	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		173	13 W	391642	7383244	Red-breasted Merganser	*Mergus serrator*	RBME	25			N				25	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		174	13 W	389135	7385269	Pacific Loon	*Gavia pacifica*	PALO	1	1		Y				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		175	13 W	387904	7386209	Red-breasted Merganser	*Mergus serrator*	RBME	1	1		Y				2	SH		MALE FLY, FEMALE DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		176	13 W	387421	7387641	Red-breasted Merganser	*Mergus serrator*	RBME	5			N				5	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		177	13 W	387990	7392437	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		179	13 W	386164	7394599	Red-throated Loon	*Gavia stellata*	RTLO			10	N				10	SH		DI
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		179	13 W	386164	7394599	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		180	13 W	385450	7395610	Red-breasted Merganser	*Mergus serrator*	RBME	4	2		N				6	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		181	13 W	385012	7396664	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		183	13 W	384603	7398706	Greater Scaup	*Aythya marila*	GRSC	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		184	13 W	384025	7400728	Pacific Loon	*Gavia pacifica*	PALO			1	N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		185	13 W	383401	7400983	American green-winged Teal	*Anas crecca*	GWTE			1	N				1	TU		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		185	13 W	383401	7400983	Canada Goose	*Branta canadensis*	CAGO			32	N				32	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		186	13 W	382182	7401480	Red-breasted Merganser	*Mergus serrator*	RBME	5	2		N				7	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		186	13 W	382182	7401480	Long-tailed Duck	*Clangula hyemalis*	LTDU	4			N				4	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		187	13 W	381251	7402281	Northern Pintail	*Anas acuta*	NOPI	4			N				4	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		188	13 W	379879	7403572	Greater Scaup	*Aythya marila*	GRSC	1	1		Y				2	SH		FLH
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		188	13 W	379879	7403572	Red-breasted Merganser	*Mergus serrator*	RBME	1			N				1	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		189	13 W	379397	7404158	Red-breasted Merganser	*Mergus serrator*	RBME	2			N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		190	13 W	379012	7405076	Red-breasted Merganser	*Mergus serrator*	RBME	2			N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		190	13 W	379012	7405076	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1		Y				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		191	13 W	378780	7405631	Red-breasted Merganser	*Mergus serrator*	RBME		4		N				4	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		191	13 W	378780	7405631	Long-tailed Duck	*Clangula hyemalis*	LTDU	1			N				1	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		192	13 W	377656	7407991	Herring Gull	*Larus argentatus*	HEGU			2	N				2	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		193	13 W	377327	7408923	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		194	13 W	376745	7409434	Red-breasted Merganser	*Mergus serrator*	RBME	12			N				12	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		195	13 W	376183	7410329	Red-breasted Merganser	*Mergus serrator*	RBME	9			N				9	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		196	13 W	375237	7411977	Common Eider	*Somateria mollissima*	COEI	18	8		N				26	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		197	13 W	375054	7412434	Northern Pintail	*Anas acuta*	NOPI	1			N				1	SH		

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		198	13 W	374436	7413327	Glaucous Gull	*Larus hyperboreus*	GLGU			1	N				1	SH		FLY
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		199	13 W	373181	7415165	Greater Scaup	*Aythya marila*	GRSC		3		N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		199	13 W	373181	7415165	Common Eider	*Somateria mollissima*	COEI	2	1		N				3	SH		
19-Jun-13	Aerial	Spring Pair	Bathurst Inlet	Shoreline		199	13 W	373181	7415165	Red-breasted Merganser	*Mergus serrator*	RBME	4			N				4	SH		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	2	168	13 W	368940	7407335	Tundra Swan	*Cygnus columbianus*	TUSW	1	1						2	LK		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	3	171	13 W	369661	7405300	Canada Goose	*Branta canadensis*	CAGO			25					25	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	4	172	12 W	629100	7402965	Unknown Loon		UNLO			2					2	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	4	173	13 W	370470	7403312	Pacific Loon	*Gavia pacifica*	PALO			1					1	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	175	13 W	371955	7401611	Unknown Gull		GULL			1					1			
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	178	12 W	625779	7398681	Unknown Diver		UNDI			1					1	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	179	12 W	628183	7398870	Red-breasted Merganser	*Mergus serrator*	RBME	1							1	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	180	12 W	631518	7399187	Tundra Swan	*Cygnus columbianus*	TUSW			3					3	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	181	13 W	370736	7399310	Red-breasted Merganser	*Mergus serrator*	RBME	2							2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	182	13 W	373995	7399302	Unknown Duck		UNDU			4					4	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	182	13 W	373995	7399302	Unknown Diver		UNDI			3					3	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	183	13 W	377259	7399309	Unknown Duck		UNDU			1					1	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	6	183	13 W	377259	7399309	Tundra Swan	*Cygnus columbianus*	TUSW	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	184	13 W	379567	7398233	Pacific Loon	*Gavia pacifica*	PALO			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	7	187	13 W	367888	7397301	Greater Scaup	*Aythya marila*	GRSC		1						1	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	7	188	12 W	627132	7396779	Red-breasted Merganser	*Mergus serrator*	RBME	2							2	LK	Medium	FLY
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	189	12 W	625601	7394703	Unknown Diver		UNDI			3					3	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	8	190	13 W	375795	7395292	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	8	190	13 W	375795	7395292	Pacific Loon	*Gavia pacifica*	PALO			1					1	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	8	190	13 W	375795	7395292	Tundra Swan	*Cygnus columbianus*	TUSW	1	1						2			
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	191	13 W	379944	7393315	Red-throated Loon	*Gavia stellata*	RTLO			2					2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	191	13 W	379944	7393315	Northern Pintail	*Anas acuta*	NOPI		1				4	II	5	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	192	13 W	377562	7393303	Greater Scaup	*Aythya marila*	GRSC			6					6	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	193	13 W	369790	7393291	Red-breasted Merganser	*Mergus serrator*	RBME	1							1	LK	Large	FLY
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	193	13 W	369790	7393291	Unknown Goose		UNGO			6					6	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	9	194	12 W	628390	7392887	Unknown Diver		UNDI			2					2	PO-M	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	10	196	13 W	368349	7391284	Tundra Swan	*Cygnus columbianus*	TUSW	1	1						2	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	197	13 W	370115	7391300	Unknown Duck		UNDU			2					2	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	198	13 W	374302	7391251	Unknown Diver		UNDI		1				4		5	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	10	199	13 W	374875	7391310	Unknown Loon		UNLO			2					2	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	200	13 W	375947	7391232	Tundra Swan	*Cygnus columbianus*	TUSW			1					1	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	202	13 W	380760	7390595	Unknown Duck		UNDU			6					6	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	251	13 W	381344	7389610	Greater Scaup	*Aythya marila*	GRSC			40					40	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	OFF	251	13 W	381344	7389610	Unknown Duck		UNDU			60					60	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	11	258	13 W	377167	7389270	Red-throated Loon	*Gavia stellata*	RTLO	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	11	260	13 W	375092	7389313	Tundra Swan	*Cygnus columbianus*	TUSW	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	11	271	13 W	370344	7389309	Northern Pintail	*Anas acuta*	NOPI		1	1					2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	11	273	13 W	369293	7389309	Greater Scaup	*Aythya marila*	GRSC	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	11	274	12 W	630079	7389060	Long-tailed Duck	*Clangula hyemalis*	LTDU	1	1						2	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	12	275	13 W	376992	7387270	Unknown Duck		UNDU		1				2		3	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	12	276	13 W	377952	7387272	Canada Goose	*Branta canadensis*	CAGO			10					10	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	12	277	13 W	378295	7387276	Long-tailed Duck	*Clangula hyemalis*	LTDU			7					7	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	13	280	13 W	380515	7385318	Red-throated Loon	*Gavia stellata*	RTLO	2	2						4	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	13	281	13 W	378541	7385360	Long-tailed Duck	*Clangula hyemalis*	LTDU	1							1	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	13	282	13 W	372218	7385325	Unknown Duck		UNDU			4					4	LK	Medium	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	284	13 W	368684	7383246	Unknown Duck		UNDU			5					5	LK	Large	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	287	13 W	378003	7383274	Unknown Duck		UNDU			4					4	PO		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	288	13 W	378492	7383253	Northern Pintail	*Anas acuta*	NOPI			5					5	PO		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	288	13 W	378492	7383253	Long-tailed Duck	*Clangula hyemalis*	LTDU		1				4		5	PO		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	288	13 W	378492	7383253	Pacific Loon	*Gavia pacifica*	PALO	1	1						2	PO		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	290	13 W	379118	7383282	Canada Goose	*Branta canadensis*	CAGO			2					2			FLY
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	14	291	13 W	385770	7383330	Red-breasted Merganser	*Mergus serrator*	RBME			23					23	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	MLA Focused	15	293	13 W	379561	7381326	Greater Scaup	*Aythya marila*	GRSC			4					4	LK	Small	
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		301	13 W	371614	7411595	Long-tailed Duck	*Clangula hyemalis*	LTDU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		303	13 W	371632	7410782	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		303	13 W	371632	7410782	Unknown Diver		UNDI			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		304	13 W	371255	7408322	Unknown Diver		UNDI			14					14	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		311	13 W	371196	7404362	Red-throated Loon	*Gavia stellata*	RTLO			1					1	OC		

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		317	13 W	370908	7404888	Surf Scoter	*Melanitta perspicillata*	SUSC	2							2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		317	13 W	370908	7404888	Greater Scaup	*Aythya marila*	GRSC	2	2	1					5	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		317	13 W	370908	7404888	Unknown Diver		UNDI			3					3	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		318	13 W	371551	7401622	Unknown Gull		GULL			8					8	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		321	13 W	373240	7397974	Tundra Swan	*Cygnus columbianus*	TUSW			1					1	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		324	13 W	374371	7402630	Unknown Gull		GULL			6					6	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		325	13 W	376839	7401845	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		326	13 W	377214	7401236	Canada Goose	*Branta canadensis*	CAGO			54					54	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		326	13 W	377214	7401236	Northern Pintail	*Anas acuta*	NOPI			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		327	13 W	379389	7392908	Red-breasted Merganser	*Mergus serrator*	RBME		2						2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		330	13 W	382609	7388134	Greater Scaup	*Aythya marila*	GRSC	45		26					71	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		330	13 W	382609	7388134	Yellow-billed Loon	*Gavia adamsii*	YBLO	1	1						2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		331	13 W	383953	7386096	Canada Goose	*Branta canadensis*	CAGO			34					34	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		331	13 W	383953	7386096	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		332	13 W	384457	7385707	Canada Goose	*Branta canadensis*	CAGO			44					44	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		333	13 W	384575	7384942	Canada Goose	*Branta canadensis*	CAGO			59					59	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		334	13 W	387366	7383324	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		335	13 W	390205	7380477	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		336	13 W	391912	7375447	Surf Scoter	*Melanitta perspicillata*	SUSC	1		1					2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		337	13 W	392944	7373327	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		338	13 W	395464	7371085	Canada Goose	*Branta canadensis*	CAGO			28					28	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		339	13 W	397352	7366148	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		340	13 W	401415	7360326	American green-winged Teal	*Anas crecca*	GWTE			1					1	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		341	13 W	401979	7360964	Canada Goose	*Branta canadensis*	CAGO			83					83	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		341	13 W	401979	7360964	Red-throated Loon	*Gavia stellata*	RTLO			1					1	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		341	13 W	401979	7360964	Northern Pintail	*Anas acuta*	NOPI			10					10	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		341	13 W	401979	7360964	Red-breasted Merganser	*Mergus serrator*	RBME	1							1	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		342	13 W	403256	7362484	Northern Pintail	*Anas acuta*	NOPI			8					8	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		343	13 W	403509	7363039	Canada Goose	*Branta canadensis*	CAGO			12					12	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		344	13 W	403218	7363446	Greater Scaup	*Aythya marila*	GRSC	4		32					36	ES		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		345	13 W	401548	7365716	Canada Goose	*Branta canadensis*	CAGO			32					32	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		346	13 W	398830	7371826	Red-breasted Merganser	*Mergus serrator*	RBME	1							1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		347	13 W	396601	7374297	Red-throated Loon	*Gavia stellata*	RTLO	1	1						2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		347	13 W	396601	7374297	Red-breasted Merganser	*Mergus serrator*	RBME	2							2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		347	13 W	396601	7374297	Greater Scaup	*Aythya marila*	GRSC			87					87	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		348	13 W	394144	7376179	Canada Goose	*Branta canadensis*	CAGO			84					84	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		348	13 W	394144	7376179	Red-breasted Merganser	*Mergus serrator*	RBME	1	1						2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		349	13 W	393110	7381100	Greater Scaup	*Aythya marila*	GRSC	17	2						19	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		350	13 W	392077	7382412	Unknown Duck		UNDU			3					3	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		351	13 W	390788	7384057	Red-breasted Merganser	*Mergus serrator*	RBME	1							1	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		361	13 W	386649	7394101	Greater Scaup	*Aythya marila*	GRSC	32	8						40	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		362	13 W	386074	7394608	Greater Scaup	*Aythya marila*	GRSC	9	3						12	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		364	13 W	383398	7400917	Red-breasted Merganser	*Mergus serrator*	RBME	1	1	20					22	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		364	13 W	383398	7400917	Canada Goose	*Branta canadensis*	CAGO			40					40	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		365	13 W	380792	7402644	Greater Scaup	*Aythya marila*	GRSC	6	2						8	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		366	13 W	375403	7411862	Herring Gull	*Larus argentatus*	HEGU			25					25	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		366	13 W	375403	7411862	Glaucous Gull	*Larus hyperboreus*	GLGU			25					25	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		367	13 W	375044	7412468	Mallard	*Anas platyrhynchos*	MALL		1	2					3	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		367	13 W	375044	7412468	Glaucous Gull	*Larus hyperboreus*	GLGU		1						1	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		367	13 W	375044	7412468	Unknown Duck		UNDU			2					2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		368	13 W	373823	7414411	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		369	13 W	373217	7415207	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	IS		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		370	13 W	374483	7413706	Red-breasted Merganser	*Mergus serrator*	RBME	2							2	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		371	13 W	376483	7410233	Common Eider	*Somateria mollissima*	COEI		1			Y	2		3	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		371	13 W	376483	7410233	Canada Goose	*Branta canadensis*	CAGO			24					24	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		371	13 W	376483	7410233	Greater White-fronted Goose	*Anser albifrons*	GWFG			7					7	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		372	13 W	376694	7409953	Canada Goose	*Branta canadensis*	CAGO			110					110	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		372	13 W	376694	7409953	Glaucous Gull	*Larus hyperboreus*	GLGU			80					80	OC		
20-Jul-13	Aerial	Summer Brood	Bathurst Inlet	Shoreline		372	13 W	376694	7409953	Herring Gull	*Larus argentatus*	HEGU			40					40	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T1	800	13W	368868	7409282	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T1	800	13W	368868	7409282	Unknown Duck		UNDU			10					10	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T1	801	13W	369788	7409286	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Medium	

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T1	801	13W	369788	7409286	Greater Scaup	*Aythya marila*	GRSC			6					6	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T2	805	13W	368954	7407283	Unknown Duck		UNDU			4					4	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T3	805	13W	368954	7407283	Tundra Swan	*Cygnus columbianus*	TUSW			4					4			
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T3	808	12W	624888	7404686	Tundra Swan	*Cygnus columbianus*	TUSW			1					1	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		811	13W	370612	7404728	Unknown Loon		UNLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T4	813	13W	370431	7403319	Red-breasted Merganser	*Mergus serrator*	RBME			4					4	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T4	814	12W	632072	7403249	Greater Scaup	*Aythya marila*	GRSC	20		20					20	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T5	817	12W	629018	7400992	Unknown Duck		UNDU			2					2	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T5	819	13W	368558	7401339	Greater Scaup	*Aythya marila*	GRSC	13	1	14					14	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		821	13W	372884	7399823	Red-breasted Merganser	*Mergus serrator*	RBME			25					25	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		822	13W	372921	7399725	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		FLY
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T6	824	12W	631497	7399174	Unknown Diver		UNDI			5					5	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T6	825	12W	630904	7399120	Northern Pintail	*Anas acuta*	NOPI			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T6	826	12W	629728	7399024	Northern Pintail	*Anas acuta*	NOPI			5					5	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T6	827	12W	625458	7398584	Canada Goose	*Branta canadensis*	CAGO			25					25	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	829	12W	626792	7396785	Unknown Duck		UNDU			3					3	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	830	12W	627306	7396850	Greater Scaup	*Aythya marila*	GRSC			4					4	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	831	12W	629135	7397010	Unknown Waterbird		UNWB			8					8	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	833	13W	374069	7397322	Greater Scaup	*Aythya marila*	GRSC			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	834	13W	376825	7397295	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T7	834	13W	376825	7397295	Greater Scaup	*Aythya marila*	GRSC			12					12	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		836	13W	380635	7395923	Greater Scaup	*Aythya marila*	GRSC	90	10						100	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		836	13W	380635	7395923	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		FLY
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T8	839	12W	629598	7394989	Northern Pintail	*Anas acuta*	NOPI			3					3	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	842	12W	627568	7392808	Unknown Goose		UNGO			16					16	TU		FLY
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	843	13W	367461	7393299	Red-throated Loon	*Gavia stellata*	RTLO			1					1	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	844	13W	370724	7393316	Snow Goose	*Chen caerulescens*	SNGO			20					20	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	845	13W	377443	7393302	Tundra Swan	*Cygnus columbianus*	TUSW			6					6	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	845	13W	377443	7393302	Greater Scaup	*Aythya marila*	GRSC			16					16	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	845	13W	377443	7393302	Red-breasted Merganser	*Mergus serrator*	RBME			23					23	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	846	13W	379744	7393352	Canada Goose	*Branta canadensis*	CAGO			28					28	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	846	13W	379744	7393352	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	846	13W	379744	7393352	Greater Scaup	*Aythya marila*	GRSC			200					200	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T9	848	13W	382080	7393047	Greater Scaup	*Aythya marila*	GRSC	13	2						15	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T10	850	13W	374580	7391276	Greater Scaup	*Aythya marila*	GRSC	3	3						6	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T10	851	13W	369276	7391333	Greater Scaup	*Aythya marila*	GRSC	10	1						11	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T10	852	13W	368711	7391314	Northern Pintail	*Anas acuta*	NOPI			3					3	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T11	856	13W	370237	7389320	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T11	857	13W	372153	7389303	Greater Scaup	*Aythya marila*	GRSC			15					15	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T11	858	13W	381443	7389306	Greater Scaup	*Aythya marila*	GRSC			17					17	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T11	859	13W	381930	7389272	Canada Goose	*Branta canadensis*	CAGO			20					20	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused		860	13W	382075	7389251	Greater Scaup	*Aythya marila*	GRSC	15							15	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	862	13W	377983	7387285	Red-throated Loon	*Gavia stellata*	RTLO			8					8	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	863	13W	374617	7387288	Tundra Swan	*Cygnus columbianus*	TUSW	1	1			Y	2		4	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	863	13W	374617	7387288	Northern Pintail	*Anas acuta*	NOPI		1			Y	6		7	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	864	13W	372623	7387281	Red-breasted Merganser	*Mergus serrator*	RBME			30					30	LK	Large	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	865	13W	371435	7387297	Greater Scaup	*Aythya marila*	GRSC			6					6	LK	Medium	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	866	13W	370620	7387291	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T12	866	13W	370620	7387291	Northern Pintail	*Anas acuta*	NOPI			5					5	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T13	869	13W	368378	7385292	Greater Scaup	*Aythya marila*	GRSC			8					8	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T13	872	13W	378431	7385260	Long-tailed Duck	*Clangula hyemalis*	LTDU			16					16	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T13	873	13W	384292	7385246	Red-breasted Merganser	*Mergus serrator*	RBME			7					7	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T13	873	13W	384292	7385246	Greater Scaup	*Aythya marila*	GRSC			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	OFF	875	13W	389179	7382316	Greater Scaup	*Aythya marila*	GRSC			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T15	877	13W	386429	7381318	Greater Scaup	*Aythya marila*	GRSC	7							7	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T15	878	13W	380841	7381280	Canada Goose	*Branta canadensis*	CAGO			11					11	TU		FLY
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T15	879	13W	379391	7381289	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	T14	886	13W	378473	7383350	Northern Pintail	*Anas acuta*	NOPI			23					23	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	OFF	888	13W	377468	7391890	Greater Scaup	*Aythya marila*	GRSC			50					50	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	MLA Focused	OFF	889	13W	375105	7394811	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	LK	Small	
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		891	13W	371049	7406454	Herring Gull	*Larus argentatus*	HEGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		892	13W	371108	7405928	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		893	13W	372158	7401302	Tundra Swan	*Cygnus columbianus*	TUSW			2					2	IS		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		893	13W	372158	7401302	Unknown Gull		UNGU			6					6	IS		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		894	13W	372592	7400956	Unknown Loon		UNLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		894	13W	372592	7400956	Unknown Merganser		UNME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		894	13W	372592	7400956	Unknown Gull		UNGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		896	13W	374521	7401333	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		897	13W	374241	7402356	Glaucous Gull	*Larus hyperboreus*	GLGU			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		897	13W	374241	7402356	Red-breasted Merganser	*Mergus serrator*	RBME			12					12	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		897	13W	374241	7402356	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		898	13W	374668	7403437	Greater Scaup	*Aythya marila*	GRSC			13					13	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		899	13W	374148	7406880	Canada Goose	*Branta canadensis*	CAGO			9					9	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		900	13W	374616	7408387	Greater Scaup	*Aythya marila*	GRSC			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		900	13W	374616	7408387	Unknown Gull		UNGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		900	13W	374616	7408387	Red-breasted Merganser	*Mergus serrator*	RBME			40					40	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		901	13W	374987	7407698	Canada Goose	*Branta canadensis*	CAGO			9					9	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		902	13W	376636	7404782	Canada Goose	*Branta canadensis*	CAGO			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		902	13W	376636	7404782	Unknown Loon		UNLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		902	13W	376636	7404782	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		903	13W	377046	7403813	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		904	13W	377071	7403475	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		904	13W	377071	7403475	Canada Goose	*Branta canadensis*	CAGO	1	1			Y	4		6	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		905	13W	377023	7402715	Red-throated Loon	*Gavia stellata*	RTLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		906	13W	376975	7402104	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		907	13W	378003	7400398	Red-breasted Merganser	*Mergus serrator*	RBME			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		907	13W	378003	7400398	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		907	13W	378003	7400398	Greater Scaup	*Aythya marila*	GRSC			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		908	13W	379740	7397887	Unknown Loon		UNLO			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		909	13W	379950	7396710	Red-breasted Merganser	*Mergus serrator*	RBME			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		910	13W	380201	7396124	Greater Scaup	*Aythya marila*	GRSC			200					200	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		911	13W	382221	7393429	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		912	13W	382221	7393429	Canada Goose	*Branta canadensis*	CAGO			13					13	TU		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		912	13W	381952	7392424	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		912	13W	381952	7392424	Red-breasted Merganser	*Mergus serrator*	RBME			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		913	13W	380344	7393373	Greater Scaup	*Aythya marila*	GRSC	450	50						500	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		914	13W	379709	7392854	Canada Goose	*Branta canadensis*	CAGO			26					26	RI/OC/HT		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		915	13W	380043	7391602	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		915	13W	380043	7391602	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		916	13W	380433	7390928	Yellow-billed Loon	*Gavia adamsii*	YBLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		916	13W	380433	7390928	Greater Scaup	*Aythya marila*	GRSC			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		917	13W	380564	7390568	Greater Scaup	*Aythya marila*	GRSC			13					13	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		918	13W	381513	7389400	Brant Goose	*Branta bernicla*	BRGO			24					24	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		919	13W	381952	7389582	Yellow-billed Loon	*Gavia adamsii*	YBLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		919	13W	381952	7389582	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		920	13W	383067	7387838	Unknown Loon		UNLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		921	13W	383344	7387295	Greater Scaup	*Aythya marila*	GRSC			18					18	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		922	13W	383699	7386822	Greater Scaup	*Aythya marila*	GRSC	11	2						13	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		923	13W	384167	7386321	Red-throated Loon	*Gavia stellata*	RTLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		924	13W	384437	7386026	Canada Goose	*Branta canadensis*	CAGO			23					23	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		924	13W	384437	7386026	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		925	13W	384683	7385442	Northern Shoveler	*Anas clypeata*	NOSH	11	2						13	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		925	13W	384683	7385442	Red-breasted Merganser	*Mergus serrator*	RBME			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		926	13W	384747	7384940	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		927	13W	385983	7382205	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		928	13W	386366	7381591	Northern Shoveler	*Anas clypeata*	NOSH			6					6	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		928	13W	386366	7381591	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		929	13W	387101	7381487	Northern Shoveler	*Anas clypeata*	NOSH			7					7	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		929	13W	387101	7381487	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		930	13W	387649	7384062	Unknown Loon		UNLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		931	13W	387879	7383853	Yellow-billed Loon	*Gavia adamsii*	YBLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		932	13W	388485	7383364	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		933	13W	388615	7383242	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		935	13W	389776	7381802	Herring Gull	*Larus argentatus*	HEGU			1					1	OC		

Appendix 7-2. Waterbird and Marine Bird Observation Data, 2013

Date	Survey Type	Survey Period	Region	Survey Strata	Transect	WPT	Zone	Easting	Northing	Species	Scientific Name	Species Code	No. Drakes	No. Hens	No. Unknown	Paired	Breeding	No. Young	Young Class	Total	Habitat	Habitat Size	Behaviour
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		936	13W	389855	7381190	Red-breasted Merganser	*Mergus serrator*	RBME			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		938	13W	390838	7377967	Pacific Loon	*Gavia pacifica*	PALO			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		938	13W	390838	7377967	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		938	13W	390838	7377967	Unknown Loon		UNLO			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		939	13W	391264	7377223	Herring Gull	*Larus argentatus*	HEGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		939	13W	391264	7377223	Red-throated Loon	*Gavia stellata*	RTLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		939	13W	391264	7377223	Glaucous Gull	*Larus hyperboreus*	GLGU			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		940	13W	393791	7372883	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		941	13W	395481	7371566	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		942	13W	395641	7370271	Red-throated Loon	*Gavia stellata*	RTLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		943	13W	396072	7368763	Red-throated Loon	*Gavia stellata*	RTLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		945	13W	397555	7366077	Greater Scaup	*Aythya marila*	GRSC	35	5						40	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		946	13W	400418	7361275	Red-breasted Merganser	*Mergus serrator*	RBME			14					14	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		946	13W	400418	7361275	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		946	13W	400418	7361275	Red-breasted Merganser	*Mergus serrator*	RBME			5					5	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		947	13W	401670	7361006	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		948	13W	402379	7361960	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		949	13W	402780	7363636	Greater Scaup	*Aythya marila*	GRSC			40					40	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		950	13W	401971	7364383	Greater Scaup	*Aythya marila*	GRSC			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		950	13W	401971	7364383	Northern Shoveler	*Anas clypeata*	NOSH	2							2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		951	13W	400568	7368112	Greater Scaup	*Aythya marila*	GRSC			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		952	13W	399298	7370666	Red-breasted Merganser	*Mergus serrator*	RBME			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		953	13W	397949	7372816	Northern Pintail	*Anas acuta*	NOPI			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		954	13W	396984	7373717	Greater Scaup	*Aythya marila*	GRSC			12					12	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		955	13W	396551	7374075	Greater Scaup	*Aythya marila*	GRSC			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		956	13W	394604	7375610	Greater Scaup	*Aythya marila*	GRSC			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		957	13W	394250	7375973	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		958	13W	392584	7378423	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		959	13W	392365	7379489	Greater Scaup	*Aythya marila*	GRSC			65					65	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		960	13W	392769	7381297	Greater Scaup	*Aythya marila*	GRSC			20					20	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		962	13W	391619	7382787	Red-throated Loon	*Gavia stellata*	RTLO			6					6	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		962	13W	391619	7382787	Canada Goose	*Branta canadensis*	CAGO			13					13	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		963	13W	388380	7385572	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		964	13W	387913	7386019	Red-throated Loon	*Gavia stellata*	RTLO			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		965	13W	387287	7387654	Unknown Waterbird		UNWB		1			Y	9		10	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		966	13W	387288	7388741	Red-breasted Merganser	*Mergus serrator*	RBME			6					6	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		967	13W	387705	7391187	Greater Scaup	*Aythya marila*	GRSC			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		967	13W	387705	7391187	Unknown Loon		UNLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		968	13W	387445	7392946	Red-breasted Merganser	*Mergus serrator*	RBME			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		969	13W	385971	7394570	Unknown Gull		UNGU					Y	7		7	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		970	13W	385167	7395731	Red-breasted Merganser	*Mergus serrator*	RBME			6					6	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		970	13W	385167	7395731	Unknown Gull		UNGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		971	13W	383493	7400705	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		971	13W	383493	7400705	Greater Scaup	*Aythya marila*	GRSC			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		971	13W	383493	7400705	Red-breasted Merganser	*Mergus serrator*	RBME			4					4	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		972	13W	382553	7401502	Greater Scaup	*Aythya marila*	GRSC			30					30	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		972	13W	382553	7401502	Unknown Loon		UNLO			3					3	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		973	13W	381273	7401817	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		974	13W	378818	7405100	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		975	13W	377645	7407636	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		975	13W	377645	7407636	Red-throated Loon	*Gavia stellata*	RTLO			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		976	13W	375879	7410603	Glaucous Gull	*Larus hyperboreus*	GLGU			1					1	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		977	13 W	375075	7412114	Glaucous Gull	*Larus hyperboreus*	GLGU			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		978	13 W	374747	7412677	Canada Goose	*Branta canadensis*	CAGO			30					30	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		979	13 W	373402	7415380	Red-breasted Merganser	*Mergus serrator*	RBME			2					2	OC		
26-Aug-13	Aerial	Fall Staging	Bathurst Inlet	Shoreline		980	13 W	374825	7413531	Northern Pintail	*Anas acuta*	NOPI			10					10	OC		
28-Aug-13	Ground	Fall Staging	George PDA	Focused		994	13 W	376189	7321531	Red-throated loon	*Gavia stellata*	RTLO			2					2	LK	Medium	SW

Appendix 8-1

Carnivore Den Occupancy and Productivity Data, 2013

Rescan™
an ERM company

Appendix 8-1. Carnivore Den Occupancy and Productivity Data, 2013

a) Carnivore Den Occupancy Data, 2013

Survey Data									Species Data			Habitat Data								
2013 Den #	Unique Den ID	Date	WPT ID	Zone	Easting	Northing	Land at Site	Occupancy Status	Species	No. of Adults	Evidence of Use	Habitat	Slope	No. Holes	Size of Holes	Soil Texture	Aspect	Camera	Photos	Comments
1	157D	23-May-13	352	13	412246	7281672	N	Possibly Occupied	Fox spp	-	tracks (fox)	E/GF		3	M	G	W	JS	644-645	sik-sik activity
2	158D	23-May-13	353	13	408186	7284026	N	Possibly Occupied	Fox spp	-	older fox tracks, old bones	E		2	S	S	UP	JS	646-647	
3		23-May-13	354	13	407339	7285839	Y	Unoccupied	Unknown	-	bone, antler	E		2	M	S/G	UP	JS	648	sik-sik tracks
4	159D	23-May-13	355	13	405674	7285731	N	Possibly Occupied	Grey Wolf	-	digging, tracks	GF		2	L	G	N	JS	649-653	
5		23-May-13	357	13	402604	7331676	N	Unoccupied	Unknown	-	caribou tracks, sik-sik tracks	GF	-	2	M	S/G	UP	JS	656	
6	160D	23-May-13	359	13	405067	7339419	N	Possibly Occupied	Grey Wolf	-	wolf and sik-sik tracks	E	M	2	L	S	SE	JS	657-658	
7	161D	23-May-13	360	13	395463	7364973	N	Possibly Occupied	Unknown	-	digging, tracks	E	M	1	L	S	N	JS	659-62	
27		24-May-13	375	13	417994	7279159	N	Not a Den	Grizzly Bear	-	digging spot	tundra/snow						JS	665	not a den, tracks leading to and from
8	162D	24-May-13	376	13	405528	7288292	Y	Possibly Occupied	Fox spp	-	bones, fox tracks, and wolf scat	E	L	6	M-L	S	N	JS; KF	666-667; 582-87	
9	163D	24-May-13	377	13	405809	7288199	N	Possibly Occupied	Fox spp	-	ptarmigan kill, feathers, recent digging, fox tracks	E	M	3	M	S	NE	JS	668-669	
10		24-May-13	379	13	402626	7294080	N	Unoccupied	Unknown	-	big hole with sik-sik tracks	snow, GF	-	1	L	S	UP	JS	670	snow tunnel, hole is quite large but tunnel is very small
11	164D	24-May-13	380	13	399196	7295350	N	Occupied Confirmed	Red Fox	1	tracks, bones, wolf scat	E	T	5	M-L	S	UP	JS	671	Beside snaky lake
12		24-May-13	381	13	397327	7297360	N	Unoccupied	Unknown	-	bones, old scat, bear tracks nearby	GF	-	3	M	G	UP			collapsed roof of den; close to esker
13		24-May-13	392	13	387882	7381999	N	Unoccupied	Unknown	-	some sik-sik tracks	GF	-	2	S	G/S	W	JS	672	could be sik-sik; near lake
14	165D	24-May-13	398	13	377930	7379230	N	Possibly Occupied	Unknown	-	some scat, old fox tracks in snow	E	T	5	S	S	UP	KF	588-590	
15	166D	25-May-13	401	13	391041	7306216	N	Possibly Occupied	Unknown	-	scat, bones, old tracks	E	T	3	M	S	UP	KF	649-650	fox?
16	167D	25-May-13	401	13	391041	7306216	N	Possibly Occupied	Unknown	-	scat	E	T	3	M	S	UP	KF	651	100 m away from wpt 401, sik-sik?
17		25-May-13	403	13	406910	7283803	N	Unoccupied	Unknown	-	old scat	GF	T	4	M	G	N	KF	652	fox?
18	107D	26-May-13	404	13	385877	7316032	N	Unoccupied	Unknown	-	bones, scat	E	T	4	M	S	UP	JS	765	fox? From last year?
19		26-May-13	406	13	379317	7322315	N	Unoccupied	Unknown	-	small patch of caribou hair	GF	T	4	S-M	G/S	UP	JS	766-767	grassy meadow near lake
20	168D	26-May-13	407	13	380944	7321685	N	Possibly Occupied	Fox spp	-	bones, maybe fox tracks	E	M	7	M-L	G/S	W	JS	768-769	large rocks near den; near large lake
21	98D	26-May-13	411	13	388621	7311806	N	Unoccupied	Unknown	-	bones, scat	E	M	5	M-L	S	E	JS	770-771	saw sik-sik, unoccupied - also located at DEN ID 98
22	169D	26-May-13	413	13	388163	7311450	N	Possibly Occupied	Unknown	-	scat, bones, recent digging	E	T	2	M	S	UP	KF	653-654	lots of digging recently
23	94D	26-May-13	414	13	388075	7311041	N	Possibly Occupied	Unknown	-	scat, bones, fur	GF	-	6	M	S	UP	JS	772-773	red fox last year
24	170D	1-Jun-13	459	13	431203	7279651	N	Possibly Occupied	Unknown	-	digging	E	T	5	M	S	S	KF	782-783	probably sik-sik; near small pond
25		1-Jun-13	460	13	434548	7279514	N	Unoccupied	Unknown	-	n/a	GF/L	T	3	M-L	S/G	W	KF	784-785	potentially abandoned den, sik sik obervations
28		1-Jun-13	461	13	434166	7274395	N	Not a Den	Grizzly Bear	-	digging and tracks	L	-	-	-	-	-	-	-	bear tracks, wolf tracks - no den
29	135D	20-Jun-13	135	13	377435	7393190	N	Not a Den	-	-	-	-	-	-	-	-	-	-	-	no den found
30	134D	20-Jun-13	134	13	369301	7389880	N	Not a Den	-	-	-	-	-	-	-	-	-	-	-	no den found
31	136D	20-Jun-13	136	13	371063	7399062	N	Not a Den	-	-	-	-	-	-	-	-	-	-	-	no den found
26	89D	23-Jun-13	Potential_ redfox_den	13	393252	7302146	N	Occupied Confirmed	Red Fox	1	-	E	T	3?	M-L	S	?	-	-	den incidentally observed after occupancy surveys

**Only dens that were possibly or confirmed to be occupied in 2013 or dens identified in previous years have an ID number in the database.*

Appendix 8-1. Carnivore Den Occupancy and Productivity Data, 2013

b) Carnivore Den Productivity Data, 2013

Suvey Data							Species Data			Habitat Data							
2013 Den #	Unique Den ID	Date	WPT ID	Land at Site	Occupancy Status	Productivity Status	Species	No. of Animals	Evidence of Use	Habitat	Slope	No. Holes	Size of Holes	Soil Texture	Aspect	Camera	Photos
1	157D	15-Jul-13	352	N	Possibly Occupied	Unproductive	Fox spp	-	no activity	E/GF		3	M	G	W	CK	9328-9330
2	158D	15-Jul-13	353	N	Possibly Occupied	Unproductive	Fox spp	-	no activity	E		2	S	S	UP	CK	9331-9336
4	159D	15-Jul-13	355	N	Possibly Occupied	Unproductive	Grey Wolf	-	no activity	GF		2	L	G	N	CK	9337-9338
7	161D	15-Jul-13	360	N	Possibly Occupied	Unproductive	Unknown	-	no activity	E	M	1	L	S	N		
8	162D	15-Jul-13	376	Y	Possibly Occupied	Possibly Productive	Fox spp	-	bones, tracks	E	L	6	M-L	S	N	CK	9406-9411
9	163D	15-Jul-13	377	Y	Possibly Occupied	Possibly Productive	Fox spp	-	skat, many bones	E	M	3	M	S	NE	CK	9368-9399
11	164D	15-Jul-13	380	Y	Occupied Confirmed	Possibly Productive	Red Fox	-	ɔones, dead sic sic, sca	E	T	5	M-L	S	UP	CK	9412-9431
14	165D	15-Jul-13	398	N	Possibly Occupied	Unproductive	Unknown	-	no activity	E	T	5	S	S	UP		
14	165D	15-Jul-13	401	N	Possibly Occupied	Unproductive	Unknown	-	no activity	E	T	3	M	S	UP		
20	168D	15-Jul-13	407	N	Possibly Occupied	Unproductive	Fox spp	-	no activity	E	M	7	M-L	G/S	W		
22	169D	15-Jul-13	413	N	Possibly Occupied	Unproductive	Unknown	-	no activity	E	T	2	M	S	UP		
23	94D	15-Jul-13	414	N	Possibly Occupied	Unproductive	Unknown	-	no activity	GF	-	6	M	S	UP		
25		15-Jul-13	460	N	Unoccupied	Unproductive	Unknown	-	no activity	GF/L	T	3	M-L	S/G	W	CK	9313-9217
26	89D	15-Jul-13	ɛntial_redfox_	N	Occupied Confirmed	Unproductive	Red Fox	-	no activity	E	T	3?	M-L	S	-		

**Only dens that were possibly or confirmed to be occupied in 2013 or dens identified in previous years have an ID number in the database.*

Appendix 8-2

Motion-Triggered Remote Camera Monitoring at Wolf Dens 56 and 57, 2013

Rescan™
an ERM company

Appendix 8-2. Motion-Triggered Remote Camera Monitoring at Wolf Dens 56 and 57, 2013

Unique Den ID	Camera No.	Date	Series	Start Time	End Time	PhotoType	Start Photo No.	End Photo No.	No. of Photos	No. of Triggers	Animal Group	Species	No. Animals	Previously Counted	Description of wildlife	Behaviour	Comment
59D	56	14-May-13	1	13:43:12	13:44:42	M	147	156	10	1	Mammal	Wolverine	1	No		Sniffing	
59D	56	18-May-13	1	13:30:28	13:31:58	M	1482	1491	10	1	Mammal	Red Fox	1	No	Carrying prey - looks like ground squirrel	Walking	Can see fox tracks parallel to camera
59D	56	21-May-13	1	5:53:10	5:54:40	M	2158	2167	10	1	Mammal	Grey Wolf	2	No	Assume mated pair - male and female	Walking, Sniffing	Sex assumed due to urination postures
59D	56	21-May-13	2	6:00:50	6:02:20	M	2169	2178	10	1	Mammal	Grey Wolf	2	Yes	Mated pair	Walking, Sniffing, Pooping	
59D	56	24-May-13	1	7:30:49	7:32:19	M	2880	2889	10	1	Mammal	Grey Wolf	1	Unsure		Walking	
59D	56	27-May-13		6:40:00		T	3616				Mammal	Caribou	1	No	Can just see head over the crest of hill	Walking	
59D	56	28-May-13	1	2:15:27	2:16:57	M	3804	3813	10	1	Mammal	Grey Wolf	2	Unsure	Mated pair?	Walking	
59D	56	28-May-13	2	2:28:24	2:29:54	M	3815	3824	10	1	Mammal	Grey Wolf	2	Yes	Mated pair	Walking	
59D	56	31-May-13	1	0:16:15	0:17:45	M	4644	4653	10	1	Mammal	Grey Wolf	1	Unsure		Walking	
59D	56	31-May-13	2	0:30:02	0:31:32	M	4656	4665	10	1	Mammal	Grey Wolf	1	Yes		Walking, Sniffing	
59D	56	1-Jun-13	1	12:36:02	12:37:32	M	5102	5111	10	1	Mammal	Grey Wolf	1+	Unsure	Potentially 2	Walking	
59D	56	9-Jun-13	1	13:35:55	13:37:25	M	7180	7189	10	1	Mammal	Grey Wolf	2	Unsure	Mated pair?	Walking	
59D	56	9-Jun-13	2	18:23:46	18:25:16	M	7269	7278	10	1	Mammal	Grey Wolf	1	Unsure	2nd animal might be present	Walking, Sniffing	
59D	56	28-Jun-13	1	18:48:11	18:49:41	M	1818	1827	10	1	Avian	Golden Eagle	1	No	Adult	Flying	
59D	56	3-Jul-13		11:00:00		T	2771				Mammal	Grey Wolf	1	Unsure	Adult	Sniffing	
59D	56	6-Jul-13	1	1:16:49	1:18:19	M	3425	3434	10	1	Mammal	Grey Wolf	1	Unsure	Adult with dark saddle	Walking	
59D	56	6-Jul-13	2	9:08:33	9:09:53	M	3482	3490	9	1	Mammal	Grey Wolf	1	No	Adult - light colouring	Walking	
59D	56	6-Jul-13	3	10:59:37	11:01:07	M	3503	3513	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Running	Do not include T shot 3506
59D	56	6-Jul-13	4	18:18:54	18:20:24	M	3567	3577	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Walking	Do not include T shot 3574
59D	56	6-Jul-13	5	23:22:55	23:24:25	M	3608	3617	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Sniffing	
59D	56	7-Jul-13	1	2:20:20	2:21:50	M	3686	3695	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Walking, Sniffing	
59D	56	8-Jul-13	1	6:30:01	6:31:31	M	3995	4004	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Walking	Don't see wolf until 3rd photo
59D	56	8-Jul-13	2	20:57:40	20:59:10	M	4171	4180	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Running	
59D	56	9-Jul-13	1	20:02:14	20:03:44	M	4350	4359	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking, Sniffing	
59D	56	10-Jul-13	1	23:43:28	23:44:58	M	4726	4735	10	1	Mammal	Grey Wolf	1	Unsure	Adult - dark saddle	Running	
59D	56	11-Jul-13	1	7:27:28	7:28:58	M	4842	4851	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Sniffing	
59D	56	11-Jul-13	2	16:51:03	16:52:33	M	4969	4978	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	11-Jul-13	3	22:30:02	22:31:32	M	5033	5042	10	1	Mammal	Grey Wolf	1	Unsure	Adult with prey	Walking	
59D	56	13-Jul-13	1	5:53:25	5:54:55	M	5341	5350	10	1	Mammal	Grey Wolf	1	Unsure	Adult - light colouring	Walking	
59D	56	14-Jul-13	1	2:46:42	2:48:12	M	5586	5595	10	1	Mammal	Grey Wolf	1	Unsure	Just see tail	Walking	
59D	56	19-Jul-13	1	13:58:20	13:59:50	M	6993	7002	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	19-Jul-13	2	19:56:49	19:58:19	M	7049	7058	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking, Standing	
59D	56	20-Jul-13	1	3:51:14	3:52:44	M	7177	7186	10	1	Mammal	Grey Wolf	2	Unsure	Adult and pup	Walking, Sitting	
59D	56	20-Jul-13	2	7:44:01	7:45:31	M	7210	7219	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	20-Jul-13	3	9:23:41	9:25:11	M	7230	7239	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	20-Jul-13	4	9:56:42	9:58:12	M	7243	7252	10	1	Mammal	Grey Wolf	2	Yes	Adults - one darker and one lighter	Walking	
59D	56	20-Jul-13	4	14:56:35	14:38:05	M	7293	7302	10	1	Mammal	Grey Wolf	2	Yes	Light coloured adult and pup	Walking, Sitting	
59D	56	20-Jul-13		15:00:00		T	7303				Mammal	Grey Wolf	1	Yes	Adult - light colouring	Standing	
59D	56	20-Jul-13	5	15:17:46	15:19:16	M	7315	7324	10	1	Mammal	Grey Wolf	1	Unsure	Adult - just tail/bum	Walking	
59D	56	20-Jul-13	6	18:38:11	18:39:41	M	7355	7364	10	1	Mammal	Grey Wolf	2	Yes	Adult and pup	Walking	
59D	56	20-Jul-13	7	20:35:11	20:36:41	M	7377	7386	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	20-Jul-13	8	21:27:23	21:28:53	M	7402	7411	10	1	Mammal	Grey Wolf	1	Unsure	Pup	Running	
59D	56	20-Jul-13		21:30:00		T	7412				Mammal	Grey Wolf	1	Yes	Adult	Standing	
59D	56	20-Jul-13		23:40:00		T	7425				Mammal	Grey Wolf	1	Unsure	Pup	Sitting	Super cute!
59D	56	21-Jul-13		0:50:00		T	7432				Mammal	Grey Wolf	2	Yes	Pups	Playing	
59D	56	21-Jul-13	1	0:50:17	3:47:00	M	7433	7442	10	1	Mammal	Grey Wolf	4+	Yes	Pups	Playing	Might be 4-5 pups - hard to tell
59D	56	21-Jul-13	2	5:32:28	5:33:58	M	7481	7490	10	1	Mammal	Grey Wolf	1	Yes	Adult	Walking	
59D	56	22-Jul-13	1	1:50:57	1:52:27	M	7693	7702	10	1	Mammal	Grey Wolf	2	Yes	Pups	Running	
59D	56	22-Jul-13	2	15:48:29	15:49:59	M	7896	7905	10	1	Mammal	Grey Wolf	1	Yes	Adult	Walking	
59D	56	23-Jul-13	1	1:21:16	1:22:46	M	8004	8013	10	1	Mammal	Grey Wolf	2	Yes	Adult and pup	Walking	
59D	56	23-Jul-13	2	1:51:05	1:52:35	M	8017	8026	10	1	Mammal	Grey Wolf	1	Yes	Adult	Walking	
59D	56	23-Jul-13	3	3:08:28	3:09:58	M	8044	8053	10	1	Mammal	Grey Wolf	2	Yes	Adult and pup	Walking	
59D	56	23-Jul-13		3:30:00		T	8056				Mammal	Grey Wolf	1	Yes	Pup	Sitting	
59D	56	23-Jul-13	4	4:20:02	4:21:32	M	8062	8071	10	1	Mammal	Grey Wolf	1	Yes	Pup	Walking, Standing	
59D	56	23-Jul-13	5	4:40:01	4:41:31	M	8074	8083	10	1	Mammal	Grey Wolf	1	Yes	Pup	Sitting	
59D	56	23-Jul-13		7:40:00		T	8111				Mammal	Grey Wolf	1	Yes	Pup	Walking	
59D	56	23-Jul-13	6	7:40:01	7:41:31	M	8112	8121	10	1	Mammal	Grey Wolf	1	Yes	Pup	Walking	
59D	56	23-Jul-13	7	20:11:57	20:13:27	M	8217	8226	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	23-Jul-13	8	21:15:20	21:16:50	M	8233	8242	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	23-Jul-13	9	21:50:38	21:52:08	M	8247	8256	10	1	Mammal	Grey Wolf	4	Unsure	Adult and 3 pups	Feeding pups	
59D	56	23-Jul-13	10	22:47:10	22:48:40	M	8282	8291	10	1	Mammal	Grey Wolf	3	Unsure	2 adults and 1 pup	Running, Resting	
59D	56	24-Jul-13	1	17:34:27	17:35:57	M	8455	8464	10	1	Mammal	Grey Wolf	4	Yes	Adult and 3 pups	Running	

Appendix 8-2. Motion-Triggered Remote Camera Monitoring at Wolf Dens 56 and 57, 2013

Unique Den ID	Camera No.	Date	Series	Start Time	End Time	PhotoType	Start Photo No.	End Photo No.	No. of Photos	No. of Triggers	Animal Group	Species	No. Animals	Previously Counted	Description of wildlife	Behaviour	Comment
59D	56	24-Jul-13		18:10:00		T	8468				Mammal	Grey Wolf	1	Unsure	Adult	Resting	
59D	56	24-Jul-13	1	22:50:30	22:52:00	M	8527	8536	10	1	Mammal	Grey Wolf	2	Unsure	Adult and pup	Running	
59D	56	25-Jul-13	1	2:19:17	2:20:47	M	8557	8567	10	1	Mammal	Grey Wolf	2	Unsure	Adult and pup	Walking	Do not include T shot 8562
59D	56	25-Jul-13	2	6:33:42	6:35:12	M	8603	8612	10	1	Mammal	Grey Wolf	4	Yes	Adult and 3 pups	Walking	
59D	56	25-Jul-13	3	6:41:42	6:43:12	M	8614	8623	10	1	Mammal	Grey Wolf	2	Yes	Adult and pup	Walking	
59D	56	25-Jul-13	4	9:45:28	9:46:58	M	8662	8671	10	1	Mammal	Grey Wolf	4	Yes	Adult and 3 pups	Walking, Feeding	
59D	56	25-Jul-13	5	11:21:00	11:22:30	M	8682	8691	10	1	Mammal	Grey Wolf	3	Yes	Adult and 2 pups	Walking, Begging	Pup is begging from adult
59D	56	25-Jul-13		13:20:00		T	8703				Mammal	Grey Wolf	1	Yes	Pup	Defecating	
59D	56	25-Jul-13	6	19:59:28	20:00:58	M	8763	8773	10	1	Mammal	Grey Wolf	1	Yes	Pup	Walking	Do not include T shot 8767
59D	56	27-Jul-13	1	3:21:56	3:23:26	M	9092	9101	10	1	Mammal	Grey Wolf	1	Unsure	Adult	Walking	
59D	56	27-Jul-13	2	19:57:49	20:00:00	M	9301	9311	11	1	Mammal	Grizzly Bear	1	No	Adult	Walking, Sniffing	Bear knocks camera over in T shot 9311
59D	56	29-Jul-13	1	4:41:50		M	9569		1		Mammal	Grey Wolf	1	Unsure	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole
59D	56	29-Jul-13	2	6:19:29		M	9587		1		Mammal	Canid	1	Unsure	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole
59D	56	29-Jul-13	3	12:21:51	12:23:21	M	9664	9673	10	1	Mammal	Canid	1	Unsure	Edge of face	Sniffing at camera	
59D	56	30-Jul-13	1	14:33:41		M	9991		1		Mammal	Unsure	1	Unsure	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole
59D	56	1-Aug-13	1	9:46:09	9:47:39	M	921	930	10	1	Mammal	Grey Wolf	1	Unsure	Face	Sniffing at camera	
59D	56	1-Aug-13	2	10:24:51	10:26:21	M	935	944	10	1	Mammal	Grey Wolf	1	Unsure	Edge of face and ear	Sniffing at camera	
59D	56	2-Aug-13	1	12:04:33	12:06:03	M	1179	1188	10	1	Mammal	Unsure	1	Unsure	Edge of face and ear	Sniffing at camera	
59D	56	4-Aug-13	1	5:15:10		M	1558	1559	2	1	Mammal	Unsure	1	Unsure	Part of face, eye, and ear	Sniffing at camera	Only included photos with animal in it rather than whole series
59D	56	8-Aug-13	1	7:35:23		M	2616		1	1	Mammal	Unsure	1	Unsure	Neck?	Sniffing at camera	Only included photos with animal in it rather than whole series
59D	56	8-Aug-13	2	17:51:34		M	2728		1	1	Avian	Long-tailed Jaegar	1	No		Flying	Only included photos with animal in it rather than whole series
59D	56	11-Aug-13	1	14:49:07		M	3401		1	1	Avian	Long-tailed Jaegar	1	Unsure		Flying	Only included photos with animal in it rather than whole series
59D	56	14-Aug-13	1	11:21:18		M	3953		1	1	Avian	Long-tailed Jaegar	1	Unsure		Flying	Only included photos with animal in it rather than whole series
59D	56	15-Aug-13	1	1:42:12	1:43:32	M	4059	4068	10	1	Mammal	Canid	1	Unsure	Part of face, eye, and ear	Sniffing at camera	
59D	56	21-Aug-13	1	14:33:03		M	6230		1	1	Mammal	Canid	1	Unsure	Tail	Walking	Only included photos with animal in it rather than whole series
59D	56	23-Aug-13	1	22:36:34	22:38:04	M	7226	7235	10	1	Avian	Short-eared Owl	1	No	Face	Checking out camera	
59D	56	24-Aug-13	1	7:55:43		M	7448		1	1	Mammal	Unsure	1	Unsure		Checking out camera	Only included photos with animal in it rather than whole series
70D	57	9-Jul-13	1	6:15:43	6:17:13	M	1794	1803	10	1	Mammal	Grizzly Bear	1	No	Face	Sniffing at camera	
70D	57	25-Jul-13	1	7:32:18	7:33:48	M	2349	2358	10	1	Mammal	Grizzly Bear	1	Unsure	Face	Sniffing at camera, Walking	Bear pushed camera down at 8:00:00

Appendix 9-1

Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Rescan™
an ERM company

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Bathurst Herd

Caribou Collar ID No.	No. of Locations per Year																	Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
104	66	69																	135
108	14	4																	18
100	66	78	38	70	69	60													381
106	66	77	14																157
109	66	80	21	12															179
103	65	80	16																161
101	64	74	25																163
105	64	79	79	80	74														376
107	51																		51
102	55																		55
118			20	72	72	9													173
160			9	11															20
129			13	15															28
127			15	67	67	67	1												217
128			15	73		47													135
125			13	66	40														119
111			34	35	62	70	72	27											300
124			14	70	66		2												152
113			25	73	12														110
121			14	72	70	24													180
119			16	70	67	73	72	34											332
122			13	55	63	63	3												197
126			9	26	33														68
110			26																26
123			15	13															28
117			14	67	72	72	71	26											322
116			13																13
115			12																12
120			13																13
112			13																13
114			7																7
130					11	70	68	64	36	6									255
137						54	70	72	11										207
133						29													29
145							79												79

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Bathurst Herd

Caribou Collar ID No.	No. of Locations per Year																		Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
144							82												82
147							56												56
140							56	11											67
141							95	111	90										296
142							95	111	25										231
149							15												15
153								80											80
154								95	90										185
158								77											77
156								95	90										185
150								87	81										168
157								95	90										185
152								3											3
162									15	110	110	88							323
165									15	4									19
169									9										9
161									15	10									25
163									15		110	103	64						292
167									15	110	30								155
168									15	110	110	98							333
171									15		110	110	65						300
166									15	110	110	64							299
189										93	3								96
178										93	109	109	95						406
180										93	109	97							299
182										93	109	42	95						339
184										93	109	109	95						406
188										93	109	108	43						353
186										93	11								104
183										8									8
191										93	109	109	95						406
187										14									14
193										92	109	109	94						404
194										91	109	97							297
192											98	16							114

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Bathurst Herd

Caribou Collar ID No.	No. of Locations per Year																		Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
185											2								2
198												131	119	12	114				376
202												117							117
197												131	131	127	61				450
196												131	119						250
195												131	118						249
200												131	21						152
199												118							118
308												130	278						408
BG218													38	342	184				564
BG205													38	301	243				582
361													231	274					505
BG213													39	356	244				639
BG204													39	337	238				614
BG216													39	271					310
BG212													39	345	237				621
BG207													38	197					235
BG215													39	238					277
BG209													38						38
BG208													39	316	243				598
BG219														169					169
BG232															259	350	232		841
BG225																333	251	245	829
BG244																257	76		333
BG247																261	265	116	642
BG246																254	73		327
BG240																253	190		443
BG235																155	179		334
BG231															250	345	264	201	1060
BG234															257	274			531
BG228															250	234			484
BG236																256	182		438
BG227															263	188			451
BG239																121			121
BG238																110			110

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Bathurst Herd

Caribou Collar ID No.	No. of Locations per Year																		Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
BG237																130			130
BG245																92			92
BG242																120			120
BG222															123				123
BG226															158				158
BGCA12401																	188	264	452
BGCA12402																	188	252	440
BGCA12403																	183	211	394
BGCA12404																	183	128	311
BGCA12405																	185	268	453
BGCA12406																	182	89	271
BGCA12407																	180	267	447
BGCA12408																	180	265	445
BGCA12409																	180	187	367
BGCA12410																	32		32
BGCA12411																	129		129
BGCA12412																	187	268	455
BGCA12413																	139		139
BGCA12457																	100		100
BGCA12489																		132	132
BGCA12621																		35	35
BGCA12624																		185	185
BGCA12626																		5	5
BGCA12627																		182	182
BGCA12628																		6	6
BGCA12629																		59	59
BGCA12630																		5	5
Total Locations per Year	577	541	516	947	778	638	837	988	642	1,409	1,566	2,279	2,049	3,285	3,124	3,733	3,948	3,370	
Total Collars (Total Functioning[1]) per Year	10	8 (7)	27 (24)	18	14	12 (11)	15 (12)	15 (14)	17 (16)	19 (16)	18 (16)	22	25	13	15	17	23	21 (18)	

[1] *Number of collars that provided 10 or more locations per year*

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Ahiak and Beverly Herd

Caribou Collar ID No.	No. of Locations per Year																	Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
131						51	22												73
132						56	42												98
134						26													26
135						56	73	75	109	102	6								421
136						56	73	9											138
138						47	58	60	50	30									245
139							94	94											188
143							95	109	82										286
146							60												60
148							92												92
172										93	109	109	110	17					438
173										93	109	104							306
174										127	172	169	175	33					676
176										93	11								104
177										93	109	109	109	16					436
179										93	109	109	110						421
181										93	27								120
301											437	507							944
302											434	546	438	516	567	341			2,842
303											434	535	438						1,407
304											440	548	440	409	15				1,852
305											442	537	433	508	346				2,266
306											447	6							453
307											34								34
308											449	242							691
309											448	553	454	496	542	7			2,500
310															120				120
311											439	546	457	244					1,686
312											197								197
313											455	573	413	179					1,620
314											449	560	422						1,431
315											454	561	234						1,249
316											184								184
317											444	551	456	371	464				2,286
318											451	122							573

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Ahiak and Beverly Herd

Caribou Collar ID No.	No. of Locations per Year																	Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
319											438	554	451	136					1,579
320											450	557	459	88	412	41			2,007
321												232							232
322												267	467	177					911
323												267	454	126					847
324												46							46
325												257	314						571
326												267	95						362
328												40							40
329												250	440	501	540	383			2,114
330												241	447	279					967
331												266	157	300	362	439	139		1,663
332												53							53
333												253	442	492	573	558	203		2,521
334												257	145						402
335												258	452	20					730
336												68							68
337												56							56
338													274	510	550	556	241		2,131
339													294	508	558	190			1,550
340													290	518	487				1,295
341													86						86
342													271	502	542	486			1,801
343													281	496	272				1,049
344													288	159					447
345													279	507	311				1,097
346													282	440					722
347													282	200					482
348													207						207
349													291	500	334				1,125
350													281	508	579	314			1,682
351													349	508	561	572	123		2,113
352													344	494	341				1,179
353													349	85					434
354													220						220

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Ahiak and Beverly Herd

Caribou Collar ID No.	No. of Locations per Year																		Total Per Collar
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	
355													345	493	547	166			1,551
356													360	261					621
357													549	500	561	544	549	110	2,813
358													349	520	557	322			1,748
359													347	498	305				1,150
360													345	494	582	339			1,760
361													89						89
362													36						36
363													350	88					438
364													171						171
365													291						291
366													349	311					660
367													87						87
BG220														845	1090	264	246		2,445
BG221														859	1106	314	14		2,293
BG224															238				238
BGCA12414																	839	705	1,544
BGCA12415																	27		27
BGCA12416																	817	531	1,348
BGCA12417																	850	817	1,667
BGCA12418																	29		29
BGCA12419																	723		723
BGCA12420																	4		4
BGCA12541																	831	177	1,008
BGCA12542																	877	806	1,683
BGCA12543																	852	814	1,666
BGCA12544																	30		30
BGCA12545																	844	228	1,072
BGCA12546																	30		30
BGCA12547																	848	340	1,188
BGCA12548																	848	789	1,637
BGCA12549																	840	471	1,311
BGCA12550																	30		30
BGCA12551																	683		683
BGCA12552																	850	809	1,659

Appendix 9-1. Summary of Collar Locations and Number of Collared Caribou from the Bathurst and Beverly/Ahiak Herds used for Kernel Density Analysis

Ahiak and Beverly Herd

	No. of Locations per Year																	Total Per Collar
Caribou Collar ID No.	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	
BGCA12553																	847	318	1,165
BGCA12554																	636		636
BGCA12555																	853	803	1,656
BGCA12556																	851	799	1,650
BGCA12557																	783	373	1,156
BGCA12558																	31		31
BGCA12559																	21		21
BGCA12560																	849	117	966
BGCA12625																		505	505
Total Locations per Year						292	609	347	241	817	8,178	11,176	17,348	15,712	13,462	5,836	17,238	9,512	
Total Collars (Total Functioning[1]) per Year						6	9	5 (4)	3	9	27 (26)	37 (36)	56	43	28	17 (16)	34 (33)	18	

[1] *Number of collars that provided 10 or more locations per year*

Appendix 9-2

Remote Camera Locations and Habitat Information

Rescan™
an ERM company

Appendix 9-2. Remote Camera Locations and Habitat Information

Camera Number and Location Suffix	UTM Zone	Easting	Northing	Camera Orientation (Degrees)	Date/Time Set Up (Deployment)	Date/Time End (Card Collection)	Movement Notes	Placement Rationale (for moved and new cameras)	Habitat	Total Caribou Observed
BR_01a	13 W	372339	7326747	267	8/26/12 4:00 PM	5/10/13 3:25 PM	moved in May 2013		Heath Tundra	0
BR_01b	13 W	379856	7318198	304	5/10/13 3:40 PM	8/23/13 12:06 PM	New location (May 2013)	TK foraging grounds	Heath Tundra	35
BR_02a	13 W	374094	7302270	356	8/26/12 3:51 PM	8/23/13 12:52 PM	No Change		River Crossing	6
BR_03a	13 W	382439	7298201	137	8/25/12 10:29 AM	8/22/13 5:05 AM	No Change		River Crossing	0
BR_04a	13 W	367751	7313892	245	8/26/12 3:34 PM	5/10/13 4:56 PM	moved in May 2013		Esker	2
BR_04b	13 W	370946	7310400	320	5/10/13 5:10 PM	8/23/13 12:40 PM	New location (May 2013)	TK feeding in Grid	Rocky Tundra	15
BR_05a	13 W	385512	7315992	300	8/26/12 2:58 PM	5/13/13 8:45 PM	moved in May 2013		Esker	0
BR_05b	13 W	385276	7316252	300	5/13/13 8:45 PM	8/23/13 3:18 PM	New location (May 2013)	Esker/Infrastructure	Esker	3
BR_06a	13 W	393907	7300999	300	8/26/12 2:10 PM	5/13/13 12:14 PM	moved in May 2013		Esker	10
BR_06b	13 W	386705	7303087		5/13/13 12:25 PM	8/23/13 1:56 PM	New location (May 2013)	Lakeside foraging and travel	Tundra/Freshwater	0
BR_07a	13 W	387597	7308385	190	8/26/12 2:30 PM	5/13/13 8:14 PM	moved in May 2013		Esker	0
BR_07b	13 W	388899	7311571	130	5/13/13 8:30 PM	8/23/13 4:00 PM	New location (May 2013)	Esker Travel & Infrastructure	Esker	0
BR_08a	13 W	394585	7307407	307	8/26/12 2:18 PM	5/13/13 9:50 AM	moved in May 2013		Rocky Tundra	4
BR_08b	13 W	394327	7307178	328	5/13/13 9:55 AM	8/23/13 2:20 PM	New location (May 2013)	Grid, 2012 Placement	Rocky Tundra	1
BR_09a	13 W	400144	7297497	90	8/26/12 12:30 PM	9/19/12 12:00 AM	moved in May 2013		Heath Tundra	0
BR_09b	13 W	395003	7371564	150	5/7/13 1:49 PM	8/26/13 6:42 PM	New location (May 2013)	Caribou Trails observed in 2012	Marine Shoreline	0
BR_10a	13 W	417330	7327873	340	8/24/12 12:00 PM	5/10/13 1:50 PM	moved in May 2013		River Crossing	0
BR_10b	13 W	386407	7322927	124	5/10/13 1:50 PM	8/23/13 11:49 AM	New location (May 2013)	TK feeding area	Heath Tundra	0
BR_11a	13 W	392564	7267456	298	8/24/12 4:14 PM	5/12/13 7:27 PM	moved in May 2013		Esker	8
BR_11b	13 W	393658	7277921	310	5/12/13 7:40 PM	8/24/13 10:23 AM	New location (May 2013)	Esker	Esker	39
BR_12a	13 W	376090	7318071	150	8/26/12 3:25 PM	5/10/13 3:59 PM	moved in May 2013		Heath Tundra	0
BR_12b	13 W	376620	7315384	270	5/10/13 4:10 PM	8/23/13 12:10 PM	New location (May 2013)	TK feeding by lake	Tundra/Freshwater	0
BR_13a	13 W	405679	7288178	290	8/26/12 12:16 PM	8/24/13 5:01 PM	No Change		Esker	121
BR_14a	13 W	390305	7312359	290	8/26/12 2:33 PM	6/1/13 1:50 PM	moved in June 2013		Wetland	0
BR_14b	13 W	392675	7328435	225	6/1/13 1:50 PM	6/19/13 10:41 AM	New location (June 2013)	Potential river crossing	River Crossing	0
BR_14c	13 W	381759	7394023	132	6/19/13 11:38 AM	8/26/13 5:55 PM	New location (June 2013)	MLA	Marine Shoreline	0
BR_15a	13 W	381277	7321450	310	8/26/12 3:15 PM	5/10/13 3:03 PM	moved in May 2013		Esker	0
BR_15b	13 W	381616	7321189	332	5/10/13 3:05 PM	8/23/13 11:58 AM	New location (May 2013)	Esker travel	Esker	1
BR_16a	13 W	431573	7269702	308	8/26/12 9:24 AM	5/12/13 9:03 AM	moved in May 2013		Heath Tundra	0
BR_16b	13 W	429410	7271518	222	5/12/13 1:20 PM	8/24/13 4:06 AM	New location (May 2013)	Infrastructure	Heath Tundra	1
BR_17a	13 W	434895	7271625	320	8/26/12 10:33 AM	5/11/13 3:54 PM	moved in May 2013		Heath Tundra	4
BR_17b	13 W	437276	7266585	92	5/11/13 4:10 PM	8/25/13 8:09 AM	New location (May 2013)	Grid (Heat map)	Heath Tundra	180
BR_18a	13 W	434151	7280644	346	8/26/12 11:31 AM	8/24/13 12:54 PM	No Change	Esker travel	Esker	55
BR_19a	13 W	420492	7277591	80	8/26/12 11:49 AM	5/12/13 12:47 PM	moved in May 2013		Heath Tundra	17

Appendix 9-2. Remote Camera Locations and Habitat Information

Camera Number and Location Suffix	UTM Zone	Easting	Northing	Camera Orientation (Degrees)	Date/Time Set Up (Deployment)	Date/Time End (Card Collection)	Movement Notes	Placement Rationale (for moved and new cameras)	Habitat	Total Caribou Observed
BR_19b	13 W	421312	7274533	90	5/12/13 1:40 PM	8/24/13 1:29 PM	New location (May 2013)	Lakeshore Travel	Tundra/Freshwater	13
BR_20a	13 W	427241	7271826	240	8/26/12 8:48 AM	5/12/13 9:54 AM	moved in May 2013		Rocky Tundra	1
BR_20b	13 W	429839	7273979	60	5/12/13 10:25 AM	8/22/13 9:00 AM	New location (May 2013)	Infrastructure	Rocky Tundra	0
BR_21a	13 W	424176	7265510	195	8/24/12 4:58 PM	5/11/13 2:28 PM	moved in May 2013		Heath Tundra	42
BR_21b	13 W	427756	7259451	140	5/11/13 2:28 PM	8/24/13 8:31 AM	New location (May 2013)	Feeding area; potential crossing	Rocky Tundra	44
BR_22a	13 W	424969	7268652	336	8/24/12 6:13 PM	5/11/13 8:12 PM	moved in May 2013		Heath Tundra	0
BR_22b	13 W	418020	7272315	308	5/11/13 8:24 PM	8/24/13 1:36 PM	New location (May 2013)	Grid; high point overlooking HT	Heath Tundra	106
BR_23a	13 W	436243	7259900	40	8/24/12 3:22 PM	5/11/13 4:19 PM	moved in May 2013		Heath Tundra	22
BR_23b	13 W	405550	7262019	110	5/12/13 6:45 AM	8/24/13 2:09 AM	New location (May 2013)	KIA Caribou Calving Grounds	Rocky Tundra	65
BR_24a	13 W	432791	7301044	5	8/26/12 5:02 PM	5/13/13 11:41 AM	moved in May 2013		Esker	0
BR_24b	13 W	416893	7300436		5/13/13 12:00 PM	8/24/13 5:43 AM	New location (May 2013)	Potential River Crossing	River Crossing	1
BR_25a	13 W	436875	7249174	343	8/24/12 3:03 PM	5/11/13 2:00 PM	moved in May 2013		Esker	0
BR_25b	13 W	424738	7259240	86	5/11/13 2:00 PM	8/24/13 8:25 PM	New location (May 2013)	potential crossing	River Crossing	1
BR_26a	13 W	441825	7276151	237	8/26/12 9:02 AM	5/11/13 5:01 PM	moved in May 2013		Heath Tundra	0
BR_26b	13 W	444060	7271980	60	5/11/13 5:14 PM	8/25/13 8:25 PM	New location (May 2013)	Grid; feeding area	Heath Tundra	13
BR_27a	13 W	411364	7282979	190	8/26/12 11:59 AM	9/20/12 12:00 AM	moved in May 2013		Heath Tundra	0
BR_27b	13 W	379364	7392604	129	5/7/13 1:00 PM	8/26/13 6:04 PM	New location (May 2013)	Caribou trails in fall	Marine Shoreline	0
BR_28a	13 W	421107	7260616	344	8/24/12 3:42 PM	8/24/13 8:18 PM	No Change		Rocky Tundra	15
BR_29a	13 W	403829	7266323	256	8/24/12 4:32 PM	8/24/13 2:35 PM	No Change		River Crossing	1
BR_30a	13 W	437153	7236588	326	8/24/12 2:37 PM	8/24/13 7:32 PM	No Change		River Crossing	55
BR_31a	13 W	387982	7383123	140	5/7/13 12:04 PM	8/26/13 9:20 AM	New Camera 2013	Port site monitoring	Heath Tundra	0
BR_32a	13 W	401398	7359148	160	5/7/13 2:43 PM	8/26/13 6:50 PM	New Camera 2013	Pinch point along shore	River Crossing	0
BR_33a	13 W	412068	7246236	118	5/8/13 3:12 PM	8/24/13 7:44 PM	New Camera 2013	KIA caribou calving grounds	Rocky Tundra	6
BR_34a	13 W	416145	7249280	100	5/8/13 3:46 PM	8/24/13 12:00 AM	New Camera 2013	KIA caribou calving grounds	Rocky Tundra	0
BR_35a	13 W	418557	7252171	162	5/8/13 4:18 PM	8/24/13 8:01 PM	New Camera 2013	KIA caribou calving grounds	Wetland	0
BR_36a	13 W	410193	7263887	270	5/8/13 5:18 PM	8/24/13 1:56 PM	New Camera 2013	Lakeshore travel	Rocky Tundra	25
BR_37a	13 W	389542	7325355	98	5/10/13 2:00 PM	8/23/13 11:40 AM	New Camera 2013	TK feeding grounds	Tundra/Freshwater	1
BR_38a	13 W	399426	7313275	240	5/10/13 2:41 PM	8/23/13 4:19 PM	New Camera 2013	TK lakeside foraging	Tundra/Freshwater	2
BR_39a	13 W	373632	7313262	286	5/10/13 4:35 PM	8/23/13 12:33 PM	New Camera 2013	TK feeding grounds	Heath Tundra	0
BR_40a	13 W	422356	7254481	330	5/11/13 12:30 PM	8/24/13 8:10 PM	New Camera 2013	KIA caribou calving grounds	Rocky Tundra	3
BR_41a	13 W	431374	7262339	10	5/11/13 2:45 PM	8/24/13 8:55 PM	New Camera 2013	Feeding; potential stream crossing	River Crossing	294
BR_42a	13 W	434741	7264905	228	5/11/13 4:30 PM	8/25/13 8:01 PM	New Camera 2013	Lakeside feeding; on Grid	Tundra/Freshwater	65
BR_43a	13 W	439908	7269744	44	5/11/13 4:48 PM	8/25/13 8:16 PM	New Camera 2013	Grid; Feeding grounds	Tundra/Freshwater	320

Appendix 9-2. Remote Camera Locations and Habitat Information

Camera Number and Location Suffix	UTM Zone	Easting	Northing	Camera Orientation (Degrees)	Date/Time Set Up (Deployment)	Date/Time End (Card Collection)	Movement Notes	Placement Rationale (for moved and new cameras)	Habitat	Total Caribou Observed
BR_44a	13 W	433243	7284727	322	5/11/13 5:30 PM	8/24/13 1:08 PM	New Camera 2013	Potential pinch point for foraging	Rocky Tundra	7
BR_45a	13 W	427127	7279797	60	5/11/13 5:50 PM	8/24/13 1:14 PM	New Camera 2013	Potential pinch point for foraging	Rocky Tundra	45
BR_46a	13 W	424401	7276855	230	5/11/13 6:05 PM	8/24/13 1:22 PM	New Camera 2013	Grid; Valley for foraging	Heath Tundra	84
BR_47a	13 W	410926	7267069	330	5/11/13 7:50 PM	8/24/13 1:50 PM	New Camera 2013	Grid; HT pinch point for foraging	Rocky Tundra	37
BR_48a	13 W	415389	7269383	220	5/11/13 8:00 PM	8/24/13 12:00 AM	New Camera 2013	Pinch point around lake	Tundra/Freshwater	351
BR_49a	13 W	399190	7263248	240	5/12/13 7:05 PM	8/24/13 2:28 PM	New Camera 2013	Potential River Crossing; KIA Calving Grounds	River Crossing	0
BR_50a	13 W	399291	7256424	258	5/12/13 7:13 PM	8/23/13 2:17 PM	New Camera 2013	KIA Caribou Calving Grounds	Heath Tundra	0
BR_51a	13 W	396732	7279708	280	5/12/13 7:45 PM	8/23/13 6:20 AM	New Camera 2013	Lakeside foraging	Tundra/Freshwater	93
BR_52a	13 W	403395	7284052	20	5/13/13 10:26 AM	8/24/13 4:54 PM	New Camera 2013	HT on Grid; foraging area	Heath Tundra	240
BR_53a	13 W	409415	7290079	312	5/13/13 10:43 AM	6/19/13 10:16 AM	New Camera 2013	Lakeside forage on grid	Tundra/Freshwater	0
BR_53b	13 W	380784	7394783	316	6/19/13 12:07 AM	8/26/13 5:28 PM	New Camera 2013	MLA	Heath Tundra	0
BR_54a	13 W	412023	7292054	70	5/13/13 10:59 AM	8/24/13 5:54 PM	New Camera 2013	HT pinch point; on grid	Heath Tundra	27
BR_55a	13 W	384749	7300758	175	5/13/13 4:00 PM	8/23/13 1:50 PM	New Camera 2013	Possible River Crossing; KIA calving grounds	River Crossing	1
BR_56a	13 W	380331	7282017	180	5/13/13 12:00 AM	8/24/13 10:03 AM	New Camera 2013	Wolf Den site Active in 2012	Not used for Caribou Analysis	0
BR_57a	13 W	455771	7286111	200	5/7/13 12:24 PM	8/24/13 12:09 PM	New Camera 2013	Wolf Den site	Not used for Caribou Analysis	0
BR_58a	13 W	390754	7306589	220	5/13/13 4:25 AM	8/23/13 12:00 AM	New Camera 2013	Esker Travel; HT valley forage	Esker	0
BR_59a	13 W	396540	7310850	90	5/13/13 4:46 PM	8/23/13 2:29 PM	New Camera 2013	Grid; facing RHT valley	Rocky Tundra	0
BR_60a	13 W	402369	7316487	135	5/13/13 5:05 PM	8/28/13 12:00 AM	New Camera 2013	Grid; facing RHT valley	Rocky Tundra	3
BR_61a	13 W	392519	7328755	154	7/25/13 12:49 PM	8/23/13 11:22 AM	New Camera 2013	potential river crossing, replacement for BR_14b	River Crossing	1
BR_62a	13 W	409407	7290062	358	7/25/13 10:45 AM	8/24/13 12:00 AM	New Camera 2013	Lakeside forage on grid, replacement for BR_53a	Tundra/Freshwater	133
BR_63a	13 W	414025	7279703	61	7/26/13 9:10 AM	8/24/13 4:17 PM	New Camera 2013	TK and collar locations analysis of crossings	Tundra/Freshwater	90
BR_64a	13 W	430980	7277828	158	7/26/13 9:50 AM	8/24/13 12:00 AM	New Camera 2013	TK and collar locations analysis of crossings	Tundra/Freshwater	11
BR_65a	13 W	438277	7277591	11	7/26/13 10:38 AM	8/24/13 12:21 PM	New Camera 2013	TK and collar locations analysis of crossings	Tundra/Freshwater	3

Appendix 9-3

Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Rescan™
an ERM company

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
Caribou Observarions - Sorted, QAQCed, and Used in Analyses (independent photo observations, no duplicates)																		
BR_01a																		no caribou observed
BR_01b	24-May-13	Spring	-	20:30:00	-	T	732	-	1	-	Mammal	Caribou	4	-	4	-	Standing	-
BR_01b	27-Jul-13	Summer	1	12:55:35	12:56:54	M	1083	1122	40	4	Mammal	Caribou	1	-	1	-	Standing	-
BR_01b	2-Aug-13	Summer	1	4:25:16	4:25:26	M	2028	2037	10	1	Mammal	Caribou	1	-	1	-	Standing	-
BR_01b	5-Aug-13	Summer	2	12:05:31	12:05:41	M	2576	2585	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_01b	13-Aug-13	Summer	2	5:37:37	5:37:48	M	3739	3748	10	1	Mammal	Caribou	1	-	1	-	Standing	-
BR_01b	20-Aug-13	Summer	1	11:24:29	12:19:46	M	4822	4876	50	5	Mammal	Caribou	4	-	4	-	Grazing	-
BR_01b	20-Aug-13	Summer	2	12:47:42	12:48:12	M	4880	4899	10	1	Mammal	Caribou	9	-	9	-	Bedded	-
BR_01b	20-Aug-13	Summer	3	13:02:08	13:02:18	M	4902	4911	10	1	Mammal	Caribou	6	-	6	-	Running	-
BR_01b	20-Aug-13	Summer	4	13:46:54	14:45:48	M	4916	5271	350	35	Mammal	Caribou	2	1	3	-	Standing	-
BR_01b	20-Aug-13	Summer	5	19:34:31	19:34:41	M	5301	5310	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_01b	20-Aug-13	Summer	6	20:29:38	20:50:01	M	5316	5338	20	2	Mammal	Caribou	2	-	2	-	Standing	-
BR_01b	20-Aug-13	Summer	7	22:53:03	22:53:45	M	5361	5380	20	2	Mammal	Caribou	1	-	1	-	Standing	-
BR_02a	12-Mar-2013	Winter		14:00:00	18:30:00	T	9791	9800	10		Mammal	Caribou	6		6		Grazing	
BR_03a																		no caribou observed
BR_04a	21-Feb-2013	Winter		8:30:00		T	8788		1		Mammal	Caribou	1	0	1		Walking	
BR_04a	21-Feb-2013	Winter		10:30:00		T	8792		1		Mammal	Caribou	1	0	1		Running	
BR_04b	20-Aug-13	Summer	1	8:03:49	8:03:59	M	4550	4559	10	1	Mammal	Caribou	5	-	5	-	Grazing	-
BR_04b	20-Aug-13	Summer	2	10:30:26	10:30:37	M	4575	4584	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_04b	20-Aug-13	Summer	3	12:13:42	12:13:52	M	4595	4604	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_04b	20-Aug-13	Summer	4	12:52:48	14:15:29	M	4609	4936	330	33	Mammal	Caribou	3	2	5	-	Grazing	-
BR_04b	20-Aug-13	Summer	5	14:57:32	15:47:57	M	4941	5035	67	7	Mammal	Caribou	2	-	2	-	Walking	
BR_05a																		no caribou observed
BR_05b	17-Jun-13	Post-calving	-	6:00:00	-	T	1831	-	1	-	Mammal	Caribou	1	-	1	-	-	-
BR_05b	20-Aug-13	Summer	1	16:28:57	16:29:07	M	4662	4671	6	1	Mammal	Caribou	1	-	1	-	Walking	
BR_05b	20-Aug-13	Summer	1	16:28:58	16:29:02	M	4663	4666	6	1	Mammal	Caribou	1	-	1	-	Walking	
BR_06a	22-Jan-2013	Winter	1	13:58:11	13:58:18	M	7742	7751	10	1	Mammal	Caribou	1	0	1		Standing	
BR_06a	22-Jan-2013	Winter	2	14:00:06	14:00:12	M	7753	7762	10	1	Mammal	Caribou	1	0	1		Walking	
BR_06a	24-Jan-2013	Winter	1	16:54:47	17:01:21	M	7864	7974	111	11	Mammal	Caribou	1	0	1		Standing	Could be more than one caribou.
BR_06a	27-Jan-2013	Winter	2	14:34:02	14:48:51	M	8124	8193	70	7	Mammal	Caribou	2	0	2		Grazing	
BR_06a	30-Jan-2013	Winter	1	18:28:45	18:29:53	M	8345	8384	40	4	Mammal	Caribou	3	0	3		Walking	
BR_06a	10-Feb-2013	Winter	1	10:35:47	10:39:11	M	8908	8927	20	2	Mammal	Caribou	2	0	2		Walking	
BR_06b																		no caribou observed
BR_07a																		no caribou observed
BR_07b																		no caribou observed
BR_08a	28-Jan-2013	Winter		16:00:00		T	7504		1		Mammal	Caribou	4	0	4		Walking	
BR_08b	15-Aug-13	Summer	1	2:16:25	2:16:35	M	3559	3568	10	1	Mammal	Caribou	1	-	1	-	Grazing	nice bull
BR_09a																		no caribou observed
BR_09b																		no caribou observed
BR_10a																		no caribou observed
BR_10b																		no caribou observed
BR_11a	27-Dec-2012	Winter	1	12:56:59	12:57:14	M	6444	6463	20	2	Mammal	Caribou	1	0	1		Other	At camera
BR_11a	28-Dec-2012	Winter	1	5:29:29	5:30:37	M	6497	6517	21	2	Mammal	Caribou	1	0	1		Other	
BR_11a	28-Dec-2012	Winter	2	14:29:09	14:56:23	M	6535	6695	161	16	Mammal	Caribou	1	0	1		Other	
BR_11a	28-Dec-2012	Winter	3	15:48:06	15:48:12	M	6698	6707	10	1	Mammal	Caribou	1	0	1		Other	

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_11a	28-Dec-2012	Winter	4	16:17:54	16:30:00	M	6709	6809	101	10	Mammal	Caribou	1	0	1		Other	Last photo is timed.
BR_11a	4-Feb-2013	Winter	1	13:12:58	13:26:57	M	9257	9316	60	6	Mammal	Caribou	1	0	1		Other	
BR_11a	4-Feb-2013	Winter	2	13:42:01	13:52:31	M	9318	9427	110	11	Mammal	Caribou	2	0	2		Other	At camera and grazing
BR_11b	1-Aug-13	Summer	1	11:17:53	11:18:04	M	1160	1169	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_11b	6-Aug-13	Summer	1	12:56:40	12:56:50	M	1930	1939	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_11b	7-Aug-13	Summer	1	9:43:28	9:43:37	M	2065	2074	10	1	Mammal	Caribou	-	1	1	-	Running	-
BR_11b	8-Aug-13	Summer	1	6:53:12	6:54:02	M	2202	2231	30	3	Mammal	Caribou	6	2	8	-	Walking	-
BR_11b	9-Aug-13	Summer	1	9:25:31	9:25:41	M	2391	2400	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_11b	10-Aug-13	Summer	1	3:32:29	3:33:54	M	2520	2559	30	1	Mammal	Caribou	2	1	3	-	Walking	-
BR_11b	10-Aug-13	Summer	2	7:23:06	7:24:34	M	2583	2622	40	4	Mammal	Caribou	8	3	11	-	Walking	-
BR_11b	10-Aug-13	Summer	3	10:24:42	10:24:51	M	2641	2650	10	1	Mammal	Caribou	1	-	1	-	Walking	Nice rack on bull
BR_11b	11-Aug-13	Summer	1	4:44:25	4:45:16	M	2761	2790	30	3	Mammal	Caribou	1	-	1	-	Grazing	-
BR_11b	12-Aug-13	Summer	1	8:23:44	8:23:55	M	2957	2966	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_11b	12-Aug-13	Summer	2	22:01:10	22:01:19	M	3049	3058	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_11b	12-Aug-13	Summer	3	22:30:21	22:34:32	M	3062	3121	60	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_11b	13-Aug-13	Summer	1	1:26:49	1:28:01	M	3139	3168	30	3	Mammal	Caribou	2	-	2	-	Grazing	-
BR_11b	13-Aug-13	Summer	2	3:34:39	3:36:41	M	3182	3211	30	3	Mammal	Caribou	1	-	1	-	Grazing	-
BR_11b	13-Aug-13	Summer	3	5:01:38	5:14:18	M	3221	3261	40	4	Mammal	Caribou	2	-	2	-	Grazing	-
BR_11b	14-Aug-13	Summer	1	9:16:52	9:17:02	M	3430	3439	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_11b	16-Aug-13	Summer	1	17:13:37	17:13:46	M	3776	3785	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_11b	20-Aug-13	Summer	1	14:01:56	14:02:06	M	4343	4352	10	1	Mammal	Caribou	1	-	1	-	Walking	Huge bull
BR_12a																		no caribou observed
BR_12b																		no caribou observed
BR_13a	30-Jun-13	Post-calving	1	11:15:03	11:15:17	M	1461	1480	20	2	Mammal	Caribou	1	-	1	-	Walking	-
BR_13a	6-Jul-13	Post-calving	2	23:37:04	23:37:11	M	2324	2333	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_13a	19-Jul-13	Post-calving	1	15:09:04	15:09:11	M	3191	3200	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_13a	20-Jul-13	Post-calving	1	2:41:17	2:41:26	M	3234	3243	10	1	Mammal	Caribou	2	-	2	cow and yearling	Running	Cow and yearling
BR_13a	23-Jul-13	Post-calving	1	21:14:00	21:14:16	M	3435	3454	20	2	Mammal	Caribou	1	-	1	-	Walking	-
BR_13a	25-Jul-13	Post-calving	1	10:20:08	14:33:35	M	130	152	20	1	Mammal	Caribou	1	-	1	-	Running	-
BR_13a	10-Aug-13	Summer	1	10:19:46	19:47:14	M	3193	4019	826	82	Mammal	Caribou	110	1	111	-	Walking	
BR_13a	11-Aug-13	Summer	1	8:42:53	8:54:56	M	4098	4118	20	2	Mammal	Caribou	3	-	3	-	Walking	-
BR_14a																		no caribou observed
BR_14b																		no caribou observed
BR_14c																		no caribou observed
BR_15a																		no caribou observed
BR_15b	10-Aug-13	Summer	1	10:07:45	10:07:55	M	3155	3164	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_16a																		no caribou observed
BR_16b	9-Aug-13	Summer	1	6:45:02	6:45:12	M	2561	2570	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_17a	27-Dec-2012	Winter		13:00:00		T	6149		1		Mammal	Caribou	1	0	1		Standing	
BR_17a	28-Dec-2012	Winter	1	21:49:17	22:04:48	M	6215	6395	181	18	Mammal	Caribou	2	0	2		Other	At camera
BR_17a	29-Dec-2012	Winter	1	9:53:20	9:53:26	M	6429	6438	10	1	Mammal	Caribou	1	0	1		Walking	
BR_17b	16-Jul-13	Post-calving	1	17:27:32	17:27:40	M	3271	3280	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_17b	19-Jul-13	Post-calving	1	22:26:10	22:26:17	M	3435	3444	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_17b	24-Jul-13	Post-calving	1	18:14:25	18:14:34	M	313	322	10	1	Mammal	Caribou	10	-	10	-	Grazing	-
BR_17b	24-Jul-13	Post-calving	2	18:57:13	18:57:23	M	327	336	10	1	Mammal	Caribou	2	2	4	-	Grazing	-
BR_17b	28-Jul-13	Summer	1	22:25:58	22:26:07	M	934	943	10	1	Mammal	Caribou	2	-	2	-	Grazing	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_17b	29-Jul-13	Summer	1	3:46:25	3:46:34	M	976	985	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_17b	29-Jul-13	Summer	2	3:54:06	3:54:16	M	987	996	10	1	Mammal	Caribou	21	-	21	-	Walking	
BR_17b	29-Jul-13	Summer	4	6:12:56	6:13:06	M	1101	1110	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_17b	29-Jul-13	Summer	5	11:19:04	11:19:14	M	1141	1150	10	1	Mammal	Caribou	5	-	5	-	Grazing	
BR_17b	29-Jul-13	Summer	6	11:25:20	11:25:29	M	1152	1161	10	1	Mammal	Caribou	3	-	3	-	Grazing	assume 3 new.
BR_17b	29-Jul-13	Summer	7	11:30:41	11:30:50	M	1163	1172	10	1	Mammal	Caribou	2	-	2	-	Grazing	2 new; 4 from previous
BR_17b	29-Jul-13	Summer	8	11:31:23	11:31:57	M	1173	1192	20	2	Mammal	Caribou	1	1	2	-	Grazing	cow/calf new; 4 from previous.
BR_17b	29-Jul-13	Summer	9	11:43:46	11:46:04	M	1194	1223	30	3	Mammal	Caribou	5	-	5	-	Grazing	
BR_17b	29-Jul-13	Summer	10	13:13:29	13:13:40	M	1233	1242	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_17b	29-Jul-13	Summer	11	23:00:45	23:01:55	M	1303	1341	40	4	Mammal	Caribou	94	5	99	-	Grazing	
BR_17b	30-Jul-13	Summer	1	12:20:43	12:20:53	M	1422	1431	10	1	Mammal	Caribou	5	-	5	-	Grazing	-
BR_17b	3-Aug-13	Summer	1	21:42:00	21:42:09	M	2064	2073	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_17b	4-Aug-13	Summer	1	17:25:55	17:26:23	M	2192	2211	20	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_17b	4-Aug-13	Summer	2	21:01:09	21:01:18	M	2234	2243	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_17b	6-Aug-13	Summer	1	13:31:09	13:31:18	M	2487	2496	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_17b	6-Aug-13	Summer	2	15:56:56	15:57:07	M	2511	2520	20	2	Mammal	Caribou	1	-	1	-	Walking	-
BR_17b	6-Aug-13	Summer	3	16:15:45	16:15:55	M	2523	2532	10	1	Mammal	Caribou	-	1	1	-	Walking	-
BR_17b	6-Aug-13	Summer	4	21:07:19	21:11:59	M	2562	2592	30	3	Mammal	Caribou	2	1	3	-	Walking	-
BR_17b	24-Aug-13	Summer	1	22:33:08	22:34:01	M	5193	5222	30	3	Mammal	Caribou	1	-	1	-	Walking	-
BR_17b	25-Aug-13	Summer	1	8:56:50	8:56:59	M	5285	5294	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_17b	25-Aug-13	Summer	2	15:37:07	15:53:24	M	5335	5386	50	5	Mammal	Caribou	1	-	1	-	Grazing	-
BR_18a	23-Sep-2012	Fall	1	12:19:59	12:20:07	M	1502	1511	10	1	Mammal	Caribou	1	0	1		Walking	
BR_18a	22-Dec-2012	Winter	1	1:10:17	1:10:33	M	5840	5859	20	2	Mammal	Caribou	4	0	4		Walking	
BR_18a	18-Jan-2013	Winter	1	7:19:54	7:20:39	M	7168	7207	40	4	Mammal	Caribou	1	0	1		Other	
BR_18a	23-Jan-2013	Winter	1	15:44:17	15:51:35	M	7465	7514	50	5	Mammal	Caribou	3	0	3		Grazing	
BR_18a	23-Jan-2013	Winter	2	16:06:55	16:07:10	M	7516	7535	20	2	Mammal	Caribou	1	0	1		Other	
BR_18a	25-Jan-2013	Winter		13:30:00		T	7626		1		Mammal	Caribou	4	0	4		Grazing	
BR_18a	25-Jan-2013	Winter	1	13:54:02	13:56:35	M	7627	7666	40	4	Mammal	Caribou	1	0	1		Other	
BR_18a	25-Jan-2013	Winter	2	14:19:19	14:19:25	M	7668	7677	10	1	Mammal	Caribou	1	0	1		Other	
BR_18a	24-Jul-13	Post-calving	1	3:41:27	3:41:37	M	212	221	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_18a	27-Jul-13	Summer	1	23:04:54	23:05:23	M	770	789	20	2	Mammal	Caribou	1	1	2	-	Grazing	-
BR_18a	27-Jul-13	Summer	2	23:06:02	23:06:11	M	790	799	10	1	Mammal	Caribou	17	-	17	-	Grazing	-
BR_18a	28-Jul-13	Summer	1	2:30:51	2:34:06	M	821	860	40	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_18a	29-Jul-13	Summer	1	5:41:57	5:42:06	M	1024	1033	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_18a	7-Aug-13	Summer	1	1:20:31	1:20:40	M	2304	2313	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_18a	8-Aug-13	Summer	1	5:49:21	5:50:25	M	2504	2524	20	1	Mammal	Caribou	4	1	5	-	Walking	-
BR_18a	8-Aug-13	Summer	2	22:13:21	22:13:32	M	2623	2632	10	1	Mammal	Caribou	7	-	7	-	Grazing	-
BR_18a	9-Aug-13	Summer	1	7:09:09	7:09:19	M	2686	2695	10	1	Mammal	Caribou	4	-	4	-	Walking	-
BR_19a	27-Aug-2012	Summer	1	7:28:43	7:28:50	M	70	79	10	1	Mammal	Caribou	1	1	2		Running	
BR_19a	13-Dec-2012	Winter	1	5:18:07	5:45:39	M	5590	5870	281	28	Mammal	Caribou	3	0	3	2 bulls are fighting	Other	
BR_19a	14-Dec-2012	Winter	1	4:58:54	4:59:03	M	5917	5926	10	1		Caribou	1	0	1		Other	
BR_19a	14-Dec-2012	Winter	2	16:13:01	16:30:00	M	5950	6140	191	19	Mammal	Caribou	5	0	5		Grazing	May be more
BR_19a	15-Dec-2012	Winter	1	14:14:50	14:20:59	M	6184	6283	100	10	Mammal	Caribou	2	0	2		Other	One playing with camera, another running
BR_19a	15-Dec-2012	Winter	2	15:00:00	15:00:47	M	6285	6305	21	2	Mammal	Caribou	1	0	1		Walking	
BR_19a	24-Dec-2012	Winter	1	14:09:02	14:11:12	M	6736	6755	20	2	Mammal	Caribou	2	0	2		Standing	
BR_19a	30-Dec-2012	Winter	1	1:45:52	1:46:00	M	7019	7028	10	1	Mammal	Caribou	1	0	1		Standing	

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_19a	31-Dec-2012	Winter	1	12:46	12:47:25	M	7099	7118	20	2	Mammal	Caribou	2	0	2		Walking	
BR_19b	13-Jul-13	Post-calving	-	23:00:00	-	T	3046	-	1	-	Mammal	Caribou	1	-	1	-	Standing	
BR_19b	15-Jul-13	Post-calving	-	10:00:00	-	T	3116	-	1	-	Mammal	Caribou	1	-	1	-	Standing	
BR_19b	2-Aug-13	Summer	1	12:38:05	12:38:14	M	1597	1606	10	1	Mammal	Caribou	8	2	10	-	Walking	-
BR_19b	6-Aug-13	Summer	1	17:30:59	17:31:09	M	2213	2222	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_20a	1-Apr-2013	Winter	1	20:37:52	20:38:00	M	560	569	10	1	Mammal	Caribou	1	0	1		Running	
BR_20b																		no caribou observed
BR_21a	8-Oct-2012	Fall	1	13:30:00	13:33:41	M	2233	2263	31	3	Mammal	Caribou	1	0	1		Walking	
BR_21a	15-Dec-2012	Winter	1	11:31:44	11:31:52	M	5524	5533	10	1	Mammal	Caribou	1	0	1		Walking	
BR_21a	16-Dec-2012	Winter	1	0:50:48	1:47:25	M	5560	5731	172	17	Mammal	Caribou	3	0	3		Other	Grazing and playing with camera. May be more than three. Camera fogged over then cleared.
BR_21a	16-Dec-2012	Winter	2	12:42:09	12:42:34	M	5764	5793	30	3	Mammal	Caribou	1	0	1		Walking	
BR_21a	25-Dec-2012	Winter	1	23:30:52	23:31:36	M	6258	6277	20	2	Mammal	Caribou	1	0	1		Walking	
BR_21a	26-Dec-2012	Winter	1	3:02:42	3:13:30	M	6295	6384	90	9	Mammal	Caribou	6	3	9		Other	Walking and standing at camera, then group runs by. Looks like three of them are juvenile.
BR_21a	26-Dec-2012	Winter	2	16:31:32	16:33:05	M	6412	6461	50	5	Mammal	Caribou	3	0	3		Walking	
BR_21a	18-Jan-2013	Winter	1	7:41:33	7:42:06	M	7578	7617	40	4	Mammal	Caribou	1	0	1		Walking	
BR_21a	18-Jan-2013	Winter		10:00:00		T	7622		1		Mammal	Caribou	1	0	1		Grazing	
BR_21a	18-Jan-2013	Winter		10:30:00		T	7623		1		Mammal	Caribou	1	0	1		Grazing	
BR_21a	18-Jan-2013	Winter	2	12:06:32	12:13:23	M	7627	7796	170	17	Mammal	Caribou	18	0	18		Grazing	
BR_21a	18-Jan-2013	Winter	3	17:25:35	17:28:40	M	7807	7889	83	9	Mammal	Caribou	2	0	2		Standing	
BR_21b	24-May-13	Spring	-	19:30:00	-	T	764	-	1	-	Mammal	Caribou	44	-	44	-	Grazing	
BR_22a	25-Aug-2012	Summer	1	18:25:25	18:25:53	M	229	258	30	3	Mammal	Caribou	1	0	1		Standing	
BR_22a	28-Aug-2012	Summer	1	20:45:43	21:00:00	M	408	418	11	1	Mammal	Caribou	5	0	5		Walking	
BR_22a	29-Aug-2012	Summer	1	1:30:27	1:30:42	M	428	447	20	2	Mammal	Caribou		1	1		Walking	
BR_22b	20-May-13	Spring	1	13:05:54	13:06:00	M	539	548	10	1	Mammal	Caribou	11	-	11	-	Running	-
BR_22b	29-Jul-13	Summer	1	11:38:03	11:38:12	M	1014	1023	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_22b	29-Jul-13	Summer	2	18:28:52	18:29:02	M	1065	1074	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_22b	29-Jul-13	Summer	3	11:12:38	11:13:09	M	1104	1123	20	2	Mammal	Caribou	1	1	2	-	Running	-
BR_22b	30-Jul-13	Summer	1	3:41:21	3:53:17	M	1151	1221	70	7	Mammal	Caribou	7	-	7	-	Grazing	
BR_22b	30-Jul-13	Summer	2	8:17:24	8:21:00	M	1248	1278	30	3	Mammal	Caribou	14	2	16	-	Walking	-
BR_22b	30-Jul-13	Summer	3	22:17:12	22:17:22	M	1362	1371	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_22b	31-Jul-13	Summer	1	12:28:35	12:29:16	M	1457	1466	10	1	Mammal	Caribou	5	-	5	-	Grazing	-
BR_22b	31-Jul-13	Summer	2	12:29:16	12:29:59	M	1467	1486	20	1	Mammal	Caribou	9	3	12	-	Grazing	
BR_22b	31-Jul-13	Summer	3	21:55:29	21:55:39	M	1544	1553	10	1	Mammal	Caribou	2	2	4	-	Grazing	-
BR_22b	31-Jul-13	Summer	4	22:37:26	22:37:36	M	1558	1567	10	1	Mammal	Caribou	4	3	7	-	Grazing	-
BR_22b	1-Aug-13	Summer	1	4:32:44	4:36:26	M	1604	1653	50	5	Mammal	Caribou	10	-	10	-	Grazing	-
BR_22b	1-Aug-13	Summer	2	11:16:50	11:20:05	M	1694	1734	40	4	Mammal	Caribou	4	1	5	-	Grazing	-
BR_22b	1-Aug-13	Summer	3	17:01:58	17:02:27	M	1769	1788	20	2	Mammal	Caribou	3	-	3	-	Walking	-
BR_22b	2-Aug-13	Summer	1	17:40:42	17:40:51	M	1937	1946	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_22b	2-Aug-13	Summer	2	23:26:14	23:26:24	M	1981	1990	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_22b	3-Aug-13	Summer	1	20:20:21	20:50:08	M	2117	2149	30	3	Mammal	Caribou	1	-	1	-	Grazing	-
BR_22b	4-Aug-13	Summer	1	16:56:53	16:57:03	M	2270	2279	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_22b	4-Aug-13	Summer	2	19:14:25	19:14:35	M	2294	2303	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_22b	5-Aug-13	Summer	2	8:48:49	8:48:59	M	2395	2404	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_22b	5-Aug-13	Summer	3	14:44:43	14:44:53	M	2441	2450	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_22b	5-Aug-13	Summer	4	20:22:41	20:22:52	M	2485	2494	10	1	Mammal	Caribou	1	-	1	-	Running	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_22b	6-Aug-13	Summer	1	0:08:53	0:11:15	M	2517	2567	50	5	Mammal	Caribou	6	-	6	-	Grazing	-
BR_22b	6-Aug-13	Summer	2	7:29:27	7:29:38	M	2611	2620	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_22b	6-Aug-13	Summer	3	17:44:39	17:44:47	M	2683	2692	10	1	Mammal	Caribou	-	1	1	-	Walking	-
BR_22b	6-Aug-13	Summer	4	19:39:51	19:40:00	M	2704	2713	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_22b	8-Aug-13	Summer	1	15:59:26	16:00:05	M	2980	3000	20	2	Mammal	Caribou	1	-	1	-	Grazing	-
BR_22b	9-Aug-13	Summer	1	3:30:47	3:30:56	M	3070	3079	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_23a	21-Dec-2012	Winter	1	3:07:39	3:23:26	M	5842	5931	90	9	Mammal	Caribou	4	0	4		Grazing	
BR_23a	22-Jan-2013	Winter	1	12:36:36	12:38:23	T	7487	7526	40	4	Mammal	Caribou	4	0	4		Walking	Two near the camera, two in the distance.
BR_23a	24-Feb-2013	Winter	1	22:33:56	22:34:08	M	9131	9140	10	1	Mammal	Caribou	3	0	3		Running	
BR_23a	25-Feb-2013	Winter	1	3:16:36	3:23:34	M	9150	9199	50	5	Mammal	Caribou	1	0	1		Walking	
BR_23a	25-Feb-2013	Winter	2	4:09:52	4:09:58	M	9212	9221	10	1	Mammal	Caribou	1	0	1		Walking	
BR_23a	25-Feb-2013	Winter		9:00:00		T	9231		1		Mammal	Caribou	7	0	7		Grazing	
BR_23a	25-Feb-2013	Winter		14:30:00		T	9242		1		Mammal	Caribou	2	0	2		Grazing	
BR_23b	2-Aug-13	Summer	1	12:19:05	12:19:15	M	1329	1338	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	2-Aug-13	Summer	2	12:53:46	12:53:55	M	1343	1352	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_23b	2-Aug-13	Summer	3	22:05:08	22:05:18	M	1552	1561	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_23b	7-Aug-13	Summer	1	6:36:35	6:36:45	M	2045	2054	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	7-Aug-13	Summer	2	7:56:15	7:56:24	M	2063	2072	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	7-Aug-13	Summer	3	19:00:27	19:40:38	M	2140	2203	60	6	Mammal	Caribou	2	-	2	-	Grazing	-
BR_23b	7-Aug-13	Summer	4	20:23:07	8:23:17	M	2208	2217	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_23b	7-Aug-13	Summer	5	21:15:21	21:26:07	M	2223	2243	20	2	Mammal	Caribou	45	-	45	-	Walking	-
BR_23b	8-Aug-13	Summer	1	19:29:56	19:30:06	M	2376	2386	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	8-Aug-13	Summer	2	20:36:00	20:36:09	M	2393	2402	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	9-Aug-13	Summer	1	18:34:18	18:34:28	M	2535	2544	10	1	Mammal	Caribou	1	-	1	-	Walking	big bull
BR_23b	12-Aug-13	Summer	1	8:32:22	9:15:50	M	2917	2950	30	1	Mammal	Caribou	3	1	4	-	Walking	-
BR_23b	16-Aug-13	Summer	1	14:49:29	14:49:39	M	3560	3569	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_23b	16-Aug-13	Summer	2	19:12:21	19:12:30	M	3597	3606	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR-24a																		no caribou observed
BR_24b	11-Aug-13	Summer	1	20:44:12	20:44:22	M	2663	2672	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_25a																		no caribou observed
BR_25b	4-Aug-13	Summer	1	20:55:09	20:55:18	M	1925	1934	10	1	Mammal	Caribou	1	-	1	-	Walking	big bull
BR_26a																		no caribou observed
BR_26b	21-Jul-13	Post-calving	1	18:51:18	18:51:41	M	3482	3511	30	3	Mammal	Caribou	2	-	2	-	Walking	2 bulls
BR_26b	1-Aug-13	Summer	1	3:53:11	3:53:20	M	1367	1376	10	1	Mammal	Caribou	1	-	1	-	Standing	-
BR_26b	5-Aug-13	Summer	1	14:08:47	14:08:58	M	2014	2023	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_26b	5-Aug-13	Summer	2	15:58:24	15:58:34	M	2035	2044	10	1	Mammal	Caribou	1	3	4	-	Grazing	-
BR_26b	6-Aug-13	Summer	2	19:11:45	19:11:55	M	2329	2338	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_26b	25-Aug-13	Summer	1	12:38:06	12:38:36	M	5035	5054	20	1	Mammal	Caribou	4	-	4	-	Walking	-
BR_27a																		no caribou observed
BR_27b																		no caribou observed
BR_28a	1-Aug-13	Summer	1	19:30:26	19:30:36	M	1174	1183	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_28a	2-Aug-13	Summer	1	7:07:14	7:07:24	M	1253	1262	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_28a	2-Aug-13	Summer	2	19:20:07	19:20:17	M	1337	1346	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_28a	4-Aug-13	Summer	1	23:54:29	23:54:58	M	1682	1701	20	2	Mammal	Caribou	1	-	1	-	Walking	-
BR_28a	4-Aug-13	Summer	2	23:55:41	23:56:09	M	1702	1721	20	2	Mammal	Caribou	4	3	7	-	Grazing	-
BR_28a	5-Aug-13	Summer	1	10:02:25	10:02:34	M	1783	1792	10	1	Mammal	Caribou	1	1	2	-	Grazing	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_28a	6-Aug-13	Summer	1	9:30:59	9:31:09	M	2006	2015	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_29a	2-Aug-13	Summer	1	12:34:05	12:34:15	M	1573	1582	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_30a	16-Feb-2013	Winter	1	15:28:50	15:30:00	M	8950	8960	11	1	Mammal	Caribou	1	0	1		Grazing	
BR_30a	20-Feb-2013	Winter		10:00:00	12:00:00	T	9141	9145	5		Mammal	Caribou	12	Unknown	12		Grazing	
BR_30a	22-Feb-2013	Winter		10:00:00		T	9237		1		Mammal	Caribou	1	0	1		Walking	
BR_30a	22-Feb-2013	Winter	1	10:18:59	10:26:27	M	9238	9367	130	13	Mammal	Caribou	2	0	2		Standing	
BR_30a	22-Feb-2013	Winter	2	11:19:39	11:19:44	M	9370	9379	10	1	Mammal	Caribou	12	0	12		Grazing	Two near camera, 10 in the distance.
BR_30a	22-Feb-2013	Winter		12:30:00	14:00:00	T	9412	9415	4		Mammal	Caribou	15	0	15		Grazing	
BR_30a	2-Mar-2013	Winter		18:00:00		T	9807		1		Mammal	Caribou	8	0	8		Grazing	
BR_30a	24-Aug-13	Summer	1	18:18:32	18:20:56	M	5862	5901	40	4	Mammal	Caribou	4	-	4	-	Walking	-
BR_31a																		no caribou observed
BR_32a																		no caribou observed
BR_33a	1-Aug-13	Summer	1	19:16:29	19:16:38	M	1546	1555	10	1	Mammal	Caribou	1	-	1	-	Walking	big bull
BR_33a	3-Aug-13	Summer	1	18:41:28	18:41:37	M	1921	1930	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_33a	5-Aug-13	Summer	1	8:54:16	8:54:25	M	2200	2209	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_33a	8-Aug-13	Summer	1	5:41:16	5:42:05	M	2693	2712	20	2	Mammal	Caribou	1	-	1	-	Walking	-
BR_33a	9-Aug-13	Summer	1	21:14:20	21:14:29	M	2980	2989	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_33a	15-Aug-13	Summer	1	7:17:49	7:17:58	M	3870	3879	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_34a																		no caribou observed
BR_35a																		no caribou observed
BR_36a	1-Aug-13	Summer	1	11:13:39	11:13:48	M	1812	1821	10	1	Mammal	Caribou	14	5	19	-	Walking	-
BR_36a	15-Aug-13	Summer	1	5:30:01	5:30:10	M	4224	4233	10	1	Mammal	Caribou	6	-	6	-	Walking	-
BR_37a	2-Jul-13	Post-calving	1	21:57:24	21:59:04	M	1901	1940	40	4	Mammal	Caribou	1	-	1	-	Standing	-
BR_38a	23-Jul-13	Post-calving	1	20:06:19	20:06:28	M	293	302	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_38a	1-Aug-13	Summer	1	0:31:59	0:32:47	M	1532	1551	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_39a																		no caribou observed
BR_40a	31-Jul-13	Summer	1	21:43:11	21:43:20	M	1344	1553	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_40a	1-Aug-13	Summer	1	20:29:56	20:30:06	M	1510	1520	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_41a	20-Jul-13	Post-calving	1	2:03:36	2:03:45	M	4150	4159	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_41a	20-Jul-13	Post-calving	2	4:57:45	4:57:55	M	4177	4186	10	1	Mammal	Caribou	1	-	1	-	Walking	Cow caribou walking
BR_41a	28-Jul-13	Summer	1	8:00:01	8:00:10	M	1123	1132	10	1	Mammal	Caribou	13	1	14	-	Grazing	
BR_41a	28-Jul-13	Summer	2	11:53:10	11:54:18	M	1350	1379	30	3	Mammal	Caribou	200	18	218	HERD of Caribou	Walking	
BR_41a	31-Jul-13	Summer	1	4:59:13	5:01:06	M	1726	1766	40	4	Mammal	Caribou	13	3	16	HERD of Caribou	Grazing	
BR_41a	3-Aug-13	Summer	1	22:00:01	22:00:10	M	2391	2400	10	1	Mammal	Caribou	1	1	2	-	Walking	
BR_41a	4-Aug-13	Summer	1	17:30:02	17:30:11	M	2548	2557	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_41a	4-Aug-13	Summer	2	18:11:50	18:11:59	M	2562	2571	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_41a	4-Aug-13	Summer	3	19:09:52	19:10:01	M	2577	2587	11	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_41a	4-Aug-13	Summer	4	22:11:45	22:11:54	M	2606	2615	10	1	Mammal	Caribou	2	1	3	-	Grazing	-
BR_41a	6-Aug-13	Summer	1	22:24:47	22:24:57	M	3015	3024	10	1	Mammal	Caribou	2	1	3	-	Grazing	-
BR_41a	6-Aug-13	Summer	2	22:56:03	22:56:12	M	3028	3037	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_41a	7-Aug-13	Summer	1	6:00:50	6:05:18	M	3081	3170	90	9	Mammal	Caribou	26	6	32	HERD of Caribou	Grazing	
BR_42a	28-May-13	Spring	1	9:40:01	9:40:10	M	3488	3497	10	1	Mammal	Caribou	1	-	1	-	Walking	Two were previously counted.
BR_42a	18-Jul-13	Post-calving	-	19:58:46	19:59:25	M	5524	5543	20	2	Mammal	Caribou	1	-	1	-	Walking	Nice bull caribou
BR_42a	25-Jul-13	Post-calving	1	17:42:00	17:42:09	M	594	603	10	1	Mammal	Caribou	1	1	2	-	Bedded	-
BR_42a	25-Jul-13	Post-calving	4	18:40:38	18:40:47	M	630	639	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_42a	25-Jul-13	Post-calving	5	20:16:40	20:16:49	M	649	658	10	1	Mammal	Caribou	1	1	2	-	Walking	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_42a	27-Jul-13	Summer	1	12:08:45	12:08:54	M	998	1007	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_42a	30-Jul-13	Summer	1	7:20:42	7:20:51	M	1632	1641	10	1	Mammal	Caribou	3	-	3	-	Walking	-
BR_42a	30-Jul-13	Summer	2	10:40:01	10:40:10	M	1662	1671	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_42a	1-Aug-13	Summer	1	10:17:35	10:17:44	M	2117	2126	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_42a	1-Aug-13	Summer	2	14:35:00	14:35:09	M	2183	2192	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_42a	4-Aug-13	Summer	1	20:55:14	20:55:23	M	2833	2842	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_42a	6-Aug-13	Summer	1	11:00:01	11:00:10	M	3152	3161	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_42a	6-Aug-13	Summer	2	23:16:10	23:16:19	M	3255	3264	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_42a	6-Aug-13	Summer	3	23:18:48	23:18:57	M	3265	3274	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_42a	8-Aug-13	Summer	1	6:58:02	6:59:44	M	3485	3524	40	4	Mammal	Caribou	45	-	45	HERD of Caribou	Grazing	Small herd
BR_43a	25-Jul-13	Post-calving	1	22:03:43	22:03:52	M	699	708	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	27-Jul-13	Summer	1	22:42:24	22:42:33	M	1251	1260	10	1	Mammal	Caribou	7	-	7	-	Grazing	-
BR_43a	28-Jul-13	Summer	1	5:38:28	5:38:37	M	1302	1311	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	28-Jul-13	Summer	2	9:41:29	9:41:39	M	1407	1416	10	1	Mammal	Caribou	6	2	8	-	Walking	-
BR_43a	28-Jul-13	Summer	3	12:03:42	12:03:51	M	1491	1500	10	1	Mammal	Caribou	6	-	6	All big bulls	Walking	-
BR_43a	28-Jul-13	Summer	4	12:04:31	12:04:40	M	1501	1510	10	1	Mammal	Caribou	3	-	3	-	Walking	-
BR_43a	28-Jul-13	Summer	5	12:05:20	12:05:29	M	1511	1520	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	28-Jul-13	Summer	6	12:13:42	12:20:10	M	1522	1562	40	4	Mammal	Caribou	12	4	16	-	Walking	-
BR_43a	28-Jul-13	Summer	7	12:49:25	12:49:34	M	1585	1594	10	1	Mammal	Caribou	6	5	11	-	Walking	-
BR_43a	28-Jul-13	Summer	8	13:44:00	13:44:09	M	1601	1610	10	1	Mammal	Caribou	25	9	34	-	Walking	-
BR_43a	28-Jul-13	Summer	9	13:44:37	13:44:45	M	1612	1620	10	1	Mammal	Caribou	15	6	21	-	Walking	
BR_43a	28-Jul-13	Summer	10	13:45:05	13:45:14	M	1621	1630	10	1	Mammal	Caribou	13	3	16	-	Walking	
BR_43a	28-Jul-13	Summer	11	13:45:49	13:45:58	M	1631	1640	10	1	Mammal	Caribou	4	-	4	-	Walking	
BR_43a	28-Jul-13	Summer	12	14:07:26	14:07:35	M	1643	1652	10	1	Mammal	Caribou	19	5	24	-	Walking	-
BR_43a	28-Jul-13	Summer	13	14:07:55	14:07:55	M	1653	1662	10	1	Mammal	Caribou	18	6	24	-	Walking	-
BR_43a	28-Jul-13	Summer	14	15:19:59	15:20:08	M	1700	1710	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_43a	28-Jul-13	Summer	15	15:51:52	15:52:56	M	1714	1733	20	2	Mammal	Caribou	11	3	14	-	Walking	-
BR_43a	3-Aug-13	Summer	1	22:10:08	22:10:17	M	3646	3655	10	1	Mammal	Caribou	1	1	2	-	Running	-
BR_43a	4-Aug-13	Summer	1	9:22:51	9:23:00	M	3753	3762	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_43a	4-Aug-13	Summer	2	14:10:01	14:10:10	M	3792	3801	10	1	Mammal	Caribou	1	-	1	-	Other	-
BR_43a	4-Aug-13	Summer	3	17:12:43	17:12:52	M	3820	3829	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	5-Aug-13	Summer	1	11:50:25	11:50:34	M	4012	4021	10	1	Mammal	Caribou	1	1	2	-	Running	-
BR_43a	5-Aug-13	Summer	2	20:04:45	20:04:54	M	4101	4110	10	1	Mammal	Caribou	-	1	1	-	Running	-
BR_43a	5-Aug-13	Summer	3	23:58:20	23:59:50	M	4134	4153	20	2	Mammal	Caribou	7	-	7	-	Grazing	-
BR_43a	6-Aug-13	Summer	1	0:00:25	0:09:17	M	4155	4234	80	8	Mammal	Caribou	65	11	76	-	Walking	-
BR_43a	6-Aug-13	Summer	2	14:23:47	14:23:56	M	4351	4360	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_43a	6-Aug-13	Summer	3	16:53:46	16:53:55	M	4376	4385	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_43a	6-Aug-13	Summer	4	19:10:01	19:10:10	M	4400	4409	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_43a	6-Aug-13	Summer	5	20:41:02	20:53:13	M	4429	4469	40	4	Mammal	Caribou	2	-	2	-	Grazing	-
BR_43a	6-Aug-13	Summer	6	21:10:57	21"11:06	M	4472	4481	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_43a	6-Aug-13	Summer	7	21:14:29	21:24:16	M	4482	4582	100	10	Mammal	Caribou	12	3	15	-	Grazing	-
BR_43a	6-Aug-13	Summer	8	22:07:41	22:09:21	M	4587	4606	20	2	Mammal	Caribou	4	1	5	-	Grazing	-
BR_43a	7-Aug-13	Summer	1	5:17:10	5:17:19	M	4650	4659	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_43a	7-Aug-13	Summer	2	7:21:40	7:21:49	M	4673	4682	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	7-Aug-13	Summer	3	16:03:07	16:03:16	M	4765	4774	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	7-Aug-13	Summer	4	22:36:17	22:36:27	M	4824	4833	10	1	Mammal	Caribou	1	-	1	-	Walking	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_43a	9-Aug-13	Summer	1	4:59:53	5:00:03	M	5086	5096	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_43a	10-Aug-13	Summer	1	22:00:34	22:00:43	M	5463	5472	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_43a	11-Aug-13	Summer	1	21:29:29	21:29:39	M	5663	5672	10	1	Mammal	Caribou	1	-	1	-	Running	-
BR_43a	17-Aug-13	Summer	1	15:31:22	15:31:31	M	7242	7251	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_44a	29-Jul-13	Summer	1	6:40:01	6:50:10	M	1441	1461	20	2	Mammal	Caribou	6	-	6	-	Grazing	-
BR_44a	7-Aug-13	Summer	1	5:07:20	5:07:30	M	3277	3286	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_45a	25-May-13	Spring	-	6:30:00	-	T	2448	-	1	-	Mammal	Caribou	3	-	3	-	Walking	-
BR_45a	26-May-13	Spring	-	15:30:00	-	T	2666	-	1	-	Mammal	Caribou	3	-	3	-	Walking	-
BR_45a	28-Jul-13	Summer	1	12:22:45	12:23:23	M	880	899	20	2	Mammal	Caribou	2	-	2	-	Grazing	-
BR_45a	29-Jul-13	Summer	1	13:18:44	13:18:53	M	1069	1078	10	1	Mammal	Caribou	18	-	18	-	Grazing	Small herd
BR_45a	29-Jul-13	Summer	2	13:22:11	13:24:20	M	1080	1119	40	4	Mammal	Caribou	2	2	4	-	Grazing	-
BR_45a	30-Jul-13	Summer	1	23:48:37	23:51:01	M	1356	1406	51	5	Mammal	Caribou	3	2	5	-	Grazing	-
BR_45a	3-Aug-13	Summer	1	9:57:55	9:58:04	M	1939	1948	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_45a	7-Aug-13	Summer	1	22:19:15	22:19:53	M	2649	2668	20	2	Mammal	Caribou	1	1	2	-	Grazing	-
BR_45a	8-Aug-13	Summer	1	21:42:30	21:42:39	M	2830	2839	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_45a	8-Aug-13	Summer	2	23:41:11	23:41:52	M	2852	2871	20	2	Mammal	Caribou	2	-	2	-	Grazing	-
BR_45a	8-Aug-13	Summer	3	23:42:39	23:42:48	M	2872	2881	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_45a	8-Aug-13	Summer	1	0:18:46	0:18:55	M	2885	2894	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	5-Jun-13	Calving	1	4:00:01	4:00:10	M	8287	8296	10	1	Mammal	Caribou	2	-	2	-	Walking	
BR_46a	31-Jul-13	Summer	1	4:50:01	4:50:10	M	4626	4635	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	31-Jul-13	Summer	2	10:23:50	10:23:59	M	4849	4558	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	31-Jul-13	Summer	3	10:32:39	10:32:48	M	4860	4869	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_46a	31-Jul-13	Summer	4	11:30:01	11:30:10	M	4906	4915	10	1	Mammal	Caribou	4	-	4	-	Grazing	-
BR_46a	31-Jul-13	Summer	5	12:40:01	12:40:10	M	4943	4952	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_46a	31-Jul-13	Summer	6	19:40:01	19:40:10	M	5285	5294	10	1	Mammal	Caribou	7	-	7	-	Grazing	Cannot identify calves
BR_46a	31-Jul-13	Summer	7	20:20:01	20:20:10	M	5309	5318	10	1	Mammal	Caribou	1	-	1	-	Grazing	Bull caribou grazing
BR_46a	31-Jul-13	Summer	8	21:50:01	21:50:10	M	5378	5387	10	1	Mammal	Caribou	6	-	6	-	Grazing	-
BR_46a	31-Jul-13	Summer	9	22:00:01	22:00:10	M	5389	5398	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_46a	5-Aug-13	Summer	1	11:50:01	11:50:01	M	7568	7577	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	6-Aug-13	Summer	1	10:30:01	10:30:10	M	8044	8053	10	1	Mammal	Caribou	2	-	2	-	Walking	
BR_46a	6-Aug-13	Summer	2	11:10:01	11:20:10	M	8088	8108	20	2	Mammal	Caribou	1	-	1	-	Grazing	-
BR_46a	6-Aug-13	Summer	3	17:10:57	17:11:06	M	8224	8233	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	6-Aug-13	Summer	4	17:14:00	17:14:09	M	8234	8243	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	7-Aug-13	Summer	1	13:06:03	13:06:12	M	8543	8552	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_46a	8-Aug-13	Summer	1	21:54:01	21:58:19	M	8940	9019	80	8	Mammal	Caribou	46	4	50	-	Grazing	Small herd, hard to count calves.
BR_46a	22-Aug-13	Summer	1	13:00:01	13:00:10	M	3484	3493	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_47a	21-May-13	Spring	1	10:50:01	10:50:10	M	7717	7726	10	1	Mammal	Caribou	4	-	4	-	Walking	-
BR_47a	30-Jul-13	Summer	1	20:45:09	20:45:18	M	2762	2771	10	1	Mammal	Caribou	-	1	1	-	Running	-
BR_47a	31-Jul-13	Summer	1	18:36:33	18:36:42	M	2973	2982	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_47a	1-Aug-13	Summer	1	3:39:52	4:28:53	M	3067	3111	40	4	Mammal	Caribou	1	-	1	-	Grazing	-
BR_47a	1-Aug-13	Summer	2	10:52:44	10:54:38	M	3281	3320	40	4	Mammal	Caribou	8	5	13	-	Walking	-
BR_47a	1-Aug-13	Summer	3	13:32:17	13:32:26	M	3437	3446	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_47a	1-Aug-13	Summer	4	17:17:52	17:18:46	M	3479	3498	20	2	Mammal	Caribou	4	1	5	-	Grazing	-
BR_47a	1-Aug-13	Summer	5	18:23:36	18:23:45	M	3516	3525	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_47a	1-Aug-13	Summer	6	19:13:32	19:14:11	M	3531	3550	20	2	Mammal	Caribou	7	3	10	-	Walking	-
BR_48a	26-May-13	Spring	1	6:50:01	6:50:10	M	4222	4231	10	1	Mammal	Caribou	1	-	1	-	Walking	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_48a	28-Jul-13	Summer	1	7:38:09	7:38:18	M	7865	7874	10	1	Mammal	Caribou	1	-	1	-	Other	-
BR_48a	28-Jul-13	Summer	2	11:32:43	11:32:52	M	8099	8108	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_48a	28-Jul-13	Summer	3	12:02:18	12:02:27	M	8142	8151	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_48a	28-Jul-13	Summer	4	14:23:42	14:24:20	M	8296	8315	20	2	Mammal	Caribou	2	-	2	-	Grazing	-
BR_48a	28-Jul-13	Summer	5	15:20:01	15:20:10	M	8372	8381	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_48a	29-Jul-13	Summer	1	19:30:01	19:40:10	M	52	72	21	2	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	30-Jul-13	Summer	1	9:20:01	10:00:10	M	895	938	43	4	Mammal	Caribou	26	-	26	-	Grazing	-
BR_48a	31-Jul-13	Summer	1	3:30:01	3:30:10	M	1944	1953	10	1	Mammal	Caribou	2	1	3	-	Grazing	-
BR_48a	31-Jul-13	Summer	3	17:40:01	18:00:10	M	2769	2810	41	4	Mammal	Caribou	5	-	5	-	Grazing	-
BR_48a	31-Jul-13	Summer	4	18:40:01	18:50:10	M	2845	2865	20	2	Mammal	Caribou	12	-	12	-	Grazing	-
BR_48a	1-Aug-13	Summer	1	3:00:01	3:50:10	M	3365	3469	105	10	Mammal	Caribou	43	-	43	-	Grazing	grazing, spending lots of time in same area
BR_48a	2-Aug-13	Summer	1	8:50:01	8:50:10	M	5906	5915	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	2-Aug-13	Summer	2	11:45:38	0:01:04	M	6103	6144	40	4	Mammal	Caribou	26	-	26	-	Grazing	-
BR_48a	3-Aug-13	Summer	1	4:50:01	4:55:01	M	6424	6443	20	2	Mammal	Caribou	13	-	13	-	Grazing	-
BR_48a	3-Aug-13	Summer	2	6:00:01	6:00:10	M	6511	6520	10	1	Mammal	Caribou	72	-	72	-	Grazing	
BR_48a	3-Aug-13	Summer	3	7:30:01	7:30:10	M	6620	6629	10	1	Mammal	Caribou	10	-	10	-	Grazing	-
BR_48a	3-Aug-13	Summer	4	7:50:01	8:00:10	M	6642	6662	20	2	Mammal	Caribou	95	-	95	-	Grazing	
BR_48a	3-Aug-13	Summer	5	8:56:57	8:57:07	M	6718	6727	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	3-Aug-13	Summer	6	17:40:01	17:50:10	M	7201	7221	20	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_48a	3-Aug-13	Summer	7	18:40:01	18:40:10	M	7267	7276	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	3-Aug-13	Summer	8	20:30:01	20:30:10	M	7378	7387	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	5-Aug-13	Summer	1	2:50:01	2:50:10	M	9220	9229	10	1	Mammal	Caribou	1	-	1	-	Grazing	Bull caribou grazing
BR_48a	5-Aug-13	Summer	2	3:20:01	3:20:10	M	9253	9262	10	1	Mammal	Caribou	4	-	4	-	Grazing	-
BR_48a	5-Aug-13	Summer	3	5:50:01	6:00:10	M	9398	9418	20	2	Mammal	Caribou	1	-	1	-	Grazing	-
BR_48a	5-Aug-13	Summer	4	8:50:01	9:00:10	M	9596	9609	20	2	Mammal	Caribou	7	-	7	-	Grazing	-
BR_48a	5-Aug-13	Summer	5	10:00:01	10:00:10	M	9673	9682	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_48a	5-Aug-13	Summer	6	12:10:01	12:10:10	M	9806	9815	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_48a	5-Aug-13	Summer	7	15:20:01	15:20:10	M	9985	9994	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_48a	6-Aug-13	Summer	1	5:03:00	5:08:09	M	868	917	50	5	Mammal	Caribou	7	-	7	-	Grazing	-
BR_48a	6-Aug-13	Summer	2	9:17:09	9:17:18	M	1193	1202	10	1	Mammal	Caribou	3	2	5	-	Running	-
BR_49a																		no caribou observed
BR_50a																		no caribou observed
BR_51a	31-Jul-13	Summer	1	14:00:01	14:10:10	M	6954	6974	20	2	Mammal	Caribou	11	-	11	-	Grazing	-
BR_51a	1-Aug-13	Summer	1	9:58:13	9:58:22	M	8073	8082	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_51a	1-Aug-13	Summer	2	10:42:56	10:43:05	M	8128	8137	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_51a	1-Aug-13	Summer	3	10:47:06	10:47:15	M	8138	8147	10	1	Mammal	Caribou	3	2	5	-	Walking	-
BR_51a	2-Aug-13	Summer	1	5:07:28	5:50:10	M	8658	8722	64	6	Mammal	Caribou	6	2	8	-	Grazing	-
BR_51a	2-Aug-13	Summer	2	6:50:02	7:40:10	M	8769	8833	64	6	Mammal	Caribou	7	-	7	-	Grazing	-
BR_51a	2-Aug-13	Summer	3	8:50:01	8:50:10	M	8901	8910	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_51a	2-Aug-13	Summer	4	10:10:01	10:30:10	M	8979	9010	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_51a	2-Aug-13	Summer	5	12:40:01	12:40:10	M	9134	9143	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_51a	2-Aug-13	Summer	6	18:00:00	18:00:09	M	9306	9315	10	1	Mammal	Caribou	1	-	1	-	Other	-
BR_51a	2-Aug-13	Summer	7	18:20:01	18:20:10	M	9318	9327	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_51a	2-Aug-13	Summer	8	21:13:25	21:20:10	M	9455	9505	50	5	Mammal	Caribou	36	-	36	-	Grazing	-
BR_51a	7-Aug-13	Summer	1	4:21:48	4:21:57	M	1995	2004	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_51a	8-Aug-13	Summer	1	19:10:01	19:10:10	M	2478	2487	10	1	Mammal	Caribou	1	-	1	-	Grazing	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_51a	11-Aug-13	Summer	1	19:03:29	19:03:38	M	3247	3256	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_51a	11-Aug-13	Summer	2	20:47:19	20:47:28	M	3339	3348	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_51a	11-Aug-13	Summer	3	21:36:43	21:36:52	M	3354	3363	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_51a	14-Aug-13	Summer	1	13:24:00	13:24:09	M	4247	4256	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_51a	18-Aug-13	Summer	1	18:44:52	18:45:01	M	7055	7064	10	1	Mammal	Caribou	1	-	1	-	Other	-
BR_51a	19-Aug-13	Summer	1	5:56:17	5:56:26	M	7162	7171	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_51a	20-Aug-13	Summer	1	9:00:01	9:00:10	M	8165	8174	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_51a	21-Aug-13	Summer	1	16:20:01	16:40:10	M	9483	9504	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_51a	22-Aug-13	Summer	1	5:32:35	5:32:44	M	9952	9961	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_52a	30-Jul-13	Summer	1	23:20:01	23:20:10	M	1146	1155	10	1	Mammal	Caribou	1	-	1	-	Grazing	Bull caribou grazing
BR_52a	31-Jul-13	Summer	1	19:42:58	19:43:07	M	1308	1317	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_52a	1-Aug-13	Summer	1	9:48:41	9:48:51	M	1422	1431	10	1	Mammal	Caribou	11	2	13	-	Grazing	-
BR_52a	1-Aug-13	Summer	2	17:11:26	17:11:36	M	1487	1496	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_52a	3-Aug-13	Summer	1	3:34:21	3:44:33	M	1753	1873	121	12	Mammal	Caribou	32	-	32	-	Grazing	-
BR_52a	3-Aug-13	Summer	2	5:07:02	5:09:28	M	1882	1921	39	4	Mammal	Caribou	19	-	19	-	Grazing	-
BR_52a	3-Aug-13	Summer	3	19:35:59	19:36:08	M	2009	2018	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	4-Aug-13	Summer	1	21:20:05	21:20:14	M	2194	2203	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou grazing
BR_52a	8-Aug-13	Summer	1	10:26:54	10:27:04	M	2814	2823	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	10-Aug-13	Summer	1	22:04:36	22:15:56	M	3232	3342	110	11	Mammal	Caribou	130	5	135	-	Grazing	
BR_52a	11-Aug-13	Summer	1	4:15:12	4:15:12	M	3379	3388	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	11-Aug-13	Summer	2	15:43:09	15:43:18	M	3458	3467	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	13-Aug-13	Summer	1	18:38:53	18:39:02	M	3803	3812	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	14-Aug-13	Summer	1	21:53:42	21:53:52	M	4007	4016	10	1	Mammal	Caribou	-	1	1	-	Walking	-
BR_52a	16-Aug-13	Summer	1	21:25:49	21:25:58	M	4412	4421	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_52a	17-Aug-13	Summer	1	20:27:07	20:27:16	M	4590	4599	10	1	Mammal	Caribou	2	2	4	-	Grazing	-
BR_52a	18-Aug-13	Summer	1	19:38:08	19:38:47	M	4779	4798	10	1	Mammal	Caribou	1	1	2	-	Grazing	-
BR_52a	18-Aug-13	Summer	2	20:11:23	20:13:17	M	4813	4852	40	4	Mammal	Caribou	15	-	15	-	Grazing	-
BR_52a	19-Aug-13	Summer	1	4:47:41	4:54:54	M	4904	4924	20	2	Mammal	Caribou	1	-	1	-	Grazing	-
BR_52a	23-Aug-13	Summer	1	4:03:06	4:04:13	M	5606	5625	20	2	Mammal	Caribou	4	-	4	-	Grazing	-
BR_52a	24-Aug-13	Summer	1	4:13:32	4:13:41	M	5883	5892	10	1	Mammal	Caribou	3	-	3	-	Grazing	-
BR_53a																		no caribou observed
BR_53b																		no caribou observed
BR_54a	20-May-13	Spring	1	22:20:01	22:20:10	M	9557	9566	10	1	Mammal	Caribou	7	-	7	-	Walking	
BR_54a	31-Jul-13	Summer	1	10:20:01	10:20:10	M	4295	4304	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_54a	31-Jul-13	Summer	2	15:40:01	15:40:10	M	4527	4536	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_54a	31-Jul-13	Summer	3	20:20:01	20:20:10	M	4675	4684	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_54a	31-Jul-13	Summer	4	21:40:01	21:40:10	M	4753	4762	10	1	Mammal	Caribou	5	-	5	-	Grazing	-
BR_54a	5-Aug-13	Summer	1	18:53:05	18:53:14	M	7256	7265	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_54a	10-Aug-13	Summer	1	20:50:58	20:51:07	M	9338	9347	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_54a	18-Aug-13	Summer	1	7:28:42	7:28:51	M	2340	2349	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_54a	20-Aug-13	Summer	1	18:50:01	18:50:10	M	3777	3786	10	1	Mammal	Caribou	2	-	2	-	Walking	-
BR_54a	20-Aug-13	Summer	1	19:20:01	19:20:10	M	3810	3819	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_54a	21-Aug-13	Summer	1	14:30:01	14:30:11	M	4095	4104	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_54a	23-Aug-13	Summer	1	17:32:30	17:32:39	M	5631	5640	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_54a	23-Aug-13	Summer	2	20:24:36	20:24:45	M	5808	5817	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_55a	19-Aug-13	Summer	1	8:20:01	8:20:10	M	6304	6313	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_56a																		Camera located at wolf den, not used in caribou analysis but one caribou recorded
BR_57a																		Camera located at wolf den, not used in caribou analysis
BR_58a																		no caribou observed
BR_59a																		no caribou observed
BR_60a	19-May-13	Spring	1	11:10:01	11:10:10	M	1120	1129	10	1	Mammal	Caribou	3	-	3	-	Walking	-
BR_61a	27-Jul-13	Summer	1	6:28:58	6:29:07	M	700	709	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_62a	27-Jul-13	Summer	1	10:20:01	10:50:10	M	8188	8230	43	4	Mammal	Caribou	2	-	2	-	Grazing	-
BR_62a	1-Aug-13	Summer	1	11:40:01	11:40:10	M	8276	8285	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_62a	1-Aug-13	Summer	2	14:00:01	14:00:10	M	8410	8419	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_62a	8-Aug-13	Summer	1	8:20:01	8:20:10	M	4915	4924	10	1	Mammal	Caribou	6	-	6	-	Grazing	-
BR_62a	9-Aug-13	Summer	1	7:10:01	7:20:10	M	5612	5632	20	2	Mammal	Caribou	36	-	36	-	Grazing	-
BR_62a	9-Aug-13	Summer	2	7:30:01	8:10:10	M	5634	5717	83	8	Mammal	Caribou	51	-	51	-	Grazing	
BR_62a	9-Aug-13	Summer	3	8:20:01	8:20:10	M	5719	5728	10	1	Mammal	Caribou	4	-	4	-	Grazing	-
BR_62a	9-Aug-13	Summer	4	8:50:01	8:50:10	M	5752	5761	10	1	Mammal	Caribou	2	-	2	-	Grazing	-
BR_62a	9-Aug-13	Summer	5	19:23:52	19:24:01	M	6005	6014	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_62a	9-Aug-13	Summer	6	21:50:01	21:50:10	M	6040	6049	10	1	Mammal	Caribou	5	-	5	-	Grazing	-
BR_62a	9-Aug-13	Summer	7	22:20:01	22:21:21	M	6053	6072	20	2	Mammal	Caribou	2	-	2	-	Grazing	-
BR_62a	10-Aug-13	Summer	1	8:20:01	8:20:10	M	6483	6492	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_62a	11-Aug-13	Summer	1	5:00:01	5:00:10	M	6837	6846	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_62a	11-Aug-13	Summer	2	6:50:01	10:30:10	M	6938	7169	232	23	Mammal	Caribou	11	-	11	-	Grazing	
BR_62a	13-Aug-13	Summer	1	7:50:01	8:20:10	M	8022	8064	43	4	Mammal	Caribou	7	-	7	-	Grazing	-
BR_62a	13-Aug-13	Summer	2	9:00:01	9:00:10	M	8099	8108	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_62a	14-Aug-13	Summer	1	9:10:01	9:10:10	M	8894	8903	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	28-Jul-13	Summer	1	23:42:00	23:42:09	M	558	567	10	1	Mammal	Caribou	5	-	5	-	Walking	-
BR_63a	3-Aug-13	Summer	1	19:20:07	19:20:16	M	1646	1655	10	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_63a	3-Aug-13	Summer	2	22:11:37	22:11:46	M	1673	1682	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	5-Aug-13	Summer	1	7:34:47	7:34:56	M	1893	1902	10	1	Mammal	Caribou	3	2	5	-	Walking	-
BR_63a	8-Aug-13	Summer	1	8:06:51	8:07:00	M	2448	2457	10	1	Mammal	Caribou	11	-	11	-	Grazing	Calves present, didn't enumerate
BR_63a	9-Aug-13	Summer	1	17:30:31	17:30:40	M	2669	2678	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	12-Aug-13	Summer	1	7:02:39	7:02:48	M	3086	3097	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	14-Aug-13	Summer	1	9:25:40	9:26:14	M	3400	3429	30	3	Mammal	Caribou	5	3	8	-	Grazing	-
BR_63a	17-Aug-13	Summer	1	17:53:24	17:53:55	M	4043	4072	30	3	Mammal	Caribou	20	6	26	-	Walking	-
BR_63a	18-Aug-13	Summer	1	7:32:45	7:32:54	M	4165	4174	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	18-Aug-13	Summer	2	7:40:42	7:42:39	M	4176	4255	80	8	Mammal	Caribou	7	4	11	-	Walking	-
BR_63a	18-Aug-13	Summer	3	13:01:01	13:01:48	M	4288	4337	50	5	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	20-Aug-13	Summer	1	8:28:16	8:28:45	M	4638	4657	20	2	Mammal	Caribou	1	-	1	-	Other	-
BR_63a	20-Aug-13	Summer	2	17:31:52	17:32:01	M	4723	4732	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_63a	20-Aug-13	Summer	3	17:59:15	17:59:24	M	4735	4744	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_63a	21-Aug-13	Summer	1	6:34:56	6:37:09	M	4831	4940	110	11	Mammal	Caribou	8	1	9	-	Grazing	Hard to see calves.
BR_63a	21-Aug-13	Summer	2	6:49:59	6:50:31	M	4942	4972	30	3	Mammal	Caribou	1	1	2	-	Walking	-
BR_63a	23-Aug-13	Summer	1	8:30:02	8:30:11	M	5331	5340	10	1	Mammal	Caribou	1	1	2	-	Walking	-
BR_63a	23-Aug-13	Summer	1	10:01:33	10:01:42	M	5442	5451	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_64a	30-Jul-13	Summer	1	3:42:02	3:42:11	M	5600	5609	10	1	Mammal	Caribou	1	-	1	looks like ungulate walking, brown?	Walking	
BR_64a	1-Aug-13	Summer	1	15:46:53	15:47:02	M	9344	9354	11	1	Mammal	Caribou	1	-	1	-	Walking	Bull caribou walking
BR_64a	6-Aug-13	Summer	1	17:55:51	17:56:00	M	6714	6723	10	1	Mammal	Caribou	1	-	1	-	Walking	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_64a	7-Aug-13	Summer	1	16:31:56	16:32:05	M	8080	8090	11	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_64a	8-Aug-13	Summer	1	8:33:14	8:33:23	M	9052	9061	10	1	Mammal	Caribou	5	-	5	-	Walking	-
BR_64a	8-Aug-13	Summer	2	9:34:47	9:34:56	M	9123	9132	10	1	Mammal	Caribou	-	1	1	-	Walking	-
BR_64a	8-Aug-13	Summer	3	13:31:22	13:31:31	M	9370	9379	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_65a	4-Aug-13	Summer	1	16:17:31	16:17:40	M	1369	1378	10	1	Mammal	Caribou	1	-	1	-	Grazing	-
BR_65a	4-Aug-13	Summer	2	18:32:11	18:32:20	M	1393	1402	10	1	Mammal	Caribou	1	-	1	-	Walking	-
BR_65a	7-Aug-13	Summer	1	11:21:15	11:21:24	M	1792	1801	10	1	Mammal	Caribou	1	-	1	-	Walking	
Other Wildlife																		
BR_01a	6-Sep-2012		1	0:47	0:49:14	M	558	627	70	7	Mammal	Grey Wolf	2	0	2	Rolling on ground	Walking	
BR_01a	7-Sep-2012		1	5:55:22	5:56:43	M	686	715	30	3	Mammal	Grizzly Bear	1	0	1		Walking	
BR_01a	7-Sep-2012		2	20:52:11	20:53:23	M	746	795	50	5	Mammal	Grizzly Bear	1	0	1		Walking	
BR_01a	9-Sep-2012		1	0:33	0:34:04	M	852	861	10	1	Mammal	Red Fox	1	0	1		Running	Pretty sure it's a red fox
BR_01a	9-Sep-2012		2	16:12:47	16:15:20	M	893	912	20	2	Mammal	Red Fox	1	0	1	Rolling on ground	Walking	Could be the same one
BR_01a	9-Sep-2012		3	21:00:35	21:02:03	M	923	962	40	4	Mammal	Grizzly Bear	1	0	1		Walking	Probably a bear, too close
BR_01a	12-Sep-2012		1	9:51:24	9:51:45	M	1094	1113	20	2	Mammal	Red Fox	1	0	1	Rolling on ground	Walking	
BR_01a	25-Sep-2012		1	19:10:52	19:12:35	M	1757	1816	60	6	Mammal	Grizzly Bear	1	0	1		Walking	Knocked over tripod
BR_01a	8-Apr-2013		1	23:25::37	23:25:45	M	1906	1915	10	1	Mammal	Grey Wolf	1	0	1		Running	
BR_01b	30-May-13		-	1:30:00	-	T	982	-	1	-	Bird	Bird	1	0	1	-	Sitting	Ptarmigan
BR_01b	21-Jun-13		1	21:54:41	21:58:50	M	2079	2228	150	15	Mammal	Grizzly Bear	1	0	1	-	Other	15th trigger CAM was knocked over; stopped recording triggers; GB continues to motion trigger camera until destroying camera (IMG_2628.. to final image)
BR_01b	5-Aug-13		1	2:34:54	2:35:04	M	2499	2508	10	1	Mammal	Red Fox	1	0	1	-	Standing	-
BR_01b	13-Aug-13		1	2:32:05	2:32:15	M	3711	3720	10	1	Mammal	Red Fox	1	0	1	-	Running	-
BR_01b	17-Aug-13		1	13:10:29	13:11:36	M	4371	4400	30	3	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_02a	27-Aug-2012		1	23:53:21	23:53:27	M	205	214	10	1	Mammal	Grey Wolf	1	0	1		Walking	A series was triggered at 23:20:11, IMG 194, but could barely see animal at right edge of frame.
BR_02a	30-Aug-2012		1	11:54:58	11:56:21	M	335	384	50	5	Mammal	Grizzly Bear	1	0	1		Standing	Probably a bear, too close
BR_02a	5-Oct-2012		1	23:01:06	23:01:12	M	2136	2145	10	1	Mammal	Grey Wolf	1	0	1		Walking	Wolf? Fox?
BR_02a	7-Oct-2012			14:00:00		T	2223		1		Mammal	Red Fox	1	0	1		Standing	Looks like a red fox but hard to tell
BR_02a	7-Mar-2013		1	17:12:18	17:12:26	M	9548	9557	10	1	Mammal	Red Fox	1	0	1		Running	
BR_02a	23-Apr-2013		1	23:16:20	23:16:27	M	1877	1886	10	1	Mammal	Wolverine	1	0	1		Walking	
BR_02a	15-May-13		1	12:17:27	12:17:33	M	101	110	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_02a	22-May-13		1	19:07:58	19:07:55	M	461	470	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_02a	23-May-13		1	17:30:04	17:30:10	M	516	525	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_02a	24-Jun-13		1	23:57:48	23:59:25	M	2284	2303	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_02a	7-Jul-13		1	23:30:08	23:37:28	M	2978	3097	120	12	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_02a	15-Jul-13		1	2:23:41	2:24:10	M	75	94	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_02a	26-Jul-13		1	12:53:14	1:07:16	M	655	905	260	26	Mammal	Grizzly Bear	1	2	3	-	Standing	-
BR_02a	26-Jul-13		2	10:58:59	11:05:10	M	965	1095	130	13	Mammal	Grizzly Bear	1	2	3	-	Standing	-
BR_02a	29-Jul-13		1	21:13:01	21:18:49	M	1599	1698	100	10	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_02a	30-Jul-13		1	5:52:38	6:00:48	M	1751	1811	60	6	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_02a	4-Aug-13		1	8:08:33	10:05:54	M	2554	2695	140	14	Mammal	Grizzly Bear	1	2	3	-	Walking	-
BR_02a	18-Aug-13		1	15:42:30	15:42:39	M	5026	5035	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_02a	18-Aug-13		2	20:20:07	20:20:56	M	5064	5083	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_02a	18-Aug-13		3	20:42:30	20:42:40	M	5098	5107	10	1	Mammal	Grey Wolf	2	0	2	-	Standing	-
BR_03a	9-Sep-2012	Tipped	7:00:00			T	616								0			Camera tipped over
BR_04a	31-Aug-2012		1	10:15:22	10:16:15	M	280	309	30	3	Mammal	Grizzly Bear	1	0	1		Walking	

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_04a	23-Sep-2012		1	13:47:24	13:48:59	M	1421	1490	70	7	Mammal	Grizzly Bear	1		1		Standing	
BR_04a	28-Oct-2012			11:30:00		T	3186		1		Mammal	Wolverine	1	0	1		Walking	Walking away. A triggered series precedes this photo, but it does not appear in any of the photos.
BR_04a	6-Feb-2013		1	18:59:35	18:59:46	M	8049	8058	10	1	Mammal	Grey Wolf	1	0	1		Standing	Probably a wolf
BR_05a															0			None
BR_05b	19-May-13		1	7:30:54	7:31:11	M	403	422	20	2	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_05b	25-Jun-13		1	3:08:30	3:08:38	M	2220	2229	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_05b	27-Jun-13		1	6:22:01	6:22:47	M	2342	2361	20	2	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_05b	13-Jul-13		1	2:26:59	2:27:06	M	3122	3131	10	1	Mammal	Arctic Hare	3	0	3	-	Walking	-
BR_05b	13-Jul-13		2	21:52:58	21:53:06	M	3171	3180	10	1	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_05b	14-Jul-13		1	3:11:11	3:11:19	M	3192	3201	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_05b	19-Jul-13		1	4:38:07	4:38:49	M	3445	3464	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_05b	1-Aug-13		1	14:16:25	14:06:34	M	1742	1751	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	
BR_05b	7-Aug-13		1	21:24:54	21:25:04	M	2680	2689	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_05b	7-Aug-13		2	23:54:27	23:54:37	M	2705	2714	10	1	Mammal	Grey Wolf	1	0	1	-	Running	-
BR_05b	13-Aug-13		1	5:21:23	5:21:33	M	3488	3497	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_05b	16-Aug-13		1	16:50:38	16:54:29	M	3999	4058	48	6	Mammal	Grizzly Bear	1	2	3	-	Walking	
BR_05b	17-Aug-13		1	20:31:08	20:31:17	M	4225	4234	10	1	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_05b	18-Aug-13		1	9:16:05	9:16:37	M	4311	4330	20	1	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_05b	3-Aug-13		1	11:38:06	11:40:29	M	2097	2117	16	1	Mammal	Grizzly Bear	1	0	1	-	Walking	
BR_05b	10-Aug-13		1	1:14:11	1:14:18	M	3011	3018	8	1	Mammal	Grey Wolf	1	0	1	-	Walking	
BR_05b	16-Aug-13		1	16:51:34	16:53:21	M	4018	4033	12	3	Mammal	Grizzly Bear	2	0	2	-	Walking	
BR_05b	18-Aug-13		1	9:16:34	9:16:35	M	4327	4328	2	1	Mammal	Grizzly Bear	1	0	1	-	Walking	
BR_06a	29-Aug-2012		1	11:26:25	11:29	M	179	248	70	7	Mammal	Grizzly Bear	1	0	1		Standing	
BR_06a	29-Aug-2012		2	11:31:27	11:31	M	250	259	10	1	Mammal	Grizzly Bear	1	0	1		Walking	
BR_06a	29-Aug-2012		3	21:35:33	21:35:42	M	280	289	10	1	Mammal	Grey Wolf	1	0	1		Walking	Looks like it may be a wolf.
BR_06a	1-Sep-2012		1	22:16:53	22:18:44	M	435	454	20	2	Mammal	Grey Wolf	2	0	2		Walking	
BR_06a	10-Sep-2012		1	11:34:25	11:38:53	M	866	925	60	6	Mammal	Grizzly Bear	1	0	1		Other	Grizzly? In front of camera
BR_06a	10-Sep-2012		2	13:55:09	13:57:29	M	930	979	50	5	Mammal	Grizzly Bear	1	0	1		Other	Grizzly? In front of camera
BR_06a	26-Sep-2012		1	0:17:31	0:29:35	M	1721	1830	110	11	Mammal	Grizzly Bear	1	0	1		Other	Grizzly becomes visible at last trigger, IMG 1821
BR_06a	6-Oct-2012		1	12:51:09	12:58:42	M	2336	2455	120	12	Mammal	Grizzly Bear	1	0	1		Other	At camera and rolling on ground
BR_06a	21-Oct-2012		1	12:06:06	12:19:41	M	3175	3274	100	10	Mammal	Grizzly Bear	1	0	1		Other	Playing with the camera. Looks like a grizzly
BR_06a	27-Jan-2013		1	11:04:59	11:05:07	M	8107	8116	10	1	Bird	Raptor	1	0	1		Flying	Flying past camera.
BR_06a	2-Feb-2013		1	0:22:14	0:22:22	M	8493	8502	10	1	Mammal	Grey Wolf	1	0	1		Standing	
BR_06a	4-Mar-2013		1	18:51:03	18:51:20	M	1	20	20	2	Mammal	Grey Wolf	1	0	1		Standing	
BR_06a	14-Mar-2013		1	10:15:48	10:20:30	M	484	523	40	4	Mammal	Grey Wolf	1	0	1		Standing	Great photos of a wolf
BR_06a	6-Apr-2013			10:00:00		T	1343		1		Mammal	Arctic Fox	1	0	1		Sitting	
BR_06a	8-Apr-2013			12:00:00		T	1443		1		Mammal	Arctic Fox	1	0	1		Standing	
BR_06a	8-Apr-2013		1	12:11:42	12:11:50	M	1444	1453	10	1	Mammal	Arctic Fox	1	0	1		Walking	
BR_06a	11-Apr-2013		1	19:54:40	19:54:47	M	1613	1622	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_06a	26-Apr-2013		1	14:30:16	14:36:52	M	2633	2652	20	2	Mammal	Wolverine	1	0	1		Walking	
BR_06a	27-Apr-2013		1	5:57:26	5:57:34	M	2693	2702	10	1	Mammal	Wolverine	1	0	1		Walking	
BR_06a	28-Apr-2013			22:00:00		T	2823		1		Mammal	Grey Wolf	1	0	1		Walking	
BR_06a	4-May-2013		1	19:52:53	19:53:01	M	3197	3206	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_06b	1-Jul-13		1	22:51:35	22:53:31	M	2413	2512	100	10	Mammal	Grizzly Bear	1	0	1	-	Standing	Camera knocked over at 22:24:24 to end.
BR_06b	1-Jul-13		Knocked Over	22:24:44	-	-	-	-	-	-	-	-	-	0	0	-	-	-
BR_06b	30-Jul-13		1	7:35:39	7:36:13	M	1238	1257	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	Kncoked over @ 7:35 and stayed knocked over

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_07a	31-Aug-2012		1	20:46:13	20:48:00	M	242	281	40	4	Mammal	Grizzly Bear	1	0	1		Other	Appears in last trigger
BR_07a	31-Aug-2012			21:00:00		T	282		1		Mammal	Grizzly Bear	1	0	1		Walking	
BR_07a	11-Sep-2012		1	16:57:53	16:58:33	M	802	831	30	3	Mammal	Grizzly Bear	1	0	1		Other	
BR_07a	15-Sep-2012		1	17:47:52	17:49:47	M	1026	1045	20	2	Mammal	Grizzly Bear	1	0	1		Other	Probably a grizzly
BR_07a	25-Mar-2013		1	8:42:02	8:47:40	M	551	600	50	5	Mammal	Wolverine	1	0	1		Other	Climbing on post
BR_07a	25-Mar-2013		2	11:43:40	11:44:11	M	607	636	30	3	Mammal	Wolverine	1	0	1		Other	Climbing on post
BR_07a	12-Apr-2013		1	7:53:14	7:58:51	M	1753	1772	20	2	Mammal	Wolverine	1	0	1		Other	Climbing on post
BR_07a	17-Apr-2013		1	8:25:51	8:26:00	M	2314	2323	10	1	Mammal	Wolverine	1	0	1		Other	
BR_07a	21-Apr-2013			11:00:00		T	2521		1		Mammal	Wolverine	1	0	1		Sitting	
BR_07a	23-Apr-2013		1	18:04:54	18:07:11	M	2632	2651	20	2	Mammal	Wolverine	1	0	1		Other	Climbing on post
BR_07a	28-Apr-2013		1	23:56:10	23:56:17	M	2903	2912	10	1	Mammal	Wolverine	1	0	1		Other	Sniffing post
BR_07b	17-May-13		1	23:35:59	23:36:06	M	260	269	10	1	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_07b	29-May-13		1	13:17:20	13:22:07	M	825	1064	240	24	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_07b	23-Jun-13		1	3:07:27	3:07:35	M	2245	2254	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_07b	26-Jun-13		1	20:10:48	20:11:41	M	2433	2452	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_07b	13-Jul-13		Fogged	0:00:00	6:30:00	-	-	2791	-	-	-	-	-	0	0	-	-	-
BR_07b	4-Aug-13		1	19:14:12	19:15:07	M	2056	2085	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_07b	7-Aug-13		1	10:20:33	10:20:43	M	2475	2484	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_07b	13-Aug-13		1	23:11:24	23:12:42	M	3426	3455	30	1	Mammal	Grizzly Bear	2	0	2	-	Running	-
BR_08a	23-Nov-2012		Fogged	16:30:00		T	4337								0			
BR_08b	26-Jul-13		1	21:14:59	21:15:09	M	673	682	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_09a	7-Oct-2012		Fogged	12:00:00		T	948								0			
BR_09a	8-Oct-2012		Clear		13:30:00	T		999							0			
BR_09a	20-Oct-2012		Fogged	19:30:00		T	1587								0			
BR_09b	28-May-13		1	16:52:15	16:56:03	M	1045	1164	120	12	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_09b	27-Jun-13		1	21:52:15	21:52:21	M	2675	2684	10	1	Mammal	Moose	1	0	1	-	Walking	-
BR_09b	28-Jun-13		1	11:40:41	11:41:17	M	2723	2742	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_09b	21-Jul-13		1	11:51:09	11:51:39	M	730	749	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_09b	26-Jul-13		1	9:59:05	9:59:51	M	1530	1549	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	potentially 2 cubs?
BR_09b	2-Aug-13		1	20:46:12	20:47:21	M	2551	2570	20	2	Mammal	Moose	1	0	1	-	Walking	-
BR_09b	5-Aug-13		1	21:37:09	21:38:12	M	3008	3027	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_09b	21-Aug-13		1	11:06:40	11:06:50	M	5269	5278	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_10a	28-Aug-2012		1	8:08:29	8:10:44	M	170	259	90	9	Mammal	Grizzly Bear	1	0	1		Other	Playing with camera. Think it is a bear.
BR_10a	31-Aug-2012		1	13:19:20	13:19:58	M	414	443	30	3	Mammal	Grizzly Bear	1	0	1		Other	Playing with camera. Tipped it over.
BR_10a	22-Sep-2012		1	20:29:35	20:32:07	M	1864	1934	71	7	Mammal	Grizzly Bear	1	0	1		Other	Playing with camera. Tipped it over.
BR_10b	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No Wildlife Photos
BR_11a	25-Aug-2012		1	4:12:29	4:12:36	M	235	244	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_11a	27-Sep-2012		1	10:42:43	10:53:35	M	1842	2041	200	20	Mammal	Grizzly Bear	1	0	1		Other	Playing with camera.
BR_11a	6-Feb-2013		1	14:31:22	14:31:47	M	9526	9545	20	2	Mammal	Unknown	1	0	1		Other	Ears visible at 9536. Wolf?
BR_11b	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No wildlife photos.
BR_12a	12-Apr-2013		Clear		10:30:00	T		1044							0			
BR_12b	14-Jun-13		1	10:30:32	10:36:46	M	1780	2099	310	31	Mammal	Grizzly Bear	1	0	1	-	Standing	Camera knocked over at 10:35 on 06/14/2013
BR_12b	19-Jun-13		1	1:54:53	1:59:31	M	2322	2461	140	14	Mammal	Grizzly Bear	1	0	1	-	Standing	Still knocked over; Bear fur still observed on photos; bear playing with knocked over camera; continued on and into101RECNX and 102RECNX with continuous false triggers of clouds.
BR_12b	3-Aug-13		1	6:49:32	6:50:02	M	2115	2135	20	1	Mammal	Grizzly Bear	1	0	1	-	Standing	Kncoked over @ 6:50 and stayed knocked over
BR_13a	1-Sep-2012		1	16:49:00	16:52:03	M	348	437	90	9	Mammal	Grizzly Bear	1	0	1	Juvenile?	Other	Rolling around

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_13a	4-Sep-2012		1	12:55:01	12:55:23	M	574	593	20	2	Mammal	Grizzly Bear	1	0	1	Juvenile?	Other	Rolling around
BR_13a	19-Sep-2012		1	19:34:23	19:34:31	M	1348	1357	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_13a	21-Sep-2012		1	21:54:50	21:59:53	M	1458	1557	100	10	Mammal	Grizzly Bear	1	0	1	Juvenile?	Other	
BR_13a	28-Sep-2012		1	15:31:29	15:32:51	M	1882	1921	40	4	Mammal	Grizzly Bear	1	0	1	Juvenile?	Other	
BR_13a	3-Oct-2012		1	0:44:07	0:44:15	M	2132	2141	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_13a	15-May-13		-	5:00:00	-	T	107	-	1	-	Mammal	Arctic Hare	1	0	1	-	Sitting	-
BR_13a	15-May-13		1	10:54:23	10:54:29	M	119	128	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_13a	31-May-13		1	18:12:00	18:30:00	M	1092	1641	550	55	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	4-Jun-13		1	2:17:00	2:22:19	M	1812	1981	170	17	Mammal	Grizzly Bear	1	0	1	-	Walking	Different bear from previous I think
BR_13a	4-Jun-13		2	5:42:03	5:44:38	M	1989	2058	70	7	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	23-Jun-13		1	16:52:05	17:00:16	M	666	826	160	16	Mammal	Grizzly Bear	1	0	1	-	Walking	Tripod baited with blood on 06/22/2013
BR_13a	23-Jun-13		2	23:27:43	23:33:11	M	839	899	60	6	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	23-Jun-13		-	23:30:00	-	T	859	-	1	-	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	24-Jun-13		1	10:27:58	10:38:06	M	921	1171	250	25	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	9-Jul-13		-	7:30:00	-	T	2455	-	1	-	Mammal	Red Fox	1	0	1	-	Walking	-
BR_13a	11-Jul-13		1	4:50:27	4:50:35	M	2566	2575	10	1	Mammal	Red Fox	1	0	1	-	Walking	-
BR_13a	16-Jul-13		1	22:50:48	22:51:23	M	3032	3061	30	3	Mammal	Wolverine	1	0	1	-	Walking	-
BR_13a	29-Jul-13		1	6:18:40	6:18:49	M	761	770	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_13a	29-Jul-13		2	18:14:38	6:14:48	M	843	852	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_13a	29-Jul-13		3	22:50:48	22:55:44	M	881	950	70	7	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	30-Jul-13		1	5:24:55	5:27:19	M	990	1029	40	4	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	30-Jul-13		2	8:06:42	8:14:45	M	1046	1156	110	11	Mammal	Grizzly Bear	1	1	2	-	Walking	-
BR_13a	30-Jul-13		3	13:20:11	13:20:20	M	1188	1197	10	1	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	2-Aug-13		1	9:38:36	9:45:37	M	1607	1717	110	11	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	4-Aug-13		1	3:45:04	3:46:18	M	1970	1999	30	3	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_13a	7-Aug-13		1	18:04:02	18:07:04	M	2740	2809	70	7	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_13a	9-Aug-13		1	23:59:34	23:59:43	M	3121	3130	10	1	Mammal	Grey Wolf	1	0	1	-	Running	-
BR_13a	11-Aug-13		2	17:51:21	17:18:40	M	4169	4188	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	knocked camera to the side.
BR_13a	24-Aug-13		1	1:23:28	1:26:31	M	6056	6135	80	8	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_14a															0			
BR_14b	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	Camera wasn't activated until June 1, 2013; no wildlife photos
BR_14c	24-Jul-13		1	19:49:33	19:49:39	M	421	430	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_14c	25-Jul-13		1	13:01:15	13:02:02	M	1954	1993	40	4	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15a	20-Sep-2012		1	22:15:34	22:18:12	M	1285	1314	30	3	Bird	Snowy Owl	1	0	1		Flying	I think it is an owl
BR_15b	20-May-13		1	23:20:32	23:28:38	M	777	986	210	21	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	20-May-13		-	23:30:00	-	T	987	-	1	-	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	24-May-13		1	20:40:55	21:00:00	M	1174	1254	80	8	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	15-Jun-13		1	14:15:10	14:16:23	M	3117	3146	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	23-Jun-13		1	17:29:15	17:29:32	M	3607	3626	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	5-Jul-13		1	0:11:03	0:11:17	M	4969	4988	20	2	Mammal	Grizzly Bear	1	0	1	-	-	-
BR_15b	16-Aug-13		1	19:33:49	19:36:56	M	4086	4155	70	7	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_15b	20-Aug-13		1	9:48:01	9:49:02	M	4673	4702	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_16a	10-Dec-2012		Snow	16:00:00		T	5212								0			
BR_16b	10-Jul-13		-	17:30:00	-	T	2968	-	1	-	Mammal	Muskox	14	0	14	feeding along lake shore	Grazing	confirm count
BR_16b	10-Jul-13		-	18:00:00	-	T	2969	-	1	-	Mammal	Muskox	2	0	2	feeding along lake shore	Grazing	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_16b	20-Jul-13		-	23:30:00	-	T	3460	-	1	-	Mammal	Muskox	12	0	12	-	Grazing	confirm count
BR_16b	5-Aug-13		1	3:15:14	3:15:57	M	2016	2025	20	2	Mammal	Muskox	11	0	11	-	Grazing	-
BR_16b	13-Aug-13		1	2:35:10	2:35:19	M	3122	3131	10	1	Mammal	-	1	0	1	-	-	Hair in corner on first image; species unknown.
BR_17a	27-Dec-2012		1	11:51:49	11:55:22	M	6057	6126	70	7	Mammal	Grizzly Bear	1	0	1		Other	
BR_17a	27-Dec-2012			12:30:00		T	6128		1		Mammal	Grizzly Bear	1	0	1		Standing	
BR_17a	27-Dec-2012		2	12:44:11	12:48:47	M	6129	6148	20	2	Mammal	Grizzly Bear	1	0	1		Other	
BR_17a	15-Apr-2013		1	23:01:41	23:01:49	M	2583	2592	10	1	Mammal	Arctic Fox	1	0	1		Running	
BR_17b	5-Jun-13		-	9:00:00	-	T	1246	-	1	-	Unknown	Unknown	1	0	1	-	-	Wolverine?
BR_18a	3-Sep-2012		1	22:54:10	22:55:30	M	447	466	20	2	Bird	Snowy Owl	1	0	1		Flying	Owl?
BR_18a	7-Sep-2012		1	16:04:59	16:12:52	M	646	741	96	10	Mammal	Unknown	1	0	1		Other	Playing with camera. Bear?
BR_18a	15-Oct-2012		1	3:42:50	3:42:58	M	2551	2560	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_18a	22-Feb-2013		1	15:52:15	15:52:22	M	9035	9044	10	1	Mammal	Grey Wolf	1	0	1		Running	
BR_18a	3-Mar-2013		Fogged	3:00:00		T	9451								0			
BR_18a	14-Mar-2013		End of card		13:00:00	T		9999							0			
BR_18a	14-Mar-2013		Beginning of card	13:30:00		T	1								0			
BR_18a	15-Mar-2013		Clear	16:00:00		T		54							0			
BR_18a	4-Jun-13		1	4:41:48	4:44:38	M	1297	1316	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_18a	10-Jun-13		1	8:02:33	8:02:41	M	1622	1631	10	1	Bird	Raptor	1	0	1	-	Sitting	Rough-legged Hawk?
BR_18a	11-Jun-13		1	22:05:48	22:05:55	M	1708	1717	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_18a	7-Aug-13		2	2:36:17	2:36:59	M	2321	2340	20	1	Mammal	Grey Wolf	1	1	2	-	Walking	-
BR_18a	18-Aug-13		1	5:30:54	5:32:24	M	3983	4002	20	2	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_19a	31-Aug-2012		1	19:53:14	19:53:20	M	297	306	10	1	Mammal	Wolverine	1	0	1		Other	Sniffing the ground
BR_19a	31-Aug-2012		2	20:29:56	20:35:28	M	308	418	111	11	Mammal	Grey Wolf	3	0	3		Other	Rolling, sniffing, running. One may be a juvenile.
BR_19a	4-Sep-2012		1	15:35:34	15:38:35	M	601	630	30	3	Mammal	Grey Wolf	1	0	1		Other	Rolling, sniffing, walking
BR_19a	8-Sep-2012		1	20:26:45	20:30:00	M	842	952	111	11	Mammal	Grey Wolf	3	0	3		Other	Rolling, sniffing, running. Probably same group as before.
BR_19a	8-Sep-2012		2	22:28:39	23:00:00	M	956	1007	52	5	Mammal	Grey Wolf	1	0	1		Other	Rolling, sniffing, running
BR_19a	25-Mar-2013			1:30:00		T	1467		1		Mammal	Arctic Fox	1	0	1		Standing	I think it's a fox
BR_19a	25-Mar-2013		1	9:35:54	9:38:38	M	1484	1503	20	2	Mammal	Wolverine	1	0	1		Walking	
BR_19a	25-Mar-2013		2	11:27:17	11:28:11	M	1507	1536	30	3	Mammal	Wolverine	1	0	1		Walking	
BR_19a	25-Mar-2013		3	16:41:56	17:02:02	M	1548	1838	291	29	Mammal	Wolverine	1	0	1		Other	Walking, running, climbing, etc.
BR_19a	27-Mar-2013		1	2:16:42	2:16:49	M	1915	1924	10	1	Mammal	Wolverine	1	0	1		Walking	
BR_19a	28-Mar-2013			21:30:00		T	2011		1		Mammal	Arctic Fox	1	0	1		Standing	
BR_19a	30-Mar-2013			5:00:00		T	2074		1		Mammal	Arctic Fox	1	0	1		Standing	
BR_19a	30-Mar-2013		1	15:13:50	15:15:39	M	2095	2134	40	4	Mammal	Wolverine	1	0	1		Other	Walking, sniffing, climbing, etc.
BR_19a	31-Mar-2013		1	2:24:47	2:30:00	M	2157	2177	21	2	Mammal	Arctic Fox	1	0	1		Walking	Last photo is timed
BR_19a	31-Mar-2013		2	5:14:25	5:15:17	M	2183	2222	40	4	Mammal	Wolverine	1	0	1		Walking	
BR_19a	8-Apr-2013		1	1:55:23	2:00:00	M	2870	2880	11	1	Mammal	Arctic Fox	1	0	1		Walking	
BR_19a	8-Apr-2013		2	20:57:44	21:24:50	M	2918	2958	41	4	Mammal	Wolverine	1	0	1		Other	Climbing
BR_19a	8-Apr-2013		3	23:14:04	23:30:00	M	2963	2973	11	1	Mammal	Arctic Fox	1	0	1		Standing	Last photo is timed
BR_19a	9-Apr-2013			23:00:00		T	3020		1		Bird	Raptor	1	0	1		Sitting	
BR_19a	17-Apr-2013		1	5:10:44	5:31:41	M	3749	3839	91	9	Mammal	Wolverine	1	0	1		Other	Climbing
BR_19a	18-Apr-2013			0:00:00		T	3876		1		Mammal	Arctic Fox	1	0	1		Standing	
BR_19a	18-Apr-2013		1	17:10:04	17:11:25	M	3911	3940	30	3	Mammal	Wolverine	1	0	1		Running	
BR_19a	5-May-2013		1	5:00:54	5:01:01	M	5093	5102	10	1	Mammal	Wolverine	1	0	1		Running	Only in first photo of series
BR_19b	15-Jul-13		1	12:54:17	12:55:06	M	3122	3161	40	4	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_19b	1-Aug-13		1	20:43:58	20:44:55	M	1472	1501	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_20a	30-Aug-2012		1	12:33:43	12:34	M	231	250	20	2	Mammal	Grizzly Bear	1	0	1		Standing	Probably a bear
BR_20a	25-Apr-2013		1	10:52:24	10:52:46	M	1702	1731	30	3	Mammal	Red Fox	1	0	1		Standing	
BR_20a	25-Apr-2013		2	18:41:00	18:41:07	M	1748	1757	10	1	Mammal	Red Fox	1	0	1		Walking	
BR_20b	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	Camera only active from May 13-15, 2013; no wildlife photos
BR_21a	26-Aug-2012		1	3:30:05	3:30:13	M	130	139	10	1	Mammal	Arctic Fox	1	0	1		Standing	
BR_21a	20-Sep-2012		1	16:57:57	16:58:05	M	1366	1375	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_21a	27-Dec-2012		1	20:10:33	20:10:41	M	6517	6526	10	1	Mammal	Arctic Fox	1	0	1		Walking	
BR_21a	28-Dec-2012		1	22:07:42	22:07:49	M	6579	6588	10	1	Mammal	Arctic Fox	1	0	1		Running	
BR_21b	21-Jul-13		1	20:57:43	20:57:51	M	3601	3610	10	1	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_21b	26-Jul-13		1	18:06:47	18:09:08	M	601	640	40	4	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_21b	28-Jul-13		1	18:20:37	18:23:45	M	931	980	50	5	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_21b	5-Aug-13		1	21:34:52	21:35:28	M	2152	2171	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_22a	3-Sep-2012		1	19:27:09	19:28:30	M	723	772	50	5	Mammal	Unknown	1	0	1		Other	
BR_22b	15-Jul-13		1	16:44:24	16:55:20	M	3264	3413	150	15	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_22b	5-Aug-13		1	1:27:27	1:27:37	M	2341	2350	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_23a	28-Aug-2012		1	7:39:50	7:39:58	M	321	330	10	1	Bird	Bird	5	0	5		Flying	Geese. Only in first photo.
BR_23a	5-Sep-2012			9:00:00		T	717		1		Bird	Bird	8	0	8		Standing	Geese
BR_23b	17-May-13		1	22:20:03	22:22:28	M	318	347	30	3	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_23b	18-May-13		1	2:21:21	2:21:28	M	356	365	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_24a	17-Sep-2012		1	11:09:05	11:14:53	M	1265	1534	270	27	Mammal	Grizzly Bear	1	1	2		Other	Playing with camera, rolling around, etc. One appears to be a juvenile.
BR_24a	28-Sep-2012		1	4:11:30	4:11:36	M	2059	2068	10	1	Mammal	Grey Wolf	1	0	1		Standing	
BR_24a	29-Sep-2012		1	10:07:23	11:26:53	M	2129	2520	392	39	Mammal	Grizzly Bear	3	0	3		Other	Playing with camera. May be same group as before. Third seen at 2491 down the hill.
BR_24a	3-Oct-2012		1	18:30:31	18:40:55	M	2728	2917	190	19	Mammal	Grizzly Bear	2	0	2		Other	Playing with camera. Probably same as previous.
BR_24a	27-Apr-2013		1	20:30:09	20:30:17	M	2831	2840	10	1	Bird	Snowy Owl	1	0	1		Flying	
BR_24b	26-May-13		1	12:14:12	12:17:05	M	656	735	80	8	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_24b	11-Jul-13		1	13:23:21	13:28:09	M	3186	3205	20	2	Bird	Bald Eagle	1	0	1	-	Sitting	-
BR_25a	4-Sep-2012		1	19:32:38	19:34:08	M	698	747	50	5	Mammal	Grizzly Bear	1	0	1		Other	Attacking tripod
BR_25b	22-May-13		-	0:30:00	-	T	552	-	1	-	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_25b	1-Jun-13		1	13:50:12	13:50:20	M	1059	1068	10	1	Mammal	Grey Wolf	1	0	1	-	Running	-
BR_25b	21-Jun-13		-	11:30:00	-	T	2024	1	-	-	Bird	Bald Eagle	1	0	1	-	Sitting	-
BR_25b	21-Jul-13		-	13:30:00	15:30:00	T	3468	3472	5	-	Bird	Bald Eagle	1	0	1	-	Sitting	-
BR_25b	30-Jul-13		1	23:40:30	23:42:50	M	1202	12221	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	wolf or fox?
BR_26a	14-Nov-2012		Snow	7:30:00		T	3867								0			
BR_26b	16-Nov-2012		Clear		13:00:00	T		3974							0			
BR_27a	22-Sep-2012		1	20:04:11	20:04:19	M	745	754	10	1	Mammal	Grey Wolf	1	0	1		Walking	
BR_27a	25-Sep-2012		1	11:12:15	11:12:22	M	881	890	10	1	Mammal	Grey Wolf	1	0	1		Walking	Looks like the same as previous. Also two birds flying by.
BR_27a	28-Sep-2012		1	12:30:41	12:30:47	M	1038	1047	10	1	Mammal	Grey Wolf	1	0	1		Walking	Looks like the same as previous.
BR_27a	11-Oct-2012		1	18:41:35	18:41:43	M	1684	1693	10	1	Mammal		1	0	1	Bull Moose	Walking	Moose
BR_27a	16-Oct-2012		1	15:31	15:31:17	M	2158	2167	10	1	Mammal	Grey Wolf	1	0	1		Running	Looks like the same wolf as before.
BR_27a	30-Oct-2012		1	19:59:40	20:00:05	M	2858	2888	31	3	Mammal	Wolverine	1	0	1		Walking	
BR_27a	30-Mar-2013		1	1:58:36	1:58:44	M	84	93	10	1	Mammal	Red Fox	1	0	1		Standing	
BR_27a	31-Mar-2013		1	6:16:40	6:16:48	M	151	160	10	1	Mammal	Red Fox	1	0	1		Standing	Only in first photo of series
BR_27a	2-Apr-2013		1	1:11:29	1:18:10	M	317	446	130	13	Mammal	Wolverine	1	0	1		Walking	
BR_27a	2-Apr-2013		2	21:17:10	21:17:17	M	487	496	10	1	Mammal	Red Fox	1	0	1		Running	
BR_27a	7-Apr-2013		1	22:33:17	22:33:40	M	740	759	20	2	Mammal	Red Fox	1	0	1		Running	

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_27a	12-Apr-2013		1	0:20:05	0:21:08	M	965	1024	60	6	Mammal	Wolverine	1	0	1		Walking	
BR_27a	15-Apr-2013		1	17:01:00	17:20:50	M	163	352	190	19	Mammal	Wolverine	1	0	1		Other	Walking, climbing, eating
BR_27a	22-Apr-2013		1	2:02:15	2:08:41	M	659	678	20	2	Mammal	Red Fox	1	0	1		Running	
BR_27a	26-Apr-2013		1	22:57:41	22:59:10	M	912	931	20	2	Mammal	Red Fox	1	0	1		Running	
BR_27a	1-May-2013		1	20:00:59	20:02:39	M	1497	1556	60	6	Mammal	Red Fox	1	0	1		Walking	
BR_27b	20-May-13		1	3:13:55	3:14:56	M	716	735	20	2	Mammal	Fox	1	0	1	-	Hunting	-
BR_27b	23-May-13		1	1:06:02	1:06:09	M	886	896	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_27b	25-May-13		-	7:30:00	-	T	1004	-	1	-	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	4-Jun-13		1	21:47:16	21:48:27	M	1533	1572	40	4	Mammal	Grey Wolf	1	0	1	-	Hunting	-
BR_27b	10-Jun-13		1	4:06:08	4:06:33	M	1826	1845	20	2	Mammal	Fox	1	0	1	-	Hunting	-
BR_27b	19-Jun-13		1	9:50:22	9:50:57	M	2289	2308	20	2	Mammal	Grey Wolf	3	0	3	-	Walking	Adult + 2 juvenile?
BR_27b	21-Jun-13		1	2:56:38	2:59:14	M	2401	2480	80	8	Mammal	Grizzly Bear	1	0	1	-	Walking	Brown
BR_27b	26-Jun-13		1	11:17:52	11:20:31	M	2738	2887	150	15	Mammal	Grizzly Bear	1	0	1	-	Walking	Golden
BR_27b	27-Jun-13		1	13:35:16	13:37:30	M	2941	3040	100	10	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_27b	3-Jul-13		1	18:39:50	18:40:27	M	3349	3368	20	2	Mammal	Wolverine	1	0	1	-	Walking	-
BR_27b	6-Jul-13		1	1:20:25	1:25:58	M	3478	3637	160	16	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	8-Jul-13		1	22:26:54	22:27:08	M	3776	3795	20	2	Mammal	Grey Wolf	1	0	1	-	Hunting	-
BR_27b	13-Jul-13		1	3:05:55	3:11:12	M	3998	4107	110	10	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	18-Jul-13		1	10:50:48	10:54:46	M	306	375	70	7	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_27b	18-Jul-13		1	4:44:50	4:45:11	M	1283	1302	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	24-Jul-13		1	12:21:47	12:24:21	M	1349	1408	60	6	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	25-Jul-13		1	16:41:53	16:42:19	M	1579	1598	20	2	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	26-Jul-13		1	3:06:17	3:06:26	M	1661	1670	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	28-Jul-13		1	20:12:21	8:17:24	M	2062	2171	110	11	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	28-Jul-13		2	20:25:02	20:33:46	M	2185	2255	80	8	Mammal	Grey Wolf	1	0	1	-	Running	-
BR_27b	29-Jul-13		1	2:24:09	2:29:46	M	2279	2438	160	16	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	1-Aug-13		1	15:35:50	15:39:27	M	2950	3039	90	9	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	1-Aug-13		2	21:01:32	21:03:03	M	3073	3102	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	3-Aug-13		1	6:12:45	6:12:55	M	3302	3311	10	1	Bird	Bird	1	4	5	-	Walking	NOPI Brood; 2 other triggers not recorded.
BR_27b	4-Aug-13		1	14:58:58	15:07:15	M	3538	3658	120	12	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	5-Aug-13		1	0:42:03	0:47:50	M	3717	3816	100	10	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	7-Aug-13		1	4:06:55	4:07:05	M	4145	4154	10	1	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_27b	9-Aug-13		1	18:07:31	18:07:41	M	4527	4536	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_27b	9-Aug-13		2	18:22:44	18:27:08	M	4539	4658	120	10	Mammal	Grizzly Bear	1	2	3	-	Walking	-
BR_27b	10-Aug-13		1	12:54:21	12:54:31	M	4770	4779	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	11-Aug-13		1	18:36:22	18:36:32	M	4958	4967	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	19-Aug-13		1	10:10:21	10:10:31	M	6070	6079	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_27b	25-Aug-13		1	9:20:14	9:27:33	M	6939	7028	90	9	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_27b	25-Aug-13		2	16:06:41	16:09:23	M	7069	7138	70	7	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_28a	12-Feb-2013		1	11:45:26	11:46:39	M	8299	8328	30	3	Mammal	Grey Wolf	2	0	2		Walking	
BR_28a	20-May-13		1	8:56:00	8:57:05	M	442	491	50	5	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_28a	3-Aug-13		1	0:58:56	0:59:06	M	1380	1389	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_28a	16-Aug-13		1	22:45:56	22:46:06	M	3463	3472	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_28a	16-Aug-13		2	22:46:36	22:46:45	M	3473	3482	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	Different wolf from previous series as has smaller build
BR_28a	24-Aug-13		1	20:18:30	20:18:39	M	4620	4629	10	1	Mammal	Unknown	1	0	1	brown large	Other	Large brown entity knocked down camera; likely Grizzly?
BR_29a	7-Sep-2012		1	19:11:16	19:15:11	M	708	857	150	15	Mammal	Grizzly Bear		2	2	Juvenile?	Other	Rolling around. One or both appear to be juvenile.

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_29a	19-May-13		1	11:59:57	12:12:57	M	363	743	380	38	Mammal	Grizzly Bear	2	0	2	-	Walking	-
BR_29a	31-May-13		1	6:11:59	6:15:34	M	1308	1417	110	11	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_29a	4-Jun-13		1	15:38:56	15:39:03	M	1629	1638	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_29a	12-Jun-13		1	5:02:29	5:17:52	M	2002	2301	300	30	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_29a	12-Jun-13		Knocked Over	5:17:52	-	-	-	-	-	-	-	-	-	0	0	-	-	knocked over to end; still able to identify wolves
BR_29a	18-Jun-13		1	4:56:16	4:56:24	M	2679	2688	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_29a	22-Jun-13		1	22:59:47	23:00:01	M	3087	3107	20	1	Mammal	Grey Wolf	2	0	2	-	Walking	-
BR_29a	13-Jul-13		1	1:49:02	1:49:09	M	4203	4212	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_29a	8-Aug-13		1	5:43:19	5:43:29	M	2446	2455	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_30a	25-Aug-2012		1	7:45:59	7:48:06	M	315	374	60	6	Mammal	Grizzly Bear	1	0	1		Other	At camera
BR_30a	28-Aug-2012		1	8:08:07	8:08:12	M	520	529	10	1	Bird	Raptor	1	0	1	Bald eagle	Sitting	
BR_30a	30-Aug-2012		1	6:34:23	6:35:05	M	623	642	20	2	Mammal	Grizzly Bear	1	0	1		Other	At camera
BR_30a	29-Nov-2012		1	4:01:18	4:03:59	M	5036	5085	50	5	Mammal	Grey Wolf	3	0	3		Walking	
BR_30a	14-Feb-2013		1	16:06:37	16:07:30	M	8806	8855	50	5	Mammal	Grey Wolf	2	0	2		Walking	
BR_30a	26-Apr-2013			8:30:00		T	2429		1		Mammal	Red Fox	1	0	1		Walking	Red Fox?
BR_30a	30-Apr-2013		1	8:42:17	8:42:25	M	2622	2631	10	1	Mammal	Red Fox	1	0	1		Walking	
BR_30a	19-May-13		1	11:18:17	11:18:25	M	562	571	10	1	Mammal	Unknown	1	0	1	hairs	Standing	
BR_30a	4-Jun-13		1	8:54:25	8:54:36	M	1625	1634	10	1	Mammal	Unknown	1	0	1	hairs	Standing	Grizzly Bear?
BR_30a	5-Jun-13		1	8:50:40	8:50:47	M	1683	1692	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_30a	11-Jun-13		1	3:16:13	3:16:20	M	1970	1979	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_30a	27-Jul-13		1	9:25:01	9:25:29	M	4470	4489	20	2	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_31a	19-May-13		1	15:46:01	15:46:41	M	181	201	21	7	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_31a	27-May-13		1	2:39:13	2:39:59	M	202	222	21	7	Mammal	Grey Wolf	1	0	1	-	Standing	Appears to have evidence of blood on right half of body
BR_31a	27-May-13		2	7:17:43	7:17:45	M	223	225	3	1	Mammal	Grey Wolf	1	0	1	-	Standing	Likely a different wolf from previous series
BR_31a	22-Jul-13		1	8:36:41	8:37:08	M	78	97	20	1	Mammal	Grizzly Bear	1	0	1	-	Walking	Inspected camera, did not knock down
BR_32a	9-Jun-13		1	20:36:04	20:36:41	M	8719	8733	15	2	Mammal	Grizzly Bear	1	0	1	-	Standing	
BR_32a	14-Aug-13		1	8:53:25	8:53:39	M	5107	5116	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_32a	26-Aug-13		1	17:39:49	17:41:06	M	8917	8947	30	3	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_33a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No wildlife photos.
BR_34a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-
BR_34a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	
BR_35a	25-May-13		1	15:33:03	15:33:12	M	2475	2484	10	1	Mammal	Wolverine	1	0	1	-	Walking	-
BR_35a	28-May-13		1	3:17:43	3:17:53	M	2843	2852	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_35a	29-May-13		1	8:42:50	8:42:59	M	3030	3039	10	1	Mammal	Grey Wolf	1	0	1	-	Running	-
BR_35a	8-Jun-13		1	7:16:20	7:17:53	M	4511	4540	30	3	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_35a	10-Aug-13		1	1:45:27	1:45:36	M	2385	2394	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_35a	10-Aug-13		2	2:33:43	2:33:52	M	2400	2409	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_35a	10-Aug-13		3	2:38:19	2:38:28	M	2410	2419	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_35a	11-Aug-13		1	22:00:58	22:01:08	M	2681	2690	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_35a	22-Aug-13		1	13:45:47	13:45:56	M	4255	4264	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_36a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No Wildlife photos
BR_37a	3-Jun-13		1	16:23:34	16:32:47	M	5111	5201	90	9	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_37a	27-Jun-13		1	18:17:16	19:00:08	M	829	853	20	2	Mammal	Arctic Fox	1	0	1	-	Running	-
BR_37a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No Wildlife Photos
BR_38a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	
BR_39a	16-May-13		1	12:05:47	12:05:58	M	1258	1267	10	1	Mammal	Wolverine	1	0	1	-	Standing	Wolverine or Grizzly?

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_39a	18-Jul-13		1	18:04:58	18:08:11	M	3967	4006	40	4	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_39a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No Wildlife Photos
BR_40a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No Wildlife Photos
BR_42a	17-Jun-13		1	11:07:09	11:07:18	M	8436	8445	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_42a	22-Jun-13		-	9:00:00	-	T	9543	-	1	-	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_42a	24-Jun-13		1	6:40:01	6:40:10	M	9908	9917	10	1	Mammal	Unknown	1	0	1	White/tan large in center of screen on shore of lake	Walking	Unknown mammal? Perhaps grizzly?
BR_43a	4-Jun-13		1	11:56:54	11:57:04	M	7607	7616	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_43a	6-Jun-13		1	7:18:36	7:18:45	M	8027	8036	10	1	Mammal	Grey Wolf	1	0	1	-	Standing	-
BR_44a	26-May-13		1	1:30:01	1:30:10	M	6615	6624	10	1	Mammal	Unknown	1	0	1	white/tan mammal like	Running	Looks like wolverine running?
BR_45a	24-Jun-13		-	14:00:00	-	T	7373	-	1	-	Mammal	Muskox	9	0	9	Herd of Muskox	Grazing	-
BR_45a	24-Jun-13		-	14:30:00	-	T	7376	-	1	-	Mammal	Muskox	3	0	3	-	Grazing	-
BR_46a	11-Jun-13		1	0:51:01	0:51:01	M	3173	3182	10	1	Mammal	Wolverine	1	0	1	-	Running	-
BR_47a	27-Jul-13		1	19:29:56	19:30:08	M	1822	1832	10	1	Mammal	Grizzly Bear	1	0	1	-	Standing	-
BR_48a	26-May-13		1	17:40:01	17:44:01	M	1839	1898	60	1	Mammal	Grizzly Bear	1	0	1	-	Walking	-
BR_48a	31-Jul-13		2	9:30:01	9:30:48	M	2330	2349	20	2	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_48a	7-Aug-13		1	21:00:01	21:00:10	M	3314	3323	10	1	Mammal	Grey Wolf	1	0	1	-	Running	
BR_49a	18-Jun-13		1	5:40:01	5:40:10	M	2770	2779	10	1	Bird	Bird	1	0	1	-	Other	GOEA in ground in front of camera
BR_49a	18-Jun-13		2	11:18:39	11:21:20	M	2883	2913	30	3	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_49a	19-Jun-13		1	16:43:41	16:44:59	M	2956	2975	20	2	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_49a	24-Jun-13		1	1:30:01	1:36:54	M	4429	4488	60	6	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_49a	19-Jul-13		1	9:43:18	9:43:27	M	1611	1620	10	1	Unknown	Unknown	1	0	1	-	Other	
BR_49a	20-Jul-13		1	19:50:01	1:10:10	M	1854	1945	90	9	Unknown	Unknown	1	0	1	-	Other	
BR_49a	28-Jul-13		1	13:20:01	13:20:10	M	2277	2286	10	1	Mammal	Unknown	1	0	1	brown/white entity running	Running	Mammal, looks like canid (wolf, fox)?
BR_50a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-
BR_50a	28-Jul-13		1	7:45:31	7:45:41	M	1025	1034	10	1	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_50a	15-Aug-13		1	5:25:20	5:25:29	M	3733	3742	10	1	Mammal	Grey Wolf	1	0	1	-	Other	-
BR_51a	28-May-13		1	12:25:34	12:27:25	M	2033	2052	20	2	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_51a	1-Jun-13		1	7:10:01	7:10:10	M	7068	7077	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_51a	1-Jun-13		2	9:00:01	9:00:10	M	7189	7198	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_52a	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	
BR_52a	1-Aug-13		3	21:28:25	21:28:34	M	1548	1557	10	1	Mammal	Grey Wolf	1	0	1	-	Other	-
BR_53a	15-May-13		1	11:47:28	11:47:37	M	735	744	10	1	Mammal	Wolverine	1	0	1	-	Standing	
BR_53b	-		-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	No wildlife photos; 10,000 false triggers
BR_54a	22-May-13		1	19:20:01	19:20:10	M	2008	2017	10	1	Mammal	Unknown	1	0	1	canid like	Other	
BR_55a	4-Jun-13		1	6:21:12	6:25:37	M	4111	4170	60	6	Mammal	Grizzly Bear	1	0	1	-	Other	Knocked down grizzly tripod.
BR_55a	6-Jul-13		1	6:46:12	6:48:19	M	912	931	20	2	Mammal	Grizzly Bear	1	0	1	-	Other	Knocked down grizzly tripod.
BR_55a	15-Jul-13		1	22:50:05	22:50:14	M	446	455	10	1	Mammal	Grizzly Bear	1	0	1	-	Other	Knocked down grizzly tripod.
BR_55a	18-Jul-13		1	1:23:35	1:23:44	M	899	908	10	1	Mammal	Unknown	1	0	1	eyelashes or hairs on nose	Other	Looks like eyelashes of a mammal?
BR_55a	26-Jul-13		1	5:20:01	5:20:10	M	960	969	10	1	Mammal	Wolverine	1	0	1	-	Other	Rolling on scent at Grizzly bear Tripod.
BR_55a	12-Aug-13		1	10:23:06	10:26:44	M	4760	4809	50	5	Mammal	Grizzly Bear	1	2	3	-	Other	Rolling on scent at Grizzly bear Tripod. Knocked Tripod Down.
BR_56a	14-May-13		1	13:43:12	13:44:42	M	147	156	10	1	Mammal	Wolverine	1		1		Sniffing	
BR_56a	18-May-13		1	13:30:28	13:31:58	M	1482	1491	10	1	Mammal	Red Fox	1		1	Carrying prey - looks like ground squirrel	Walking	Can see fox tracks parallel to camera

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_56a	19-May-13										Bird	Greater White-fronted Goose	1		1			
BR_56a	20-May-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	20-May-13										Bird	Canada Goose	1		1			At least one, seen multiple times during day
BR_56a	21-May-13		1	5:53:10	5:54:40	M	2158	2167	10	1	Mammal	Grey Wolf	2		2	Assume mated pair - male and female	Walking, Sniffing	Sex assumed due to urination postures
BR_56a	21-May-13		2	6:00:50	6:02:20	M	2169	2178	10	1	Mammal	Grey Wolf	2		2	Mated pair	Walking, Sniffing,	
BR_56a	23-May-13										Bird	GWFG	1		1			At least one, seen multiple times during day
BR_56a	24-May-13		1	7:30:49	7:32:19	M	2880	2889	10	1	Mammal	Grey Wolf	1		1		Walking	
BR_56a	27-May-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	28-May-13		1	2:15:27	2:16:57	M	3804	3813	10	1	Mammal	Grey Wolf	2		2	Mated pair?	Walking	
BR_56a	28-May-13		2	2:28:24	2:29:54	M	3815	3824	10	1	Mammal	Grey Wolf	2		2	Mated pair	Walking	
BR_56a	28-May-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	30-May-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	31-May-13		1	0:16:15	0:17:45	M	4644	4653	10	1	Mammal	Grey Wolf	1		1		Walking	
BR_56a	31-May-13		2	0:30:02	0:31:32	M	4656	4665	10	1	Mammal	Grey Wolf	1		1		Walking, Sniffing	
BR_56a	1-Jun-13		1	12:36:02	12:37:32	M	5102	5111	10	1	Mammal	Grey Wolf	1		1	Potentially 2	Walking	
BR_56a	1-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	2-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	3-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	4-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	5-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	5-Jun-13										Bird	Large shorebird?	1		1			
BR_56a	6-Jun-13										Bird	Greater White-fronted Goose	1		1			At least one, seen multiple times during day
BR_56a	7-Jun-13										Bird	Greater White-fronted Goose	1		1			
BR_56a	8-Jun-13										Bird	Greater White-fronted Goose	1		1			
BR_56a	9-Jun-13		1	13:35:55	13:37:25	M	7180	7189	10	1	Mammal	Grey Wolf	2		2	Mated pair?	Walking	
BR_56a	9-Jun-13		2	18:23:46	18:25:16	M	7269	7278	10	1	Mammal	Grey Wolf	1		1	2nd animal might be present	Walking, Sniffing	
BR_56a	21-Jun-13										Bird	Canada Goose	1		1			At least one, V formation flying
BR_56a	28-Jun-13		1	18:48:11	18:49:41	M	1818	1827	10	1	Avian	Golden Eagle	1		1	Adult	Flying	
BR_56a	3-Jul-13			11:00:00		T	2771				Mammal	Grey Wolf	1		1	Adult	Sniffing	
BR_56a	6-Jul-13		1	1:16:49	1:18:19	M	3425	3434	10	1	Mammal	Grey Wolf	1		1	Adult with dark saddle	Walking	
BR_56a	6-Jul-13		2	9:08:33	9:09:53	M	3482	3490	9	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Walking	
BR_56a	6-Jul-13		3	10:59:37	11:01:07	M	3503	3513	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Running	
BR_56a	6-Jul-13		4	18:18:54	18:20:24	M	3567	3577	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Walking	
BR_56a	6-Jul-13		5	23:22:55	23:24:25	M	3608	3617	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Sniffing	
BR_56a	7-Jul-13		1	2:20:20	2:21:50	M	3686	3695	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Walking, Sniffing	
BR_56a	8-Jul-13		1	6:30:01	6:31:31	M	3995	4004	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Walking	
BR_56a	8-Jul-13		2	20:57:40	20:59:10	M	4171	4180	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Running	
BR_56a	9-Jul-13		1	20:02:14	20:03:44	M	4350	4359	10	1	Mammal	Grey Wolf	1		1	Adult	Walking, Sniffing	
BR_56a	10-Jul-13		1	23:43:28	23:44:58	M	4726	4735	10	1	Mammal	Grey Wolf	1		1	Adult - dark saddle	Running	
BR_56a	11-Jul-13		1	7:27:28	7:28:58	M	4842	4851	10	1	Mammal	Grey Wolf	1		1	Adult	Sniffing	
BR_56a	11-Jul-13		2	16:51:03	16:52:33	M	4969	4978	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	11-Jul-13		3	22:30:02	22:31:32	M	5033	5042	10	1	Mammal	Grey Wolf	1		1	Adult with prey	Walking	
BR_56a	13-Jul-13		1	5:53:25	5:54:55	M	5341	5350	10	1	Mammal	Grey Wolf	1		1	Adult - light colouring	Walking	
BR_56a	14-Jul-13		1	2:46:42	2:48:12	M	5586	5595	10	1	Mammal	Grey Wolf	1		1	Just see tail	Walking	

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_56a	19-Jul-13		1	13:58:20	13:59:50	M	6993	7002	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	19-Jul-13		2	19:56:49	19:58:19	M	7049	7058	10	1	Mammal	Grey Wolf	1		1	Adult	Walking, Standing	
BR_56a	20-Jul-13		1	3:51:14	3:52:44	M	7177	7186	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking, Sitting	
BR_56a	20-Jul-13		2	7:44:01	7:45:31	M	7210	7219	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	20-Jul-13		3	9:23:41	9:25:11	M	7230	7239	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	20-Jul-13		4	9:56:42	9:58:12	M	7243	7252	10	1	Mammal	Grey Wolf	1	1	2	Adults - one darker and one lighter	Walking	
BR_56a	20-Jul-13		4	14:56:35	14:38:05	M	7293	7302	10	1	Mammal	Grey Wolf	1	1	2	Light coloured adult and pup	Walking, Sitting	
BR_56a	20-Jul-13			15:00:00		T	7303				Mammal	Grey Wolf	1		1	Adult - light colouring	Standing	
BR_56a	20-Jul-13		5	15:17:46	15:19:16	M	7315	7324	10	1	Mammal	Grey Wolf	1		1	Adult - just tail/bum	Walking	
BR_56a	20-Jul-13		6	18:38:11	18:39:41	M	7355	7364	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking	
BR_56a	20-Jul-13		7	20:35:11	20:36:41	M	7377	7386	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	20-Jul-13		8	21:27:23	21:28:53	M	7402	7411	10	1	Mammal	Grey Wolf		1	1	Pup	Running	
BR_56a	20-Jul-13			21:30:00		T	7412				Mammal	Grey Wolf	1		1	Adult	Standing	
BR_56a	20-Jul-13			23:40:00		T	7425				Mammal	Grey Wolf		1	1	Pup	Sitting	
BR_56a	21-Jul-13			0:50:00		T	7432				Mammal	Grey Wolf		2	2	Pups	Playing	
BR_56a	21-Jul-13		1	0:50:17	3:47:00	M	7433	7442	10	1	Mammal	Grey Wolf		4	4	Pups, potentially more	Playing	Might be 4-5 pups - hard to tell
BR_56a	21-Jul-13		2	5:32:28	5:33:58	M	7481	7490	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	22-Jul-13		1	1:50:57	1:52:27	M	7693	7702	10	1	Mammal	Grey Wolf		2	2	Pups	Running	
BR_56a	22-Jul-13		2	15:48:29	15:49:59	M	7896	7905	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	23-Jul-13		1	1:21:16	1:22:46	M	8004	8013	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking	
BR_56a	23-Jul-13		2	1:51:05	1:52:35	M	8017	8026	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	23-Jul-13		3	3:08:28	3:09:58	M	8044	8053	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking	
BR_56a	23-Jul-13			3:30:00		T	8056				Mammal	Grey Wolf		1	1	Pup	Sitting	
BR_56a	23-Jul-13		4	4:20:02	4:21:32	M	8062	8071	10	1	Mammal	Grey Wolf		1	1	Pup	Walking, Standing	
BR_56a	23-Jul-13		5	4:40:01	4:41:31	M	8074	8083	10	1	Mammal	Grey Wolf		1	1	Pup	Sitting	
BR_56a	23-Jul-13			7:40:00		T	8111				Mammal	Grey Wolf		1	1	Pup	Walking	
BR_56a	23-Jul-13		6	7:40:01	7:41:31	M	8112	8121	10	1	Mammal	Grey Wolf		1	1	Pup	Walking	
BR_56a	23-Jul-13		7	20:11:57	20:13:27	M	8217	8226	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	23-Jul-13		8	21:15:20	21:16:50	M	8233	8242	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	23-Jul-13		9	21:50:38	21:52:08	M	8247	8256	10	1	Mammal	Grey Wolf	1	3	4	Adult and 3 pups	Feeding pups	
BR_56a	23-Jul-13		10	22:47:10	22:48:40	M	8282	8291	10	1	Mammal	Grey Wolf	2	1	3	2 adults and 1 pup	Running, Resting	
BR_56a	24-Jul-13		1	17:34:27	17:35:57	M	8455	8464	10	1	Mammal	Grey Wolf	1	3	4	Adult and 3 pups	Running	
BR_56a	24-Jul-13			18:10:00		T	8468				Mammal	Grey Wolf	1		1	Adult	Resting	
BR_56a	24-Jul-13		1	22:50:30	22:52:00	M	8527	8536	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Running	
BR_56a	25-Jul-13		1	2:19:17	2:20:47	M	8557	8567	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking	
BR_56a	25-Jul-13		2	6:33:42	6:35:12	M	8603	8612	10	1	Mammal	Grey Wolf	1	3	4	Adult and 3 pups	Walking	
BR_56a	25-Jul-13		3	6:41:42	6:43:12	M	8614	8623	10	1	Mammal	Grey Wolf	1	1	2	Adult and pup	Walking	
BR_56a	25-Jul-13		4	9:45:28	9:46:58	M	8662	8671	10	1	Mammal	Grey Wolf	1	3	4	Adult and 3 pups	Walking, Feeding	
BR_56a	25-Jul-13		5	11:21:00	11:22:30	M	8682	8691	10	1	Mammal	Grey Wolf	1	2	3	Adult and 2 pups	Walking, Begging	Pup is begging from adult
BR_56a	25-Jul-13			13:20:00		T	8703				Mammal	Grey Wolf		1	1	Pup	Pooping	
BR_56a	25-Jul-13		6	19:59:28	20:00:58	M	8763	8773	10	1	Mammal	Grey Wolf		1	1	Pup	Walking	
BR_56a	27-Jul-13		1	3:21:56	3:23:26	M	9092	9101	10	1	Mammal	Grey Wolf	1		1	Adult	Walking	
BR_56a	27-Jul-13		2	19:57:49	20:00:00	M	9301	9311	11	1	Mammal	Grizzly Bear	1		1	Adult	Walking, Sniffing	Bear knocks camera over in T shot 9311
BR_56a	29-Jul-13		1	4:41:50		M	9569		1		Mammal	Grey Wolf	1		1	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole

Appendix 9-3. Images of Wildlife Captured by Remote Cameras, August 2012 to August 2013

Camera Number/ Location	Date	Seasonal Period for Caribou	Series	Start Time	End Time	PhotoType	Start Photo #	End Photo #	# of Photos	# of Triggers	Animal Group	Species	# Adults	# Young	Total Observed	Description of Wildlife	Behaviour	Comment
BR_56a	29-Jul-13		2	6:19:29		M	9587		1		Mammal	Canid	1		1	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole
BR_56a	29-Jul-13		3	12:21:51	12:23:21	M	9664	9673	10	1	Mammal	Canid	1		1	Edge of face	Sniffing at camera	
BR_56a	30-Jul-13		1	14:33:41		M	9991		1		Mammal	Unsure	1		1	Edge of face	Sniffing at camera	Only included photos with animal in it rather than whole
BR_56a	1-Aug-13		1	9:46:09	9:47:39	M	921	930	10	1	Mammal	Grey Wolf	1		1	Face	Sniffing at camera	
BR_56a	1-Aug-13		2	10:24:51	10:26:21	M	935	944	10	1	Mammal	Grey Wolf	1		1	Edge of face and ear	Sniffing at camera	
BR_56a	2-Aug-13		1	12:04:33	12:06:03	M	1179	1188	10	1	Mammal	Unsure	1		1	Edge of face and ear	Sniffing at camera	
BR_56a	4-Aug-13		1	5:15:10		M	1558	1559	2	1	Mammal	Unsure	1		1	Part of face, eye, and ear	Sniffing at camera	Only included photos with animal in it rather than whole
BR_56a	8-Aug-13		1	7:35:23		M	2616		1	1	Mammal	Unsure	1		1	Neck?	Sniffing at camera	Only included photos with animal in it rather than whole
BR_56a	8-Aug-13		2	17:51:34		M	2728		1	1	Avian	Long-tailed Jaegar	1		1		Flying	Only included photos with animal in it rather than whole
BR_56a	11-Aug-13		1	14:49:07		M	3401		1	1	Avian	Long-tailed Jaegar	1		1		Flying	Only included photos with animal in it rather than whole
BR_56a	14-Aug-13		1	11:21:18		M	3953		1	1	Avian	Long-tailed Jaegar	1		1		Flying	Only included photos with animal in it rather than whole
BR_56a	15-Aug-13		1	1:42:12	1:43:32	M	4059	4068	10	1	Mammal	Canid	1		1	Part of face, eye, and ear	Sniffing at camera	
BR_56a	21-Aug-13		1	14:33:03		M	6230		1	1	Mammal	Canid	1		1	Tail	Walking	Only included photos with animal in it rather than whole
BR_56a	23-Aug-13		1	22:36:34	22:38:04	M	7226	7235	10	1	Avian	Short-eared Owl	1		1	Face	Checking out	
BR_56a	24-Aug-13		1	7:55:43		M	7448		1	1	Mammal	Unsure	1		1		Checking out	Only included photos with animal in it rather than whole
BR_57a	9-Jul-13		1	6:15:43	6:17:13	M	1794	1803	10	1	Mammal	Grizzly Bear	1		1	Face	Sniffing at camera	
BR_57a	25-Jul-13		1	7:32:18	7:33:48	M	2349	2358	10	1	Mammal	Grizzly Bear	1		1	Face	Sniffing at camera, Walking	Bear pushed camera down at 8:00:00
BR_58a	17-May-13		1	16:56:11	16:57:41	M	2735	2744	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_58a	18-May-13		1	15:40:30	15:42:00	M	4571	4580	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_58a	30-Jul-13		1	21:13:34	21:13:43 PM	M	3508	3517	10	1	Mammal	Grey Wolf	1	0	1	-	Walking	-
BR_59a	-		-	-	-	-	-	-	-	-	-	-	-	0		-	-	No Wildlife photos
BR_59a	-		-	-	-	-	-	-	-	-	-	-	-	0		-	-	No Wildlife Photos
BR_59a	-		-	-	-	-	-	-	-	-	-	-	-	0		-	-	No Wildlife Photos
BR_60a	-		-	-	-	-	-	-	-	-	-	-	-	0		-	-	No wildlife photos. Motion Triggered.
BR_60a	-		-	-	-	-	-	-	-	-	-	-	-	0		-	-	No Wildlife Photos; photos only go up until 08/11/2013
BR_63a	5-Aug-13		2	7:35:40	7:35:49	M	1903	1912	10	1	Mammal	Arctic Fox	1	0	1	ears only, brown/white	Walking	Think the ears are Arctic Fox. Could be wolf as well.
BR_63a	5-Aug-13		3	22:26:45	22:29:51	M	2002	2051	50	5	Mammal	Grizzly Bear	1	0	1	-	Other	Large, brown, perhaps grizzly bear. Didn't knock over cam though?
BR_63a	7-Aug-13		1	5:58:51	5:59:30	M	2241	2280	40	4	Mammal	Grey Wolf	2	0	2	-	Other	-
BR_64a	26-Jul-13		1	21:10:04	21:10:16	M	698	707	10	1	Mammal	Grizzly Bear	1	0	1	-	Other	-
BR_65a	24-Aug-13		1	12:21:11	12:21:25	M	4256	4265	10	1	Mammal	Grizzly Bear	1	0	1	-	Other	Knocked down camera; Grizzly?

Appendix V5-5G

Back River Project: 2014 Wildlife Camera Baseline Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2014 Wildlife Camera Baseline Report

Rescan Environmental Services Ltd., an ERM company
ERM Rescan Building, 15th Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

December 2014

BACK RIVER PROJECT
2014 WILDLIFE CAMERA BASELINE REPORT

December 2014
Project #0234411-0025 (0833-002-05)

Citation:
Rescan. 2014. *Back River Project: 2014 Wildlife Camera Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan Environmental Services Ltd., an ERM company
Vancouver, British Columbia

Executive Summary

Rescan™
an ERM company

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. For 2014, the wildlife baseline program included setting out remote cameras in strategic locations and analysis of the camera data.

This report details the results of the remote camera study carried out from the fall of 2013 to the summer of 2014. The overall objective of the remote camera study was to document the presence, abundance, and distribution of wildlife, with particular emphasis on caribou.

A total of 90 Reconyx PC800 Professional digital cameras were deployed to monitor caribou and other wildlife in the terrestrial Regional Study Area (RSA) and along the Tibbitt to Contwoyto Lake Winter Road (TCWR) Winter Road Connector from August 2013 to July 2014. In May 2014, 25 cameras were collected from the terrestrial RSA and placed within the marine RSA, in order to monitor for the presence of caribou, specifically Dolphin and Union caribou, at and surrounding the Marine Laydown Area (MLA). Data were analyzed separately for those cameras located in the terrestrial RSA and along the TCWR Winter Road Connector from August 2013 to July 2013, and those cameras located in the marine RSA from May to July 2014.

Camera data indicate that there are seasonal patterns in the distribution of caribou within the region. Caribou numbers, as recorded by camera, were the highest during the summer and fall of 2013, with smaller peaks recorded over the winter (mid-November, 2013) and during the spring migration of 2014 (late April and mid-May). By comparison, relatively few caribou were recorded during the calving and post-calving periods of 2014 on any of the cameras. Similar trends in the seasonal abundance of caribou were recorded during the 2013 camera study (Rescan 2014), with high numbers of caribou recorded during the summer, very low numbers during the calving and post-calving periods, and varying numbers during the remaining seasonal periods.

Camera data, coupled with caribou collar data from the Bathurst Beverly/Ahaik, and Dolphin and Union caribou herds (Poole et al. 2010; Rescan 2014), suggests that the caribou recorded on images primarily belonged to the Beverly/Ahiak caribou herd. Beverly/Ahiak caribou summer, fall, and winter ranges overlap with the terrestrial RSA, and several spring migration paths have passed through the terrestrial RSA since collaring began for the herd in 2001. Further, Beverly/Ahiak calving and post-calving ranges are located well to the northeast of the Project. By comparison, Bathurst caribou calve a few hundred kilometers to the northwest of the Project, and summer to the southwest of the Project near Contwoyto Lake, and their fall and winter ranges are located to the south of their summer range, near and below the treeline. However, several Bathurst caribou have migrated across the lower half of the TCWR Winter Road Connector, and through the terrestrial RSA in the spring on their way to their calving grounds since 1996. Therefore, caribou detected on cameras during the spring migration of 2014 may have been Bathurst caribou. Dolphin and Union caribou spend the summer and fall on Victoria Island, and migrate across the newly formed sea ice in the Dolphin and Union Strait and Coronation Gulf in the late fall and winter. Collar data for Dolphin and Union caribou suggests that the majority of the herd spend the winter close to the coastline of the Arctic mainland before heading north across the sea ice in the spring, and thus it is unlikely that caribou recorded by cameras located in the terrestrial RSA or along the TCWR Winter Road Connector over the winter or by cameras located in the marine RSA during the spring belonged to the Dolphin and Union herd.

A number of other wildlife species were recorded by cameras, including 19 species of birds and 7 species of mammals. Bird species were infrequently recorded at remote cameras, possibly due to their small size, while mammal species, particularly grizzly bear, were frequently recorded. Grizzly bear were recorded at over half of all the cameras across their survey periods. Notable observations of other wildlife recorded by remote cameras include the documentation of a spring staging area for waterbirds at the south end of Beechey Lake, and the confirmation of successful breeding of grizzly bear and grey wolf through the observations of family groups in 2013 and 2014.

Acknowledgements

Rescan™
an ERM company

Acknowledgements

This report was prepared for Sabina Gold and Silver Corp. (Sabina) by Rescan Environmental Services Ltd., an ERM company (Rescan). Fieldwork was conducted by Julia Shewan (B.Sc.). Extensive field support was kindly provided by Sabina logistics team and camp management, Sabina Environmental Co-ordinators Merle Keefe and Cheryl Wray, as well as Great Slave Helicopters, and Det'on Cho Expediting. Fieldwork was conducted with the assistance of Sabina field assistants Merle Keefe, Cheryl Wray, Bryn Storm, and AJ Porter. Report writing was conducted by Julia Shewan and reviewed by Greg Sharam (Ph.D.) and Deborah Muggli (Ph.D., M.Sc., R.P.Bio).

Table of Contents

an ERM company

BACK RIVER PROJECT
2014 WILDLIFE CAMERA BASELINE REPORT

Table of Contents

Executive Summary i

Acknowledgements iii

Table of Contents v

List of Figures vi

List of Tables vi

List of Plates vii

List of Appendices vii

Glossary and Abbreviations ix

1. Introduction 1-1

2. Methods 2-1

2.1 Study Area 2-1

2.2 Remote Camera Study Design 2-1

2.3 Remote Camera Setup and Operations 2-2

2.4 Data Analysis 2-2

2.4.1 Evaluating Number of Caribou and Other Wildlife Recorded at Remote Cameras 2-7

2.4.2 Trends in Caribou Abundance and Distribution 2-7

2.4.2.1 Caribou Detection Rates 2-7

2.4.2.2 Temporal Trends 2-8

3. Results 3-1

3.1 Terrestrial RSA and TCWR Winter Road Connector Cameras 3-1

3.1.1 Survey Period 3-1

3.1.2 Trends in Caribou Abundance and Distribution 3-1

3.1.2.1 Caribou Detection Rates 3-1

3.1.2.2 Temporal Trends 3-1

3.1.3 Other Wildlife Recorded by Remote Camera 3-6

3.1.3.1 Birds 3-6

3.1.3.2 Mammals 3-10

3.2 MLA and Marine RSA Cameras 3-12

3.2.1 Survey Period 3-12

3.2.2 Trends in Caribou Abundance and Distribution 3-12
3.2.2.1 Caribou Detection Rates 3-13
3.2.2.2 Temporal Trends 3-13
3.2.3 Other Wildlife Recorded by Remote Camera 3-13
3.2.3.1 Birds 3-13
3.2.3.2 Mammals 3-18

4. Summary and Discussion 4-1
4.1 Caribou 4-1
4.2 Other Wildlife 4-2

References R-1

List of Figures

FIGURE **PAGE**

Figure 1-1. Back River Project Location 1-2

Figure 2.1-1. Remote Camera Locations, Terrestrial RSA and TCWR Winter Road Connector, August 2013 to July 2014 2-3

Figure 2.1-2. Remote Camera Locations, MLA and Marine RSA, May to July 2014 2-5

Figure 3.1-1. Number of Caribou Observed at Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014 3-3

Figure 3.1-2. Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Terrestrial RSA and TCWR Winter Road Connector Cameras, 2013 to 2014 3-5

Figure 3.2-1. Number of Caribou Observed at MLA and Marine RSA Cameras, May to July 2014 3-15

Figure 3.2-2. Temporal Trends in the Number of Caribou and Caribou Groups Recorded at MLA and Marine RSA Cameras, 2014 3-17

List of Tables

TABLE **PAGE**

Table 2.4-1. General Seasonal Period Dates for Bathurst and Beverly/Ahiak Caribou 2-8

Table 3.1-1. Bird Species Recorded by Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014 3-9

Table 3.1-2. Mammal Species Recorded by Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014 3-10

Table 3.2-1. Bird Species Recorded by MLA and Marine RSA Cameras, May to July 2014 3-13

Table 3.2-2. Mammal Species Recorded by MLA and Marine RSA Cameras, May to July 2014 3-18

List of Plates

PLATE **PAGE**

Plate 2.3-1. Set up of a remote camera in the marine RSA, May 2014. 2-2

Plate 3.1-1. Caribou recorded at Camera BR_47 located near the Goose Property Area, September 5, 2013. 3-2

Plate 3.1-2. Caribou recorded at Camera BR_82 located along the TCWR Winter Road Connector, September 21, 2013.....3-2

Plate 3.1-3. Caribou recorded at Camera BR_43 located near the Goose Property Area, November 18, 2013. 3-7

Plate 3.1-4. Caribou recorded at Camera BR_33 located near the Goose Property Area, November 22, 2013. 3-7

Plate 3.1-5. Caribou recorded at Camera BR_05 located within the George Potential Development Area (PDA), April 20, 2014.....3-8

Plate 3.1-6. Caribou recorded at Camera BR_67 located along the TCWR Winter Road Connector, May 14, 2014. 3-8

Plate 3.1-7. Flock of geese staging at the south end of Beechey Lake on May 17, 2014 (two greater white-fronted goose flying with numerous geese [indicated by red circle] along the ice). 3-10

Plate 3.1-8. Examples of mammals recorded by remote cameras, 2013 and 2014. 3-11

Plate 3.2-1. Caribou recorded at Camera BR_98 located to the southwest of the MLA, May 22, 2014. 3-14

Plate 3.2-2. Caribou recorded at Camera BR_114 located in the MLA PDA, May 23, 2014. 3-14

Plate 3.2-3. Grizzly bear family group recorded at Camera BR_113 located within the MLA PDA, May 23, 2014. 3-18

List of Appendices

Appendix 1. Remote Camera Locations and Setup Information

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Appendix 3. Images of Wildlife Captured by MLA and Marine RSA Remote Cameras, May to July 2014

Glossary and Abbreviations

Rescan™
an ERM company

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

CESCC	Canadian Endangered Species Conservation Council
COSEWIC	Committee on the Status of Endangered Wildlife in Canada – A federal committee of experts that assesses and designates the level of threat to wildlife and vegetation species in Canada.
Marine RSA	Marine Regional Study Area
MLA	Marine Laydown Area
PDA	Potential Development Area
Raptor	Birds of prey including hawks, eagles, falcons, and owls. Common raven is considered a functional raptor based on similar nesting preferences to other true raptor species in the Arctic.
Terrestrial RSA	Terrestrial Regional Study Area
Upland Bird	Passerines (with the exception of common raven, which is included as a functional raptor), shorebirds, and ptarmigan.
Waterbird	Umbrella term used to encompass all birds that exclusively use water habitat for foraging, breeding, or staging during the year.

1. Introduction

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). This report presents the results of the 2014 wildlife baseline program that was completed to support the ongoing permitting efforts for the Project.

The 2014 wildlife baseline program consisted of monitoring wildlife by remote camera. Remote cameras were initially used in 2012 and results from 2012 to the fall of 2013 can be found in Rescan (2013) and Rescan (2014). This report presents the results from the fall of 2013 to the summer of 2014.

The overall objective of the remote camera program is to document the presence, abundance, and distribution of wildlife, with particular emphasis on barren-ground caribou. Three caribou herds have been identified whose ranges overlap the area of the Project; the Bathurst herd, the Beverly herd (also known as the Ahiak herd), and the Dolphin and Union herd (Rescan 2013). The Dolphin and Union herd, named for the Dolphin and Union Strait, is considered to be a genetically distinct population of barren-ground caribou (*R. t. groenlandicus x pearyi*). Further information on these herds and their distribution and population can be found in Rescan (2014).

The main study areas of the remote camera program from the fall of 2013 to the summer of 2014 were the Goose and George Property Areas and the proposed Tibbitt to Contwoyto Lake Winter Road (TCWR) Winter Road Connector. In the spring of 2014, additional cameras were added to cover the Marine Laydown Area (MLA) in southern Bathurst Inlet.

Chapter 2 of this report presents the camera locations and methods, Chapter 3 presents the results, and Chapter 4 presents a short summary and discussion. Raw data are included as appendices to this report.

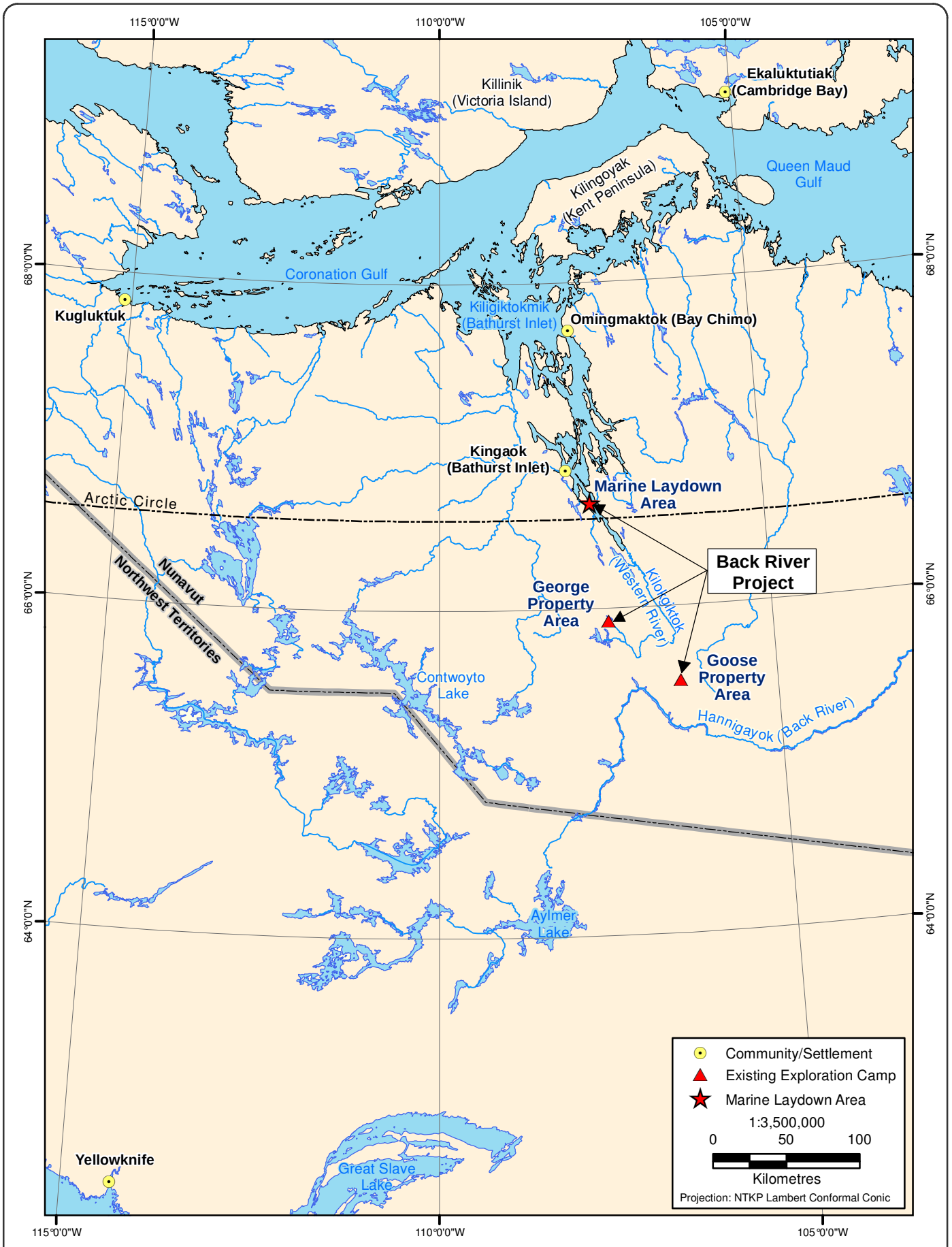


Figure 1-1

Back River Project Location

Sabina GOLD & SILVER CORP.

Rescan an ERM company

2. Methods

2. Methods

2.1 STUDY AREA

The remote camera program focused on both the Goose and George Properties and the regional study area surrounding them, the terrestrial Regional Study Area (RSA; Figure 2.1-1). A potential access corridor, the TCWR Winter Road Connector, was also covered in the remote camera program (Figure 2.1-1). Cameras were also placed in and around the Marine Laydown Area (MLA) located within the marine Regional Study Area (marine RSA; Figure 2.1-2).

The terrestrial RSA encompasses the Project's Potential Development Areas (PDAs) and a 35 km buffer on either side of proposed Project infrastructure and winter road corridors between the three Project areas (Goose Property Area, George Property Area, and the MLA). The study area for the TCWR Winter Road Connector includes the area of the proposed winter road alignment (which would vary from 10 m on land to 30 m over water) and areas within one kilometre from the alignment.

The marine RSA encompasses the MLA as well as the marine areas of Bathurst Inlet, from the southern-most tip of the Inlet to approximately 15 km north of Omingmaktok and is approximately 75 km in width.

2.2 REMOTE CAMERA STUDY DESIGN

From August 2013 to July 2014, 90 Reconyx PC800 Professional digital cameras were used to monitor the presence of wildlife, specifically caribou, within the terrestrial RSA and marine RSA. Remote cameras have been used since 2012 to document caribou seasonal presence at the Project (Rescan 2013, 2014).

From August 2013 to May 2014, a total of 90 cameras were placed within the terrestrial RSA in areas surrounding the Goose and George Property Areas and the MLA, and outside the terrestrial RSA along the TCWR Winter Road Connecter (Figure 2.1-1; Appendix 1). These cameras were deployed during the 2013 wildlife baseline program; further details on the 2013 study design and camera placement rationale can be found in Rescan (2014).

In May 2014, 25 cameras were collected from areas surrounding the Goose Property Area and the MLA, and were installed in the marine RSA at and surrounding the MLA (Figure 2.1-2; Appendix 1). These 25 cameras were deployed to monitor the seasonal presence of caribou at the MLA, specifically caribou from the Dolphin and Union herd during the winter of 2014/2015. Eleven cameras were placed within 10 km of the MLA in order to record caribou that may travel through or use areas of proposed infrastructure. The remaining 14 cameras were placed further than 10 km from the MLA in areas identified as being important crossings or foraging areas for caribou identified by Inuit Elders in 2013 (Rescan 2014), or potential caribou ice crossing areas identified from the draft West Kitikmeot Regional Land Use Plan, which was drafted in 2005 and has not been finalized (NPC 2005). These 25 cameras were checked in July 2014, and were left in place to continue monitoring over the winter.

Two cameras in the terrestrial RSA were demobilized in May 2014, due to camera malfunctions, and one camera that was intended to be part of the study at the MLA, Camera BR_25, was not recovered from the field at this time (Figure 2.1-1). The remaining 62 cameras in the terrestrial RSA and along the TCWR Winter Road Connector were not checked in May 2014, and were left in place to monitor caribou and other wildlife until July 2014. At this time, 13 cameras near the Goose Property Area were selected to remain in place for further monitoring over the winter. The remainder were collected and demobilized; however one camera, BR_89, was not recovered from the field (Figure 2.1-1; Appendix 1).

2.3 REMOTE CAMERA SETUP AND OPERATIONS

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a wooden tripod, topped with a plywood cap, and were secured with rocks to prevent it from being knocked over when encountered by wildlife (Plate 2.3-1). Energizer® Lithium batteries were used to maintain camera performance at low-temperatures over the winter.

Plate 2.3-1. Set up of a remote camera in the marine RSA, May 2014.

Remote cameras were programed to take two types of photos: timed photographs and motion-triggered photographs. Timed photographs were taken at set intervals throughout the day (every 30 minutes during the survey period) and motion-triggered photos were automatically taken whenever there was movement detected by the infrared spectrum in front of the camera. Based on the remote camera trigger specifications (field of view) and evidence collected during the 2012 and 2013 remote camera studies (Rescan 2013, 2014), the motion trigger range of the remote cameras is approximately 25 to 30 m, depending on the size of animal moving through the camera's field of view. Further details on remote camera operations can be found in Rescan (2014).

2.4 DATA ANALYSIS

The remote camera data was grouped and summarized according to location, and included all available camera data. Data from all cameras located near the Goose and George Property Areas, the MLA, and along the proposed TCWR Winter Road Connector from August 2013 to the time when they were moved, demobilized, or checked (May or July 2014) were grouped for analysis. Data from the 25 cameras located within the marine RSA from May to July 2014 were grouped and analyzed separately from those located in the terrestrial RSA and along the TCWR Winter Road Connector.

PROJECT #0234411-0025 GIS # BAC-23-322 December 10 2014

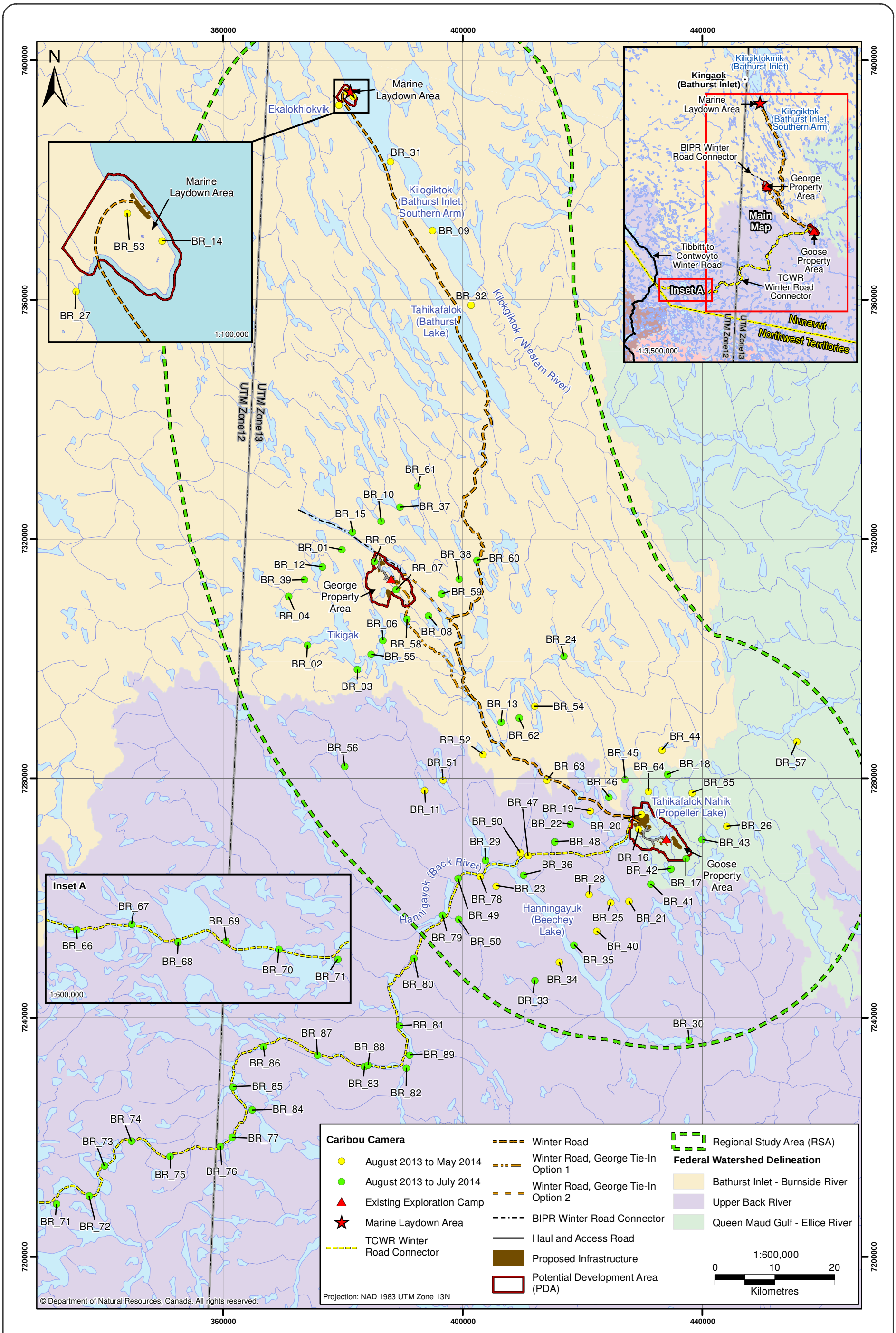


Figure 2.1-1

Sabina GOLD & SILVER CORP.

Remote Camera Locations, Terrestrial RSA and TCWR Winter Road Connector, August 2013 to July 2014

Figure 2.1-1

Rescan an ERM company

PROJECT # 0234411-0025 GIS # BAC-23-323 December 10 2014

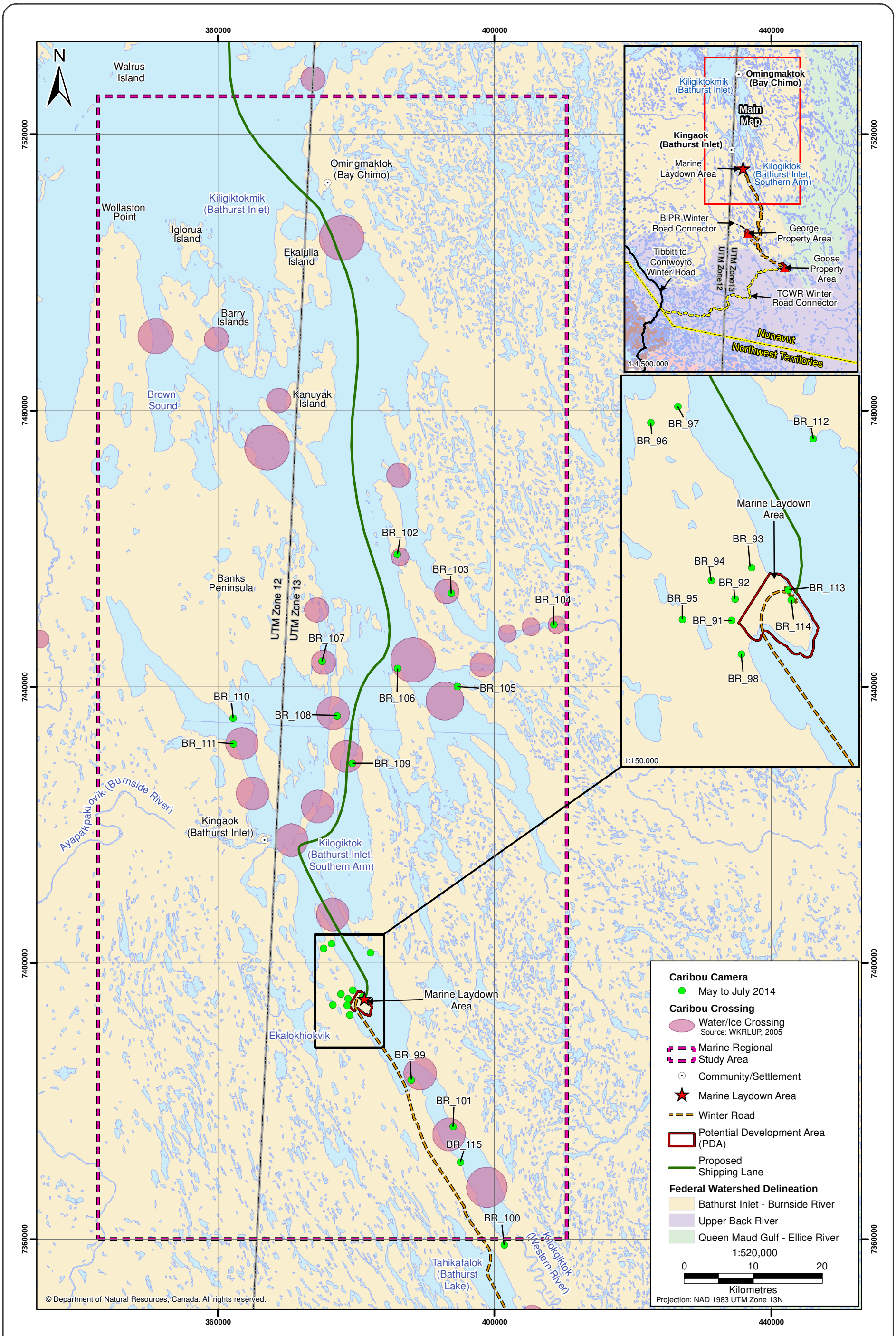


Figure 2.1-2

Sabina GOLD & SILVER CORP.

Remote Camera Locations, MLA and Marine RSA, May to July 2014

Figure 2.1-2

Rescan an ERM company

2.4.1 Evaluating Number of Caribou and Other Wildlife Recorded at Remote Cameras

Each camera's photo-set from August 2013 to July 2014 was scanned for caribou and other wildlife observations using either Reconyx software or a PC photo viewing software. Only motion-triggered photos were assessed for the presence of wildlife for the entire survey period. Evidence collected during remote camera studies in 2012 and 2013 suggest that the majority of wildlife, particularly caribou, is accounted for on motion-triggered photos (Rescan 2013, 2014).

For each photo that included a wildlife observation, the following data were recorded: date, time, photo numbers, species, number of animals, and their behaviour (e.g., resting, foraging, travelling). All photo observations of caribou and other wildlife were checked by a second observer to ensure that the number of individuals was recorded accurately.

For small numbers of caribou observed by motion-triggered photos, the exact number of individuals could be easily determined by counting individuals across the set of triggered photographs. For large numbers of caribou, the number of individuals was estimated over entire motion-triggered photo sets, and total observed for that time period of triggered photos was the highest number of individuals detected within one of the photos. Where the same caribou, or group of caribou, were identified on multiple motion-triggered photo sets within a day, only the first observation of those individuals were included in total number observed to avoid double-counting caribou.

The same distinctions were made when totalling the number of individuals of other wildlife detected by remote camera. Some wildlife, such as bears and wolves, are curious and frequently visit cameras throughout the year. Thus, effort was placed on identifying the same individuals that repeatedly visited cameras, in order to avoid double-counting individuals.

2.4.2 Trends in Caribou Abundance and Distribution

2.4.2.1 Caribou Detection Rates

Caribou detection rates by camera were calculated to facilitate a spatial comparison of the number of caribou detected between cameras. Detection rates were calculated by adjusting caribou count data by camera effort in days, in order to account for variation in the amount of time that cameras were deployed and able to record photos of wildlife. On occasion, cameras become obscured by snow or ice, are knocked over or damaged by wildlife, or memory cards fill up before the camera is checked and data is downloaded. It is therefore important to standardize the units of effort across cameras such that caribou numbers by camera can be meaningfully compared.

Camera effort was calculated as the total number of active deployment days (camera days). In order to calculate camera effort, the total period for which each camera recorded images (the dates associated with the first and last images recorded) was determined. Following which, periods of inactivity in 24-h increments, such as when a camera is obscured or knocked over, were tabulated and subtracted from each cameras total period of operation. Thus, the standard unit of camera effort is one uninterrupted day during which a camera continuously recorded images without impairment.

Caribou detection rates were calculated using the following equation:

$$Caribou\ Detection\ Rate\ (\frac{Caribou}{Day}) = \frac{Total\ Caribou\ Observed\ per\ Camera}{Camera\ Effort\ (in\ days)}$$

2.4.2.2 Temporal Trends

The total number of caribou recorded and the total number of caribou groups observed were pooled across the survey period for terrestrial RSA and TCWR Winter Road Connector cameras (August 2013 to July 2014) and MLA and marine RSA cameras (May to July 2014) to investigate temporal trends in caribou abundance. The total counts not adjusted for camera effort were used in this analysis.

A caribou group constitutes an observation of a unique assemblage of one or more individuals that can be identified on its basis of group size, behaviour, and composition (i.e., sex and age). In general, caribou groups are distinguished from one another by time. It was assumed that observations of caribou separated by 30 minutes or more constituted two separate groups unless the behaviour or composition of the animals observed suggested that they were the same individuals (and thus the same group).

Temporal data was discussed by seasonal periods for Bathurst, Beverly/Ahiak, and Dolphin and Union caribou according to Table 2.4-1, where applicable. These stages are loosely defined by higher or lower movement rates for migrations vs. winter and summer ranges (Johnson et al. 2005).

Table 2.4-1. General Seasonal Period Dates for Bathurst and Beverly/Ahiak Caribou

Seasonal Period	Bathurst	Beverly/Ahiak	Dolphin and Union
Winter	November 1 to April 14	November 1 to April 14	December 1 to April 20
Spring Migration	April 15 to June 4	April 15 to June 4	April 21 to June 9 (Late Winter-Spring Migration)
Calving	June 5 to June 15	June 5 to June 20	June 10 to July 1
Post-calving	June 16 to July 20	June 21 to July 25	
Summer	July 21 to August 31	July 26 to August 31	July 1 to September 20
Fall Migration	September 1 to October 31	September 1 to October 31	September 21 to November 30 (Fall-Early Winter Migration)

The start and end dates of peak calving recorded for Bathurst and Beverly/Ahaik caribou across the years were used to define the calving period; the peak of calving refers to the day when 50% of the caribou have calved. The weaning of calves was used to define the end of post-calving period Bathurst and Beverly/Ahaik caribou; calves are typically weaned three to five weeks after they are born (Russell, Kofinas, and Griffith 2002). It is acknowledged that these seasonal periods vary seasonally, particularly dates defining calving and post-calving (Sutherland and Gunn 1996; Russell, Kofinas, and Griffith 2002; Gunn et al. 2013); thus, a wider spread in dates is used here than in more recent studies (e.g., Flanders et al. 2009). The start date of calving and roughly three weeks following calving (calf weaning period) were used to define the calving and post-calving period for Dolphin and Union caribou, based on Poole et al. (2010).

In general, the dates for between all herds are similar, except for an extended summer period for Dolphin and Union caribou. Dolphin and Union caribou are dependent on the formation of sea ice the Dolphin and Union Strait and Coronation gulf to travel between their calving and summer ranges on Victoria Island and their winter range on the Arctic mainland. Thus, Dolphin and Union caribou start their southward migration later than other herds to allow for sea ice to form, which generally starts around mid- to late October (Poole et al. 2010).

3. Results

3. Results

3.1 TERRESTRIAL RSA AND TCWR WINTER ROAD CONNECTOR CAMERAS

3.1.1 Survey Period

The survey period for terrestrial RSA and TCWR Winter Road Connector cameras spanned from late August 2013 to mid-July 2014. Specifically, the start date was between August 23 and 27, 2013, and the end date was between July 12 and 15, 2014.

The number of cameras that were placed on the tundra varied during the survey period. From late August 2013 to early May 2014, a total of 90 cameras were located within the terrestrial RSA and along the TCWR Winter Road Connector. In early May 2014, 25 cameras were collected from the terrestrial RSA and were placed at and surrounding the MLA (Appendix 1). In addition, two cameras were removed from the field in May due to camera malfunctions and another (Camera BR_25) was not recovered from the field. Thus, for the remainder of the survey period (early May to mid-July), a total of 62 cameras were located on the tundra. During the camera demobilization in July, one camera, BR_89, was not recovered from the field. Therefore, the camera sample size for analysis from August 2013 to May 2014 is 88 cameras, and the sample size for analysis from May to July 2014 is 61 cameras.

3.1.2 Trends in Caribou Abundance and Distribution

Overall, a total of 2,253 caribou were recorded in 469 individual groups from August 2013 to July 2014 (Appendix 2). Similar numbers of caribou (2,732 caribou) were recorded during the 2013 camera study which ran from August 2012 to August 2013 (Rescan 2014).

3.1.2.1 Caribou Detection Rates

In general, high caribou detection rates were recorded at most cameras within and surrounding the Goose Property Area, while comparatively lower detection rates were recorded at cameras within and surrounding the George Property Area. The majority of camera located along the TCWR Winter Road Connector had relatively low caribou detection rates or no caribou detections. No caribou were recorded at a subset of cameras that were near the MLA from August 2013 to May 2014 (Figure 3.1-1). Additional cameras were installed in the marine RSA in May 2014 and the results from these cameras are presented in Section 3.2.

The highest caribou detection rate was recorded at camera BR_58 located adjacent to the George Property Area; camera BR_58 recorded a high of 14 caribou/camera day. However, camera BR_58 was only operational for one day before the camera encountered an error and stopped recording pictures. Therefore, this high caribou detection rate is a result of a very low camera effort and thus is not directly comparable to the rest of the cameras. Excluding BR_58, the highest caribou detection rates were recorded at BR_47 (2.6 caribou/camera day), BR_62 (1.4 caribou/camera day), and BR_54 (1.0 caribou/camera day), and BR_43 (1.0 caribou/camera day). BR_47 and BR_43 are located near the Goose Property Area, while BR_54 and BR_62 are located between the Goose and George Property Areas (Figure 3.1-1).

3.1.2.2 Temporal Trends

Caribou were detected in varying numbers throughout the survey period (Figure 3.1-2). The highest numbers of caribou and caribou groups was recorded from the August to September 2013, spanning the end of the summer period and beginning of the fall migration period for caribou (Plates 3.1-1 and 3.1-2).

Plate 3.1-1. Caribou recorded at Camera BR_47 located near the Goose Property Area, September 5, 2013.

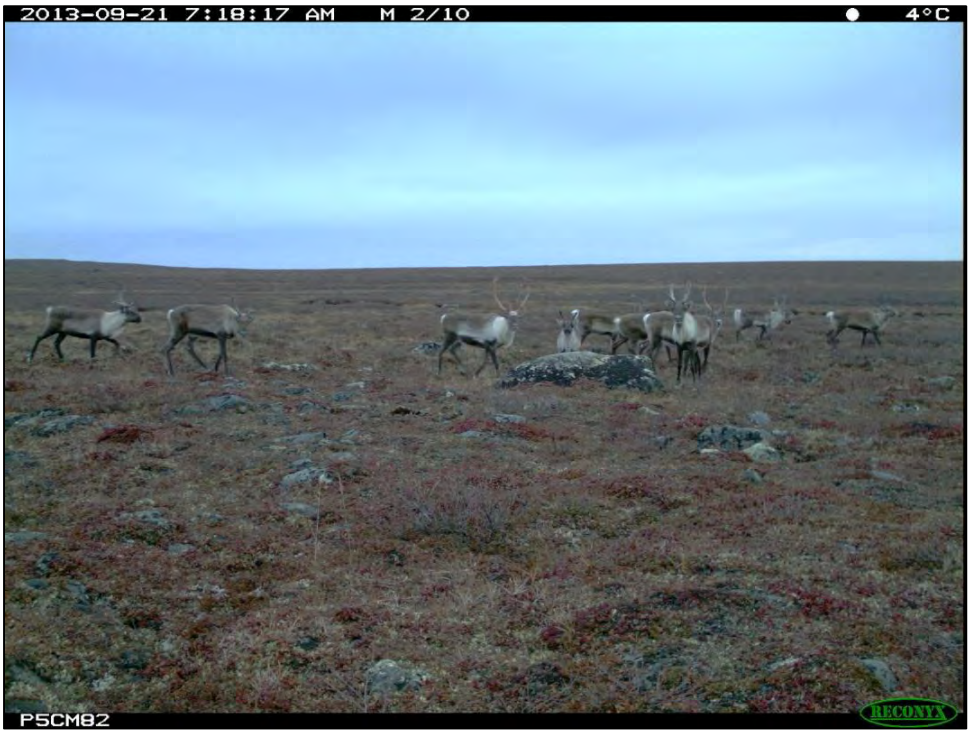
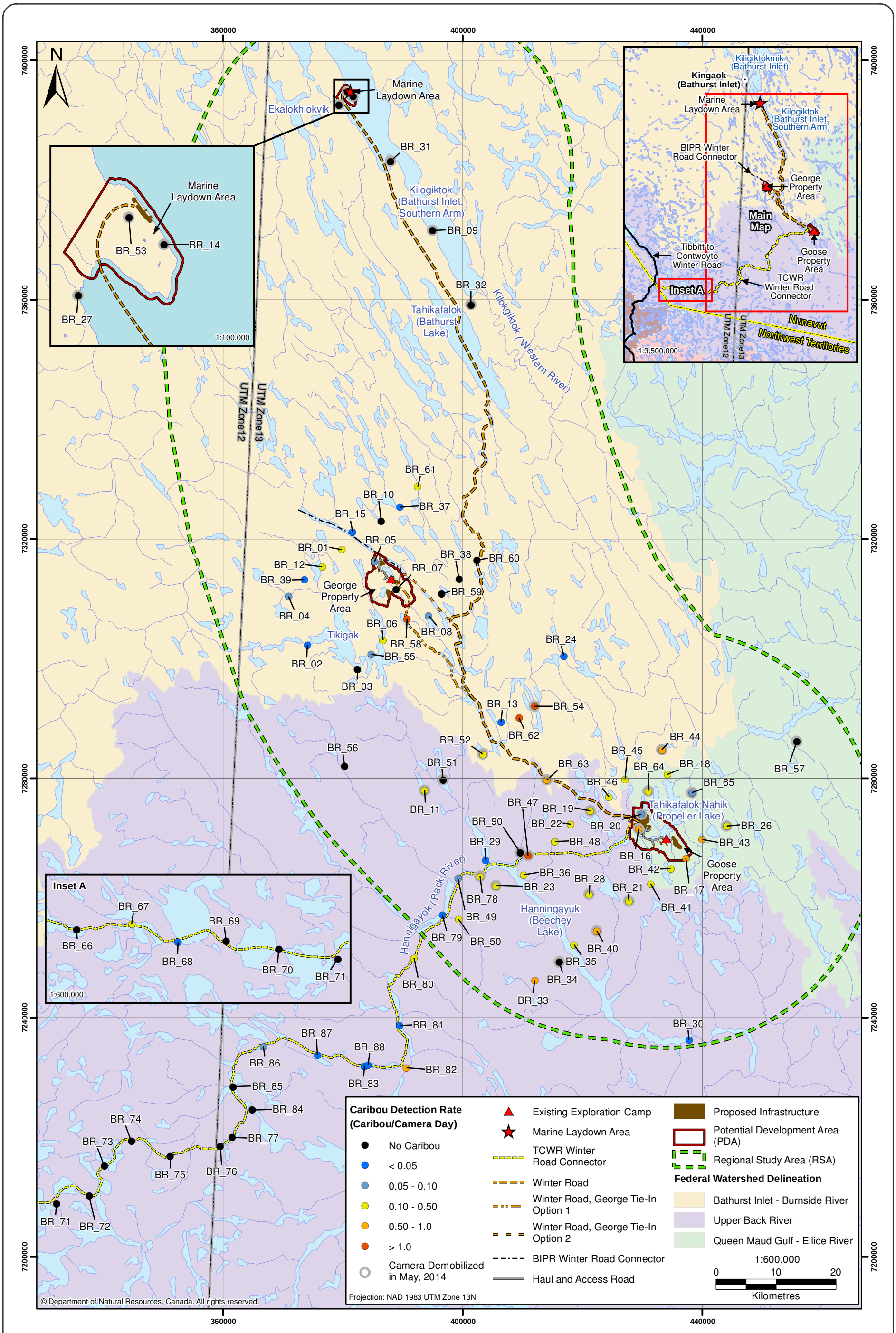


Plate 3.1-2. Caribou recorded at Camera BR_82 located along the TCWR Winter Road Connector, September 21, 2013.

PROJECT #0234411-0025 GIS # BAC-23-325 December 10 2014



© Department of Natural Resources, Canada. All rights reserved.

Figure 3.1-1

Sabina GOLD & SILVER CORP.

Number of Caribou Observed at Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014

Figure 3.1-1

Rescan an ERM company

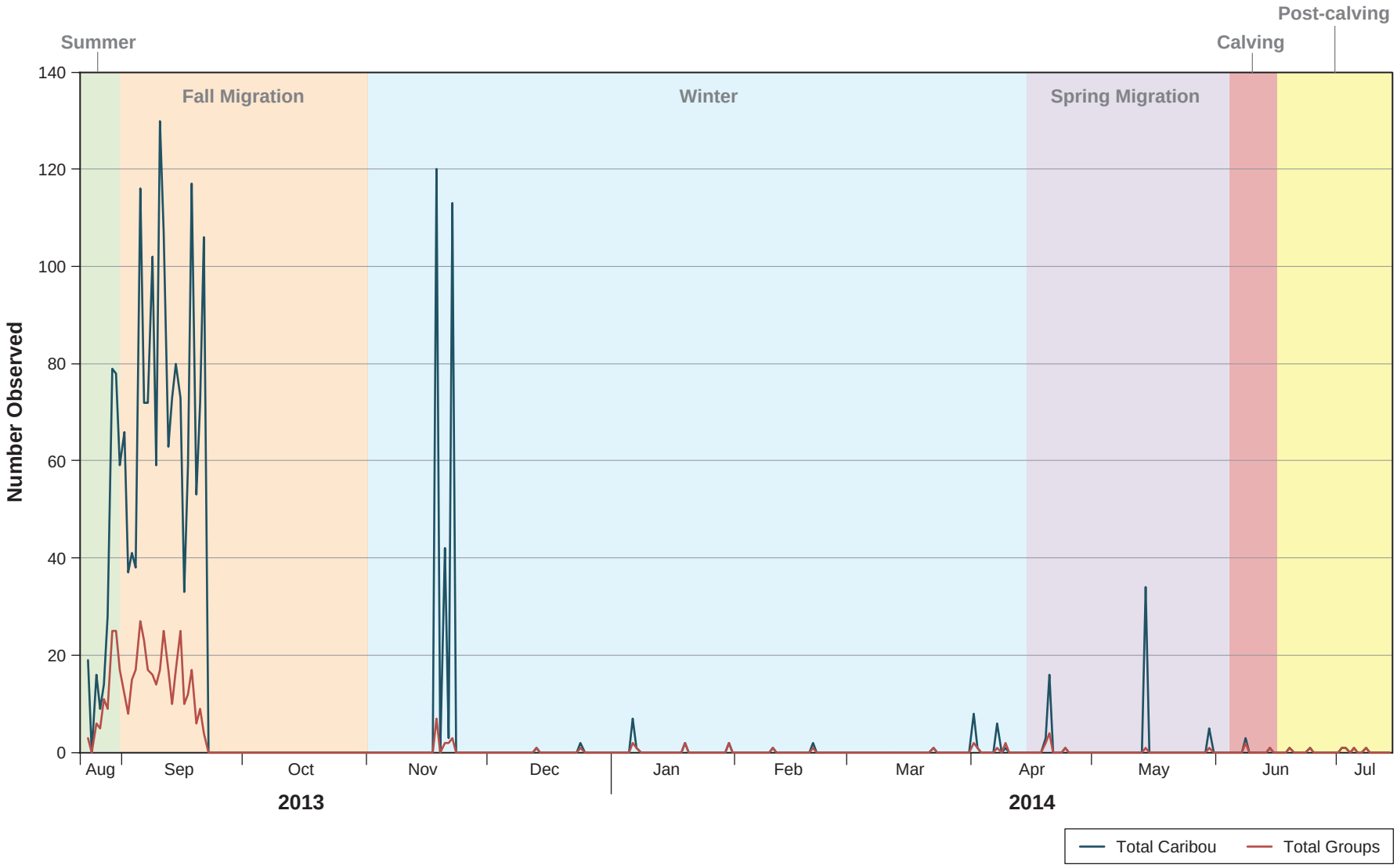


Figure 3.1-2

Sabina GOLD & SILVER CORP.

Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Terrestrial RSA and TCWR Winter Road Connector Cameras, 2013 to 2014

Figure 3.1-2

Rescan an ERM company

From August 23 to September 21, 2013, a total of 1,871 caribou were recorded in 419 different groups across cameras, which equates to 83% of all caribou detected and 89% of all groups detected across the entire survey period. The high number of caribou detected relative to the high number of groups recorded suggests that caribou were passing through the area in small, dispersed groups. Larger groups of caribou would be indicated by a high number of caribou relative to a low number of individual groups recorded.

A second peak in caribou numbers was recorded in mid to late November 2013, during the winter period for caribou (Figure 3.1-2; Plates 3.1-3 and 3.1-4). From November 18 to 21, 2013, a total of 278 caribou were recorded across 14 individual groups, which equals roughly 12% and 3% of the total caribou and caribou groups observed, respectively. The high number of caribou detected relative to the low number of groups recorded suggests that caribou were passing through in large groups.

Across the rest of the survey period, caribou were recorded in low numbers. Small peaks in caribou numbers were recorded during the spring migration period in April and May (Figure 3.1-2; Plates 3.1-5 and 3.1-6). The highest numbers were recorded on April 20, 2014 (n = 16 caribou, 4 groups) and May 14, 2014 (n = 34 caribou, 1 group).

Of note, no calves born in 2014 were positively identified on images recorded in 2014. However, the camera survey period terminated in the middle of the post-calving period for caribou. Based on the results of the 2013 camera study, the majority of caribou with calves born in 2013 were documented on cameras in the late post-calving and summer periods. The areas used by post-calving females and their calves in 2013 are described in Rescan (2014).

Caution should be taken when interpreting the numbers of caribou recorded by cameras over the winter. Camera views were often obscured by snow and ice for extended periods of time over the winter. It is possible that some caribou may have passed by remote cameras but were not recorded because cameras were obscured. However, fewer caribou are expected to use areas within the terrestrial RSA and along the TCWR Winter Road Connector during the winter given that these areas do not overlap with the winter range of Bathurst caribou and there has been variable overlap between these areas and the winter range of Beverly/Ahiak caribou in recent years (2001 to 2012; Rescan 2014). In addition, most Dolphin and Union caribou are thought to winter within 100 km from the coast (Poole et al. 2010), areas well to the north of the terrestrial RSA. Therefore, few caribou are expected to have been missed during periods when remote cameras were obscured.

3.1.3 Other Wildlife Recorded by Remote Camera

3.1.3.1 Birds

A total of 15 different bird species were recorded at 25 different camera locations (Table 3.1-1; Appendix 2). All birds positively identified to species on images recorded by remote camera have been previously documented during wildlife baseline studies conducted for the Project (Rescan 2012, 2013, 2014).

In general, bird species were infrequently recorded, with all species being recorded at five or less camera locations. Due to their generally small size (relative to caribou and other larger mammals), birds often fail to trigger the cameras when they fly by unless they are landing on the camera tripod itself. Therefore, the low number of cameras with observations of birds is to be expected.

Plate 3.1-3. Caribou recorded at Camera BR_43 located near the Goose Property Area, November 18, 2013.

Plate 3.1-4. Caribou recorded at Camera BR_33 located near the Goose Property Area, November 22, 2013.

Plate 3.1-5. Caribou recorded at Camera BR_05 located within the George Potential Development Area (PDA), April 20, 2014.

Plate 3.1-6. Caribou recorded at Camera BR_67 located along the TCWR Winter Road Connector, May 14, 2014.

Table 3.1-1. Bird Species Recorded by Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014

Group	Species	No. Cameras with Observations	Species Recorded by Month						
			2013			2014			
			Aug	Sep	Oct	Apr	May	Jun	Jul
Raptor	Bald Eagle	3	X	X				X	X
	Common Raven	5	X				X	X	
	Golden Eagle	1							X
	Short-eared Owl	4		X			X		
	Snowy Owl	1		X	X				
Upland Bird	**American Golden-plover**	1						X	
	Horned Lark	2						X	
	Lapland Longspur	1						X	
	White-crowned sparrow	2					X	X	
	Willow Ptarmigan	3	X				X	X	
	Unknown Songbird					X			
Waterbird	Canada Goose	5	X	X			X	X	
	Greater White-fronted Goose	2					X	X	
	Herring Gull	2						X	X
	Parasitic Jaeger	1						X	
	Sandhill Crane	1					X		
	Unknown Duck	1						X	
	Unknown Goose	2	X				X		
	Unknown Gull	1						X	
Total Species Observed		**15**							
Total Number of Cameras with Observations		**25**							

Note: Species of Conservation Concern indicated in bold type

Temporally, the highest number of species detected by remote cameras was recorded in May and June (13 species), coinciding with the spring migration and breeding periods for birds, followed by August and September (6 species), coinciding with the fall migration period for birds. Very few bird species were recorded over the winter. The last record of a bird species before the winter was in October, where a snowy owl was recorded on October 8. The next record of a bird recorded by a remote camera took place April, where an unknown songbird (either a snow bunting or a hoary redpoll) was observed on April 18 (Appendix 2). Snow bunting has not been documented at the Back River Project since wildlife baseline studies began in 2011.

Notable observations of birds recorded by remote cameras include the documentation of a waterbird staging area used in the spring of 2014 at Camera BR_30, located on the southern end of Beechey Lake. On May 17 and 18, 2014, a large mixed flock of geese totalling approximately 300 individuals was recorded along the shore and within in the open water areas of the Beechey Lake (Plate 3.1-7). In addition, several species of conservation concern were recorded by remote cameras, including American golden-plover, golden eagle, short-eared owl, and white-crowned sparrow. All four of these species are listed as Sensitive in Nunavut by the Canadian Endangered Species Conservation Council (CESCC; CESCC 2010), and short-eared owl is listed as a species of Special Concern on Schedule 1 of the *Species at Risk Act* (2002).

Plate 3.1-7. Flock of geese staging at the south end of Beechey Lake on May 17, 2014 (two greater white-fronted goose flying with numerous geese [indicated by red circle] along the ice).

3.1.3.2 Mammals

A total of 7 different mammal species were recorded at 68 different camera locations (Table 3.1-2; Plate 3.1-8; Appendix 2). All mammals recorded by remote camera have been previously documented during wildlife baseline studies conducted for the Project (Rescan 2012, 2013, 2014).

Table 3.1-2. Mammal Species Recorded by Terrestrial RSA and TCWR Winter Road Connector Cameras, August 2013 to July 2014

Species	No. Cameras with Observations	Species Recorded by Month										
		2013					2014					
		Aug	Sep	Oct	Nov	Dec	Feb	Mar	Apr	May	Jun	Jul
Arctic Fox	4	X								X		
Arctic Hare	4	X		X		X			X			
Grey Wolf	38	X	X	X	X	X		X	X	X	X	X
Grizzly Bear	49	X	X	X					X	X	X	X
Muskox	2	X									X	
Red Fox	17	X	X				X	X	X	X	X	
Wolverine	16		X	X			X	X	X	X	X	
Total Species Observed	**7**											
Total Number of Cameras with Observations	**68**											

Note: Species of Conservation Concern indicated in bold type

a) *Red fox recorded at Camera BR_82 located along the TCWR Winter Road Connector, May 8, 2014.*

b) *Grizzly bear recorded at Camera BR_02 located to the southwest of the George Property Area, September 15, 2013.*

c) *Wolves recorded at Camera BR_56 located between the Goose and George Property Areas, August 30, 2013 (adults in background, young in foreground).*

d) *Arctic Fox recorded at Camera BR_45 located near the Goose Property Area, August 30, 2013.*

Plate 3.1-8. Examples of mammals recorded by remote cameras, 2013 and 2014.

Grizzly bear and grey wolf were the most frequently observed mammals at remote cameras, with observations at 49 and 38 of the 88 camera locations, respectively. By comparison, the rest of the mammals recorded were detected at 17 or less camera locations.

Temporally, grey wolf was the most frequently detected mammal across the survey period, with detections at cameras in every month of the survey period except for January and February (Table 3.1-2). Grizzly bear, red fox, and wolverine were also detected in most months of the survey period. Grizzly bear were recorded from August to October 2013, and from April to July 2014, suggesting that most bears in the area enter into winter hibernation around October and become active in the spring as early as April. Red fox and wolverine were detected in the late summer and fall in 2013 (August to October) and again from the late winter to spring of 2014 (February to June). The temporal patterns in the detections of these large carnivores are consistent with those recorded during the 2013 camera study (Rescan 2014).

Given the high numbers of cameras with grizzly bear and grey wolf detections, remote cameras were grouped to general areas to investigate whether there was any spatial pattern in grizzly bear and wolf detections. Camera groups included the cameras deployed surrounding the Goose Property Area (n = 29), George Property Area (n = 19), MLA (n = 6), TCWR Winter Road Connector (n = 24), and outside of proposed Project areas (n = 10; see Appendix 1 for which cameras fall into each group).

There was no strong spatial pattern in grizzly bear and wolf detections at remote cameras. Grizzly bear visited less than half the cameras surrounding the Goose Property Area (10 of 29 cameras; 34%) but were recorded at over half of cameras deployed in the areas (George Property Area, MLA, TCWR Winter Road Connector, and Outside). Grey wolf were generally detected at less than half of all cameras located in any area, except for those located at the MLA (4 of 6 cameras; 66%) and Outside (6 of 10 cameras; 60%). Two cameras set up outside of proposed Project areas were deployed at known wolf den sites (Cameras BR_56 and BR_57) in 2013 to monitor the status of those den sites over the year. The wolf den that was monitored by camera BR_56 was active during 2013 baseline season, while the other site where camera BR_57 was place was inactive. As den sites can be reused across the years, the presence of wolves at these two cameras was expected.

Notable observations of mammals recorded by remote cameras include the documentation of family groups for grizzly bear and grey wolf. Three grizzly bear family groups were recorded, including a female with one cub and a female with two cubs at Camera BR_02 in September 2013, and a female and two cubs at camera BR_42 in May 2014 (Appendix 2). A grey wolf family was recorded at camera BR_56, which was set up to monitor the wolf den at that location. Up to three young wolves and several adults attended the den site located at Camera BR_56 up until mid-September 2013, after which no more observations were recorded, suggesting that the wolf pack had moved on to another location. A number of wolves were recorded at this location starting in March 2014, with recurrent observations through late June, suggesting that this den was being used again in 2014. No pups were recorded in 2014; however, it is possible the camera was demobilized before the pups emerged from the den site.

In addition, two species recorded by remote camera, grizzly bear and wolverine, are of conservation concern. Grizzly bear are listed as Sensitive in Nunavut (CESCC 2010), and are also considered a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; COSEWIC 2012), though they are not yet listed under SARA. The wolverine is secure in Nunavut, but the western Arctic population of wolverine, which includes the population present in the terrestrial RSA are listed as a species of Special Concern by COSEWIC (COSEWIC 2003).

3.2 MLA AND MARINE RSA CAMERAS

3.2.1 Survey Period

The survey period for MLA and marine RSA cameras spanned from early May to mid-July 2014. Specifically, the start date for these cameras was between May 14 and 17, and the end date was between July 9 and 13.

3.2.2 Trends in Caribou Abundance and Distribution

Overall, 37 caribou were recorded in 13 individual groups at MLA and marine RSA cameras from May to July 2014 (Appendix 3). By contrast, no caribou have been recorded at cameras located near and surrounding the MLA in any previous year of study (this report; Rescan 2014). These results suggest that caribou use of areas near the MLA may be sporadic and vary from year to year.

3.2.2.1 Caribou Detection Rates

Caribou detection rates were low across all MLA and marine RSA cameras, though in general, caribou detection rates were the highest at cameras located within 10 km of the MLA relative to those located further away from the MLA (Figure 3.2-1).

The highest caribou detect rates were recorded at Camera BR_98 (0.3 caribou/camera day), followed by BR_114 (0.2 caribou/camera day), and BR_103 (0.1 caribou/camera day). Camera BR_98 is located just outside of the MLA Potential Development Area (PDA) to the southwest, camera BR_114 is located within the MLA PDA and directly adjacent to proposed infrastructure, and Camera BR_103 is located north of the MLA along the east shore of Bathurst Inlet (Figure 3.2-1).

3.2.2.2 Temporal Trends

The majority of caribou recorded by MLA and marine RSA cameras were observed in May during the spring migration period for Bathurst and Beverly/Ahiak caribou and the late winter-spring migration period for Dolphin and Union caribou (Figure 3.2-2; Plates 3.2-1 and 3.2-2). From May 21 to May 27, 2014, 23 caribou were recorded in four different groups, which equates to 62% of the total caribou observed and 30% of all groups observed. The large number of caribou observed versus the small number of individual groups recorded indicates that caribou were passing through in relatively larger groups.

For the remainder of the survey period, spanning the calving and post-calving periods for Bathurst and Beverly/Ahiak caribou, and the calving through summer periods for Dolphin and Union caribou, caribou were detected sporadically and often recorded as single individuals or in groups of two (Figure 3.2-2).

3.2.3 Other Wildlife Recorded by Remote Camera

3.2.3.1 Birds

A total of eight bird species were recorded at five different camera locations (Table 3.2-1). All birds positively identified to species on images recorded by remote camera have been previously documented in Bathurst Inlet during wildlife baseline studies conducted for the Project (Rescan 2013, 2014).

Table 3.2-1. Bird Species Recorded by MLA and Marine RSA Cameras, May to July 2014

Group	Species	No. Cameras with Observations	Species Recorded by Month		
			May	June	July
Raptor	Common Raven	1	X	X	X
	Golden Eagle	1			X
Upland Bird	Horned Lark	1		X	
Waterbird	Canada Goose	1		X	
	Glaucous Gull	1		X	
	Green-winged Teal	1			X
	Northern Pintail	1		X	
	Red-breasted Merganser	1			X
	Unknown Gull	1			X
	Unknown Duck	1		X	
Total Species Observed		**8**			
Total Number of Cameras with Observations		**5**			

Note: Species of Conservation Concern indicated in bold type

Plate 3.2-1. Caribou recorded at Camera BR_98 located to the southwest of the MLA, May 22, 2014.

Plate 3.2-2. Caribou recorded at Camera BR_114 located in the MLA PDA, May 23, 2014.

PROJECT # 0234411-0025 GIS # BAC-23-326 December 10 2014

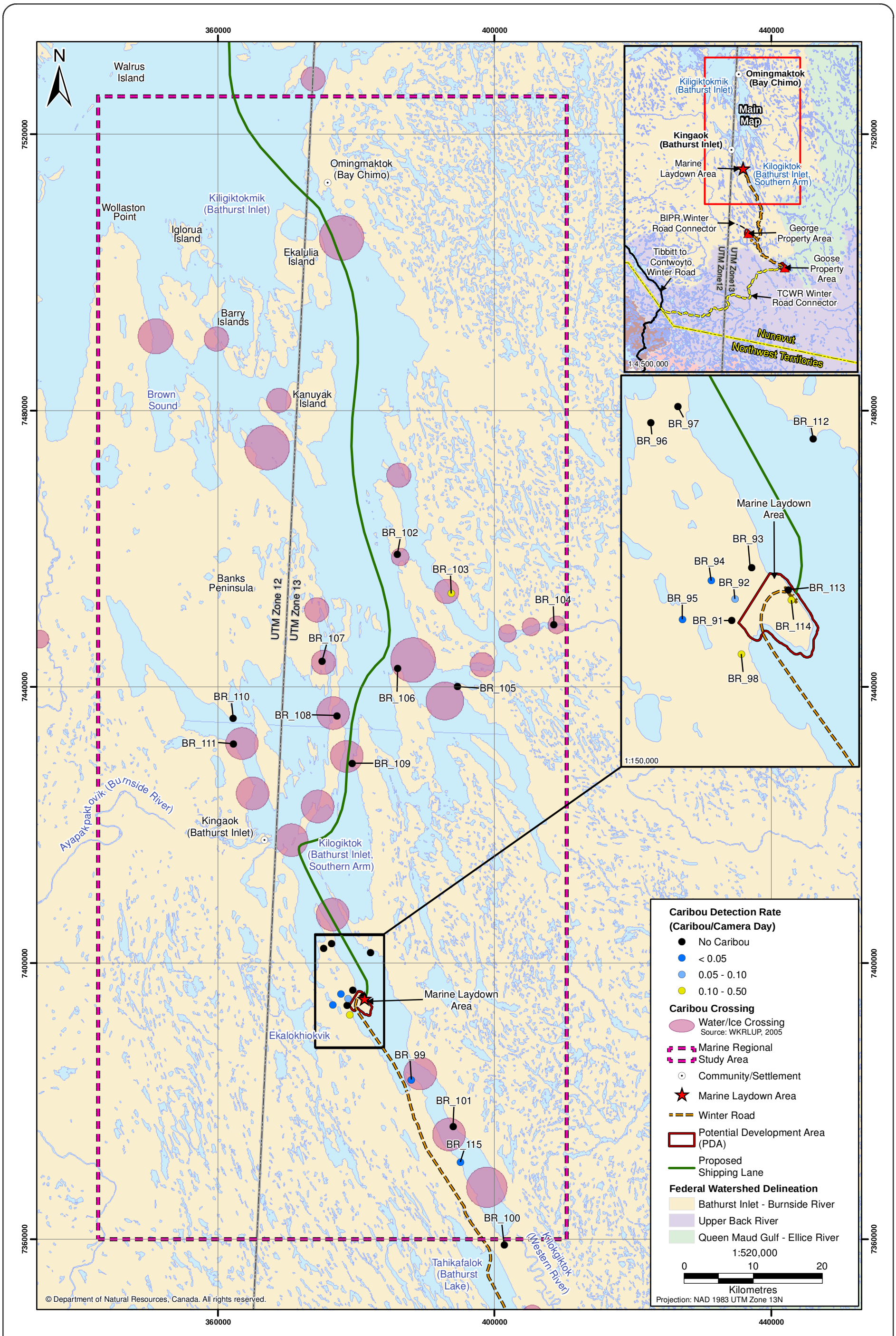


Figure 3.2-1

Sabina GOLD & SILVER CORP.

Number of Caribou Observed at MLA and Marine RSA Cameras, May to July 2014

Figure 3.2-1

Rescan an ERM company

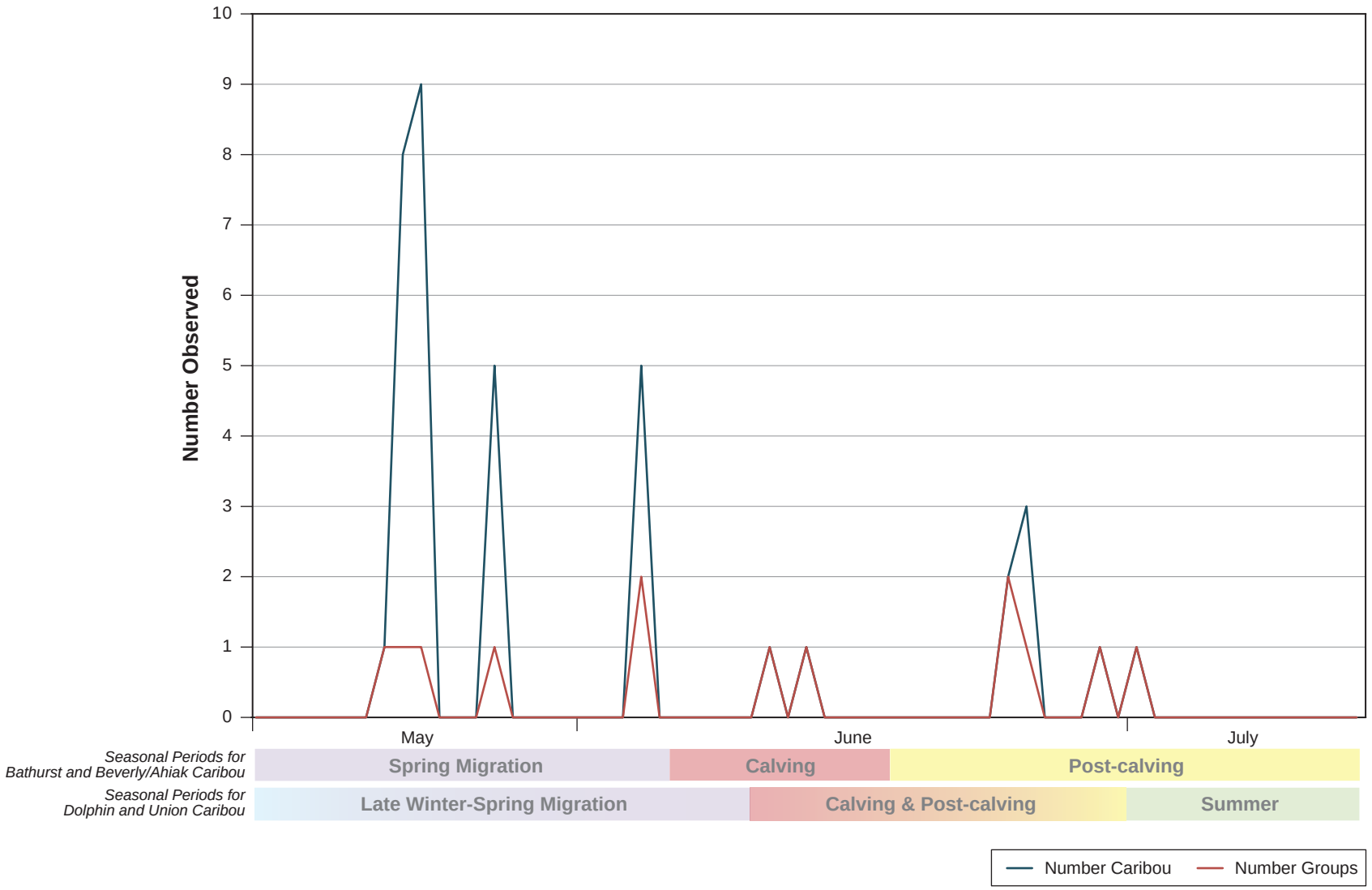


Figure 3.2-2

Sabina GOLD & SILVER CORP.

Temporal Trends in the Number of Caribou and Caribou Groups Recorded at MLA and Marine RSA Cameras, 2014

Figure 3.2-2

Rescan an ERM company

Across the three month survey period from May to July, most bird species were recorded on images in June (n = 5 species), followed by July (n = 4 species). Of note, most of the species recorded were detected at one camera, Camera BR_98, where Canada goose, glaucous gull, green-winged teal, red-breasted merganser, and an unknown gull species were documented on images in June and July.

Two species recorded on images are of conservation concern. Golden eagle and glaucous gull are considered Sensitive species in Nunavut (CESCC 2010).

3.2.3.2 Mammals

Three mammal species, including grey wolf, grizzly bear, and red fox, were recorded at 23 different cameras locations (Table 3.2-2). All three species have been previously documented in Bathurst Inlet during wildlife baseline studies conducted for the Project (Rescan 2013, 2014).

Table 3.2-2. Mammal Species Recorded by MLA and Marine RSA Cameras, May to July 2014

Species	No. Cameras with Observations	Species Recorded by Month		
		May	June	July
Grey Wolf	6	X	X	
Grizzly Bear	22	X	X	X
Red Fox	2	X		
Total Species Observed	**3**			
Total Number of Cameras with Observations	**23**			

Note: Species of Conservation Concern indicated in bold type

Grizzly bear was the most frequently recorded mammal at MLA and marine RSA cameras; grizzly bear were recorded at 88% of all cameras (22 of 25 cameras) and during every month of the survey period. One grizzly bear family group consisting of a female and two second year cubs (born in 2013) were recorded at camera BR_113, located in the MLA PDA adjacent to proposed infrastructure (Figure 2.2-2; Plate 3.2-3). Grizzly bear are listed as Sensitive in Nunavut and are also considered a species of Special Concern by COSEWIC (COSEWIC 2012), though they are not yet listed under SARA.

a) One cub investigating the camera while the female forages in the background.

b) Another cub walking away from the camera.

Plate 3.2-3. Grizzly bear family group recorded at Camera BR_113 located within the MLA PDA, May 23, 2014.

4. Discussion

4. Summary and Discussion

4.1 CARIBOU

Trends of caribou distribution and seasonal abundance at the Back River Project were investigated through the use of remote cameras distributed across the terrestrial RSA, along the TCWR Winter Road Connector, and in the marine RSA from August 2013 to July 2014. Data collected were summarized to provide insight on the seasonal patterns of caribou distribution by area and time period, including terrestrial RSA and TCWR Winter Road Connector cameras from August 2013 to July 2014, and MLA and marine RSA cameras from May to July 2014.

Across the survey period for terrestrial RSA and TCWR Winter Road Connector cameras, camera data indicate that there are spatial and temporal patterns in the distribution of caribou at the Project. Overall, caribou were encountered most frequently at cameras located near the Goose Property Area relative to cameras set up in other Project areas. Most cameras located within 30 km of the Goose Property Area had caribou detection rates of 0.1 caribou/camera day or higher, while those cameras located surrounding the George Property Area and along the TCWR Winter Road Connector often recorded less than 0.1 caribou/camera day, and all cameras set up near the MLA had no caribou detections from August 2013 to May 2014. Temporally, caribou numbers were the highest at cameras during late August through late September 2013, corresponding to the late summer and early fall migration period for caribou. Additional peaks in caribou numbers were recorded over the winter (mid-November), as well as in the spring (late April and mid-May). Very similar spatial and temporal trends in the seasonal abundance of caribou were recorded during the 2013 camera study, and these trends are supported by several years of caribou collaring data (Rescan 2014). Thus, similar patterns in the seasonal distribution and abundance of caribou in the terrestrial RSA can be expected in the future.

Across the survey period for MLA and marine RSA cameras, camera data suggest that caribou are infrequent visitors to the areas of lower Bathurst Inlet in the spring and early summer. Caribou were detected in low numbers from May to July 2014, with 8 of the 25 cameras recording the presence of caribou. Among these eight cameras, detection rates were generally higher for those cameras placed within 10 km of the MLA compared to those located further away. Most of the caribou detected by MLA and marine RSA cameras were recorded in May relative to June and July. This result is anticipated as May corresponds to the time when caribou, including caribou from the Bathurst, Beverly/Ahiak, and Dolphin and Union herds, are migrating northward towards their calving grounds to give birth in early June (Table 2.4-1). The calving and post-calving areas for the Bathurst and Beverly/Ahiak do not overlap with the MLA (Rescan 2014), and Dolphin and Union caribou calve and summer on Victoria Island. Thus, low numbers of caribou can be expected in lower Bathurst Inlet during the calving period and the several weeks following calving when post-calving females are headed to summer ranges.

The detections of caribou by MLA and marine RSA cameras from May to July 2014 represent the first time when caribou have been recorded by remote camera placed at and surrounding the MLA. Six cameras have been operational at the MLA and in lower Bathurst Inlet since August 2012 and no caribou were detected at these cameras from August 2012 to May 2014.

Camera data, coupled with caribou collar data from the Bathurst Beverly/Ahaik, and Dolphin and Union caribou herds (Poole et al. 2010; Rescan 2014), suggests that the caribou recorded on images primarily belonged to the Beverly/Ahiak caribou herd. Beverly/Ahiak caribou have overlapping seasonal ranges during the periods when most caribou were recorded by terrestrial RSA and TCWR Winter Road Connector cameras (summer, fall, and winter), whereas Bathurst caribou do not. Bathurst caribou

summer to the southwest of the Project near Contwoyto Lake, and their fall and winter ranges are located to the south of their summer range, near and below the treeline. Bathurst and Beverly/Ahiak caribou's calving and post-calving ranges are located a few hundred kilometers northwest (Bathurst caribou) and northeast (Beverly/Ahiak caribou) of the Project. During spring migration, both Bathurst and Beverly/Ahiak caribou have been known to travel through the terrestrial RSA on their way to calving grounds since collaring began for the herds (1996 for Bathurst caribou, 2001 for Beverly/Ahiak caribou). In particular, several Bathurst caribou have migrated across the lower half of the TCWR Winter Road Connector since 1996 (Rescan 2014). Thus, caribou detected on cameras during the spring migration of 2014 may have been Bathurst caribou.

It is unlikely that caribou encountered in the winter belong to the Dolphin and Union herd, although this herd winters on the tundra near the Project. The majority of this herd is thought to winter within 100 km of the sea ice in the Coronation Gulf and Dolphin and Union Strait; collared females from this herd have infrequently been recorded in areas south of Bathurst Inlet during the winter (Poole et al. 2010; Dumond and Lee 2013). Furthermore, there is a low likelihood that caribou recorded during the spring on MLA and marine RSA cameras were Dolphin and Union caribou, as these caribou are expected to be further north in mid to late May. Based on collaring data, the median date for initiation of northward sea-ice crossing for Dolphin and Union caribou was May 24, and caribou wintering along the Artic mainland coast to the west of Bathurst Inlet may start even earlier in May (Poole et al. 2010).

4.2 OTHER WILDLIFE

A total of 19 species of birds and 7 species of mammals were recorded on images taken by cameras. All species positively identified have been previously recorded during baseline studies for the Project.

Seasonal trends in the presence of other wildlife species as recorded by remote cameras during 2013 and 2014 is consistent with that recorded in the 2013 camera study (Rescan 2014). Grizzly bear and grey wolf are among the most frequently recorded species, both spatially and temporally. The frequency in these species detections may be related to their curiosity about the cameras. Based on the evidence collected from previous camera studies conducted for the Project, grizzly bear and grey wolf appear to be attracted to remote cameras, possibly due to the foreign smell, the light that the camera produces, or for the opportunity to use the camera tripod as a marking spot or a scratching post.

Remote cameras were useful in recording the presence of an important habitat feature in 2014. A spring staging area for waterbirds was recorded at the south end of Beechey Lake at Camera BR_30. Over 300 geese were present in this area for several days in mid-May (Appendix 2). Remote cameras were also useful in confirming breeding in grizzly bear and grey wolves in 2013 and 2014. Two grizzly bear family groups were recorded in 2013, and two were recorded in 2014. A wolf den located in the terrestrial RSA at Camera BR_56 was active and productive in 2013, and it was very likely that this den site was active in 2014, though no pups were observed and it could not be confirmed as productive in 2014.

References

References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

2002. *Species at Risk Act*, SC. C. 29.

CESCC. 2010. *Wild Species 2010: The General Status of Species in Canada*. Canadian Endangered Species Conservation Council. http://www.wildspecies.ca/searchtool.cfm?lang=e (accessed November 2011).

COSEWIC. 2003. *COSEWIC assessment and update status report on the wolverine Gulo gulo in Canada*. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

COSEWIC. 2012. *COSEWIC assessment and update status report on the Grizzly Bear Ursus arctos in Canada*. 91. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

Dumond, M. and D. S. Lee. 2013. Dolphin and Union Caribou Herd Status and Trend. *Arctic*, 66 (3): 329-77.

Flanders, D., A. Gunn, P. Cizek, and D. Gladders. 2009. *Caribou Landscape Vulnerability Mapping Bathurst Inlet Port and Road*. Submitted to the Nunavut Impact Review Board as Part of the CARC Technical Presentation by the Canadian Arctic Resources Committee:

Gunn, A., A. D'Hont, J. Williams, and J. Boulanger. 2013. *Satellite Collaring in the Bathurst Herd of Barren-ground Caribou. 1996 to 2005*. Manuscript Report No. 225. Government of the Northwest Territories, Environment and Natural Resources: Yellowknife, NT.

Johnson, C. J., M. S. Boyce, R. L. Case, H. D. Cluff, R. J. Gau, A. Gunn, and R. Mulders. 2005. Cumulative effects of human developments on arctic wildlife. *Wildlife Monographs*, 160: 1-36.

NPC. 2005. *Draft West Kitikmeot Regional Land Use Plan, Public Hearing, Cambridge Bay, January 18-19, 2005*. January, 2005: Cambridge Bay, Nunavut.

Poole, K. G., A. Gunn, B. R. Patterson, and M. Dumond. 2010. Sea Ice and Migration of the Dolphin and Union Caribou Herd in the Canadian Arctic An Uncertain Future. *Arctic*, 63 (4): 414-28.

Rescan. 2012. *Back River Project: Wildlife Baseline Report 2011*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013. *Back River Project: Wildlife Baseline Report 2012*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2014. *Back River Project: Wildlife Baseline Report 2013*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC.

Russell, D. E., G. Kofinas, and B. Griffith. 2002. *Barren-Ground Caribou Calving Ground Workshop Report of Proceedings*. Canadian Wildlife Service. Technical Report Series Number 390.: Ottawa, Ontario.

Sutherland, M. and A. Gunn. 1996. *Bathurst calving ground surveys, 1965-1996*. Department of Environment and Resources, Wildlife and Economic Development, Government of the Northwest Territories. File Report No. 118.: Yellowknife, NT.

Appendix 1

Remote Camera Locations and Setup Information

Rescan™
an ERM company

Appendix 1. Remote Camera Locations and Setup Information

Camera Number	Zone	Easting	Northing	Camera Orientation (Degrees)	Camera Area Group	Date Camera Set	Date of Final Card Collection	Placement Rationale	No. of Caribou	Camera Effort (Days)	Detection Rate (Caribou/Camera Day)
Terrestrial RSA and TCWR Winter Road Connector Cameras											
BR_01	13 W	379856	7318198	304	George	23-Aug-13	4-Jul-14	TK foraging grounds	28	154	0.182
BR_02	13 W	374094	7302270	356	George	23-Aug-13	5-Jul-14		1	124	0.008
BR_03	13 W	382439	7298201	137	George	22-Aug-13	5-Jul-14		0	55	0.000
BR_04	13 W	370946	7310400	320	George	23-Aug-13	4-Jul-14	TK feeding in Grid	20	216	0.093
BR_05	13 W	385276	7316252	300	George	23-Aug-13	5-Jul-14	Esker/Infrastructure	14	147	0.095
BR_06	13 W	386705	7303087		George	23-Aug-13	4-Jul-14	Lakeside foraging and travel	31	228	0.136
BR_07	13 W	388899	7311571	130	George	23-Aug-13	5-Jul-14	Esker Travel & Infrastructure	0	155	0.000
BR_08	13 W	394327	7307178	328	George	23-Aug-13	4-Jul-14	Grid, 2012 Placement	3	56	0.054
BR_09	13 W	395003	7371564	150	MLA	26-Aug-13	5-Jul-14	Caribou Trails observed in 2012	0	111	0.000
BR_10	13 W	386407	7322927	124	George	23-Aug-13	4-Jul-14	TK feeding area	0	53	0.000
BR_11	13 W	393658	7277921	310	Outside	24-Aug-13	4-Jul-14	Esker	73	158	0.461
BR_12	13 W	376620	7315384	270	George	23-Aug-13	4-Jul-14	TK feeding by lake	8	17	0.471
BR_13	13 W	406437	7289369	290	Outside	24-Aug-13	5-Jul-14		3	106	0.028
BR_14	13 W	381759	7394023	132	MLA	26-Aug-13	7-May-14	MLA	0	14	0.000
BR_15	13 W	381616	7321189	332	George	23-Aug-13	4-Jul-14	Esker travel	2	109	0.018
BR_16	13 W	429410	7271518	222	Goose	24-Aug-13	7-May-14	Infrastructure	87	138	0.629
BR_17	13 W	437276	7266585	92	Goose	25-Aug-13	15-Jul-14	Goose Monitoring Camera; Grid (Heat map)	83	158	0.527
BR_18	13 W	434151	7280644	346	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Esker travel	27	86	0.315
BR_19	13 W	421312	7274533	90	Goose	24-Aug-13	7-May-14	Lakeshore Travel	19	130	0.147
BR_20	13 W	429839	7273979	60	Goose	22-Aug-13	7-May-14	Infrastructure	10	142	0.070
BR_21	13 W	427756	7259451	140	Outside	24-Aug-13	7-May-14	Feeding area; potential crossing	40	127	0.315
BR_22	13 W	418020	7272315	308	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Grid; high point overlooking HT	61	183	0.333
BR_23	13 W	405550	7262019	110	Goose	24-Aug-13	7-May-14	KIA Caribou Calving Grounds	54	126	0.427
BR_24	13 W	416893	7300436		Outside	24-Aug-13	5-Jul-14	Potential River Crossing	1	213	0.005
BR_25	13 W	424738	7259240	86	n/a	24-Aug-13	camera not recovered	potential crossing			
BR_26	13 W	444060	7271980	60	Goose	25-Aug-13	7-May-14	Grid; feeding area	22	129	0.171
BR_27	13 W	379364	7392604	129	MLA	26-Aug-13	14-May-14	Caribou trails in fall	0	220	0.000
BR_28	13 W	421107	7260616	344	Goose	24-Aug-13	8-May-14		49	129	0.379
BR_29	13 W	403829	7266323	256	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera	1	140	0.007
BR_30	13 W	437772	7236265	326	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera	5	194	0.026
BR_31	13 W	387982	7383123	140	MLA	26-Aug-13	14-May-14	Port site monitoring	0	172	0.000
BR_32	13 W	401398	7359148	160	MLA	26-Aug-13	14-May-14	Pinch point along shore	0	250	0.000
BR_33	13 W	412068	7246236	118	Goose	24-Aug-13	15-Jul-14	KIA caribou calving grounds	148	205	0.722
BR_34	13 W	416145	7249280	100	Goose	24-Aug-13	7-May-14	KIA caribou calving grounds	0	1	0.000
BR_35	13 W	418557	7252171	162	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; KIA caribou calving grounds	34	237	0.143
BR_36	13 W	410193	7263887	270	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Lakeshore travel	50	274	0.182
BR_37	13 W	389542	7325355	98	George	23-Aug-13	4-Jul-14	TK feeding grounds	1	145	0.007
BR_38	13 W	399426	7313275	240	George	23-Aug-13	4-Jul-14	TK lakeside foraging	0	123	0.000
BR_39	13 W	373632	7313262	286	George	23-Aug-13	5-Jul-14	TK feeding grounds	1	47	0.021
BR_40	13 W	422356	7254481	330	Goose	24-Aug-13	7-May-14	KIA caribou calving grounds	68	93	0.734
BR_41	13 W	431374	7262339	10	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Feeding; potential stream crossing	21	181	0.116
BR_42	13 W	434741	7264905	228	Goose	25-Aug-13	15-Jul-14	Goose Monitoring Camera; Lakeside feeding; on Grid	29	221	0.131
BR_43	13 W	439908	7269744	44	Goose	25-Aug-13	15-Jul-14	Goose Monitoring Camera; Grid; Feeding grounds	230	237	0.969
BR_44	13 W	433243	7284727	322	Goose	24-Aug-13	5-Jul-14	Potential pinch point for foraging	58	63	0.925
BR_45	13 W	427127	7279797	60	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Potential pinch point for foraging	21	204	0.103

Appendix 1. Remote Camera Locations and Setup Information

Camera Number	Zone	Easting	Northing	Camera Orientation (Degrees)	Camera Area Group	Date Camera Set	Date of Final Card Collection	Placement Rationale	No. of Caribou	Camera Effort (Days)	Detection Rate (Caribou/Camera Day)
BR_46	13 W	424401	7276855	230	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Grid; Valley for foraging	16	135	0.118
BR_47	13 W	410926	7267069	330	Goose	24-Aug-13	4-Jul-14	Grid; HT pinch point for foraging	165	64	2.558
BR_48	13 W	415389	7269383	220	Goose	24-Aug-13	15-Jul-14	Goose Monitoring Camera; Pinch point around lake	37	108	0.343
BR_49	13 W	399190	7263248	240	Goose	24-Aug-13	4-Jul-14	Potential River Crossing; KIA Calving Grounds	14	202	0.069
BR_50	13 W	399291	7256424	258	Goose	23-Aug-13	14-Jul-14	KIA Caribou Calving Grounds	72	259	0.278
BR_51	13 W	396732	7279708	280	Mid	23-Aug-13	16-May-14	Lakeside foraging	0	33	0.000
BR_52	13 W	403395	7284052	20	Mid	24-Aug-13	16-May-14	HT on Grid; foraging area	39	136	0.288
BR_53	13 W	380784	7394783	316	MLA	26-Aug-13	17-May-14	MLA	0	153	0.000
BR_54	13 W	412023	7292054	70	Outside	24-Aug-13	4-Jul-14	HT pinch point; on grid	64	64	1.007
BR_55	13 W	384749	7300758	175	George	23-Aug-13	4-Jul-14	Possible River Crossing; KIA calving grounds	11	180	0.061
BR_56	13 W	380331	7282017	180	Outside	24-Aug-13	5-Jul-14	Wolf Den site Active in 2012	0	197	0.000
BR_57	13 W	455771	7286111	200	Outside	24-Aug-13	8-May-14	Wolf Den site	0	175	0.000
BR_58	13 W	390754	7306589	220	George	23-Aug-13	5-Jul-14	Esker Travel; HT valley forage	14	1	14.000
BR_59	13 W	396540	7310850	90	George	23-Aug-13	4-Jul-14	Grid; facing RHT valley	0	118	0.000
BR_60	13 W	402369	7316487	135	George	28-Aug-13	4-Jul-14	Grid; facing RHT valley	0	154	0.000
BR_61	13 W	392519	7328755	154	George	23-Aug-13	4-Jul-14	potential river crossing	55	152	0.362
BR_62	13 W	409407	7290062	358	Outside	24-Aug-13	5-May-14	Lakeside forage on grid	71	51	1.392
BR_63	13 W	414025	7279703	61	Goose	24-Aug-13	8-May-14	TK and collar locations analysis of crossings	66	78	0.841
BR_64	13 W	430980	7277828	158	Goose	24-Aug-13	7-May-14	TK and collar locations analysis of crossings	16	91	0.175
BR_65	13 W	438277	7277591	11	Goose	24-Aug-13	7-May-14	TK and collar locations analysis of crossings	14	180	0.078
BR_66	12 W	571607	7207089	280	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	0	0.000
BR_67	12 W	580660	7208916	167	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	35	224	0.156
BR_68	12 W	588649	7206682	70	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	1	196	0.005
BR_69	12 W	596646	7207646	309	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	180	0.000
BR_70	12 W	605562	7207075	99	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	22	0.000
BR_71	12 W	615515	7206374	254	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	268	0.000
BR_72	12 W	620809	7208205	75	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	33	0.000
BR_73	12 W	622846	7213467	132	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	239	0.000
BR_74	12 W	626968	7217956	42	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	36	0.000
BR_75	12 W	633598	7216110	99	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	38	0.000
BR_76	13 W	359587	7218508	32	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	19	0.000
BR_77	13 W	361585	7219973	149	TCWR Winter Road	25-Aug-13	19-Jul-14	facing potential winter road crossing point	0	233	0.000
BR_78	13 W	402900	7263592	310	TCWR Winter Road	27-Aug-13	5-Jul-14	facing potential winter road crossing point	57	171	0.333
BR_79	13 W	396621	7257138	126	TCWR Winter Road	27-Aug-13	12-Jul-14	facing potential winter road crossing point	2	133	0.015
BR_80	13 W	391893	7249926	255	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	42	245	0.171
BR_81	13 W	389516	7238662	296	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	8	266	0.030
BR_82	13 W	390621	7231629	358	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	131	149	0.879
BR_83	13 W	383614	7231840	244	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	5	260	0.019
BR_84	13 W	364897	7224534	330	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	0	69	0.000
BR_85	13 W	361742	7228436	64	TCWR Winter Road	27-Aug-13	19-Jul-14	facing potential winter road crossing point	0	271	0.000
BR_86	13 W	366745	7235234	302	TCWR Winter Road	27-Aug-13	19-Jul-14	facing potential winter road crossing point	7	73	0.096
BR_87	13 W	375798	7233806	338	TCWR Winter Road	27-Aug-13	19-Jul-14	facing potential winter road crossing point	4	138	0.029
BR_88	13 W	384210	7232115	169	TCWR Winter Road	27-Aug-13	15-Jul-14	facing potential winter road crossing point	4	209	0.019
BR_89	13 W	391199	7233790	85	n/a	28-Aug-13	camera not recovered from	facing potential winter road crossing point			
BR_90	13 W	409637	7267577	220	TCWR Winter Road	28-Aug-13	5-Jul-14	facing potential winter road crossing point	0	0	0.000

Appendix 1. Remote Camera Locations and Setup Information

Camera Number	Zone	Easting	Northing	Camera Orientation (Degrees)	Camera Area Group	Date Camera Set	Date of Final Card Collection	Placement Rationale	No. of Caribou	Camera Effort (Days)	Detection Rate (Caribou/Camera Day)
MLA and Marine RSA Cameras											
BC_91	13 W	378685	7393905	162		14-May-14	9-Jul-14	Monitoring near the MLA	0	55	0.000
BC_92	13 W	378817	7394807	122		14-May-14	9-Jul-14	Monitoring near the MLA	3	55	0.055
BC_93	13 W	379516	7396112	118		14-May-14	9-Jul-14	Monitoring near the MLA	0	0	error
BC_94	13 W	377833	7395564	180		14-May-14	9-Jul-14	Monitoring near the MLA	2	55	0.036
BC_95	13 W	376621	7393953	80		14-May-14	9-Jul-14	Monitoring near the MLA	1	55	0.018
BC_96	13 W	375299	7402162	220		14-May-14	9-Jul-14	Monitoring near the MLA	0	18	0.000
BC_97	13 W	376440	7402844	90		14-May-14	9-Jul-14	Monitoring near the MLA	0	17	0.000
BC_98	13 W	379086	7392504	120		14-May-14	9-Jul-14	Monitoring near the MLA	15	55	0.273
BC_99	13 W	387982	7383123	140		14-May-14	9-Jul-14	Lower Bathurst Inlet near potential crossing area; Same location as BR_31	1	55	0.018
BR_100	13 W	401398	7359148	160		14-May-14	9-Jul-14	Lower Bathurst Inlet; TK foraging area; Same location as BR_32	0	55	0.000
BR_101	13 W	394002	7376300	220		17-May-14	9-Jul-14	Lower Bathurst Inlet near potential crossing area	0	5	0.000
BR_102	13 W	385951	7459170	166		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	11	0.000
BR_103	13 W	393736	7453502	292		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	4	40	0.100
BR_104	13 W	408568	7448979	228		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	56	0.000
BR_105	13 W	394611	7440021	240		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	1	0.000
BR_106	13 W	385989	7442648			17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	41	0.000
BR_107	13 W	375066	7443703	108		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	8	0.000
BR_108	13 W	377241	7435807	5		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	11	0.000
BR_109	13 W	379444	7428887	326		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	3	0.000
BR_110	12 W	623713	7434730	128		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	10	0.000
BR_111	12 W	624110	7431052	108		17-May-14	13-Jul-14	Northern Bathurst Inlet near potential crossing area	0	56	0.000
BR_112	13 W	382085	7401494	226		17-May-14	9-Jul-14	Monitoring near the MLA	0	52	0.000
BR_113	13 W	381041	7395180	112		17-May-14	9-Jul-14	Monitoring with the MLA PDA	0	45	0.000
BR_114	13 W	381167	7394749	98		17-May-14	9-Jul-14	Monitoring with the MLA PDA	10	52	0.192
BR_115	13 W	395063	7371174	138		17-May-14	9-Jul-14	Lower Bathurst Inlet near potential crossing area	1	52	0.019

Appendix 2

Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Rescan™
an ERM company

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_1	23-Aug-13	Summer	1	7:26:11	7:31:18	331	401	70	7	Mammal	Caribou	BR1_1	5			5	5	Feeding	
BR_1	10-Sep-13	Fall	1	21:19:06	21:20:54	1053	1112	60	6	Mammal	Caribou	BR1_2	1			1	1	Walking	
BR_1	11-Sep-13	Fall	1	11:06:48	11:13:02	1141	1240	100	10	Mammal	Caribou	BR1_3	8			8	8	Feeding	
BR_1	11-Sep-13	Fall	1	11:54:39	11:56:28	1242	1281	40	4	Mammal	Caribou	BR1_3	7		Y	7	0	Feeding	
BR_1	11-Sep-13	Fall	1	19:19:54	19:20:25	1297	1316	20	2	Mammal	Grizzly Bear		1			1	1		
BR_1	16-Sep-13	Fall	1	17:54:04	17:54:37	1554	1573	20	2	Mammal	Caribou	BR1_4	2			2	2	Feeding	
BR_1	18-Sep-13	Fall	1	10:03:21	10:04:32	1655	1694	40	4	Mammal	Caribou	BR1_5	2			2	2	Feeding	One caribou is feeding, the other is really investigating the camera.
BR_1	18-Sep-13	Fall	2	10:05:54	10:07:22	1695	1744	50	5	Mammal	Caribou	BR1_5	2		Y	2	0	Feeding	About a minute and a half break between motion triggered series.
BR_1	18-Sep-13	Fall	1	10:24:32	10:26:49	1745	1794	50	5	Mammal	Caribou	BR1_5	3		Y	3	0	Feeding	Counted in next series - only 3 visible here while 10 visible in next series.
BR_1	18-Sep-13	Fall	2	10:29:13	10:31:53	1795	1865	71	7	Mammal	Caribou	BR1_6	10			10	10	Feeding	
BR_1	28-Oct-13	Fall	1	13:47:27	13:50:02	3792	3851	60	6	Mammal	Grizzly Bear		1			1	1		
BR_2	24-Aug-13	Summer	1	16:05:51	16:06:00	86	95	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	25-Aug-13	Summer	1	5:38:05	5:38:15	123	132	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Counted in next series of photos. In this series, only one wolf - in next series there are two.
BR_2	25-Aug-13	Summer	2	5:39:18	5:40:24	133	162	30	3	Mammal	Grey Wolf		2			2	2	Walking	
BR_2	25-Aug-13	Summer	1	10:19:38	10:19:47	172	181	10	1	Mammal	Caribou	BR2_1	1			1	1	Walking	
BR_2	26-Aug-13	Summer	1	4:00:51	4:01:52	218	247	30	3	Mammal	Grey Wolf		2			2	2	Walking	
BR_2	31-Aug-13	Summer	1	22:53:47	22:53:58	525	534	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Counted in next series of photos (#2)
BR_2	31-Aug-13	Summer	2	22:55:17	22:56:23	535	564	30	3	Mammal	Grey Wolf		2			2	2	Walking	
BR_2	31-Aug-13	Summer	3	22:57:32	22:57:41	565	574	10	1	Mammal	Grey Wolf		2		Y	2	0	Walking	Counted in two previous series.
BR_2	2-Sep-13	Fall	1	3:55:01	3:55:10	633	642	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	9-Sep-13	Fall	1	10:57:43	11:00:01	993	1043	51	5	Mammal	Grizzly Bear		1	1		2	2	Walking	
BR_2	10-Sep-13	Fall	1	21:02:08	21:02:17	1112	1121	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	15-Sep-13	Fall	1	5:58:07	5:59:48	1331	1360	30	3	Mammal	Grizzly Bear		1	1		2	2	Other	One walks out of the frame early, while the other rolls around on the ground.
BR_2	15-Sep-13	Fall	2	6:02:19	6:02:32	1362	1371	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Rolling on ground. Captured in previous and following series.
BR_2	15-Sep-13	Fall	3	6:03:54	6:04:06	1372	1381	10	1	Mammal	Grizzly Bear		1	1	Y	2	0	Other	One is rolling on ground, the other is investigating the camera. Captured in previous series.
BR_2	15-Sep-13	Fall	1	6:43:30	6:44:29	1383	1412	30	3	Mammal	Grizzly Bear		1	2	Y/N	3	1	Walking	Investigated camera for a bit. There were two cubs that are seen in this series - so one was not previously counted.
BR_2	15-Sep-13	Fall	1	10:00:26	10:02:49	1420	1489	70	7	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_2	18-Sep-13	Fall	1	10:18:47	10:18:56	1634	1643	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	21-Sep-13	Fall	1	16:57:20	16:58:14	1801	1820	20	2	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	24-Oct-13	Fall	1	2:00:22	2:00:33	3376	3385	10	1	Mammal	Arctic Hare		1			1	1	Running	
BR_2	28-Oct-13	Fall	1	20:38:20	20:38:31	3615	3624	10	1	Mammal	Arctic Hare		1			1	1	Running	
BR_2	13-Mar-14	Winter	1	13:47:56	13:48:06	150	159	10	1	Mammal	Red Fox		1			1	1	Running	
BR_2	4-Apr-14	Winter	1	3:59:48	3:59:57	1196	1205	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	8-May-14	Spring Migration	1	21:47:25	21:47:35	2874	2883	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	17-May-14	Spring Migration	1	11:19:51	11:20:01	3295	3304	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	17-May-14	Spring Migration	1	21:53:58	21:54:08	3326	3335	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_2	18-May-14	Spring Migration	1	13:32:48	13:40:44	3368	3507	140	14	Mammal	Grizzly Bear		1			1	1	Walking	Walking around and investigating camera. Bear knocked it over.
BR_3	no wildlife photos																		
BR_4	29-Aug-13	Summer	1	6:27:09	6:28:50	296	325	30	3	Mammal	Caribou	BR4_1	4			4	4	Walking	Also feeding.
BR_4	30-Aug-13	Summer	1	12:08:37	12:08:46	386	395	10	1	Mammal	Caribou	BR4_2	4			4	4	Walking	
BR_4	31-Aug-13	Summer	1	22:11:45	22:11:54	464	473	10	1	Mammal	Caribou	BR4_3	4			4	4	Walking	
BR_4	6-Sep-13	Fall	1	12:29:17	12:29:26	742	751	10	1	Mammal	Caribou	BR4_4	8			8	8	Feeding	
BR_5	26-Aug-13	Summer	1	7:16:22	7:16:56	149	168	20	2	Mammal	Grizzly Bear		1			1	1		
BR_5	3-Sep-13	Fall	1	22:16:36	22:16:46	593	602	10	1	Bird	Short-eared Owl		1			1	1	Flying	
BR_5	3-Sep-13	Fall	1	22:20:27	22:20:36	603	612	10	1	Bird	Short-eared Owl		1		Y	1	0	Flying	
BR_5	3-Sep-13	Fall	1	23:54:04	23:54:13	616	625	10	1	Bird	Short-eared Owl		1		Y	1	0	Flying	
BR_5	3-Sep-13	Fall	2	23:55:12	23:55:21	626	635	10	1	Bird	Short-eared Owl		1		Y	1	0	Flying	
BR_5	7-Sep-13	Fall	1	19:31:23	19:35:37	820	899	80	8	Mammal	Caribou	BR5_1	2			2	2		Investigating camera.
BR_5	8-Sep-13	Fall	1	15:53:17	15:55:51	940	1009	70	7	Mammal	Caribou	BR5_2	2			2	2		
BR_5	11-Sep-13	Fall	1	23:23:24	23:24:05	1169	1188	20	2	Bird	Short-eared Owl		1			1	1	Flying	
BR_5	28-Sep-13	Fall	1	19:32:46	19:32:56	2008	2017	10	1	Unknown	Unknown		1			1	1		Wildlife species behind camera.
BR_5	16-Oct-13	Fall	1	12:37:00	12:37:11	2844	2853	10	1	Unknown	Unknown		1			1	1		Can not see wildlife species - it is very close to camera.
BR_5	14-Apr-14	Winter	1	22:18:40	22:18:50	1538	1547	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_5	17-Apr-14	Spring Migration	1	21:09:10	21:09:20	1690	1699	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_5	17-Apr-14	Spring Migration	2	21:10:25	21:10:34	1700	1709	10	1	Mammal	Grey Wolf		1		Y	1	0	Other	Investigating camera.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_5	20-Apr-14	Spring Migration	1	8:52:05	8:52:15	1829	1838	10	1	Mammal	Caribou	BR5_3	9			9	9	Walking	
BR_5	28-Apr-14	Spring Migration	1	5:39:29	5:39:39	2217	2226	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_5	14-May-14	Spring Migration	1	15:43:38	15:43:48	3015	3024	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_5	31-May-14	Spring Migration	1	22:55:04	22:55:34	3865	3884	20	2	Mammal	Grizzly Bear		1			1	1	Walking	Investigated the camera, then walked away.
BR_5	2-Jun-14	Spring Migration	1	17:26:04	17:30:09	3970	4060	91	9	Mammal	Grizzly Bear		2			2	2	Other	Investigating camera.
BR_5	2-Jun-14	Spring Migration	2	17:32:20	17:34:32	4061	4100	40	4	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera.
BR_5	2-Jun-14	Spring Migration	3	17:35:43	17:36:18	4101	4120	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera.
BR_5	3-Jun-14	Spring Migration	1	19:34:48	19:37:54	4173	4222	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera for quite a while.
BR_5	3-Jun-14	Spring Migration	2	19:39:25	19:41:20	4223	4262	40	4	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera.
BR_5	3-Jun-14	Spring Migration	1	22:48:17	22:50:05	4269	4288	20	2	Mammal	Grizzly Bear		2			2	2	Other	
BR_5	2-Jul-14	Post-calving	1	21:42:45	21:46:04	5879	5958	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera and walking around.
BR_5	5-Jul-14	Post-calving	1	4:23:07	4:23:17	6098	6107	10	1	Mammal	Caribou	BR5_4	1			1	1	Walking	
BR_6	24-Aug-13	Summer	1	6:36:55	6:39:06	45	84	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_6	25-Aug-13	Summer	1	3:35:08	3:35:55	217	236	20	2	Mammal	Caribou	BR6_1	3			3	3	Feeding	
BR_6	25-Aug-13	Summer	1	3:44:43	3:45:14	237	256	20	2	Mammal	Caribou	BR6_1	3		Y	3	0	Feeding	
BR_6	25-Aug-13	Summer	1	3:52:39	3:53:15	257	276	20	2	Mammal	Caribou	BR6_1	5		Y/N	5	2	Feeding	Includes two not seen before.
BR_6	25-Aug-13	Summer	1	3:56:47	3:56:56	277	286	10	1	Mammal	Caribou	BR6_1	4		Y	4	0	Feeding	
BR_6	5-Sep-13	Fall	1	6:57:42	6:58:39	901	920	20	2	Mammal	Caribou	BR6_2	3			3	3	Feeding	
BR_6	5-Sep-13	Fall	1	18:44:45	18:44:55	945	954	10	1	Mammal	Caribou	BR6_3	6	1		7	7	Feeding	
BR_6	11-Sep-13	Fall	1	12:50:01	12:50:11	1231	1240	10	1	Mammal	Caribou	BR6_4	1			1	1	Feeding	
BR_6	11-Sep-13	Fall	1	12:52:09	12:53:14	1241	1270	30	3	Mammal	Caribou	BR6_5	1			1	1	Feeding	
BR_6	11-Sep-13	Fall	1	12:59:20	12:59:29	1271	1280	10	1	Mammal	Caribou	BR6_6	2			2	2	Feeding	
BR_6	11-Sep-13	Fall	2	13:01:14	13:01:23	1282	1291	10	1	Mammal	Caribou	BR6_6	2		Y/N	2	1	Feeding	The one caribou in the background was definitely counted in the previous entry (start time 12:59:20).
BR_6	11-Sep-13	Fall	1	14:32:05	14:32:15	1295	1304	10	1	Mammal	Caribou	BR6_7	1			1	1	Walking	
BR_6	13-Sep-13	Fall	1	20:20:39	20:20:48	1412	1421	10	1	Mammal	Caribou	BR6_8	2			2	2	Walking	
BR_6	14-Sep-13	Fall	1	19:17:51	19:18:01	1468	1477	10	1	Mammal	Caribou	BR6_9	2			2	2	Walking	
BR_6	14-Sep-13	Fall	1	19:44:42	19:46:55	1479	1538	60	6	Mammal	Caribou	BR6_10	1			1	1	Other	Investigating camera. May have been previously observed.
BR_6	19-Jan-14	Winter	1	14:28:44	14:29:14	7624	7643	20	2	Mammal	Caribou	BR6_11	1			1	1	Walking	
BR_6	19-Jan-14	Winter	2	14:31:11	14:31:20	7645	7654	10	1	Mammal	Caribou	BR6_12	1			1	1	Walking	
BR_6	20-Feb-14	Winter	1	17:28:31	17:32:23	9196	9256	70	7	Unknown	Unknown								Camera triggered by caribou but the viewfinder is totally obscured so you cannot see the caribou.
BR_6	20-Feb-14	Winter	2	17:32:34	15:33:28	9257	9276	20	2	Mammal	Caribou	BR6_13	2			2	2	Walking	
BR_6	2-Apr-14	Winter	1	18:58:01	18:58:11	1248	1257	10	1	Mammal	Caribou	BR6_14	1			1	1	Walking	
BR_6	27-Apr-14	Spring Migration	1	13:40:49	13:40:58	2448	2457	10	1	Mammal	Wolverine		1			1	1	Running	
BR_6	29-Apr-14	Spring Migration	1	15:35:56	15:36:06	2558	2567	10	1	Mammal	Red Fox		1			1	1	Running	
BR_6	7-Jun-14	Calving	1	7:58:53	7:59:02	4424	4433	10	1	Bird	Bird		1			1	1		Songbird landing on plywood cap - all you can see is the shadow.
BR_6	8-Jun-14	Calving	1	15:11:03	15:11:12	4497	4506	10	1	Bird	Horned Lark		1			1	1	Flying	
BR_6	8-Jun-14	Calving	1	15:51:51	15:52:00	4508	4517	10	1	Mammal	Muskox		2			2	2	Running	
BR_6	23-Jun-14	Post-calving	1	12:04:12	12:04:22	5237	5246	10	1	Unknown	Unknown		1			1	1		Only photo of wildlife species is on the second photo (IMG_5238) - just a partial blurry image.
BR_7	2-Sep-13	Fall	1	6:02:45	6:05:31	561	610	50	5	Mammal	Grizzly Bear		1			1	1	Other	Walked to camera.
BR_7	9-Sep-13	Fall	1	7:44:58	7:45:09	950	959	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_7	1-Oct-13	Fall	1	19:21:46	19:22:20	2039	2058	20	2	Mammal	Grizzly Bear		1			1	1	Other	Walked to camera.
BR_7	4-Oct-13	Fall	1	19:22:16	19:23:24	2203	2232	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_7	5-Oct-13	Fall	1	20:16:55	20:18:44	2283	2312	30	3	Mammal	Grizzly Bear		2			2	2	Other	Investigating camera.
BR_7	17-Mar-14	Winter	1	15:25:29	15:25:38	128	137	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_7	24-Apr-14	Spring Migration	1	14:20:26	14:24:38	1960	2069	110	11	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_7	27-Apr-14	Spring Migration	1	9:14:17	9:14:27	2204	2213	10	1	Mammal	Grey Wolf		2			2	2	Walking	
BR_7	27-Apr-14	Spring Migration	1	16:57:49	16:58:00	2229	2238	10	1	Mammal	Grey Wolf		2			2	2	Walking	
BR_7	27-Apr-14	Spring Migration	1	21:03:07	21:04:15	2248	2267	20	2	Mammal	Grey Wolf		2		Y	2	0	Walking	Two individuals that look very similar to those counted before.
BR_7	17-May-14	Spring Migration	1	16:01:47	16:02:19	3218	3237	20	2	Mammal	Grizzly Bear		1			1	1	Other	
BR_7	19-May-14	Spring Migration	1	7:51:42	7:53:25	3317	3356	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_7	21-May-14	Spring Migration	1	20:31:38	20:32:35	3479	3498	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_7	12-Jun-14	Calving	1	7:58:44	7:58:53	4529	4538	10	1	Bird	Lapland Longspur		1			1	1	Flying	
BR_8	4-Sep-13	Fall	1	3:40:38	3:40:50	586	595	10	1	Bird	Short-eared Owl		1			1	1	Flying	
BR_8	11-Sep-13	Fall	1	11:44:24	11:44:33	948	957	10	1	Mammal	Caribou	BR8_1	3			3	3	Feeding	

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_8	27-Sep-13	Fall	1	19:21:13	19:21:23	1741	1750	10	1	Bird	Short-eared Owl		1			1	1	Flying	
BR_8	27-Sep-13	Fall	1	19:31:58	19:32:07	1752	1761	10	1	Bird	Short-eared Owl		1			1	1		
BR_9	30-Apr-14	Spring Migration	1	5:46:54	5:47:05	1872	1881	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_9	12-May-14	Spring Migration	1	6:20:28	6:20:37	2469	2478	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_9	14-May-14	Spring Migration	1	2:15:06	2:15:16	2567	2576	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf walking away from the camera.
BR_9	18-Apr-14	Spring Migration	1	5:33	5:33:53	1286	1295	10	1	Bird	Bird		1			1	1	Flying	Possibly a snow bunting or a hoary redpoll flies past the camera.
BR_10	1-Sep-13	Fall	1	19:21:37	19:21:46	468	477	10	1	Bird	Bird		1			1	1		
BR_11	29-Aug-13	Summer	1	19:13:44	19:13:53	269	278	10	1	Mammal	Caribou	BR11_1	1			1	1	Grazing	
BR_11	29-Aug-13	Summer	2	22:18:58	22:19:07	285	294	10	1	Mammal	Caribou	BR11_2	2			2	2	Grazing	
BR_11	30-Aug-13	Summer	1	1:28:01	1:32:06	301	361	60	6	Mammal	Caribou	BR11_3	2			2	2	Grazing	
BR_11	31-Aug-13	Summer	1	21:37:12	21:37:21	450	459	10	1	Mammal	Caribou	BR11_4	1			1	1	Walking	
BR_11	1-Sep-13	Fall	1	19:16:11	19:23:50	503	542	40	4	Mammal	Caribou	BR11_5	2			2	2	Walking	Possible calf/yearling/2nd year walking around then running out, adult coming in grazing afterwards.
BR_11	3-Sep-13	Fall	1	5:59:08	5:59:18	612	621	10	1	Mammal	Caribou	BR11_6	1			1	1	Walking	
BR_11	3-Sep-13	Fall	2	20:27:15	20:28:59	651	670	20	2	Mammal	Caribou	BR11_7	2			2	2	Walking	
BR_11	3-Sep-13	Fall	3	22:23:45	22:24:33	675	704	30	3	Mammal	Caribou	BR11_8	7	1		8	8	Walking	Group of 4 adults plus one young, then 3 adults come by.
BR_11	3-Sep-13	Fall	4	23:01:30	23:02:52	707	746	40	4	Mammal	Caribou	BR11_8	3		Y	3	0	Walking	Looks like similar group as earlier.
BR_11	3-Sep-13	Fall	5	23:47:30	23:47:24	748	757	10	1	Mammal	Caribou	BR11_8	3		Y	3	0	Walking	
BR_11	4-Sep-13	Fall	1	4:58:37	4:59:56	768	807	40	4	Mammal	Caribou	BR11_9	4			4	4	Walking	
BR_11	4-Sep-13	Fall	2	22:12:51	22:13:21	843	862	20	2	Mammal	Caribou	BR11_10	2	2		4	4	Grazing	Looks like two calves and two adults.
BR_11	5-Sep-13	Fall	1	8:39:19	8:39:28	884	893	10	1	Mammal	Caribou	BR11_11	1			1	1	Walking	A male walking.
BR_11	5-Sep-13	Fall	2	14:46:47	14:49:29	906	945	40	4	Mammal	Caribou	BR11_12	1			1	1	Walking	Curious male sniffing the camera.
BR_11	6-Sep-13	Fall	1	11:35:22	11:35:32	988	997	10	1	Mammal	Caribou	BR11_13	1			1	1	Walking	
BR_11	7-Sep-13	Fall	1	2:25:15	2:25:24	1027	1036	10	1	Mammal	Caribou	BR11_14	5			5	5	Walking	
BR_11	7-Sep-13	Fall	2	22:05:40	22:06:12	1077	1096	20	2	Mammal	Caribou	BR11_15	16			16	16	Walking	
BR_11	11-Sep-13	Fall	1	20:58:18	20:58:45	1287	1305	20	2	Mammal	Grey Wolf		1			1	1	Walking	
BR_11	18-Sep-13	Fall	1	14:55:18	14:55:47	1630	1649	20	2	Mammal	Caribou	BR11_16	8			8	8	Grazing	Group grazing near lake.
BR_11	18-Sep-13	Fall	2	15:28:04	15:29:05	1651	1680	30	3	Mammal	Caribou	BR11_16	8	2	Y/N	10	8	Grazing	Two young mixed in, at least two male counted before.
BR_11	18-Sep-13	Fall	3	23:16:25	23:16:35	1697	1706	10	1	Mammal	Caribou	BR11_17	5			5	5	Walking	Could be from previous group.
BR_11	25-Sep-13	Fall	1	5:25:39	5:27:06	2007	2026	20	2	Mammal	Grizzly Bear		1			1	1	Other	Grizzly rocking the camera stand.
BR_11	26-Sep-13	Fall	1	21:44:18	21:45:21	2108	2127	20	2	Mammal	Grey Wolf		3			3	3	Walking	Pack of at 3 wolves hanging out near camera.
BR_11	10-Feb-14	Winter	1	17:43:51	17:44:02	8696	8705	10	1	Mammal	Caribou	BR11_18	1			1	1	Other	
BR_11	3-Apr-14	Winter	1	13:33:02	13:33:13	1195	1204	10	1	Mammal	Wolverine		1			1	1	Running	
BR_12	28-Aug-13	Summer	1	5:14:23	5:14:33	267	276	10	1	Mammal	Caribou	BR12_1	1			1	1	Feeding	
BR_12	31-Aug-13	Summer	1	13:38:13	13:38:23	438	447	10	1	Mammal	Caribou	BR12_2	4			4	4	Feeding	
BR_12	31-Aug-13	Summer	1	20:52:20	20:52:49	462	481	20	2	Mammal	Caribou	BR12_3	1			1	1	Walking	
BR_12	4-Sep-13	Fall	1	6:27:49	6:28:41	645	674	30	3	Mammal	Caribou	BR12_4	1			1	1	Other	Investigating camera - mostly behind camera.
BR_12	5-Sep-13	Fall	1	16:05:36	16:05:45	743	752	10	1	Mammal	Caribou	BR12_5	1			1	1	Feeding	
BR_12	8-Sep-13	Fall	1	22:55:09	22:55:19	910	919	10	1	Bird	Short-eared Owl		1			1	1	Flying	
BR_12	10-Sep-13	Fall	1	19:36:22	19:36:31	1010	1019	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera and knocked it over. It is down for the rest of the time until the end (July 2014).
BR_13	2-Sep-13	Fall	1	21:46:46	21:46:56	452	461	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_13	2-Sep-13	Fall	1	21:52:45	21:53:48	462	491	30	3	Mammal	Grey Wolf		2		Y/N	2	1	Other	Rolling on ground, walking through camera view. One wolf observed is same wolf from previous entry.
BR_13	3-Sep-13	Fall	1	22:53:23	22:53:32	542	551	10	1	Mammal	Red Fox		1			1	1	Walking	Must be something on the ground as fox is smelling in same general area as wolves were last time.
BR_13	3-Sep-13	Fall	1	23:50:45	23:50:54	554	563	10	1	Mammal	Red Fox		1		Y	1	0	Running	
BR_13	10-Sep-13	Fall	1	5:36:09	5:37:02	864	883	20	2	Mammal	Grey Wolf		2			2	2	Other	May be same wolves as another entry. It appears that a spot on the ground attracts them.
BR_13	11-Sep-13	Fall	1	3:08:18	3:08:28	927	936	10	1	Mammal	Grey Wolf		2			2	2	Other	Attracted to spot.
BR_13	12-Sep-13	Fall	1	5:27:07	5:28:04	989	1018	30	3	Mammal	Caribou	BR13_1	3			3	3	Other	May have been feeding at first - then one became interested in camera; other two walked away.
BR_13	14-Sep-13	Fall	1	1:18:12	1:18:23	1107	1116	10	1	Mammal	Red Fox		1			1	1	Other	Attracted to spot on ground.
BR_13	14-Sep-13	Fall	2	1:20:20	1:20:54	1117	1136	20	2	Mammal	Red Fox		1		Y	1	0	Other	Attracted to spot on ground.
BR_13	14-Sep-13	Fall	1	17:12:10	17:17:13	1169	1288	120	12	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera and attracted to spot - rolling on it.
BR_13	18-Sep-13	Fall	1	5:37:36	5:38:37	1458	1477	20	2	Mammal	Grey Wolf		1			1	1	Other	Attracted to spot - rolling around.
BR_13	18-Sep-13	Fall	1	18:24:26	18:25:11	1503	1522	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_13	20-Sep-13	Fall	1	12:56:01	12:56:37	1584	1603	20	2	Mammal	Grey Wolf		1			1	1	Other	Investigating the camera.
BR_13	29-Sep-13	Fall	1	4:04:27	4:06:54	2043	2092	50	5	Mammal	Grey Wolf		2			2	2	Other	Investigating spot and walking around.
BR_13	29-Sep-13	Fall	1	4:26:44	4:46:53	2093	2102	10	1	Mammal	Red Fox		1			1	1	Other	
BR_13	29-Sep-13	Fall	2	4:27:55	4:28:04	2103	2112	10	1	Mammal	Red Fox		1		Y	1	0	Other	
BR_13	20-Apr-14	Spring Migration	1	6:23:07	6:23:17	1862	1871	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_13	22-Apr-14	Spring Migration	1	23:13:24	23:13:34	2002	2011	10	1	Unknown	Unknown		1			1	1		Looks to maybe be an owl or bird flying in the air that triggered the camera but cannot positively ID.
BR_13	22-Apr-14	Spring Migration	1	23:21:05	23:21:14	2012	2021	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_13	27-Apr-14	Spring Migration	1	15:08:27	15:09:43	2246	2275	30	3	Mammal	Grey Wolf		1			1	1	Other	Investigated spot and walked away.
BR_13	29-Apr-14	Spring Migration	1	11:57:18	11:57:28	2365	2374	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_13	6-May-14	Spring Migration	1	8:46:37	8:46:46	2705	2714	10	1	Mammal	Arctic Fox		1			1	1	Walking	
BR_13	8-May-14	Spring Migration	1	13:34:19	13:34:29	2821	2830	10	1	Bird	Common Raven		1			1	1	Walking	Walked to spot on ground that other wildlife species have been interested in.
BR_13	12-May-14	Spring Migration	1	20:05:03	20:05:12	3036	3045	10	1	Mammal	Wolverine		1			1	1	Running	
BR_13	13-May-14	Spring Migration	1	16:43:17	16:43:26	3087	3096	10	1	Mammal	Grizzly Bear		1			1	1	Walking	
BR_13	13-May-14	Spring Migration	2	16:46:57	16:48:35	3097	3126	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Interested in spot on ground - rolling on it.
BR_13	13-May-14	Spring Migration	3	16:49:38	16:51:08	3127	3166	40	4	Mammal	Grizzly Bear		1		Y	1	0	Walking	Walked over to investigate camera.
BR_13	13-May-14	Spring Migration	4	16:52:14	16:53:21	3167	3196	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigates camera and knocks it over.
BR_13	13-May-14	Spring Migration	5	16:58:34	16:59:38	3197	3226	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera after knocking it over; walked away.
BR_14	5-Sep-13	Fall	1	16:48:00	16:49:54	519	558	30	3	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera.
BR_14	9-Sep-13	Fall	1	10:55:35	10:56:21	739	758	20	1	Mammal	Grizzly Bear		1			1	1	Other	Grizzly smashes camera, no more record. Could be the same as before.
BR_15	31-Aug-13	Summer	1	6:25:59	6:26:10	433	442	10	1	Bird	Common Raven		2			2	2	Walking	Walking around.
BR_15	28-Sep-13	Fall	1	19:13:50	19:14:54	1813	1842	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_15	6-May-14	Spring Migration	1	13:44:43	13:44:52	2403	2412	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_15	6-May-14	Spring Migration	2	13:46:50	13:46:59	2413	2422	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_15	11-May-14	Spring Migration	1	15:25:27	15:30:53	2666	2766	100	10	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_15	11-May-14	Spring Migration	2	15:32:03	15:32:13	2767	2776	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera.
BR_15	7-Jun-14	Calving	1	12:24:39	12:28:26	4042	4141	100	10	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_15	24-Jun-14	Post-calving	1	17:26:07	17:26:16	4992	5001	10	1	Mammal	Caribou	BR15_1		1		1	1	Walking	
BR_15	2-Jul-14	Post-calving	1	23:52:24	23:52:38	5399	5408	10	1	Mammal	Caribou	BR15_2	1			1	1	Walking	
BR_16	9-Sep-13	Fall	1	12:30:57	12:31:06	782	791	10	1	Mammal	Caribou	BR16_1	3	2		5	5	Grazing	Same group as before.
BR_16	21-Sep-13	Fall	1	14:22:12	14:22:22	1371	1380	10	1	Mammal	Caribou	BR16_2	61	1		62	62	Grazing	At least one young in group.
BR_16	21-Sep-13	Fall	1	16:38:15	16:38:46	1386	1405	20	2	Mammal	Caribou	BR16_3	11			11	11	Grazing	One curious male is checking out the camera.
BR_16	19-Apr-14	Spring Migration	1	20:14:49	20:22:16	1514	1573	60	6	Mammal	Caribou	BR16_4	2			2	2	Grazing	
BR_16	20-Apr-14	Spring Migration	1	4:31:24	4:32:00	1591	1610	20	2	Mammal	Caribou	BR16_5	1			1	1	Grazing	
BR_16	20-Apr-14	Spring Migration	2	5:15:11	5:23:55	1612	1681	70	7	Mammal	Caribou	BR16_6	3			3	3	Grazing	
BR_16	20-Apr-14	Spring Migration	3	5:36:43	5:39:51	1683	1732	50	5	Mammal	Caribou	BR16_7	3			3	3	Grazing	
BR_17	26-Aug-13	Summer	1	1:34:30	1:35:03	22	41	20	2	Mammal	Caribou	BR17_1	2			2	2	Walking	Couple of caribou walking left to right.
BR_17	26-Aug-13	Summer	2	4:24:46	4:24:55	52	63	10	1	Mammal	Caribou	BR17_2	1			1	1	Grazing	Walking right to left.
BR_17	27-Aug-13	Summer	1	14:45:49	14:46:00	136	145	10	1	Mammal	Caribou	BR17_3	1			1	1	Grazing	Caribou grazing right to left.
BR_17	27-Aug-13	Summer	2	16:07:52	16:08:22	149	168	20	2	Mammal	Caribou	BR17_4	2			2	2	Grazing	Caribou grazing right to left.
BR_17	29-Aug-13	Summer	1	3:13:45	3:16:42	239	268	30	3	Mammal	Caribou	BR17_5	1			1	1	Grazing	Caribou grazing all directions.
BR_17	29-Aug-13	Summer	2	3:36:16	3:36:25	270	279	10	1	Mammal	Caribou	BR17_5	1		Y	1	0	Grazing	Caribou grazing left to right.
BR_17	29-Aug-13	Summer	3	19:40:55	19:43:33	312	381	70	7	Mammal	Caribou	BR17_6	8			8	8	Grazing	Small herd of caribou grazing left to right, three walking near lakeshore in background.
BR_17	29-Aug-13	Summer	4	23:22:06	23:23:00	389	418	30	3	Mammal	Caribou	BR17_6	1		Y	1	0	Walking	Caribou walking left to right.
BR_17	30-Aug-13	Summer	1	18:54:54	18:57:00	458	517	70	7	Mammal	Caribou	BR17_7	2			2	2	Walking	Couple of caribou checking out the camera.
BR_17	30-Aug-13	Summer	2	19:38:08	19:38:17	520	529	10	1	Mammal	Caribou	BR17_7	2		Y	2	0	Walking	Shadows of previous caribou trigger the camera.
BR_17	31-Aug-13	Summer	1	18:36:35	18:38:53	576	615	40	4	Mammal	Caribou	BR17_8	5			5	5	Grazing	Caribou, grazing from right to left.
BR_17	1-Sep-13	Fall	1	0:31:17	0:34:39	628	697	70	7	Mammal	Caribou	BR17_9	31			31	31	Walking	Big group, first they are walking from right to left, then start running back from left to right. Total number observed 31 on the rightward pass.
BR_17	9-Sep-13	Fall	1	13:56:38	13:59:51	1128	1147	20	2	Mammal	Caribou	BR17_10	3			3	3	Grazing	A few caribou grazing left to right.
BR_17	11-Sep-13	Fall	1	10:30:41	10:31:27	1238	1257	20	2	Mammal	Caribou	BR17_11	5			5	5	Grazing	A few caribou grazing right to left.
BR_17	14-Sep-13	Fall	1	8:35:34	8:39:40	1398	1417	20	2	Mammal	Caribou	BR17_12	1			1	1	Walking	
BR_17	14-Sep-13	Fall	2	23:40:00	23:40:09	1448	1457	10	1	Mammal	Caribou	BR17_13	15			15	15	Walking	Big herd, walking from left to right.
BR_17	15-Sep-13	Fall	1	1:48:32	1:48:41	1462	1471	10	1	Mammal	Caribou	BR17_14	1			1	1	Standing	Lone caribou standing right of pic.
BR_17	18-Sep-13	Fall	1	0:26:14	0:27:58	1613	1642	30	3	Mammal	Caribou	BR17_15	3			3	3	Grazing	A few caribou grazing from right to left.
BR_17	18-Sep-13	Fall	2	6:29:38	6:29:47	1655	1664	10	1	Mammal	Caribou	BR17_16	1			1	1	Grazing	Caribou grazing right to left.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_17	12-May-14	Spring Migration	1	11:09:09	11:09:20	3014	3023	10	1	Mammal	Wolverine		1			1	1	Walking	Wolverine walking to the right.
BR_17	14-Jun-14	Calving	1	23:27:56	23:29:00	1564	1583	20	2	Mammal	Caribou	BR17_17	1			1	1	walking	
BR_17	15-Jun-14	Calving	1	2:12:46	2:12:56	1590	1599	10	1	Mammal	Caribou	BR17_17	1		Y	1	0	walking	Same male.
BR_18	30-Aug-13	Summer	1	16:00:02	16:00:11	316	325	10	1	Mammal	Caribou	BR18_1	1			1	1	Walking	Idem.
BR_18	2-Sep-13	Fall	1	3:57:29	3:57:38	445	454	10	1	Mammal	Caribou	BR18_2	1			1	1	Walking	Lone caribou walking right to left.
BR_18	4-Sep-13	Fall	1	22:42:22	22:52:47	589	608	20	2	Mammal	Grey Wolf		2			2	2	Walking	Couple of wolves pacing in front of the camera.
BR_18	5-Sep-13	Fall	1	15:01:22	15:01:31	642	651	10	1	Mammal	Caribou	BR18_3	1			1	1	Walking	Lone caribou walking right to left.
BR_18	6-Sep-13	Fall	1	11:03:28	11:09:51	702	781	80	8	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera.
BR_18	9-Sep-13	Fall	1	6:43:37	6:44:26	917	946	30	3	Mammal	Caribou	BR18_4	1			1	1	Other	Looks like youngish caribou checking out the camera.
BR_18	11-Sep-13	Fall	1	9:59:55	10:00:04	1049	1059	11	1	Mammal	Grey Wolf		1			1	1	Walking	Cool wolf checking out the camera, not sure if seen before.
BR_18	14-Sep-13	Fall	1	1:36:20	1:36:31	1187	1196	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf back, walking left to right. Looks like one previously seen.
BR_18	14-Sep-13	Fall	1	9:44:46	9:45:55	1213	1252	10	1	Mammal	Caribou	BR18_5	7			7	7	Walking	Small herd of caribou walking from right to left.
BR_18	14-Sep-13	Fall	1	13:58:36	14:01:56	1261	1341	81	8	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera again.
BR_18	19-Sep-13	Fall	1	10:57:04	10:57:11	1585	1594	10	1	Mammal	Caribou	BR18_6	4			4	4	Grazing	A few caribou grazing and going to the left.
BR_18	20-Sep-13	Fall	1	6:10:07	6:11:14	1634	1663	30	3	Mammal	Caribou	BR18_7	1			1	1	Other	Young/yearling checking camera.
BR_18	20-Sep-13	Fall	2	7:50:16	8:01:11	1667	1937	270	27	Mammal	Caribou	BR18_8	10			10	10	Grazing	Small herd of caribou walking from left to right, takes a long time to check out the camera.
BR_18	21-Sep-13	Fall	1	14:12:52	14:15:47	1998	2067	70	7	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera again and again, this time smashing it. No more pics.
BR_18	17-Sep-13	Fall	1	11:26:05	11:26:15	1504	1513	10	1	Bird	Snowy Owl		1			1	1	Flying	Flying through.
BR_18	17-May-14	Spring Migration	1	15:19:10	15:35:12	222	301	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_18	7-Jun-14	Calving	1	10:27:44	10:28:54	1320	1339	20	2	bird	White-crowned Sparrow		1			1	1	Flying	
BR_18	13-Jun-14	Calving	1	12:38:37	12:38:46	1633	1642	10	1	bird	White-crowned Sparrow		1		Y	1	0	Flying	
BR_18	18-Jun-14	Post-calving	1	18:39:34	18:40:21	1925	1944	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_18	25-Jun-14	Post-calving	1	5:02:12	5:02:21	2284	2293	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_18	26-Jun-14	Post-calving	1	7:49:23	7:49:33	2347	2356	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Away from camera, looks to be same individual as before.
BR_18	2-Jul-14	Post-calving	1	7:31:38	7:31:47	2645	2654	10	1	Mammal	Grey Wolf		1			1	1	Walking	White individual.
BR_18	3-Jul-14	Post-calving	1	0:51:01	0:51:10	2689	2698	10	1	Mammal	Caribou	BR18_9	1			1	1	walking	
BR_19	30-Aug-13	Summer	1	11:38:17	11:38:28	295	304	10	1	Mammal	Caribou	BR19_1	3			3	3	Grazing	
BR_19	31-Aug-13	Summer	1	19:40:53	19:46:24	369	438	70	7	Mammal	Caribou	BR19_2	1			1	1	Other	One curious caribou is sniffing up the camera.
BR_19	5-Sep-13	Fall	1	12:09:04	12:09:14	664	673	10	1	Mammal	Caribou	BR19_3	1			1	1	Walking	
BR_19	18-Sep-13	Fall	1	13:24:31	13:25:01	1300	1319	20	2	Mammal	Caribou	BR19_4	7			7	7	Grazing	
BR_19	20-Sep-13	Fall	1	9:01:22	9:01:55	1408	1427	20	2	Mammal	Caribou	BR19_5	7			7	7	Grazing	Possibly the same as seen earlier.
BR_19	15-Mar-14	Winter	1	5:15:36	5:15:45	9868	9877	10	1	Mammal	Grey Wolf		1			1	1	Walking	Walking up to camera.
BR_20	4-Sep-13	Fall	1	13:35:44	13:35:53	551	560	10	1	Mammal	Caribou	BR20_1	3			3	3	Grazing	Caribou part of the previous group.
BR_20	8-Sep-13	Fall	1	9:51:06	9:51:16	745	754	10	1	Mammal	Caribou	BR20_2	7			7	7	Grazing	
BR_20	10-Oct-13	Fall	1	10:33:10	10:34:54	2303	2332	30	3	Mammal	Grizzly Bear		1			1	1	Other	Grizzly chewing on camera.
BR_21	11-Sep-13	Fall	1	12:50:44	12:51:53	859	898	40	4	Mammal	Caribou	BR21_1	1			1	1	Other	Curious caribou sniffing the camera.
BR_21	16-Sep-13	Fall	1	12:45:33	12:46:40	1139	1178	40	4	Mammal	Caribou	BR21_2	1			1	1	Other	Yearling checking out camera.
BR_21	16-Sep-13	Fall	2	13:34:44	13:40:14	1181	1240	60	6	Mammal	Caribou	BR21_3	6			6	6	Grazing	A few caribou are gazing near the camera, one of them is curious about the tripod.
BR_21	23-Sep-13	Fall	1	11:39:43	11:39:54	1573	1582	10	1	Unknown	Unknown							Other	Unknown animal.
BR_21	20-Nov-13	Winter	1	10:21:05	10:21:16	4364	4373	10	1	Mammal	Caribou	BR21_4	32			32	32	Grazing	Some animals counted in previous timed photo.
BR_22	29-Aug-13	Summer	1	17:58:40	17:59:46	269	298	10	1	Mammal	Caribou	BR22_1	6			6	6	Grazing	Small herd of caribou grazing from right.
BR_22	3-Sep-13	Fall	1	17:34:39	17:53:58	539	588	50	5	Mammal	Caribou	BR22_2	11			11	11	Grazing	Small herd of caribou grazing, moving towards left of picture.
BR_22	3-Sep-13	Fall	2	20:22:06	20:30:18	594	704	111	10	Mammal	Caribou	BR22_3	2			2	2	Grazing	2 caribou grazing and one curious about camera.
BR_22	4-Sep-13	Fall	1	3:58:10	3:58:43	719	738	20	2	Mammal	Caribou	BR22_4	1			1	1	Walking	
BR_22	4-Sep-13	Fall	2	16:44:10	16:44:56	765	784	20	2	Mammal	Caribou	BR22_5	1			1	1	Walking	
BR_22	5-Sep-13	Fall	1	9:38:38	9:39:43	819	848	20	2	Mammal	Caribou	BR22_6	1			1	1	Walking	
BR_22	6-Sep-13	Fall	1	5:34:30	5:34:40	889	898	10	1	Mammal	Caribou	BR22_7	2			2	2	Walking	Couple of caribou walking from right to left.
BR_22	7-Sep-13	Fall	1	11:36:14	11:36:23	959	968	10	1	Mammal	Caribou	BR22_8	1			1	1	Walking	Caribou walking in from left of picture.
BR_22	7-Sep-13	Fall	2	14:58:40	14:59:48	975	1004	10	1	Mammal	Caribou	BR22_9	1			1	1	Grazing	Caribou grazing in from left of picture.
BR_22	8-Sep-13	Fall	1	11:18:26	11:21:38	1046	1095	50	5	Mammal	Caribou	BR22_10	2			2	2	Grazing	Couple of caribou walk and graze into view, right to left.
BR_22	9-Sep-13	Fall	1	12:21:28	12:22:19	1146	1175	30	3	Mammal	Caribou	BR22_11	1			1	1	Walking	Caribou walking in from left of picture.
BR_22	14-Sep-13	Fall	1	5:54:39	5:55:55	1403	1442	40	4	Mammal	Caribou	BR22_12	10	1		11	11	Walking	Herd of caribou walking from right to left.
BR_22	15-Sep-13	Fall	1	11:43:57	11:44:51	1503	1522	40	4	Mammal	Caribou	BR22_13	2			2	2	Walking	
BR_22	5-Oct-13	Fall	1	7:50:38	7:54:15	2475	2544	70	7	Mammal	Grizzly Bear		1			1	1	Other	
BR_22	20-Nov-13	Winter	1	14:42:08	14:44:39	4767	4826	60	6	Mammal	Caribou	BR22_14	10			10	10	Walking	
BR_22	1-Apr-14	Winter	1	19:59:39	20:02:00	1174	1194	21	2	Mammal	Caribou	BR22_15	7			7	7	Walking	

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_22	1-Apr-14	Winter	2	20:40:48	20:40:58	1196	1205	10	1	Mammal	Caribou	BR22_16	1			1	1	Walking	
BR_22	20-May-14	Spring Migration	1	19:52:33	19:54:55	353	412	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_22	20-May-14	Spring Migration	2	21:06:06	21:06:47	416	435	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera.
BR_22	30-May-14	Spring Migration	1	1:46:52	1:47:01	877	886	10	1	Mammal	Grey Wolf		1			1	1	Walking	Walking up to and past camera.
BR_22	8-Jul-14	Post-calving	1	3:57:49	3:58:00	2843	2852	10	1	Mammal	Caribou	BR22_17	1			1	1	walking	
BR_23	28-Aug-13	Summer	1	18:59:57	19:00:06	212	222	11	1	Mammal	Caribou	BR23_1	3			3	3	Walking	One timed photo was taken within the series.
BR_23	28-Aug-13	Summer	2	19:55:14	19:55:55	224	243	20	2	Mammal	Caribou	BR23_2	19			19	19	Walking	Same group as before.
BR_23	1-Sep-13	Fall	1	19:43:21	19:43:30	456	465	10	1	Mammal	Caribou	BR23_3	1			1	1	Other	
BR_23	5-Sep-13	Fall	1	8:33:48	8:34:16	636	655	20	2	Mammal	Caribou	BR23_4	2			2	2	Walking	Caribou walking in front of camera, one in background.
BR_23	6-Sep-13	Fall	1	11:42:07	11:50:50	710	739	30	3	Mammal	Caribou	BR23_5	11			11	11	Grazing	
BR_23	8-Sep-13	Fall	1	20:45:16	20:45:25	854	863	10	1	Mammal	Caribou	BR23_6	1			1	1	Grazing	
BR_23	10-Sep-13	Fall	1	20:40:27	20:46:02	960	999	40	4	Mammal	Caribou	BR23_7	8			8	8	Walking	
BR_23	11-Sep-13	Fall	1	15:30:54	15:31:03	1038	1047	10	1	Mammal	Caribou	BR23_8	2			2	2	Grazing	
BR_23	11-Sep-13	Fall	2	18:12:13	18:12:22	1053	1062	10	1	Mammal	Caribou	BR23_8	4		Y/N	4	3	Grazing	One caribou nearby, a couple in the background grazing - similar looking bull in foreground, likely counted.
BR_23	11-Sep-13	Fall	3	18:42:01	18:42:53	1064	1093	30	3	Mammal	Caribou	BR23_9	2			2	2	Grazing	
BR_23	12-Sep-13	Fall	1	13:28:25	13:28:34	1131	1140	10	1	Unknown	Unknown							Other	Unknown animal.
BR_23	18-Sep-13	Fall	1	0:57:41	0:57:52	1404	1413	10	1	Mammal	Caribou	BR23_10	1	1		2	2	Walking	
BR_24	10-Sep-13	Fall	1	16:00:43	16:07:36	834	873	40	1	Mammal	Wolverine		1			1	1	Other	Investigating the camera.
BR_24	28-May-14	Spring Migration	1	12:46:42	12:46:51	5068	5077	10	1	Bird	White-crowned sparrow		1			1	1	Standing	
BR_24	28-May-14	Spring Migration	2	12:47:29	12:47:38	5078	5087	10	1	Bird	Short-eared Owl		1			1	1	Flying	
BR_24	7-Jun-14	Calving	1	11:52:03	11:52:13	5566	5575	10	1	Bird	Parasitic Jaeger		1			1	1	Hunting	Parasitic jaeger drops on sleeping/resting wolf on riverbed.
BR_24	7-Jun-14	Calving	1	11:52:03	11:52:13	5566	5575	10	1	Mammal	Grey Wolf		1			1	1	Walking	Attacked by parasitic jaeger and then walks away.
BR_24	8-Jun-14	Calving	1	8:10:55	8:11:04	5617	5626	10	1	Bird	Unknown		1			1	1	Flying	Unidentifiable songbird.
BR_24	8-Jun-14	Calving	1	12:37:10	12:42:29	5646	5775	130	13	Mammal	Caribou	BR24_1	1			1	1	Feeding	
BR_24	8-Jun-14	Calving	1	15:35:13	13:35:22	5782	5791	10	1	Bird	Unknown		1			1	1	Flying	Unidentifiable songbird.
BR_24	26-Jun-14	Post-calving	1	20:10:42	20:11:50	6775	6794	20	2	Bird	Bald Eagle		1			1	1	Standing	Perched on rock and then flew away.
BR_24	28-Jun-14	Post-calving	1	15:55:41	15:55:50	6882	6891	10	1	Bird	Bald Eagle		2			2	2	Standing	One flew in and stood on ground; the other is in the background perched on a rock.
BR_24	1-Jul-14	Post-calving	1	14:03:32	14:03:42	7043	7052	10	1	Bird	Bald Eagle		1			1	1	Flying	Sitting on rock in previous timed photos, and triggers camera by flying away.
BR_26	31-Aug-13	Summer	1	1:00:33	1:01:05	281	300	20	2	Mammal	Caribou	BR26_1	1			1	1	Grazing	
BR_26	1-Sep-13	Fall	1	7:14:34	7:14:44	361	370	10	1	Mammal	Caribou	BR26_2	1			1	1	Walking	
BR_26	1-Sep-13	Fall	2	12:12:34	12:18:59	381	400	20	2	Mammal	Caribou	BR26_3	2			2	2	Grazing	
BR_26	1-Sep-13	Fall	3	13:20:42	13:29:33	401	472	70	7	Mammal	Caribou	BR26_3	3	1	Y/N	4	3	Grazing	One adult male is the same as a previous series, and one looks to be young of the year.
BR_26	1-Sep-13	Fall	4	13:32:18	13:37:14	474	513	40	4	Mammal	Caribou	BR26_4	4		n	4	4	Grazing	Two possible calves or yearlings
BR_26	1-Sep-13	Fall	5	19:48:54	19:49:03	526	535	10	1	Mammal	Caribou	BR26_5	1			1	1	Grazing	
BR_26	2-Sep-13	Fall	1	7:27:36	7:27:46	559	568	10	1	Mammal	Caribou	BR26_6	2			2	2	Grazing	Looks like a couple of caribous that were there previously.
BR_26	3-Sep-13	Fall	1	17:52:51	17:53:00	638	647	10	1	Mammal	Caribou	BR26_7	3			3	3	Grazing	
BR_26	7-Sep-13	Fall	1	10:07:38	10:09:11	825	854	30	3	Mammal	Caribou	BR26_8	1			1	1	Grazing	Lone female without antlers walking past camera.
BR_26	14-Sep-13	Fall	1	16:21:05	16:21:15	1223	1232	10	1	Mammal	Caribou	BR26_9	2			2	2	Grazing	2 caribou grazing close by.
BR_26	17-Sep-13	Fall	1	16:39:55	16:40:05	1378	1387	10	1	Mammal	Caribou	BR26_10	2			2	2	Grazing	
BR_27	9-Sep-13	Fall	1	14:07:31	14:09:34	675	724	50	5	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera.
BR_27	10-Sep-13	Fall	1	16:28:09	16:28:18	777	786	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf walking away from the camera.
BR_27	15-Sep-13	Fall	1	8:55:46	8:56:50	1012	1041	30	3	Mammal	Grizzly Bear		1			1	1	Other	Curious bear hitting camera again, then traverses the water.
BR_27	22-Sep-13	Fall	1	16:01:48	16:13:32	1393	1412	20	2	Mammal	Grey Wolf		2			2	2	Other	Couple of wolves passing in front of camera, apparently relieving themselves.
BR_27	9-Oct-13	Fall	1	13:15:53	13:16:03	2223	2232	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_27	10-Oct-13	Fall	1	21:40:36	21:40:46	2298	2307	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf sniffing ground in front of camera.
BR_27	19-Oct-13	Fall	1	18:34:34	18:34:46	2734	2743	10	1	Mammal	Grizzly Bear		1			1	1	Walking	
BR_27	19-Oct-13	Fall	1	18:40:01	18:40:10	2744	2753	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_27	11-Feb-14	Winter	1	9:56:36	9:56:48	8256	8265	10	1	Mammal	Wolverine		1			1	1	Other	Wolverine checking out camera.
BR_27	28-Feb-14	Winter	1	15:54:17	15:54:26	9094	9103	10	1	Mammal	Red Fox		1			1	1	Sitting	
BR_27	3-Apr-14	Winter	1	15:20:16	15:20:25	736	745	10	1	Mammal	Unknown		1			1	1	Other	A shadow triggers the camera. Possibly a fox or a hare, no tracks are left to ID.
BR_27	19-Apr-14	Spring Migration	1	18:25:39	18:25:48	1520	1529	10	1	Mammal	Wolverine		1			1	1	Walking	Wolverine walking near camera.
BR_27	21-Apr-14	Spring Migration	1	9:18:57	9:19:06	1608	1617	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf sniffing up the camera then walking away.
BR_27	4-May-14	Spring Migration	1	10:21:25	10:21:34	2244	2253	10	1	Mammal	Wolverine		1			1	1	Walking	Wolverine walking near camera.
BR_27	7-May-14	Spring Migration	1	23:11:24	23:12:41	2424	2443	20	2	Mammal	Grey Wolf		1			1	1	Walking	Wolf walking near the camera, looks like a different wolf than earlier in the year. Also looks like it's a pregnant female.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_28	9-Sep-13	Fall	1	8:54:09	8:54:51	766	785	20	2	Mammal	Caribou	BR28_1	12			12	12	Grazing	Herd grazing nearby.
BR_28	9-Sep-13	Fall	2	9:07:42	9:11:40	787	816	30	3	Mammal	Caribou	BR28_1	7		Y/N	7	2	Grazing	Looks to be mostly the same individuals in the background - two new individuals in foreground.
BR_28	10-Sep-13	Fall	1	13:45:11	13:45:21	874	883	10	1	Mammal	Caribou	BR28_2	7			7	7	Grazing	Couple of caribou grazing plus one sniffing the camera.
BR_28	12-Sep-13	Fall	1	20:02:50	20:04:13	993	1022	30	3	Mammal	Caribou	BR28_3	5			5	5	Grazing	
BR_28	13-Sep-13	Fall	2	22:59:23	22:59:33	1076	1085	10	1	Mammal	Caribou	BR28_4	2	2		4	4	Walking	A group of caribou walking past the camera.
BR_28	14-Sep-13	Fall	1	6:14:51	6:15:32	1101	1120	20	1	Mammal	Caribou	BR28_5	1			1	1	Grazing	Lone caribou grazing.
BR_28	16-Sep-13	Fall	1	12:02:32	12:02:42	1229	1238	10	1	Mammal	Caribou	BR28_6	13			13	13	Grazing	Herd of caribou grazing nearby.
BR_28	19-Sep-13	Fall	1	22:00:30	22:02:46	1403	1462	60	6	Mammal	Caribou	BR28_7	5			5	5	Walking	Group passing in the night, looks like new ones than before.
BR_28	20-Apr-14	Spring Migration	1	15:08:39	15:08:48	1674	1683	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_29	24-Aug-13	Summer	1	20:58:10	20:58:19	23	32	10	1	Mammal	Grey Wolf		2			2	2	Walking	Couple of wolves walking left to right of the camera.
BR_29	2-Sep-13	Fall	1	15:03:30	15:03:40	454	463	10	1	Mammal	Caribou	BR29_1	1			1	1	Grazing	One big male grazing right to left.
BR_29	14-Sep-13	Fall	1	1:40:29	1:40:39	1013	1022	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_29	15-Sep-13	Fall	1	9:39:45	9:39:56	1087	1096	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_29	19-Sep-13	Fall	1	21:41:25	21:45:18	1313	1362	50	5	Mammal	Grizzly Bear		1			1	1	Other	
BR_29	24-Sep-13	Fall	1	9:54:57	9:55:07	1579	1588	10	1	Mammal	Grey Wolf		1			1	1	Other	Curious wolf checking out the camera.
BR_29	25-Sep-13	Fall	1	0:06:41	0:06:52	1618	1627	10	1	Mammal	Grey Wolf		3		Y/N	3	2	Walking	Pack of wolves walking left to right. One has been previously ID, the others are likely new.
BR_29	28-May-14	Spring Migration	1	16:24:48	16:48:38	597	676	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, tips it to left but it tips back by when the bear leaves.
BR_29	7-Jun-14	Calving	1	3:40:47	3:42:41	1132	1162	30	3	Mammal	Grizzly Bear		1			1	1	walking	Walks up to camera and starts tossing it around, camera stops functioning while bear is investigating.
BR_30	27-Aug-13	Summer	1	0:25:36	0:25:45	126	135	10	1	Mammal	Caribou	BR30_1	1			1	1	Walking	One big male walking left to right.
BR_30	2-Sep-13	Fall	1	12:39:55	12:40:35	449	468	20	2	Mammal	Caribou	BR30_2	3			3	3	Walking	Few caribou walking left to right.
BR_30	6-Sep-13	Fall	1	7:49:45	7:50:54	651	680	30	3	Mammal	Grizzly Bear		1			1	1	Other	
BR_30	20-Sep-13	Fall	1	12:52:46	12:52:56	1363	1372	10	1	Mammal	Caribou	BR30_3	1			1	1	Walking	Caribou walking left to right
BR_30	12-May-14	Spring Migration	1	22:11:51	22:12:01	2625	2634	10	1	Bird	Sandhill Crane		1			1	1	Walking	
BR_30	12-May-14	Spring Migration	1	22:11:51	22:12:01	2625	2634	10	1	Bird	Canada Goose		4			4	4	Walking	
BR_30	17-May-14	Spring Migration	1	20:45:59	20:46:08	216	225	10	1	Bird	Greater White-fronted Goose		3			3	3	Flying	
BR_30	17-May-14	Spring Migration	1	20:45:59	20:46:08	216	225	10	1	bird	Goose		300			300	300	other	Approximated group size - large flock in river. Hangs around for a while (from sequence of previous and following timed photos). Likely mix of Canada goose, greater white-fronted and some snow geese.
BR_30	18-May-14	Spring Migration	1	0:51:29	0:51:29	234	243	10	1	bird	Goose		300		Y	300	0	Flying	Approximated group size - large flock flies by. Flock has been hanging around for day, and stays for a number of days (from timed photos).
BR_30	26-May-14	Spring Migration	1	16:52:18	16:52:27	660	669	10	1	bird	Common Raven		1			1	1	Flying	
BR_30	8-Jun-14	Calving	1	6:39:28	6:39:39	1834	1843	10	1	Bird	Greater White-fronted Goose		1			1	1	Flying	Lands next to camera.
BR_30	8-Jun-14	Calving	2	21:24:44	21:24:54	1873	1882	10	1	Bird	Gull		1			1	1	Flying	
BR_30	23-Jun-14	Post-calving	1	11:54:19	11:54:28	2894	2903	10	1	Bird	unknown		1			1	1	Flying	Just a wing on the left side, not enough to positively identify.
BR_30	8-Jul-14	Post-calving	1	18:02:44	18:02:53	3767	3776	10	1	Bird	unknown		1			1	1	Flying	Flying low over river, a songbird but cannot see enough to positively ID.
BR_30	12-Jul-14	Post-calving	1	11:42:35	11:42:41	3996	4005	10	1	Bird	unknown		2			2	2	Flying	Flying over river, songbird, could be a pair of horned lark.
BR_31	7-Sep-13	Fall	1	9:26:33	9:28:32	587	626	40	4	Mammal	Grizzly Bear		1			1	1	Other	
BR_31	13-Sep-13	Fall	1	11:47:30	11:49:28	960	999	40	4	Mammal	Grizzly Bear		1			1	1	Other	
BR_31	22-Sep-13	Fall	1	21:34:17	21:37:11	1452	1531	80	8	Mammal	Grizzly Bear		1			1	1	Other	
BR_31	28-Apr-14	Spring Migration	1	15:16:20	15:18:53	2894	2923	30	3	Mammal	Grey Wolf		2			2	2	Walking	Couple of wolves checking out the camera.
BR_31	9-May-14	Spring Migration	1	9:01:35	9:01:45	3440	3449	10	1	Mammal	Grey Wolf		1			1	1	Walking	Wolf walking past the camera. Looks to be a pregnant female.
BR_32	no wildlife photos																		
BR_33	26-Aug-13	Summer	1	8:54:02	5:54:11	95	104	10	1	Mammal	Caribou	BR33_1	4			4	4	Feeding	
BR_33	26-Aug-13	Summer	1	17:47:44	17:51:19	123	222	100	10	Mammal	Caribou	BR33_2	1			1	1	Standing	Investigated camera for a bit and then stood right next to it.
BR_33	27-Aug-13	Summer	1	4:03:22	4:03:54	244	263	20	2	Mammal	Caribou	BR33_3	2			2	2	Walking	
BR_33	27-Aug-13	Summer	1	4:48:13	4:48:22	265	274	10	1	Mammal	Caribou	BR33_4	1			1	1	Walking	
BR_33	27-Aug-13	Summer	2	4:50:50	4:50:59	275	284	10	1	Mammal	Caribou	BR33_5	1			1	1	Walking	
BR_33	27-Aug-13	Summer	1	6:03:17	6:03:26	288	297	10	1	Mammal	Caribou	BR33_6	1			1	1	Walking	
BR_33	28-Aug-13	Summer	1	11:22:48	11:22:57	366	375	10	1	Mammal	Caribou	BR33_7	1			1	1	Walking	
BR_33	28-Aug-13	Summer	1	13:32:42	13:33:42	381	410	30	3	Mammal	Caribou	BR33_8	1			1	1	Other	Investigating and breathing on camera, then walked away.
BR_33	29-Aug-13	Summer	1	13:52:22	13:52:31	469	478	10	1	Mammal	Caribou	BR33_9	1			1	1	Walking	
BR_33	29-Aug-13	Summer	1	15:10:57	15:14:10	482	561	80	8	Mammal	Caribou	BR33_10	15			15	15	Walking	One caribou investigating camera; the rest are far back walking across camera view.
BR_33	29-Aug-13	Summer	1	15:53:58	15:54:07	563	572	10	1	Mammal	Caribou	BR33_11	1			1	1	Walking	
BR_33	3-Sep-13	Fall	1	14:06:31	14:06:40	860	869	10	1	Mammal	Caribou	BR33_12	1			1	1	Walking	
BR_33	3-Sep-13	Fall	2	14:08:08	14:08:17	870	879	10	1	Mammal	Caribou	BR33_12	1		Y	1	0	Walking	

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_33	5-Sep-13	Fall	1	15:59:51	16:00:00	989	998	10	1	Mammal	Caribou	BR33_13	1			1	1	Walking	
BR_33	7-Sep-13	Fall	1	13:17:40	13:18:08	1110	1129	20	2	Mammal	Caribou	BR33_14	4			4	4	Walking	
BR_33	22-Nov-13	Winter	1	14:44:57	14:56:21	5611	5880	270	27	Mammal	Caribou	BR33_15	95	2		97	97	Walking	Looks to be at least two young.
BR_33	22-Nov-13	Winter	2	14:59:37	15:00:09	5881	5901	21	2	Mammal	Caribou	BR33_16	1			1	1	Other	Investigated camera and then walked away.
BR_33	22-Nov-13	Winter	3	15:06:20	15:09:18	5902	5961	60	6	Mammal	Caribou	BR33_17	15			15	15	Walking	
BR_33	11-Apr-14	Winter	1	23:22:09	23:22:18	2739	2748	10	1	Mammal	Arctic Hare		1			1	1	Running	
BR_34	no wildlife photos																		
BR_35	30-Aug-13	Summer	1	19:40:30	19:41:05	298	317	20	2	Mammal	Grey Wolf		2			2	2	Walking	Couple of wolves walking left to right of the camera.
BR_35	3-Sep-13	Fall	1	8:55:33	8:55:42	488	497	10	1	Mammal	Grey Wolf		1			1	1	Walking	Lone wolf checks out the camera.
BR_35	3-Sep-13	Fall	2	19:00:13	19:07:37	519	578	50	5	Mammal	Grey Wolf		4		Y/N	4	1	Walking	Pack of wolves comprised of members seen before, but one member was not previously counted.
BR_35	14-Sep-13	Fall	1	6:21:18	6:21:28	1081	1090	10	1	Mammal	Caribou	BR35_1	1			1	1	Walking	Caribou walking left to right.
BR_35	14-Sep-13	Fall	2	15:24:03	15:24:13	1109	1118	10	1	Mammal	Caribou	BR35_2	23			23	23	Walking	Herd grazing near and far.
BR_35	14-Sep-13	Fall	3	4:40:26	16:40:58	1122	1141	20	2	Mammal	Caribou	BR35_3	1			1	1	Walking	Young caribou sniffing the ground and walking towards the left.
BR_35	18-Sep-13	Fall	1	22:41:50	22:41:59	1346	1355	10	1	Mammal	Grey Wolf		2			2	2	Other	Couple of wolves frolicking near camera, hard to see if seen previously.
BR_35	2-Oct-13	Fall	1	20:59:18	20:59:27	2024	2033	10	1	Mammal	Grey Wolf		1			1	1	Other	Lone wolf walking left to right.
BR_35	19-Oct-13	Fall	1	18:23:24	18:23:34	2845	2854	10	1	Mammal	Grey Wolf		1			1	1	Walking	Lone wolf walking left to right.
BR_35	21-Nov-13	Winter	1	5:28:20	5:36:39	4413	4463	10	1	Mammal	Caribou	BR35_4	2			2	2	Walking	Two caribou walking around camera, rear up at each other in one photo.
BR_35	21-Nov-13	Winter	2	8:16:42	8:16:51	4469	4478	10	1	Mammal	Caribou	BR35_5	1			1	1	Walking	Same caribou.
BR_35	7-Apr-14	Winter	1	10:28:26	10:34:14	1060	1170	111	11	Mammal	Caribou	BR35_6	6			6	6	Grazing	Small herd of caribou grazing and moving to the right.
BR_35	8-Jun-14	Calving	1	19:05:40	19:05:49	1280	1289	10	1	Mammal	Grey Wolf		2			2	2	walking	One is scent marking, the other walking.
BR_35	7-Jul-14	Post-calving	1	9:27:39	9:28:11	2672	2691	20	1	Mammal	Grizzly Bear		1			1	1	walking	Walks up and investigates camera.
BR_35	7-Jul-14	Post-calving	2	23:57:26	23:57:36	2721	2730	10	1	Mammal	Grey Wolf		2			2	2	walking	Checking out area near where previous wolf had scent marked, possibly same pair.
BR_36	11-Sep-13	Fall	1	8:49:14	8:50:49	1735	1764	30	3	Mammal	Caribou	BR36_1	2			2	2	Walking	Adult and possible young/yearling walking from right to left.
BR_36	13-Sep-13	Fall	1	18:51:39	18:52:34	1991	2020	30	3	Mammal	Caribou	BR36_2	43			43	43	Walking	Two caribou near the camera plus a herd grazing in behind.
BR_36	13-Sep-13	Fall	2	19:30:01	19:32:21	2033	2072	40	4	Mammal	Caribou	BR36_3	1			1	1	Grazing	
BR_36	13-Sep-13	Fall	3	19:43:57	19:44:06	2073	2082	10	1	Mammal	Caribou	BR36_4	1			1	1	Grazing	
BR_36	15-Sep-13	Fall	1	17:42:10	17:43:05	2195	2214	20	2	Mammal	Caribou	BR36_5	2	1		3	3	Walking	Caribou grazing.
BR_36	31-Dec-13	Winter	1	7:30:01	7:30:10	2912	2921	10	1	Mammal	Arctic Hare		1			1	1	Sitting	
BR_37	8-Oct-13	Fall	1	12:43:42	12:43:51	3061	3070	10	1	Bird	Snowy Owl		1			1	1	Flying	
BR_37	9-Apr-14	Winter	1	3:40:45	3:41:16	3968	3987	20	2	Mammal	Caribou	BR37_1	1			1	1	Other	
BR_37	9-Apr-14	Winter	1	4:07:43	4:08:19	3989	4008	20	2	Mammal	Caribou	BR37_1	1		Y	1	0	Other	
BR_37	29-May-14	Spring Migration	1	10:53:48	10:53:57	7392	7401	10	1	Bird	Unknown		1			1	1	Flying	Unidentifiable bird, looks to be a larger bird, such as a raptor.
BR_37	7-Jun-14	Calving	1	21:26:15	21:26:25	8125	8134	10	1	Mammal	Unknown		1			1	1	Other	Unidentifiable wildlife.
BR_37	11-Jun-14	Calving	1	8:35:28	8:36:40	8392	8421	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_37	2-Jul-14	Post-calving	1	8:29:54	8:30:03	9929	9939	11	1	Bird	Unknown		1			1	1	Flying	Unidentifiable bird, trips camera then is seen flying away in the background.
BR_38	22-May-14	Spring Migration	1	11:43:56	11:45:17	3899	3938	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera (very close to lens).
BR_38	22-May-14	Spring Migration	1	11:53:50	11:54:52	3939	3968	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigated the camera. Same bear as previous entry.
BR_38	22-May-14	Spring Migration	2	11:56:29	11:56:40	3969	3978	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating the camera.
BR_38	26-May-14	Spring Migration	1	13:05:05	13:07:30	4160	4199	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_38	26-May-14	Spring Migration	2	13:10:54	13:11:35	4200	4219	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating the camera.
BR_38	26-May-14	Spring Migration	3	13:13:47	13:13:56	4220	4229	10	1	Mammal	Grizzly Bear		1		Y	1	0	Walking	Walking towards camera.
BR_38	27-May-14	Spring Migration	1	18:17:48	18:17:57	4322	4331	10	1	Mammal	Wolverine		1			1	1	Walking	
BR_39	29-Aug-13	Summer	1	14:00:01	14:00:10	432	441	10	1	Bird	Unknown		1			1	1	Standing	Small bird on rocks.
BR_39	1-Sep-13	Fall	1	8:54:22	8:54:31	635	644	10	1	Mammal	Grizzly Bear		1			1	1	Walking	
BR_39	4-Sep-13	Fall	1	5:00:01	5:00:10	852	861	10	1	Mammal	Caribou	BR39_1	1			1	1	Feeding	
BR_39	12-Oct-13	Fall	1	8:28:23	8:37:46	4362	4582	221	22	Mammal	Grizzly Bear		1			1	1	Other	Bear was investigating camera. Knocked it over.
BR_40	30-Aug-13	Summer	1	18:58:57	18:59:08	296	305	10	1	Mammal	Caribou	BR40_1	1			1	1	Other	
BR_40	12-Sep-13	Fall	1	21:45:17	21:47:26	936	975	40	4	Mammal	Caribou	BR40_2	16	1		17	17	Walking	At least one young present. Herd moving to left.
BR_40	12-Sep-13	Fall	2	22:00:42	22:00:51	977	986	10	1	Mammal	Caribou	BR40_3	2			2	2	Walking	Couple of caribou walking.
BR_40	14-Sep-13	Fall	1	12:10:44	12:12:22	1063	1092	30	3	Mammal	Caribou	BR40_4	1			1	1	Grazing	Couple of caribou graving, looks like one female without antlers in the front.
BR_40	14-Sep-13	Fall	1	12:58:11	12:58:43	1094	1113	20	2	Mammal	Caribou	BR40_4	2		Y/N	2	1	Grazing	One caribou from previous series, one new one in background.
BR_40	15-Sep-13	Fall	1	7:48:22	7:56:02	1152	1201	50	5	Mammal	Caribou	BR40_5	4			4	4	Grazing	A few caribou passing through grazing. Seem like new ones.
BR_40	15-Sep-13	Fall	2	10:39:09	10:40:42	1208	1237	30	3	Mammal	Caribou	BR40_6	6			6	6	Grazing	
BR_40	15-Sep-13	Fall	3	11:55:46	11:58:24	1240	1309	70	7	Mammal	Caribou	BR40_6	28	1	Y/N	29	23	Grazing	Big herd passing through, can see one young clearly. Six previously counted as part of same group earlier in the day - herd is moving right now.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_40	15-Sep-13	Fall	4	12:00:57	12:18:21	1311	1350	40	4	Mammal	Caribou	BR40_6	15		Y	15	0	Grazing	Same herd as before, less members visible.
BR_40	15-Sep-13	Fall	5	12:39:08	12:39:17	1352	1361	10	1	Mammal	Caribou	BR40_7	1			1	1	Walking	
BR_40	15-Sep-13	Fall	6	13:10:29	13:10:38	1363	1372	10	1	Mammal	Caribou	BR40_8	1			1	1	Walking	Same caribou, walking away.
BR_40	15-Sep-13	Fall	7	13:23:12	13:26:11	1373	1392	20	2	Mammal	Caribou	BR40_9	5			5	5	Grazing	
BR_40	15-Sep-13	Fall	8	17:35:20	17:36:12	1402	1421	20	2	Mammal	Caribou	BR40_10	4			4	4	Grazing	
BR_40	15-Sep-13	Fall	9	20:34:34	20:34:43	1428	1437	10	1	Mammal	Caribou	BR40_11	2			2	2	Walking	Two caribou walking by at night.
BR_40	17-Apr-14	Spring Migration	1	12:48:02	12:48:11	1695	1704	10	1	Mammal	Wolverine		1			1	1	Walking	One lone wolverine walking.
BR_41	25-Aug-13	Summer	1	23:26:41	23:27:59	16	35	20	2	Mammal	Grey Wolf		2			2	2	Walking	Couple of wolves walking towards the left.
BR_41	29-Aug-13	Summer	1	16:26:17	16:27:05	214	233	20	2	Mammal	Caribou	BR41_1	1			1	1	Other	Caribou sniffing the camera.
BR_41	31-Aug-13	Summer	1	8:08:49	8:09:45	314	343	30	3	Mammal	Caribou	BR41_2	1			1	1	Other	Caribou sniffing the camera.
BR_41	31-Aug-13	Summer	2	13:43:44	13:47:36	355	414	60	6	Mammal	Caribou	BR41_3	2			2	2	Walking	Caribou sniffing the camera and pacing in fro.nt
BR_41	3-Sep-13	Fall	1	19:39:54	19:42:49	571	620	50	5	Mammal	Caribou	BR41_4	1			1	1	Grazing	
BR_41	4-Sep-13	Fall	1	6:39:49	18:39:58	667	676	10	1	Mammal	Caribou	BR41_5	2			2	2	Grazing	Walking and grazing, one caribou in background near lake.
BR_41	7-Sep-13	Fall	1	14:11:11	14:15:27	812	831	20	2	Mammal	Caribou	BR41_6	2			2	2	Grazing	Caribou grazing around in the background.
BR_41	11-Sep-13	Fall	1	12:21:35	12:21:45	1020	1029	10	1	Mammal	Caribou	BR41_7	1			1	1	Grazing	Caribou grazing around in the front.
BR_41	20-Sep-13	Fall	1	10:22:31	10:24:02	1458	1477	20	2	Mammal	Caribou	BR41_8	3			3	3	Grazing	A few caribou grazing and checking out the camera, moving to the left.
BR_41	20-Sep-13	Fall	2	11:57:08	11:57:17	1481	1490	10	1	Mammal	Caribou	BR41_9	7			7	7	Walking	Small herd walking from left to right.
BR_41	19-Jun-14	Post-calving	1	9:14:00	9:14:29	1795	1814	20	2	Mammal	Caribou	BR41_10	1			1	1	Other	Staring at camera.
BR_42	29-Aug-13	Summer	1	6:56:18	7:01:24	176	226	51	5	Mammal	Caribou	BR42_1	2			2	2	Other	Curious caribou checking out the camera, one behind caribou the whole time.
BR_42	29-Aug-13	Summer	2	8:18:49	8:21:39	229	248	20	2	Mammal	Caribou	BR42_2	9	2		11	11	Grazing	Herd of caribou grazing and moving to the right.
BR_42	29-Aug-13	Summer	1	20:56:22	20:57:25	274	293	20	2	Mammal	Caribou	BR42_3	1			1	1	Walking	Lone caribou walking towards the right.
BR_42	30-Aug-13	Summer	1	19:14:28	19:15:58	339	378	40	4	Mammal	Caribou	BR42_4	1			1	1	Grazing	Lone caribou grazing and wandering.
BR_42	30-Aug-13	Summer	2	23:17:33	23:17:42	387	396	10	1	Mammal	Caribou	BR42_5	4			4	4	Walking	Small herd moving to the left.
BR_42	1-Sep-13	Fall	1	12:13:37	12:13:48	471	480	10	1	Mammal	Caribou	BR42_6	2			2	2	Grazing	Two caribou grazing towards the right.
BR_42	2-Sep-13	Fall	1	14:55:32	14:55:41	534	543	10	1	Mammal	Caribou	BR42_7	1			1	1	Walking	Caribou walking to the right.
BR_42	8-Sep-13	Fall	1	23:05:21	23:05:30	849	558	10	1	Mammal	Caribou	BR42_8	2			2	2	Walking	Checking out the camera.
BR_42	9-Sep-13	Fall	1	5:20:29	5:20:39	871	880	10	1	Unknown	Unknown		1			1	1	other	Something zips by the camera, cannot ID.
BR_42	11-Sep-13	Fall	1	17:30:00	17:30:11	1001	1011	11	1	Mammal	Caribou	BR42_9	1			1	1	Walking	Lone caribou walking towards the right.
BR_42	15-Sep-13	Fall	1	7:02:51	7:03:01	1183	1192	10	1	Mammal	Caribou	BR42_10	2			2	2	Walking	Couple of caribou grazing.
BR_42	17-Sep-13	Fall	1	16:11:00	16:11:10	1307	1316	10	1	Mammal	Caribou	BR42_11	1			1	1	Walking	Younger caribou checking the camera.
BR_42	22-Mar-14	Winter	1	4:17:08	4:17:22	232	241	10	1	Mammal	Caribou	BR42_12	1			1	1	Walking	
BR_42	4-May-14	Spring Migration	1	15:31:33	15:31:43	2329	2338	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_42	6-May-14	Spring Migration	1	19:13:09	19:13:18	2442	2451	10	1	Mammal	Arctic Fox		1			1	1	Walking	
BR_42	16-May-14	Spring Migration	1	22:02:18	22:07:32	170	259	90	9	Mammal	Grizzly Bear		1	2		3	3	Other	Looks like a cub is investigating camera, two others (mom and other cub) are seen walking away from camera.
BR_43	25-Aug-13	Summer	1	21:48:05	21:48:14	24	33	10	1	Mammal	Arctic Hare		1			1	1	Grazing	Hare grazing.
BR_43	26-Aug-13	Summer	1	0:48:20	0:00:00	40	49	10	1	Mammal	Arctic Hare		1			1	1	Grazing	
BR_43	26-Aug-13	Summer	1	9:01:30	9:01:38	67	76	10	1	Mammal	Caribou	BR43_1	1			1	1	Grazing	Same caribou walking right to left.
BR_43	29-Aug-13	Summer	1	12:07:51	12:09:39	227	276	50	5	Mammal	Caribou	BR43_2	7			7	7	Grazing	Small herd checking the camera and grazing right to left.
BR_43	29-Aug-13	Summer	2	14:10:36	14:10:46	281	290	10	1	Mammal	Caribou	BR43_3	2			2	2	Walking	Caribou walking right to left.
BR_43	29-Aug-13	Summer	3	14:32:27	14:32:36	292	301	10	1	Mammal	Caribou	BR43_4	1			1	1	Grazing	Caribou grazing on the left.
BR_43	29-Aug-13	Summer	4	15:17:11	15:17:40	303	322	20	2	Mammal	Caribou	BR43_5	5			5	5	Walking	Another bunch of caribou grazing and walking to the left.
BR_43	29-Aug-13	Summer	5	16:55:44	17:02:37	326	406	80	8	Mammal	Caribou	BR43_6	3			3	3	Walking	Another bunch of caribou grazing and walking to the left, plus a couple get around to checking the camera.
BR_43	29-Aug-13	Summer	6	18:16:29	18:17:08	409	428	20	2	Mammal	Caribou	BR43_7	1			1	1	Grazing	Caribou grazing on the left.
BR_43	29-Aug-13	Summer	7	18:52:25	18:17:08	430	439	10	1	Mammal	Caribou	BR43_7	1		Y	1	0	Walking	Same caribou now walking to the left.
BR_43	30-Aug-13	Summer	1	3:25:59	3:26:08	457	466	10	1	Mammal	Arctic Hare		1			1	1	Sitting	Hare spotted again.
BR_43	30-Aug-13	Summer	2	8:16:45	8:16:54	477	486	10	1	Mammal	Caribou	BR43_8	1	1		2	2	Walking	Adult + young walking towards right side.
BR_43	30-Aug-13	Summer	3	13:41:51	1:48:31	498	587	90	9	Mammal	Caribou	BR43_9	4			4	4	Grazing	Group walking past over the next hour and a half, split into distinct events with individuals not previously counted.
BR_43	30-Aug-13	Summer	4	14:11:15	14:11:24	589	598	10	1	Mammal	Caribou	BR43_10	1			1	1	Grazing	
BR_43	30-Aug-13	Summer	5	14:23:40	14:29:57	599	618	20	2	Mammal	Caribou	BR43_11	4			4	4	Grazing	
BR_43	30-Aug-13	Summer	6	14:35:41	14:42:42	620	689	70	7	Mammal	Caribou	BR43_12	3			3	3	Grazing	
BR_43	30-Aug-13	Summer	7	15:48:25	15:50:04	692	731	40	4	Mammal	Caribou	BR43_12	3		Y	3	0	Grazing	A few caribou grazing and checking out the camera.
BR_43	31-Aug-13	Summer	1	6:36:05	6:45:31	762	831	70	7	Mammal	Caribou	BR43_13	15			15	15	Grazing	Herd grazing and walking to the right, at least 15 if not more creatures.
BR_43	31-Aug-13	Summer	2	18:40:52	18:41:01	856	865	10	1	Mammal	Caribou	BR43_14	9			9	9	Walking	Moving to the left.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_43	31-Aug-13	Summer	3	19:24:05	19:24:35	867	886	20	2	Mammal	Caribou	BR43_15	5			5	5	Walking	Few caribou moving to the right.
BR_43	1-Sep-13	Fall	1	19:43:42	19:47:14	936	955	20	2	Mammal	Caribou	BR43_16	4			4	4	Walking	Walking from right to left.
BR_43	2-Sep-13	Fall	1	17:03:04	17:06:08	999	1018	20	2	Mammal	Caribou	BR43_17	2			2	2	Walking	Walking from right to left.
BR_43	3-Sep-13	Fall	1	12:42:57	12:43:06	1058	1067	20	2	Mammal	Caribou	BR43_18	4			4	4	Walking	Herd walking from left to right.
BR_43	4-Sep-13	Fall	1	12:51:41	12:51:53	1116	1125	10	1	Mammal	Grizzly Bear		1			1	1	Other	
BR_43	5-Sep-13	Fall	1	16:53:59	16:58:20	1182	1221	40	4	Mammal	Caribou	BR43_19	10			10	10	Grazing	Herd walking from left to right, big males mostly.
BR_43	8-Sep-13	Fall	1	15:03:13	15:03:23	1363	1372	10	1	Mammal	Caribou	BR43_20	3			3	3	Grazing	Group grazing from left to right.
BR_43	11-Sep-13	Fall	2	22:47:41	22:47:51	1532	1541	10	1	Mammal	Caribou	BR43_21	15			15	15	Running	Group running through the night.
BR_43	12-Sep-13	Fall	1	6:03:03	6:26:34	1557	1586	30	1	Mammal	Caribou	BR43_22	6			6	6	Walking	Small group walking from left to right.
BR_43	12-Sep-13	Fall	2	10:24:59	10:25:08	1595	1604	10	1	Mammal	Caribou	BR43_23	1			1	1	Walking	One walking left to right.
BR_43	17-Sep-13	Fall	1	17:27:47	17:29:10	1859	1878	20	2	Mammal	Caribou	BR43_24	1	1		2	2	Walking	Adult + young walking right to left.
BR_43	7-Oct-13	Fall	1	20:47:08	20:47:18	2846	2855	10	1	Mammal	Arctic Hare		1			1	1	Grazing	Hare grazing.
BR_43	10-Oct-13	Fall	1	23:43:13	23:43:23	3006	3015	10	1	Mammal	Arctic Hare		1			1	1	Grazing	Hare grazing.
BR_43	18-Nov-13	Winter	1	11:42:22	11:52:09	4864	4923	82	8	Mammal	Caribou	BR43_25	19			19	19	Walking	Huge herd walking across landscape, from right to left.
BR_43	18-Nov-13	Winter	2	12:32:45	12:37	4926	5025	100	10	Mammal	Caribou	BR43_25	8		Y/N	8	5	Walking	Remnants of previous group, three have been previously counted.
BR_43	18-Nov-13	Winter	3	12:56:15	12:56:47	5026	5045	20	1	Mammal	Caribou	BR43_26	54			54	54	Walking	Some proportion are new individuals, though impossible to count accurately. Assume all new.
BR_43	18-Nov-13	Winter	4	14:36:54	14:56:11	5050	5089	40	4	Mammal	Caribou	BR43_27	29			29	29	Walking	Members of the herd walking towards the right side of the camera, possibly same herd that ran off.
BR_43	18-Nov-13	Winter	5	16:11:49	16:29:38	5093	5112	20	2	Mammal	Caribou	BR43_28	12			12	12	Walking	Members of the herd walking towards the left side of the camera, many caribou also in the background.
BR_43	18-Nov-13	Winter	6	18:58:00	19:00:42	5118	5188	71	7	Mammal	Caribou	BR43_28	2		Y	2	0	Other	Curious caribou checks out the camera, other in the background.
BR_43	18-Nov-13	Winter	7	23:00:54	23:01:03	5197	5206	10	1	Mammal	Caribou	BR43_29	1			1	1	Walking	Walks by camera.
BR_43	22-Nov-13	Winter	1	16:28:17	16:30:43	5385	5435	51	5	Mammal	Grey Wolf		2			2	2	Other	Couple of wolves sniff the camera.
BR_43	7-Jul-14	Post-calving	1	22:58:40	22:58:50	2737	2746	10	1	Bird	Golden Eagle		1			1	1	Flying	Flies down and perches on rock, being harassed by herring gull.
BR_43	7-Jul-14	Post-calving	1	22:58:40	22:58:50	2737	2746	10	1	Bird	Herring Gull		1			1	1	Flying	Buzzing golden eagle.
BR_44	3-Sep-13	Fall	1	15:30:01	15:30:10	1976	1985	10	1	Bird	Canada Goose		3			3	3	Standing	
BR_44	5-Sep-13	Fall	1	17:33:10	17:33:19	2456	2465	10	1	Mammal	Caribou	BR44_1	6			6	6	Walking	Same herd plus couple of caribou come close
BR_44	6-Sep-13	Fall	1	10:00:01	10:00:10	2539	2548	10	1	Mammal	Caribou	BR44_2	7			7	7	Sitting	
BR_44	6-Sep-13	Fall	2	10:30:01	10:30:10	2550	2559	10	1	Mammal	Caribou	BR44_2	10		Y/N	10	3	Sitting	Same herd as in the previous series, but three new individuals show up.
BR_44	6-Sep-13	Fall	3	16:00:01	16:00:10	2621	2630	10	1	Mammal	Caribou	BR44_2	2		Y/N	2	1	Walking	Same caribou on the left + another one on the right.
BR_44	6-Sep-13	Fall	4	16:30:01	16:30:10	2632	2641	10	1	Mammal	Caribou	BR44_3	6			6	6	Other	Six caribou are sitting down.
BR_44	6-Sep-13	Fall	4	17:30:01	17:30:10	2644	2653	10	1	Mammal	Caribou	BR44_3	5		Y	5	0	Sitting	Idem.
BR_44	6-Sep-13	Fall	5	17:50:17	17:50:26	2654	2663	10	1	Mammal	Caribou	BR44_4	1			1	1	Grazing	One different caribou grazing in front of camera, no other is seen nearby.
BR_44	9-Sep-13	Fall	1	19:36:44	19:37:25	3452	3471	20	2	Mammal	Caribou	BR44_5	1			1	1	Grazing	Curious male grazing in front of camera.
BR_44	9-Sep-13	Fall	2	19:51:01	19:51:11	3472	3481	10	1	Mammal	Caribou	BR44_6	2			2	2	Walking	A couple of caribou passing through.
BR_44	10-Sep-13	Fall	1	10:30:01	10:30:10	3692	3701	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_44	11-Sep-13	Fall	1	11:00:01	11:00:10	4021	4030	10	1	Mammal	Caribou	BR44_7	6			6	6	Grazing	
BR_44	11-Sep-13	Fall	2	12:00:01	12:00:01	4033	4042	10	1	Mammal	Caribou	BR44_7	9		Y	9	3	Grazing	Three new from previous motion.
BR_44	11-Sep-13	Fall	3	12:30:01	12:30:10	4044	4053	10	1	Mammal	Caribou	BR44_7	14		Y/N	14	5	Grazing	Same group as previous photos, but numbers are higher - five new individuals.
BR_44	12-Sep-13	Fall	1	12:00:01	12:00:10	4281	4290	10	1	Mammal	Caribou	BR44_8	7			7	7	Grazing	
BR_44	12-Sep-13	Fall	2	12:30:01	12:30:10	4292	4301	10	1	Mammal	Caribou	BR44_8	7		Y	7	0	Sitting	
BR_44	15-Sep-13	Fall	-	0:23:39		4871	4880	10	1	Mammal	Grey Wolf		1			1		Walking	Wolf comes walking in front of the camera.
BR_44	17-Sep-13	Fall	1	10:48:54	10:49:25	5488	5507	10	1	Mammal	Caribou	BR44_9	1			1		Grazing	Big male caribou.
BR_44	17-Sep-13	Fall	2	13:17:05	1:18:00	5553	5582	30	3	Mammal	Caribou	BR44_10	6			6		Grazing	Appears to be a new herd of caribou passing through.
BR_44	17-Sep-13	Fall	3	19:47:42	19:48:10	5686	5705	20	2	Mammal	Caribou	BR44_10	3		Y/N	3	2	Grazing	Two more caribou show up.
BR_44	20-Sep-13	Fall	1	0:50:42	0:50:51	6332	6341	10	1	Mammal	Caribou	BR44_11	1			1	1	Walking	Lone caribou walking in front of camera.
BR_44	20-Sep-13	Fall	2	10:00:01	10:00:10	6501	6510	10	1	Mammal	Grey Wolf		1			1	1	Sitting	
BR_44	3-Oct-13	Fall	1	10:00:01	10:00:10	9513	9522	10	1	Mammal	Wolverine		1			1	1	Walking	Wolverine walking across the camera.
BR_45	30-Aug-13	Summer	1	5:17:09	5:17:18	323	332	10	1	Mammal	Arctic Fox		1			1	1	Standing	Arctic fox bolting to the left.
BR_45	31-Aug-13	Summer	1	7:24:44	7:25:17	385	404	20	2	Mammal	Caribou	BR45_1	1			1	1	Grazing	Caribou grazing toward the right side.
BR_45	31-Aug-13	Summer	1	6:32:39	18:33:11	428	447	20	2	Mammal	Caribou	BR45_2	1	1		2	2	Walking	Adult + young walking right to left.
BR_45	3-Sep-13	Fall	1	12:09:39	12:13:08	619	658	30	3	Mammal	Caribou	BR45_2	5		Y/N	5	4	Grazing	One individual previously counted, new individuals coming into graze in foreground.
BR_45	5-Sep-13	Fall	1	13:34:45	13:36:19	778	817	40	4	Mammal	Caribou	BR45_3	1			1	1	Other	Curious caribou checking out the camera.
BR_45	5-Sep-13	Fall	2	16:39:41	16:39:50	824	833	10	1	Mammal	Caribou	BR45_4	1			1	1	Grazing	Big caribou grazing.
BR_45	7-Sep-13	Fall	1	10:50:51	10:52:46	938	977	40	4	Mammal	Caribou	BR45_5	4			4	4	Grazing	Group of caribou grazing from left to right.
BR_45	7-Sep-13	Fall	2	15:45:49	15:48:37	988	1027	40	4	Mammal	Caribou	BR45_6	5			5	5	Grazing	Group of caribou grazing from left to right.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_45	15-Sep-13	Fall	1	8:48:00	8:48:09	1418	1427	10	1	Mammal	Caribou	BR45_7	3			3	3	Grazing	Group of caribou grazing from right to left.
BR_46	25-Aug-13	Summer	1	21:12:02	21:16:48	275	324	50	5	Mammal	Caribou	BR46_1	10			10	10	Grazing	Idem.
BR_46	31-Aug-13	Summer	1	7:25:31	7:30:11	1305	1375	71	7	Mammal	Muskox		1			1	1	Other	Scratching camera stand.
BR_46	3-Sep-13	Fall	1	14:45:09	14:45:18	2054	2063	10	1	Mammal	Caribou	BR46_2	1			1	1	Walking	Caribou walking to the left.
BR_46	3-Sep-13	Fall	2	21:16:17	21:19:05	2097	2116	20	2	Mammal	Caribou	BR46_3	3			3	3	Walking	Caribou walking to the left.
BR_46	8-Sep-13	Fall	1	7:30:01	7:30:10	2910	2919	10	1	Mammal	Caribou	BR46_4	2			2	2	Grazing	
BR_47	5-Sep-13	Fall	1	14:30:01	14:30:10	3939	3948	10	1	Mammal	Caribou	BR47_1	1			1	1	Walking	
BR_47	5-Sep-13	Fall	2	15:00:01	15:00:10	3950	3959	10	1	Mammal	Caribou	BR47_2	24			24	24	Grazing	
BR_47	5-Sep-13	Fall	3	15:30:01	15:30:10	3961	3970	10	1	Mammal	Caribou	BR47_2	6		Y	6	0	Walking	
BR_47	5-Sep-13	Fall	4	16:00:01	16:00:10	3972	3981	10	1	Mammal	Caribou	BR47_2	3		Y	3	0	Walking	
BR_47	5-Sep-13	Fall	5	16:30:01	16:30:10	3983	3992	10	1	Mammal	Caribou	BR47_2	7		Y	7	0	Sitting	
BR_47	5-Sep-13	Fall	6	18:00:01	18:00:10	4006	4015	10	1	Mammal	Caribou	BR47_2	6		Y	6	0	Walking	
BR_47	5-Sep-13	Fall	7	20:00:01	20:00:10	4040	4049	10	1	Mammal	Caribou	BR47_3	23			23	23	Grazing	
BR_47	5-Sep-13	Fall	8	20:06:44	20:08:40	4050	4069	20	1	Mammal	Caribou	BR47_3	13		Y	13	0	Grazing	
BR_47	5-Sep-13	Fall	9	20:42:49	20:43:20	4071	4090	20	1	Mammal	Caribou	BR47_3	43		Y/N	43	22	Grazing	Larger numbers in this photo, likely 9 are not previously counted.
BR_47	6-Sep-13	Fall	1	14:30:01	14:30:10	4357	4366	10	1	Mammal	Caribou	BR47_4	2			2	2	Grazing	
BR_47	6-Sep-13	Fall	2	18:00:01	18:00:10	4424	4433	10	1	Mammal	Caribou	BR47_5	3			3	3	Grazing	
BR_47	6-Sep-13	Fall	3	18:06:58	18:07:07	4434	4443	10	1	Mammal	Caribou	BR47_5	3		Y	3	0	Grazing	
BR_47	6-Sep-13	Fall	4	18:30:01	18:30:10	4445	4454	10	1	Mammal	Caribou	BR47_6	2			2	2	Grazing	
BR_47	6-Sep-13	Fall	5	19:00:01	19:00:10	4456	4465	10	1	Mammal	Caribou	BR47_7	1			1	1	Grazing	
BR_47	6-Sep-13	Fall	6	20:00:01	20:00:10	4478	4487	10	1	Mammal	Caribou	BR47_8	6			6	6	Grazing	
BR_47	6-Sep-13	Fall	7	20:30:01	20:30:10	4489	4498	10	1	Mammal	Caribou	BR47_9	1			1	1	Grazing	
BR_47	6-Sep-13	Fall	8	20:44:40	20:49:12	4499	4548	50	5	Mammal	Caribou	BR47_10	6			6	6	Grazing	Two caribou grazing in the forefront, four walking around in the background.
BR_47	7-Sep-13	Fall	1	0:20:37	0:20:46	4576	4585	10	1	Mammal	Caribou	BR47_11	6			6	6	Walking	Six caribou passing in front of the camera.
BR_47	7-Sep-13	Fall	2	6:30:01	18:30:10	4649	4658	10	1	Mammal	Caribou	BR47_12	1			1	1	Walking	
BR_47	7-Sep-13	Fall	3	12:36:56	12:37:05	4761	4770	10	1	Mammal	Caribou	BR47_13	11			11	11	Grazing	
BR_47	7-Sep-13	Fall	4	12:56:47	12:57:39	4771	4790	20	2	Mammal	Caribou	BR47_14	12			12	12	Grazing	Some caribou in the background, two approach the camera (possible calf/yearling).
BR_47	7-Sep-13	Fall	5	13:00:01	13:00:10	4792	4801	10	1	Mammal	Caribou	BR47_14	9		Y	9	0	Walking	Some caribou in the background.
BR_47	8-Sep-13	Fall	1	15:47:51	15:48:27	5125	5144	20	2	Mammal	Caribou	BR47_15	1			1	1	Walking	One curious caribou circles the camera.
BR_47	12-Sep-13	Fall	1	16:00:01	16:00:10	6568	6577	10	1	Mammal	Caribou	BR47_16	4			4	4	Walking	Some caribou in the background.
BR_47	13-Sep-13	Fall	1	14:00:01	14:00:10	6872	6881	10	1	Mammal	Caribou	BR47_17	15			15	15	Grazing	
BR_47	13-Sep-13	Fall	2	15:30:01	15:30:10	6885	6894	10	1	Mammal	Caribou	BR47_17	18		Y/N	18	3	Grazing	Same group staying there a long time, numbers fluctuate - three new individuals.
BR_47	13-Sep-13	Fall	3	16:30:01	16:30:10	6897	6906	10	1	Mammal	Caribou	BR47_17	20		Y/N	20	2	Grazing	Same group staying there a long time, numbers fluctuate - two new individuals.
BR_47	13-Sep-13	Fall	4	17:30:01	17:30:10	6909	6918	10	1	Mammal	Caribou	BR47_17	3		Y	3	0	Grazing	
BR_47	15-Sep-13	Fall	1	11:00:01	11:30:10	7412	7421	10	1	Mammal	Caribou	BR47_18	2			2	2	Grazing	
BR_47	15-Sep-13	Fall	2	11:30:01	11:30:10	7423	7432	10	1	Mammal	Caribou	BR47_19	3			3	3	Walking	
BR_47	15-Sep-13	Fall	3	19:30:01	19:30:10	7539	7548	10	1	Mammal	Caribou	BR47_20	1			1	1	Grazing	
BR_47	16-Sep-13	Fall	1	19:13:52	19:14:01	7836	7845	10	1	Mammal	Caribou	BR47_21	1			1	1	Grazing	
BR_47	19-Sep-13	Fall	1	8:09:56	8:10:06	8568	8577	10	1	Mammal	Caribou	BR47_22	4			4	4	Grazing	
BR_47	19-Sep-13	Fall	2	12:30:01	12:30:10	8617	8626	10	1	Mammal	Caribou	BR47_23	6			6	6	Grazing	
BR_47	20-Sep-13	Fall	1	15:30:01	15:30:10	9061	9070	10	1	Mammal	Caribou	BR47_24	2			2	2	Walking	
BR_48	28-Aug-13	Summer	1	9:30:01	9:30:10	1985	1994	10	1	Bird	Canada Goose		70			70	70	Flying	
BR_48	30-Aug-13	Summer	1	11:30:01	11:30:10	3035	3044	10	1	Mammal	Caribou	BR48_1	9			9	9	Grazing	
BR_48	1-Sep-13	Fall	1	15:30:01	15:54:23	4099	4118	20	2	Mammal	Caribou	BR48_2	5			5	5	Grazing	
BR_48	4-Sep-13	Fall	1	3:07:28	3:08:05	5328	5347	20	2	Mammal	Caribou	BR48_3	2			2	2	Walking	Couple caribou walking right to left.
BR_48	4-Sep-13	Fall	2	11:21:41	11:21:50	5504	5513	10	1	Mammal	Caribou	BR48_4	3	1		4	4	Grazing	Couple caribou grazing right to left, looks like a female with calf.
BR_48	6-Sep-13	Fall	1	17:35:59	18:00:10	6663	6683	21	2	Mammal	Caribou	BR48_5	8			8	8	Grazing	Few caribou grazing, one comes up close and triggers camera, then they move below near lake.
BR_48	8-Sep-13	Fall	1	5:30:52	5:55:02	7415	7534	120	12	Mammal	Caribou	BR48_6	4			4	4	Other	Few caribou walking around, one comes checking out the camera for a long time.
BR_48	30-May-14	Spring Migration	1	18:34:20	18:38:49	2491	2550	60	6	Mammal	Caribou	BR48_7	5			5	5	walking	Likely juvenile male (small antlers) with some females and maybe a female juvenile (small, no visible antler buds).
BR_48	11-Jun-14	Calving	1	8:00:00	8:00:11	4336	4345	10	1	Bird	American Golden-Plover		1			1	1	Sitting	Resting on tundra.
BR_49	29-Aug-13	Summer	1	18:29:52	18:30:01	308	318	11	1	Bird	Bald Eagle		1			1	1	Standing	Flew in.
BR_49	1-Sep-13	Fall	1	21:16:34	21:16:43	498	507	10	1	Mammal	Caribou	BR49_1	10			10	10	Feeding	Caribou in foreground walked by; caribou in background are feeding.
BR_49	6-Sep-13	Fall	1	8:15:40	8:15:51	812	821	10	1	Mammal	Caribou	BR49_2	2			2	2	Feeding	
BR_49	11-Sep-13	Fall	1	17:30:38	17:31:06	1171	1190	20	2	Mammal	Caribou	BR49_3	2			2	2	Walking	
BR_49	24-May-14	Spring Migration	1	15:47:45	15:48:40	4249	4268	20	2	Mammal	Grizzly Bear		1			1	1	Other	Grizzly bear knocks camera to ground.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_50	30-Aug-13	Summer	1	6:34:46	6:35:33	402	421	20	2	Mammal	Caribou	BR50_1	15			15	15	Feeding	
BR_50	30-Aug-13	Summer	2	6:37:38	6:39:02	422	451	30	3	Mammal	Caribou	BR50_2	12			12	12	Feeding	
BR_50	31-Aug-13	Summer	1	19:22:10	19:22:19	525	534	10	1	Mammal	Caribou	BR50_3	4			4	4	Feeding	
BR_50	2-Sep-13	Fall	1	12:49:01	12:49:30	628	647	20	2	Mammal	Caribou	BR50_4	26			26	26	Walking	Feeding along the way.
BR_50	6-Sep-13	Fall	1	8:54:03	8:54:12	852	861	10	1	Mammal	Caribou	BR50_5	1			1	1	Walking	
BR_50	6-Sep-13	Fall	2	8:56:07	8:56:41	862	881	20	2	Mammal	Caribou	BR50_5	1		Y	1	0		
BR_50	6-Sep-13	Fall	3	8:59:22	9:01:48	882	932	51	5	Mammal	Caribou	BR50_5	1		Y	1	0		
BR_50	9-Sep-13	Fall	1	16:25:26	16:25:58	1121	1140	20	2	Mammal	Caribou	BR50_6	4			4	4	Walking	Also feeding.
BR_50	9-Sep-13	Fall	1	16:27:17	16:28:13	1141	1170	30	3	Mammal	Caribou	BR50_6	4		Y	4	0	Walking	Also feeding.
BR_50	12-Sep-13	Fall	1	18:58:18	18:59:49	1330	1369	40	4	Mammal	Caribou	BR50_7	1			1	1	Other	Investigating camera.
BR_50	12-Sep-13	Fall	1	19:25:38	19:26:57	1371	1410	40	4	Mammal	Caribou	BR50_8	7			7	7	Feeding	One caribou is investigating camera; the rest are feeding.
BR_50	12-Sep-13	Fall	2	19:33:03	19:33:51	1412	1431	20	2	Mammal	Caribou	BR50_8	4		Y	4	0	Feeding	One caribou is investigating the camera; the rest are feeding. Likely counted in previous series.
BR_50	12-Sep-13	Fall	3	19:35:26	19:36:44	1432	1471	40	4	Mammal	Caribou	BR50_8	4		Y	4	0	Feeding	One caribou is investigating the camera; the rest are feeding. Likely counted in previous series.
BR_50	13-Sep-13	Fall	1	14:51:19	14:51:28	1510	1519	10	1	Mammal	Caribou	BR50_9	2			2	2	Feeding	
BR_50	25-May-14	Spring Migration	1	17:42:22	17:42:59	4249	4268	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_51	no wildlife photos																		
BR_52	28-Aug-13	Summer	1	0:18:15	0:18:24	298	307	10	1	Mammal	Arctic Fox		1			1	1	Walking	
BR_52	30-Aug-13	Summer	1	2:45:50	2:45:59	391	400	10	1	Mammal	Red Fox		1			1	1	Walking	Red fox, walking past the camera. Doesn't look like same fox as earlier.
BR_52	30-Aug-13	Summer	2	11:48:38	11:48:47	419	428	10	1	Mammal	Caribou	BR52_1	1			1	1	Grazing	
BR_52	1-Sep-13	Fall	1	9:00:01	9:00:10	560	569	10	1	Bird	Canada Goose		9			9	9	Feeding	
BR_52	8-Sep-13	Fall	1	8:49:51	8:55:03	1005	1034	30	3	Mammal	Caribou	BR52_2	11			11	11	Grazing	A few caribou grazing in the area.
BR_52	8-Sep-13	Fall	2	14:18:55	14:21:56	1046	1125	80	8	Mammal	Caribou	BR52_3	20	1		21	21	Grazing	
BR_52	8-Sep-13	Fall	3	22:36:28	22:36:38	1143	1152	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_52	14-Sep-13	Fall	1	20:59:14	21:01:09	1537	1567	30	3	Mammal	Grizzly Bear		1			1	1	Walking	Curious grizzly checking out the camera.
BR_52	18-Sep-13	Fall	1	0:29:42	10:23:21	1758	1767	10	1	Mammal	Caribou	BR52_4	5			5	5	Running	
BR_52	18-Sep-13	Fall	2	10:23:12	10:23:21	1788	1797	10	1	Mammal	Caribou	BR52_5	1			1	1	Walking	
BR_52	19-Sep-13	Fall	1	4:05:26	4:05:46	1834	1853	20	1	Mammal	Red Fox		1			1	1	Walking	Red fox, walking past the camera. Doesn't look like same fox as earlier.
BR_52	27-Sep-13	Fall	1	11:03:17	11:06:20	2382	2481	100	10	Mammal	Grizzly Bear		1			1	1	Other	Curious grizzly checking out the camera again, nearly breaks it.
BR_53	18-Sep-13	Fall	1	8:35	#########	1147	1166	20	2	Mammal	Grey Wolf		1			1	1	Walking	
BR_54	28-Aug-13	Summer	1	7:30:01	7:30:10	1313	1322	10	1	Mammal	Caribou	BR54_1	1			1	1	Grazing	
BR_54	28-Aug-13	Summer	2	7:37:09	7:37:18	1323	1332	10	1	Mammal	Caribou	BR54_2	1			1	1	Grazing	
BR_54	30-Aug-13	Summer	1	8:15:20	8:15:33	2050	2059	10	1	Mammal	Grizzly Bear		1			1	1	Walking	Curious grizzly checking out the camera.
BR_54	4-Sep-13	Fall	1	5:11:55	5:12:29	3744	3763	10	1	Mammal	Caribou	BR54_3	1			1	1	Walking	Caribou walking past the camera.
BR_54	9-Sep-13	Fall	1	0:00:01	0:00:10	5528	5537	10	1	Bird	Bald Eagle		1			1	1	Flying	
BR_54	15-Sep-13	Fall	1	16:35:14	16:35:23	7335	7344	10	1	Mammal	Caribou	BR54_4	2			2	2	Walking	
BR_54	17-Sep-13	Fall	1	17:30:01	17:30:10	8003	8012	10	1	Mammal	Caribou	BR54_5	39			39	39	Grazing	
BR_54	19-Sep-13	Fall	1	8:00:01	20:00:10	8460	8469	10	1	Mammal	Caribou	BR54_6	20			20	20	Grazing	
BR_55	7-Sep-13	Fall	1	9:30:01	9:30:10	1033	1042	10	1	Bird	Unknown		1			1	1	Walking	Songbird flew in and walked around.
BR_55	8-Sep-13	Fall	1	7:24:09	7:24:18	1096	1105	10	1	Mammal	Caribou	BR55_1	8			8	8	Feeding	Possibly a younger caribou in background.
BR_55	11-Sep-13	Fall	1	10:05:54	10:06:25	1306	1325	20	2	Mammal	Caribou	BR55_2	3			3	3	Walking	
BR_55	15-Sep-13	Fall	1	19:00:02	19:00:11	1616	1625	10	1	Bird	Unknown		1			1	1	Standing	Flew away.
BR_55	22-Sep-13	Fall	1	8:06:27	8:08:51	2050	2079	30	3	Mammal	Grizzly Bear		3			3	3	Walking	One is investigating the camera; the other two are walking away.
BR_55	17-Mar-14	Winter	1	14:00:30	14:00:39	1731	1740	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_55	5-May-14	Spring Migration	1	18:37:31	18:37:40	4622	4631	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_55	2-Jun-14	Spring Migration	1	19:30:01	19:30:10	6688	6697	10	1	Bird	Unknown		1			1	1	Flying	Unidentifiable songbird.
BR_55	8-Jun-14	Calving	1	21:02:04	21:02:13	7149	7158	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_55	29-Jun-14	Post-calving	1	21:36:15	21:36:24	8708	8717	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_56	25-Aug-13	Summer	1	7:10:09	7:10:18	113	122	10	1	Mammal	Grey Wolf		2			2	2	Walking	One is walking, the other is standing on the hill.
BR_56	25-Aug-13	Summer	1	8:30:02	8:30:11	126	135	10	1	Mammal	Grey Wolf			1		1	1	Walking	
BR_56	25-Aug-13	Summer	2	8:32:06	8:32:15	136	145	10	1	Mammal	Grey Wolf			1	Y	1	0	Walking	
BR_56	25-Aug-13	Summer	1	13:20:44	13:21:59	155	184	30	3	Mammal	Grey Wolf			2	Y	2	0	Walking	
BR_56	25-Aug-13	Summer	1	13:31:55	13:32:04	186	195	10	1	Mammal	Grey Wolf			2	Y	2	0	Walking	Most likely are the same two wolves seen in previous entry.
BR_56	25-Aug-13	Summer	1	18:34:50	18:34:59	206	215	10	1	Mammal	Grey Wolf			3	Y/N	3	1	Sitting	One new young.
BR_56	25-Aug-13	Summer	2	18:38:19	18:39:59	216	245	30	1	Mammal	Grey Wolf			2	Y	2	0	Walking	Likely the same wolves from previous series.
BR_56	26-Aug-13	Summer	1	17:52:07	17:53:01	292	311	20	2	Mammal	Grey Wolf		2		Y	2	0	Walking	
BR_56	30-Aug-13	Summer	1	8:27:06	8:27:15	575	584	10	1	Mammal	Grey Wolf		2	1	Y	3	0	Walking	

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_56	30-Aug-13	Summer	1	18:38:18	18:38:27	606	615	10	1	Mammal	Grey Wolf		1	3	Y	4	0	Walking	
BR_56	31-Aug-13	Summer	1	18:32:23	18:33:39	684	703	20	2	Mammal	Grizzly Bear		1			1	1	Walking	
BR_56	3-Sep-13	Fall	1	20:48:51	20:49:00	902	911	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	May be a wolf seen in previous entry.
BR_56	3-Sep-13	Fall	1	20:57:30	20:57:39	912	921	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Most likely the same wolf as previous entry.
BR_56	15-Sep-13	Fall	1	7:02:43	7:02:52	1661	1670	10	1	Mammal	Grey Wolf			3	Y	3	0		Young are getting bigger.
BR_56	30-Sep-13	Fall	1	2:31:29	2:31:46	2622	2631	10	1	Mammal	Unknown		1			1	1		Could be a wolverine or a grizzly bear, but too little to go on.
BR_56	6-Mar-14	Winter	1	16:14:50	16:16:47	3346	3375	30	3	Mammal	Grey Wolf		3			3	3	Walking	
BR_56	7-Apr-14	Winter	1	17:47:36	17:47:45	5215	5224	10	1	Mammal	Grey Wolf		2		Y	2	0	Walking	
BR_56	7-Apr-14	Winter	2	17:49:36	17:49:45	5225	5234	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	23-Apr-14	Spring Migration	1	18:00:45	18:00:54	6164	6173	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_56	5-May-14	Spring Migration	1	13:52:08	13:54:39	6851	6910	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_56	5-May-14	Spring Migration	2	13:55:57	13:58:00	6911	6960	50	5	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera. Counted in previous series.
BR_56	5-May-14	Spring Migration	3	13:59:43	13:59:53	6961	6970	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera. Counted in previous series.
BR_56	6-May-14	Spring Migration	1	20:22:49	20:22:58	7062	7071	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	22-May-14	Spring Migration	1	7:26:15	7:26:24	8044	8053	10	1	Mammal	Grey Wolf		2		Y	2	0	Standing	
BR_56	22-May-14	Spring Migration	2	7:28:03	7:28:12	8054	8063	10	1	Mammal	Grey Wolf		4		Y/N	4	1	Running	New individual shows up. Pack could be larger than four members.
BR_56	25-May-14	Spring Migration	1	6:00:01	6:00:10	8256	8265	10	1	Mammal	Grey Wolf		2		Y/N	2	1	Standing	Whiter individual has not been seen before. This is either submissive behaviour to an alpha, or perhaps this is the alpha pair.
BR_56	25-May-14	Spring Migration	1	12:37:17	12:37:26	8279	8288	10	1	Mammal	Grey Wolf		1		Y	1	0	Sitting	
BR_56	25-May-14	Spring Migration	1	12:37:17	12:37:26	8279	8288	10	1	Bird	Greater White-fronted Goose		1			1	1	Flying	
BR_56	25-May-14	Spring Migration	1	21:00:52	21:01:01	8316	8325	10	1	Mammal	Grey Wolf		1			1	1	Walking	Walking and standing.
BR_56	26-May-14	Spring Migration	1	10:00:01	10:00:10	8352	8261	10	1	Mammal	Grey Wolf		1		Y	1	0	Other	Laying down at top of hill.
BR_56	26-May-14	Spring Migration	1	11:47:11	11:47:20	8365	8374	10	1	Mammal	Grey Wolf		2		Y	2	0	Other	One wolf is walking the other standing. This 2nd whiter, submissive wolf hasn't been counted yet either. Pack is likely six individuals. The upper looks to be the alpha female (pregnant).
BR_56	27-May-14	Spring Migration	1	11:33:22	11:33:31	8443	8452	10	1	Bird	Greater White-fronted Goose		4			4	4	Standing	Some are walking around.
BR_56	27-May-14	Spring Migration	1	17:00:01	17:00:10	8464	8473	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	27-May-14	Spring Migration	2	17:01:31	17:01:40	8474	8483	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Very likely same wolf from previous series.
BR_56	28-May-14	Spring Migration	1	18:47:06	18:47:15	8545	8554	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Food in mouth.
BR_56	28-May-14	Spring Migration	1	19:12:39	19:12:48	8556	8565	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	29-May-14	Spring Migration	1	10:26:42	10:26:51	8606	8615	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	29-May-14	Spring Migration	1	14:00:20	14:00:29	8624	8633	10	1	Bird	Greater White-fronted Goose		2			2	2	Flying	
BR_56	29-May-14	Spring Migration	1	15:51:58	15:52:07	8637	8646	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	29-May-14	Spring Migration	2	15:55:09	15:55:18	8647	8656	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Very likely it is the same wolf as previous series.
BR_56	30-May-14	Spring Migration	1	9:37:44	9:38:36	8703	8722	20	2	Bird	Common Raven		1			1	1	Flying	
BR_56	30-May-14	Spring Migration	1	9:49:38	9:50:12	8723	8742	20	2	Bird	Common Raven		1		Y	1	0	Flying	Flew at camera - possibly landed on it.
BR_56	31-May-14	Spring Migration	1	13:42:25	13:42:34	8809	8818	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	31-May-14	Spring Migration	1	13:42:25	13:42:34	8809	8818	10	1	Bird	Common Raven		1		Y	1	0	Standing	Flew in and stood on ground.
BR_56	6-Jun-14	Calving	1	12:41:29	12:41:38	9245	9254	10	1	Mammal	Grey Wolf		1		Y	1	0	Standing	
BR_56	6-Jun-14	Calving	1	20:27:25	20:27:34	9270	9279	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	7-Jun-14	Calving	1	10:40:20	10:40:29	9309	9318	10	1	Mammal	Grey Wolf		1		Y	1	0	Running	
BR_56	7-Jun-14	Calving	1	13:17:37	13:18:47	9324	9353	30	3	Bird	Bird		1			1	1	Standing	
BR_56	7-Jun-14	Calving	1	13:17:37	13:18:47	9324	9353	30	3	Mammal	Grey Wolf		1		Y	1	0	Standing	
BR_56	7-Jun-14	Calving	1	18:09:21	18:09:30	9364	9373	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	7-Jun-14	Calving	1	21:07:59	21:08:08	9380	9389	10	1	Mammal	Grey Wolf		2		Y	2	0	Walking	
BR_56	7-Jun-14	Calving	1	21:16:09	21:16:18	9390	9399	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	Looks like pregnant female.
BR_56	8-Jun-14	Calving	1	8:22:33	8:22:42	9422	9431	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	8-Jun-14	Calving	1	10:39:31	10:39:40	9437	9446	10	1	Mammal	Grey Wolf		1		Y	1	0	Standing	
BR_56	8-Jun-14	Calving	1	19:13:27	19:13:36	9464	9473	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	13-Jun-14	Calving	1	8:52:48	8:52:57	9763	9772	10	1	Mammal	Grey Wolf		1		Y	1	0	Walking	
BR_56	18-Jun-14	Post-calving	1	14:24:35	14:24:47	61	70	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_56	18-Jun-14	Post-calving	1	14:37:26	14:38:05	72	91	20	2	Mammal	Grey Wolf		2		Y	2	0	Walking	
BR_56	18-Jun-14	Post-calving	1	20:49:08	20:50:46	128	167	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera. Tilted it upwards.
BR_57	6-Mar-14	Winter	1	16:30:21	16:30:30	4643	4652	10	1	Mammal	Grey Wolf		2			2	2	Walking	Two wolves walking across the tundra.
BR_57	6-May-14	Spring Migration	1	17:27:13	17:27:51	9082	9101	20	2	Mammal	Grey Wolf		2			2	2	Walking	Two wolves, sniffing tracks on the ground.
BR_58	23-Aug-13	Summer	1	20:30:58	20:31:57	164	193	30	3	Mammal	Caribou	BR58_1	14			14	14	Feeding	Some walking, most feeding.
BR_58	23-Aug-13	Summer	1	21:00:01	21:00:10	195	204	10	1	Mammal	Caribou	BR58_1	10		Y	10	0	Feeding	In far background feeding.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_59	no wildlife photos																		
BR_60	22-Jun-14	Post-calving	1	15:55:54	15:56:04	4375	4384	10	1	Unknown	Unknown		1			1	1		Likely small bird tripping camera, unidentifiable.
BR_61	27-Aug-13	Summer	1	12:50:58	12:54:03	366	435	70	7	Mammal	Caribou	BR61_1	2			2	2	Walking	Investigated camera for a bit.
BR_61	27-Aug-13	Summer	2	12:56:00	12:56:32	436	455	20	2	Mammal	Caribou	BR61_1	1		Y	1	0	Walking	Investigated camera for a bit. Counted in previous series.
BR_61	27-Aug-13	Summer	3	13:10:01	13:10:57	457	486	30	3	Mammal	Caribou	BR61_1	2		Y	2	0	Other	Investigating camera. Counted in Series 1.
BR_61	30-Aug-13	Summer	1	9:00:01	9:00:10	733	742	10	1	Bird	Goose		5			5	5	Walking	Five geese, likely Canada goose walking.
BR_61	10-Sep-13	Fall	1	16:30:01	16:30:10	1616	1625	10	1	Mammal	Caribou	BR61_2	47			47	47	Walking	
BR_61	16-Sep-13	Fall	1	19:00:09	19:02:38	2179	2218	40	4	Mammal	Caribou	BR61_3	1			1	1	Other	Investigating the camera.
BR_61	17-Sep-13	Fall	1	5:34:45	5:35:21	2250	2269	20	2	Mammal	Caribou	BR61_4	1			1	1	Feeding	
BR_61	17-Sep-13	Fall	1	6:19:35	6:19:44	2271	2280	10	1	Mammal	Caribou	BR61_5	1			1	1	Walking	
BR_61	17-Sep-13	Fall	2	6:20:54	6:22:48	2281	2320	40	4	Mammal	Caribou	BR61_5	1		Y	1	0	Standing	Investigating camera.
BR_61	17-Sep-13	Fall	3	6:28:14	6:28:24	2321	2330	10	1	Mammal	Caribou	BR61_5	1		Y	1	0	Walking	Assumed it was the same caribou as in Series 1.
BR_61	23-Sep-13	Fall	1	20:28:10	20:29:05	2887	2906	20	2	Mammal	Grey Wolf		1			1	1	Walking	Investigated the camera a little.
BR_61	21-Apr-14	Spring Migration	1	1:43:02	1:43:13	8011	8020	10	1	Unknown	Unknown		1			1	1		Likely a fox or a wolf visiting the camera, but not enough to go on.
BR_61	24-Apr-14	Spring Migration	1	12:42:40	12:42:49	8297	8306	10	1	Mammal	Caribou	BR61_6	1			1	1	Walking	
BR_61	8-Jun-14	Calving	1	12:35:52	12:40:22	2904	3013	110	11	Mammal	Caribou	BR61_7	2			2	2	Standing	Walked over and investigated camera. A lot of time spent standing. Both caribou not in same picture at same time.
BR_61	23-Jun-14	Post-calving	1	6:00:01	6:00:10	4755	4764	10	1	Bird	Horned Lark		1			1	1	Standing	
BR_62	14-Sep-13	Fall	1	10:15:58	10:16:07	9533	9542	10	1	Mammal	Caribou	BR62_1	5			5	5	Feeding	
BR_62	14-Sep-13	Fall	1	13:30:01	13:30:10	9610	9619	10	1	Mammal	Caribou	BR62_1	2		Y	2	0	Feeding	
BR_62	15-Sep-13	Fall	1	13:00:01	13:00:10	68	77	10	1	Mammal	Caribou	BR62_2	2			2	2	Feeding	
BR_62	15-Sep-13	Fall	1	13:30:01	13:30:10	79	88	10	1	Mammal	Caribou	BR62_2	3		Y/N	3	1	Feeding	Two previously counted caribou from series before.
BR_62	15-Sep-13	Fall	1	14:00:01	14:00:10	90	99	10	1	Mammal	Caribou	BR62_2	3		Y	3	0	Feeding	Very likely same caribou as in previous series.
BR_62	15-Sep-13	Fall	1	14:20:39	14:20:48	100	109	10	1	Mammal	Caribou	BR62_3	1			1	1	Walking	
BR_62	15-Sep-13	Fall	1	15:00:01	15:00:10	122	131	10	1	Mammal	Caribou	BR62_4	1			1	1	Feeding	
BR_62	15-Sep-13	Fall	1	15:30:01	15:30:10	133	142	10	1	Mammal	Caribou	BR62_5	2			2	2	Feeding	
BR_62	18-Sep-13	Fall	1	14:00:01	14:00:10	1474	1483	10	1	Mammal	Caribou	BR62_6	6			6	6	Feeding	
BR_62	18-Sep-13	Fall	1	17:30:01	17:30:10	1521	1530	10	1	Mammal	Caribou	BR62_7	39			39	39	Feeding	
BR_62	18-Sep-13	Fall	1	20:00:01	20:00:10	1576	1585	10	1	Mammal	Caribou	BR62_8	14			14	14	Feeding	
BR_62	28-Sep-13	Fall	1	11:17:58	11:18:38	6038	6057	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_63	29-Aug-13	Summer	1	10:22:09	10:23:44	299	328	30	3	Mammal	Caribou	BR63_1	3			3	3	Grazing	Three caribou grazing near camera, looks like maybe a young one.
BR_63	29-Aug-13	Summer	1	10:23:16	10:23:25	309	318	10	1	Bird	Willow Ptarmigan		2			2	2	Flying	Flushed up by caribou.
BR_63	29-Aug-13	Summer	2	18:03:27	18:03:36	345	354	10	1	Mammal	Caribou	BR63_2	2			2	2	Walking	Same caribou coming up near camera.
BR_63	30-Aug-13	Summer	1	11:01:41	11:03:32	389	408	10	1	Mammal	Caribou	BR63_3	1			1	1	Grazing	
BR_63	30-Aug-13	Summer	1	15:19:47	15:19:56	417	426	10	1	Mammal	Caribou	BR63_4	1			1	1	Grazing	
BR_63	30-Aug-13	Summer	2	15:54:45	15:54:54	428	437	10	1	Mammal	Caribou	BR63_4	1		Y	1	0	Grazing	Looks to be the same individual as before.
BR_63	30-Aug-13	Summer	3	18:37:30	18:39:02	444	463	20	1	Mammal	Caribou	BR63_5	4			4	4	Grazing	Group of caribou grazing, looks like different group.
BR_63	2-Sep-13	Fall	1	8:30:01	8:30:10	608	617	10	1	Mammal	Caribou	BR63_6	1			1	1	Grazing	Idem.
BR_63	19-Sep-13	Fall	1	20:19:00	20:23:09	1677	1746	70	7	Mammal	Caribou	BR63_7	14			14	14	Other	Herd of caribou pass by at night and take a keen interest in the camera. At least a dozen adults and possibly one young/yearling spotted.
BR_63	20-Sep-13	Fall	1	2:50:52	2:51:02	1760	1769	10	1	Mammal	Grey Wolf		1			1	1	Other	Just under camera investigating.
BR_63	20-Sep-13	Fall	2	6:50:44	6:58:19	1778	1917	140	14	Mammal	Caribou	BR63_8	40			40	40	Other	Again, herd of caribou pass by and take a keen interest in the camera. A few lick the camera repeatedly.
BR_64	27-Aug-13	Summer	1	9:04:59	9:05:27	148	167	20	2	Mammal	Caribou	BR64_1	3			3	3	Grazing	A few caribou grazing by the river.
BR_64	29-Aug-13	Summer	1	14:57:17	14:57:26	275	284	10	1	Mammal	Caribou	BR64_2	1			1	1	Grazing	Walking along the river.
BR_64	5-Sep-13	Fall	1	4:02:37	4:02:46	630	639	10	1	Mammal	Caribou	BR64_3	1	1		2	2	Walking	Female and young walking by the camera.
BR_64	7-Sep-13	Fall	1	11:51:46	11:52:15	751	770	20	2	Mammal	Caribou	BR64_4	1			1	1	Other	Curious caribou checks the camera.
BR_64	7-Sep-13	Fall	2	12:36:17	12:42:23	773	912	140	14	Mammal	Caribou	BR64_4	1		Y	1	0	Other	Curious caribou checks the camera.
BR_64	9-Sep-13	Fall	1	12:54:44	12:56:54	1009	1048	40	4	Mammal	Caribou	BR64_5	8			8	8	Grazing	Small herd grazing by the river.
BR_64	16-Sep-13	Fall	1	7:32:38	7:32:47	1375	1384	10	1	Mammal	Grey Wolf		1			1	1	Walking	Adult wolf walking.
BR_64	19-Apr-14	Spring Migration	1	3:51:52	4:09:29	1748	1878	130	12	Mammal	Caribou	BR64_6	1			1	1	Other	One curious caribou checks out the camera for awhile. Appears to be alone.
BR_65	30-Aug-13	Summer	1	18:18:52	18:23:19	311	420	110	11	Mammal	Caribou	BR65_1	2			2	2	Other	A couple of caribou sniffing the camera.
BR_65	30-Aug-13	Summer	2	18:41:21	18:47:52	422	481	110	11	Mammal	Caribou	BR65_2	1			1	1	Other	Another caribou checks out the camera.
BR_65	31-Aug-13	Summer	1	11:17:14	11:17:23	515	524	10	1	Mammal	Caribou	BR65_3	1			1	1	Other	Another caribou checks out the camera.
BR_65	16-Sep-13	Fall	1	14:14:05	14:14:14	1299	1308	10	1	Mammal	Caribou	BR65_4	4			4	4	Grazing	Caribou grazing near camera, can't see if new one or not. Three others in the background.
BR_65	18-Sep-13	Fall	1	15:28:58	15:30:31	1407	1437	30	1	Mammal	Caribou	BR65_5	6			6	6	Grazing	Grazing.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_66	no wildlife photos																		
BR_67	28-Aug-13	Summer	1	0:52:11	0:52:20	223	232	10	1	Mammal	Caribou	BR67_1	1			1	1	walking	Walking to left.
BR_67	28-Aug-13	Summer	2	6:11:41	6:27:04	244	303	60	6	Mammal	Caribou	BR67_1	1		Y	1	0	walking	Walking around camera and investigating.
BR_67	10-Sep-13	Fall	1	16:05:20	16:06:19	948	967	20	2	Mammal	Grizzly Bear		1			1	1	Standing	Investigating camera.
BR_67	19-Sep-13	Fall	1	18:48:00	18:50:09	1405	1454	50	5	Mammal	Grizzly Bear		1			1	1	Standing	Investigating camera.
BR_67	16-Dec-13	Winter	1	15:20:24	3:20:33	5722	5731	10	1	Mammal	Grey Wolf		2			2	2	Standing	Walking around camera and investigating.
BR_67	14-May-14	Spring Migration	1	3:24:20	3:24:30	2971	2980	10	1	mammal	Caribou	BR67_2	34			34	34	Feeding	Foraging, walking.
BR_67	1-Jun-14	Spring Migration	1	19:38:19	19:42:10	3878	3917	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_68	11-Sep-13	Fall	1	13:34:16	1:34:25	860	869	10	1	Mammal	Caribou	BR68_1	1			1	1	walking	Towards camera.
BR_68	14-Apr-14	Winter	1	2:38:52	2:39:00	1193	1202	10	1	Mammal	red fox		1			1	1	walking	
BR_68	19-May-14	Spring Migration	1	13:38	13:38:19	2881	2890	10	1	bird	Willow Ptarmigan		1			1	1	walking	Runs under camera and trips it right at the end before it disappears.
BR_68	4-Jun-14	Spring Migration	1	1:27:08	1:27:17	3658	3667	10	1	Mammal	wolverine		1			1	1	running	Just trips the camera before disappearing.
BR_68	11-Jun-14	Calving	1	13:05:26	13:05:35	4024	4033	10	1	bird	Common Raven		1			1	1	walking	Hanging out in front of camera.
BR_68	30-Jun-14	Post-calving	1	13:25:08	13:25:17	4962	4971	10	1	Mammal	Grey Wolf		1			1	1	running	Running quickly.
BR_68	7-Jul-14	Post-calving	1	18:47:52	18:49:49	5363	5392	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_68	12-Jul-14	Post-calving	1	10:35:46	10:36:52	5637	5656	20	2	Mammal	Grizzly Bear		1			1	1	Other	Different from previous attack.
BR_68	18-Jul-14	Post-calving	1	18:11:28	18:14:07	5970	6029	60	6	Mammal	Grizzly Bear		1		Y	1	0	Other	Looks like same bear.
BR_69	24-Sep-13	Fall	1	7:10:39	7:13:41	2071	2110	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_69	24-Sep-13	Fall	1	18:11:23	18:11:32	2133	2142	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera from behind, just a little bit of tipping IDs the bear.
BR_69	13-Oct-13	Fall	1	8:42:07	8:47:15	3340	3419	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_69	21-Oct-13	Fall	1	5:16:15	5:19:43	4053	4092	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_69	21-Oct-13	Fall	2	5:32:22	5:19:43	4094	4153	60	6	Mammal	Grizzly Bear		1		Y	1	0	Other	Same bear as previous series.
BR_69	28-Oct-13	Fall	1	16:41:56	16:43:55	4612	4631	20	2	Mammal	Grizzly Bear		1			1	1	walking	Walking under camera.
BR_69	17-May-14	Spring Migration	1	20:27:57	20:32:52	8618	8718	100	10	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_69	12-Jul-14	Post-calving	1	12:01:32	12:03:46	2807	2856	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera then walks away.
BR_69	12-Jul-14	Post-calving	2	11:16:03	11:18:36	2879	2928	50	5	Mammal	Grizzly Bear		1			1	1	Other	
BR_70	16-Sep-13	Fall	1	4:25:06	4:29:03	1170	1189	20	2	Mammal	Grizzly Bear		1			1	1	Other	No more useful pictures after camera is knocked over.
BR_71	28-Apr-14	Spring Migration	1	11:05:56	11:14:07	1835	1954	120	12	Mammal	Grizzly Bear		1			1	1	Other	
BR_72	27-Sep-13	Fall	1	19:15:38	19:24:54	2186	2275	90	9	Mammal	Grizzly Bear		1			1	1	Other	No more useful pictures after camera is knocked over.
BR_73	12-Mar-14	Winter	1	9:57:18	9:57:27	9644	9653	10	1	Mammal	wolverine		1			1	1	walking	
BR_73	7-Apr-14	Winter	1	21:11:48	21:11:58	926	935	10	1	Mammal	Grey Wolf		1			1	1	walking	Walks under camera.
BR_73	10-Apr-14	Winter	1	6:41:13	6:41:23	1051	1060	10	1	Mammal	red fox		1			1	1	walking	Walks away from camera.
BR_73	12-Apr-14	Winter	1	15:48:50	15:48:59	1175	1184	10	1	Mammal	wolverine		1			1	1	walking	Looks to be rolling around in snow.
BR_73	24-May-14	Spring Migration	1	5:47:13	5:47:28	3181	3190	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_73	19-Jun-14	Post-calving	1	0:50:49	0:51:01	4439	4448	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_73	19-Jun-14	Post-calving	2	7:22:37	7:22:47	4486	4495	10	1	bird	Canada Goose		3			3	3	flying	Taking off from small pond.
BR_73	8-Jul-14	Post-calving	1	18:05:15	18:08:58	5406	5435	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_74	3-Sep-13	Fall	1	6:23:02	6:29:13	456	515	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_74	11-Sep-13	Fall	1	19:21:22	19:25:41	926	995	70	7	Mammal	Grizzly Bear		1			1	1	Other	
BR_74	22-Sep-13	Fall	1	6:11:13	6:17:58	1498	1587	90	9	Mammal	Grizzly Bear		1			1	1	Other	
BR_74	28-Sep-13	Fall	1	14:17:12	14:17:25	1892	1901	10	1	Mammal	Grizzly Bear		1			1	1	Other	
BR_74	1-Oct-13	Fall	1	3:06:01	3:19:05	2024	2183	160	16	Mammal	Grizzly Bear		1			1	1	Other	No more useful pictures after camera is knocked over.
BR_75	5-Sep-13	Fall	1	16:56:20	16:59:35	570	609	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_75	5-Sep-13	Fall	2	17:02	17:06:23	611	690	80	8	Mammal	Grizzly Bear		1		Y	1	0	Other	Same bear as previous series.
BR_75	7-Oct-13	Fall	1	17:44:00	5:58:48	2228	2447	220	22	Mammal	wolverine		1			1	1	Other	Takes camera out of enclosure and probably chews it .
BR_76	28-Aug-13	Summer	1	2:15:32	2:16:28	206	225	20	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_76	13-Sep-13	Fall		7:25:41	7:27:57	1344	1383	40	4	Mammal	Grizzly Bear		2			2	2	Other	Eventually knocks over camera and no more useful pictures.
BR_77	25-Sep-13	Fall	1	18:47:25	18:57:49	1522	1681	160	16	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_77	18-Mar-14	Winter	1	11:22:55	11:23:09	20	29	10	1	Mammal	wolverine		1			1	1	Other	Investigating camera.
BR_77	11-May-14	Spring Migration	1	18:36:00	6:26:09	2637	2646	10	1	Mammal	Grey Wolf		1			1	1	Other	Investigating camera.
BR_77	8-Jun-14	Calving	1	3:34:08	3:34:54	3961	3980	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_77	26-Jun-14	Post-calving	1	4:03:25	4:03:35	4846	4855	10	1	Mammal	Grizzly Bear		1			1	1	Other	
BR_78	9-Sep-13	Fall	1	8:40:39	8:40:49	692	701	10	1	Mammal	Caribou	BR78_1	15			15	15	Grazing	Herd of caribou passing by.
BR_78	10-Sep-13	Fall	1	18:11:46	18:11:57	769	778	10	1	Mammal	Caribou	BR78_2	3			3	3	Grazing	A few caribou grazing.
BR_78	11-Sep-13	Fall	1	12:52:52	12:53:01	816	825	10	1	Mammal	Caribou	BR78_3	27			27	27	Grazing	
BR_78	11-Sep-13	Fall	2	19:10:09	19:12:38	839	918	80	8	Mammal	Caribou	BR78_4	11			11	11	Grazing	Herd of caribou passing by - walking from right to left.

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_78	22-Sep-13	Fall	1	17:59:15	18:01:00	1455	1474	30	3	Mammal	Grey Wolf		1			1	1	Grazing	
BR_78	13-Dec-13	Winter	1	5:02:17	5:02:27	5385	5394	10	1	Mammal	Caribou	BR78_5	1			1	1	Standing	One caribou checking out the camera. Looking cold out there.
BR_79	29-Aug-13	Summer	1	20:44:45	20:44:54	137	146	10	1	Mammal	Grizzly Bear		1			1	1	Other	Likely a Grizzly Bear - moving camera around a little.
BR_79	15-Sep-13	Fall	1	10:33:24	10:33:33	953	962	10	1	Mammal	Caribou	BR79_1	1			1	1	Walking	
BR_79	16-Sep-13	Fall	1	17:27:31	17:27:40	1024	1033	10	1	Mammal	Caribou	BR79_2	1			1	1	Other	
BR_79	27-Sep-13	Fall	1	15:33:08	15:34:37	1559	1588	30	3	Mammal	Grizzly Bear		1			1	1	Other	Grizzly gnawing at camera.
BR_79	6-Oct-13	Fall	1	13:37:56	13:39:23	2017	2056	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_79	13-Apr-14	Winter	1	19:09:22	19:09:31	1201	1210	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_79	17-Apr-14	Spring Migration	1	15:23:27	15:23:37	1395	1404	10	1	Mammal	Red Fox		1			1	1	Running	
BR_79	17-May-14	Spring Migration	1	18:40:46	18:40:57	2852	2861	10	1	Mammal	Red Fox		1			1	1	Running	
BR_79	17-Jun-14	Post-calving	1	15:38:58	15:40:52	4344	4403	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_80	10-Sep-13	Fall	1	12:16:23	12:19:45	725	804	80	8	Mammal	Caribou	BR80_1	12			12	12	Standing	Standing, feeding, and walking.
BR_80	10-Sep-13	Fall	1	15:06:48	15:07:16	811	830	20	2	Mammal	Caribou	BR80_2	1			1	1	Walking	
BR_80	10-Sep-13	Fall	1	16:36:17	16:36:26	834	843	10	1	Mammal	Caribou	BR80_3	1			1	1	Walking	
BR_80	10-Sep-13	Fall	1	19:09:35	19:09:44	849	858	10	1	Mammal	Caribou	BR80_4	4			4	4		
BR_80	10-Sep-13	Fall	2	19:16:41	19:20:18	859	938	80	8	Mammal	Caribou	BR80_4	15		Y/N	15	14	Walking	Standing, walking, feeding. At least one previously counted (big male).
BR_80	10-Sep-13	Fall	3	19:27:22	19:31:39	939	1039	101	10	Mammal	Caribou	BR80_4	8		Y	8	0	Walking	Standing, walking, and feeding.
BR_80	14-Sep-13	Fall	1	8:18:40	8:20:02	1209	1238	30	3	Mammal	Caribou	BR80_5	7			7	7	Walking	
BR_80	14-Sep-13	Fall	1	20:02:56	20:03:07	1263	1272	10	1	Mammal	Caribou	BR80_6	1			1	1	Walking	
BR_80	30-Jan-14	Winter	1	12:19:47	12:19:56	7881	7890	10	1	Mammal	Caribou	BR80_7	1			1	1	Walking	
BR_80	30-Jan-14	Winter	1	12:42:18	12:42:27	7892	7901	10	1	Mammal	Caribou	BR80_8	1			1	1	Feeding	
BR_80	26-Apr-14	Spring Migration	1	16:46:02	16:46:11	2039	2048	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_80	6-May-14	Spring Migration	1	11:44:43	11:44:54	2519	2528	10	1	Mammal	Wolverine		1			1	1	Running	
BR_80	6-May-14	Spring Migration	1	14:34:48	14:34:57	2535	2544	10	1	Mammal	Red Fox		1			1	1	Running	
BR_80	8-Jun-14	Calving	1	20:40:22	20:40:32	4141	4150	10	1	Bird	Duck		1			1	1	Other	Pair of duck, likely long-tailed duck or greater scaup.
BR_80	9-Jun-14	Calving	1	15:37:42	15:38:55	4189	4228	40	4	Mammal	Grizzly Bear		1			1	1	Other	It knocked the camera over on the ground.
BR_81	11-Sep-13	Fall	1	3:22:05	3:22:15	744	753	10	1	Mammal	Grey Wolf		2			2	2	Standing	
BR_81	24-Dec-13	Winter	1	17:04:46	17:05:41	5774	5793	20	2	Mammal	Grey Wolf		2			2	2	Standing	Looking at camera then walking behind it.
BR_81	6-Jan-14	Winter	1	14:52:35	14:52:45	6413	6422	10	1	Mammal	Caribou	BR81_1	3			3	3	Walking	
BR_81	6-Jan-14	Winter	2	14:58:18	14:58:54	6423	6442	20	2	Mammal	Caribou	BR81_2	4			4	4	Walking	Three in background walking; 1 in foreground standing next to camera.
BR_81	7-Jan-14	Winter	1	14:04:46	14:02:56	6490	6499	10	1	Mammal	Caribou	BR81_3	1			1	1	Walking	
BR_81	7-Apr-14	Winter	1	19:13:17	19:13:26	831	840	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_81	13-Apr-14	Winter	1	8:56:17	8:56:26	1108	1117	10	1	Mammal	Wolverine		1			1	1	Running	
BR_81	29-May-14	Spring Migration	1	2:53:13	2:53:47	3314	3333	20	2	Mammal	Grizzly Bear		1			1	1	Standing	Investigating camera, then walked away.
BR_81	28-Jun-14	Post-calving	1	11:44:39	11:44:48	4802	4811	10	1	Mammal	Wolverine		1			1	1	Walking	
BR_82	30-Aug-13	Summer	1	1:40:45	1:41:14	143	162	20	2	Mammal	Red Fox		1			1	1	Standing	Walked a bit in front of the camera, stood, then ran off.
BR_82	4-Sep-13	Fall	1	1:10:50	1:10:59	402	411	10	1	Mammal	Caribou	BR82_1	6			6	6	Running	
BR_82	4-Sep-13	Fall	2	1:18:34	1:18:43	412	421	10	1	Mammal	Caribou	BR82_1	5		Y	5	0	Running	
BR_82	4-Sep-13	Fall	1	5:01:26	5:01:35	430	439	10	1	Mammal	Caribou	BR82_2	1			1	1	Walking	
BR_82	4-Sep-13	Fall	1	15:59:21	15:59:49	461	480	20	1	Mammal	Caribou	BR82_3	5			5	5	Feeding	
BR_82	4-Sep-13	Fall	1	16:31:06	16:32:22	483	522	40	4	Mammal	Caribou	BR82_4	1			1	1	Standing	
BR_82	4-Sep-13	Fall	1	16:52:11	16:52:56	523	542	20	2	Mammal	Caribou	BR82_5	1			1	1	Standing	
BR_82	8-Sep-13	Fall	1	6:51:14	6:51:45	715	734	20	2	Mammal	Caribou	BR82_6	13			13	13	Walking	some along the horizon.
BR_82	8-Sep-13	Fall	2	6:58:30	7:00:05	735	765	31	3	Mammal	Caribou	BR82_6	30		Y/N	30	25	Feeding	Caribou feeding and walking. Five counted in previous series.
BR_82	8-Sep-13	Fall	3	7:01:35	7:03:32	766	805	40	4	Mammal	Caribou	BR82_6	29		Y	29	0	Feeding	Caribou feeding and walking. Look to be the same as previous series.
BR_82	8-Sep-13	Fall	4	7:06:49	7:06:58	806	815	10	1	Mammal	Caribou	BR82_6	16		Y	16	0	Feeding	Caribou feeding and walking. Look to be the same as previous series.
BR_82	9-Sep-13	Fall	1	21:22:23	21:22:32	892	901	10	1	Mammal	Caribou	BR82_7	5			5	5	Feeding	
BR_82	9-Sep-13	Fall	2	22:39:09	22:39:18	905	914	10	1	Mammal	Caribou	BR82_7	5		Y	5	0	Walking	
BR_82	10-Sep-13	Fall	1	1:55:24	1:55:33	921	930	10	1	Mammal	Caribou	BR82_8	4			4	4	Feeding	
BR_82	10-Sep-13	Fall	2	2:47:02	2:47:11	933	942	10	1	Mammal	Caribou	BR82_8	4		Y	4	0	Walking	
BR_82	10-Sep-13	Fall	3	3:21:35	3:21:44	944	953	10	1	Mammal	Caribou	BR82_8	15		Y/N	15	13	Standing	Two counted from previous series. Walking, running.
BR_82	10-Sep-13	Fall	4	3:23:25	3:23:34	954	963	10	1	Mammal	Caribou	BR82_8	5		Y	5	0	Standing	Feeding and walking.
BR_82	10-Sep-13	Fall	5	5:22:26	5:22:59	968	987	20	2	Mammal	Caribou	BR82_8	20		Y/N	20	13	Walking	At least seven caribou previously counted. May be that this is the same group that is bedded down in the area.
BR_82	10-Sep-13	Fall	6	5:26:41	5:26:50	988	997	10	1	Mammal	Caribou	BR82_8	2		Y	2	2	Walking	
BR_82	12-Sep-13	Fall	1	8:38:04	8:40:24	1101	1140	40	4	Mammal	Caribou	BR82_9	2			2	2	Feeding	

Appendix 2. Images of Wildlife Captured by Terrestrial RSA and TCWR Winter Road Connector Remote Cameras, August 2013 to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_82	12-Sep-13	Fall	2	8:41:44	8:45:45	1141	1250	110	11	Mammal	Caribou	BR82_9	2		Y/N	2	1	Standing	One of the caribou was not counted in previous series. Standing, feeding, and walking.
BR_82	12-Sep-13	Fall	1	19:34:52	19:36:33	1273	1312	40	4	Mammal	Caribou	BR82_10	5			5	5	Feeding	
BR_82	16-Sep-13	Fall	1	6:51:42	6:51:52	1479	1488	10	1	Mammal	Caribou	BR82_11	1			1	1	Walking	
BR_82	21-Sep-13	Fall	1	7:14:30	7:16:25	1730	1759	30	3	Mammal	Caribou	BR82_12	11			11	11	Walking	
BR_82	21-Sep-13	Fall	2	7:17:40	7:19:30	1760	1809	50	5	Mammal	Caribou	BR82_12	27		Y/N	27	22	Walking	At least five individuals counted from previous series. Total may be an over estimate as some may have circled back.
BR_82	23-Apr-14	Spring Migration	1	14:13:30	14:13:39	2107	2116	10	1	Mammal	Grey Wolf		2			2	2	Walking	
BR_82	8-May-14	Spring Migration	1	18:28:08	18:28:17	2845	2854	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_82	7-Jul-14	Post-calving	1	22:07:02	22:07:35	5743	5762	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_83	12-Sep-13	Fall	1	8:52:59	8:54:13	780	799	20	2	Mammal	Caribou	BR83_1	2			2	2	Standing	Behind camera most of time.
BR_83	16-Sep-13	Fall	1	17:19:55	17:20:06	1009	1018	10	1	Mammal	Caribou	BR83_2	3			3	3	Walking	
BR_83	23-Sep-13	Fall	1	6:23:00	6:23:43	1333	1352	20	2	Mammal	Grizzly Bear		1			1	1	Standing	Investigating camera.
BR_83	6-Oct-13	Fall	1	8:30:30	8:31:22	1992	2011	20	2	Mammal	Grizzly Bear		1			1	1	Standing	Investigating camera.
BR_83	9-Mar-14	Winter	1	11:04:54	11:05:04	9409	9418	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_83	20-May-14	Spring Migration	1	4:59:42	5:03:32	2893	2963	71	7	Mammal	Grizzly Bear		1			1	1	Other	Really investigating the camera.
BR_83	26-May-14	Spring Migration	1	14:11:38	14:14:17	3290	3339	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_83	20-Jun-14	Post-calving	1	19:51:03	19:51:38	4571	4590	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera.
BR_83	30-Jun-14	Post-calving	1	1:23:43	1:24:12	5074	5093	20	2	Mammal	Grizzly Bear		1			1	1	Walking	
BR_84	no wildlife photos																		
BR_85	12-Feb-14	Winter	1	12:40:39	12:40:49	8189	8198	10	1	Mammal	red fox		1			1	1	walking	
BR_85	5-Mar-14	Winter	1	16:22:38	16:22:48	9214	9223	10	1	Mammal	red fox		1			1	1	walking	
BR_85	18-Apr-14	Spring Migration	1	17:00:12	17:00:21	1339	1348	10	1	Mammal	wolverine		1			1	1	walking	
BR_85	22-Apr-14	Spring Migration	1	16:49:39	16:50:09	1540	1559	20	1	Mammal	wolverine		1			1	1	walking	Sniffing around a patch of ground on left side.
BR_85	24-Apr-14	Spring Migration	1	13:07:32	13:08:39	1649	1668	20	2	Mammal	red fox		2			2	2	walking	Walking along wolverine tracks to the left side.
BR_85	30-Apr-14	Spring Migration	1	12:10:31	12:10:40	1955	1964	10	1	Mammal	wolverine		1		Y	1	0	walking	Sniffing/urinating on patch of ground again, likely the same individual as before.
BR_85	16-May-14	Spring Migration	1	21:49:20	21:49:30	2772	2781	10	1	Mammal	wolverine		1			1	1	walking	
BR_85	6-Jun-14	Calving	1	9:46:11	9:46:22	3766	3775	10	1	bird	Willow Ptarmigan		1			1	1	walking	Displaying male.
BR_85	13-Jun-14	Calving	1	14:50:49	14:50:58	4152	4161	10	1	bird	Herring Gull		1			1	1	flying	Flying along river.
BR_85	6-Jul-14	Post-calving	1	23:22:19	23:22:29	5413	5422	10	1	Mammal	Grey Wolf		1			1	1	walking	Walked up to river and then departed.
BR_86	31-Aug-13	Summer	1	6:26:48	6:28:02	554	573	20	2	Mammal	Caribou	BR86_1	2			2	2	walking	
BR_86	5-Sep-13	Fall	1	11:17:10	11:19:30	1323	1372	50	5	Mammal	Caribou	BR86_2	3			3	3	walking	
BR_86	30-Sep-13	Fall	1	12:14:47	12:14:58	4979	4988	10	1	Mammal	Grizzly Bear		1			1	1	walking	Walking away from camera.
BR_86	24-Dec-13	Winter	1	2:01:06	2:02:42	7169	7188	20	2	Mammal	Caribou	BR86_3	2			2	2	walking	At least two caribou are visible even in the really pixelated/washed photo, though there could be more that are obscured by the pixilation.
BR_87	17-Sep-13	Fall	1	17:00:15	17:00:25	1032	1041	10	1	Mammal	Caribou	BR87_1	4			4	4	walking	Three individuals in foreground and one running in background.
BR_87	23-Oct-13	Fall	1	12:37:35	12:37:35	2761	2770	10	1	Mammal	unknown		1			1	1	other	Something jiggling camera, likely a bear.
BR_87	28-Oct-13	Fall	1	19:16:44	7:21:17	3024	3093	70	7	Mammal	Grizzly Bear		1			1	1	other	Investigating camera.
BR_87	27-May-14	Spring Migration	1	8:11:49	8:13:19	3211	3230	10	1	Mammal	Grizzly Bear		1			1	1	other	Investigating camera.
BR_87	29-May-14	Spring Migration	1	8:22:02	8:26:49	3327	3426	100	1	Mammal	Grizzly Bear		1		Y	1	0	other	Bear is attacking camera for a long time and knocks camera over.
BR_88	5-Sep-13	Fall	1	14:15:20	14:16:37	459	498	40	4	Mammal	Caribou	BR88_1	3			3	3	Standing	Standing, feeding, walking.
BR_88	5-Sep-13	Fall	1	16:54:55	16:55:42	504	533	30	3	Mammal	Caribou	BR88_1	4		Y/N	4	1	Feeding	Feeding and standing. May be the three caribou from previous entry.
BR_88	19-Oct-13	Fall	1	8:26:15	8:26:27	2629	2638	10	1	Mammal	Grey Wolf		2			2	2	Standing	Investigating camera while one runs in behind.
BR_88	23-Apr-14	Spring Migration	1	19:32:31	19:32:40	1611	1620	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_88	29-May-14	Spring Migration	1	9:08:25	9:08:35	3328	3337	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_88	31-May-14	Spring Migration	1	8:57:15	8:58:39	3433	3462	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating the camera.
BR_90	no wildlife photos																		

Appendix 3

Images of Wildlife Captured by MLA and Marine RSA Remote Cameras, May to July 2014

Rescan™
an ERM company

Appendix 3. Images of Wildlife Captured by MLA and Marine RSA Remote Cameras, May to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_91	7-Jun-14	Calving	1	4:47:09	4:47:18	1187	1196	10	1	Bird	Unknown		1			1	1	Flying	Flying away from camera
BR_91	8-Jun-14	Calving	1	20:30:13	20:30:22	1277	1286	10	1	Bird	Unknown		1			1	1	Flying	Flying toward camera
BR_92	4-Jun-14	Spring Migration	1	21:46:05	21:55:57	1036	1235	200	20	Mammal	Caribou	CM92_1	3			3	3	Walking	Also feeding and investigating the camera
BR_92	8-Jun-14	Calving	1	0:40:35	0:40:44	1386	1395	10	1	Mammal	Grey Wolf		1			1	1	Running	
BR_93	no wildlife photos																		
BR_94	4-Jun-14	Spring Migration	1	11:42:03	11:43:31	1125	1174	50	5	Mammal	Caribou	CM94_1	2			2	2	Walking	Investigating camera, one has small antler buds and the others is just coming up
BR_94	7-Jul-14	Post-calving	1	5:06:35	5:08:16	3206	3245	40	4	Mammal	Grizzly Bear		2			2	2	Other	Investigating camera
BR_95	22-May-14	Spring Migration	1	19:32:22	19:48:52	417	636	220	22	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_95	6-Jun-14	Calving	1	18:54:04	18:57:05	1355	1404	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_95	13-Jun-14	Calving	1	20:36:48	20:36:57	1745	1754	10	1	Mammal	Caribou	CM95_1	1			1	1	Running	Antlered individual
BR_95	14-Jun-14	Calving	1	19:17:40	19:20:50	1800	1869	70	7	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, possibility it is the same bear as earlier - there may be two bears but too difficult to confirm
BR_95	5-Jul-14	Post-calving	1	19:51:37	19:53:03	2899	2938	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_96	2-Jun-14	Spring Migration	1	15:36:15	15:51:17	925	1125	200	20	Mammal	Grizzly Bear		2			2	2	Other	Investigates camera and knocks it over, camera stops functioning after it has been knocked over
BR_97	1-Jun-14	Spring Migration	1	13:46:40	13:52:13	884	1013	130	13	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera and knocks it down
BR_98	21-May-14	Spring Migration	1	15:18:30	15:18:39	357	366	10	1	Mammal	Caribou	CM98_1	1			1	1	Walking	Walking across stream ice to north-east, whiter individual with antlers
BR_98	22-May-14	Spring Migration	1	13:13:00	13:13:11	411	420	10	1	Mammal	Caribou	CM98_2	8			8	8	Walking	Walking across stream ice, feeding on opposite shore, all quite white individuals
BR_98	27-May-14	Spring Migration	1	17:02:32	17:02:42	669	678	10	1	Mammal	Caribou	CM98_3	5			5	5	Walking	Walking to south-west, crossing steam ice
BR_98	31-May-14	Spring Migration	1	14:56:09	14:57:22	866	895	29	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	2-Jun-14	Spring Migration	1	2:31:40	2:33:01	968	987	20	2	Mammal	Unknown		1			1	1	Other	Investigating camera, likely a grizzly bear but no definable features to identify are visible
BR_98	5-Jun-14	Calving	1	10:16:20	10:17:13	1147	1166	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	8-Jun-14	Calving	1	0:12:26	12:12:35	1301	1310	10	1	Mammal	Grey Wolf		1			1	1	Walking	White individual
BR_98	12-Jun-14	Calving	1	2:58:54	14:59:05	1542	1551	10	1	Bird	Canada Goose		9			9	9	Other	Swimming and feeding on shoreline
BR_98	13-Jun-14	Calving	1	16:56:29	16:56:38	1604	1613	10	1	Bird	Canada Goose		20		Y/N	20	11	Other	swimming and feeding on shoreline, part of flock before. 11 new individuals
BR_98	13-Jun-14	Calving	1	16:56:29	16:56:38	1604	1613	10	1	Bird	Northern Pintail		2			2	2	Other	Two males swimming
BR_98	14-Jun-14	Calving	1	8:50:25	8:50:44	1656	1665	10	1	Bird	Canada Goose		3		Y	3	0	Walking	
BR_98	18-Jun-14	Post-calving	1	17:14:11	17:22:54	1885	1954	70	7	Bird	Canada Goose		22		Y/N	22	2	Other	Swimming, same flock, two new individuals
BR_98	18-Jun-14	Post-calving	2	17:58:19	17:58:28	1956	1965	10	1	Bird	Canada Goose		5		Y	5	0	Other	Swimming
BR_98	18-Jun-14	Post-calving	3	19:20:04	19:20:13	1969	1978	10	1	Bird	Canada Goose		18		Y	18	0	Other	
BR_98	19-Jun-14	Post-calving	1	19:15:57	7:27:50	2047	1076	30	3	Bird	Canada Goose		25		Y/N	25	3	Other	Swimming and feeding on opposite shore, same flock, three new individuals
BR_98	19-Jun-14	Post-calving	2	19:50:18	19:55:50	2078	2137	60	6	Bird	Canada Goose		19		Y	19	0	Other	Swimming and feeding on this shore
BR_98	20-Jun-14	Post-calving	1	22:39:09	22:30:46	2191	2231	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera (includes one timed photo in series)
BR_98	23-Jun-14	Post-calving	1	23:31:10	23:32:11	2418	2447	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, could be the same bear as previously
BR_98	30-Jun-14	Post-calving	1	0:10:36	0:11:12	2957	2976	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	1-Jul-14	Post-calving	1	3:47:58	3:50:56	3102	3121	20	2	Bird	Red-breasted Merganser		5			5	5	Other	Two females swimming (or juveniles)
BR_98	1-Jul-14	Post-calving	2	4:04:53	4:06:32	3133	3152	20	2	Bird	Green-winged Teal		2			2	2	Other	swimming
BR_98	1-Jul-14	Post-calving	2	4:06:23	4:06:32	3143	3152	10	1	Bird	Gull		4			4	4	Flying	
BR_98	1-Jul-14	Post-calving	3	15:08:20	15:08:31	3235	3244	10	1	Mammal	Caribou	CM98_4	1			1	1	Walking	
BR_98	2-Jul-14	Post-calving	1	7:33:02	7:33:45	3288	3307	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	2-Jul-14	Post-calving	2	23:17:39	23:17:49	3359	3368	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, possibly same bear as in the morning
BR_98	5-Jul-14	Post-calving	1	19:37:25	19:38:46	3636	3655	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	7-Jul-14	Post-calving	1	13:27:55	13:28:35	3739	3758	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_98	7-Jul-14	Post-calving	2	15:24:36	15:24:45	3763	3772	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_98	8-Jul-14	Post-calving	1	4:16:15	4:16:24	4109	4118	10	1	Bird	Gull		1			1	1	Flying	
BR_99	20-May-14	Spring Migration	1	1:51:57	1:52:08	291	300	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_99	21-May-14	Spring Migration	1	0:38:21	0:43:19	347	396	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_99	11-Jun-14	Calving	1	9:11:35	9:12:18	1432	1451	20	2	Mammal	Caribou	CM99_1	1			1	1	Other	Investigating camera, antered individual
BR_99	16-Jun-14	Post-calving	1	16:09:38	16:19:48	1706	1715	10	1	Mammal	Grey Wolf		1			1	1	Walking	Investigating camera
BR_100	22-Jun-14	Post-calving	1	20:08:06	8:09:25	1902	1941	40	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_101	22-May-14	Spring Migration	1	9:46:28	9:49:28	234	273	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera and knocks it down
BR_102	27-May-14	Spring Migration	1	21:28:18	21:33:30	512	612	100	10	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, includes the timed photo inbetween but is the same bear
BR_102	28-May-14	Spring Migration	1	18:29:08	18:33:27	654	734	80	8	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, possibly same bear as last night that comes back and knocks it down
BR_103	22-May-14	Spring Migration	1	8:12:04	8:14:26	245	284	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_103	29-May-14	Spring Migration	1	7:58:11	7:58:20	620	629	10	1	Unknown	Unknown					0			Looks to be a wing, cannot identify
BR_103	9-Jun-14	Calving	1	4:59:46	5:02:42	1162	1222	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera

Appendix 3. Images of Wildlife Captured by MLA and Marine RSA Remote Cameras, May to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_103	10-Jun-14	Calving	1	9:23:42	9:53:52	1279	1288	10	1	Mammal	Grey Wolf		1			1	1	Walking	
BR_103	11-Jun-14	Calving	1	17:56:57	17:57:33	1354	1373	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_103	12-Jun-14	Calving	1	0:45:30	0:47:31	1388	1437	50	5	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_103	12-Jun-14	Calving	2	2:05:25	2:05:38	1441	1450	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Bear visited camera, identified by breath on screen
BR_103	13-Jun-14	Calving	2	10:30:03	10:32:53	1516	1565	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_103	17-Jun-14	Post-calving	1	20:50:14	20:53:02	1778	1837	60	6	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, looks to be blonde individual
BR_103	21-Jun-14	Post-calving	1	16:42:16	16:42:27	2042	2051	10	1	Mammal	Grizzly Bear		1			1	1	Walking	Walking along shoreline
BR_103	24-Jun-14	Post-calving	1	4:14:59	4:14:09	2191	2200	10	1	Mammal	Caribou	CM103_1	1			1	1	Walking	Grazing while walking, small antler buds
BR_103	25-Jun-14	Post-calving	1	2:33:15	2:33:24	2256	2265	10	1	Mammal	Caribou	CM103_2	3			3	3	Walking	Walking along shoreline, two antlered male and a smaller individual with antler buds
BR_103	27-Jun-14	Post-calving	1	0:41:53	0:42:04	2368	2377	10	1	Mammal	Grey Wolf		1			1	1	Running	
BR_103	27-Jun-14	Post-calving	2	0:50:23	0:52:37	2378	2437	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_103	27-Jun-14	Post-calving	3	22:00:13	22:02:06	2481	2530	50	5	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigates camera and knocks it over
BR_104	28-May-14	Spring Migration	1	20:47:53	20:47:02	577	586	10	1	Mammal	Unknown					0		Other	Investigating camera from behind, just jiggling - likely a bear
BR_104	30-May-14	Spring Migration	1	21:08:31	21:11:05	684	733	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_104	5-Jun-14	Calving	1	20:39:50	20:44:22	1021	1100	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_104	12-Jul-14	Post-calving	1	2:03:21	2:05:30	2840	2889	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_105	18-May-14	Spring Migration	1	9:07:45	9:07:56	103	112	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_105	18-May-14	Spring Migration	2	23:25:07	23:34:16	161	231	70	7	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera and knocks it down
BR_106	17-May-14	Spring Migration	1	23:53:00	23:53:29	33	52	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	18-May-14	Spring Migration	1	20:49:25	20:55:24	95	144	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	27-May-14	Spring Migration	1	22:22:51	22:32:33	580	660	80	8	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	3-Jun-14	Spring Migration	1	17:21:51	5:22:02	986	995	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	6-Jun-14	Calving	1	11:22:53	11:23:04	1128	1137	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	8-Jun-14	Calving	1	10:08:44	10:16:47	1232	1281	50	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	9-Jun-14	Calving	1	11:54:56	11:55:05	1333	1342	9	1	Mammal	Unknown					0		Other	Investigating camera from behind, just jiggling - likely a bear
BR_106	11-Jun-14	Calving	1	17:05:30	17:07:51	1450	1489	39	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	11-Jun-14	Calving	2	19:53:12	19:54:20	1495	1514	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_106	16-Jun-14	Post-calving	1	7:01:15	7:01:54	1730	1749	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_106	16-Jun-14	Post-calving	2	13:08:16	13:11:37	1762	1791	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_106	16-Jun-14	Post-calving	3	22:52:14	22:52:25	1811	1820	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	17-Jun-14	Post-calving	1	22:45:59	22:46:57	1869	1888	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	25-Jun-14	Post-calving	1	16:50:27	16:50:36	2261	2270	10	1	Bird	Glaucous Gull		1			1	1	Walking	Walking along shoreline
BR_106	28-Jun-14	Post-calving	1	6:50:15	6:50:24	2395	2404	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_106	28-Jun-14	Post-calving	2	16:31:08	16:31:38	2425	2444	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as earlier
BR_107	25-May-14	Spring Migration	1	15:25:19	15:36:42	399	619	220	22	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera for a long time, and finally knocks it over
BR_108	19-May-14	Spring Migration	1	14:36:19	14:39:59	130	219	90	9	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_108	20-May-14	Spring Migration	1	10:19:50	10:21:41	259	308	50	5	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, same bear as before
BR_109	20-May-14	Spring Migration	1	15:56:04	15:59:05	159	218	60	6	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, knocks it over
BR_110	19-May-14	Spring Migration	1	19:47:29	19:47:40	136	145	10	1	Mammal	Red Fox		1			1	1	Walking	Walks around and faces camera for moment
BR_110	27-May-14	Spring Migration	1	16:08:41	16:17:03	523	702	180	18	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera and knocks it down
BR_111	30-May-14	Spring Migration	1	20:15:00	20:15:10	654	663	10	1	Bird	Common Raven		1			1	1	Flying	
BR_111	10-Jun-14	Calving	1	19:01:44	19:01:57	1190	1199	10	1	Bird	Common Raven		1		Y	1	0	Sitting	Perched on camera
BR_111	10-Jun-14	Calving	1	19:01:44	19:01:57	1190	1199	10	1	Bird	Duck		2			2	2	Other	Swimming in the ocean
BR_111	17-Jun-14	Post-calving	1	15:46:06	15:46:17	1529	1538	10	1	Bird	Common Raven		1		Y	1	0	Sitting	Perched on camera
BR_111	17-Jun-14	Post-calving	2	16:29:10	16:29:29	1540	1549	10	1	Bird	Common Raven		1		Y	1	0	Sitting	Perched on camera
BR_111	22-Jun-14	Post-calving	1	5:41:19	5:42:36	1769	1798	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_111	22-Jun-14	Post-calving	2	20:11:06	20:11:41	1828	1847	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_111	22-Jun-14	Post-calving	3	20:40:51	20:42:24	1849	1868	20	2	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera
BR_111	29-Jun-14	Post-calving	1	12:25:28	12:27:39	2198	2217	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_111	3-Jul-14	Post-calving	1	6:23:22	6:23:34	2418	2427	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_111	10-Jul-14	Post-calving	1	9:54:15	9:55:12	2781	2800	20	2	Bird	Common Raven		1		Y	1	0	Sitting	Perched on camera
BR_112	30-May-14	Spring Migration	1	14:59:55	15:01:15	652	682	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera (includes one timed photo in series)
BR_112	5-Jun-14	Calving	1	11:17:15	11:17:24	963	972	10	1	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_112	1-Jul-14	Post-calving	1	21:08:35	21:08:44	2251	2260	10	1	Bird	Golden Eagle		1			1	1	Flying	
BR_113	23-May-14	Spring Migration	1	13:06:47	13:14:05	302	411	110	11	Mammal	Grizzly Bear		1	1		2	2	Other	Investigating camera, it looks like a mom and a second year cub

Appendix 3. Images of Wildlife Captured by MLA and Marine RSA Remote Cameras, May to July 2014

Camera Number	Date	Caribou Seasonal Period	Daily Series	Start Time	End Time	Start Photo	End Photo	No. of Photos	No. of Triggers	Animal Group	Species	Caribou Group ID	No. of Adults	No. of Young	Previously Counted	Total Animals (in Detection)	Total Unique Animals (for Analysis)	Behaviour	Comment(s)
BR_113	23-May-14	Spring Migration	2	13:46:13	13:50:56	413	492	80	8	Mammal	Grizzly Bear		1	2	Y/N	3	1	Other	Investigating camera, same bears, another cub is still jiggling the camera in behind while the other walks in front (one new individual)
BR_113	26-May-14	Spring Migration	1	2:57:31	2:57:40	615	624	10	1	Mammal	Red Fox		1			1	1	Walking	
BR_113	28-May-14	Spring Migration	1	11:21:46	11:21:55	738	747	10	1	Unknown	Unknown					0	0		Looks to be a wing or something of the like, too little to identify
BR_113	31-May-14	Spring Migration	1	19:47:23	19:47:32	909	918	10	1	Mammal	Grey Wolf		1			1	1	Walking	Investigating camera
BR_113	2-Jun-14	Spring Migration	1	11:17:41	11:19:01	998	1027	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigates camera, tilts it down some
BR_113	11-Jun-14	Calving	1	18:11:50	18:16:11	1474	1553	80	8	Mammal	Grizzly Bear			1	Y	1	0	Other	Walks up and investigates camera, looks to be same cub as before
BR_113	15-Jun-14	Calving	1	17:30:20	17:34:14	1744	1794	50	5	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera, may be the cub but cannot really see individual
BR_113	20-Jun-14	Post-calving	1	16:48:30	16:49:51	2033	2062	30	3	Mammal	Grizzly Bear			1	Y	1	0	Other	Walks up and investigates camera, looks to be same cub as before, leaves camera tilted forward more
BR_113	25-Jun-14	Post-calving	1	20:22:27	20:23:08	2310	2329	20	2	Mammal	Grizzly Bear			1	Y	1	0	Other	Walks up and investigates camera, looks to be same cub as before
BR_113	2-Jul-14	Post-calving	1	20:56:26	21:04:02	2667	2797	130	13	Mammal	Grizzly Bear			1	Y	1	0	Other	Investigates camera and knocks it over, plays with camera like a cub
BR_114	23-May-14	Spring Migration	1	3:07:17	3:07:26	271	280	10	1	Mammal	Caribou	CM114_1	9			9	9	Walking	Walking away from camera
BR_114	23-May-14	Spring Migration	2	14:05:43	14:06:26	303	322	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_114	4-Jun-14	Calving	1	21:32:47	21:39:37	914	983	70	7	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_114	20-Jun-14	Post-calving	1	16:55:33	16:56:36	1742	1771	30	3	Mammal	Grizzly Bear		1			1	1	Walking	Walks up and investigates camera
BR_114	29-Jun-14	Post-calving	1	22:46:38	22:46:48	2226	2235	10	1	Mammal	Caribou	CM114_2	1			1	1	Walking	Stares at camera then walks away grazing
BR_114	2-Jul-14	Post-calving	1	21:18:07	21:18:36	2397	2416	20	2	Mammal	Grizzly Bear		1			1	1	Walking	Walks up and investigates camera
BR_115	21-May-14	Spring Migration	1	9:49:47	9:51:17	187	216	30	3	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_115	21-May-14	Spring Migration	1	17:30:35	17:36:08	233	322	90	9	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera
BR_115	28-May-14	Spring Migration	1	11:03:38	11:05:02	646	665	20	2	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_115	28-May-14	Spring Migration	2	21:28:05	21:28:15	686	695	10	1	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera, only see it tipping (bear is behind the camera)
BR_115	28-May-14	Spring Migration	3	22:37:44	22:38:33	699	728	30	3	Mammal	Grizzly Bear		1		Y	1	0	Other	Investigating camera
BR_115	2-Jun-14	Spring Migration	1	12:49:30	12:49:39	949	958	10	1	Mammal	Grey Wolf		1			1	1	Walking	Investigating camera
BR_115	4-Jun-14	Spring Migration	1	14:53:52	14:55:30	1059	1098	40	4	Mammal	Grizzly Bear		1			1	1	Other	Investigating camera
BR_115	7-Jun-14	Calving	1	13:34:44	13:34:54	1241	1250	10	1	Bird	Horned Lark		1			1	1	Flying	Flying toward camera
BR_115	8-Jun-14	Calving	1	21:57:06	21:59:43	1335	1404	70	7	Mammal	Grizzly Bear		2			2	2	Other	Two bears playing with camera
BR_115	24-Jun-14	Post-calving	1	20:37:55	8:38:07	2171	2180	10	1	Mammal	Caribou	CM115_1	1			1	1	Walking	Investigating camera, antlered individual

Appendix V5-5H

Back River Project: 2015 Wildlife Camera Baseline Report

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
2015 Wildlife Camera Baseline Report

Rescan Environmental Services Ltd., an ERM company
ERM Rescan Building, 15th Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

November 2015

BACK RIVER PROJECT
2015 WILDLIFE CAMERA BASELINE REPORT

November 2015
Project #0283709-0047 (0833-002-05)

Citation:
Rescan. 2015. *Back River Project: 2015 Wildlife Camera Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan Environmental Services Ltd., an ERM company
Vancouver, British Columbia

Executive Summary

Rescan™
an ERM company

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. For 2015, the wildlife baseline program included monitoring strategic locations with wildlife cameras.

This report details the results of the remote camera study carried out from the summer of 2014 to the spring of 2015. The overall objective of the remote camera study was to document the presence, relative abundance, and distribution of wildlife, with particular emphasis on caribou.

A total of 38 Reconyx PC800 Professional digital cameras were deployed to monitor caribou and other wildlife in the terrestrial Regional Study Area (RSA) and the marine RSA; 13 cameras were located in the terrestrial RSA and 25 cameras in the marine RSA from July 2014 to April 2015. Cameras in the terrestrial RSA monitored wildlife at strategic locations identified during previous camera studies near the Goose Property Area. Cameras in the marine RSA were placed at and surrounding the Marine Laydown Area (MLA) to document whether caribou, potentially the Dolphin and Union caribou herd, used the site in winter. Data were analyzed separately for cameras located in the terrestrial RSA and marine RSA.

The cameras were active between July 2014 and April 2015. The majority of caribou recorded on terrestrial RSA cameras and marine RSA cameras were recorded during the summer and fall of 2014. Smaller numbers of caribou were recorded during other seasons, including the late post-calving period (mid to late July; terrestrial RSA and marine RSA cameras), while very low numbers were observed during the winter (late February; marine RSA cameras). Similar trends in the seasonal abundance of caribou were recorded by cameras in the terrestrial RSA during 2013 and 2014 (Rescan 2014a, 2014b). Across multiple years, consistently high numbers of caribou have been recorded during the summer period, with comparatively low numbers recorded during other seasonal periods. Caribou detections in the marine RSA, lower Bathurst Inlet, have been few and sporadic without any consistent temporal trends.

The camera data, when compared to collar data from the Bathurst, Beverly/Ahaik, and Dolphin and Union caribou herds (Poole et al. 2010; Rescan 2014a), suggests that three caribou herds may have been recorded by cameras. Bathurst caribou were possibly recorded on images captured during the post-calving period in the terrestrial RSA, as this is the primary period when the range of the Bathurst caribou overlaps with the southwestern terrestrial RSA. During the remainder of the year, there is no overlap between the range of the Bathurst herd and the terrestrial RSA. During the summer and fall, cameras in the terrestrial RSA are likely recording Beverly/Ahiak caribou, particularly at the river crossing on the southwest end of Beechey Lake. The observation of caribou (two individuals) at the MLA in the marine RSA during winter is either Dolphin and Union caribou or Beverly/Ahiak caribou. Collar data of the Dolphin and Union herd indicate that the southern edge of herds winter range is slightly north of the MLA. This herd migrates north in the spring to Victoria Island, returning to the mainland at freeze up. Collar data from the Beverly/Ahiak herd indicate that the herds winter range has periodically overlapped the southern portions of Bathurst Inlet since 2001 (Rescan 2014a).

A number of other wildlife species were recorded by cameras, including 12 species of birds and 5 species of mammals. Bird species were infrequently recorded at cameras, possibly due to their small size, while mammal species, particularly grizzly bear, were frequently recorded. Grizzly bear were recorded on multiple occasions at cameras located in the marine RSA in the summer and fall, with

86% of all marine RSA cameras recording grizzly bear detections. Similarly, roughly half of all cameras located in the terrestrial RSA recorded grizzly bear detection. Notable observations of other wildlife recorded by remote cameras include the documentation of a fall migration timing for waterbirds within Bathurst Inlet. The last observation of a migratory waterbird in Bathurst Inlet took place on October 2, 2014, after which ice started to form along the shorelines. This observation suggests that some migratory species may be present up to the time when ice formation begins in the late fall.

Acknowledgements

Rescan™
an ERM company

Acknowledgements

This report was prepared for Sabina Gold and Silver Corp. (Sabina) by Rescan Environmental Services Ltd., an ERM company (Rescan). Fieldwork was conducted by Sabina Environmental Co-ordinator Merle Keefe, Tyler Gale (M.A.Sc.), and Sabina field assistant Gail Putuguq. Extensive field support was kindly provided by the Sabina logistics team and camp management, as well as Great Slave Helicopters, and Det'on Cho Expediting. Report writing was conducted by Julia Shewan (B.Sc.) and reviewed by Greg Sharam (Ph.D.) and Deborah Muggli (Ph.D., M.Sc, R.P.Bio.).

Table of Contents

Rescan™
an ERM company

BACK RIVER PROJECT
2015 WILDLIFE CAMERA BASELINE REPORT

Table of Contents

Executive Summary i

Acknowledgements iii

Table of Contents v

List of Figures vi

List of Tables vi

List of Plates vii

List of Appendices vii

Glossary and Abbreviations ix

1. Introduction 1-1

2. Methods 2-1

2.1 Study Area 2-1

2.2 Remote Camera Study Design 2-1

2.3 Remote Camera Setup and Operations 2-1

2.4 Data Analysis 2-2

2.4.1 Evaluating Number of Caribou and Other Wildlife Recorded at Remote Cameras 2-2

2.4.2 Trends in Caribou Abundance and Distribution 2-2

2.4.2.1 Caribou Detection Rates 2-2

2.4.2.2 Temporal Trends 2-7

3. Results 3-1

3.1 Terrestrial RSA Cameras 3-1

3.1.1 Survey Period 3-1

3.1.2 Trends in Caribou Abundance and Distribution 3-1

3.1.2.1 Caribou Detection Rates 3-1

3.1.2.2 Temporal Trends 3-1

3.1.3 Other Wildlife Recorded by Remote Camera 3-11

3.1.3.1 Birds 3-11

3.1.3.2 Mammals 3-11

3.2 Marine RSA Cameras 3-13

3.2.1 Survey Period 3-13

3.2.2 Trends in Caribou Abundance and Distribution 3-13

3.2.2.1 Caribou Detection Rates 3-13
3.2.2.2 Temporal Trends 3-14
3.2.3 Other Wildlife Recorded by Remote Camera 3-21
3.2.3.1 Birds 3-21
3.2.3.2 Mammals 3-22
4. Summary and Discussion 4-1
4.1 Caribou 4-1
4.2 Other Wildlife 4-2
References R-1

List of Figures

FIGURE **PAGE**

Figure 1-1. Back River Project Location 1-2
Figure 2.1-1. Remote Camera Locations, Terrestrial RSA, July 2014 to April 2015 2-3
Figure 2.1-2. Remote Camera Locations, Marine RSA, July 2014 to April 2015 2-5
Figure 3.1-1. Survey Period and Camera Effort for Terrestrial RSA Cameras, July 2014 to April 2015 ... 3-3
Figure 3.1-2. Number of Caribou Observed at Terrestrial RSA Cameras, July 2014 to April 2015 3-5
Figure 3.1-3. Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Terrestrial RSA Cameras, 2014 to 2015 3-7
Figure 3.2-1. Survey Period and Camera Effort for Marine RSA Cameras, July 2014 to April 2015 3-15
Figure 3.2-2. Number of Caribou Observed at Marine RSA Cameras, July 2014 to April 2015 3-17
Figure 3.2-3. Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Marine RSA Cameras, 2014 to 2015 3-19

List of Tables

TABLE **PAGE**

Table 2.4-1. General Seasonal Period Dates for Three Caribou Herds 2-7
Table 3.1-1. Number of Caribou and Caribou Detection Rates Recorded at Terrestrial RSA Cameras by Month 3-8
Table 3.1-2. Detections of Caribou Calves Born in 2014 by Remote Camera 3-10
Table 3.1-3. Bird Species Recorded by Terrestrial RSA Cameras, July 2014 to April 2015 3-11
Table 3.1-4. Mammal Species Recorded by Terrestrial RSA Cameras, July 2014 to April 2015 3-12

Table 3.2-1. Number of Caribou and Caribou Detection Rates Recorded at Marine RSA Cameras by Month 3-20

Table 3.2-2. Bird Species Recorded by Marine RSA Cameras, 2014 3-21

Table 3.2-3. Mammal Species Recorded by Marine RSA Cameras, 2014 and 2015 3-22

List of Plates

PLATE **PAGE**

Plate 3.1-1. Caribou recorded at Camera BR_30 using a water crossing at the south end of Beechey Lake, August 29, 2014. 3-2

Plate 3.1-2. Large herd of approximately 420 individuals walking past Camera BR_17, located on the southeast border of the Goose Property PDA, August 4, 2014. 3-2

Plate 3.1-3. Large group of caribou recorded at Camera BR_45, located approximately 5 km northwest of the Goose Property PDA, August 9, 2014. 3-9

Plate 3.1-4. Large group of caribou recorded at Camera BR_22, located approximately 10 km west of the Goose Property PDA, August 12, 2014 (group was more dispersed and continuously moved past the camera across a period of 15 minutes). 3-9

Plate 3.1-5. Examples of mammals recorded by terrestrial RSA cameras in 2014 and 2015. 3-12

Plate 3.2-1. Caribou individual recorded at Camera BR_113, located within the MLA PDA, on February 22, 2015 (two photos from the same detection event)..... 3-21

Plate 3.2-2. Examples of bears recorded on multiple occasions at a single camera in July, Camera BR_108 located on north end of Quadyuk Island. 3-23

List of Appendices

Appendix 1. Remote Camera Locations and Setup Information

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Glossary and Abbreviations

Rescan™
an ERM company

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

CESCC	Canadian Endangered Species Conservation Council
COSEWIC	Committee on the Status of Endangered Wildlife in Canada – A federal committee of experts that assesses and designates the level of threat to wildlife and vegetation species in Canada.
Marine RSA	Marine Regional Study Area
MLA	Marine Laydown Area
PDA	Potential Development Area
Raptor	Birds of prey including hawks, eagles, falcons, and owls. Common raven is considered a functional raptor based on similar nesting preferences to other true raptor species in the Arctic.
Terrestrial RSA	Terrestrial Regional Study Area
Upland Bird	Passerines (with the exception of common raven, which is included as a functional raptor), shorebirds, and ptarmigan.
Waterbird	Umbrella term used to encompass all birds that exclusively use water habitat for foraging, breeding, or staging during the year.

1. Introduction

1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). This report presents the results of the 2015 wildlife baseline program that was completed to support the ongoing permitting efforts for the Project.

The 2015 wildlife baseline program consisted of monitoring wildlife by remote camera. Remote cameras were initially used in 2012 and have been used for wildlife monitoring in subsequent years. Results from previous camera programs can be found in Rescan (2013), Rescan (2014a), and Rescan (2014b). This report presents the results from the summer of 2014 to the spring of 2015.

The overall objective of the remote camera program is to document the presence, relative abundance, and distribution of wildlife, with particular emphasis on barren-ground caribou. Three caribou herds have been identified whose ranges overlap the area of the Project; the Bathurst herd, the Beverly/Ahiak herd, and the Dolphin and Union herd (Rescan 2013). The Dolphin and Union herd, named for the Dolphin and Union Strait, is considered to be a genetically distinct population of barren-ground caribou (*R. t. groenlandicus x pearyi*). Further information on these herds and their distribution and population can be found in Rescan (2014a).

The main study areas of the remote camera program from the summer of 2014 to the spring of 2015 were the Goose Property Area and the Marine Laydown Area (MLA) in southern Bathurst Inlet. Chapter 2 of this report presents the camera locations and methods, Chapter 3 presents the results, and Chapter 4 presents a short summary and discussion. Raw data are included as appendices to this report.

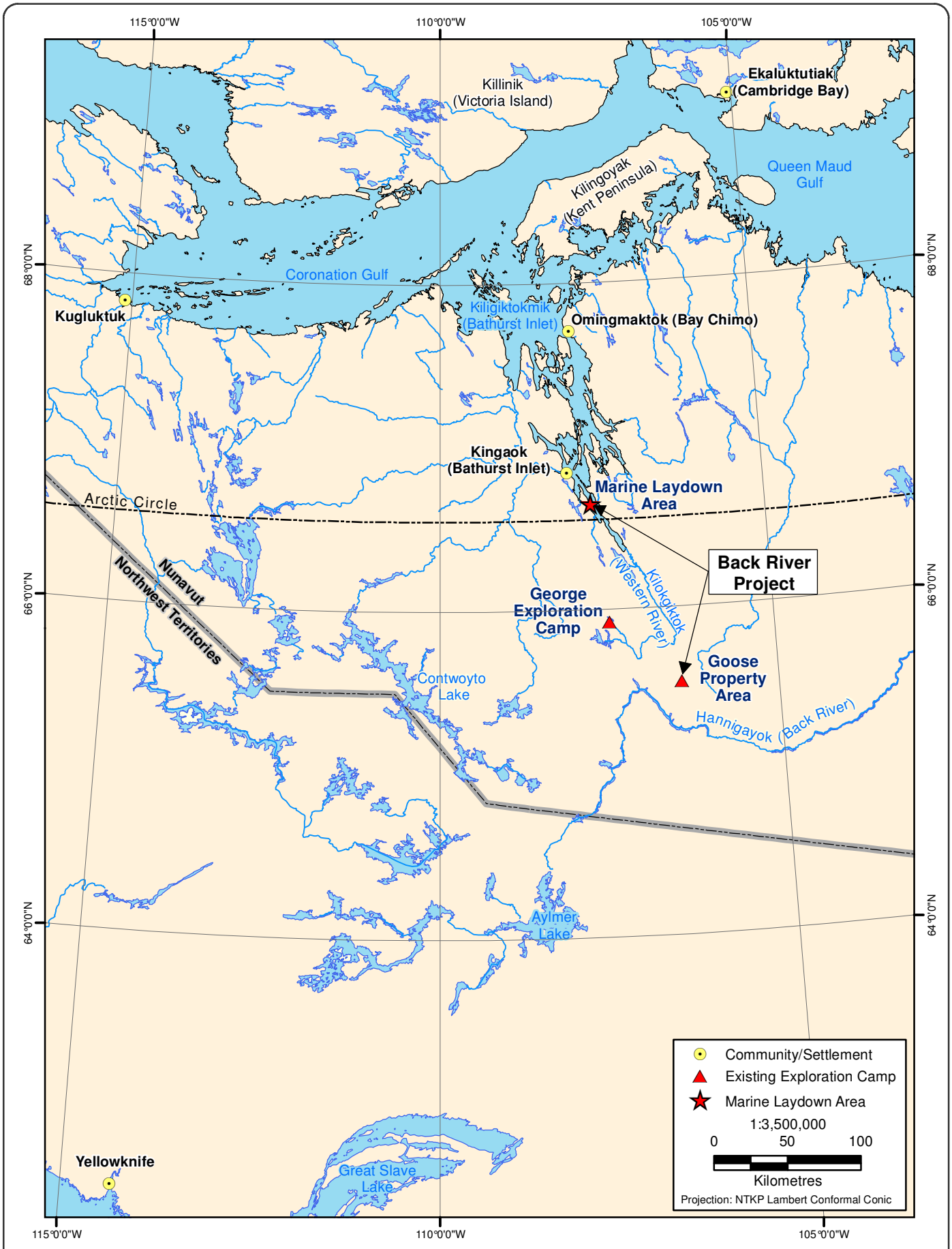


Figure 1-1

Back River Project Location

Sabina GOLD & SILVER CORP.

Rescan an ERM company

2. Methods

2. Methods

2.1 STUDY AREA

The remote camera program focused on the southern portion of the terrestrial Regional Study Area (RSA) and the marine RSA (Figures 2.1-1 and 2.1-2).

The terrestrial RSA encompasses the Project's Potential Development Areas (PDAs) and a 35-km buffer surrounding the proposed Project infrastructure and winter road corridors between the two Project areas (Goose Property Area and the Marine Laydown Area (MLA)). The marine RSA encompasses the MLA as well as the marine areas of Bathurst Inlet, from the southern-most tip of the Inlet to approximately 15 km north of Omingmaktok and is approximately 75 km in width.

2.2 REMOTE CAMERA STUDY DESIGN

From July 2014 to April 2015, 38 Reconyx PC800 Professional digital cameras were used to monitor the presence of wildlife, specifically caribou, within the terrestrial RSA and marine RSA. Remote cameras have been used since 2012 to document caribou seasonal presence in the Project area (Rescan 2013, 2014a, 2014b).

A total of 13 cameras were placed within the terrestrial RSA in areas surrounding the Goose Property Area (Figure 2.1-1; Appendix 1). These cameras were part of the remote camera programs conducted in 2013 and 2014 (see Rescan 2014a; 2014b for further details). The locations for nine cameras were selected in order to continue data collection in strategic locations used by caribou in previous years near the Goose Property Area; these nine cameras surrounded the Goose PDA. The remaining four cameras were strategically placed at potential caribou crossing areas and high use areas along Beechey Lake identified through Traditional Knowledge and by previous camera studies (Cameras BR_29, BR_30, BR_35, and BR_36; Figure 2.1-1).

Twenty-five cameras were placed within the marine RSA at and surrounding the MLA (Figure 2.1-2; Appendix 1). These cameras were part of a camera program in 2014 and were deployed during May, 2014; further details on the 2014 study design and camera placement rationale can be found in Rescan (2014b).

2.3 REMOTE CAMERA SETUP AND OPERATIONS

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a wooden tripod, topped with a plywood cap, and were secured with rocks to prevent it from being knocked over by wildlife. Energizer® Lithium batteries were used to maintain camera performance at low-temperatures over the winter.

Remote cameras were programed to take two types of photos: timed photographs and motion-triggered photographs. Timed photographs were taken at set intervals throughout the day (every 30 minutes during the survey period) and motion-triggered photos were automatically taken whenever there was movement detected in the infrared spectrum in front of the camera. Based on the remote camera trigger specifications (field of view) and evidence collected during the 2012 and 2013 remote camera studies (Rescan 2013, 2014a), the motion trigger range of the remote cameras is approximately 25 to 30 m, depending on the size of animal moving through the camera's field of view. Further details on remote camera operations can be found in Rescan (2014a).

2.4 DATA ANALYSIS

The remote camera data was grouped and summarized by camera location, and included all available camera data. Data from the 13 cameras located near the Goose Property Area within the terrestrial RSA were grouped for analysis. Data from the 25 cameras located within the marine RSA were grouped and analyzed separately from those located in the terrestrial RSA. Further details on how data were analysed is provided below.

2.4.1 Evaluating Number of Caribou and Other Wildlife Recorded at Remote Cameras

Each camera's photo-set from July 2014 to April 2015 was scanned for caribou and other wildlife observations using either Reconyx software or a PC photo viewing software. Motion-triggered photos were assessed for the presence of wildlife for the entire survey period at 13 cameras located near the Goose Property Area, while both motion-triggered and timed photos were reviewed across the survey period for cameras located at the Marine RSA. Evidence collected during remote camera studies in 2012 and 2013 suggest that the majority of wildlife, particularly caribou, is accounted for on motion-triggered photos (Rescan 2013, 2014a). However, the main purpose of cameras located within the marine RSA was to document the presence of Dolphin and Union caribou within Bathurst Inlet over the winter. Therefore, timed photos were also reviewed to increase the chances of detecting Dolphin and Union caribou.

For each photo that included a wildlife observation, the following data were recorded: date, time, photo numbers, species, number of animals, and their behaviour (e.g., resting, foraging, travelling). All photo observations of caribou and other wildlife were checked by a second observer to ensure that the number of individuals was recorded accurately.

For small numbers of caribou observed by motion-triggered photos, the exact number of individuals could be easily determined by counting individuals across the set of triggered photographs. For large numbers of caribou, the number of individuals was estimated over entire motion-triggered photo sets, and total observed for that time period of triggered photos was the highest number of individuals detected within one of the photos. Where the same caribou, or group of caribou, were identified on multiple motion-triggered photo sets within a day, only the first observation of those individuals were included in total number observed to avoid double-counting caribou.

The same distinctions were made when totalling the number of individuals of other wildlife detected by remote camera. Some wildlife, such as bears and wolves, are curious and frequently visit cameras throughout the year. Thus, effort was placed on identifying the same individuals that repeatedly visited cameras, in order to avoid double-counting individuals.

2.4.2 Trends in Caribou Abundance and Distribution

2.4.2.1 Caribou Detection Rates

Caribou detection rates by camera were calculated to facilitate a spatial comparison of the number of caribou detected between cameras. Detection rates were calculated by adjusting caribou count data by camera effort in days, in order to account for variation in the amount of time that cameras were deployed and able to record photos of wildlife. On occasion, cameras become obscured by snow or ice, are knocked over or damaged by wildlife, or memory cards fill up before the camera is checked and data is downloaded. It is therefore important to standardize the units of effort across cameras such that caribou numbers by camera can be meaningfully compared.

GIS # BAC-23-337

June 01 2015

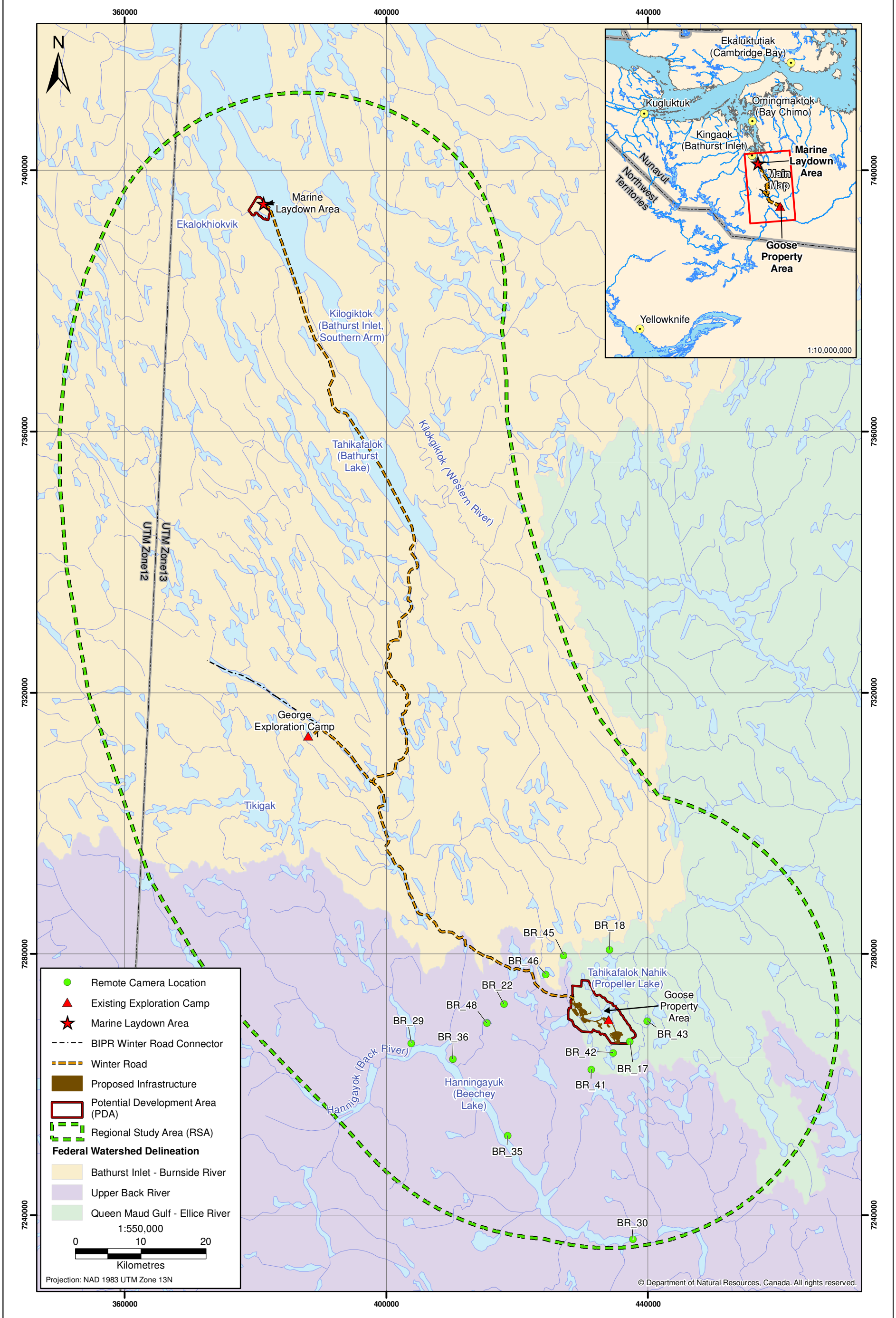


Figure 2.1-1

Remote Camera Locations, Terrestrial RSA, July 2014 to April 2015

Sabina GOLD & SILVER CORP.

Rescan an ERM company

GIS # BAC-23-338

November 12 2015

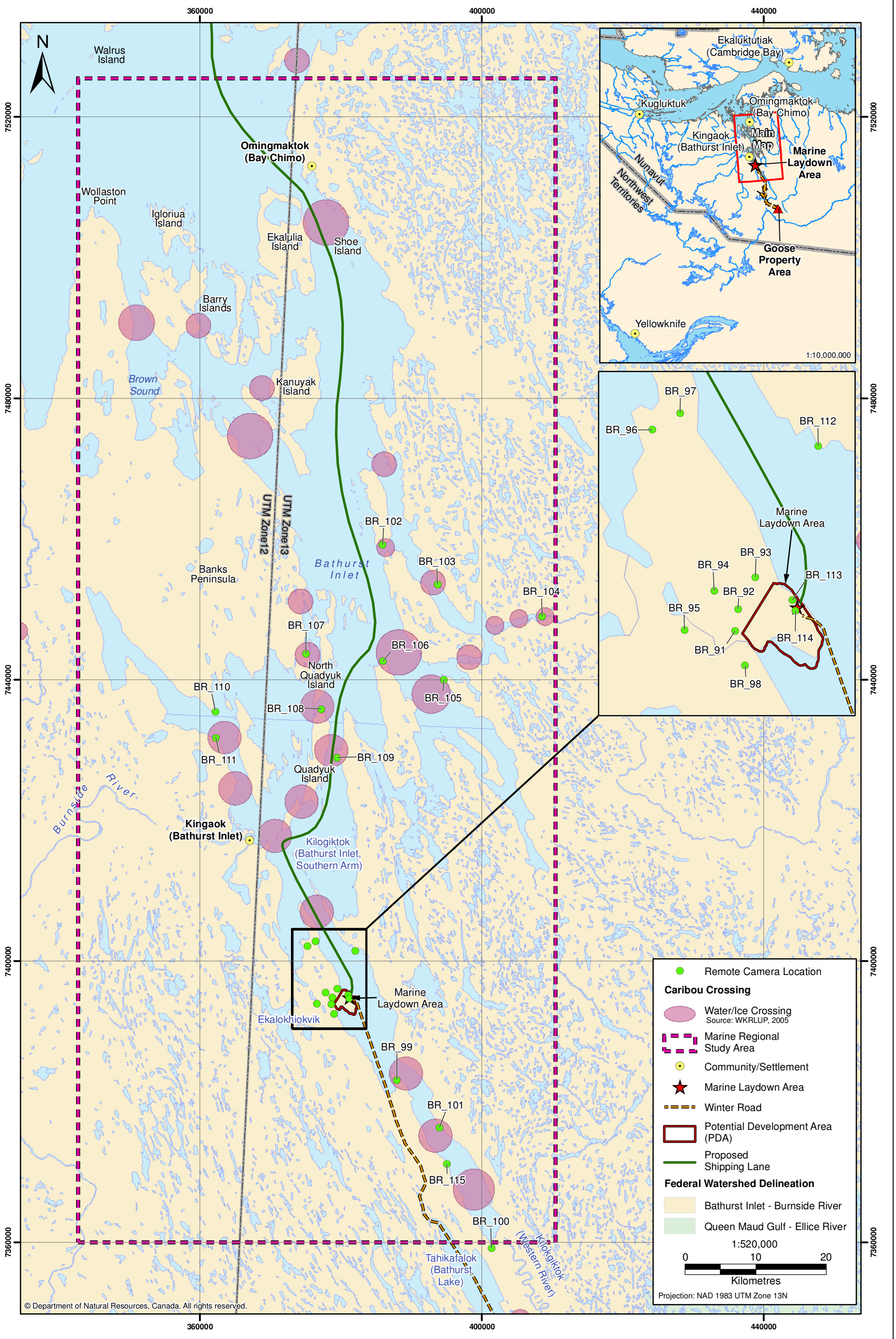


Figure 2.1-2

Remote Camera Locations, Marine RSA, July 2014 to April 2015

Sabina GOLD & SILVER CORP.

Rescan an ERM company

Camera effort was calculated as the total number of active deployment days (camera days). In order to calculate camera effort, the total period for which each camera recorded images (the dates associated with the first and last images recorded) was determined. Following which, periods of inactivity in 24-h increments, such as when a camera is obscured or knocked over, were tabulated and subtracted from each cameras total period of operation. Thus, the standard unit of camera effort is one uninterrupted day during which a camera continuously recorded images without impairment.

Caribou detection rates were calculated using the following equation:

$$Caribou\ Detection\ Rate\ (\frac{Caribou}{Day}) = \frac{Total\ Caribou\ Observed\ per\ Camera}{Camera\ Effort\ (in\ days)}$$

2.4.2.2 Temporal Trends

The total number of caribou recorded and the total number of caribou groups observed were pooled across the survey period for terrestrial RSA and marine RSA cameras to investigate temporal trends in caribou abundance. Temporal trends were analyzed using the total counts not adjusted for camera effort across the entire survey period, in addition to count data corrected for effort by month (caribou detection rate per month).

A caribou group constitutes an observation of a unique assemblage of one or more individuals that can be identified on its basis of group size, behaviour, and composition (i.e., sex and age). In general, caribou groups are distinguished from one another by time. It was assumed that observations of caribou separated by 30 minutes or more constituted two separate groups unless the position and behaviour of the animals (e.g., bedded individuals) or the composition of the animals observed suggested that they were the same individuals (and thus the same group).

Temporal data was discussed by seasonal periods for Bathurst, Beverly/Ahiak, and Dolphin and Union caribou according to Table 2.4-1, where applicable. These stages are loosely defined by higher or lower movement rates for migrations vs. winter and summer ranges (Johnson et al. 2005).

Table 2.4-1. General Seasonal Period Dates for Three Caribou Herds

Seasonal Period	Bathurst	Beverly/Ahiak	Dolphin and Union
Winter	November 1 to April 14	November 1 to April 14	December 1 to April 20
Spring Migration	April 15 to June 4	April 15 to June 4	April 21 to June 9 (Late Winter-Spring Migration)
Calving	June 5 to June 15	June 5 to June 20	June 10 to July 1[1]
Post-calving	June 16 to July 20	June 21 to July 25	June 10 to July 1[1]
Summer	July 21 to August 31	July 26 to August 31	July 1 to September 20
Fall Migration	September 1 to October 31	September 1 to October 31	September 21 to November 30 (Fall-Early Winter Migration)

[1] *Calving and Post-calving dates are combined for Dolphin and Union Herds; specific dates not given due to limited data.*

The start and end dates of peak calving recorded for Bathurst and Beverly/Ahiak caribou across the years were used to define the calving period; the peak of calving refers to the day when 50% of the caribou have calved. The weaning of calves was used to define the end of post-calving period Bathurst and Beverly/Ahiak caribou; calves are typically weaned three to five weeks after they are born (Russell, Kofinas, and Griffith 2002). It is acknowledged that these seasonal periods vary seasonally, particularly dates defining calving and post-calving (Sutherland and Gunn 1996; Russell, Kofinas, and Griffith 2002; Gunn et al. 2013); thus, a wider spread in dates is used here than in more recent studies

(e.g., Flanders et al. 2009). The start date of calving and roughly three weeks following calving (calf weaning period) were used to define the calving and post-calving period for Dolphin and Union caribou, based on Poole et al. (2010).

In general, the dates for all herds are similar, except for an extended summer period for Dolphin and Union caribou. Dolphin and Union caribou are dependent on the formation of sea ice in the Dolphin and Union Strait and Coronation gulf to travel between their calving and summer ranges on Victoria Island and their winter range on the Arctic mainland. Thus, Dolphin and Union caribou start their southward migration later than other herds to allow for sea ice to form, which generally starts around mid- to late October (Poole et al. 2010).

3. Results

3. Results

3.1 TERRESTRIAL RSA CAMERAS

3.1.1 Survey Period

The survey period for terrestrial RSA cameras surrounding the Goose Property Area started between July 12 and 15, 2014, and ended between April 7 to 11, 2015 (Figure 3.1-1; Appendix 1).

3.1.2 Trends in Caribou Abundance and Distribution

Overall, a total of 3,514 caribou were recorded in 369 individual groups across the 13 cameras operating from July 2014 to April 2015 (Appendix 2). Interestingly, the numbers recorded in the present study are higher than those recorded in previous camera studies, despite larger numbers of cameras operating during previous studies. In the 2014 camera study, a total of 2,253 caribou were recorded from August 2013 to July 2014; the number of cameras operating across the 2014 study period varied from 88 cameras from August 2013 to May 2014, and 61 cameras from May to July 2014 (Rescan 2014b). In the 2013 camera study, a total of 2,732 caribou were recorded from August 2012 to August 2013; the number of cameras operating across the 2013 study period ranged from 30 from August 2012 to May 2013, and 65 cameras from May to August 2013 (Rescan 2014a).

3.1.2.1 Caribou Detection Rates

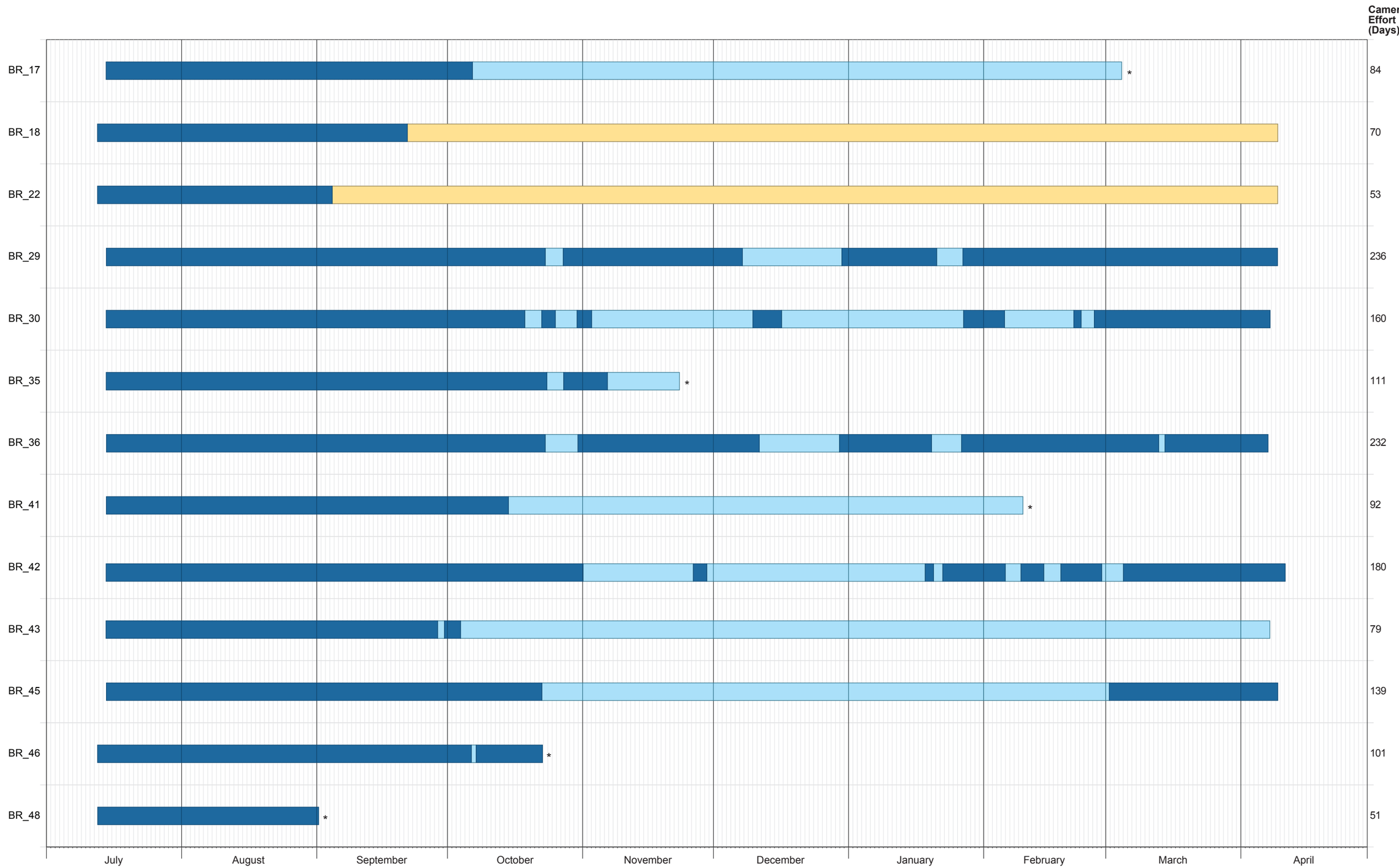
In general, most remote cameras surrounding the Goose Property area had caribou detection rates of higher than 1.0 caribou/camera day from July 2014 to April 2015 (Figure 3.1-2). The highest detection rate was recorded at BR_22 (8.7 caribou/camera day), followed by BR_17 (6.5 caribou/camera day), BR_43 (4.8 caribou/camera day) and BR_45 (4.7 caribou/camera day; Figure 3.1-2; Appendix 1). There was no spatial trend in cameras with high caribou detection rates; Cameras BR_17 and BR_43 were located to the southeast of the Goose Property Area and Cameras BR_22 and BR_45 were located to the northwest of the Goose Property Area. Detection rates at cameras located along Beechey Lake were among the lowest recorded during the survey period, with the lowest detection rate recorded at Camera BR_30 located facing a water crossing at the south end of Beechey Lake (0.4 caribou/camera day; Figure 3.1-2). Despite the fewer caribou recorded at Camera BR_30 across the survey period, caribou were observed on images using this water crossing (Plate 3.1-1).

3.1.2.2 Temporal Trends

All caribou recorded across the survey period were recorded from July to October in 2014; no caribou were recorded after October 20 by terrestrial RSA cameras (Figure 3.1-3; Appendix 2). The vast majority of caribou were recorded during August, corresponding with the summer period for caribou. A total of 3,045 caribou were recorded across 312 different groups from August 4 to 31, 2014, equating to 87% of all caribou detected and 85% of all groups detected across the entire survey period. The average caribou detection rate across cameras in August was 7.6 caribou/camera day (Table 3.1-1). Spatially, caribou detection rates in August were highest at Camera BR_45 (20 caribou/camera day), BR_17 (17 caribou/camera day), and BR_22 (13 caribou/camera day; Table 3.1-1). These high detection rates were likely influenced by larger sized groups passing by the camera. The largest group size recorded was approximately 420 individuals at Camera BR_17 on August 4, a group which included females and calves born in 2014, as well as mature bulls and juveniles (Plate 3.1-2). Groups of approximately 200 individuals were recorded walking and grazing around Cameras BR_22 and BR_45 (Plates 3.1-3 and 3.1-4). Collar data indicate that the caribou detected in August are likely Beverley/Ahiak caribou. Bathurst Caribou spend the summer period to the south of the Project area, in the area surrounding Contwoyto Lake.

Plate 3.1-1. Caribou recorded at Camera BR_30 using a water crossing at the south end of Beechey Lake, August 29, 2014.

Plate 3.1-2. Large herd of approximately 420 individuals walking past Camera BR_17, located on the southeast border of the Goose Property PDA, August 4, 2014.



Camera Active
Camera Obscured
Camera Knocked Over

*Note: *Cameras that experienced a malfunction and stopped recording images before the field check in April, 2015.*

Survey Period and Camera Effort for Terrestrial RSA Cameras, July 2014 to April 2015

Figure 3.1-1

GIS # BAC-23-339

November 12 2015

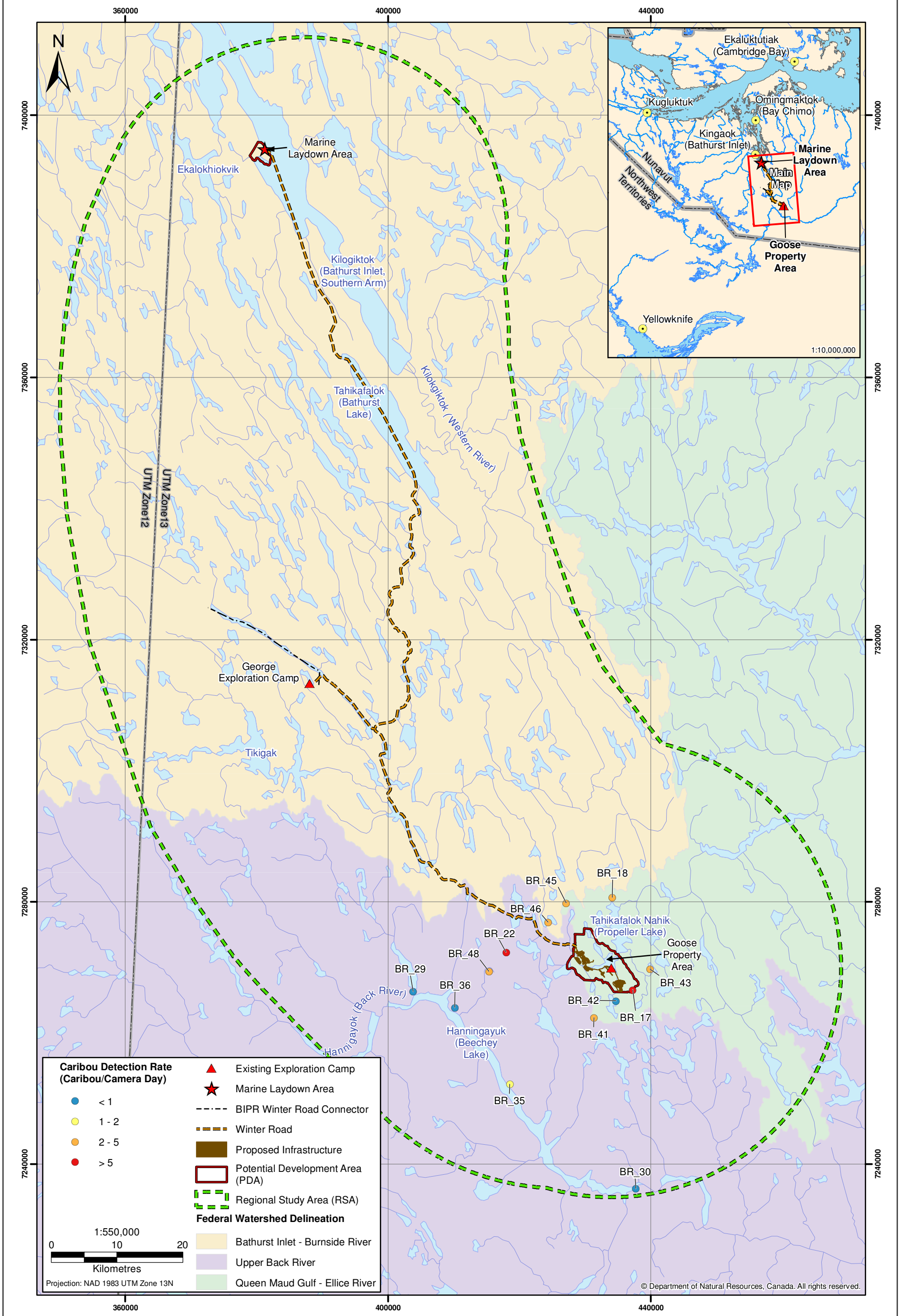


Figure 3.1-2

Number of Caribou Observed at Terrestrial RSA Cameras, July 2014 to April 2015

Sabina GOLD & SILVER CORP.

Rescan an ERM company

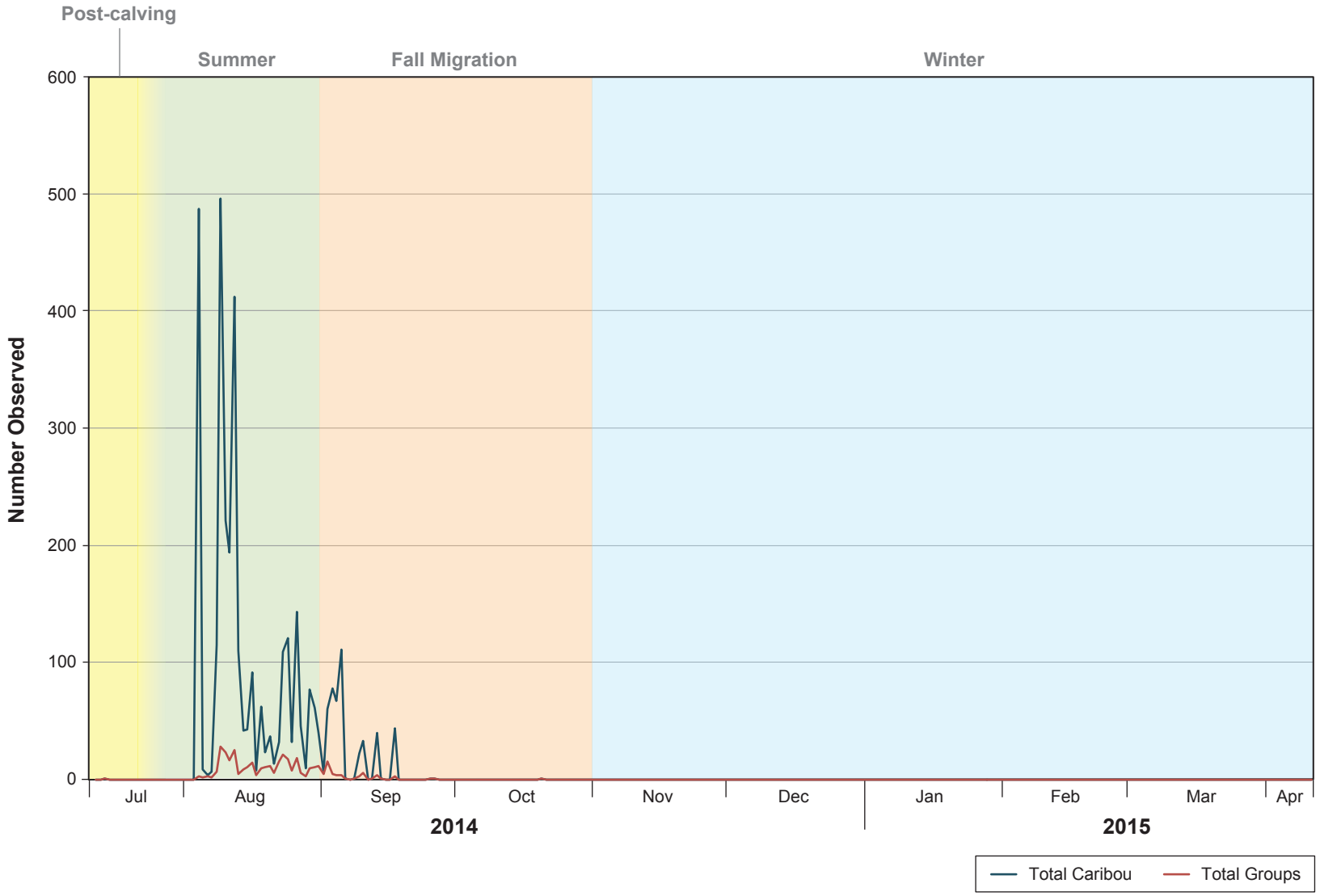


Figure 3.1-3

Sabina GOLD & SILVER CORP.

Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Terrestrial RSA Cameras, 2014 to 2015

Figure 3.1-3

Rescan an ERM company

Table 3.1-1. Number of Caribou and Caribou Detection Rates Recorded at Terrestrial RSA Cameras by Month[1]

Camera No.	July			August			September			October		
	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)
BR_17	17	0	0	31	515	16.6	30	31	1.0	6	0	0
BR_18	19	0	0	31	173	5.6	20	12	0.6	Knocked over		
BR_22	19	1	0.05	31	403	13.0	3	59	19.3	Knocked over		
BR_29	17	0	0	31	41	1.3	30	120	4.0	27	0	0
BR_30	17	0	0	31	56	1.8	30	1	0.03	22	0	0
BR_35	17	0	0	31	91	2.9	30	17	0.6	27	1	0.04
BR_36	17	0	0	31	42	1.4	30	89	3.0	23	0	0
BR_41	17	0	0	31	192	6.2	30	9	0.3	14	0	0
BR_42	17	0	0	31	137	4.4	30	11	0.4	31	0	0
BR_43	17	0	0	31	323	10.4	28	58	2.1	3	0	0
BR_45	17	0	0	31	628	20.3	30	27	0.9	22	0	0
BR_46	19	0	0	31	253	8.2	30	33	1.1	21	0	0
BR_48	19	0	0	31	191	6.2	0.4	0	0	-		
Total		**1**			**3,045**			**467**			**1**	
Average			**0.004**			**7.6**			**2.6**			**0.004**

[1] *Data is presented for the months in which caribou were recorded by cameras; months with no detections are not presented in the table.*
[2] *Total days that cameras were active and recording images per month. Camera BR_48 stopped functioning in early September, and thus did record images for October.*

Plate 3.1-3. Large group of caribou recorded at Camera BR_45, located approximately 5 km northwest of the Goose Property PDA, August 9, 2014.

Plate 3.1-4. Large group of caribou recorded at Camera BR_22, located approximately 10 km west of the Goose Property PDA, August 12, 2014 (group was more dispersed and continuously moved past the camera across a period of 15 minutes).

Moderate numbers of caribou were recorded in September, corresponding to the beginning of the fall migration period for caribou. A total of 467 caribou were recorded across 55 different groups from September 1 to Sept 26, 2014, equating to 13% of all caribou detected and 15% of all groups detected across the entire survey period. Across all cameras, the average caribou detection rate was 2.8 caribou/camera day for the month of September. Spatially, caribou detection rates were highest Camera BR_22 (19 caribou/camera day). However, Camera BR_22 was only operational for 3 days in September before it was knocked over by wildlife and ceased to collect data. Therefore, this high caribou detection rate is a result of a very low camera effort. The highest caribou detection rates in September for cameras that were active for the entire month were Camera BR_29 (4.0 caribou/camera day), BR_36 (3.0 caribou/camera day), and BR_43 (2.1 caribou/camera day; Table 3.1-1).

The remaining caribou were detected in July and October; each detection involved one caribou passing by the camera. The caribou recorded in July was detected on Camera BR_22, and the caribou recorded in October was detected on Camera BR_35 (Table 3.1-1).

Calves born in 2014 were recorded at 10 of the 13 cameras set up in the terrestrial RSA (Table 3.1-2; Appendix 2). The majority of calves were recorded on images during the summer period, with a minimum of 226 individuals counted. As caribou calves are much smaller than adults, they can easily be missed on images, particularly when large numbers of caribou are passing by the camera. Thus, the numbers of caribou calves counted represent the minimum number that may be present. Calves were often recorded as part of large groups that travelled past a camera, including the large group that walked past Camera BR_17 in early August (Plate 3.1-2). These observations confirm the presence of post-calving groups of females.

Table 3.1-2. Detections of Caribou Calves Born in 2014 by Remote Camera

	Minimum Number of Calves Counted			
Camera No.	Post-calving	Summer	Fall Migration	Total
BR_17		70		70
BR_18		23		23
BR_22		57		57
BR_29			1	1
BR_30		1		1
BR_41		10		10
BR_43		18		18
BR_45		15		15
BR_46		25		25
BR_48		6		6
Total		**225**	**1**	**226**

No caribou were recorded over the winter of 2014/2015. This is consistent with the results of previous camera studies for the Project, where relatively few caribou have been recorded over the winter relative to other seasonal periods (e.g., summer). However, caution should be taken when interpreting the numbers of caribou recorded by cameras over the winter, or lack thereof. Camera views were often obscured by snow and ice for extended periods of time over the winter (Figure 3.1-1). However, fewer caribou are expected to use areas around the Goose Property Area within the terrestrial RSA during the winter given that these areas do not overlap with the winter range of Bathurst caribou and there has been variable overlap between these areas and the winter range of Beverly/Ahiak caribou in recent years (2001 to 2012; Rescan 2014a). In addition, most Dolphin and Union caribou are thought to

winter within 100 km from the coast (Poole et al. 2010), areas well to the north of the Goose Property Area. Therefore, few caribou are expected to have been missed during periods when remote cameras were obscured.

3.1.3 Other Wildlife Recorded by Remote Camera

3.1.3.1 Birds

A total of 5 bird species were recorded at 5 camera locations (Table 3.1-3; Appendix 2). Each of the bird species have been documented by remote cameras during previous studies, as well as during wildlife baseline studies conducted for the Project (Rescan 2012, 2013, 2014a, 2014b). In general, bird species were infrequently recorded both spatially and temporally. Each species was detected at one camera location, and in one month (Table 3.1-3). None of the species recorded are of conservation concern.

Table 3.1-3. Bird Species Recorded by Terrestrial RSA Cameras, July 2014 to April 2015

			Species Recorded by Month[1]			
			2014			2015
Group	Species	No. Cameras with Observations	Aug	Sept	Dec	Mar
Raptor	Common Raven	1		X		
	Snowy Owl	1			X	
Upland Bird	Unknown Ptarmigan	1				X
Waterbird	Canada Goose	1	X			
	Herring Gull	1	X			
Total Species Observed		**5**				
Total Number of Cameras with Observations		**5**				

[1] *Data is presented for the months in which bird species were recorded by cameras; months with no detections are not presented in the table.*
[2] *The observation of an unknown ptarmigan species is included in count of total species, as the observation constitutes a detection of either a willow or a rock ptarmigan, the two species known to overwinter on the tundra.*

Detections of birds by remote camera conform to the seasonal presence of various species in the terrestrial RSA. Both Canada goose and herring gull are migratory species, and were detected in August, which corresponds to the fall migration period for species that spend the spring and summer in the Arctic and migrate south for the winter. Common raven, snowy owl, and ptarmigans (both willow and rock ptarmigan) overwinter on the tundra, and were recorded in the fall and over the winter (Table 3.1-3).

3.1.3.2 Mammals

A total of 3 different mammal species were recorded at 11 different camera locations (Table 3.1-4; Plate 3.1-5; Appendix 2). All mammals recorded by remote camera have been previously documented by remote cameras during previous studies, as well as during wildlife baseline studies conducted for the Project (Rescan 2012, 2013, 2014a, 2014b).

Grizzly bear and grey wolf were detected at a similar number of remote cameras across the survey period, with detections at 6 and 8 remote cameras, respectively. However, grizzly bear detections were spread out temporally, with detections in July through October, whereas grey wolf were only recorded in August and September. Arctic fox was recorded at one camera (Camera BR_29) in early April, 2015 (Table 3.1-4; Plate 3.1-3).

Table 3.1-4. Mammal Species Recorded by Terrestrial RSA Cameras, July 2014 to April 2015

Species	No. Cameras with Observations	Species Recorded by Month[1]				
		2014				2015
		Jul	Aug	Sep	Oct	Apr
Arctic Fox	1					X
Grey Wolf	8		X	X		
Grizzly Bear	6	X	X	X	X	
Total Species Observed	**3**					
Total Number of Cameras with Observations	**11**					

Note: Species of Conservation Concern indicated in bold type.
[1] Data is presented for the months in which mammal species were recorded by cameras; months with no detections are not presented in the table.

a) Arctic fox recorded at Camera BR_29, April 2, 2015

b) Grizzly bear recorded at Camera BR_18, July 22, 2014

c) Three grey wolves recorded at Camera BR_35, September 8, 2014

d) Grizzly bear approaching Camera BR_35, September 8, 2014

Plate 3.1-5. Examples of mammals recorded by terrestrial RSA cameras in 2014 and 2015.

Of note, grey wolf were the only species to be recorded as a group of individuals. There were several detections of groups of two and three individuals (e.g., Plate 3.1-3). In contrast, grizzly bears were always recorded as single individuals, and there was one observation of a solitary Arctic fox. In previous camera studies, remote cameras have recorded family groups for grizzly bear on terrestrial RSA cameras (Rescan 2014a, 2014b).

Grizzly bear is a species of conservation concern. Grizzly bear are listed as Sensitive in Nunavut (CESCC 2010), and are also considered a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; COSEWIC 2012), though they are not yet listed under SARA.

3.2 MARINE RSA CAMERAS

3.2.1 Survey Period

The survey period for marine RSA cameras spanned from July 9 and 13, 2014 to an end date between April 8 to 10, 2015 (Figure 3.2-1; Appendix 1).

Three cameras placed in the marine RSA could not be recovered in April 2015 due to deep snow. These three cameras had been knocked over and the camera housing on wooden tripods were buried; cameras could not be extracted despite effort to remove snow and ice and recover cameras. Therefore, the sample size for analysis from July 2014 to April 2015 is 22 cameras.

It should be noted that there was a higher than typical level of grizzly bear activity recorded at marine RSA cameras from July, 2014 to April, 2015. The majority of remote cameras were visited by inquisitive grizzly bears across a number of occasions, and often camera tripods were damaged and knocked over (Figure 3.2-1; grizzly bear detections are discussed in further detail in Section 3.2.3.2). As a result, only 6 of the 25 remote cameras that were installed in July 2014 remained standing over the winter and collected data for the survey period (Figure 3.2-1).

3.2.2 Trends in Caribou Abundance and Distribution

Overall, 35 caribou were recorded in 24 groups at marine RSA cameras from July 2014 to April 2015 (Appendix 3). A similar number of caribou (37 individuals) were recorded in the 2014 camera study within the marine RSA that ran from May to July, 2014 (Rescan 2014b), while no caribou were recorded at remote cameras located near the MLA during camera studies that spanned from August 2012 to May 2014 (Rescan 2014a, 2014b). These results suggest that caribou use of areas near the MLA may be sporadic and vary from year to year.

3.2.2.1 Caribou Detection Rates

Given the low number of caribou recorded across the study, caribou detection rates were low across all marine RSA cameras (Figure 3.2-2). The highest detection rates were recorded at Cameras BR_92 (0.19 caribou/camera day) and BR_95 (0.13 caribou/camera day), both of which are located to the west of the MLA PDA (Figure 3.2-2). However, both of these cameras were knocked over by grizzly bears shortly after they were deployed (Figure 3.2-1), and thus the higher caribou detection rates are likely influenced by low camera effort. The highest caribou detection rates for cameras that were recording for the entire survey period was recorded at Camera BR_112 (0.05 caribou/camera day) located roughly 10 km north of the MLA on the east side of Bathurst Inlet.

In general, the cameras that recorded caribou were for the most part located in the southern portion of Bathurst Inlet (south of Kingaok; Figure 3.2-2). Of the ten cameras that were installed in the more northern portion of Bathurst Inlet (BR_102 through BR_111) and from which data were recovered, only

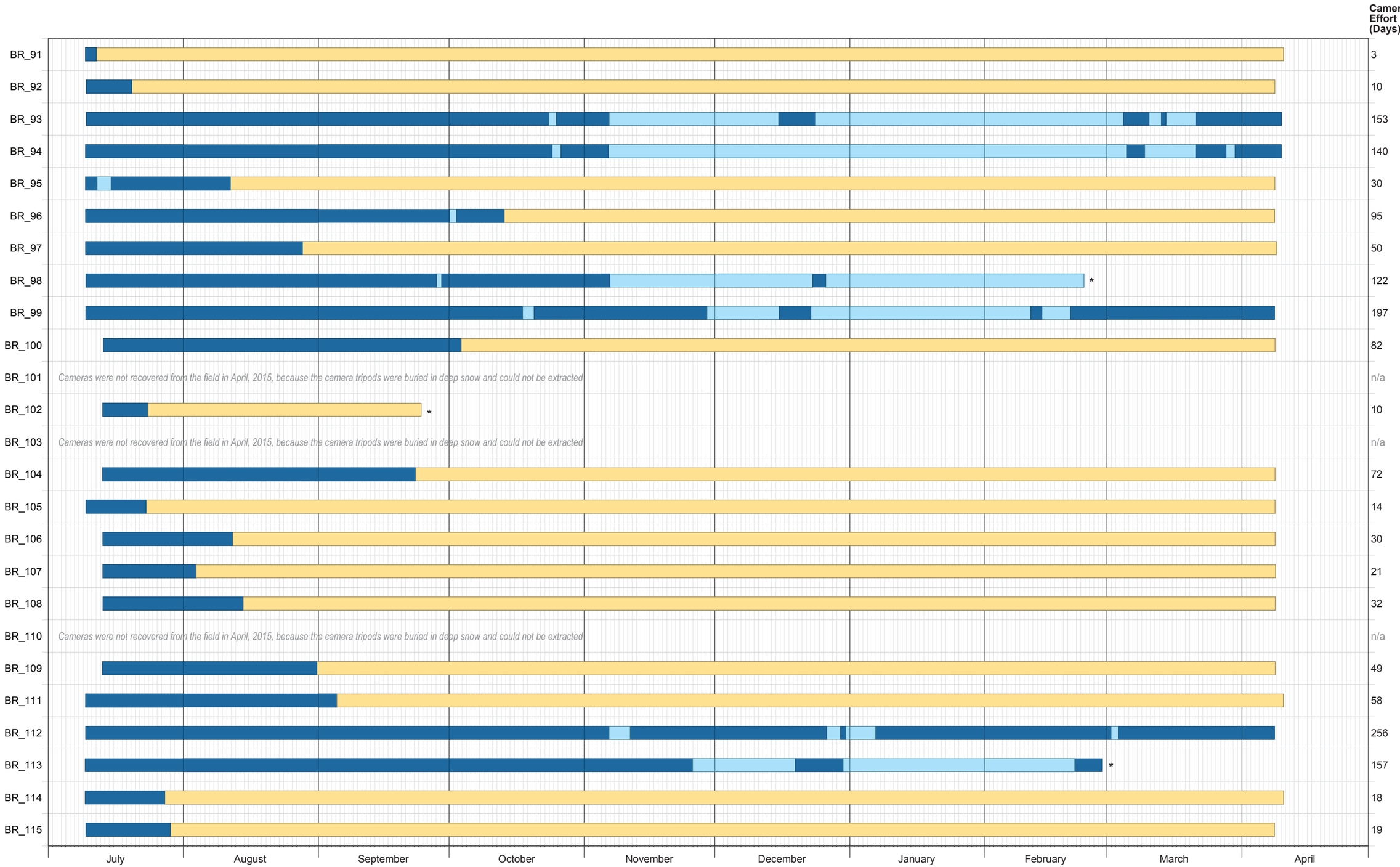
one camera, Camera BR_111, had a caribou detection during the survey period (2 caribou recorded in one group on August 21, 2014; Appendix 3). This result suggests that caribou may generally be more abundant in southern areas of Bathurst Inlet, although most cameras within the marine RSA were not recording for the entire survey period (i.e., were knocked over early in the survey period; Figure 3.2-1). The cumulative effort for all cameras operating to the north of Kingaok was 286 camera days, whereas the cumulative effort of all cameras operating to the south of Kingaok was 1,331 camera days. Therefore, the lower number of detections in cameras located in more northern areas of Bathurst Inlet relative to those located further south may be an artefact of low camera effort, rather than observable trend in caribou distribution within the marine RSA.

3.2.2.2 Temporal Trends

Caribou were detected in varying numbers throughout the survey period at the marine RSA (Figure 3.2-3). The highest numbers of caribou and caribou groups was recorded from August to September 2013, spanning the end of the summer period and beginning of the fall migration period for caribou of the Beverly/Ahiak herd, and the summer and start of the fall-early winter migration period for Dolphin and Union caribou. A total of 28 caribou were recorded across 17 different groups from August 1 to September 16, 2014, which equates to 80% of all caribou recorded and 71% of all groups recorded. The caribou recorded in August and September were likely Beverly/Ahiak caribou. Collar data indicate that the MLA is on the western periphery of the Beverly/Ahiak summer and fall range, whereas the Bathurst range is considerably to the south during summer and fall, surrounding Contwoyto Lake south to the treeline, and the Dolphin and Union caribou are on Victoria Island at that time. Caribou detection rates were, on average, similar across cameras in August (0.04 caribou/camera day) and September (0.04 caribou/camera day; Table 3.2-1). Spatially, the cameras with the highest caribou detection rates in August were Cameras BR_95 (0.28 caribou/camera day) and BR_96 (0.19 caribou/camera day), while Camera BR_112 had the highest caribou detection rate in September (0.37 caribou/camera day; Table 3.2-1).

The remainder of caribou were recorded in July (5 caribou across 5 groups) and February (2 caribou across 2 groups; Appendix 3). The average caribou detection rate across all cameras recording in July was 0.02 caribou/camera day, and all cameras that recorded caribou were located to the west of the MLA PDA (BR_92, BR_94, and BR_95; Figure 3.2-2). Among these three cameras with caribou detections in July, 2014, Camera BR_92 has the highest caribou detection rate (0.19 caribou/camera day; Table 3.2-1). The five individuals recorded in July were likely post-calving Bathurst or Beverly/Ahiak caribou, as Dolphin and Union caribou are located on Victoria Island during the summer.

The two caribou recorded in February were recorded at one camera, Camera BR_113, located within the MLA PDA (Plate 3.2-1). Camera BR_113 had a caribou detection rate of 0.32 caribou/camera day during February, and the average detection rate across all cameras that were active and recording was 0.11 caribou/camera day (Table 3.2-1). The time period when caribou were recorded in February overlaps the winter period for Bathurst, Beverly/Ahiak, and Dolphin and Union caribou. The two individuals recorded were either Beverly/Ahiak caribou or Dolphin and Union caribou. The winter range of Beverly/Ahiak caribou has overlapped the marine RSA in several years since 2001 (Rescan 2014a), and the winter range of Dolphin and Union caribou includes areas within 100 km of the coastline (which includes the marine RSA (Poole et al. 2010). The winter range for Bathurst caribou does not overlap the marine RSA.



Sabina GOLD & SILVER CORP. Rescan an ERM company

Camera Active
Camera Obscured
Camera Knocked Over

*Note: *Cameras that experienced a malfunction and stopped recording images before the field check in April, 2015.*

Survey Period and Camera Effort for Marine RSA Cameras, July 2014 to April 2015

Figure 3.2-1

GIS # BAC-23-340

November 12 2015

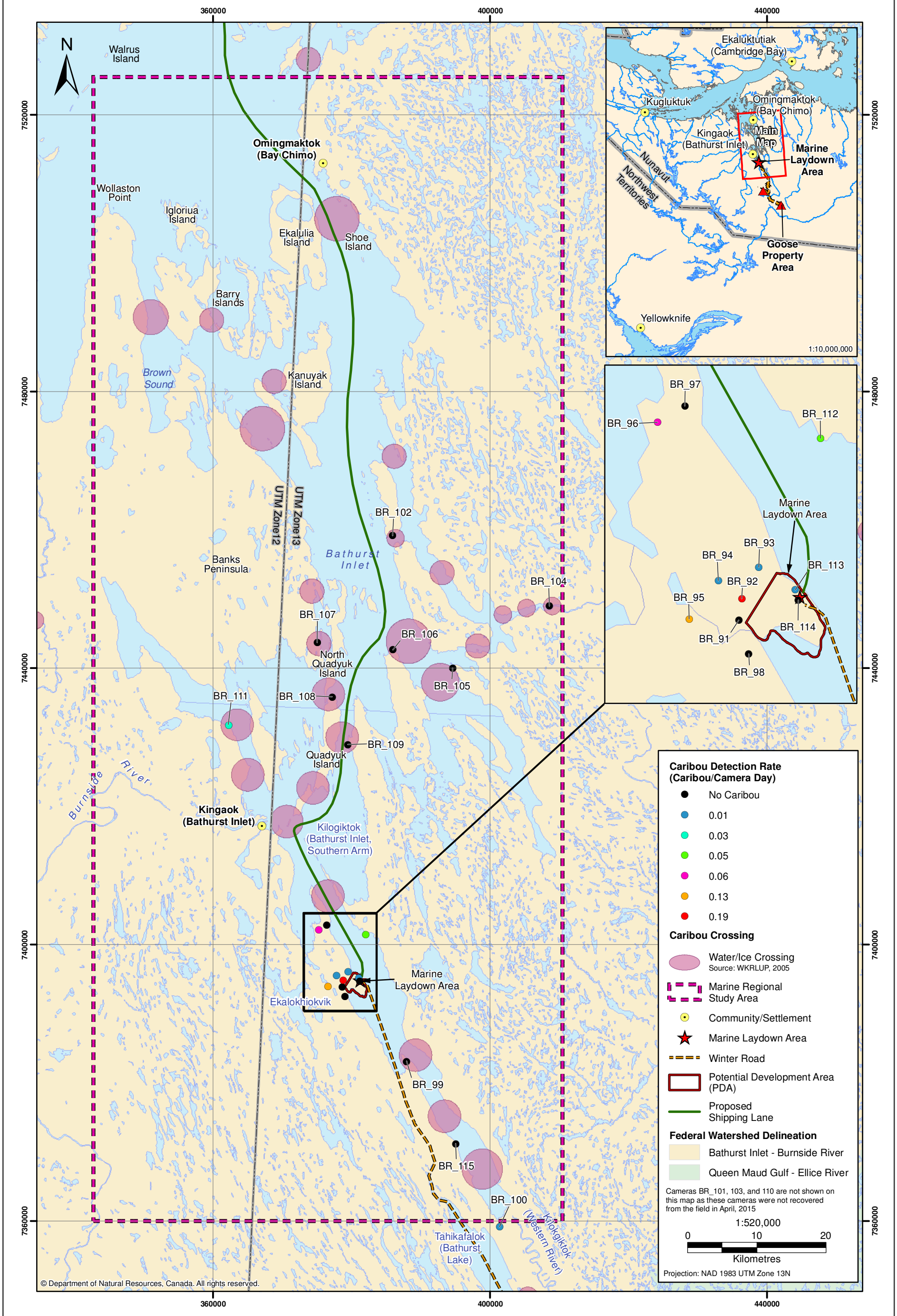


Figure 3.2-2

Number of Caribou Observed at Marine RSA Cameras, July 2014 to April 2015

Sabina GOLD & SILVER CORP.

Rescan an ERM company

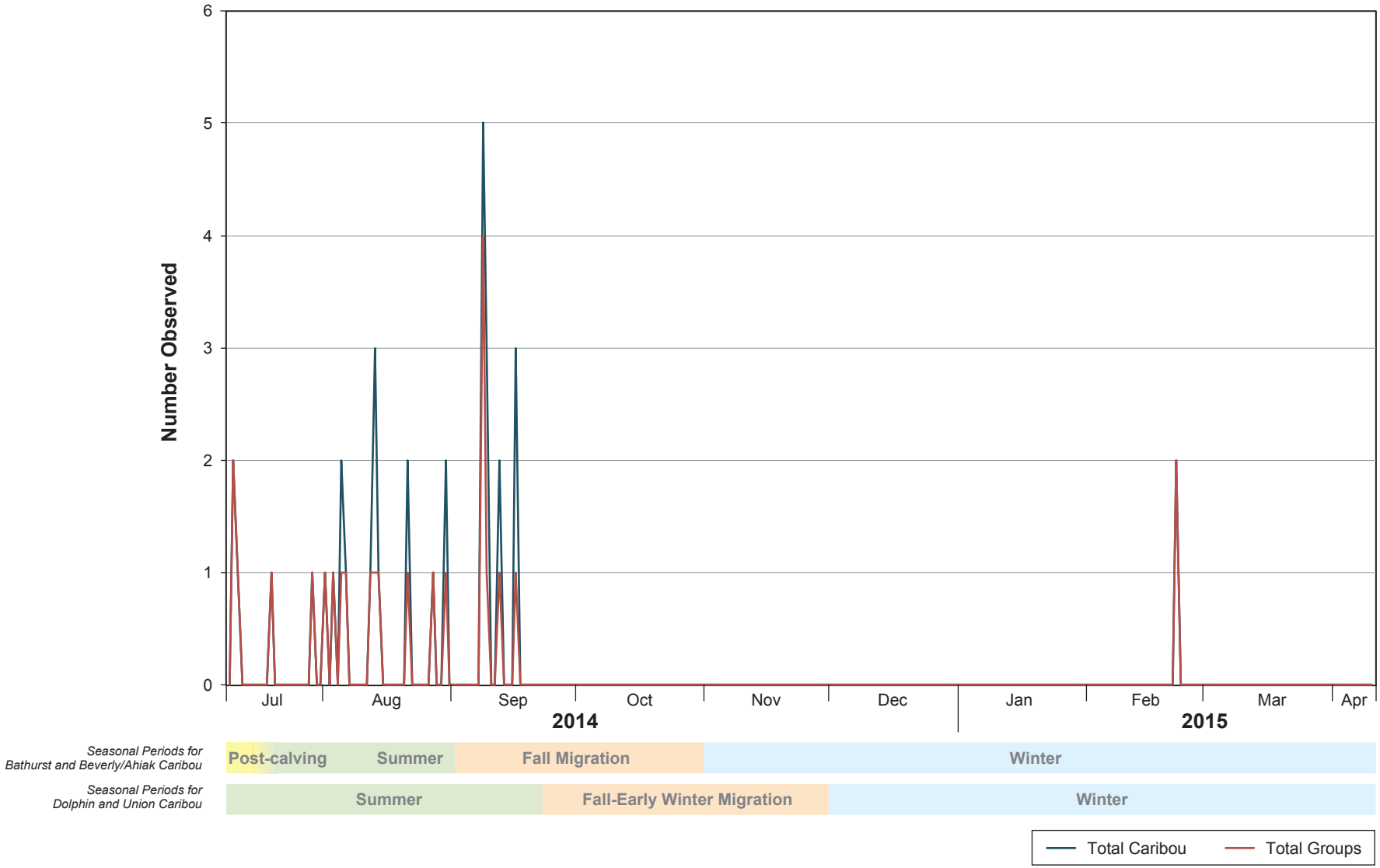


Figure 3.2-3

Sabina GOLD & SILVER CORP.

Temporal Trends in the Number of Caribou and Caribou Groups Recorded at Marine RSA Cameras, 2014 to 2015

Figure 3.2-3

Rescan an ERM company

Table 3.2-1. Number of Caribou and Caribou Detection Rates Recorded at Marine RSA Cameras by Month[1]

Camera No.	July			August			September			February		
	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)	Camera Days[2]	No. Caribou	Detection Rate (Caribou/ Camera Day)
BR_91	3	0	0	knocked over			-			-		
BR_92	10	2	0.19	knocked over			-			-		
BR_93	22	0	0	31	0	0	30	2	0.07	0	-	-
BR_94	22	2	0.09	31	0	0	30	0	0	0	-	-
BR_95	19	1	0.05	11	3	0.28	knocked over			-		
BR_96	22	0	0	31	6	0.19	30	0	0	knocked over		
BR_97	22	0	0	27	0	0	knocked over			-		
BR_98	22	0	0	31	0	0	29	0	0	0	-	-
BR_99	22	0	0	31	0	0	30	0	0	11	0	0
BR_100	18	0	0	31	1	0.03	30	0	0	knocked over		
BR_102	10	0	0	knocked over			-			-		
BR_104	19	0	0	31	0	0	22	0	0	knocked over		
BR_105	14	0	0	knocked over			-			-		
BR_106	18	0	0	11	0	0	knocked over			-		
BR_107	18	0	0	3	0	0	knocked over			-		
BR_108	18	0	0	14	0	0	knocked over			-		
BR_109	19	0	0	31	0	0	knocked over			-		
BR_111	22	0	0	31	2	0.06	4	0	0	knocked over		
BR_112	22	0	0	31	3	0.10	30	11	0.37	28	0	0
BR_113	23	0	0	31		0	30	0	0	6	2	0.32
BR_114	18	0	0	knocked over			-			-		
BR_115	19	0	0	knocked over			-			-		
Total		**5**			**15**			**13**			**2**	
Average			**0.02**			**0.04**			**0.04**			**0.11**

[1] *Data is presented for the months in which caribou were recorded by cameras; months with no detections are not presented in the table.*
[2] *Total days that cameras were active and recording images per month. When a camera was obscured for an entire month, the camera days were recorded as 0.*

Plate 3.2-1. Caribou individual recorded at Camera BR_113, located within the MLA PDA, on February 22, 2015 (two photos from the same detection event).

3.2.3 Other Wildlife Recorded by Remote Camera

3.2.3.1 Birds

A total of 10 bird species were recorded at 13 different camera locations; all detections were recorded in 2014 (Table 3.2-2). All birds positively identified to species on images recorded by remote camera have been previously documented in Bathurst Inlet during wildlife baseline studies conducted for the Project (Rescan 2013, 2014a, 2014b).

Table 3.2-2. Bird Species Recorded by Marine RSA Cameras, 2014

Group	Species	No. Cameras with Observations	Species Recorded by Month[1]			
			Jul	Aug	Sep	Oct
Upland bird	Common Redpoll	1		X		
	Horned Lark	1		X		
	Lapland Longspur	2	X	X		
	Unknown Songbird	2	X	X		
	Willow Ptarmigan	1			X	
Waterbird	Canada Goose	2	X	X		
	Glaucous Gull	5	X	X		
	Greater Scaup	1	X	X		
	Herring Gull	1	X			
	Red-breasted Merganser	6	X	X	X	
	Red-throated Loon	1	X			
	Unknown Duck	4	X	X	X	X
	Unknown Gull	7	X	X	X	
	Unknown Loon	1			X	
Total Species Observed		**10**				
Total Number of Cameras with Observations		**13**				

Note: Species of Conservation Concern indicated in bold type.
[1] Data is presented for the months in which bird species were recorded by cameras; months with no detections are not presented in the table.

The majority of bird species recorded by remote cameras were recorded in July (8 species) and August (7 species), coinciding with the period when bird species are rearing young (July) and then preparing for the southward migration (August; for migratory species). Red-breasted merganser and glaucous gull were the most frequently recorded bird species, with detections at 6 and 5 remote cameras, respectively (Table 3.2-2).

Of note, migratory waterbird species were recorded in September and October. Groups of red-breasted merganser and unknown ducks, gulls, and loon were recorded swimming along the shores of Bathurst Inlet up to mid to late September (Sept 10 to 25, 2014; Appendix 3), and the last recorded observation of a migratory species was a group of unknown duck on October 2, 2014 (Appendix 3). Ice formation began along the shorelines of Bathurst Inlet starting in the middle of October (ca. October 12), and a consolidated sheet of ice was formed by the end of October. These results indicate that the fall migration period for waterbirds in Bathurst Inlet may extend up to when ice forms along Bathurst Inlet.

One species recorded on images is of conservation concern; glaucous gull are considered Sensitive species in Nunavut (CESCC 2010).

3.2.3.2 Mammals

Four mammal species, including grey wolf, grizzly bear, red fox, and wolverine, were recorded at 20 different cameras locations (Table 3.2-3). All three species have been previously documented in Bathurst Inlet during wildlife baseline studies conducted for the Project (Rescan 2013, 2014a, 2014b).

Table 3.2-3. Mammal Species Recorded by Marine RSA Cameras, 2014 and 2015

Species	No. Cameras with Observations	Species Recorded by Month[1]						
		2014						2015
		Jul	Aug	Sep	Oct	Nov	Dec	Mar
Grey Wolf	4	X	X					
Grizzly Bear	19	X	X	X	X			
Red Fox	2	X				X		X
Wolverine	3					X	X	X
Total Species Observed	**4**							
Total Number of Cameras with Observations	**20**							

Note: Species of Conservation Concern indicated in bold type.
[1] Data is presented for the months in which mammal species were recorded by cameras; months with no detections are not presented in the table.

Grizzly bear, a species of conservation concern (listed as species of Special Concern under COSWEIC; COSEWIC 2012), was the most frequently recorded mammal at marine RSA cameras; grizzly bear were recorded at 86% of all cameras from which data was recovered (19 of 22 cameras). Grizzly bears were active from July up to October; when they begin hibernation. Bear visits to cameras were most frequent in July, with 33 detections across 16 cameras; some cameras had up to six grizzly bear detections across the recording period for July (roughly 22 camera days; Plate 3.2-2). The number of bear detections in August was also high, with 24 detections recorded across 11 cameras; some cameras recorded grizzly bear on up to four separate occasions (Appendix 3). Grizzly bear activity at cameras decreased in September and October, with just four detections at four cameras in September, and two detections at two cameras in October (Appendix 3). Detections of grizzly bear recorded from July to October included observations of single individuals as well as family groups (females with second year cubs). Differentiation of individuals was complicated by the behaviour of grizzly bears, which

frequently approached camera tripods from the rear and or the side and remained very close to the camera lens during the entire visit, and thus no distinguishing characteristics could be recorded. These results indicate that grizzly bears are very widely distributed in Bathurst Inlet in the summer, and are inquisitive of foreign objects. This is further evidenced by the number of camera tripods that were knocked over and damaged by grizzly bear; grizzly bear were recorded knocking over 16 of 22 cameras (Figure 3.2-1), and a fair amount of damage to these tripods (e.g., chewing) was noted during the camera check in April, 2015.

Single bear recorded on July 16, 2014

Single bear recorded on July 20, 2014

Single bear recorded on July 21, 2014

Three bears (one behind camera, two in background) recorded on July 28, 2014

Plate 3.2-2. Examples of bears recorded on multiple occasions at a single camera in July, Camera BR_108 located on north end of Quadyuk Island.

Grey wolf, red fox, and wolverine were detected at relatively few camera locations (five or less; Table 3.2-3). Temporally, grey wolf were recorded on images in July and August; wolves are expected to migrate southward in the fall, loosely following migratory caribou as they travel south towards the treeline. Red fox and wolverine spend the winter on the tundra, and were both recorded on images during the winter (e.g., November, December, and March).

4. Summary and Discussion

4. Summary and Discussion

4.1 CARIBOU

Trends of caribou distribution and seasonal abundance at the Back River Project were investigated through the use of remote cameras distributed across the terrestrial RSA surrounding the Goose Property Area, and in the marine RSA from July 2014 to April 2015. Data collected were summarized to provide insight on the seasonal patterns of caribou distribution by area and time period.

There were several notable trends in seasonal distribution of caribou recorded by cameras located near the Goose Property Area. In general, caribou detection rates were highest at cameras that were located in close proximity to the Goose Property PDA, while cameras located to the south of the Goose Property PDA along Beechey Lake had the lowest caribou detection rates. Cameras located near the Goose Property PDA generally had caribou detection rates of higher than 1.0 caribou/camera day up to a high of 8.7 caribou/camera day, while cameras located along Beechey Lake had caribou detection rates of 1.0 caribou/day or less. Temporally, caribou were recorded from July through October, 2014, with no detections over the winter and in the spring of 2015. Caribou numbers were highest in August, with a total of 3,045 caribou recorded and an average detection rate of 7.6 caribou/camera day across all cameras. Of the remaining caribou, most were detected in September (467 caribou; average 2.6 caribou/camera day); only one detection of a single caribou was recorded in July and October. Similar trends in the seasonal abundance of caribou in and around the Goose Property Area has been recorded during previous camera studies, with consistently high numbers of caribou recorded in the summer and fall relative to other seasonal periods (Rescan 2013, 2014a, 2014b). Trends in abundance of caribou near the Goose Property Area are supported by several years of caribou collaring data, which indicate that the summer and fall range of the Beverly/Ahiak caribou has overlapped the southern terrestrial RSA and the Goose Property Area in the majority of years since 2001 (Rescan 2014a). Thus, similar patterns in the seasonal distribution and abundance of caribou in the terrestrial RSA can be expected in the future.

Camera data from the marine RSA cameras suggest that caribou are infrequent visitors to the areas of lower Bathurst Inlet in the summer, fall, winter, and the spring. A total of 35 caribou were recorded from July 2014 to April 2015 at 7 remote cameras; caribou detection rates recorded during the survey period were below 0.2 caribou/camera day. Spatially, caribou were more frequently recorded at cameras placed in the lower portion of Bathurst Inlet (south of Kingaok); only one camera north of Kingaok had a caribou detection across the survey period. Temporally, caribou were recorded in July through September, and once in February; the majority of caribou were recorded in August through mid-September (28 of 35 individuals; 80% of total).

Camera data, coupled with caribou collar data from the Bathurst, Beverly/Ahiak, and Dolphin and Union caribou herds (Poole et al. 2010; Rescan 2014a), suggests that the caribou recorded on images at both the terrestrial RSA and the Marine RSA cameras primarily belonged to the Beverly/Ahiak caribou herd. Beverly/Ahiak caribou have overlapping seasonal ranges during the periods when most caribou were recorded by terrestrial RSA and marine RSA cameras (summer and fall), whereas Bathurst caribou and Dolphin and Union caribou do not. Bathurst caribou summer to the southwest of the Project near Contwoyto Lake, and their fall range is located to the south of their summer range, near and below the treeline. Dolphin and Union caribou spend the summer and fall (from early July to late October) on Victoria Island (Poole et al. 2010). The calving and post-calving areas of all three caribou herds are located well outside of the Project area. The calving and post-calving ranges of Bathurst and Beverly/Ahiak caribou located a few hundred kilometers northwest (Bathurst) and northeast

(Beverly/Ahiak) of the Project, and Dolphin and Union caribou are not known to calve on the mainland. Therefore, the few caribou recorded during the post-calving period in 2014 may belong to either the Bathurst or Beverly/Ahiak caribou herd. The two caribou recorded during the winter (February 2015) at a camera located within the marine RSA is likely from the Beverly/Ahiak herd, whose winter range has overlapped portions of southern Bathurst Inlet in recent years. These animals could also be Dolphin and Union caribou, because this herds winter range is thought to include habitat up to 100 km from the mainland coast (which includes the marine RSA). Winter observations of caribou are unlikely to be from the Bathurst herd because this herd's range is well to the south of the RSA during this period (Rescan 2014a).

4.2 OTHER WILDLIFE

A total of 12 species of birds and 5 species of mammals were recorded on images taken by cameras. All species positively identified have been previously recorded during baseline studies for the Project.

Seasonal trends in the presence of other wildlife species as recorded by cameras from July 2014 to April 2015 is consistent with that recorded during previous cameras studies (Rescan 2014a, 2014b). Most notably, Grizzly bear, as well as grey wolf, have always been among the most frequently recorded mammal species, both spatially and temporally. The frequency in these species detections is likely related to their curiosity about the cameras. Detections of grizzly bear recorded by camera over the last three years of study indicate that bears often approach the camera tripods to investigate the camera and the wooden tripod and are possibly attracted by the foreign smell or lights the camera produces (e.g., night flash). Grey wolves are frequently seen walking around the camera tripod and marking a nearby bush, thus suggesting they may be using the tripod as a territorial marking spot.

Remote cameras located in the marine RSA gathered useful information on the fall migration timing of migratory waterbirds in lower Bathurst Inlet. Data collected indicate that migratory waterbirds may use marine habitat along the shorelines of Bathurst Inlet possibly until ice formation begins in October. A flock of unknown duck were documented in early October, and ice formation began shortly thereafter in mid- to late October.

References

References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

CESCC. 2010. *Wild Species 2010: The General Status of Species in Canada*. Canadian Endangered Species Conservation Council. http://www.wildspecies.ca/searchtool.cfm?lang=e (accessed November 2011).

COSEWIC. 2012. *COSEWIC assessment and update status report on the Grizzly Bear Ursus arctos in Canada*. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

Flanders, D., A. Gunn, P. Cizek, and D. Gladders. 2009. *Caribou Landscape Vulnerability Mapping Bathurst Inlet Port and Road*. Submitted to the Nunavut Impact Review Board as Part of the CARC Technical Presentation by the Canadian Arctic Resources Committee: np.

Gunn, A., A. D'Hont, J. Williams, and J. Boulanger. 2013. *Satellite Collaring in the Bathurst Herd of Barren-ground Caribou. 1996 to 2005*. Manuscript Report No. 225. Government of the Northwest Territories, Environment and Natural Resources: Yellowknife, NT.

Johnson, C. J., M. S. Boyce, R. L. Case, H. D. Cluff, R. J. Gau, A. Gunn, and R. Mulders. 2005. Cumulative effects of human developments on arctic wildlife. *Wildlife Monographs*, 160: 1-36.

Poole, K. G., A. Gunn, B. R. Patterson, and M. Dumond. 2010. Sea Ice and Migration of the Dolphin and Union Caribou Herd in the Canadian Arctic An Uncertain Future. *Arctic*, 63 (4): 414-28.

Rescan. 2012. *Back River Project: Wildlife Baseline Report 2011*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2013. *Back River Project: Wildlife Baseline Report 2012* Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2014a. *Back River Project: 2013 Wildlife Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM Company: Vancouver, BC.

Rescan. 2014b. *Back River Project: 2014 Wildlife Camera Baseline Report*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company: Vancouver, BC.

Russell, D. E., G. Kofinas, and B. Griffith. 2002. *Barren-Ground Caribou Calving Ground Workshop Report of Proceedings*. Canadian Wildlife Service. Technical Report Series Number 390.: Ottawa, Ontario.

Sutherland, M. and A. Gunn. 1996. *Bathurst calving ground surveys, 1965-1996*. Department of Environment and Resources, Wildlife and Economic Development, Government of the Northwest Territories. File Report No. 118.: Yellowknife, NT.

Appendix 1

Remote Camera Locations and Setup Information

Rescan™
an ERM company

Appendix 1. Remote Camera Locations and Setup Information

Camera Number	Zone	Easting	Northing	Camera Orientation (Degrees)	Date Camera Set	Date of Card Collection[1]	Placement Rationale	No. of Caribou	Camera Effort (Days)	Detection Rate (Caribou/Camera Day)
Terrestrial RSA Cameras										
BR_17	13 W	437276	7266585	92	15-Jul-14	7-Apr-15	Goose Monitoring Camera; Grid (Heat map)	546	84	6.5
BR_18	13 W	434151	7280644	346	15-Jul-14	9-Apr-15	Goose Monitoring Camera; Esker travel	185	70	2.6
BR_22	13 W	418020	7272315	308	15-Jul-14	9-Apr-15	Goose Monitoring Camera; Grid; high point overlooking HT	463	53	8.7
BR_29	13 W	403829	7266323	256	15-Jul-14	9-Apr-15	Goose Monitoring Camera	161	236	0.7
BR_30	13 W	437772	7236265	326	15-Jul-14	7-Apr-15	Goose Monitoring Camera	57	160	0.4
BR_35	13 W	418557	7252171	162	15-Jul-14	7-Apr-15	Goose Monitoring Camera; KIA caribou calving grounds	109	111	1.0
BR_36	13 W	410193	7263887	270	15-Jul-14	7-Apr-15	Goose Monitoring Camera; Lakeshore travel	131	232	0.6
BR_41	13 W	431374	7262339	10	15-Jul-14	7-Apr-15	Goose Monitoring Camera; Feeding; potential stream crossing	201	92	2.2
BR_42	13 W	434741	7264905	228	15-Jul-14	7-Apr-15	Goose Monitoring Camera; Lakeside feeding; on Grid	148	180	0.8
BR_43	13 W	439908	7269744	44	15-Jul-14	7-Apr-15	Goose Monitoring Camera; Grid; Feeding grounds	381	79	4.8
BR_45	13 W	427127	7279797	60	15-Jul-14	9-Apr-15	Goose Monitoring Camera; Potential pinch point for foraging	655	139	4.7
BR_46	13 W	424401	7276855	230	15-Jul-14	9-Apr-15	Goose Monitoring Camera; Grid; Valley for foraging	286	101	2.8
BR_48	13 W	415389	7269383	220	15-Jul-14	9-Apr-15	Goose Monitoring Camera; Pinch point around lake	191	51	3.8
Marine RSA Cameras										
BC_91	13 W	378685	7393905	162	9-Jul-14	10-Apr-15	Monitoring near the MLA	0	3	0
BC_92	13 W	378817	7394807	122	9-Jul-14	10-Apr-15	Monitoring near the MLA	2	10	0.19
BC_93	13 W	379516	7396112	118	9-Jul-14	10-Apr-15	Monitoring near the MLA	2	153	0.01
BC_94	13 W	377833	7395564	180	9-Jul-14	10-Apr-15	Monitoring near the MLA	2	140	0.01
BC_95	13 W	376621	7393953	80	9-Jul-14	10-Apr-15	Monitoring near the MLA	4	30	0.13
BC_96	13 W	375299	7402162	220	9-Jul-14	8-Apr-15	Monitoring near the MLA	6	95	0.06
BC_97	13 W	376440	7402844	90	9-Jul-14	8-Apr-15	Monitoring near the MLA	0	50	0
BC_98	13 W	379086	7392504	120	9-Jul-14	10-Apr-15	Monitoring near the MLA	0	122	0
BC_99	13 W	387982	7383123	140	9-Jul-14	8-Apr-15	Lower Bathurst Inlet near potential crossing area	0	197	0
BR_100	13 W	401398	7359148	160	9-Jul-14	8-Apr-15	Lower Bathurst Inlet; TK foraging area	1	82	0.01
BR_101	13 W	394002	7376300	220	9-Jul-14	not recovered	Lower Bathurst Inlet near potential crossing area	-	-	-
BR_102	13 W	385951	7459170	166	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	10	0
BR_103	13 W	393736	7453502	292	13-Jul-14	not recovered	Northern Bathurst Inlet near potential crossing area	-	-	-
BR_104	13 W	408568	7448979	228	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	72	0
BR_105	13 W	394611	7440021	240	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	14	0
BR_106	13 W	385989	7442648		13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	30	0
BR_107	13 W	375066	7443703	108	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	21	0
BR_108	13 W	377241	7435807	5	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	32	0
BR_109	13 W	379444	7428887	326	13-Jul-14	8-Apr-15	Northern Bathurst Inlet near potential crossing area	0	49	0
BR_110	12 W	623713	7434730	128	13-Jul-14	not recovered	Northern Bathurst Inlet near potential crossing area	-	-	-
BR_111	12 W	624110	7431052	108	13-Jul-14	10-Apr-15	Northern Bathurst Inlet near potential crossing area	2	58	0.03
BR_112	13 W	382085	7401494	226	9-Jul-14	8-Apr-15	Monitoring near the MLA	14	256	0.05
BR_113	13 W	381041	7395180	112	9-Jul-14	10-Apr-15	Monitoring with the MLA PDA	2	157	0.01
BR_114	13 W	381167	7394749	98	9-Jul-14	10-Apr-15	Monitoring with the MLA PDA	0	18	0
BR_115	13 W	395063	7371174	138	9-Jul-14	8-Apr-15	Lower Bathurst Inlet near potential crossing area	0	19	0

[1] *Cameras BR_101, BR_103, and BR_110 could not be recovered frrom the field in April, 2015 as camera tripods had been knocked over and covered by deep snow*

Appendix 2

Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Rescan™
an ERM company

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_17	4-Aug-14	Summer	Summer	1	13:05:26	13:08:07	M	80	8	Mammal	Caribou	350	70	420	N	Walking	Rationale for enumeration was counted a block of 50 adults then extrapolated over entire herd; from number of calves actually seen estimated that calf to adult ratio was 1/5, thus 70 young.
BR_17	6-Aug-14	Summer	Summer	1	4:09:51	4:10:00	M	10	1	Mammal	Caribou	1		1	N	Walking	sizable male, decent rack
BR_17	8-Aug-14	Summer	Summer	1	22:39:01	22:39:37	M	20	2	Mammal	Caribou	7		7	N	grazing	three individuals in foreground, several individuals in background grazing
BR_17	9-Aug-14	Summer	Summer	1	4:21:26	4:21:36	M	10	1	Mammal	Caribou	1		1	N	grazing	small single tine antlers
BR_17	9-Aug-14	Summer	Summer	2	9:21:50	9:23:42	M	50	5	Mammal	Caribou	3		3	N	grazing	one small juvenile (small antler buds barely showing)
BR_17	9-Aug-14	Summer	Summer	3	14:21:58	14:22:45	M	20	2	Mammal	Caribou	1		1	N	grazing	small antlers (no branching) and ragged coat
BR_17	10-Aug-14	Summer	Summer	1	14:28:46	14:29:28	M	20	2	Mammal	Caribou	1		1	N	Walking	this individual looks similar to the one seen hours before
BR_17	10-Aug-14	Summer	Summer	2	4:10:46	4:12:21	M	50	5	Mammal	Caribou	5		5	N	grazing	two juvis, two individuals grazing in background
BR_17	10-Aug-14	Summer	Summer	3	16:41:30	16:41:39	M	10	1	Mammal	Caribou	1		1	N	grazing	large bull with velvety antlers
BR_17	10-Aug-14	Summer	Summer	4	20:13:45	20:53:44	M	50	5	Mammal	Caribou	8		8	Y/N	grazing	the large bull seen previously is in foreground, the others are grazing in background
BR_17	11-Aug-14	Summer	Summer	1	6:06:09	6:13:19	M	170	17	Mammal	Caribou	1		1	N	standing	shorter antlers, but branching is starting on front and back tines
BR_17	11-Aug-14	Summer	Summer	2	7:17:54	7:40:19	M	80	8	Mammal	Caribou	3		3	N	grazing	
BR_17	11-Aug-14	Summer	Summer	3	8:58:25	8:58:34	M	10	1	Mammal	Caribou	1		1	N	grazing	velvety, single tine antler
BR_17	11-Aug-14	Summer	Summer	4	22:33:51	22:36:10	M	50	5	Mammal	Caribou	3		3	N	standing	small juvenile with older individual, another grazing in background
BR_17	13-Aug-14	Summer	Summer	1	1:01:50	1:02:29	M	20	2	Mammal	Caribou	1		1	N	Walking	short antlers
BR_17	16-Aug-14	Summer	Summer	1	7:01:01	7:01:11	M	10	1	Mammal	Caribou	1		1	N	grazing	lighter individual, short, velvety antlers
BR_17	16-Aug-14	Summer	Summer	2	10:38:51	10:39:20	M	20	2	Mammal	Caribou	30		30	N	grazing	
BR_17	18-Aug-14	Summer	Summer	1	10:59:01	11:20:37	M	80	8	Mammal	Caribou	10		10	N	grazing	
BR_17	18-Aug-14	Summer	Summer	2	12:34:16	13:29:32	M	80	8	Mammal	Caribou	4		4	Y	grazing	same group as before
BR_17	19-Aug-14	Summer	Summer	1	8:52:48	8:52:57	M	10	1	Mammal	Caribou	3		3	N	grazing	big bulls
BR_17	22-Aug-14	Summer	Summer	1	12:28:11	12:32:17	M	50	5	Mammal	Caribou	2		2	N	grazing	
BR_17	22-Aug-14	Summer	Summer	2	18:13:17	18:14:38	M	40	4	Mammal	Caribou	5		5	N	Walking	
BR_17	24-Aug-14	Summer	Summer	1	15:51:22	16:36:27	M	70	7	Mammal	Caribou	8		8	N	Running	a couple juveniles mixed in, some individuals have longer, thin antlers
BR_17	3-Sep-14	Fall Migration	Summer	1	10:05:52	10:06:48	M	30	3	Mammal	Caribou	7		7	N	Walking	one juvenile, the rest have antlers that are either single tine or starting to branch
BR_17	10-Sep-14	Fall Migration	Summer	1	10:31:43	10:31:52	M	10	1	Mammal	Caribou	5		5	N	grazing	
BR_17	10-Sep-14	Fall Migration	Summer	2	13:19:59	13:20:08	M	10	1	Mammal	Caribou	5		5	N	grazing	four are large bulls, hard to tell what the antler size is on the other as it's further from the camera
BR_17	13-Sep-14	Fall Migration	Summer	1	14:20:27	14:29:43	M	20	2	Mammal	Caribou	14		14	N	Walking	
BR_18	22-Jul-14	Post-calving	Summer	1	5:24:07	5:25:00	M	20	2	Mammal	Grizzly Bear	1		1	N	Walking	pretty scrawny/lanky individual, patchy fur
BR_18	7-Aug-14	Summer	Summer	1	3:23:32	3:38:19	M	30	3	Mammal	Caribou	6		6	N	Walking	hard light to distinguish features
BR_18	9-Aug-14	Summer	Summer	1	0:08:06	0:08:16	M	10	1	Mammal	Grey wolf	2		2	N	Walking	
BR_18	9-Aug-14	Summer	Summer	2	8:19:02	8:19:11	M	10	1	Mammal	Caribou	60	20	80	N	Walking	mixed group.
BR_18	10-Aug-14	Summer	Summer	1	8:37:59	8:39:07	M	30	3	Mammal	Grizzly Bear	1		1	N	Standing	
BR_18	12-Aug-14	Summer	Summer	1	3:53:10	3:54:10	M	20	1	Mammal	Caribou	12	1	13	N	Walking	
BR_18	12-Aug-14	Summer	Summer	2	4:18:23	4:34:16	M	50	5	Mammal	Caribou	24		24	N	Walking	
BR_18	12-Aug-14	Summer	Summer	3	7:10:56	7:11:05	M	10	1	Mammal	Caribou	6		6	N	Walking	
BR_18	12-Aug-14	Summer	Summer	4	8:18:36	14:58:39	M	40	4	Mammal	Caribou	4	1	5	N	Walking	
BR_18	12-Aug-14	Summer	Summer	5	15:39:58	15:40:07	M	10	1	Mammal	Caribou	6		6	N	Walking	one larger male in group
BR_18	13-Aug-14	Summer	Summer	1	4:25:24	4:39:06	M	20	1	Mammal	Caribou	3		3	N	Walking	
BR_18	13-Aug-14	Summer	Summer	2	16:39:34	16:35:16	M	20	2	Mammal	Grizzly Bear	1		1	N	standing	
BR_18	16-Aug-14	Summer	Summer	1	13:44:38	13:44:48	M	10	1	Mammal	Caribou	4	1	5	N	standing	most have smaller antlers (no branching), plus one calf
BR_18	18-Aug-14	Summer	Summer	1	5:27:10	5:28:12	M	20	2	Mammal	Caribou	6		6	N	Running	some branching starting individuals antlers
BR_18	22-Aug-14	Summer	Summer	1	13:52:12	13:52:23	M	10	1	Mammal	Caribou	1		1	N	Walking	large male
BR_18	23-Aug-14	Summer	Summer	1	20:19:30	20:20:26	M	30	3	Mammal	Caribou	6		6	N	Walking	most have longer, single tine antlers
BR_18	26-Aug-14	Summer	Summer	1	11:05:55	11:06:06	M	10	1	Mammal	Caribou	3		3	N	Walking	large bulls
BR_18	26-Aug-14	Summer	Summer	2	17:59:08	6:16:21	M	20	2	Mammal	Caribou	2		2	N	Walking	two large bulls
BR_18	26-Aug-14	Summer	Summer	3	19:46:57	19:47:07	M	10	1	Mammal	Grizzly Bear	1		1	N	standing	shakes camera and moves it slightly
BR_18	27-Aug-14	Summer	Summer	1	13:38:19	13:38:29	M	10	1	Mammal	Caribou	5		5	N	Walking	
BR_18	28-Aug-14	Summer	Summer	1	19:37:34	19:37:44	M	10	1	Mammal	Unknown	1		1	N	Standing	possibly a wolf, or fox, tips of animal only seen on bottom of frame
BR_18	31-Aug-14	Summer	Summer	1	2:31:20	2:31:30	M	10	1	Mammal	Caribou	2		2	N	standing	one comes to investigate camera
BR_18	1-Sep-14	Fall Migration	Summer	1	6:54:47	6:54:58	M	10	1	Mammal	Caribou	1		1	N	Walking	large male
BR_18	2-Sep-14	Fall Migration	Summer	1	11:11:31	11:11:42	M	10	1	Mammal	Caribou	1		1	N	Running	large male
BR_18	2-Sep-14	Fall Migration	Summer	2	13:37:40	13:39:49	M	20	1	Mammal	Caribou	1		1	N	Walking	small rack, but branching started in front and back tines
BR_18	2-Sep-14	Fall Migration	Summer	3	16:16:40	16:17:56	M	30	3	Mammal	Caribou	8		8	N	Walking	one big male, the rest have smaller antlers

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_18	10-Sep-14	Fall Migration	Summer	1	7:13:42	7:14:51	M	20	2	Mammal	Caribou	1		1	N	standing	
BR_18	21-Sep-14	Fall Migration	Fall Migration	1	19:07:46	19:09:28	M	30	0	Mammal	Grizzly Bear	1		1	N	Standing	knock camera over
BR_22	14-Jul-14	Post-calving	Summer	1	12:11:37	12:11:46	M	10	1	Mammal	Caribou	1		1	N	grazing	longer tines, antler plate on brow tine but not much branching on back tine
BR_22	9-Aug-14	Summer	Summer	1	20:33:35	20:33:44	M	10	1	Mammal	Caribou	1		1	N	grazing	larger male
BR_22	10-Aug-14	Summer	Summer	1	13:59:09	13:59:19	M	10	1	Mammal	Caribou	1		1	N	Walking	small, single tine antlers
BR_22	11-Aug-14	Summer	Summer	1	23:49:29	23:49:39	M	10	1	Mammal	Caribou	1		1	N	Running	
BR_22	12-Aug-14	Summer	Summer	1	5:11:24	5:16:54	M	130	13	Mammal	Caribou	2		2	N	grazing	two smaller individuals, antlers are short and stubby
BR_22	12-Aug-14	Summer	Summer	2	6:00:44	6:02:36	M	60	6	Mammal	Caribou	10	4	14	N	Walking	
BR_22	12-Aug-14	Summer	Summer	3	7:33:29	7:49:32	M	40	4	Mammal	Caribou	160	40	200	N	Walking	large group, difficult to tell who have been counted before. Approx. numbers. Several large bulls mixed in.
BR_22	12-Aug-14	Summer	Summer	4	8:45:59	8:51:56	M	70	7	Mammal	Caribou	40	10	50	N	Walking	Mixed group of all ages.
BR_22	12-Aug-14	Summer	Summer	5	13:52:17	13:52:26	M	10	1	Mammal	Caribou	1		1	N	grazing	possibly female - larger body size but no antlers
BR_22	12-Aug-14	Summer	Summer	6	14:53:22	14:59:31	M	60	6	Mammal	Caribou	5		5	N	Walking	all have fairly scraggly coats, one smaller juvenile with antler buds hardly showing
BR_22	12-Aug-14	Summer	Summer	7	16:27:00	16:35:34	M	100	10	Mammal	Caribou	11		11	N	grazing	a half dozen are grazing on the knoll in the background. Generally smaller individuals, not well developed antlers. One juvenile with a inch or two long antler bud.
BR_22	14-Aug-14	Summer	Summer	1	10:56:31	10:57:24	M	30	3	Mammal	Caribou	3		3	N	grazing	bulls - two have large, well developed racks, the latter has less branching
BR_22	14-Aug-14	Summer	Summer	2	12:14:24	12:15:14	M	30	3	Mammal	Caribou	7		7	N	Walking	single tine antlers, and one juvenile
BR_22	14-Aug-14	Summer	Summer	3	16:50:51	16:51:01	M	10	1	Mammal	Caribou	1	1	2	N	Walking	
BR_22	15-Aug-14	Summer	Summer	1	4:28:54	4:29:28	M	20	2	Mammal	Caribou	4		4	N	grazing	all are bulls with generally large racks
BR_22	17-Aug-14	Summer	Summer	1	15:15:47	15:15:56	M	10	1	Mammal	Caribou	1		1	N	Walking	single tine antlers
BR_22	19-Aug-14	Summer	Summer	2	14:57:18	14:58:34	M	30	3	Mammal	Caribou	1		1	N	Walking	branching started on back tine
BR_22	20-Aug-14	Summer	Summer	1	11:46:21	12:42:51	M	220	22	Mammal	Caribou	5		5	N	grazing	one large bull grazing around and around camera, and several join
BR_22	20-Aug-14	Summer	Summer	2	14:43:35	14:55:15	M	40	4	Mammal	Caribou	5		5	N	grazing	mostly large bulls
BR_22	22-Aug-14	Summer	Summer	1	10:51:33	10:52:46	M	30	3	Mammal	Caribou	2		2	N	grazing	velvety antlers, some branching on back tine
BR_22	22-Aug-14	Summer	Summer	2	16:29:10	16:40:56	M	110	11	Mammal	Caribou	3		3	N	Walking	
BR_22	22-Aug-14	Summer	Summer	3	22:11:49	22:12:17	M	20	2	Mammal	Caribou	2	1	3	N	Walking	
BR_22	23-Aug-14	Summer	Summer	1	0:03:07	1:23:02	M	70	7	Mammal	Caribou	5		5	N	grazing	circling around camera again and again
BR_22	23-Aug-14	Summer	Summer	2	12:20:48	12:23:30	M	50	5	Mammal	Caribou	1		1	N	grazing	possibly a female - larger body but no antlers
BR_22	23-Aug-14	Summer	Summer	3	13:36:22	13:35:31	M	10	1	Mammal	Caribou	3		3	N	Standing	two grazing in grassland in background
BR_22	23-Aug-14	Summer	Summer	4	16:33:32	16:35:59	M	60	6	Mammal	Caribou	5		5	N	Walking	large male walks through grassland in background
BR_22	23-Aug-14	Summer	Summer	5	22:03:46	22:04:29	M	20	2	Mammal	Grey wolf	2		2	N	Walking	walking around, looks to be sniffing something out
BR_22	24-Aug-14	Summer	Summer	1	5:09:16	5:10:51	M	30	3	Mammal	Caribou	4		4	N	grazing	large bulls, big racks
BR_22	24-Aug-14	Summer	Summer	2	17:04:04	17:04:13	M	10	1	Mammal	Caribou	4		4	N	Walking	generally smaller antlers than seen in previous series
BR_22	25-Aug-14	Summer	Summer	1	16:44:11	16:44:20	M	10	1	Mammal	Caribou	1		1	N	grazing	short, squat antlers - just starting branch on back tine
BR_22	26-Aug-14	Summer	Summer	1	11:25:08	11:25:38	M	20	2	Mammal	Caribou	6		6	N	Running	big bulls, something startled them because they run halfway through series
BR_22	26-Aug-14	Summer	Summer	2	15:10:54	15:18:50	M	90	9	Mammal	Caribou	2		2	N	standing	one has light velvet on antlers, the other darker velvet
BR_22	26-Aug-14	Summer	Summer	3	22:30:49	22:30:58	M	10	1	Mammal	Caribou	3	1	4	N	Running	cow-calf, followed by bulls
BR_22	27-Aug-14	Summer	Summer	1	8:02:33	8:05:41	M	40	4	Mammal	Caribou	1		1	N	grazing	doing laps around camera
BR_22	29-Aug-14	Summer	Summer	1	19:43:19	19:45:11	M	50	5	Mammal	Caribou	4		4	N	grazing	
BR_22	30-Aug-14	Summer	Summer	1	0:42:09	0:42:36	M	20	2	Mammal	Caribou	4		4	N	Running	bad light, cannot tell if it's the same group as seen before
BR_22	30-Aug-14	Summer	Summer	2	5:43:29	5:47:08	M	50	5	Mammal	Caribou	2		2	N	Walking	one small juvenile investigates camera, the other walks by
BR_22	30-Aug-14	Summer	Summer	3	6:51:23	6:51:52	M	20	2	Mammal	Caribou	1		1	N	Walking	large bull
BR_22	30-Aug-14	Summer	Summer	4	9:24:28	9:33:46	M	80	8	Mammal	Caribou	16		16	N	Walking	another group in background on knoll, at least 6 smaller juveniles (very small antler buds) mixed in group
BR_22	30-Aug-14	Summer	Summer	5	13:48:18	13:55:31	M	130	13	Mammal	Caribou	5		5	N	grazing	single tine antlers on all of them
BR_22	30-Aug-14	Summer	Summer	6	17:09:13	17:18:06	M	150	15	Mammal	Caribou	3		3	N	Standing	one relatively small individual with a single tine antler, the other two have larger antlers with some branching starting
BR_22	30-Aug-14	Summer	Summer	7	19:48:38	19:50:31	M	60	6	Mammal	Caribou	6		6	N	Standing	six individuals on knoll in background, one in foreground triggering camera (single tine antlers)
BR_22	31-Aug-14	Summer	Summer	1	10:49:02	10:49:57	M	30	3	Mammal	Caribou	4		4	N	grazing	large bulls
BR_22	1-Sep-14	Fall Migration	Summer	1	6:02:19	6:02:49	M	20	2	Mammal	Caribou	1		1	N	Walking	brown velvet, some branching on front and back tines
BR_22	1-Sep-14	Fall Migration	Summer	2	10:46:10	10:46:38	M	20	2	Mammal	Caribou	1		1	N	grazing	greyer velvet, one antler slightly longer
BR_22	2-Sep-14	Fall Migration	Summer	1	2:37:32	2:37:41	M	10	1	Mammal	Grey wolf	2		2	N	standing	could be the same pair as before, but both times they have showed up in the night
BR_22	2-Sep-14	Fall Migration	Summer	2	9:45:05	9:45:14	M	10	1	Mammal	Caribou	1		1	N	Walking	branching started on back tine
BR_22	3-Sep-14	Fall Migration	Summer	1	9:21:56	8:27:00	M	90	9	Mammal	Caribou	35		35	N	Walking	larger group, some larger males mixed in
BR_22	3-Sep-14	Fall Migration	Summer	2	13:55:54	13:58:02	M	40	4	Mammal	Caribou	21		21	N	Walking	large males lead off, followed by smaller individuals in back of group

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_22	10-Sep-14	Fall Migration	Summer	1	13:30:00		M							0	N		camera apparently tips over, no trigger or animal recorded.
BR_29	11-Aug-14	Summer	Summer	1	21:10:33	21:10:43	M	10	1	Mammal	Caribou	3		3	N	Grazing	big bulls
BR_29	17-Aug-14	Summer	Summer	1	6:01:29	6:01:39	M	10	1	Mammal	Caribou	1		1	N	Walking	short, squat antlers
BR_29	17-Aug-14	Summer	Summer	2	21:57:48	21:57:58	M	10	1	Mammal	Caribou	5		5	N	Grazing	a few individuals in background look to be crossing river
BR_29	18-Aug-14	Summer	Summer	1	6:04:08	6:09:03	M	50	5	Mammal	Caribou	17		17	N	Grazing	
BR_29	18-Aug-14	Summer	Summer	2	13:03:01	13:03:09	M	10	1	Mammal	Caribou	14		14	N	Walking	a few large males mixed in to group
BR_29	29-Aug-14	Summer	Summer	1	15:12:19	15:12:30	M	10	1	Mammal	Caribou	1		1	N	Walking	large male, gray velvet
BR_29	4-Sep-14	Fall Migration	Summer	1	6:51:32	7:00:00	M	41	4	Mammal	Caribou	60		60	N	Walking	large group foraging, then turn away from camera and start crossing river in background
BR_29	4-Sep-14	Fall Migration	Summer	2	9:06:20	9:06:31	M	10	1	Mammal	Caribou	3		3	N	Grazing	lighter, well kept coats, on individual has antlers starting to branch, other two have single tines
BR_29	5-Sep-14	Fall Migration	Summer	1	13:47:46	14:00:00	M	21	2	Mammal	Caribou	24		24	N	Grazing	mostly larger bulls - same thing, move towards river and cross
BR_29	10-Sep-14	Fall Migration	Summer	1	6:56:12	6:56:22	M	10	1	Mammal	Caribou	1	1	2	N	Running	
BR_29	17-Sep-14	Fall Migration	Summer	1	11:20:00	11:25:36	M	20	2	Mammal	Caribou	31		31	N	Grazing	one very white individual mixed in.
BR_29	22-Mar-15	Winter	Winter	1	6:33:46	6:33:57	M	10	1	Bird	Ptarmigan	2		2	N	Standing	cannot differentiate between willow and rock in winter.
BR_29	2-Apr-15	Winter	Summer	1	22:40:19	22:40:29	M	10	1	Mammal	Arctic Fox	1		1	N	Running	
BR_30	16-Jul-14	Post-calving	Summer	1	9:59:13	10:15:55	M	30	3	Mammal	Grizzly Bear	1		1	N	Standing	
BR_30	29-Jul-14	Summer	Summer	1	2:50:25	2:51:23	M	20	2	Unknown	Unknown	1		1	N	Standing	likely a wolverine or a grizzly bear, view is tilted to right now
BR_30	7-Aug-14	Summer	Summer	1	4:19:56	4:20:07	M	10	1	Mammal	Grizzly Bear	1		1	N	Standing	
BR_30	7-Aug-14	Summer	Summer	2	10:56:54	10:57:04	M	10	1	Mammal	Caribou	1		1	N	Walking	moves past quickly
BR_30	8-Aug-14	Summer	Summer	1	12:06:23	12:06:33	M	10	1	Mammal	Grey wolf	1		1	N	Walking	good shot, light grey individual
BR_30	10-Aug-14	Summer	Summer	1	13:52:19	13:54:03	M	40	4	Mammal	Grizzly Bear	1		1	N	Standing	jiggles camera stand and rights view
BR_30	23-Aug-14	Summer	Summer	1	9:32:24	9:32:34	M	10	1	Bird	Herring Gull	3		3	N	Flying	One juvenile and two adults
BR_30	27-Aug-14	Summer	Summer	1	14:10:27	14:10:37	M	10	1	Mammal	Caribou	1		1	N	Standing	
BR_30	28-Aug-14	Summer	Summer	1	16:30:57	16:31:48	M	30	3	Mammal	Caribou	4		4	N	Walking	smaller individuals, not huge antlers
BR_30	29-Aug-14	Summer	Summer	1	10:43:54	10:48:16	M	30	3	Mammal	Caribou	49	1	50	N	Walking	Caribou using river as crossing point.
BR_30	8-Sep-14	Fall Migration	Summer	1	7:29:30	7:31:01	M	40	4	Mammal	Caribou	1		1	N	Standing	large male
BR_30	20-Sep-14	Fall Migration	Summer	1	19:31:33	19:31:44	M	10	1	Mammal	Grey wolf	1		1	N	Walking	
BR_35	24-Aug-14	Summer	Summer	1	4:47:58 PM	4:48:07 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	moderate rack, some branching
BR_35	24-Aug-14	Summer	Summer	2	8:48:58 PM	8:54:26 PM	M	50	5	Mammal	Caribou	2		2	Y/N	grazing	the first one has a smaller sized rack than one before, though it is starting to branch, then the same individual as previous series comes in
BR_35	24-Aug-14	Summer	Summer	3	9:18:57 PM	9:23:11 PM	M	40	4	Mammal	Caribou	25		25	N	grazing	mixed group, some large males mixed in but most look to have smaller racks
BR_35	25-Aug-14	Summer	Summer	1	5:28:19 PM	5:29:47 PM	M	20	2	Mammal	Caribou	11		11	N	grazing	group of large bulls, all have antler plates on brow tine
BR_35	25-Aug-14	Summer	Summer	2	9:22:16 PM	9:22:25 PM	M	10	1	Mammal	Caribou	1		1	N	walking	another large bull
BR_35	26-Aug-14	Summer	Summer	1	5:41:03 AM	5:51:11 AM	M	30	3	Mammal	Caribou	12		12	N	grazing	couple large bulls, another with no antlers, and the others are too far to distinguish. Something looks to have started them, as they bolt near the end
BR_35	26-Aug-14	Summer	Summer	2	6:17:01 AM	6:18:29 AM	M	20	2	Mammal	Caribou	7		7	N	walking	smaller rack with single tine on closer individual, the other one looks to be a larger male; the remainder are in distance
BR_35	26-Aug-14	Summer	Summer	3	7:03:06 AM	7:04:32 AM	M	30	3	Mammal	Caribou	6		6	N	walking	large males
BR_35	26-Aug-14	Summer	Summer	4	8:55:01 AM	8:55:44 AM	M	50	5	Mammal	Caribou	7		7	N	grazing	all smaller individuals, a few juveniles plus older ones with antlers that have some branching
BR_35	26-Aug-14	Summer	Summer	5	9:32:11 AM	9:34:32 AM	M	40	4	Mammal	Caribou	13		13	N	grazing	possible that some of these have been counted before but all individuals seem to be moving in the same direct (left to right) so counted these as new. Smaller individuals with racks that have started to branch, some coming up along lakeshore
BR_35	26-Aug-14	Summer	Summer	6	10:31:57 AM	10:32:06 AM	M	10	1	Mammal	Caribou	2		2	N	grazing	moderate sized bull in foreground, another larger male in background
BR_35	26-Aug-14	Summer	Summer	7	12:10:25 PM	12:10:34 PM	M	10	1	Mammal	Caribou	4		4	N	grazing	generally smaller sized antlers, not as large as some seen previously
BR_35	26-Aug-14	Summer	Summer	8	1:25:23 PM	1:25:58 PM	M	20	2	Mammal	Caribou	1		1	N	grazing	large bull, well defined plate on brow tine
BR_35	30-Aug-14	Summer	Summer	1	9:48:00 PM	9:48:09 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	looks like pure white individual
BR_35	3-Sep-14	Fall Migration	Summer	1	5:29:18 PM	5:34:30 PM	M	41	4	Mammal	Caribou	14		14	N	grazing	mixed group though no calves. Several bulls with a larger rack, the remainder have single tines antlers - some with branching
BR_35	4-Sep-14	Fall Migration	Summer	1	7:25:58 PM	7:26:07 PM	M	10	1	Mammal	Caribou	3		3	N	grazing	one small individual with no antlers, another with single tine antlers, and the other looks to have a larger rack
BR_35	8-Sep-14	Fall Migration	Summer	1	5:59:23 AM	6:00:56 AM	M	31	3	Mammal	Grey Wolf	3		3	N	walking	grey individual checks out camera, another two individuals smell/dig/roll at something a few meters away - one of them is grey and another looks like it could be white with some dirty patches (perhaps the same one as seen previously). This lighter individual marks the ground before leaving
BR_35	8-Sep-14	Fall Migration	Summer	2	5:48:15 PM	5:50:01 PM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	large looking bear, chocolate brown with light ridge along back

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_35	24-Sep-14	Fall Migration	Fall Migration	1	12:55:41 PM	12:58:11 PM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	blonder looking individual than seen before
BR_35	25-Sep-14	Fall Migration	Fall Migration	1	1:23:54 PM	1:24:04 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	large white individual that has a blood stained face and front legs
BR_35	20-Oct-14	Fall Migration	Fall Migration	1	12:05:47 PM	12:05:59 PM	M	10	1	Mammal	Caribou	1		1	N	investigating camera	bull with large rack, looking prepped for winter
BR_36	12-Aug-14	Summer	Summer	1	7:38:54 PM	7:39:05 PM	M	10	1	Mammal	Caribou	5		5	N	walking	one right below camera to start off with, four other move by - all have relatively short antlers, some have some branching
BR_36	17-Aug-14	Summer	Summer	1	11:47:59 PM	11:49:33 PM	M	20	2	Mammal	Caribou	1		1	N	walking	bull with large antlers, well defined plate on brow tine
BR_36	23-Aug-14	Summer	Summer	1	9:23:30 PM	9:40:22 PM	M	50	5	Mammal	Caribou	1		1	N	grazing	pretty short antlers, start of branching on back tine
BR_36	27-Aug-14	Summer	Summer	1	3:27:15 PM	3:51:30 PM	M	31	3	Mammal	Caribou	24		24	N	grazing	triggered by individual with velvety antlers, some branching starting on back tine, then more show up later when the same caribou triggers it again
BR_36	27-Aug-14	Summer	Summer	2	4:05:40 PM	4:05:49 PM	M	10	1	Mammal	Caribou	9		9	N	grazing	different individuals, most look to be smaller sized antlered individuals
BR_36	29-Aug-14	Summer	Summer	1	10:31:46 PM	10:32:49 PM	M	30	3	Mammal	Caribou	2		2	N	grazing	one has larger, branched antlers, the other single tine
BR_36	4-Sep-14	Fall Migration	Summer	1	7:05:07 PM	7:05:16 PM	M	10	1	Mammal	Caribou	1		1	N	walking	smaller antlers but have started to branch on back tine
BR_36	5-Sep-14	Fall Migration	Summer	1	7:52:22 AM	7:53:16 AM	M	30	3	Mammal	Caribou	25		25	N	grazing	mostly large males with big racks, a few have smaller sized racks - moving to right
BR_36	5-Sep-14	Fall Migration	Summer	2	11:06:17 AM	11:08:48 AM	M	20	2	Mammal	Caribou	61		61	N	grazing	different group as moving in the same direction as the males. Most are in background so hard to tell features. The ones closest to the camera include a large bull, smaller individual with antlers that are starting to branch.
BR_36	5-Sep-14	Fall Migration	Summer	3	3:02:46 PM	3:02:56 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	shorter antlers but lots of branching started
BR_36	6-Sep-14	Fall Migration	Summer	1	12:41:20 AM	12:42:16AM	M	20	2	Mammal	Caribou	1		1	N	grazing	first individual looks to have no antlers, followed by a smaller juvenile with smaller antler buds
BR_36	1-Dec-14	Winter	Winter	1	3:43:34 PM	3:43:44 PM	M	10	1	Bird	Snowy Owl	1		1	N	flying	swoops by at left side of frame, low over ground
BR_41	4-Aug-14	Summer	Summer	1	9:25:34 PM	9:26:21 PM	M	30	3	Mammal	Caribou	54	4	58	N	walking	all pass by in a short period, mix of female with calves and some larger bulls, the rest have moderate antlers. Three smaller juveniles
BR_41	9-Aug-14	Summer	Summer	1	9:04:37 AM	9:05:08AM	M	20	2	Mammal	Caribou	25	1	26	N	walking	mixed group, one identifiable calf. Something appears to have startled them, because they start running to left at the end of the series
BR_41	9-Aug-14	Summer	Summer	2	3:11:41 PM	3:13:05 PM	M	20	2	Mammal	Caribou	3		3	N	walking	two large males, one of which beds down at end of series. Another smaller individual with single tine antlers.
BR_41	9-Aug-14	Summer	Summer	3	6:50:00 PM	6:50:33 PM	M	20	2	Mammal	Caribou	4		4	N	walking	two large bulls, one is walking next to a chocolate coloured individual with very small antlers (female?) and another smaller male picks up the rear. Possible that the two big bulls were those from previous series, though neither are close enough to the camera to tell
BR_41	9-Aug-14	Summer	Summer	4	11:43:52 PM	11:44:21 PM	M	20	2	Mammal	Caribou	6		6	N	grazing	all have generally small sized antlers
BR_41	10-Aug-14	Summer	Summer	1	12:53:46 AM	12:59:42 AM	M	60	6	Mammal	Caribou	1		1	N	grazing	small antlers, grazing quite a bit and attracted by lights on camera
BR_41	10-Aug-14	Summer	Summer	2	1:34:33 AM	1:37:16 AM	M	50	5	Mammal	Caribou	5	2	7	N	walking	hard to distinguish individuals, but two calves are identifiable
BR_41	10-Aug-14	Summer	Summer	3	3:31:26 AM	3:31:35 AM	M	10	1	Mammal	Caribou	5	2	7	Y	walking	attracted by lights, same group as a few hours before
BR_41	10-Aug-14	Summer	Summer	4	4:15:12 AM	4:15:21 AM	M	10	1	Mammal	Caribou	1		1	N	walking	strolls by. Hard light to identify features
BR_41	10-Aug-14	Summer	Summer	5	1:51:23 PM	1:53:40 PM	M	50	5	Mammal	Caribou	5		5	N	walking	two smaller juveniles, the others have smaller antlers
BR_41	10-Aug-14	Summer	Summer	6	11:27:27 PM	11:30:40 PM	M	31	3	Mammal	Caribou	7		7	N	walking	two males with larger racks, the rest have smaller antlers
BR_41	11-Aug-14	Summer	Summer	1	1:59:43 AM	1:59:52 AM	M	10	1	Mammal	Caribou	1		1	N	grazing	looks like a juvenile, small individual
BR_41	12-Aug-14	Summer	Summer	1	5:22:43 AM	5:22:54 AM	M	10	1	Mammal	Caribou	1		1	N	grazing	small, single tine antlers
BR_41	12-Aug-14	Summer	Summer	2	10:26:52 AM	10:31:18 AM	M	51	5	Mammal	Caribou	4		4	N	grazing	smaller racked individuals grazing in meadow
BR_41	12-Aug-14	Summer	Summer	3	2:17:42 PM	2:17:51 PM	M	10	1	Mammal	Caribou	1		1	N	walking	single tine antlers
BR_41	12-Aug-14	Summer	Summer	4	3:09:38 PM	3:10:09 PM	M	20	2	Mammal	Caribou	1		1	N	walking	smaller sized antlers with some branching - this individual was bedded down in meadow on previous timed photos
BR_41	15-Aug-14	Summer	Summer	1	7:15:58 AM	7:19:42 AM	M	100	10	Mammal	Caribou	4		4	N	grazing	generally small antlers, little to no branching
BR_41	15-Aug-14	Summer	Summer	2	10:35:18 AM	10:36:16 AM	M	30	3	Mammal	Caribou	1		1	N	grazing	very large male with well defined plate on brow antler tine
BR_41	15-Aug-14	Summer	Summer	3	11:00:01 AM	11:00:45 AM	M	20	2	Mammal	Caribou	1		1	N	grazing	smaller antlers, not many branches yet
BR_41	16-Aug-14	Summer	Summer	1	10:41:44 AM	10:44:05 AM	M	40	4	Mammal	Caribou	9	1	10	N	grazing	most individuals have smaller antlers
BR_41	16-Aug-14	Summer	Summer	2	11:20:46 AM	11:20:56 AM	M	10	1	Mammal	Caribou	4		4	N	walking	most are in background, look to be smaller antlered individuals
BR_41	16-Aug-14	Summer	Summer	3	8:22:44 PM	8:24:28 PM	M	40	4	Mammal	Caribou	4		4	N	walking	one juvenile, the rest have small antlers
BR_41	19-Aug-14	Summer	Summer	1	2:47:14 PM	2:47:23 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	small antlers with one branch, raggy coat
BR_41	19-Aug-14	Summer	Summer	2	9:40:22 PM	9:4-:55 PM	M	20	2	Mammal	Caribou	1		1	N	grazing	larger male, moderate rack covered with velvet
BR_41	20-Aug-14	Summer	Summer	1	6:36:31 AM	6:39:10 AM	M	20	2	Mammal	Caribou	1		1	N	grazing	decent coat, smaller antlers with no branching yet
BR_41	20-Aug-14	Summer	Summer	2	10:09:06 AM	10:09:15 AM	M	10	1	Mammal	Caribou	1		1	N	grazing	looks to be a cow, no antlers but larger body
BR_41	20-Aug-14	Summer	Summer	3	11:10:47 AM	11:10:56 AM	M	10	1	Mammal	Caribou	12		12	N	grazing	one smaller juvenile with small antler buds, the rest look to be individuals with smaller sized antlers (little branching)
BR_41	22-Aug-14	Summer	Summer	1	10:04:33 AM	10:05:39 AM	M	30	3	Mammal	Caribou	2		2	N	walking	single tine antlers with no branching but are moderate size. Second individual has smaller antlers but a little branching

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_41	22-Aug-14	Summer	Summer	2	10:48:45 AM	10:48:54 AM	M	10	1	Mammal	Caribou	2		2	N	walking	small juvenile (small antler buds) with another larger individual with small antlers
BR_41	23-Aug-14	Summer	Summer	1	4:02:18 PM	4:15:53 PM	M	90	9	Mammal	Caribou	3		3	N	walking	all have smaller antlers, one with branching
BR_41	24-Aug-14	Summer	Summer	1	9:14:36 AM	9:14:45 AM	M	10	1	Mammal	Caribou	1		1	N	walking	small antlers, but they are not fully visible in frame
BR_41	24-Aug-14	Summer	Summer	2	1:51:43 PM	1:51:52 PM	M	10	1	Mammal	Caribou	1		1	N	walking	smaller antlers, one branch at back tine
BR_41	25-Aug-14	Summer	Summer	1	11:00:09 AM	11:00:59 AM	M	20	2	Mammal	Caribou	3		3	N	walking	smaller juvenile with tall buds, second individual with smaller antlers and branch on back tine, and another juvenile with buds just barely coming up
BR_41	25-Aug-14	Summer	Summer	2	5:04:39 PM	5:04:48 PM	M	10	1	Mammal	Caribou	1		1	N	walking	raggy coat and no antlers
BR_41	25-Aug-14	Summer	Summer	3	6:23:14 PM	6:24:02 PM	M	30	3	Mammal	Caribou	6		6	N	walking	bulls with big racks, with a small juvenile and an individual with smaller antlers and no branching
BR_41	26-Aug-14	Summer	Summer	1	4:15:20 PM	4:15:29 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	small antlers, maybe some branching on back tine
BR_41	28-Aug-14	Summer	Summer	1	11:01:18 AM	11:02:32 AM	M	20	2	Mammal	Caribou	1		1	N	grazing	no antlers
BR_41	29-Aug-14	Summer	Summer	1	4:18:13 PM	4:22:42 PM	M	50	5	Mammal	Caribou	4		4	N	grazing	large bulls
BR_41	31-Aug-14	Summer	Summer	1	11:52:35 AM	11:54:25 AM	M	30	3	Mammal	Caribou	1		1	N	walking	juvenile, lighter coloured and small antler buds - investigates camera
BR_41	2-Sep-14	Fall Migration	Summer	1	12:30:00 PM	12:43:48 PM	M	111	11	Mammal	Caribou	2		2	N	investigating camera	first individual disappears shortly into series, the other one with short antlers investigates camera for long period
BR_41	2-Sep-14	Fall Migration	Summer	2	1:04:13 PM	1:04:22 PM	M	10	1	Mammal	Caribou	4		4	N	walking	longer, single tine antlers; three individuals in background
BR_41	2-Sep-14	Fall Migration	Summer	3	3:50:07 PM	3:52:22 PM	M	50	5	Mammal	Caribou	1		1	N	investigating camera	curious individual with short antlers
BR_41	2-Sep-14	Fall Migration	Summer	4	5:02:21 PM	5:02:58 PM	M	20	2	Mammal	Caribou	1		1	N	walking	single tine antler with no front, looks very similar to one that has been recorded before
BR_41	3-Sep-14	Fall Migration	Summer	1	12:06:58 PM	12:07:30 PM	M	20	2	Mammal	Caribou	1		1	N	walking	smaller single tine antlers with no front tine, lighter coloured coat - different colour than one seen previous day
BR_41	24-Sep-14	Fall Migration	Fall Migration	1	10:03:47 AM	10:03:57 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	sniffs and goes
BR_42	6-Aug-14	Summer	Summer	1	7:00:00 AM	10:00:00 AM	M	17	1	Mammal	Caribou	1		1	N	grazing	grazing along lakeshore. Included timed photos where caribou can be seen bedded down at shoreline
BR_42	8-Aug-14	Summer	Summer	1	3:37:30 PM	3:38:58 PM	M	30	3	Mammal	Caribou	6		6	N	grazing	moving to right, then comes up hill and moves towards left. Smaller antlers, one small juvenile
BR_42	8-Aug-14	Summer	Summer	2	5:36:50 PM	5:36:90 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	smaller set of antlers, no branching
BR_42	9-Aug-14	Summer	Summer	1	3:59:53 AM	4:07:17 AM	M	51	5	Mammal	Caribou	6		6	N	grazing	three larger bulls, and three smaller individuals with non-branching antlers
BR_42	9-Aug-14	Summer	Summer	2	4:36:49 AM	4:59:06 AM	M	30	3	Mammal	Caribou	6		6	N	grazing	assuming these are new ones as they are heading left to right, as was the previous group. Four individuals don't appear to have antlers but are larger bodied (females?), one smaller juvenile with antler buds, and another with single tine antlers
BR_42	9-Aug-14	Summer	Summer	3	8:42:20 AM	8:54:36 AM	M	20	2	Mammal	Caribou	5		5	N	grazing	moving in same direction as previous groups. Smaller sized individuals with generally singled tine antlers
BR_42	9-Aug-14	Summer	Summer	4	3:06:17 PM	3:25:14 AM	M	60	6	Mammal	Caribou	6		6	N	walking	some general direction of movement. One curious caribou sniffing at camera
BR_42	9-Aug-14	Summer	Summer	5	3:41:44 PM	3:41:53 PM	M	10	1	Mammal	Caribou	4		4	N	grazing	three are grazing along lakeshore, the other is closer to the camera
BR_42	9-Aug-14	Summer	Summer	6	5:56:31 PM	5:58:29 PM	M	20	2	Mammal	Caribou	7		7	N	grazing	four larger sized bulls (one bedded), others are smaller individuals
BR_42	9-Aug-14	Summer	Summer	7	6:13:41 PM	6:13:50 PM	M	10	1	Mammal	Caribou	1		1	Y	grazing	seen in previous series
BR_42	9-Aug-14	Summer	Summer	8	6:48:43 PM	6:48:52 PM	M	10	1	Mammal	Caribou	1		1	N	walking	new individual, small single tine antlers
BR_42	9-Aug-14	Summer	Summer	9	7:45:16 PM	7:45:25 PM	M	10	1	Mammal	Caribou	4		4	N	walking	all look to be smaller sized individuals with short antlers
BR_42	9-Aug-14	Summer	Summer	9	8:05:10 PM	8:05:19 PM	M	10	1	Mammal	Caribou	1		1	N	walking	small antlers and shaggy coat
BR_42	9-Aug-14	Summer	Summer	10	8:37:20 PM	8:37:29 PM	M	10	1	Mammal	Caribou	8		8	N	walking	most have small single tine antlers, two look to be juveniles with small antler buds
BR_42	10-Aug-14	Summer	Summer	1	4:54:48 AM	4:55:18 AM	M	20	2	Mammal	Caribou	2		2	N	walking	small antlers
BR_42	10-Aug-14	Summer	Summer	2	6:09:11 AM	6:09:20 AM	M	10	1	Mammal	Caribou	2		2	N	grazing	could be part of groups seen on previous days, as the individuals are now moving from right to left
BR_42	10-Aug-14	Summer	Summer	3	6:33:34 AM	6:34:04 AM	M	20	2	Mammal	Caribou	2		2	N	grazing	could be part of groups seen on previous days, as the individuals are now moving from right to left
BR_42	10-Aug-14	Summer	Summer	4	7:49:59 AM	7:50:52 AM	M	20	2	Mammal	Caribou	1		1	N	investigating camera	small juvenile curious about camera
BR_42	11-Aug-14	Summer	Summer	1	6:13:01 AM	6:16:49 AM	M	80	8	Mammal	Caribou	2		2	N	walking	one small juvenile with slightly larger antler buds than one seen previously, and a lighter larger individual accompanies
BR_42	11-Aug-14	Summer	Summer	2	12:59:55 PM	1:19:21 PM	M	91	1	Mammal	Caribou	9		9	N	grazing	one small juvenile, three larger bulls walking along shoreline, and the rest have small or no antlers but are larger bodied
BR_42	12-Aug-14	Summer	Summer	1	7:47:35 AM	7:50:58 AM	M	40	4	Mammal	Caribou	1		1	N	walking	one small juvenile. Two individuals have darker chocolate coats, the rest are lighter. All have antlers, but not exceptionally large ones
BR_42	12-Aug-14	Summer	Summer	2	9:07:35 AM	9:07:44 AM	M	10	1	Mammal	Caribou	3		3	N	walking	large bulls, big racks
BR_42	12-Aug-14	Summer	Summer	3	8:19:45 PM	8:19:54 PM	M	10	1	Mammal	Caribou	1		1	N	investigating camera	quite scraggly coat, small antlers

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_42	12-Aug-14	Summer	Summer	4	9:11:58 PM	9:12:32 PM	M	20	2	Mammal	Caribou	2		2	N	walking	one individual with moderate rack, some branching on back tine, good looking coat; second individual is larger bull
BR_42	14-Aug-14	Summer	Summer	1	7:26:57 AM	7:30:10 AM	M	31	3	Mammal	Caribou	4		4	N	walking	one individual (single tine antlers) near camera, three walking left to right below camera, one of which is a juvenile
BR_42	14-Aug-14	Summer	Summer	2	9:29:38 PM	9:36:50 PM	M	91	1	Mammal	Caribou	1		1	N	investigating camera	this individual is similar to one seen previously, but not definitive
BR_42	15-Aug-14	Summer	Summer	1	9:41:51 AM	9:42:00 AM	M	10	1	Mammal	Caribou	2		2	N	walking	very possible these have been recorded previously, as they are individual with smaller sized antlers
BR_42	18-Aug-14	Summer	Summer	1	8:08:09 AM	8:17:54 AM	M	180	18	Mammal	Caribou	8		8	N	walking	walking amid snow. Two smaller juveniles mixed in, one larger bull, and the rest have small to moderate sized antlers
BR_42	19-Aug-14	Summer	Summer	1	4:51:23 AM	4:54:29 AM	M	50	5	Mammal	Caribou	2		2	N	investigating camera	camera is fogged so hard to count individuals - two are visible and have moderate sized antlers with branching
BR_42	19-Aug-14	Summer	Summer	2	5:38:36 AM	6:00:29 AM	M	71	7	Mammal	Caribou	3		3	N	walking	still fogged - two larger individuals plus a smaller juvenile
BR_42	21-Aug-14	Summer	Summer	1	11:05:13 AM	11:05:41 AM	M	20	2	Mammal	Caribou	1		1	N	walking	smallish antlers, good looking coat
BR_42	22-Aug-14	Summer	Summer	1	4:22:53 AM	4:26:25 AM	M	70	7	Mammal	Caribou	2		2	N	investigating camera	smaller juvenile curious about camera, another larger individual grazes in background
BR_42	23-Aug-14	Summer	Summer	1	9:15:47 AM	9:15:56 AM	M	10	1	Mammal	Caribou	4		4	N	grazing	one juvenile, the others look to be larger, but non-antlered individuals
BR_42	24-Aug-14	Summer	Summer	1	1:37:59 AM	1:38:08 AM	M	10	1	Mammal	Caribou	2		2	N	walking	two individuals walk by in the night, cannot tell features
BR_42	24-Aug-14	Summer	Summer	2	1:59:01 PM	2:00:32 PM	M	20	2	Mammal	Caribou	7		7	N	walking	first individual has smaller antlers but some branching, the rest are progressively bigger bulls (several large racks)
BR_42	24-Aug-14	Summer	Summer	3	3:59:37 PM	4:00:53 PM	M	21	2	Mammal	Caribou	5		5	N	walking	a couple large bulls, the rest have smaller antlers. It also looks like there may be caribou moving way off in the distance based on movement of dots (not counted)
BR_42	26-Aug-14	Summer	Summer	1	1:22:45 PM	1:22:54 PM	M	10	1	Mammal	Caribou	1		1	N	walking	just visible on left side of frame, cannot tell if it has antlers
BR_42	29-Aug-14	Summer	Summer	1	11:52:55 AM	11:56:27 AM	M	20	2	Mammal	Caribou	8		8	N	walking	most have small racks with no branching, two are larger bulls with more well developed antlers
BR_42	31-Aug-14	Summer	Summer	1	7:07:45 PM	7:08:36 PM	M	30	3	Mammal	Caribou	6		6	N	walking	most look to be larger bulls, some are near lakeshore
BR_42	2-Sep-14	Fall Migration	Summer	1	2:43:13 PM	2:43:41 PM	M	20	2	Mammal	Caribou	10		10	N	walking	all but one is a bull with a large, well defined rack, moving to left
BR_42	9-Sep-14	Fall Migration	Summer	1	1:24:30 AM	1:26:04 AM	M	20	2	Mammal	Grey Wolf	1		1	N	walking	looks to be pretty light individual, walks around and checks out camera (likely attracted by red light in the dark)
BR_42	10-Sep-14	Fall Migration	Summer	1	10:08:33 AM	10:09:08 AM	M	20	2	Mammal	Caribou	1		1	N	grazing	juvenile with small antler buds, larger individual with small rack with some branching
BR_43	4-Aug-14	Summer	Summer	1	10:51:23	10:52:17	M	30	3	Mammal	Caribou	9		9	N	Walking	mixed group, juveniles and large bulls and what look to be females
BR_43	5-Aug-14	Summer	Summer	1	17:00:03	17:01:57	M	50	5	Mammal	Caribou	8		8	N	grazing	some smaller juveniles (small antler buds)
BR_43	6-Aug-14	Summer	Summer	1	18:58:55	18:59:05	M	10	1	Mammal	Caribou	1	1	2	N	Walking	looks to be a calf following a female
BR_43	8-Aug-14	Summer	Summer	1	18:43:04	18:46:05	M	50	1	Mammal	Caribou	3		3	N	grazing	big bull, nice photos
BR_43	8-Aug-14	Summer	Summer	2	19:05:00	19:15:50	M	180	18	Mammal	Caribou	30	1	31	N	Walking	hard to distinguish calves from juveniles
BR_43	8-Aug-14	Summer	Summer	3	19:38:44	20:01:09	M	100	10	Mammal	Caribou	54	12	66	N	grazing	hard to distinguish calves from juveniles
BR_43	9-Aug-14	Summer	Summer	1	3:58:43	3:58:52	M	10	1	Mammal	Caribou	1		1	N	Walking	
BR_43	9-Aug-14	Summer	Summer	2	9:11:55	9:13:15	M	40	4	Mammal	Caribou	8		8	N	Walking	two juveniles mixed in (small antler buds)
BR_43	9-Aug-14	Summer	Summer	3	12:19:05	12:20:01	M	20	2	Mammal	Caribou	1		1	N	grazing	
BR_43	9-Aug-14	Summer	Summer	4	12:38:52	12:39:26	M	20	2	Mammal	Caribou	1		1	N	Walking	single antler (missing other)
BR_43	9-Aug-14	Summer	Summer	5	14:15:39	14:15:48	M	10	1	Mammal	Caribou	1		1	N	grazing	
BR_43	9-Aug-14	Summer	Summer	6	20:09:22	20:24:42	M	100	10	Mammal	Caribou	11		11	N	grazing	several smaller individuals mixed in (juveniles)
BR_43	9-Aug-14	Summer	Summer	7	20:59:17	20:59:26	M	10	1	Mammal	Caribou	1		1	N	Walking	
BR_43	10-Aug-14	Summer	Summer	1	13:09:55	13:53:42	M	220	22	Mammal	Caribou	7		7	N	Walking	four large bulls, the rest are smaller individuals with antlers that do no branch (two look to be juveniles)
BR_43	10-Aug-14	Summer	Summer	1	14:51:27	14:52:07	M	20	2	Mammal	Caribou	2		2	N	Walking	look similar to those seen before (one is a juvenile with smaller antler buds)
BR_43	10-Aug-14	Summer	Summer	2	18:43:50	18:45:56	M	30	3	Mammal	Caribou	1		1	N	Walking	
BR_43	10-Aug-14	Summer	Summer	3	20:01:29	20:01:38	M	10	1	Mammal	Caribou	2		2	N	Walking	
BR_43	10-Aug-14	Summer	Summer	4	20:20:38	20:21:16	M	20	2	Mammal	Caribou	12	1	13	N	Walking	one definitive calf, a few juveniles, some with smaller sized antlers, and one large male trails behind
BR_43	10-Aug-14	Summer	Summer	5	22:13:46	20:25:57	M	20	2	Mammal	Caribou	5	1	6	N	Walking	
BR_43	11-Aug-14	Summer	Summer	1	4:52:59	4:53:11	M	10	1	Mammal	Caribou	1	1	2	N	Walking	
BR_43	11-Aug-14	Summer	Summer	2	5:47:37	5:47:48	M	10	1	Mammal	Caribou	1		1	N	Walking	
BR_43	11-Aug-14	Summer	Summer	3	7:50:47	7:50:57	M	10	1	Mammal	Caribou	7		7	N	Walking	one large bull mixed in with group
BR_43	11-Aug-14	Summer	Summer	4	11:26:30	11:26:40	M	10	1	Mammal	Caribou	1		1	N	standing	smaller antlers, no branching
BR_43	12-Aug-14	Summer	Summer	1	3:51:29	3:52:50	M	30	3	Mammal	Caribou	2		2	N	grazing	bulls, one has a larger rack
BR_43	12-Aug-14	Summer	Summer	2	6:01:51	6:20:00	M	10	1	Mammal	Caribou	41		41	N	Walking	tight moving herd, no calves but lots of smaller juveniles with antler buds just showing

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_43	13-Aug-14	Summer	Summer	1	3:20:23	4:26:40	M	400	40	Mammal	Caribou	50	1	51	N	Walking	one definitive calf mixed on, a lot of moving back and forth so it is hard to count total numbers. Several juveniles in group, as seen by small antler buds
BR_43	15-Aug-14	Summer	Summer	1	13:27:25	13:27:35	M	10	1	Mammal	Caribou	2		2	N	Walking	
BR_43	15-Aug-14	Summer	Summer	2	14:44:10	14:44:38	M	20	2	Mammal	Caribou	12		12	N	Walking	most have smaller antlers, just a few show evidence of branching
BR_43	15-Aug-14	Summer	Summer	3	16:00:30	16:40:00	M	10	1	Mammal	Caribou	1		1	N	Walking	
BR_43	15-Aug-14	Summer	Summer	4	17:01:31	17:01:40	M	10	1	Mammal	Caribou	2		2	N	Walking	
BR_43	18-Aug-14	Summer	Summer	5	3:40:40	3:40:50	M	10	1	Mammal	Caribou	2		2	N	Walking	
BR_43	20-Aug-14	Summer	Summer	1	4:17:39	4:18:30	M	30	1	Mammal	Caribou	1		1	N	Walking	large bull
BR_43	20-Aug-14	Summer	Summer	2	9:33:31	9:38:44	M	80	8	Mammal	Caribou	3		3	N	grazing	
BR_43	20-Aug-14	Summer	Summer	3	16:50:16	16:50:26	M	10	1	Mammal	Caribou	4		4	N	grazing	one large bull mixed in with group
BR_43	21-Aug-14	Summer	Summer	1	4:52:59	4:53:50	M	30	3	Mammal	Caribou	1		1	N	Walking	antlers branched on back tine
BR_43	22-Aug-14	Summer	Summer	1	15:32:31	15:34:35	M	40	4	Mammal	Caribou	2		2	N	grazing	
BR_43	22-Aug-14	Summer	Summer	2	16:36:41	16:41:59	M	20	2	Mammal	Caribou	1		1	N	Walking	
BR_43	22-Aug-14	Summer	Summer	3	17:34:01	17:34:33	M	20	2	Mammal	Caribou	1		1	N	Walking	
BR_43	22-Aug-14	Summer	Summer	4	17:55:18	17:55:53	M	20	2	Mammal	Caribou	3		3	N	grazing	
BR_43	23-Aug-14	Summer	Summer	1	2:21:46	2:21:57	M	10	1	Mammal	Caribou	1		1	N	grazing	
BR_43	23-Aug-14	Summer	Summer	2	20:29:58	20:30:09	M	10	1	Mammal	Caribou	2		2	N	grazing	
BR_43	24-Aug-14	Summer	Summer	1	16:48:58	16:49:08	M	10	1	Mammal	Caribou	1		1	N	grazing	
BR_43	24-Aug-14	Summer	Summer	2	22:37:39	22:36:54	M	30	3	Mammal	Grey wolf	1		1	N	Walking	
BR_43	30-Aug-14	Summer	Summer	1	9:41:24	9:42:30	M	20	1	Mammal	Caribou	4		4	N	Walking	
BR_43	31-Aug-14	Summer	Summer	1	6:03:18	6:03:28	M	10	1	Mammal	Caribou	1		1	N	Walking	
BR_43	2-Sep-14	Fall Migration	Summer	1	7:35:15	7:35:25	M	20	1	Mammal	Caribou	1		1	N	Walking	
BR_43	2-Sep-14	Fall Migration	Summer	2	8:32:12	8:32:21	M	10	1	Mammal	Caribou	2		2	N	grazing	big bulls
BR_43	2-Sep-14	Fall Migration	Summer	3	17:36:37	17:37:11	M	20	2	Mammal	Caribou	2		2	N	Walking	smaller antlers, no branching
BR_43	9-Sep-14	Fall Migration	Summer	1	20:23:15	20:29:05	M	60	6	Mammal	Caribou	4		4	N	Walking	one large bull, one smaller juvenile with antler buds just showing, and the other two have smaller sized antlers
BR_43	9-Sep-14	Fall Migration	Summer	2	21:08:36	21:12:02	M	90	9	Mammal	Caribou	8		8	N	Running	
BR_43	9-Sep-14	Fall Migration	Summer	1	1:12:59	2:40:28	M	70	7	Mammal	Caribou	10		10	N	grazing	aPossibly same individuals that have grazing in area, but light too poor to differentiate individuals
BR_43	12-Sep-14	Fall Migration	Summer	1	18:05:57	18:06:06	M	10	1	Mammal	Caribou	1		1	N	grazing	
BR_43	13-Sep-14	Fall Migration	Summer	1	12:16:12	12:19:52	M	50	5	Mammal	Caribou	7		7	N	grazing	
BR_43	13-Sep-14	Fall Migration	Summer	2	16:28:28	16:44:22	M	40	4	Mammal	Caribou	17		17	N	Walking	first is a large bull, the remainder are a mixed of smaller antlered individuals and juveniles
BR_43	13-Sep-14	Fall Migration	Summer	3	18:18:10	18:18:19	M	10	1	Mammal	Caribou	2		2	N	Walking	
BR_43	14-Sep-14	Fall Migration	Summer	1	16:00:31	16:00:41	M	10	1	Mammal	Caribou	1		1	N	Walking	big bull
BR_43	17-Sep-14	Fall Migration	Summer	1	6:23:40	6:23:50	M	10	1	Mammal	Caribou	1		1	N	Walking	smaller individual, likely juvenile (no antlers showing)
BR_43	17-Sep-14	Fall Migration	Summer	2	8:11:02	8:11:12	M	10	1	Bird	Common Raven	1		1	N	standing	
BR_43	25-Sep-14	Fall Migration	Fall Migration	1	6:20:58	6:21:08	M	10	1	Mammal	Caribou	1		1	N	Walking	large bull
BR_43	26-Sep-14	Fall Migration	Fall Migration	1	11:45:33	11:45:43	M	10	1	Mammal	Caribou	1		1	N	Walking	antlers branched on back tine
BR_45	8-Aug-14	Summer	Summer	1	5:06:37 PM	5:06:48 PM	M	10	1	Mammal	Caribou	1		1	N	walking	bull, ragged looking coat
BR_45	9-Aug-14	Summer	Summer	1	9:06:39 AM	9:07:18 AM	M	20	2	Mammal	Caribou	190	6	196	N	walking	very hard to estimate numbers are there are so many. Definitely undercounted calves that are in the distance as they are too hard to differentiate from juveniles
BR_45	9-Aug-14	Summer	Summer	2	10:03:27 PM	10:04:18 PM	M	30	3	Mammal	Caribou	100	3	103	N	walking	large group, estimated numbers. Calves, juveniles, females, and males
BR_45	10-Aug-14	Summer	Summer	1	9:07:34 PM	9:07:43 PM	M	10	1	Mammal	Caribou	1		1	N	running	small juvenile running
BR_45	11-Aug-14	Summer	Summer	1	3:28:15 PM	3:29:27 PM	M	20	2	Mammal	Caribou	13		13	N	grazing	some foraging in foreground, others foraging in background along side lake. Generally all fairly small individuals, small racks
BR_45	11-Aug-14	Summer	Summer	2	9:06:50 AM	9:22:17 PM	M	250	25	Mammal	Caribou	135	4	139	N	walking	very large group, estimated numbers - a large number of them were travelling along the lakeshore. Probably underestimated calves
BR_45	11-Aug-14	Summer	Summer	3	10:34:30 PM	10:37:14 PM	M	40	4	Mammal	Caribou	7		7	N	grazing	one very large male, the rest are generally smaller
BR_45	12-Aug-14	Summer	Summer	1	1:31:55 AM	1:34:30 AM	M	70	7	Mammal	Caribou	11	1	12	N	grazing	one calf with cow, mixed in with males
BR_45	12-Aug-14	Summer	Summer	2	3:52:17 AM	3:52:46 AM	M	20	2	Mammal	Caribou	1		1	N	walking	quite small rack, not a lot of branching
BR_45	13-Aug-14	Summer	Summer	1	1:08:35 AM	1:09:24 AM	M	20	2	Mammal	Caribou	2		2	N	walking	two bulls, not huge antlers
BR_45	16-Aug-14	Summer	Summer	1	9:52:30 AM	9:58:12 AM	M	50	5	Mammal	Caribou	11		11	N	walking	most walking close to camera, three others in distance. Mostly individuals with smaller antler buds and some branched antlers.
BR_45	20-Aug-14	Summer	Summer	1	5:51:31 AM	5:51:40 AM	M	10	1	Mammal	Caribou	2		2	N	walking	quite certain these two individuals have been spotted a few days before
BR_45	22-Aug-14	Summer	Summer	1	5:12:24 PM	5:12:33 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	smaller rack, not at lot of ragged patches on coat
BR_45	22-Aug-14	Summer	Summer	2	8:33:44 PM	8:35:04 PM	M	30	3	Mammal	Caribou	2		2	N	grazing	smaller sized individuals, very short antlers - scraggly tufts of fur along the back

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_45	23-Aug-14	Summer	Summer	1	5:06:25 AM	5:21:17 AM	M	60	6	Mammal	Caribou	5		5	N	grazing	most have scraggly looking coats, smaller, non-branched velvety antlers. One or two have clean coats
BR_45	23-Aug-14	Summer	Summer	2	5:43:01 AM	5:43:37 AM	M	20	2	Mammal	Caribou	1		1	N	walking	pretty small individual
BR_45	23-Aug-14	Summer	Summer	3	8:06:10 AM	8:23:12 AM	M	60	6	Mammal	Caribou	10		10	N	walking	group foraging in background and foreground. Mostly individuals with small antlers
BR_45	23-Aug-14	Summer	Summer	4	6:24:30 PM	6:25:19 PM	M	30	3	Mammal	Caribou	2		2	N	walking	larger individual appears to be grazing, smaller juvenile with just the tiniest of antler buds comes up to investigate camera
BR_45	23-Aug-14	Summer	Summer	5	7:05:34 PM	7:16:09 PM	M	90	9	Mammal	Caribou	5		5	N	walking	smaller juvenile (bigger antler buds than one just previously seen) walking in foreground and another grazing in background, other come to join later
BR_45	23-Aug-14	Summer	Summer	6	7:10:08 PM	7:13:55 PM	M	40	4	Bird	Canada Goose	10		10	N	grazing	alighted for a small portion of triggered series with caribou, right hand side just down hill
BR_45	23-Aug-14	Summer	Summer	7	7:59:42 PM	8:12:12 PM	M	121	12	Mammal	Caribou	20		20	N	walking	lots moving around in foreground and background, ends with a small juvenile investigating camera
BR_45	23-Aug-14	Summer	Summer	8	8:41:42 PM	8:41:52 PM	M	10	1	Mammal	Caribou	16		16	N	walking	possibly same group, but there are some larger males in this group, whereas there wasn't in the previous one
BR_45	23-Aug-14	Summer	Summer	9	9:52:55 PM	9:55:33 PM	M	50	5	Mammal	Caribou	5		5	N	grazing	just milling about, all have smaller sized antlers, one looks to be a juvenile
BR_45	24-Aug-14	Summer	Summer	1	12:09:41 AM	12:30:45 AM	M	71	7	Mammal	Caribou	7		7	N	grazing	thee larger bulls to start off with, then smaller individuals move through
BR_45	24-Aug-14	Summer	Summer	2	3:36:55 AM	3:37:05 AM	M	10	1	Mammal	Caribou	1		1	Y	grazing	this individual was part of previous group
BR_45	24-Aug-14	Summer	Summer	3	5:48:48 AM	5:51:45 AM	M	90	9	Mammal	Caribou	37	1	38	N	grazing	mixed group, moving to the left
BR_45	24-Aug-14	Summer	Summer	4	5:50:30 PM	5:51:56 PM	M	20	2	Mammal	Caribou	1		1	N	walking	turns toward camera and sniffs
BR_45	25-Aug-14	Summer	Summer	1	5:53:46 PM	5:53:55 PM	M	10	1	Mammal	Caribou	2		2	N	grazing	two big bulls, big racks
BR_45	26-Aug-14	Summer	Summer	1	6:02:02 AM	6:02:45 AM	M	20	2	Mammal	Grey Wolf	1		1	N	walking	light individual, though not white. Zig-zags through view
BR_45	29-Aug-14	Summer	Summer	1	6:08:09 PM	6:08:19 PM	M	10	1	Mammal	Caribou	1		1	N	walking	moderate rack, some branching in front and back tines. Looks back at camera
BR_45	30-Aug-14	Summer	Summer	1	5:04:51 AM	5:13:17 AM	M	90	9	Mammal	Caribou	3		3	N	grazing	looks to be three separate individuals, though there could be one more - camera is fogged and light is poor
BR_45	31-Aug-14	Summer	Summer	1	8:39:45 AM	8:39:55 AM	M	10	1	Mammal	Caribou	2		2	N	grazing	smaller sized racks
BR_45	31-Aug-14	Summer	Summer	2	12:23:48 PM	12:24:57 PM	M	30	3	Mammal	Caribou	10		10	N	grazing	smaller sized individuals, not well defined racks. One is a small juvenile.
BR_45	31-Aug-14	Summer	Summer	3	4:55:21 PM	5:03:26 PM	M	111	11	Mammal	Caribou	2		2	N	investigating camera	one very curious individual, then another that is has a well kept coat and a small set of antlers with some branching
BR_45	31-Aug-14	Summer	Summer	4	6:28:05 PM	6:28:16 PM	M	10	1	Mammal	Caribou	5		5	N	grazing	one large male, the rest have smaller racks
BR_45	31-Aug-14	Summer	Summer	5	8:01:52 PM	8:02:21 PM	M	20	2	Mammal	Caribou	2		2	N	grazing	smaller individuals, non branched antlers
BR_45	1-Sep-14	Fall Migration	Summer	1	7:21:55 PM	7:23:25 PM	M	30	3	Mammal	Caribou	1		1	N	grazing	good looking coat, some branching on antlers
BR_45	2-Sep-14	Fall Migration	Summer	1	6:15:03 AM	6:19:10 AM	M	20	2	Mammal	Caribou	5		5	N	grazing	one comes to investigate the camera. Most have smaller antlers
BR_45	2-Sep-14	Fall Migration	Summer	2	1:04:13 PM	1:05:03 PM	M	30	3	Mammal	Caribou	5		5	N	grazing	small antler, only one where branching can be seen on back tine
BR_45	2-Sep-14	Fall Migration	Summer	3	5:41:43 PM	5:43:17 PM	M	40	4	Mammal	Caribou	16		16	N	grazing	mixed group, some have larger antlers, some smaller, and one juvenile with antler buds barely showing
BR_45	11-Oct-14	Fall Migration	Fall Migration	1	3:46:52 PM	3:50:56 PM	M	80	8	Mammal	Grizzly Bear	1		1	N	investigating camera	jiggles camera slightly as it investigates tripod, then it topples the tripod so the camera is pointing down. No more effective photo taking because of displaced view.
BR_46	14-Jul-14	Post-calving	Summer	1	2:12:09 PM	2:16:09 PM	M	90	9	Mammal	Grizzly Bear	1		1	N	investigating camera	very curious bear, in front of camera for a long while
BR_46	5-Aug-14	Summer	Summer	1	1:25:19 AM	1:35:28 AM	M	21	2	Mammal	Caribou	1		1	N	walking	antlered male, smaller sized rack, walking around and grazing
BR_46	10-Aug-14	Summer	Summer	1	3:50:48 PM	3:54:10 PM	M	90	9	Mammal	Caribou	130	14	144	N	walking	large group, estimated numbers as they moved from left to right. Lots of males, females, and several calves mixed in. Some large bulls trailing at end of group. Probably more than was counted
BR_46	13-Aug-14	Summer	Summer	1	7:01:00 AM	7:02:30 AM	M	50	5	Mammal	Caribou	43	10	53	N	walking	assuming they are a different group. Smaller sized nursery group with a few males mixed in. Lots of smaller juveniles following around, hard to tell from this years calves
BR_46	15-Aug-14	Summer	Summer	1	3:01:25 PM	3:01:56 PM	M	20	2	Mammal	Caribou	10	1	11	N	grazing	mostly grazing as they move. Two really large bulls in foreground, a smaller group in background with one calf.
BR_46	15-Aug-14	Summer	Summer	2	9:36:59 PM	10:00:00 PM	M	81	8	Mammal	Caribou	2		2	Y	grazing	these are the really big bulls from the previous group, grazing by themselves now. Caught on one timed photo at the end before camera turns off.
BR_46	16-Aug-14	Summer	Summer	1	1:44:45 PM	1:56:16 PM	M	70	7	Mammal	Caribou	9		9	N	grazing	all of them are smaller individuals, not well developed antlers. One juvenile that hardly has antler buds
BR_46	16-Aug-14	Summer	Summer	2	9:18:45 PM	10:00:01 PM	M	30	3	Mammal	Caribou	3		3	N	grazing	one of these bulls may have been counted before, looks to be the same large male.
BR_46	18-Aug-14	Summer	Summer	1	7:008:44 AM	7:09:41 AM	M	20	2	Mammal	Caribou	1		1	N	walking	smaller individual, short antlers
BR_46	19-Aug-14	Summer	Summer	1	8:43:05 PM	8:43:14 PM	M	10	1	Mammal	Caribou	1		1	N	grazing	could be the same as the one seen yesterday, though hard to tell
BR_46	20-Aug-14	Summer	Summer	1	4:33:42 PM	4:41:49 PM	M	40	4	Mammal	Caribou	1		1	N	grazing	bull, largish rack - grazes around area for quite a while before leaving
BR_46	20-Aug-14	Summer	Summer	2	8:46:02 PM	8:52:50 PM	M	20	2	Mammal	Caribou	1		1	N	grazing	different individual, small branched antler

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_46	21-Aug-14	Summer	Summer	1	3:56:29 AM	4:08:49 AM	M	61	6	Mammal	Caribou	4		4	N	grazing	one fairly small individual, the rest look to be antlered individuals
BR_46	21-Aug-14	Summer	Summer	2	6:11:05 AM	6:18:18 AM	M	30	3	Mammal	Caribou	1		1	Y	grazing	this is the same small individual with short, branched antler seen day before
BR_46	21-Aug-14	Summer	Summer	3	7:40:28 AM	7:40:37 AM	M	10	1	Mammal	Caribou	2		2	Y/N	grazing	short, branched antler individual is back with another new individual
BR_46	23-Aug-14	Summer	Summer	1	11:06:59 AM	11:07:52 AM	M	20	2	Mammal	Caribou	8		8	N	grazing	a few large males, then some caribou with smaller racks
BR_46	23-Aug-14	Summer	Summer	2	6:03:29 PM	6:03:38 PM	M	10	1	Mammal	Caribou	3		3	N	grazing	very short antlers on all of them
BR_46	25-Aug-14	Summer	Summer	1	2:28:26 AM	2:28:56 AM	M	20	2	Mammal	Caribou	7		7	N	grazing	
BR_46	31-Aug-14	Summer	Summer	1	5:45:45 AM	6:00:10 AM	M	31	1	Mammal	Caribou	3		3	N	grazing	large bulls grazing in front of a gorgeous rainbow
BR_46	31-Aug-14	Summer	Summer	2	9:23:35 PM	9:32:36 PM	M	21	2	Mammal	Caribou	2		2	N	walking	dark, hard to ID individual (sex, build)
BR_46	1-Sep-14	Fall Migration	Summer	1	3:33:49 AM	3:33:58 AM	M	10	1	Mammal	Caribou	2		2	N	walking	could be the same seen hours before, but too hard to tell
BR_46	10-Sep-14	Fall Migration	Summer	1	10:23:56 AM	10:24:43 AM	M	30	3	Mammal	Caribou	19		19	N	grazing	mostly grazing, some walking. Some big bulls
BR_46	17-Sep-14	Fall Migration	Summer	1	8:25:02 AM	8:27:50 AM	M	30	3	Mammal	Caribou	12		12	N	grazing	smaller guys, little antlers - last guy to pass has one long, single antler
BR_48	10-Aug-14	Summer	Summer	1	5:46:35 PM	5:47:04 PM	M	20	2	Mammal	Caribou	1		1	N	walking	big velvety antlers. Investigates camera, then moves off
BR_48	14-Aug-14	Summer	Summer	1	3:33:25 AM	3:40:08 AM	M	20	2	Mammal	Caribou	4		4	N	feeding	smaller sized individuals travelling as a group (generally smaller antlers). Either walking or feeding while travelling left to right
BR_48	14-Aug-14	Summer	Summer	2	6:24:26 AM	8:00:10 AM	M	54	5	Mammal	Caribou	5		5	N	bedded	Five separate individuals identified, one triggering the camera in the first series with two bedded in background, timed photos where caribou moved in background, another joins them, and then they all leave and a small caribou triggers the camera
BR_48	14-Aug-14	Summer	Summer	3	7:00:01 AM	7:14:12 AM	M	30	3	Mammal	Caribou	15		15	N	walking	first group seen in distance, then one walks by camera, then one investigates camera
BR_48	14-Aug-14	Summer	Summer	4	8:21:25 PM	8:21:59 PM	M	20	2	Mammal	Caribou	1		1	N	investigating camera	
BR_48	15-Aug-14	Summer	Summer	1	11:01:19 PM	11:01:28 PM	M	10	1	Mammal	Caribou	2	1	3	N	running	moving quickly
BR_48	16-Aug-14	Summer	Summer	1	10:29:14 AM	10:29:24 AM	M	10	1	Mammal	Caribou	1		1	N	walking	smaller antler buds. Nothing distinctive
BR_48	16-Aug-14	Summer	Summer	2	10:33:15 AM	10:49:28 AM	M	170	17	Mammal	Caribou	6		6	Y/N	investigating camera	A total of six individuals can be seen across series, one has been counted in the previous series. A few are only counted as bedded individuals in background.
BR_48	16-Aug-14	Summer	Summer	3	11:53:15 AM	11:53:55 AM	M	20	2	Mammal	Caribou	1		1	N	investigating camera	smelling camera. Cannot tell if it's one that's been seen before.
BR_48	16-Aug-14	Summer	Summer	4	12:06:14 PM	12:06:23 PM	M	10	1	Mammal	Caribou	1		1	N	walking	larger rack, not been seen before
BR_48	16-Aug-14	Summer	Summer	5	12:24:35 PM	12:27:13 PM	M	40	4	Mammal	Caribou	1		1	N	walking	juvenile, just barely growing antler buds
BR_48	16-Aug-14	Summer	Summer	6	7:28:22 PM	7:29:45 PM	M	30	3	Mammal	Caribou	5		5	N	feeding	two bedded down, three standing and foraging. Two looks like more mature adult bulls, others have smaller racks
BR_48	18-Aug-14	Summer	Summer	1	2:57:22 PM	2:58:06 PM	M	20	2	Mammal	Caribou	1		1	N	feeding	moderate rack, some branching in front and back tines
BR_48	18-Aug-14	Summer	Summer	2	4:23:14 PM	4:23:23 PM	M	10	1	Mammal	Caribou	2		2	N	feeding	two smaller individuals, one has very small non-branched antlers, the other more sizable rack but different that previously recorded individual
BR_48	18-Aug-14	Summer	Summer	3	6:23:08 PM	6:28:56 PM	M	110	11	Mammal	Caribou	1		1	N	walking	smaller individual walks up and checks out camera. Different antler shape than other seen before.
BR_48	19-Aug-14	Summer	Summer	1	10:56:18 AM	11:04:29 AM	M	51	5	Mammal	Caribou	3		3	N	feeding	one curious individual (looks to be juvenile) investigating camera while another grazes in the background. The another smaller individual comes to check out the camera before walking away. Includes one timed photo in the middle of series
BR_48	19-Aug-14	Summer	Summer	2	12:05:10 PM	12:05:38 PM	M	20	2	Mammal	Caribou	5		5	N	feeding	looks to be one female that comes to check out camera, while four graze in the distance near the lake
BR_48	19-Aug-14	Summer	Summer	3	12:37:43 PM	12:37:52 PM	M	10	1	Mammal	Caribou	2		2	N	feeding	one near camera, while another grazes in background. Hard to tell if they are the same ones
BR_48	19-Aug-14	Summer	Summer	4	2:15:38 PM	2:20:18 PM	M	80	8	Mammal	Caribou	1		1	N	investigating camera	very curious. Larger looking bull, well defined antlers
BR_48	20-Aug-14	Summer	Summer	1	12:15:18 AM	12:15:56 AM	M	20	2	Mammal	Caribou	1		1	N	investigating camera	antlers don't have branching but they are generally long - different than those seen before
BR_48	21-Aug-14	Summer	Summer	1	12:48:06 AM	12:51:22 AM	M	70	7	Mammal	Caribou	4		4	N	investigating camera	one curious individual at camera, three individuals behind staring at camera
BR_48	21-Aug-14	Summer	Summer	2	1:28:53 AM	1:29:02 AM	M	10	1	Mammal	Caribou	1		1	N	grazing	walks past camera. Antlers, but not huge ones
BR_48	21-Aug-14	Summer	Summer	3	4:29:43 PM	4:32:38 PM	M	41	4	Mammal	Caribou	1		1	N	grazing	no antlers, curious about camera
BR_48	23-Aug-14	Summer	Summer	1	9:52:20 AM	9:52:29 AM	M	10	1	Mammal	Caribou	3		3	N	grazing	fairly small antlers on all individuals
BR_48	24-Aug-14	Summer	Summer	1	2:34:31 PM	2:49:16 PM	M	60	6	Mammal	Caribou	7		7	N	grazing	first individual has one antler and checks out camera. More show up as that individual moves off
BR_48	24-Aug-14	Summer	Summer	2	5:10:53 PM	5:19:53 PM	M	50	5	Mammal	Caribou	5		5	N	grazing	one individual investigates the camera while others graze. Look to be different individual that before
BR_48	24-Aug-14	Summer	Summer	3	6:57:49 PM	7:00:10 AM	M	41	4	Mammal	Caribou	2	1	3	N	grazing	one investigates camera, while a female and a calf join
BR_48	26-Aug-14	Summer	Summer	1	12:30:00 PM	12:54:28 PM	M	11	1	Mammal	Caribou	43		43	N	grazing	a lot moving along the shoreline of lake, these move out towards the distance while more move across closer to camera
BR_48	26-Aug-14	Summer	Summer	2	1:01:05 PM	1:08:37 PM	M	80	8	Mammal	Caribou	5		5	N	bedded	one checking out camera, four are bedded in background. These look like new ones based on time series

Appendix 2. Images of Wildlife Captured by Terrestrial RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_48	26-Aug-14	Summer	Summer	3	4:48:18 PM	4:53:27 PM	M	60	6	Mammal	Caribou	24		24	N	grazing	approximate numbers based on ones that are visible/can be counted.
BR_48	27-Aug-14	Summer	Summer	1	6:58:25 PM	7:00:36 AM	M	41	4	Mammal	Caribou	6		6	N	grazing	one curious juvenile at the camera, another grazing. The several more show up from behind camera, and two do some loops around (and are identified based on antlers)
BR_48	28-Aug-14	Summer	Summer	1	6:08:40 AM	6:08:49 AM	M	10	1	Mammal	Caribou	5		5	N	grazing	three in foreground, plus a few more grazing in distance. Look to be mostly females, one very small juvenile that barely has antler buds
BR_48	29-Aug-14	Summer	Summer	1	7:18:29 AM	7:19:49 AM	M	30	3	Mammal	Caribou	1		1	N	grazing	smaller antlers, not many branches yet
BR_48	29-Aug-14	Summer	Summer	2	10:02:09 AM	10:05:17 AM	M	40	4	Mammal	Caribou	4		4	N	grazing	four grazing close to camera, another in the distance. All have antlers, but they are fairly small sets
BR_48	29-Aug-14	Summer	Summer	3	5:09:51 PM	5:12:09 PM	M	40	4	Mammal	Caribou	2		2	N	grazing	curious juvenile with a larger male grazing just in front of camera
BR_48	30-Aug-14	Summer	Summer	1	4:31:20 AM	4:35:38 AM	M	90	9	Mammal	Caribou	5	1	6	N	grazing	counted 6 individuals, though there could be more because it's dark and individuals are so close to the camera. One very curious juvenile and several others with smaller sets of antlers (one doesn't have antler buds and is identified as a calf)
BR_48	30-Aug-14	Summer	Summer	2	7:13:00 AM	7:13:09 AM	M	10	1	Mammal	Caribou	8	3	11	N	running	startled/very alert individuals moving right to left - stop and look back at what presumably is a wolf (because wolf strides by moments later - next series)
BR_48	30-Aug-14	Summer	Summer	3	7:19:05 AM	7:19:14 AM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	mostly white individual strolls by camera from left to right, likely was chasing caribou group with calves

Appendix 3

Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Rescan™
an ERM company

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_91	12-Jul-14	Post-calving	Summer	1	1:04:54 AM	1:05:04 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	angry bear, knocks camera over right after it got set up!
BR_92	10-Jul-14	Post-calving	Summer	1	4:53:17 AM	4:53:27 AM	M	10	1	Mammal	Caribou	1		1	N	walking	jots past camera, smaller sized antlers
BR_92	11-Jul-14	Post-calving	Summer	1	12:13:17 PM	12:14:10 PM	M	30	3	Mammal	Caribou	1		1	N	walking	smaller antler buds, curious individual that walks up to camera
BR_92	16-Jul-14	Post-calving	Summer	1	5:05:54 PM	5:06:05 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	quite blonde individual
BR_92	20-Jul-14	Post-calving	Summer	1	3:38:48 AM	3:40:21 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	maybe the same individual, looks to be quite blonde. Knock tripod over at the end.
BR_93	11-Jul-14	Post-calving	Summer	1	5:39:04 PM	5:42:51 PM	M	50	5	Mammal	Grizzly Bear	1		1	N	investigating camera	rocks it back and forth, but the tripod stays up.
BR_93	25-Jul-14	Post-calving	Summer		10:30:00 PM		T	1		Bird	Lapland Longspur	1		1	N	walking	male pecking at ground
BR_93	7-Aug-14	Summer	Summer	1	6:38:35 AM	6:40:21 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_93	12-Sep-14	Fall Migration	Summer		6:30:00 AM		T	1		Mammal	Caribou	2		2	N	walking	walking in distance, two bulls with racks
BR_93	26-Mar-15	Winter	Winter		12:00:00 PM		T	1		Mammal	Wolverine	2		2	N	walking	walking around in distance, can be seen in the two following timed photos so they are hanging around in that area.
BR_94	19-Jul-14	Post-calving	Summer	1	12:31:54 PM	12:32:03 PM	M	10	1	Mammal	Caribou	1		1	N	walking	smaller size antlers. Just checking out the camera.
BR_94	29-Jul-14	Summer	Summer	1	9:38:15 PM	9:38:47 PM	M	20	2	Mammal	Caribou	1		1	N	walking	smaller individual than seen before - less developed set of antlers. Comes to sniff camera.
BR_94	4-Sep-14	Fall Migration	Summer	1	5:18:49 AM	5:18:59 AM	M	10	1	Bird	Willow Ptarmigan	7		7	N	walking	settled in front of camera, then walks off to right
BR_94	3-Nov-14	Winter	Fall Migration	1	11:50:22 PM	11:50:52 PM	M	20	2	Mammal	Red Fox	1		1	N	walking	walks up to camera
BR_94	25-Mar-15	Winter	Winter	1	9:30:16 PM	9:30:28 PM	M	10	1	Mammal	Red Fox	1		1	N	walking	walks past camera
BR_95	10-Jul-14	Post-calving	Summer	1	6:08:38 AM	6:08:48 AM	M	10	1	Mammal	Caribou	1		1	N	walking	juvenile - smaller set of antler buds
BR_95	12-Jul-14	Post-calving	Summer	1	4:48:39 AM	4:49:57 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	knocks over camera. Someone comes and sets camera back up again in a few days.
BR_95	3-Aug-14	Summer	Summer	1	9:29:47 AM	9:30:17 AM	M	21	2	Mammal	Caribou	1		1	N	walking	older individual than seen before. Larger antlers though not well branched. Curious about camera, walks up and haves a sniff. One timed photo in series.
BR_95	5-Aug-14	Summer	Summer	1	9:58:19 PM	9:59:37 PM	M	40	4	Mammal	Caribou	2		2	N	walking	one older bull - nice set of antlers, and a younger one. Not the same as seen before as the smaller guy has antler plates on front.
BR_95	11-Aug-14	Summer	Summer	1	6:31:38 PM	6:36:25 PM	M	60	6	Mammal	Grizzly Bear	1		1	N	investigating camera	rocks camera stand back and forth and finally knocks it over.
BR_96	30-Jul-14	Summer	Summer	1	11:53:51 AM	10:57:07 AM	M	60	6	Mammal	Grizzly Bear	1		1	N	investigating camera	blondish individual. Looks to damage the tripod but it's still standing.
BR_96	1-Aug-14	Summer	Summer	1	6:46:08 PM	6:46:19 PM	M	10	1	Mammal	Caribou	1		1	N	walking	looks to be a bull, not a huge rack. Little curious about camera.
BR_96	13-Aug-14	Summer	Summer		8:00:00 AM		T	1		Mammal	Caribou	3		3	N	feeding	grazing off in the distance.
BR_96	18-Aug-14	Summer	Summer		10:00:00 AM		T	1		Bird	Lapland Longspur	1		1	N	flying	centre-left of frame
BR_96	30-Aug-14	Summer	Summer		1:30:00 PM		T	1		Mammal	Caribou	1		1	N	feeding	grazing - larger bull. Seen in following timed photo moving to the right side of frame.
BR_96	30-Aug-14	Summer	Summer	1	5:41:32 PM	5:41:41 PM	M	10	1	Mammal	Caribou	1		1	Y	walking	this looks like the bull that was off in the distance - now walking in front of camera.
BR_96	13-Oct-14	Fall Migration	Fall Migration	1	4:15:46 PM	4:16:21 PM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	BIG bear - definitely fattened up for winter. Makes a bee-line for the camera and knocks it over
BR_97	21-Aug-14	Summer	Summer	1	10:17:48 PM	10:20:33 PM	M	60	6	Mammal	Grizzly Bear	1		1	N	investigating camera	mostly behind frame
BR_97	28-Aug-14	Summer	Summer	1	7:21:16 AM	7:21:27 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	angry bear, knocks camera over in the first image - must have come at it at a run. Knocked over for rest of period.
BR_98	no wildlife recorded																
BR_99	6-Aug-14	Summer	Summer	1	4:50:11 AM	4:51:51 AM	M	50	5	Mammal	Grizzly Bear	1		1	N	investigating camera	looks like it could have damaged the tripod some - still standing though.
BR_99	16-Aug-14	Summer	Summer	1	11:26:00 PM	11:26:13 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_99	18-Aug-14	Summer	Summer	1	9:47:03 PM	9:54:40 PM	M	190	19	Mammal	Grizzly Bear	1	1	2	N	investigating camera	Two bears - looks like mother and cub. They have damaged the camera tripod.
BR_99	20-Aug-14	Summer	Summer	1	11:10:42 PM	11:12:26 PM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	looks to be a different bear than the pair that were here before.
BR_99	20-Sep-14	Fall Migration	Summer	1	1:00:12 PM	1:01:31 PM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	rocking tripod. View is adjusted up marginally.
BR_99	8-Nov-14	Winter	Fall Migration	1	11:48:21 PM	11:51:55 PM	M	50	5	Mammal	Wolverine	1		1	N	investigating camera	looks to be clambering on the tripod, sniffing around the camera
BR_100	22-Jul-14	Post-calving	Summer	1	6:26:38 AM	6:32:21 AM	M	121	12	Mammal	Grizzly Bear	1		1	N	investigating camera	very curious bear, there for a long time. Includes one timed photo in middle of series
BR_100	24-Jul-14	Post-calving	Summer	1	7:12:02 AM	7:12:11 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	possibly same bear as a few days ago
BR_100	30-Jul-14	Summer	Summer	1	7:51:20 PM	7:51:31 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	curious
BR_100	2-Aug-14	Summer	Summer	1	8:52:29 PM	8:52:47 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	likely same bear, though hard to tell because bear is not in front of frame for long
BR_100	3-Aug-14	Summer	Summer	1	5:58:07 PM	5:58:21 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_100	6-Aug-14	Summer	Summer	1	9:34:48 PM	9:35:29 PM	M	20	2	Mammal	Grey Wolf	1		1	N	walking	light individual, walks by camera, likely marks it
BR_100	7-Aug-14	Summer	Summer	1	2:11:15 PM	2:11:25 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	very light individual

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_100	12-Aug-14	Summer	Summer		12:30:00 PM		T	1		Mammal	Caribou	1		1	N	walking	partially obscured by bushes
BR_100	23-Aug-14	Summer	Summer	1	7:38:11 AM	7:38:21 AM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	light individual, maybe same as before
BR_100	3-Oct-14	Fall Migration	Fall Migration	1	6:47:58 PM	6:49:04 PM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	knocks over tripod, and rips some of the 2x4 apart
BR_101														0			
BR_102	16-Jul-14	Post-calving	Summer		3:30:00 PM		T	1		Bird	Red-breasted Merganser	4		4	N	swimming	swimming along shoreline; females. A couple seen an hour earlier swimming along shoreline - amalgamated
BR_102	17-Jul-14	Post-calving	Summer	1	8:01:41 AM	8:01:52 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	just curious
BR_102	18-Jul-14	Post-calving	Summer		7:00:00 AM		T	1		Bird	Red-breasted Merganser	6		6	N	swimming	swimming along shoreline; two males and four females
BR_102	19-Jul-14	Post-calving	Summer		6:00:00 AM		T	1		Bird	Red-breasted Merganser	11		11	N	swimming	swimming along shoreline; two males and 9 females. A group seen earlier in the day, amalgamated
BR_102	20-Jul-14	Post-calving	Summer		2:00:00 AM		T	1		Bird	Red-breasted Merganser	2		2	N	swimming	swimming along shoreline; females
BR_102	23-Jul-14	Post-calving	Summer	1	9:36:37 PM	9:47:14 PM	M	50	5	Mammal	Grizzly Bear	1		1	N	investigating camera	investigating/scratching then knocks camera tripod over
BR_103														0			
BR_104	26-Sep-14	Fall Migration	Fall Migration	1	5:32:01 AM	5:37:46 AM	M	80	8	Mammal	Grizzly Bear	1		1	N	investigating camera	bear comes and takes camera out of housing, camera precariously hanging off of tripod, pointed back at housing
BR_105	16-Jul-14	Post-calving	Summer	1	1:30:02 PM	1:30:12 PM	M	10	1	Bird	Glaucous Gull	1		1	N	flying	
BR_105	17-Jul-14	Post-calving	Summer		8:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	flying	
BR_105	19-Jul-14	Post-calving	Summer		4:00:00 PM		T	1		Bird	Glaucous Gull	13		13	N	standing	perched on rock, seen in previous and following timed photos
BR_105	20-Jul-14	Post-calving	Summer	1	9:00:26 PM	9:00:35 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	lighter individual, but not completely white
BR_105	20-Jul-14	Post-calving	Summer	2	11:42:04 PM	11:42:13 PM	M	10	1	Mammal	Grey Wolf	1		1	Y	walking	same individual walking back along shoreline the other way
BR_105	20-Jul-14	Post-calving	Summer	2	11:42:04 PM	11:42:13 PM	M	10	1	Bird	Glaucous Gull	1		1	N	flying	
BR_105	21-Jul-14	Post-calving	Summer		12:30:00 AM		T	1		Bird	Glaucous Gull	2		2	N	standing	perched on rock
BR_105	21-Jul-14	Post-calving	Summer	1	10:30:00 PM	10:30:13 PM	M	11	1	Bird	Red-breasted Merganser	5		5	N	swimming	swimming around the rock were gulls have been perching
BR_105	21-Jul-14	Post-calving	Summer	1	10:30:00 PM	10:30:13 PM	M	11	1	Bird	Glaucous Gull	2		2	N	flying	swimming around the rock were gulls have been perching
BR_105	21-Jul-14	Post-calving	Summer	2	10:33:21 PM	10:34:08 AM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	same light individual as seen days previous
BR_105	21-Jul-14	Post-calving	Summer	3	11:30:00 PM	12:00:13 AM	M	12	1	Bird	Red-breasted Merganser	34		34	N	swimming	two timed followed by a triggered series, gulls show up in trigger but group of mergansers show up in timed and form a raft near the gulls in the triggered series
BR_105	21-Jul-14	Post-calving	Summer	3	11:30:00 PM	12:00:13 AM	M	12	1	Bird	Gull	6		6	N	swimming	only show up in triggered photos
BR_105	22-Jul-14	Post-calving	Summer		2:00:00 AM		T	1		Bird	Gull	11		11	N	standing	sitting on the gull rock, they stay there for an hour or so
BR_105	23-Jul-14	Post-calving	Summer	1	3:30:02 AM	3:30:12 AM	M	10	1	Bird	Red-breasted Merganser	10		10	N	swimming	were sitting along shoreline in previous timed photos, then part of motion. Moved off into inlet
BR_105	23-Jul-14	Post-calving	Summer	2	7:00:02 AM	7:00:12 AM	M	10	1	Bird	Gull	1		1	N	flying	part of mis-trigger
BR_105	23-Jul-14	Post-calving	Summer	3	10:43:12 AM	10:51:57 AM	M	110	11	Mammal	Grizzly Bear	1		1	N	investigating camera	bear comes and knocks over camera
BR_106	15-Jul-14	Post-calving	Summer		7:30:00 PM		T	1		Bird	Gull	2		2	N	flying	one is in swimming, the other flying
BR_106	15-Jul-14	Post-calving	Summer	1	10:00:00 PM	10:00:17 PM	M	11	1	Mammal	Grey Wolf	1		1	N	walking	looks around camera, then leaves
BR_106	16-Jul-14	Post-calving	Summer		2:30:00 AM		T	1		Bird	Red-throated Loon	1		1	N	swimming	swimming along shoreline
BR_106	18-Jul-14	Post-calving	Summer	1	6:22:32 AM	6:26:49 AM	M	100	10	Mammal	Grizzly Bear	1		1	N	investigating camera	quite curious, looks to be scratching
BR_106	22-Jul-14	Post-calving	Summer		12:00:00 PM		T	1		Bird	Gull	1		1	N	swimming	in Inlet, seen in following timed photo as well
BR_106	25-Jul-14	Post-calving	Summer		5:00:00 AM		T	1		Bird	Herring Gull	3		3	N	standing	perched along shoreline, resting
BR_106	27-Jul-14	Summer	Summer	1	1:06:27 AM	1:08:44 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_106	27-Jul-14	Summer	Summer		9:30:00 AM		T	1		Bird	Red-breasted Merganser	6		6	N	swimming	swimming along shoreline
BR_106	28-Jul-14	Summer	Summer	1	7:45:41 PM	7:45:50 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_106	28-Jul-14	Summer	Summer	1	7:45:41 PM	7:45:50 PM	M	10	1	Bird	Red-breasted Merganser	1		1	N	swimming	can see behind bear in water
BR_106	28-Jul-14	Summer	Summer		11:00:00 PM		T	1		Bird	Herring Gull	2		2	N	standing	perched along shoreline, resting
BR_106	29-Jul-14	Summer	Summer		11:00:00 AM		T	1		Bird	Glaucous Gull	1		1	N	swimming	swimming along shoreline
BR_106	30-Jul-14	Summer	Summer		7:30:00 AM		T	1		Bird	Herring Gull	1		1	N	flying	flying low over water along shoreline
BR_106	5-Aug-14	Summer	Summer	1	10:30:06 AM	10:30:15 PM	M	10	1	Bird	Red-breasted Merganser	14		14	N	swimming	
BR_106	6-Aug-14	Summer	Summer	1	12:49:51 AM	12:50:oo AM	M	10	1	Bird	Red-breasted Merganser	14		14	Y	swimming	same group now swimming opposite direction
BR_106	7-Aug-14	Summer	Summer	1	3:52:43 PM	3:52:52 PM	M	10	1	Bird	Red-breasted Merganser	3		3	N	swimming	females
BR_106	9-Aug-14	Summer	Summer		6:00:00 PM		T	1		Bird	Unknown	6		6	N	standing	probable common eiders - a few preening on shore, the other swimming
BR_106	10-Aug-14	Summer	Summer		1:00:00 PM		T	1		Bird	Unknown	4	8	12	N	swimming	could be common eider with young - looks to the right size, shape, although it is a little late for young that size
BR_106	10-Aug-14	Summer	Summer	1	3:59:44 PM	3:59:53 PM	M	10	1	Bird	Gull	1		1	N	flying	
BR_106	10-Aug-14	Summer	Summer	1	3:59:44 PM	3:59:53 PM	M	10	1	Bird	Red-breasted Merganser	1		1	N	swimming	
BR_106	12-Aug-14	Summer	Summer	1	5:51:49 AM	5:56:15 AM	M	80	8	Mammal	Grizzly Bear	1		1	N	investigating camera	takes camera out of housing, chews on camera a bit and knocks over tripod
BR_107	16-Jul-14	Post-calving	Summer		4:00:00 AM		T	1		Bird	Canada Goose	19		19	N	swimming	swimming along shoreline

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_107	20-Jul-14	Post-calving	Summer		3:00:00 AM		T	1		Bird	Greater Scaup	3		3	N	swimming	looks like three males cruising along shoreline
BR_107	20-Jul-14	Post-calving	Summer		11:30:00 AM		T	1		Bird	Greater Scaup	45		45	N	swimming	large flock, mostly males and some females. At least 3 have been counted in previous timed.
BR_107	20-Jul-14	Post-calving	Summer		12:00:00 AM		T	1		Bird	Greater Scaup	63		63	N	swimming	large flock, mostly males and some females. At least 40 have been counted in previous timed.
BR_107	24-Jul-14	Post-calving	Summer	1	2:41:20 AM	2:43:56 AM	M	50	5	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_107	25-Jul-14	Post-calving	Summer		12:00:00 AM		T	1		Bird	Gull	1		1	N	swimming	in inlet
BR_107	26-Jul-14	Summer	Summer		5:00:00 AM					Bird	Gull	1		1	N	flying	likely glaucous gull
BR_107	1-Aug-14	Summer	Summer		1:30:00 PM		T	1		Bird	Canada Goose	10		10	N	swimming	swimming along shoreline
BR_107	3-Aug-14	Summer	Summer		9:30:00 AM		T	1		Bird	Greater Scaup	37		37	N	swimming	mix of males and female swimming along shoreline
BR_107	3-Aug-14	Summer	Summer		10:30:00 AM		T	1		Bird	Greater Scaup	18		18	Y	swimming	part of large flock before, seen in following timed image
BR_107	3-Aug-14	Summer	Summer	1	10:39:28 PM	10:44:42 PM	M	70	7	Mammal	Grizzly Bear	1		1	N	investigating camera	comes up from below, pulls camera out of housing.
BR_108	16-Jul-14	Post-calving	Summer	1	11:30:27 AM	11:30:55 AM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	sniffing at camera, poses for camera. Great shot. Then walks away and sniffs at a patch of flowers on the ground
BR_108	20-Jul-14	Post-calving	Summer	1	10:56:44 PM	11:00:12 PM	M	21	2	Mammal	Grizzly Bear	1		1	N	investigating camera	could be the same bear, or different. Both animals sniffed/mouthed the same patch of flowers (looks like fireweed). One timed photo.
BR_108	21-Jul-14	Post-calving	Summer	1	7:49:03 AM	7:50:58 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	walks up to camera, likely same bear as last night. Did a little sniff at the same patch of flowers
BR_108	23-Jul-14	Post-calving	Summer		1:30:00 PM		T	1		Bird	Red-breasted Merganser	3		3	N	swimming	swimming along shoreline
BR_108	28-Jul-14	Summer	Summer	2	10:34:50 PM	10:38:24 PM	M	90	9	Mammal	Grizzly Bear	1	2	3	N	investigating camera	looks like either mom and two older cubs. One stays at the camera and jiggles it around, while the other two lose interest earlier and walk away
BR_108	30-Jul-14	Summer	Summer	1	3:46:53 AM	3:47:14 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	larger looking bear, likely different from those that visited a few days ago
BR_108	14-Aug-14	Summer	Summer	1	6:19:21 PM	6:23:02 PM	M	70	7	Mammal	Grizzly Bear	1		1	N	investigating camera	knocks over camera in the end
BR_109	15-Jul-14	Post-calving	Summer	1	12:46:27 AM	12:46:37 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	behind frame, swarm of mosquitoes around camera and camera shakes a bit
BR_109	15-Jul-14	Post-calving	Summer		11:00:00 AM		T	1		Bird	Gull	1		1	N	flying	likely glaucous gull based on size, a few more seen on timed photos later that day, likely same individual
BR_109	16-Jul-14	Post-calving	Summer		8:30:00 PM		T	1		Bird	Glaucous Gull	2		2	N	standing	sitting on rocks by shoreline
BR_109	17-Jul-14	Post-calving	Summer		1:30:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	18-Jul-14	Post-calving	Summer		5:30:00 PM		T	1		Bird	Glaucous Gull	3		3	N	standing	three now sitting along rocks
BR_109	20-Jul-14	Post-calving	Summer	1	8:36:44 PM	8:36:53 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	looks to be marking camera, white individual
BR_109	22-Jul-14	Post-calving	Summer		1:00:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	28-Jul-14	Summer	Summer	1	3:54:27 PM	3:54:59 PM	M	20	2	Mammal	Grey Wolf	1		1	N	walking	different individual from before, this guy is grey/grizzled colour
BR_109	28-Jul-14	Summer	Summer	1	3:54:27 PM	3:54:59 PM	M	20	2	Bird	Glaucous Gull	1		1	N	flying	checking out wolf and what it is doing
BR_109	28-Jul-14	Summer	Summer	2	8:03:24 PM	8:03:33 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	this looks to be the same individual as the white one seen a few days earlier
BR_109	29-Jul-14	Summer	Summer		1:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	31-Jul-14	Summer	Summer		9:00:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	1-Aug-14	Summer	Summer	1	10:26:48 AM	10:27:38 AM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	looks to be scratching, rubbing
BR_109	2-Aug-14	Summer	Summer		4:00:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	2-Aug-14	Summer	Summer	1	10:44:39 PM	10:44:50 PM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	white individual marks rock - looks to be the same white individual seen in area
BR_109	5-Aug-14	Summer	Summer		5:12:36 AM	5:13:35 AM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	smaller sized bear, perhaps different from ones seen before
BR_109	5-Aug-14	Summer	Summer		10:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	8-Aug-14	Summer	Summer		5:30:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting much closer to camera on rocks
BR_109	10-Aug-14	Summer	Summer	1	6:03:40 PM	6:03:51 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	curious
BR_109	12-Aug-14	Summer	Summer		9:30:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	12-Aug-14	Summer	Summer		10:00:00 AM		T	1		Bird	Horned Lark	1		1	N	standing	sitting on rock near camera
BR_109	19-Aug-14	Summer	Summer		3:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	20-Aug-14	Summer	Summer		5:30:00 AM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rocks by shoreline, likely same as seen before
BR_109	21-Aug-14	Summer	Summer		6:00:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	gull and squirrel chilling out in the same place
BR_109	22-Aug-14	Summer	Summer		10:00:00 AM		T	1		Bird	Glaucous Gull	2		2	N	standing	on rocks, good resting place for gulls obviously
BR_109	24-Aug-14	Summer	Summer		7:30:00 AM		T	1		Bird	Glaucous Gull	2		2	N	standing	on rocks, good resting place for gulls obviously
BR_109	25-Aug-14	Summer	Summer	1	9:22:23 AM	9:22:33 AM	M	10	1	Mammal	Grey Wolf	1		1	N	walking	white individual walking past camera, maybe same white individual as seen before
BR_109	29-Aug-14	Summer	Summer		3:00:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	on rocks, good resting place for gulls obviously
BR_109	30-Aug-14	Summer	Summer		12:00:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	nearer to camera, perched on rocks

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_109	31-Aug-14	Summer	Summer	1	2:00:00 PM	2:51:59 PM	M	32	3	Mammal	Grizzly Bear	1	2	3	N	walking	can see bears approaching on two timed photos, then they trigger the camera a few times. Mother and cubs from last year it looks like - cubs are a decent size. Finally knock it over by the end of their visit.
BR_110														0			
BR_111	21-Jul-14	Post-calving	Summer		11:30:00 AM		T	1		Bird	unknown	47		47	N	swimming	swimming along shoreline - likely red-breasted merganser
BR_111	22-Jul-14	Post-calving	Summer	1	1:53:21 AM	1:53:31 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_111	26-Jul-14	Summer	Summer		7:00:00 PM		T	1		Bird	Gull	1		1	N	Standing	Sitting by shoreline
BR_111	28-Jul-14	Summer	Summer		8:30:00 PM		T	1		Bird	unknown	21		21	N	swimming	swimming along shoreline - likely greater scaup
BR_111	29-Jul-14	Summer	Summer		3:30:00 PM		T	1		Bird	unknown	22		22	N	swimming	swimming along shoreline - likely greater scaup
BR_111	29-Jul-14	Summer	Summer		4:00:00 PM		T	1		Bird	unknown	41		41	Y	swimming	swimming along shoreline - likely greater scaup - part of group in previous photo - about 20 previously counted
BR_111	29-Jul-14	Summer	Summer		6:30:00 PM		T	1		Bird	Glaucous Gull	2		2	N	flying	
BR_111	1-Aug-14	Summer	Summer		1:00:00 AM		T	1		Bird	Glaucous Gull	2		2	N	standing	two gulls chilling along shoreline, could be the ones seen before
BR_111	2-Aug-14	Summer	Summer		4:30:00 AM		T	1		Bird	Glaucous Gull	1		1	N	flying	likely same individual as before
BR_111	3-Aug-14	Summer	Summer		7:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	flying	likely same individual as before
BR_111	6-Aug-14	Summer	Summer		7:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	standing	sitting on rock, same spot as other gulls seen before, very likely same individual
BR_111	8-Aug-14	Summer	Summer		9:00:00 PM		T	1		Bird	unknown	14		14	N	swimming	along shoreline
BR_111	8-Aug-14	Summer	Summer		9:30:00 PM		T	1		Bird	unknown	14		14	N	swimming	along shoreline
BR_111	17-Aug-14	Summer	Summer		7:30:00 PM		T	1		Bird	Glaucous Gull	1		1	N	flying	likely same individual as seen in previous images
BR_111	21-Aug-14	Summer	Summer	1	8:52:29 PM	8:52:39 PM	M	10	1	Mammal	Caribou	2		2	N	walking	velvety antlers, one visible, one assumed from moving shadow
BR_111	22-Aug-14	Summer	Summer		7:00:00 PM		T	1		Bird	Glaucous Gull	1		1	N	flying	
BR_111	25-Aug-14	Summer	Summer		8:30:00 PM		T	1		Bird	unknown	14		14	N	swimming	swimming along shoreline - likely greater scaup
BR_111	5-Sep-14	Fall Migration	Summer	1	5:49:18 AM	5:49:29 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	bear not visible, knocks tripod over
BR_112	20-Jul-14	Post-calving	Summer		5:30:00 AM		T	1		Bird	Gull	4		4	N	swimming	swimming in Inlet
BR_112	22-Jul-14	Post-calving	Summer		8:00:00 AM		T	1		Mammal	Red Fox	2		2	N	walking	walking right along shoreline, second one hidden by rocks
BR_112	25-Jul-14	Post-calving	Summer	1	12:42:10 PM	12:42:19 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	small bear, likely a cub or yearling
BR_112	25-Jul-14	Post-calving	Summer	2	3:14:28 PM	3:!4:38 PM	M	10	1	Mammal	Grizzly Bear	1		1	Y	investigating camera	same bear that was just at the camera
BR_112	26-Jul-14	Summer	Summer	1	12:50:20 PM	12:50:32 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	very likely the same individual as above
BR_112	27-Jul-14	Summer	Summer	1	2:06:52 AM	2:07:02 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	other	not in front of camera.
BR_112	27-Jul-14	Summer	Summer		9:00:00 AM		T	1		Bird	Gull	4		4	N	swimming	drifting on water at right edge of frame
BR_112	27-Jul-14	Summer	Summer	2	12:23:42 PM	12:23:53 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	tipping tripod, bear not fully in frame
BR_112	27-Jul-14	Summer	Summer	2	12:23:42 PM	12:23:53 PM	M	10	1	Bird	Glaucous Gull	1		1	N	standing	on beach - probably wondering what the bear is up to
BR_112	29-Jul-14	Summer	Summer		9:30:00 AM		T	1		Bird	Unknown	1		1	N	flying	likely a Lapland longspur
BR_112	29-Jul-14	Summer	Summer	1	3:59:12 PM	3:59:25 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	looks like same bear as has been plaguing this tripod
BR_112	29-Jul-14	Summer	Summer	2	6:53:18 PM	6:55:55 PM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	looks like same bear as has been plaguing this tripod
BR_112	6-Aug-14	Summer	Summer	1	10:33:15 PM	10:34:15 PM	M	20	1	Mammal	Caribou	1		1	N	grazing	walking across frame, looks toward camera (curiosity)
BR_112	14-Aug-14	Summer	Summer	1	4:04:52 PM	4:05:03 PM	M	10	1	Mammal	Caribou	1		1	N	walking	head down walking - adult bull
BR_112	17-Aug-14	Summer	Summer	1	10:17:30 AM	10:17:39 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	wet bear - not sure if it's the same one as previous visit
BR_112	19-Aug-14	Summer	Summer		9:30:00 AM		T	1		Bird	Sparrow	1		1	N	flying	flying in front of camera - plumage suggests a sparrow, could be a Harris's
BR_112	22-Aug-14	Summer	Summer	1	8:01:12 PM	8:01:42 PM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	
BR_112	27-Aug-14	Summer	Summer	1	3:24:08 AM	3:24:17 AM	M	10	1	Mammal	Caribou	1		1	N	walking	adult bull
BR_112	8-Sep-14	Fall Migration	Summer	1	2:23:06 AM	2:23:16 AM	M	10	1	Mammal	Caribou	1		1	N	walking	adult bull, possibly same animal as last month just hanging around in area
BR_112	8-Sep-14	Fall Migration	Summer	2	5:01:57 AM	5:02:06 AM	M	10	1	Mammal	Caribou	1		1	Y	walking	same animal as a few hours before
BR_112	8-Sep-14	Fall Migration	Summer	3	9:00:00 AM	9:05:30 AM	M	91	9	Mammal	Caribou	2		2	N	walking	possibly that one of these bulls is the same as before, one animal very curious about camera. One timed photo at start, followed by sequential triggers
BR_112	8-Sep-14	Fall Migration	Summer	4	9:12:10 PM	9:12:24 PM	M	10	1	Mammal	Caribou	1		1	N	walking	
BR_112	8-Sep-14	Fall Migration	Summer	5	11:43:15 PM	11:43:25 PM	M	10	1	Mammal	Caribou	1		1	N	walking	adult bull, very likely same as before
BR_112	9-Sep-14	Fall Migration	Summer	1	6:48:06 PM	6:50:34 PM	M	40	4	Mammal	Caribou	3		3	N	walking	looks like a different individuals - males - velvet on antlers, and different tine shapes
BR_112	10-Sep-14	Fall Migration	Summer		2:30:00 PM		T	1		Bird	Duck	100		100	N	swimming	likely a large group of scaups or red-breasted merganser - too backlit to differentiate species - estimated numbers
BR_112	10-Sep-14	Fall Migration	Summer		3:00:00 PM		T	1		Bird	Duck	97		97	Y	swimming	likely a large group of scaups or red-breasted merganser - too backlit to differentiate species - counted numbers
BR_112	12-Sep-14	Fall Migration	Summer		4:30:00 PM		T	1		Bird	Gull	1		1	N	Flying	flying at right side of frame
BR_112	16-Sep-14	Fall Migration	Summer	1	9:11:11 PM	11:01:01 AM	M	34	3	Mammal	Caribou	3		3	N	walking	these look like similar to the ones before.

Appendix 3. Images of Wildlife Captured by Marine RSA Remote Cameras, July 2014 to April 2015

Camera Number	Date	Caribou Seasonal Period (Bathurst and Beverly/Ahiak)	Caribou Seasonal Period (Dolphin and Union)	Daily Series	Start Time	End Time	Photo Type	No. of Photos	No. of Triggers	Animal Group	Species	No. Adults	No. Young	Total	Previously Counted	Behaviour	Comment(s)
BR_112	20-Sep-14	Fall Migration	Summer		7:30:00 PM		T	1		Bird	Red-breasted Merganser	1		1	N	swimming	male
BR_112	13-Nov-14	Winter	Fall Migration		9:30:0AM		T	1		Mammal	unknown	4		4	N	walking	could be a group of four caribou on the ice, or a group of four snowmobiles.
BR_112	3-Dec-14	Winter	Winter	1	3:17:12 AM	3:17:23 AM	M	10	1	Mammal	Wolverine	1		1	N	investigating camera	just below frame - see whiskers
BR_113	9-Jul-14	Post-calving	Summer		11:00:00 PM		T	1		Bird	Canada Goose	5		5	N	swimming	swimming along shoreline
BR_113	10-Jul-14	Post-calving	Summer		1:30:00 AM		T	1		Bird	Canada Goose	5		5	Y	swimming	same group, just on right edge of frame
BR_113	27-Jul-14	Summer	Summer		10:30:00 AM		T	1		Bird	Canada Goose	17		17	N	walking	walking along shoreline, some in water
BR_113	27-Jul-14	Summer	Summer	1	11:10:20 AM	11:14:17 AM	M	60	6	Mammal	Grizzly Bear	1		1	N	investigating camera	not sure if it's the same bear hanging around
BR_113	27-Jul-14	Summer	Summer		6:00:00 PM		T	1		Bird	Canada Goose	5		5	Y	swimming	swimming out in Inlet
BR_113	28-Jul-14	Summer	Summer	1	10:46:25 AM	10:47:54 AM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	rubbing on tripod
BR_113	30-Jul-14	Summer	Summer		7:30:00 AM		T	1		Bird	Canada Goose	1		1	N	swimming	swimming out in Inlet
BR_113	30-Jul-14	Summer	Summer		8:00:00 AM		T	1		Bird	Canada Goose	4		4	Y	swimming	swimming out in Inlet
BR_113	1-Aug-14	Summer	Summer	1	8:39:44 PM	8:40:25 PM	M	20	2	Mammal	Grizzly Bear	1		1	N	investigating camera	not sure if it's the same bear hanging around
BR_113	7-Aug-14	Summer	Summer	1	7:34:48 AM	7:34:58 AM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	not sure if it's the same bear hanging around
BR_113	8-Aug-14	Summer	Summer		5:30:00 PM		T	1		Bird	Red-breasted Merganser	1		1	N	swimming	swimming along shoreline
BR_113	12-Aug-14	Summer	Summer	1	5:13:18 AM	5:13:27 AM	M	10	1	Bird	Gull	1		1	N	Flying	flying along shoreline
BR_113	12-Aug-14	Summer	Summer	2	11:08:52 AM	11:09:02 AM	M	10	1	Bird	Common Redpoll	1		1	N	investigating camera	clinging to tripod, could be a juvenile (young of the year)
BR_113	15-Aug-14	Summer	Summer		5:30:00 PM		T	1		Bird	Red-breasted Merganser	3		3	N	swimming	diving and swimming
BR_113	15-Aug-14	Summer	Summer		6:30:00 PM		T	1		Bird	Red-breasted Merganser	2		2	Y	swimming	swimming closer to shore
BR_113	15-Aug-14	Summer	Summer		7:00:00 PM		T	1		Bird	Red-breasted Merganser	2		2	Y	swimming	further from shore now
BR_113	15-Aug-14	Summer	Summer	1	8:08:14 PM	8:09:39 AM	M	40	4	Mammal	Grizzly Bear	1		1	N	investigating camera	seems like the same bear as before, but not sure
BR_113	18-Aug-14	Summer	Summer		6:30:00 AM		T	1		Bird	Red-breasted Merganser	28		28	N	swimming	swimming along shoreline
BR_113	21-Aug-14	Summer	Summer		9:00:00 AM		T	1		Bird	Red-breasted Merganser	23		23	Y	swimming	swimming opposite way along shoreline (north)
BR_113	22-Aug-14	Summer	Summer		7:00:00 PM		T	1		Bird	Canada Goose	2		2	N	swimming	swimming along shoreline
BR_113	25-Aug-14	Summer	Summer		12:30:00 PM		T	1		Bird	Canada Goose	5		5	N	swimming	right corner of frame
BR_113	25-Aug-14	Summer	Summer		1:00:00 PM		T	1		Bird	Canada Goose	14		14	N	flying	
BR_113	25-Aug-14	Summer	Summer	1	9:27:32 PM	9:27:47 PM	M	10	1	Mammal	Grizzly Bear	1		1	N	investigating camera	maybe same bear
BR_113	2-Sep-14	Fall Migration	Summer		7:30:00 PM		T	1		Bird	Red-breasted Merganser	1		1	N	swimming	swimming along shoreline
BR_113	11-Sep-14	Fall Migration	Summer	1	9:29:48 PM	9:37:10 PM	M	60	6	Mammal	Grizzly Bear	1		1	N	investigating camera	maybe same bear (includes one timed photo in series)
BR_113	23-Sep-14	Fall Migration	Fall Migration		2:00:00 PM		T	1		Bird	Loon	1		1	N	swimming	swimming along shoreline
BR_113	25-Sep-14	Fall Migration	Fall Migration		10:00:00 AM		T	1		Bird	Loon	3		3	N	swimming	swimming along shoreline
BR_113	2-Oct-14	Fall Migration	Fall Migration		9:00:00 AM		T	1		Bird	Unknown	2		2	N	swimming	swimming along shoreline, recording to document when birds leave the inlet, looks like some red-breasted mergansers
BR_113	22-Feb-15	Winter	Winter	1	3:43:20 PM	3:43:29 PM	M	10	1	Mammal	Caribou	1		1	N	at camera, below it	
BR_113	22-Feb-15	Winter	Winter	2	6:08:57 PM	6:09:08 PM	M	10	1	Mammal	Caribou	1		1	N	investigating camera	very likely the same individual as above, a few hours earlier
BR_114	16-Jul-14	Post-calving	Summer	1	5:58:39 AM		M	10	1	Mammal	Grizzly Bear	1		1	N	walking	just does a walk by, nothing serious
BR_114	16-Jul-14	Post-calving	Summer	2	6:31:53 AM	6:32:04 AM	M	10	1	Mammal	Grizzly Bear	1		1	Y	walking	curious bear returns
BR_114	20-Jul-14	Post-calving	Summer		6:30:00 AM		T	1		Bird	Unknown	1		1	N	flying	likely Lapland longspur but too hard to tell
BR_114	27-Jul-14	Summer	Summer	1	5:19:24 PM	5:20:59 PM	M	30	3	Mammal	Grizzly Bear	1		1	N	investigating camera	knocks over camera, not sure if it is the same bear as a few days ago
BR_115	29-Jul-14	Summer	Summer	1	12:47:28 AM	12:48:21 AM	M	30	3	Mammal	Unknown	1		1	N	investigating camera	animal knocked over tripod, likely a grizzly bear or a wolverine

Appendix V5-6A

Back River Project: Grizzly Bear and Wolverine DNA Report, 2012

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
Grizzly Bear and Wolverine DNA Report, 2012

Rescan™ Environmental Services Ltd.
Rescan Building, Sixth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

July 2013

BACK RIVER PROJECT

GRIZZLY BEAR AND WOLVERINE DNA REPORT, 2012

July 2013
Project #0194096-0040-0013

Citation:
Rescan. 2013. *Back River Project: Grizzly Bear and Wolverine DNA Report, 2012*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan™ Environmental Services Ltd.
Vancouver, British Columbia

Executive Summary

Rescan™
Engineers and Scientists

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) in the West Kitikmeot region of Nunavut. This report presents preliminary results from grizzly bear and wolverine DNA studies as part of the 2012 wildlife baseline program, and is considered an interim report of the two year grizzly bear DNA study and the two year wolverine DNA study. The objectives for 2012 were to calculate total number of grizzly bears and wolverines that currently use the DNA Study Areas and to record the movement of individual bears and wolverines. Grizzly bear hair samples will be collected as part of the 2013 summer baseline program and wolverine hair samples will be collected as part of the 2013 spring baseline program. Once all hair samples from 2013 have been analyzed and results are available, the data will be combined for both DNA programs to estimate a superpopulation, which will be presented in a separate final report in 2014.

A total of 2,340 hair samples were collected during the 2012 grizzly bear DNA survey period. From these samples, a total of 111 grizzly bear individuals were identified through DNA hair analysis – 46 males and 65 females. Eight potential family groups were detected. Four grizzly bears identified in the Project were also detected in a DNA study area approximately 200 km to the south of the Project.

A total of 196 hair samples were collected during the 2012 wolverine DNA survey period. From these samples, 12 individual wolverines were identified through DNA hair analyses - four females and eight males. The majority of wolverine detections were in the southern half of the DNA study area, particularly in the southwest and central grid cells along the proposed winter road. One of the individuals identified was previously detected in a DNA study conducted at Ekati approximately 225 km to the southwest of the Back River wolverine study area.

Acknowledgements

Rescan™
Engineers and Scientists

Acknowledgements

This report was prepared for Sabina Gold & Silver Corp. (Sabina) by Rescan Environmental Services Ltd. (Rescan). Fieldwork was conducted by Christine Kent (B.A.), Heather Major (Ph.D.), Andrea Buckman (Ph.D.), Kelly Squires (Ph.D., M.Sc., R.P.Bio), Julia Shewan (B.Sc.), Kate Fremlin (B.Sc, R.P.Bio), and Katie Kuker (M.Sc.). Extensive field support was kindly provided by Sabina logistics team and camp management, Sabina Environmental Co-ordinators Merle Keefe and Darcy Kanayok, as well as Northern Air Support Helicopters, Blackcomb Helicopters, and Discovery Expediting. Fieldwork was conducted with the assistance of Sabina field assistants Merle Keefe, Darcy Kanayok, Dennis Qirqqut, Jacqueline Busson, Elvin Kanayok, Fraser Titley, and Quin Sheppard. Report writing was conducted by Christine Kent, Josh Traylor (Ph.D.), Tracey Zacharias (B.Sc.), Cole Kirkham (B.Sc.) and reviewed by Andrea Buckman (Ph. D.), Greg Sharam (Ph.D.), and Deborah Muggli (Ph.D., M.Sc., R.P.Bio).

Table of Contents

Rescan™
Engineers and Scientists

BACK RIVER PROJECT
GRIZZLY BEAR AND WOLVERINE DNA REPORT, 2012

Table of Contents

Executive Summary i

Acknowledgements iii

Table of Contents v

List of Figures vi

List of Tables vii

List of Plates vii

List of Appendices viii

Glossary and Abbreviations ix

1. Introduction 1-1

2. Study Areas 2-1

2.1 Regional Setting of Wildlife Study Areas 2-1

3. Grizzly Bear DNA 3-1

3.1 Introduction 3-1

3.2 Objectives 3-2

3.3 Methods 3-2

3.3.1 Grizzly Bear Study Area 3-2

3.3.2 Hair Collection 3-5

3.3.3 Remote Cameras 3-6

3.3.4 Laboratory Analysis 3-7

3.3.4.1 Database Management and DNA Extraction 3-7

3.3.4.2 Microsatellite Genotyping 3-7

3.4 Results 3-7

3.4.1 Summary 3-7

3.4.2 DNA Results 3-8

3.4.2.1 Population Analysis 3-27

3.4.3 Field Observations 3-27

3.5 Discussion 3-27

4. Wolverine DNA 4-1

4.1 Introduction 4-1
4.2 Objectives 4-1
4.3 Methods 4-2
4.3.1 Post Set-up 4-2
4.3.2 Hair Collection 4-2
4.3.3 Remote Digital Cameras 4-5
4.3.4 Laboratory Analysis 4-6
4.3.4.1 DNA Extraction 4-6
4.3.4.2 Microsatellite Genotyping 4-6
4.4 Results 4-6
4.4.1 Summary 4-6
4.4.2 Wolverine DNA Data Quality 4-6
4.4.3 Wolverine DNA Analysis Results 4-7
4.4.4 Wolverine Movement in the Study Area 4-9
4.4.5 Preliminary 2013 Field Collection Results 4-9
4.4.6 Remote Camera and Incidental Observations 4-10
4.4.6.1 Remote Camera Detections 4-10
4.4.6.2 Den Locations in and near the RSA, 2012 4-10
4.4.6.3 Incidental Wolverine Sightings in the RSA, 2012 4-18
4.5 Discussion 4-18

References R-1

List of Figures

FIGURE **PAGE**

Figure 1-1. Back River Project Location 1-2

Figure 2-1. Wildlife Baseline Study Areas, Back River Project, 2012 2-2

Figure 3.3-1. Grizzly Bear DNA Combined Survey Grid and Post Locations, 2012 3-3

Figure 3.4-1. Capture Frequency of Grizzly Bear Individuals at Tripod Locations, 2012 3-11

Figure 3.4-2. Grizzly Bear DNA Hair Capture Locations, 2012 ..... map pocket

Figure 3.4-3a. Grizzly Bear DNA Hair Capture Locations, Session 1, 2012 3-13

Figure 3.4-3b. Grizzly Bear DNA Hair Capture Locations, Session 2, 2012 3-15

Figure 3.4-3c. Grizzly Bear DNA Hair Capture Locations, Session 3, 2012 3-17

Figure 3.4-3d. Grizzly Bear DNA Hair Capture Locations, Session 4, 2012 3-19

Figure 3.4-3e. Grizzly Bear DNA Hair Capture Locations, Session 5, 2012 3-21

Figure 3.4-3f. Grizzly Bear DNA Hair Capture Locations, Session 6, 2012 3-23

Figure 3.4-3g. Grizzly Bear DNA Hair Capture Locations, Session 7, 2012 3-25

Figure 3.4-4. Grizzly Bear Area Used during DNA Surveys, 2012 3-29

Figure 4.3-1. Wolverine DNA Study Grid, Back River, 2012 4-3

Figure 4.4-1. Capture Frequency of Individual Wolverine at Hair Snagging Stations, 2012 4-8

Figure 4.4-2. Wolverine DNA Hair Capture Locations, Back River Project, 2012..... 4-11

Figure 4.4-3. Minimum Area Used by Individual Wolverines during DNA Surveys, 2012..... 4-13

Figure 4.4-4. Wolverine DNA North Study Grid, Back River, 2013 4-14

Figure 4.4-5. Wolverine Den Locations Observed in Back River, 2012 4-17

List of Tables

TABLE **PAGE**

Table 3.4-1. Summary of Grizzly Bear Hair Samples Collected in the Field, 2012.....3-8

Table 3.4-2. Potential Family Units Identified within the Combined DNA Study Area 3-10

Table 3.4-3. Distance Travelled and Area Used by Grizzly Bears, 2012 3-27

Table 4.4-1. Summary of Wolverine Hair Samples Collected, 2012 4-7

Table 4.4-2. Summary of Distances Travelled for Wolverines Detected Among Multiple DNA Posts, 2012 4-9

Table 4.4-3. Summary of Wolverine and Incidental Carnivores Detected by Remote Digital Cameras Deployed Near DNA Posts, 2012 4-15

List of Plates

PLATE **PAGE**

Plate 3.3-1. Example of barbed wire tripod used to snag grizzly bear hairs during DNA study. 3-5

Plate 3.4-1. Example of a hair cluster sample collected during DNA surveys. 3-8

Plate 3.4-2. Photos of grizzly bears at tripod stations taken by remote cameras. 3-9

Plate 4.3-1. Field crews adding wolverine lure to a baited post for DNA study on March 24, 2012. 4-4

Plate 4.3-2. A camera set up at wolverine post #38. 4-4

Plate 4.4-1. Wolverine approaching a baited post for DNA study on March 29, 2012. 4-16

Plate 4.4-2. Wolverine climbing a baited post for DNA study on March 28, 2012..... 4-16

List of Appendices

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

Appendix 3. Distance Travelled by Individual Grizzly Bears per Session, 2012

Appendix 4. Distance Travelled by Individual Grizzly Bears during the 2012 Survey Period

Appendix 5. Area Used by Individual Grizzly Bears during the 2012 Survey Period

Appendix 6. Remote Camera Grizzly Bear Observations, 2012

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

Appendix 8. Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Glossary and Abbreviations

Rescan™
Engineers and Scientists

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Correlation	Statistical relationship between two factors.
CESCC	Canadian Endangered Species Conservation Council
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - A federal committee of experts that assesses and designates the level of threat to wildlife and vegetation species in Canada.
Carnivore	An animal that feeds on flesh
Ecosystem	A volume of earth-space that is composed of non-living parts (climate, geologic materials, groundwater, and soils) and living or biotic parts, which are all constantly in a state of motion, transformation, and development. No size or scale is inferred.
Ecozone	The ecozone lies at the top of the ecological hierarchy, and therefore it defines, on a subcontinental scale, the major physiographic features of the country
GPS	Global Positioning System
Habitat	Land and water surface used by wildlife. This may include biotic and abiotic aspects such as vegetation, exposed bedrock, water and topography.
Hectare (ha)	10,000 m^2 or 0.01 km^2 or 2.47 acres
NWMB	Nunavut Wildlife Management Board
NWT	Northwest Territories
RSA	Regional Study Area
Slave Geological Province	A geological formation extending from Great Slave Lake to the Coronation Gulf, which lies between Victoria Island and mainland Nunavut
Topography	The configuration of a surface, including its relief and the position of its natural and person-made features
Waterbird	General term used to encompass all bird species associated with wetlands and waterbodies. This includes waterfowl (ducks and geese), shorebirds (e.g., sandpipers and plovers), and other water-associated species such as gulls, terns, and marsh birds such as sora and American bittern.

1. Introduction

1. Introduction

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut. Exploration programs were run out of both the Goose and George camps in 2012 (Figure 1-1).

For 2012, Sabina contracted Rescan Environmental Services (Rescan) to conduct a comprehensive baseline program that covered the geographical area of the Goose Property, the George Property, and a Marine Laydown Area located on the southern part of Bathurst Inlet. The following components were included in the 2012 baseline program:

- Meteorology;
- Air Quality and Dust;
- Noise;
- Hydrology and Bathymetry;
- Freshwater Water Quality, Sediment Quality, Aquatic Biology;
- Freshwater Fish and Fish Habitat;
- Marine Water Quality, Sediment Quality, Aquatic Biology;
- Marine Fish and Fish Habitat;
- Wildlife (Terrestrial and Marine);
- Wildlife DNA Study (Grizzly Bear and Wolverine);
- Ecosystem Mapping;
- Vegetation and Wetlands (including Rare Plants);
- Soils and Terrain;
- Country Foods;
- Archaeology;
- Socio-Economics;
- Land Use; and
- Metal Leaching/Acid Rock Drainage (ML/ARD).

The 2012 baseline program was designed around potential infrastructure and known deposits at the Goose Property, the George Property, and the Marine Laydown Area. It was assumed that access from the Marine Laydown Area to George and Goose properties would be by winter road, and that access between the George and Goose properties would also be by winter road.

This report presents preliminary results from the 2012 Wolverine and Grizzly Bear DNA studies conducted during the 2012 baseline program. Wolverine and grizzly bear hair samples will be collected as part of the 2013 summer baseline program. Once all hair samples from 2013 have been analyzed and results are available, the data will be combined to model a super-population estimate, which will be presented in a separate final report.

Figure 1-1

Back River Project Location

Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

The objectives for this interim stage of the study are to:

- Calculate the total number of wolverines that currently use the Back River study area; and
- Calculate the total number of grizzly bears that currently use the Back River study area.

The objectives of the overall DNA program are to:

- Generate a super-population estimate of both wolverines and grizzly bears for the Back River study area as a potential baseline for trend monitoring;
- Describe the spatial and temporal distribution of wolverines and grizzly bears on site;
- Identify wolverines and grizzly bears that were sampled in areas outside of the Back River study area by other surveys; and
- Calculate demographic variables for wolverines and grizzly bears, such as sex ratios, and apparent survival and reproductive rates.

These overall objectives can only be achieved by combining the results across multiple sampling sessions and years to obtain sufficient captures and recaptures required for statistical analyses.

2. Study Areas

2. Study Areas

There are two separate study areas used for the DNA studies: a Grizzly Bear DNA Study Area and a Wolverine DNA Study Area (Figure 2-1). The survey area for the wolverine DNA hair study was centred between Goose and George Camps, within the Regional Study Area (RSA) for the Project (Figure 2-1). The Wolverine DNA Study Area covers an area of approximately 169,200 hectares (ha). The Grizzly Bear DNA Study Area is approximately 1,872,000 ha and encompasses a portion of the RSA and extends outside to the west of the RSA (Figure 2-1).

2.1 REGIONAL SETTING OF WILDLIFE STUDY AREAS

The wildlife study areas are all located within the Southern Arctic Ecozone. Ecozones are broad scale landscape units with similar abiotic and biotic factors including climate, geography, and vegetation (Strong and Zoltai 1989; Environment Canada 2000). The Southern Arctic Ecozone extends across much of the southern portion of continental Nunavut, and is bordered by the Northern Arctic Ecozone to the north. The southern border of the Southern Arctic Ecozone is defined by a lack of full-size trees. Stunted forms of tree species, such as dwarf birch (*Betula nana*), green alder (*Alnus viridis* spp. *crispa*), and many species of willow (*Salix* sp.) grow throughout the ecozone, with stunted white (*Picea glauca*) and black spruce (*P. mariana*) present more towards the south. Much of the area is dominated by sedge fens, cottongrass tussock tundra, and heath. Sparsely vegetated areas, such as the wind-swept crests of eskers, are also common (NRC 2007).

PROJECT # 0194096-0017 GIS # BAC-23-191 July 19, 2013

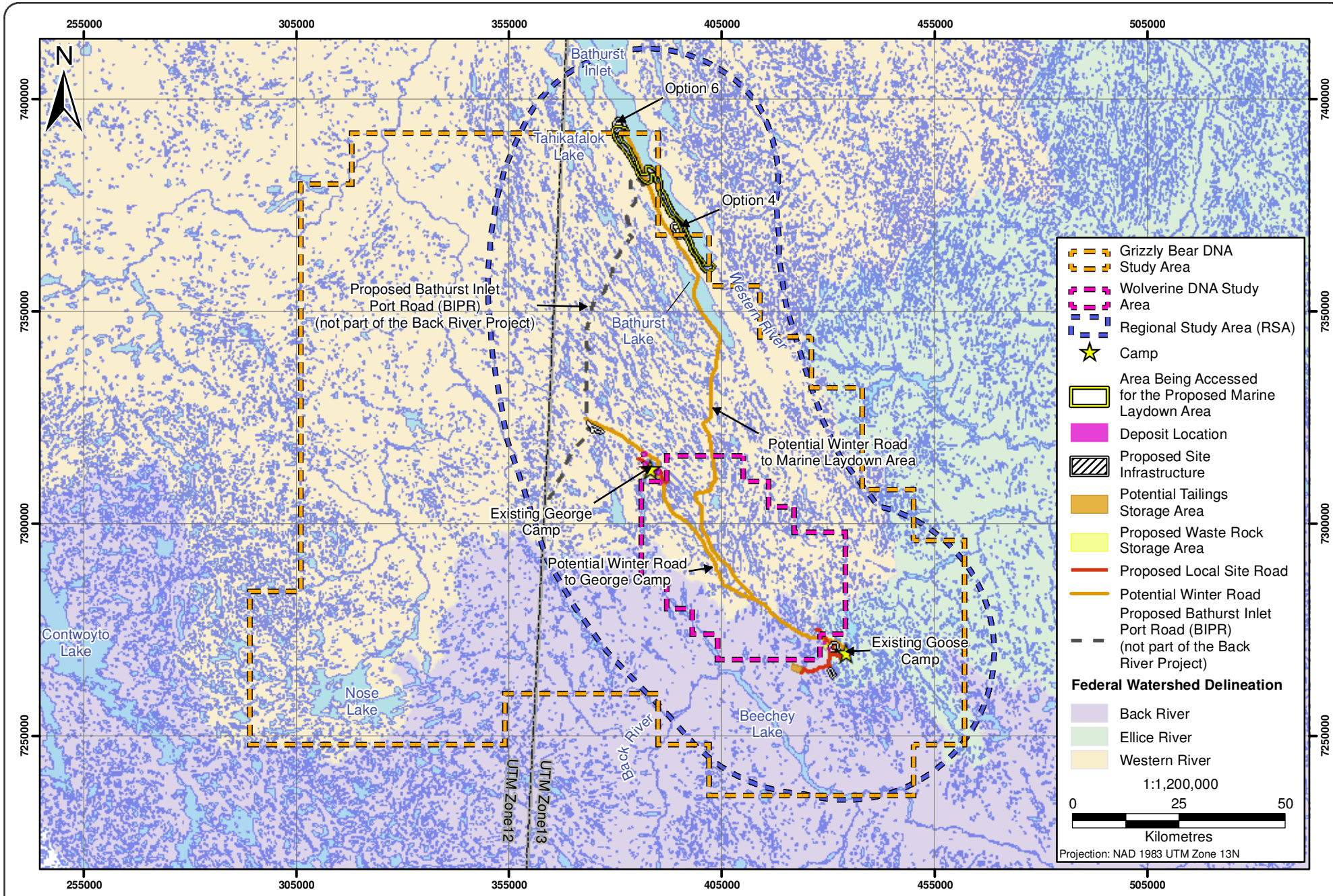


Figure 2-1

Sabina GOLD & SILVER CORP.

Wildlife Baseline Study Areas, Back River Project, 2012

Figure 2-1

Rescan™ Engineers & Scientists

3. Grizzly Bear DNA

Rescan™
Engineers and Scientists

3. Grizzly Bear DNA

3.1 INTRODUCTION

The grizzly bear (*Ursus arctos*) is a species of conservation concern that occurs within the Project Area. Grizzly bears are federally considered a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Nunavut currently does not have a species ranking program administered by the Nunavut Wildlife Management Board (NWMB), and thus the Canadian Endangered Species Conservation Council (CESCC) designations for Nunavut were used to assess the status of grizzly bears in the territory (CESCC 2010). Grizzly bears are listed as Sensitive by the CESCC.

Barren ground grizzly bears occur at low densities and roam over larger areas. Home ranges average 2,100 km^2 for females and 7,200 km^2 for males, which are the largest home ranges for grizzly bears in North America (McLoughlin et al. 1999; McLoughlin et al. 2003). In general, barren ground grizzly bears select home ranges with a large proportion of eskers for denning (McLoughlin et al. 2003). Males emerge from their esker dens the last week of April and females the first week of May, often returning to den at the end of October. The esker dens typically are associated with adjacent tussock tundra, lichen veneer, birch seep, and tall shrub plant communities that can provide suitable forage. Barren-ground grizzly bears can also be carnivorous and caribou (*Rangifer tarandus*) can make up a large part of their annual diet (Gau 1998). Other available protein sources in the region are northern red-backed voles (*Myodes rutilus*), ptarmigan (*Lagopus* spp.), Arctic ground squirrel (*Uroceitellus parryii*), and fish. The bears supplement their diet with succulent vegetation in early summer and berries in the late summer and fall (Gau 1998).

Barren ground grizzly bears are at the most northern and eastern limits of the continental grizzly bear range, thereby reducing overall population connectivity (McLoughlin and Messier 2001). Genetic diversity has been demonstrated to be comparatively low for grizzly bears in the NWT as a result of this relative isolation from other bears (D. Paetkau et al. 1998). Furthermore, the Arctic tundra environment consists of harsh climates and low productivity that contribute to low reproductive rates and smaller average litter sizes (McLoughlin and Messier 2001; McLoughlin et al. 2003), which may make northern grizzly bear populations particularly sensitive to human disturbance.

In order to census bears, researchers have used live captures to mark bears and then recaptured bears using camera stations (Mace 1994), aerial survey (Larsen and Markel 1989), and hair removal and deoxyribonucleic acid (DNA) fingerprinting analysis (Proctor et al. 2005). Most recently, hair removal and DNA fingerprinting have been used to mark and recapture bears (Woods et al. 1999; Mowat and Strobeck 2000; Poole, Mowat, and Fear 2001; Boulanger et al. 2002; Proctor et al. 2005; C. D. Apps and McLellan 2006; Rescan 2011b). This latter method has several benefits because live capture of bears is unnecessary, individuals can be identified with a small risk of error, and hair removal sites are faster to set up and are checked less often than live-capture sites (Mowat and Strobeck 2000). Roots of mammalian hair contain sufficient DNA for analysis (Higuchi et al. 1988). In mark-recapture studies, an initial population sample is captured, marked, and released. The population is then resampled during ≥ 1 additional sessions (Woods et al. 1999). The ratio of newly captured animals to recaptures is then used to compute a population estimate (White et al. 1982).

Bears can traverse in and out of study areas during sampling, which violates the assumption of geographic closure in most studies that use mark-recapture or related methods (Miller et al. 1997).

Abundance estimates derived from mark-recapture correspond to the "superpopulation" if movement is random across grid boundaries (Kendall 1999). In the context of mark-recapture DNA studies, the superpopulation is defined as the number of animals that inhabit the sampling grid and surrounding area (as opposed to the grid alone; Boulanger et al. 2004). While the superpopulation estimate represents the number of animals that traverse an area, the estimate is compromised by the undefined sampling area and therefore cannot be used to estimate density (Boulanger et al. 2004). Under a trend monitoring objective, however, an absolute abundance or density estimate is not necessary, and the assumptions of population closure can be relaxed (C. Apps 2010). In this case, the initial superpopulation estimate can be used as the basis for monitoring relative changes over the long term.

This report presents preliminary results from Grizzly Bear DNA studies as part of the 2012 wildlife baseline program. Grizzly bear hair samples will be collected as part of the 2013 summer baseline program. Once all hair samples from 2013 have been analyzed and results are available, the data will be combined to model a superpopulation estimate, which will be presented in a separate final report in 2014.

3.2 OBJECTIVES

The objectives for this interim stage of the study are to:

- Calculate the total number of grizzly bears that currently use the DNA Study Area; and
- Record movements of grizzly bear individuals.

The objectives of the overall DNA program (2-year study) that will be presented in 2014 are to:

- Generate a super-population estimate of grizzly bears for the DNA Study Area as potential baseline data for trend monitoring;
- Describe the spatial and temporal distribution of grizzly bears in the DNA Study Area;
- Identify overlap with grizzly bears that were sampled in areas outside of the DNA Study Area by other surveys; and,
- Calculate demographic variables for grizzly bears, such as sex ratios.

These overall objectives can only be achieved by combining the results across multiple sampling sessions and years to obtain sufficient captures and recaptures required for statistical analyses.

3.3 METHODS

3.3.1 Grizzly Bear Study Area

Within the DNA Study Area, 126 of the 130 cells were sampled for grizzly bear hair (Figure 3.3-1). Four cells were excluded because of close proximity to exploration camps. Each cell was 12 km by 12 km (144 km^2). Cell size was dependent on several factors, including the need to maximize capture probabilities (i.e., the likelihood of obtaining a hair sample), minimizing capture heterogeneity (i.e., variation in capture rates by sex and age class), and logistics. The cell size was chosen so that it was not larger than the expected area used by an individual bear over a sampling period, and it was assumed that a bear traveling through a cell had an equal probability of encountering a tripod as any other bear (C. Apps 2010).

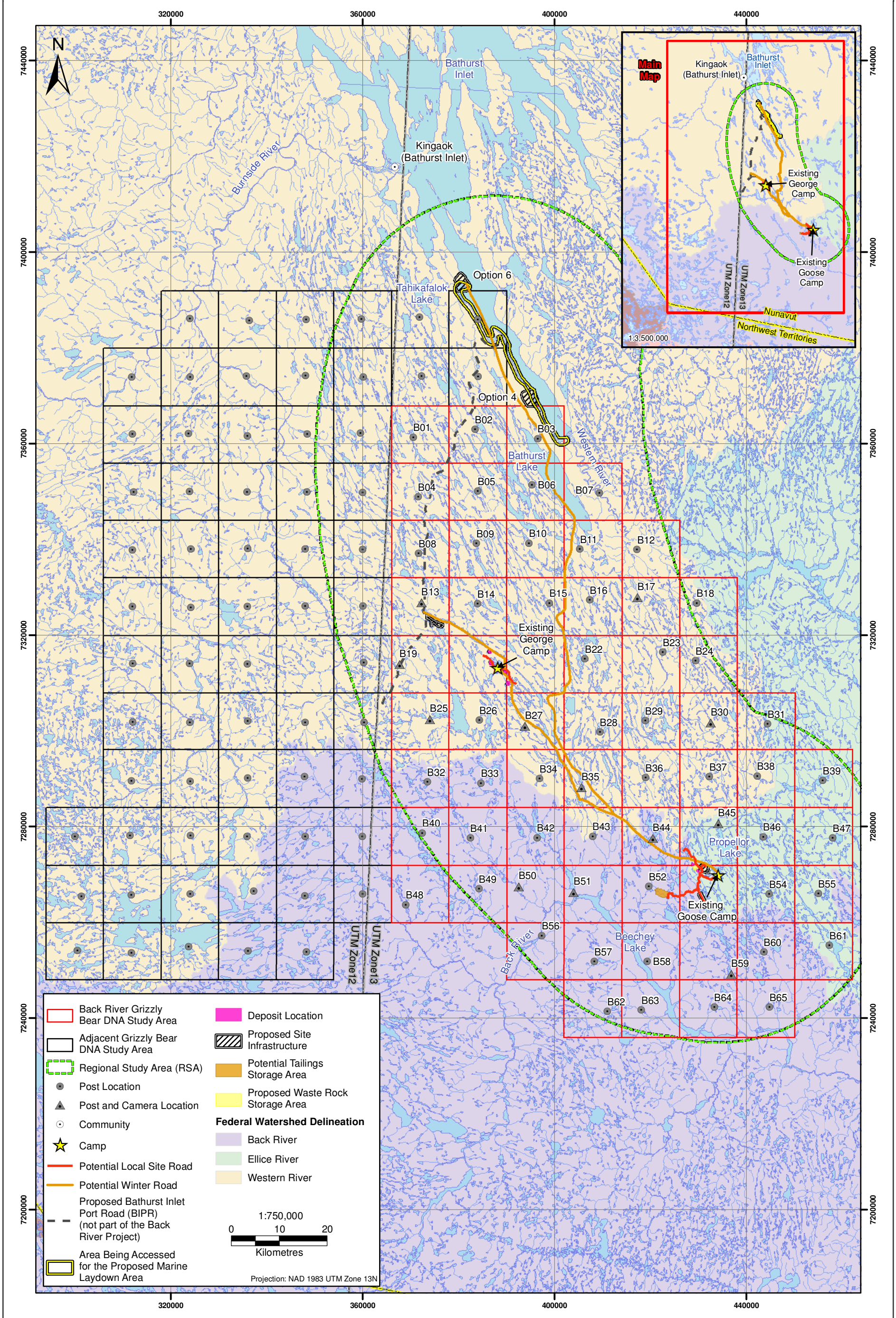


Figure 3.3-1

Sabina GOLD & SILVER CORP.

Grizzly Bear DNA Combined Survey Grid and Post Locations, 2012

Figure 3.3-1

Rescan™ Engineers & Scientists

3.3.2 Hair Collection

One wooden tripod wrapped in barbed wire was used to collect grizzly bear hair (Plate 3.3-1) in a given cell, and the tripod remained at that location for the duration of the sampling season. Tripod locations were recorded by a handheld GPS (Figure 3.3-1). Within each cell, the tripod was located in an area of high quality grizzly bear habitat (e.g., esker, riparian area, upland meadow, wetland meadow) to increase the likelihood of "capturing" a bear. Short-distance, non-reward lures (e.g., cured cow's blood, fish oil, castor oil, and sweeter scents like anise oil and bergamot oil) was used to attract bears to the tripods. The lures were poured on the top of the tripods, down the legs (posts), and in the centre on the ground to encourage a bear to squeeze between the legs.

Plate 3.3-1. Example of barbed wire tripod used to snag grizzly bear hairs during DNA study.

There were seven sampling periods (sessions) between May 28 and August 15, at approximately 10 day intervals. Most studies in British Columbia opt for three to four sessions (C. Apps 2010); however, given the relatively low densities of grizzly bears in the Arctic, and their large home ranges (~2,000 km^2 for females) and movement patterns, it was decided that more sessions were required to ensure sufficient captures and recaptures of individuals for population analyses.

During field sample collection, the barbed wire along the posts of the tripod, the ground under the tripod, and vegetation adjacent to the tripod were all searched for bear hair. Each clump of hair that was found was placed in a separate labelled coin envelope. Samples were then air dried for 48 hours and stored in paper bags for subsequent analysis. For each tripod, the three posts were arbitrarily selected as post 1, 2, or 3. Hair samples were labelled according to which post they were found on, or if they were collected off the ground. For subsampling purposes, hair samples along a post were grouped into clusters. A cluster is defined as a series of hair samples from consecutive barbs and a new cluster is identified following an empty barb.

After hair samples were collected, all barbs on which hair was found were burned with a propane torch to prevent double counting in the following session. In addition, tripods were moved a few metres after the check if hair had been collected from the ground to ensure grizzly hair from the current session would not contaminate future session samples.

Studies have suggested that moving tripods between sessions improves precision in population estimates (Boulanger et al. 2004); however, this is not logistically feasible in larger northern study areas. As a result, tripods were re-baited with a novel scent lure after each collection event to minimize acclimation by bears to sampling locations.

3.3.3 Remote Cameras

Reconyx PC800 Professional digital cameras were placed facing the DNA tripods in 12 of the cells in the eastern portion of the study area (B13, B17, B19, B25, B27, B30, B35, B44, B45, B50, B51, and B59; Figure 3.3-1). Remote cameras were used to determine capture failure (i.e., whether some grizzly bears visiting a tripod were not leaving behind hair samples), and for those posts with hair samples, to determine whether DNA analyses were recording the correct number of grizzly bears visiting tripods (i.e., number of individuals identified by DNA matched the number observed by camera to have rubbed against the posts).

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a tripod, which was secured with rocks to prevent it from being knocked over when encountered by wildlife. Energizer® Lithium batteries were used to maintain camera performance at low-temperatures. Each camera was programmed to take a photograph every 30 minutes during deployment, in addition to being triggered by motion in the infrared spectrum. Motion in front of the camera would trigger the camera to take 10 photos at 1-second intervals. Along with each photo, the cameras would record the date, time, type of trigger (i.e., time [T] or motion [M]), number of triggered photos taken (i.e., 1/10 - 10/10), temperature, and camera number. Cameras were programmed to immediately record a second set of 10 photos upon re-triggering. Remote cameras and DNA tripods were set-up at the same time. During each hair sample check, the cameras were also examined to ensure they were properly working.

A protocol was developed to ascertain if individual grizzly bears visiting DNA tripods were the same individual or multiple individuals to remove duplicate bears for comparison with the WGI data. First, when multiple photo series were triggered, the photos recorded during the second and subsequent triggers were considered part of the same series if they were taken less than 5 minutes apart. Second, if both timed and triggered photos were taken within 5 minutes of each other, they were initially recorded separately but were then combined and reviewed to remove any duplicates. Next, all data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as carnivores may spend more than 5 minutes at a site. If a photo series (motion or time triggered) were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were from the same animal. Observations of carnivores were considered a duplicate if it was not possible to tell individuals apart within the 24 hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series. Finally, photographs were reviewed to ascertain if the grizzly bear interacted with the DNA tripod (i.e., rubbed against the post and thus potentially left a DNA sample).

3.3.4 Laboratory Analysis

3.3.4.1 Database Management and DNA Extraction

Genetic analyses on collected hair samples were conducted by Wildlife Genetics International (WGI) in Nelson, British Columbia. Sub-selection rules were provided that attempted to balance budgetary considerations with sample size and hair sample quality. Three criteria were used to exclude samples from DNA extraction. First, samples containing less than two guard hair roots and less than 30 underfur were set aside. This is a higher quality threshold than is typically used, and was applied in response to the lower extraction success rates in other northern projects. Second, a 1-in-3 selection rule was applied, where the analysis was limited to one of every three samples from a series of adjacent samples, biasing towards samples of higher quality. Finally, samples with an appearance inconsistent with grizzly bear hair were excluded. Leftover hair was archived at WGI.

DNA was extracted using QIAGEN's DNeasy Tissue kits, and followed the manufacturer's instructions (for details see http://www.qiagen.com). WGI aimed to use 10 guard hair roots where available. When underfurs were used, the number of roots used in the analysis was an estimate because entire clumps of whole underfur were extracted rather than clipping individual roots.

3.3.4.2 Microsatellite Genotyping

The analysis of individual identity was based on a gender marker, plus the seven microsatellite markers that have been used in grizzly bear projects from the Kitikmeot region of Nunavut. The 8-locus analysis of individual identity followed a 3-phase approach, which started with a first pass of all nine markers on all extracted samples. After the first pass, mixed and hopeless samples were set aside, with 'hopeless' being defined as having produced high-confidence data scores for less than four of eight markers during the first pass. The first pass was followed by a clean-up phase in which data points that were weak or difficult to read the first time were re-analyzed. In some cases multiple rounds of re-analysis were used when it appeared that there was potential to upgrade a sample to a high-confidence 8-locus score.

The last phase of analysis was error-checking which followed published protocol for selective data re-analysis (D Paetkau 2003). Genotyping errors, which can lead to false individuals being recognized, normally create pairs of genotypes that match at all but one or two markers. Typically, such 1MM- and 2MM-pairs are sought out, and rule out genotyping error by re-analyzing the mismatching markers in each pair.

3.4 RESULTS

3.4.1 Summary

Samples were collected in the field during seven sessions from May 28 to August 16, 2012. A total of 2,340 hair samples were collected (Table 3.4-1), All of which were submitted for DNA analysis to WGI (Plate 3.4-1). Of the 2,340 samples collected, 1,053 (45%) were successfully extracted and assigned to 111 grizzly bear individuals. Eight potential family units were identified. Grizzly bear individuals identified in this study area have not been detected in other DNA study areas to the east and west of the RSA; however, four grizzly bears were also detected in a DNA study area to the south of the Project. Remote cameras placed at 12 tripods recorded a maximum of 75 bears. Eight family units consisting of 20 grizzly bears were identified. Two of the potential family units identified through mapping bear movement were confirmed by remote cameras.

Table 3.4-1. Summary of Grizzly Bear Hair Samples Collected in the Field, 2012

Session	Date Range	Type of Bait Used	Number of Cells with Capture	Number of Samples Taken	Number of Successful Hair Extractions	Number of Individual Bears Detected
Set-up tripods	May 28 – June 2	Fish oil	-	-	-	-
Session #1	June 6 – 11	Blood	15	169	80	19 (12M:7F)
Session #2	June 19 – 22	Blood	31	233	107	28 (14M:14F)
Session #3	June 28 – July 2	Fish oil	50	385	154	40 (16M:25F)
Session #4	July 10 – 16	Castor oil, sweet apple oil, and sweet oil	35	386	166	28 (5M:23F)
Session #5	July 23 – 26	Blood	35	370	174	28 (8M:20F)
Session #6	August 3 – 5	Anise oil, bergamot oil, castor oil	53	444	258	58 (25M:33F)
Session #7 (Take down tripods)	August 13 – 16	n/a	49	353	114	36 (16M:20F)
Total			**-**	**2,340**	**1,053**	**111 (46M:65F)**

Plate 3.4-1. Example of a hair cluster sample collected during DNA surveys.

3.4.2 DNA Results

The 2,340 records in the 2012 bear database were classified as follows:

1. *Successful samples* (45%): 1,053 samples that were assigned to individuals.

2. *Inadequate samples* (19.9%): 465 samples that lacked sufficient hair follicles for DNA extraction.
3. *Sub-selected samples* (21.5%): 503 samples that were excluded due to sub-selection rules/criteria.
4. *Bombed samples* (12.7%): 298 samples that failed during microsatellite analysis.
5. *Mixed samples* (0.6%): 14 samples that showed evidence of ≥ 3 alleles per marker.
6. *Non-target samples* (0.3%): 7 samples did not appear to be from bears.

Successful DNA extraction of the adjacent western cell samples was relatively good (80%) compared to other barren ground grizzly bear work, as were samples from the Back River DNA Study Area (75%). The stringent quality threshold likely influenced the high success rate, as an average of 8.3 guard hairs were used per extracted sample in the adjacent western DNA Study Area and 7.0 guard hairs used in the Back River Study Area; in all samples, one underfur was treated as the equivalent to 0.2 guard hairs.

The success of extracts from underfur alone (N = 166) were poor in comparison to the extracts that used ≥2 guard hair roots (65% compared to 85% in the adjacent western cell samples, and 59% to 84% in the Back River DNA Study Area samples). Variation in success rates were also noted between specific sessions. This relationship between success rate and collection date suggests a potential environmental influence. After the last phase of analysis of hair samples collected within the adjacent western DNA Study Area, there were 7 2MM-pairs; it is unexpected to have this number within a small dataset. This is likely due to a higher than average degree of relationship within the population sampled. The detailed genetic marker data are presented in Appendix 1.

The 1,053 good samples were assigned to 111 grizzly bears; 46 males and 65 females (Plate 3.4-2). Eight potential family units were identified (Table 3.4-2). Grizzly bears were categorized as a potential family unit when bears were observed during ≥1 session at ≥2 cells. While there were some cases where multiple samples from a single sampling period were tied to the same bear, there were also many bears that were detected across multiple sampling sessions. Sixty-eight individuals were recaptured at least once. Of the 68, one bear was detected in six sessions, two bears in five sessions, 16 bears in four sessions, 16 bears in three sessions, and 33 bears were detected in two sessions. Four individuals were new captures during the last sampling session. A summary of individual bear genotypes and capture/recapture rates for 2012 is included in Appendix 2.

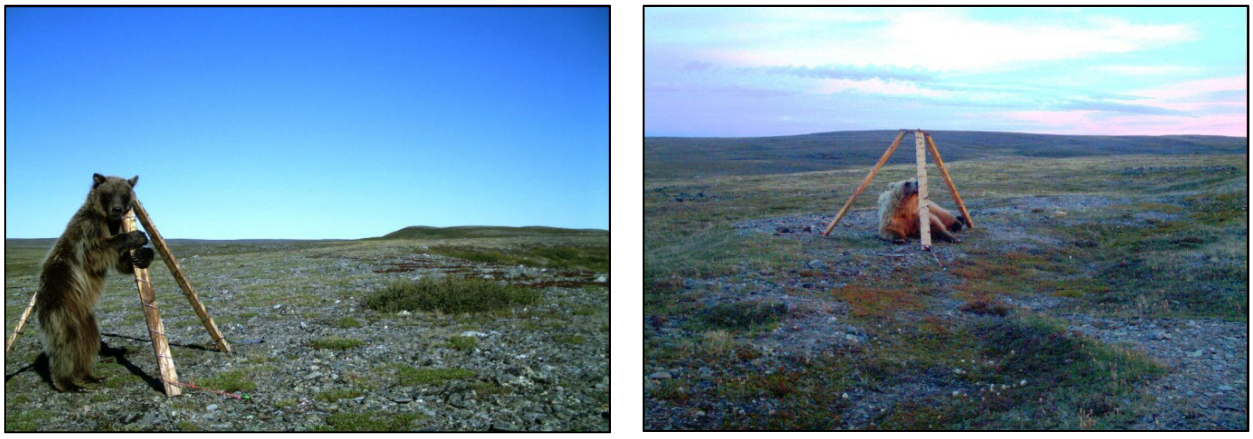


Plate 3.4-2. Photos of grizzly bears at tripod stations taken by remote cameras.

Table 3.4-2. Potential Family Units Identified within the Combined DNA Study Area

Bear ID in Potential Family Unit	Gender of Bears	Session (and Cell) Captured Together
12 and 13	Male and female	1 (HR32); 3 (HR26); 6 (HR21); and 7 (HR17, HR27)
22 and 289	Female and female	4 (HR45); 5 (HR45); 6 (HR35)
125 and 130	Female and female	3 (HR35); 4 (BR48)
161 and 164	Male and female	3 (HR15, HR50)
256, 257, and 262	Female, female, and female	3 (HR44, HR55); 4 (HR58)
br91 and br97	Male and female	1 (BR22); 7 (BR35)
br218 and br219	Female and female	2 (BR29); 6 (BR24); 7 (BR30)
br237 and br244	Female and male	2 (BR34, BR51, BR56); 5 (BR42); 6 (BR41, BR57); 7 (BR56)

The largest number of individual bears was detected in cell H7 where seven different grizzly bears were identified at this northwestern tripod near Burnside River (Figure 3.4-1). Cells H6 and B13 had the second largest number of grizzly bears detected (N = 6); H6 was located along the Bathurst Inlet near the proposed Port Site, and B13 was located along the proposed BIPR road. Overall, grizzly bear capture frequency appears evenly distributed across the DNA Study Area.

Some grizzly bears were detected in the same sampling cell on multiple occasions. One male (ID 66) and two female grizzly bears (IDs 60 and br155) were detected in the same cell during four sessions (Figure 3.4-2). The male bear was found in cell H6 and the females were in cells H36 and B7, respectively. Five females were found within the same cells during three sessions: cells B11 (ID br66), B13 (ID br250), B18 (ID br195), B21 (ID 421), and B35 (ID 289). These multiple recaptures are possibly indicative of high habitat value in these cells within the respective grizzly bear home ranges.

Grizzly bear detection during session 1 and 2 mainly occurred in the eastern half of the DNA Study Area in comparison to session 3, which occurred primarily in the western half of the DNA study area (Figures 3.4-3a to 3.4-3c). During sessions 4 and 5, grizzly bears were evenly distributed, with the exception of the northwest and southeast corners of the DNA Study Area, where little to no bears were detected (Figures 3.4-3d and 3.4-3e). Bears were evenly distributed in session 6, when the highest number (N = 58) of grizzly bears were detected during a session (Figure 3.4-3f). Grizzly bears were also observed throughout the study area in session 7, with the exception of the southwest corner of the DNA study area (Figure 3.4-3g).

During the entire survey period, the average distance travelled by a female grizzly bear during any one session (i.e., over approximately 10 days) was 25.7 km; for male bears was 42.5 km; and for potential family units was 32.6 km (Table 3.4-3). The locations and distance travelled by grizzly bears per session is illustrated in Figures 3.4-3a to g. Given the topography and presence of waterbodies between many of the cells, the actual distances travelled between points are likely considerably higher. The range of distance travelled by a male grizzly bear in one session was 11.5 to 89.9 km. For example, male grizzly bear 693 travelled 89.9 km over approximately 10 days during session 6 (Figure 3.4-3f, Table 3.4-3, and Appendix 3). The shortest distance travelled by female grizzly bears within the DNA Study Area ranged from 9.7 to 54.9 km. Female bear 60 travelled the greatest distance (54.9 km) during session 2 and session 3 (Appendix 3; Figures 3.4-3b and 3.4-3c). This individual was identified in the same three cells during both sessions. The range of distance travelled by potential family units was 10.9 to 84.8 km. Female bear 161 and male bear 164 (potential cub) travelled a distance of 84.8 km during session 3 (Figure 3.4-3c and Appendix 3).

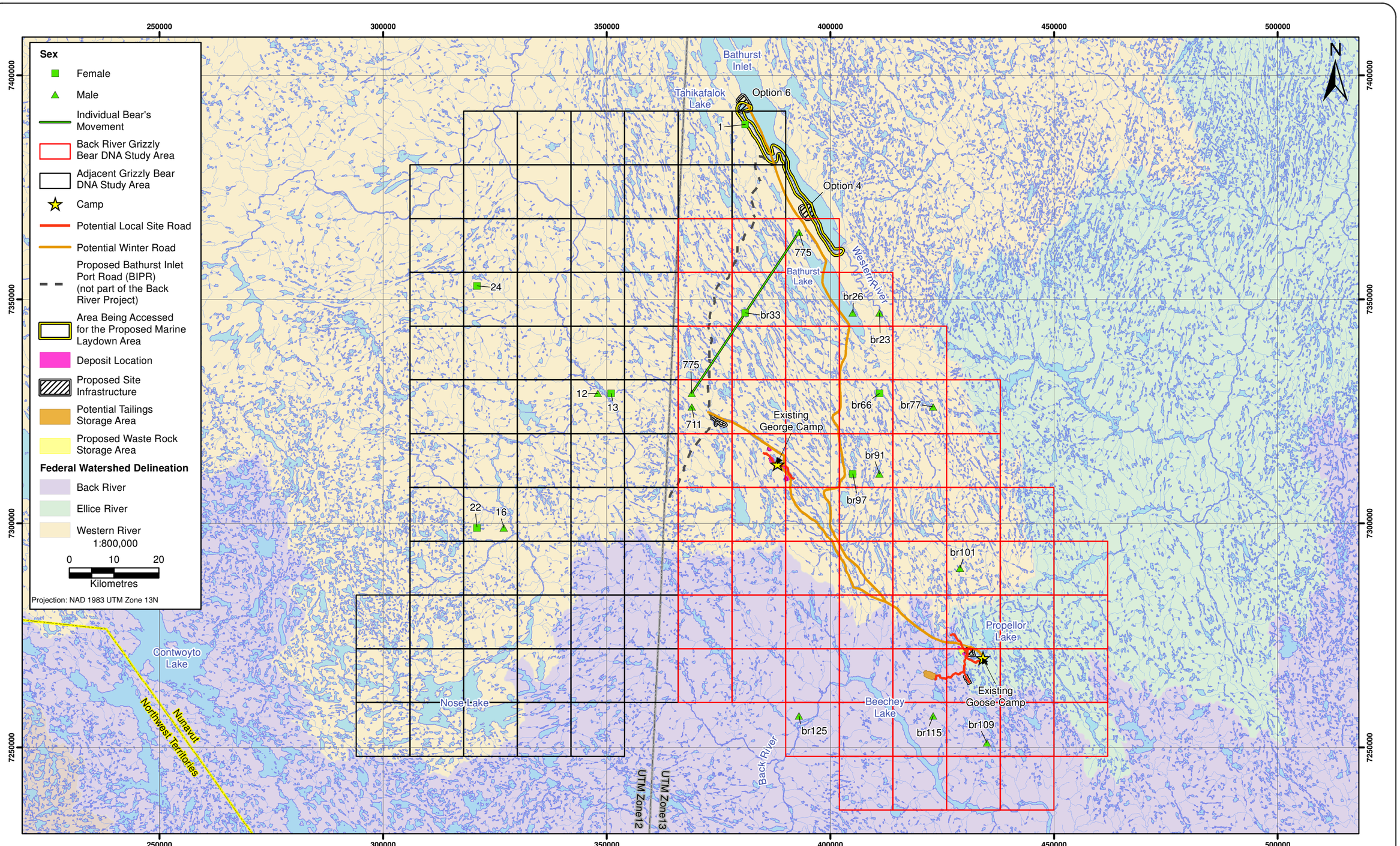
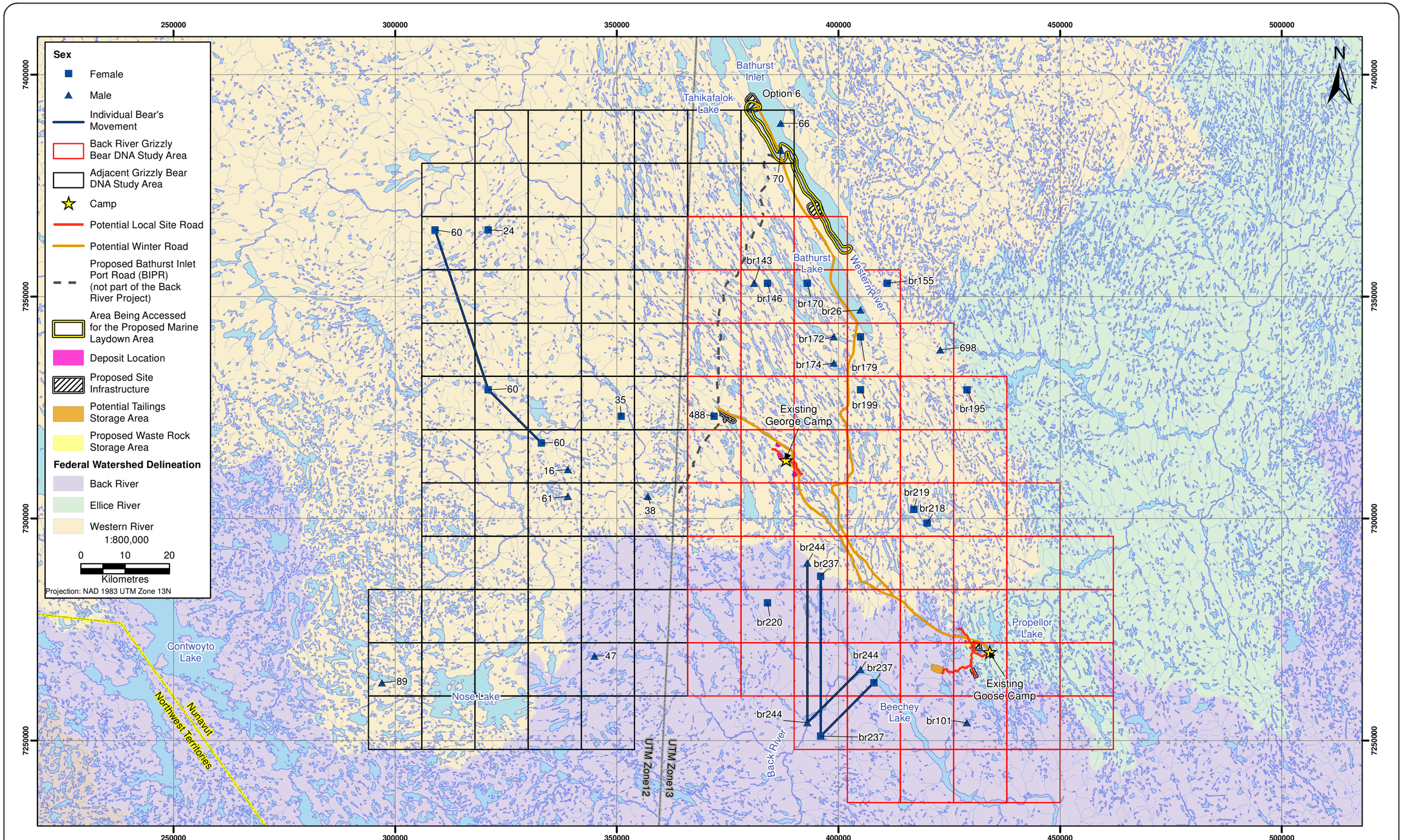


Figure 3.4-3a

Grizzly Bear DNA Hair Capture Locations, Session 1, 2012



Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

Figure 3.4-3b

Grizzly Bear DNA Hair Capture Locations, Session 2, 2012

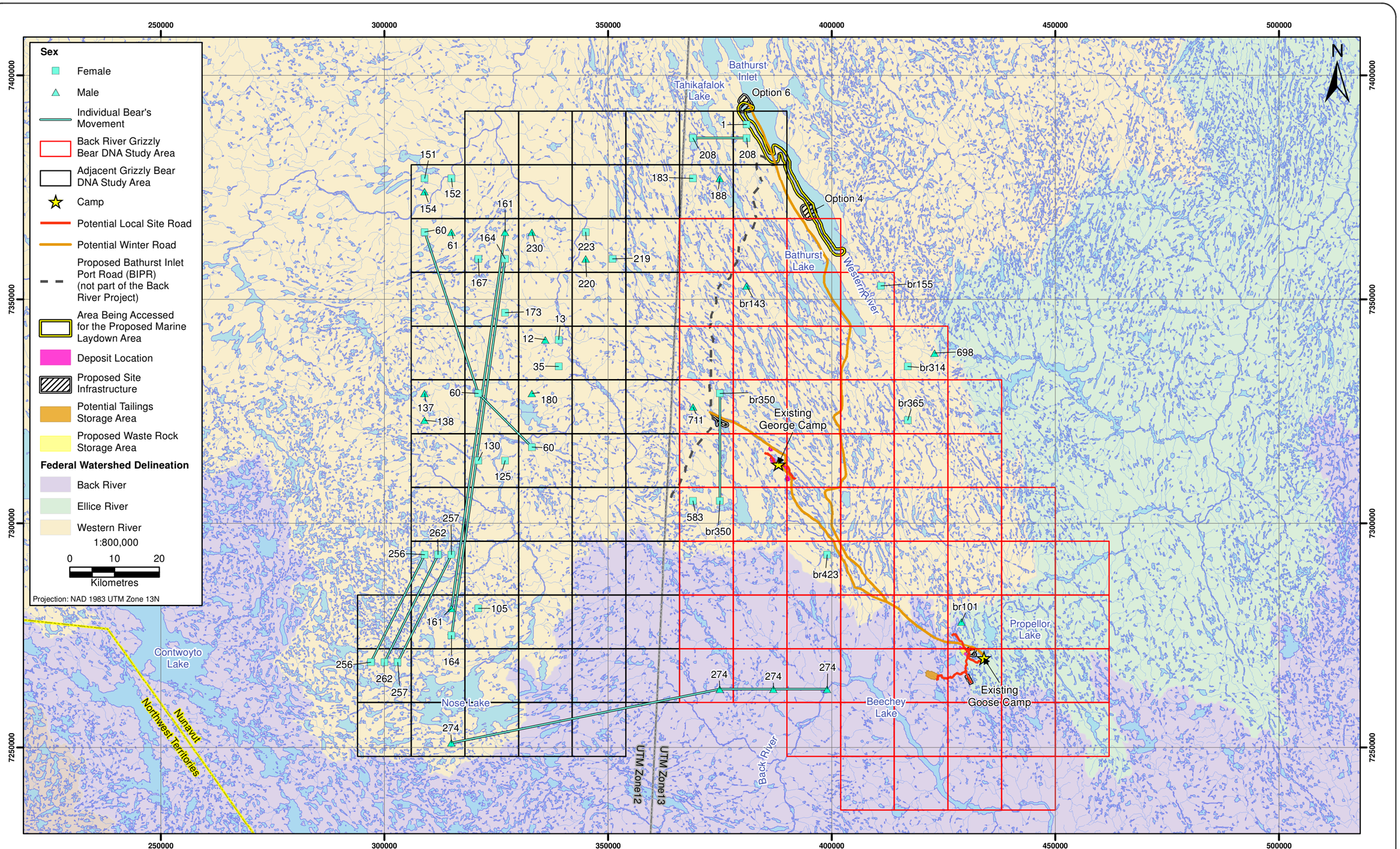
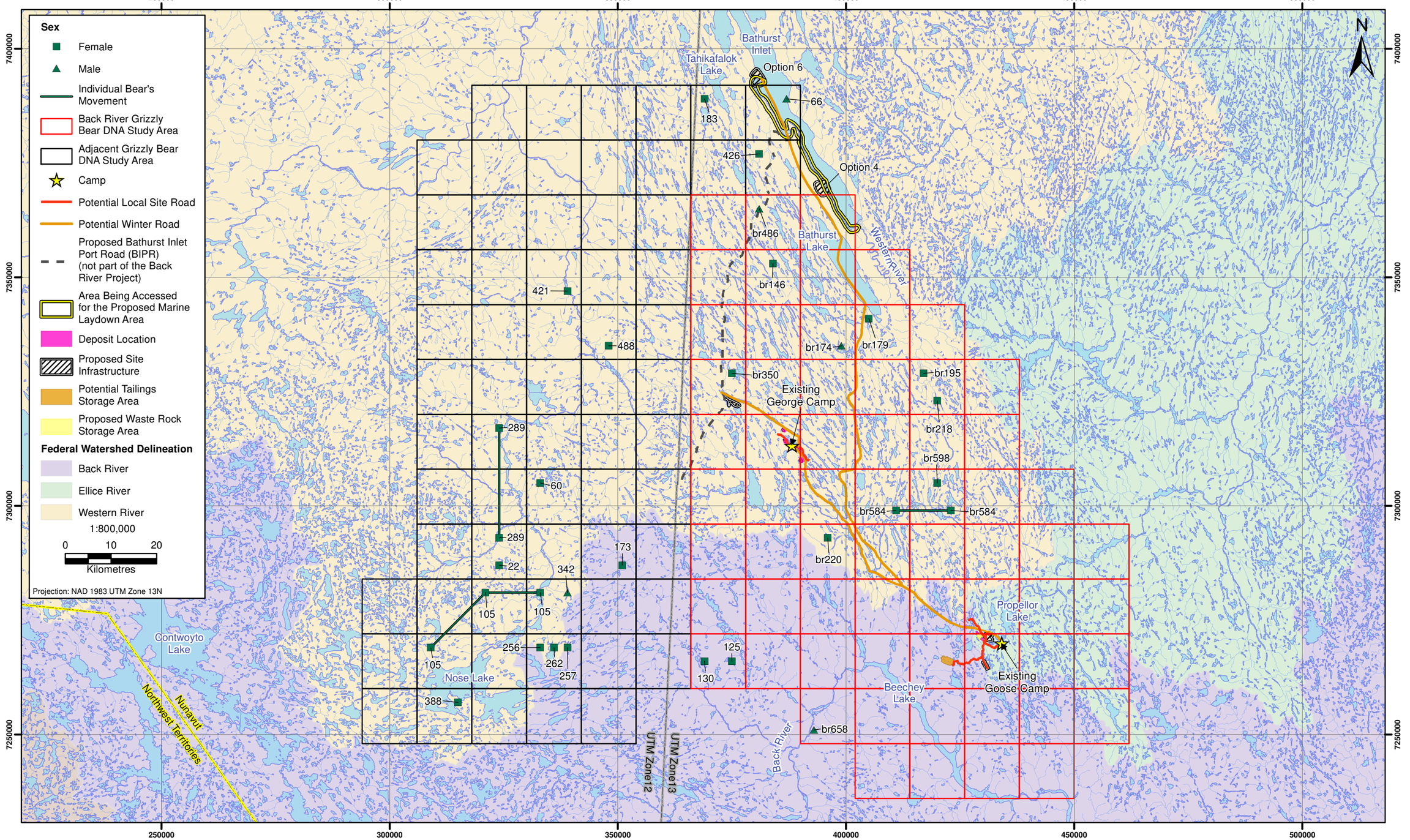


Figure 3.4-3c

Grizzly Bear DNA Hair Capture Locations, Session 3, 2012

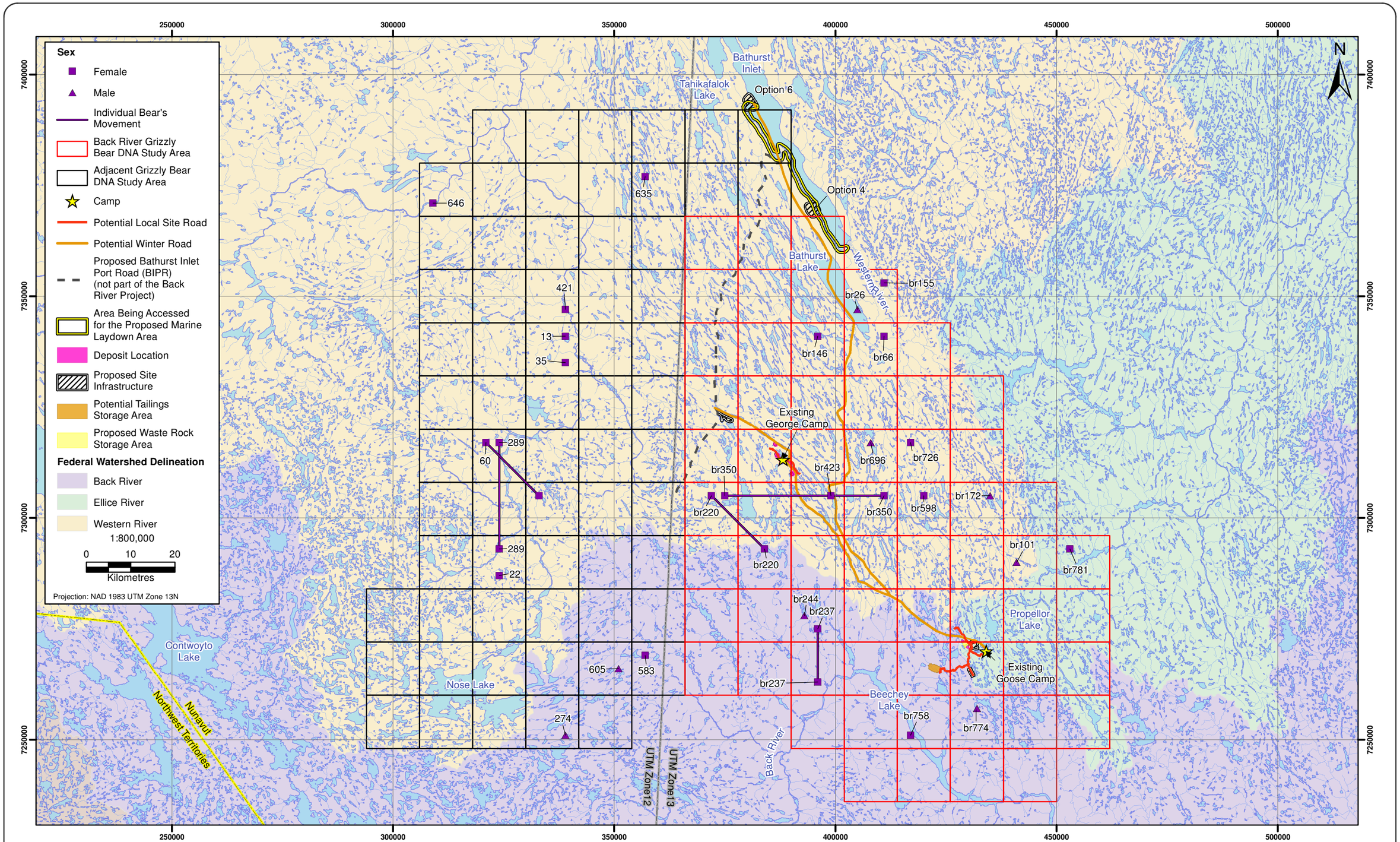


Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

Figure 3.4-3d

Grizzly Bear DNA Hair Capture Locations, Session 4, 2012



Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

Figure 3.4-3e

Grizzly Bear DNA Hair Capture Locations, Session 5, 2012

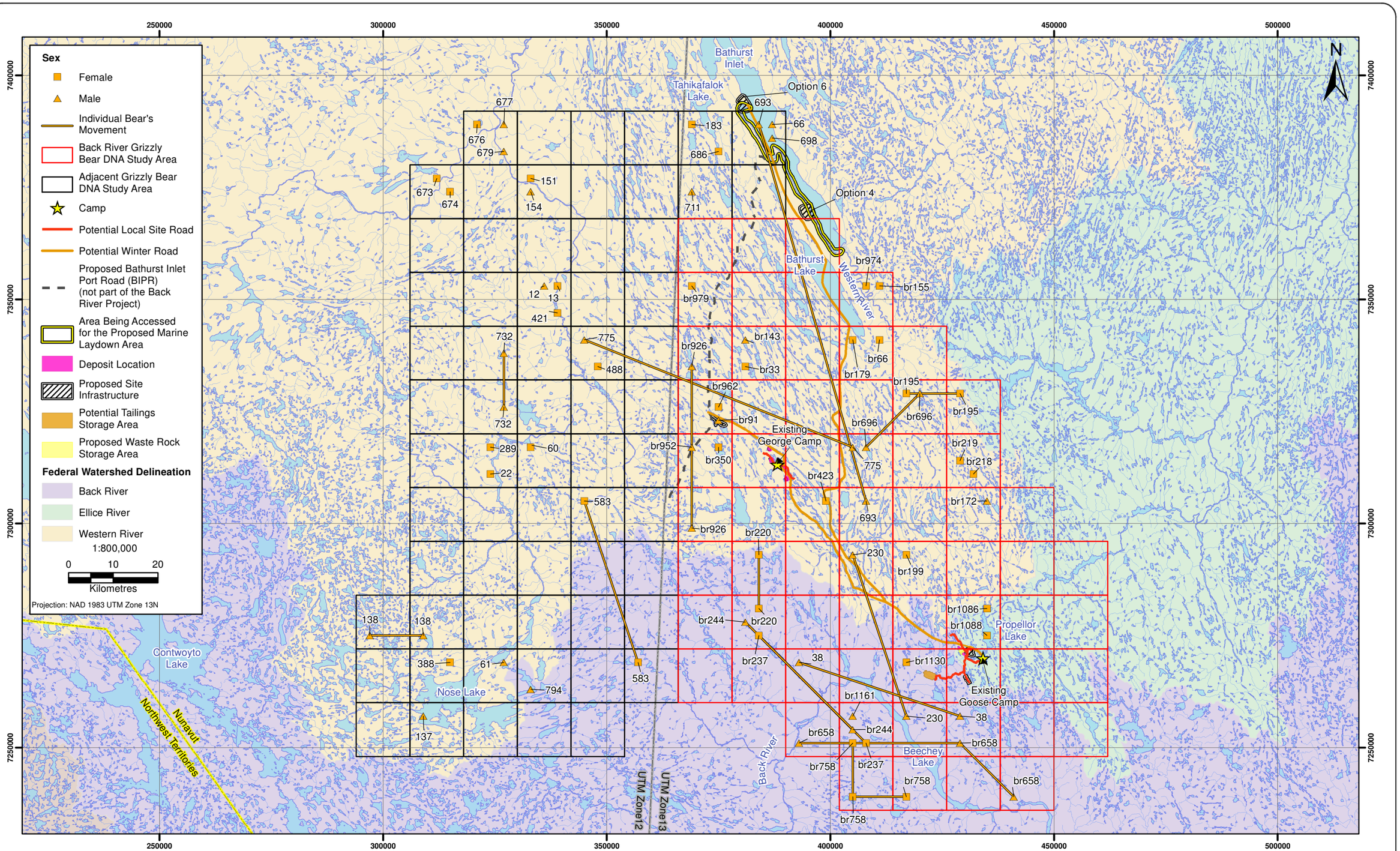


Figure 3.4-3f

Grizzly Bear DNA Hair Capture Locations, Session 6, 2012

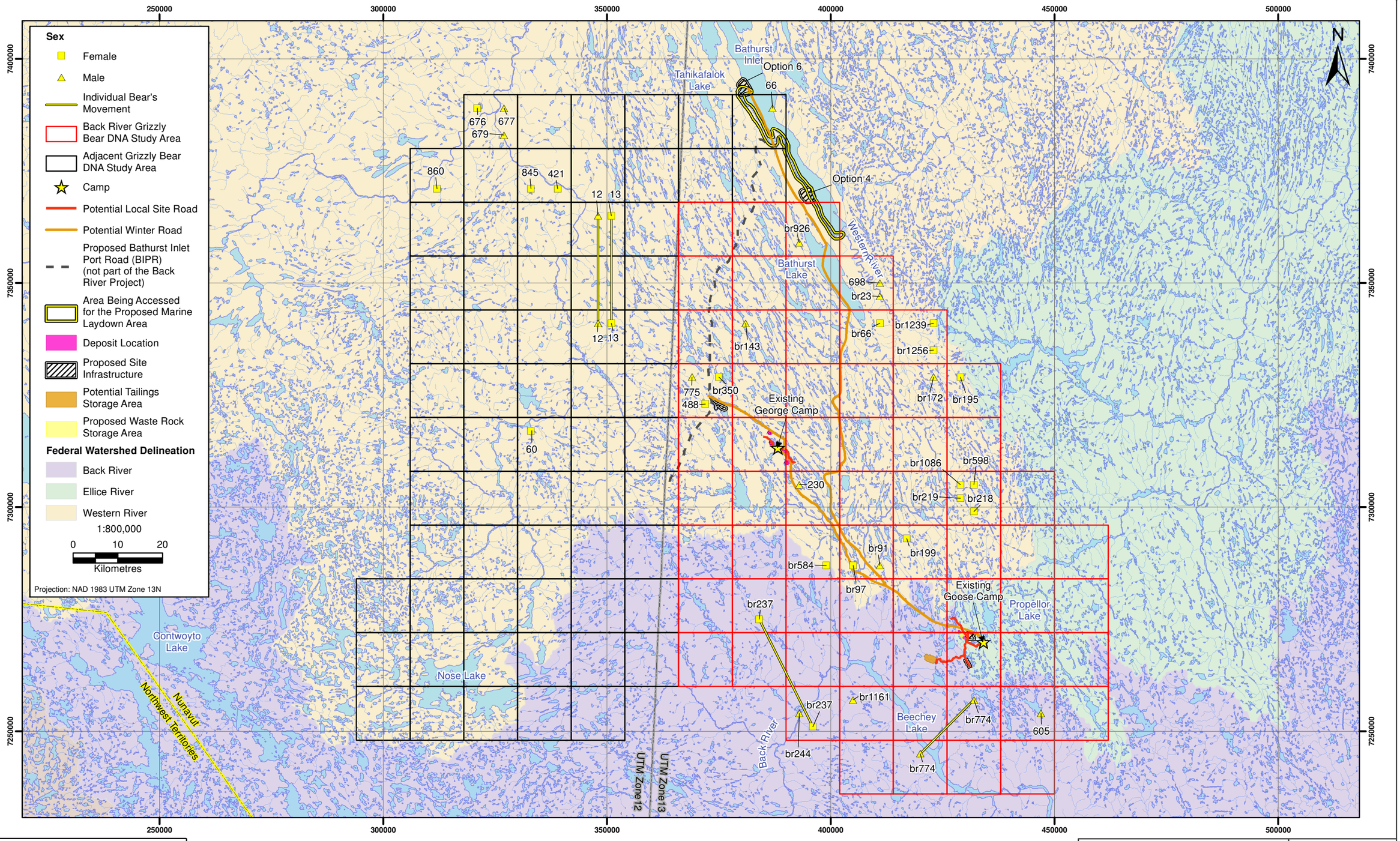


Figure 3.4-3g

Grizzly Bear DNA Hair Capture Locations, Session 7, 2012

Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

Table 3.4-3. Distance Travelled and Area Used by Grizzly Bears, 2012

	Parameter	Average Distance Travelled or Area Used	Range of Distance Travelled or Area Used
Distance travelled by an individual bear per 1 session	Female	25.7 km	9.7 km – 54.9 km
	Male	42.5 km	11.5 km – 89.9 km
	Potential family unit	32.6 km	10.9 km – 84.8 km
Distance travelled during entire survey period	Female	24.6 km	10.9 – 64.6 km
	Male	58.6 km	10.9 - 137.9 km
	Potential family unit	46.3 km	24.6 - 84.8 km
Area used during entire survey period	Female	250.8 km2	30.7 - 496.0 km2
	Male	431.3 km2	2.6 - 1,278.6 km2
	Potential family unit	305.6 km2	0.5 – 462.2 km2

The average distance travelled by male grizzly bears during the entire survey period (i.e., over approximately 80 days) was 58.6 km, whereas females averaged 24.6 km and potential family groups averaged 46.3 km (Table 3.4-3). The distance travelled by a family member was used when calculating the average, as it was assumed that potential family members travelled together although they were not always detected through hair analysis. The distance travelled by an individual male grizzly bear was 137.9 km (bear ID 230) and the distance travelled by an individual female was 64.6 km (bear ID 60; Appendix 1). Potential family unit 161 and 164 travelled 84.8 km. Again, the topography and presence of waterbodies between many of the cells would result in actual distances travelled between points to be considerably higher.

A total of 29 bears were detected at greater than three tripods, including 11 males, 7 females, and 11 bears from six potential family groups (Appendix 5 and Figure 3.4-4). On average, female bears used an area of 250.8 km^2, males used an average of 431.3 km^2, and family groups used an average of 305.6 km^2 (Table 3.4-3). The largest area recorded to be used during the survey period by an individual male grizzly bear was 1,278.6 km^2 (ID 775; Figure 3.4-4). The largest area used by an individual female grizzly bear was 496.0 km^2 (ID br350), and by a family group was 462.2 km^2 (ID br91).

3.4.2.1 Population Analysis

A population analysis was not conducted based on the 2012 grizzly bear DNA results as a minimum of two years of samples is required. A second year of DNA surveys is being conducted in 2013 and will provide an appropriate sample size in order to conduct a population assessment.

3.4.3 Field Observations

Remote cameras were positioned facing grizzly bear tripods in 12 sampling cells. Remote camera data detected a maximum of 74 individual grizzly bears (some may have been repeat visitors between sessions; Appendix 6). There were four occasions where cameras took pictures of grizzly bears but DNA analysis did not detect grizzly bear presence (session 1 cell B35, session 2 cell B27, session 5 cell B17, and session 6 cell B51).

A maximum of eight potential family groups (20 individuals) were recorded by remote cameras during the survey period. Family units were mainly a mother and cub pair; a mother with three cubs was observed twice. Two grizzly bear individuals were recorded together; however, picture quality did not allow age to be determined (i.e., whether they were cubs or yearlings).

3.5 DISCUSSION

The objective of the DNA study for 2012 was to estimate the number of grizzly bears that currently use the study area. The DNA analyses conducted by WGI reported a total of 111 grizzly bears (45 males and

66 females) within the 18,720 km^2 study area. Four of these grizzly bears were also detected in a study centred on the Lac de Gras region to the south (Rescan 2013b), demonstrating the large movements of barren ground grizzly bears and the large territories they may utilize in a given year.

The overall rate of successful DNA extraction was relatively good (80%) when compared to other grizzly bear work in similar areas. The strict quality thresholds used to pre-screen samples for analysis likely increased the success rates. However, the success rate of extracting DNA from underfur samples was poor in comparison to samples that used ≥2 guard hair roots. This is potentially because of exposure to sunlight or moisture, which can degrade DNA samples. Underfur has a finer structure than guard hairs, which may make them more susceptible to environmental conditions. Furthermore, new underfur growth does not generally occur until late summer or fall, such that underfur collected in the spring or early summer are remnants from the previous year that may have naturally degraded. The duration between sessions was kept close to 10 days in order to reduce potential degradation. Sub-selection rules were then applied only to high quality samples that remained in each cluster after pre-screening. Samples from the same cluster were assumed to be from the same individual. This reduced the potential to miss individuals due to sampling bias, and hence potentially underestimate the number of animals on the study area.

The minimum area used by grizzly bears was determined for 25% of the bears identified through DNA analyses. Over the approximately 80 day study, males had larger ranges (largest range recorded was 1,279 km^2) within the DNA study area compared to female bears and potential family units (largest ranges recorded were 496 and 462 km^2, respectively). On average, males can range over 7,000 km^2 per year (McLoughlin et al. 1999; McLoughlin et al. 2003), which may cause male grizzly bears to appear transient. As such, they are less likely to be encountered repeatedly. Female grizzly bears tend to have smaller home ranges and demonstrate high fidelity to those home ranges (McLoughlin et al. 1999; McLoughlin et al. 2003). Only 12 grizzly bears were common to both the Back River DNA Study Area and the adjacent western cells.

The average maximum distance travelled by a male grizzly bear (58.6 km) during 2012 survey period was over double the average for female bears (24.6 km). The maximum distance recorded for a male bear (137.9 km) was also double the amount of the maximum distance of a female bear (64.6 km). This is consistent with the notion that male movement rates are higher than females and average an extra 2-3 km/day during the summer and late summer periods (McLoughlin et al. 1999). The average minimum distance travelled by a male bear during one check (42.5 km) was two-thirds greater than the average of female bears (25.7 km).

Grizzly bears appeared to be equally distributed throughout the study area during the survey period. Grizzly bear tripods were not placed near camp or the Project location in order to reduce the potential for human and bear interactions. However, incidental observations of grizzly bears were recorded in these areas (Rescan 2012).

Eight potential family units were identified through mapping the movements of individual grizzly bears identified by DNA analysis. Grizzly bears were categorized as a potential family unit when bears were observed during greater than one session at greater than two cells. Eight family units were also identified through camera data; however, only two of these family groups correspond with the potential family groups identified through DNA analysis (families br218 and br219; br237 and br244). Hair from cubs does not snag on the barbed wire as easily as adult hair, which could explain why camera data identified family units where DNA analysis did not. There were three occasions where family units were not observed in camera data but potential family units had been categorized through mapping grizzly bear movements from hair DNA. In one of these cells, the camera had been knocked over which could explain why a family unit was not observed. In the other two situations, bears br91 and br97 had been categorized as a potential family due to being detected in two cells during two sessions; however, the remote cameras did not capture these two bears together or as a family unit.

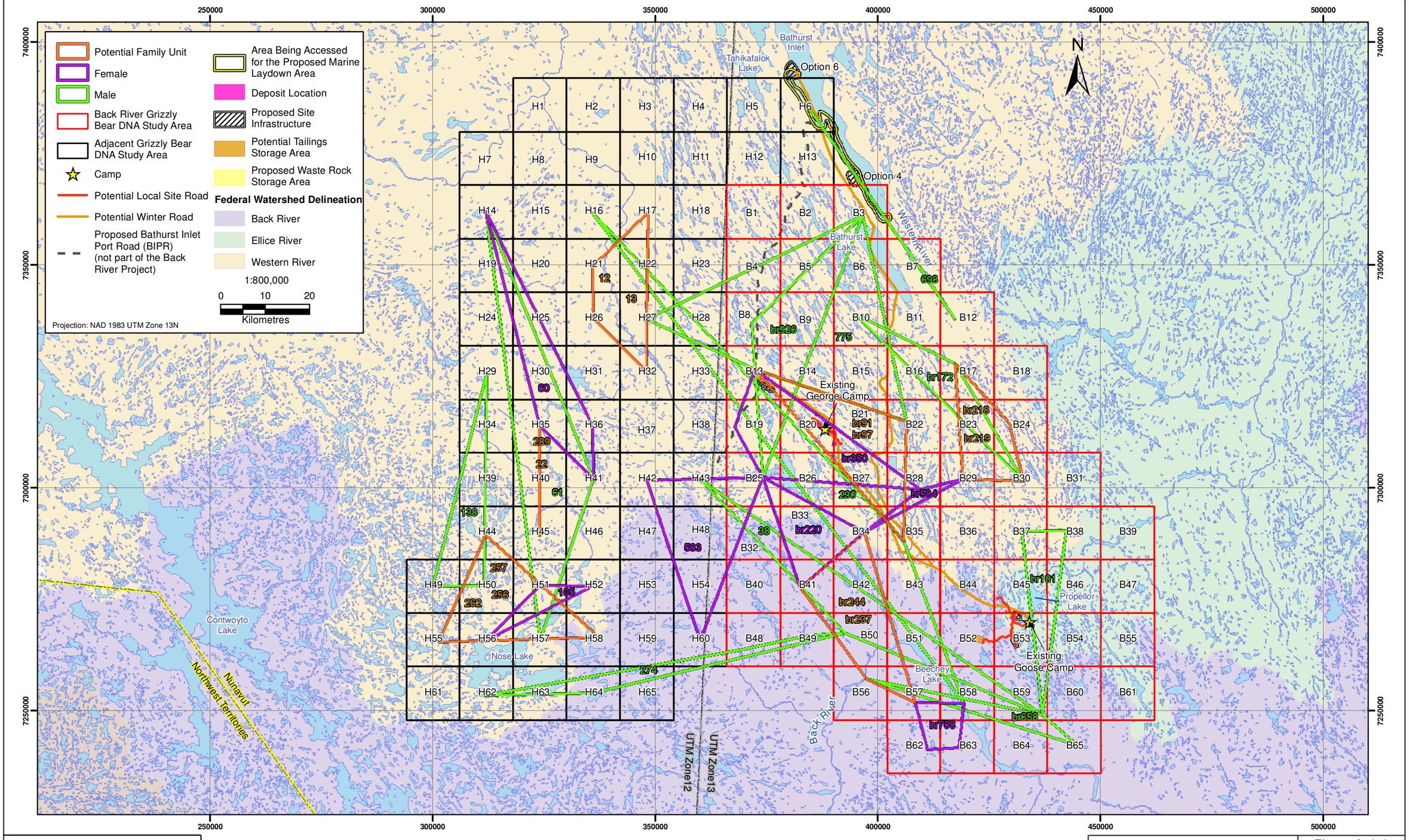


Figure 3.4-4

Grizzly Bear Area Used during DNA Surveys, 2012

Remote cameras were placed in 12 cells within the eastern portion of the Grizzly Bear DNA Study Area. A maximum of 74 grizzly bears were photographed by the cameras; however, some of the images were likely repeat observations of the same bear so the total number would be less than the reported number. There were four occasions where cameras captured pictures of grizzly bears but DNA analysis did not identify an individual grizzly bear. Hair samples were collected during three of these occasions, but were determined to be inadequate, failed during microsatellite analysis, or were excluded due to sub-selection rules. There were no hair samples captured during the fourth occasion. This may be due to the fact that first year cub hair does not catch on the barbed wire as easily as adult bears, or wind may have blown the hair off the barb wire. Some of the tripods were already knocked down during these visits, or bears did not appear to rub against the tripods.

This first year of this DNA study suggests that this area in Nunavut is productive for grizzly bears. The Grizzly Bear DNA Study Area supports a large number of grizzly bears, potentially because of the prevalence of esker habitats for secure denning, potential seasonal access to caribou, fish resources in the abundant lakes and streams in the area, productive forage in riparian zones, and the relatively low level of hunting in this area. The density of barren ground grizzly bears was estimated to be 3.5 bears per 1,000 km^2 for the central barrens of mainland Nunavut and the Northwest Territories (McLoughlin and Messier 2001), and up to six or seven bears per 1,000 km^2 in the Kitikmeot region of western Nunavut (Dumond 2010). The overall goals of the two year DNA program is to estimate the number of grizzly bears that are likely to occur in the Grizzly Bear DNA Study Area as a baseline for monitoring. For northern grizzly bear populations that are at naturally low densities with individuals that range over vast distances, multiple sampling sessions across multiple years is required to attain adequate data for statistical analyses as accurate population estimates are dependent on sufficiently high recapture rates (Proctor et al. 2010).

4. Wolverine DNA

Rescan™
Engineers and Scientists

4. Wolverine DNA

4.1 INTRODUCTION

Wolverine populations (*Gulo gulo*) in the central Arctic are federally listed as stable (COSEWIC 2003) and listed as secure in Nunavut (CESCC 2005), while the western Canadian wolverine population (which includes part of Nunavut) is federally listed as a species of Special Concern (COSEWIC 2003). Wolverines were documented in the Regional Study Area (RSA) during baseline studies conducted in 2010 (Rescan 2011a) and 2012 (Rescan 2013a), but not in 2011.

Wolverines are culturally and economically important to the Inuit. Wolverine are highly respected by Inuit people for their cunning ability to fool hunters (Thorpe et al. 2001). Wolverine pelts are also highly valued for their frost-resistant properties and used as trim and lining for clothing, including parkas and mittens.

Home range sizes for wolverines in the Slave Geologic Province average 126 km^2 for adult females and 404 km^2 for adult males (Mulders 2000). Food availability is the dominant factor influencing movement patterns and home range selection by wolverines (Banci 1994). Their primary food source is caribou supplemented with a variety of other species, such as large mammals (muskox or moose), carnivores (wolverine, red fox, Arctic fox, and ermine), small mammals (lemmings, voles, Arctic ground squirrels, and hares), marine mammals, and fish (Mulder 2000).

Wolverines are challenging to study due to their large home ranges, low population densities, and solitary natures (Persson, Wedholm, and Segerstrom 2010; Inman et al. 2012a); however, recent advances in camera trapping and DNA analysis have resulted in new information on population dynamics, including more rigorous estimates of population densities (Mulders, Boulanger, and Paetkau 2007; Royle et al. 2011).

Wolverines traverse in and out of grid areas during sampling, which violates the assumption of geographic closure in most studies that use mark-recapture or related methods (Miller et al. 1997). Abundance estimates derived from mark-recapture correspond to the "superpopulation" if movement is random across grid boundaries (Kendall 1999). In the context of mark-recapture DNA studies, the superpopulation is defined as the number of animals that inhabit the sampling grid and surrounding area (as opposed to the grid area alone) (Boulanger et al. 2004). While the superpopulation estimate represents the number of animals that traverse an area, the estimate is compromised by the undefined sampling area and therefore cannot be used to estimate density (Boulanger et al. 2004). Under a trend monitoring objective, however, an absolute abundance or density estimate is not necessary, and the assumptions of population closure can be relaxed (Apps 2010). In this case, the superpopulation estimate can be used as the basis for monitoring relative changes over the long term.

Sabina has conducted a two-year assessment of wolverine abundance and distribution using a DNA hair-capture study (2012 to 2013). This report provides preliminary results from 2012 and 2013. Once complete laboratory data has been provided from 2013, all the DNA results will be combined to model a superpopulation estimate, which will be presented in a separate DNA report in 2014.

4.2 OBJECTIVES

The objectives for this interim stage of the study are to:

- Calculate the total number and the spatial distribution of wolverines that currently use the DNA Study Area.

The objectives for the overall wolverine DNA (2-year study) that will be presented in 2014 are to:

- Generate a superpopulation estimate for wolverine in the Back River study area as a potential baseline for trend monitoring;
- Describe the spatial and temporal distribution of wolverine in the DNA Study Area;
- Identify wolverine that were sampled in areas outside of the Back River study area in nearby study areas (e.g. Hackett River Project study area); and,
- Calculate demographic variables for wolverines, such as sex ratios.

These overall objectives can only be achieved by combining the results across multiple sampling sessions and years to obtain sufficient captures and recaptures required for statistical analyses.

4.3 METHODS

The survey area for the wolverine DNA hair study was a 169,200 ha grid, roughly centered between Goose and George Camps (Figure 4.3-1). The survey grid was divided into 47 cells, each measuring 6 km x 6 km. The deployment of sampling stations within a cell was designed to ensure that no posts were positioned or baited closer than 5 km from either camp to avoid attracting animals into the camps. One unbaited post, however, was positioned near the goose neck on Goose Lake as a wolverine den was observed in the vicinity during other wildlife baseline studies conducted in 2012 (Rescan 2013).

4.3.1 Post Set-up

Within each cell, a five-foot-long 4” x 4” post wrapped with barbed wire was positioned and secured with rocks placed on a four-foot-long 1” x 4” cross-plank base (Plate 4.3-1). A long-distance (strong-smelling) lure was used to attract wolverines to the post and a piece of fish placed at the top of each post provided incentive to climb the posts. The lures were poured on the top and sides of the posts, while the fish was nailed to the top of the post. Posts were set up between March 22 and March 25, 2012.

Wolverine posts were placed at the approximate centre of each cell. The exact location was determined by habitat and topography likely to attract wolverines, such as areas where wolverines are likely to find food in late winter (e.g., along lakes and rivers, and at the base of cliffs).

Data collected during post set-up included date, habitat type, UTM coordinates, lure and bait used, wildlife sign observed, and whether a remote camera was placed at the site. In 2012, 14 remote cameras were set up at select wolverine posts to record wildlife visits and behaviour at the posts (Plate 4.3-2).

4.3.2 Hair Collection

Three sampling sessions (checks) were conducted to collect hair samples, spaced 10 to 14 days apart. The first check occurred between April 5 and 8, the second between April 16 and 17, and the final check and post removal was conducted between April 26 and 27. Lure and bait were provided during set-up and the first two checks. At the final check, hair samples were collected, and the posts were disassembled and removed from the tundra.

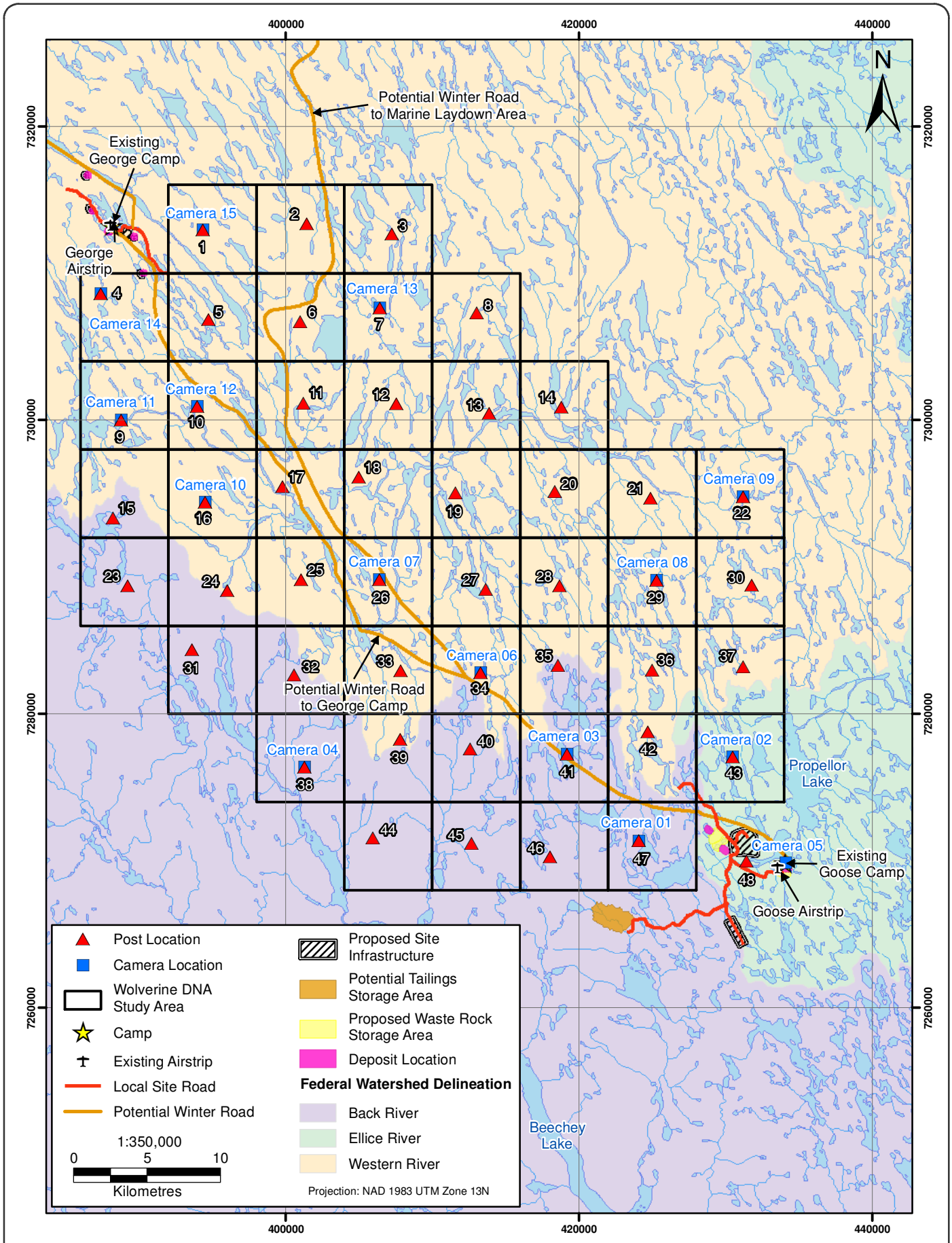


Figure 4.3-1

Wolverine DNA Study Grid, Back River, 2012

Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

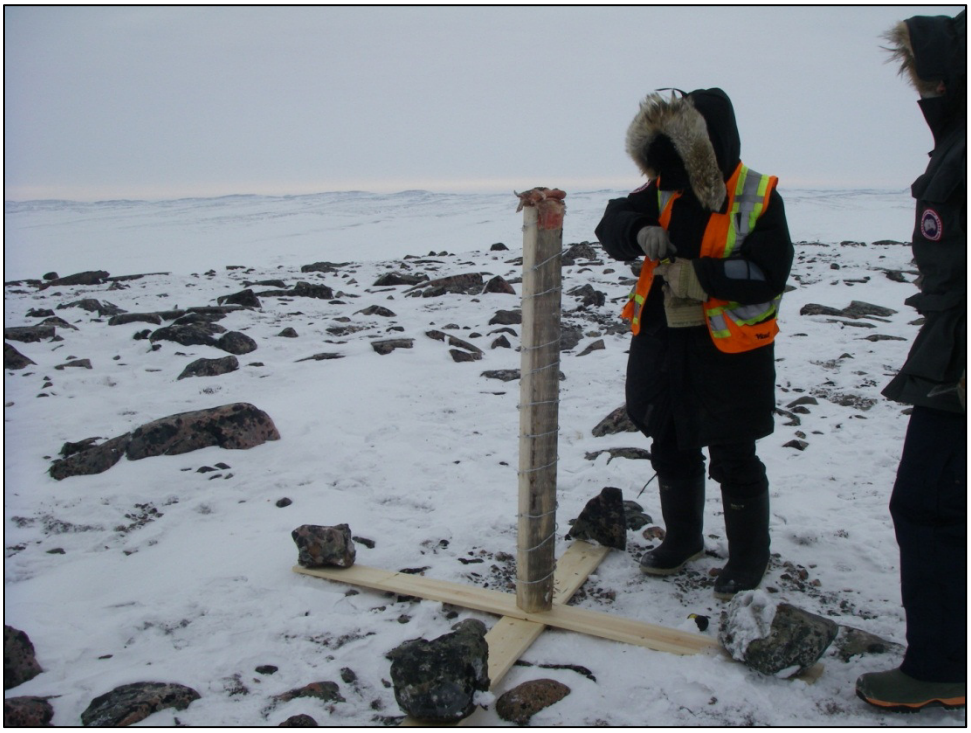


Plate 4.3-1. Field crews adding wolverine lure to a baited post for DNA study on March 24, 2012.

Plate 4.3-2. A camera set up at wolverine post #38.

Each hair sample collected from a barb was placed into a coin envelope and was given a unique identification (ID) number. The coin envelope was labeled with the date, cell number, sample location (where on the post it was found), and the unique ID number. For each post, the sides of the post were arbitrarily selected as side A, B, C or D. Hair samples were labelled according to which side of the post they were found on. For subsampling purposes, hair samples along a side were grouped into clusters. A cluster is defined as a series of hair samples from consecutive barbs. A new cluster is identified following an empty barb. Samples within a cluster were assumed to be from the same individual. All coin envelopes containing the hair samples from one post (one cell) were then stored inside a letter-sized envelope labeled with the cell number, date, and number of samples collected at that post. Hair samples were air dried for 48 hours and stored in envelopes for shipping to the laboratory.

Data collected during hair collection checks included date, post condition, lure and bait used, wildlife sign, number of hair samples collected, and photo numbers.

4.3.3 Remote Digital Cameras

Reconyx PC800 Professional digital cameras were placed at 14 wolverine DNA sampling locations (Figure 4.3-1) to determine capture failure (i.e., whether some wolverine visiting a post were not leaving behind hair samples), and for those posts with hair samples, to determine whether DNA analyses were recording the correct number of wolverines visiting posts (i.e., number of individuals identified by DNA matched the number observed by camera to have climbed the posts). Remote digital cameras recorded observations of wolverines and other wildlife between March 22 and April 27, 2012.

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a tripod, which was secured with rocks to prevent it from being knocked over when encountered by wildlife (Plate 4.3-2). Energizer® Lithium batteries were used to maintain camera performance at low-temperatures. Each camera was programmed to take a photograph every 30 minutes during deployment, in addition to being triggered by motion in the infrared spectrum. Motion in front of the camera would trigger the camera to take 10 photos at one-second intervals. Along with each photo, the cameras would record the date, time, type of trigger (i.e., time [T] or motion [M]), number of triggered photos taken (i.e., 1/10 - 10/10), temperature, and camera number. Cameras were programmed to immediately record a second set of 10 photos upon re-triggering. Memory cards from these Remote digital cameras were collected during the final wolverine DNA check.

A protocol was developed to ascertain if individual wolverines visiting DNA posts were the same individual or multiple individuals to remove duplicate wolverines for comparison with the WGI data. First, when multiple photo series were triggered, the photos recorded during the second and subsequent triggers were considered part of the same series if they were taken less than 5 minutes apart. Second, if both timed and triggered photos were taken within 5 minutes of each other, they were initially recorded separately but were then combined and reviewed to remove any duplicates. Next, all data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as carnivores may spend more than 5 minutes at a site. If a photo series (motion or time triggered) were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were from the same animal. Observations of carnivores were considered a duplicate if it was not possible to tell individuals apart within the 24 hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series. Finally, photographs were reviewed to ascertain if the wolverine interacted with the DNA post (i.e., climbed the post and thus potentially left a DNA sample).

4.3.4 Laboratory Analysis

4.3.4.1 DNA Extraction

All hair samples were submitted to Wildlife Genetics International (WGI) in Nelson, British Columbia for analysis. WGI analyzed only the most promising single sample from each unique cell/check/cluster combination, with a minimum quality threshold of one guard hair root or five underfur hair samples. Samples that were excluded by the sub-selection rule (i.e., that were not the most promising sample in their cell/check/cluster) were classified *Xsubselect*, while those that fell below the quality threshold were classed *Xinadequate*. DNA was extracted using QIAGEN's spin columns. The note taking conventions and DNA extraction process followed the manufacturer's instructions (for details search http://www.qiagen.com) and was consistent with past projects, with the goal of using 10 guard hair roots when available. The amount of material leftover for potential re-extraction was classified as A (excellent) through C (none).

4.3.4.2 Microsatellite Genotyping

Microsatellite genotyping was used to identify individual wolverines. DNA extracted from samples went directly through a multi-locus analysis of individual identity with no initial single-locus prescreen for sample quality or species. This analysis used eight standard markers applied to other wolverine projects in the Arctic, including a *ZFX/ZFY* gender marker and seven microsatellite markers.

Genotyping followed a standard 3-phase approach, starting with a first pass of all eight markers for the samples analyzed. After the first pass, samples that produced high-confidence genotype scores (based on peak height and appearance of sample) for three or less of the eight markers were set aside (*Xbomb*). The first pass was followed by a cleanup phase in which WGI reanalyzed data points that were weak or difficult to read the first time.

The third phase of analysis included error-checking, and followed WGI's published protocol of reanalyzing the mismatched markers in pairs of genotypes that match at all-but-one or all-but-two markers (Paetkau 2003). For the error-check, WGI compared the Back River samples against 641 genotypes from other Nunavut and NWT wolverine studies, checking for errors that might have caused a particular animal to receive slightly different genotype scores in different study areas. During this phase, WGI analyzed an additional two markers per individual, so that comparisons among study areas (including those Projects outside of the RSA) could be based on 10 markers, instead of eight. Once the genotyping was completed, WGI defined an individual for each unique multi-locus genotype.

4.4 RESULTS

4.4.1 Summary

Samples were collected in the field during three sessions from March 22 to April 27, 2012. A total of 196 wolverine hair samples were collected during 2012 and submitted for DNA analysis. The majority of samples were collected in the southwest portion of the wolverine DNA grid. Of the total number of samples collected, 74 samples (38%) were successfully extracted and assigned to 12 independent individuals. One of these individuals was previously detected in a DNA study conducted at Ekati approximately 225 km to the southwest of the Back River wolverine study area. Remote cameras placed at 14 tripods recorded a maximum of 60 wolverines.

4.4.2 Wolverine DNA Data Quality

Forty-seven wolverine DNA posts were set-up and checked for hair samples between March 22 and April 27, 2012. A total of 196 hair samples were collected during this time and submitted to the

WGI laboratory for DNA analysis (Table 4.4-1). The detailed field hair collection and genetic marker data are recorded in Appendix 7. A summary of individual wolverine genotypes and capture/recapture rates for 2012 is included in Appendix 8.

Table 4.4-1. Summary of Wolverine Hair Samples Collected, 2012

Check #	Date Range	Lure Used	Food Reward Used	# Cells with a Capture	# Samples	# Successful Hair Extractions	# of Individual Wolverines Detected*
Set-up	March 22 - 25	None	None	2	3	1	1 (1M)
Check #1	April 5, 8	1 oz Skunk Essence	Fish	17	53	16	6 (4M:2F)
Check #2	April 16 - 17	1 oz Skunk Essence	Fish	20	69	28	7 (4M:3F)
Check #3	April 26 - 27	1 oz Skunk Essence	Fish	22	71	29	8 (4M:4F)
Total					**196**	**74**	**12 (8M:4F)**

* *Some individuals were detected in more than one check.*

The 196 hair samples recorded in the 2012 wolverine database were classified by WGI as follows:

1. *Successful samples* (38%): 74 samples that were assigned to individuals.
2. *Inadequate samples* (23%): 46 samples that lacked sufficient hair follicles for DNA extraction.
3. *Sub-selected samples* (25%): 49 samples that were excluded due to sub-selection rules.
4. *Bombed samples (*13%): 25 samples of unknown species that failed during microsatellite analysis.
5. *Non-target samples* (1%): 2 samples that were identified as red fox by DNA species testing.

4.4.3 Wolverine DNA Analysis Results

The WGI lab extracted DNA from 101 samples (52 % of samples submitted for analysis) due to samples that were either excluded because of inadequate hair follicles for DNA extraction or due to sub-selection rules. Of the samples extracted, 27 were further excluded from analysis due to having ≤3 microsatellite markers matching those indicative of wolverine samples or failed during the clean-up phase, leaving a total of 74 samples that had high confidence scores for the eight markers used for wolverine identification.

From the 74 successfully analyzed hair samples, a total of 12 individuals were identified, including four females and eight males. Lab results indicate that two posts were visited by three different wolverine individuals, eight posts were visited by two different individuals, 17 posts were visited by one individual, and 22 posts were not visited at all (Figure 4.4-1). The majority of the posts that were frequented by wolverines were in the southern part of the DNA grid, primarily the southwest portion.

Seven individuals were detected across multiple sampling sessions, including five that were recaptured at least once, and two that were recaptured twice. Two individuals were new captures during the last sampling session. One male (WV155) was identified as a re-capture of a wolverine previously detected in the NWT during another monitoring study, approximately 225 km southwest of the Back River study.

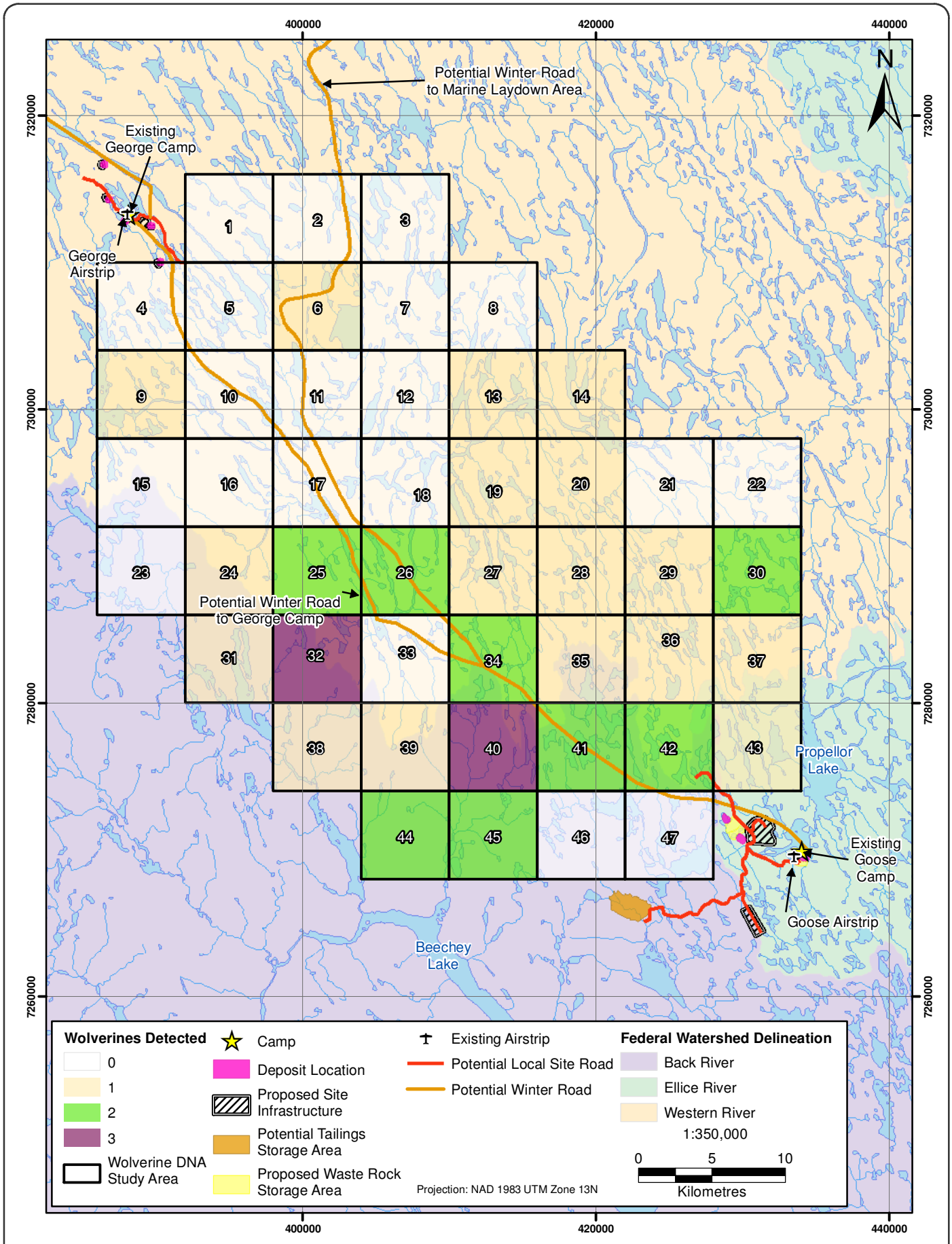


Figure 4.4-1

Capture Frequency of Individual Wolverine at Hair Snagging Stations, 2012

Sabina GOLD & SILVER CORP.

Rescan™ Engineers & Scientists

4.4.4 Wolverine Movement in the Study Area

Three males and two females were captured in more than one cell during a single 10-14 day sampling period (Table 4.4-2). These capture events represent cumulative straight line distance movements ranging from 24 to 43 km for females and 12 to 36 km for males between multiple DNA posts (Table 4.4-2). The longest straight line distance between two posts visited by an individual (WV007) during the entire survey was 22 km (Figure 4.4-2). Given the topography and presence of waterbodies between many of the cells, the actual distances travelled between points are likely considerably higher.

Table 4.4-2. Summary of Distances Travelled for Wolverines Detected Among Multiple DNA Posts, 2012

Wolverine	Check #	Distance (km)	Sex
WV_045	1	24.546	F
WV_045	2	28.986	F
WV_172	2	33.103	F
WV_172	3	42.716	F
WV_001	1	12.061	M
WV_001	2	21.908	M
WV_001	3	26.234	M
WV_007	1	29.386	M
WV_057	2	29.436	M
WV_057	3	35.868	M

A minimum convex polygon (MCP) representing the minimum spatial distribution of a wolverine during the entire survey period was calculated for individuals that were detected at greater than three posts, which included three male wolverines and two females (Figure 4.4-3). Minimum recorded area estimates for individual wolverines ranged from 89 km^2 to 264 km^2, with an average area of 162 km^2. Male wolverines had slightly larger areas of use than females (166 km^2 versus 157 km^2). There were several cases where MCP's overlapped with each other, including at least one case for every individual. The largest spatial overlap was 129 km^2 between a male (WV057) and a female (WV172). Cells 25, 26, 28, 32, 34, and 40 all had three intersecting territories; cell 34 had the largest area of intersecting spatial distributions with3 territories comprised of 52 km^2 of multiple use.

4.4.5 Preliminary 2013 Field Collection Results

In 2013, two study areas were sampled for wolverine DNA in the same manner as the 2012 study, which included the same 2012 study area, and an additional northern grid centered on the marine laydown area located at Bathurst Inlet (Figure 4.4-4).

A total of 497 hair samples were collected in 2013, including 272 in the southern grid and 225 in the northern grid. During the preparation of this report, 2013 DNA results were not available. These results will be presented in a final report in 2014. The combined southern and northern grid roughly doubled the area sampled for wolverines, and the number of hair samples collected increased by just over 300 samples. The increase in sample size may partially reflect the application of lessons learned during the 2012 field season, such as where to position posts on the landscape. In 2013, posts were positioned in valleys and on the edges of waterbodies based on new evidence that wolverines feed in these areas (Kim Poole, Aurora Wildlife Research, unpublished data presented at technical sessions hosted by ENR, Feb. 2013).

4.4.6 Remote Camera and Incidental Observations

4.4.6.1 Remote Camera Detections

Remote digital images of wolverines were recorded at six of the 14 remote digital camera stations set up for the wolverine DNA study (Table 4.4-3). A total of 60 wolverine picture series were detected whereby wolverines were observed approaching a post (Plate 4.4-1), although only 25 of these events resulted in a wolverine climbing the DNA post with the possibility of leaving a hair sample throughout all check periods (Table 4.4-3; Plate 4.4-2). There were no instances of DNA posts with hair samples that were not climbed meaning that when wolverines climb a post at least one sample is collected.

Cameras in cell numbers 26, 29, 34, 38, and 41, which are all located in the southern portion of the DNA grid, detected the most wolverines compared to cameras in the northern portion. This finding was consistent with DNA results indicating a greater number of wolverines in the southern portion of the DNA grid (Figure 4.4-1). The highest number of observations was recorded during the time period spanning checks one and two (April 5 to 17; Table 4.4-3). During this time period there were 24 instances where a wolverine visited a remote digital camera and eight instances where the wolverine interacted with the DNA post. The time period spanning setup and check one had 18 instances where a wolverine visited a remote digital camera and nine instances where wolverines interacted with the DNA post. All observations were of adult wolverines only. Wolverine pups were likely still in their natal dens.

Overall, correspondence among WGI findings and remote digital cameras was high (76%). There were a total of 32 instances where DNA results agreed with photos recorded by remote digital cameras. For example, there were 25 instances where no wolverines were detected by DNA analysis, or by remote digital cameras (0 DNA/0 Camera) and seven instances where both the DNA results and the remote digital cameras detected one wolverine (1 DNA/1 Camera) per sampling period. In contrast, there were eight instances where remote digital cameras detected more wolverine activity than indicated by DNA results (1 DNA:3 Camera, N=3; 0 DNA:1 Camera, N=2; and 1 DNA:2 Camera, N=3); however, it is possible that it was the same individual repeatedly being photographed by the cameras. Finally, there was at least one instance where the DNA results indicated more visits by wolverines than was detected by remote digital camera (2 DNA:1 Camera), and one occasion where two individual wolverines were detected by DNA results and the remote digital camera was non-operational. It should be noted that wolverines detected at remote cameras and recorded as unique individuals may have been repeat observations of the same animal at the same camera or at multiple cameras.

Grey wolves (N=29) and Arctic fox (N=15) were the only other carnivores detected by remote digital cameras during the wolverine DNA study (Table 4.4-3). The highest of number of grey wolves (n = 16) and Arctic foxes (n = 9) were recorded between DNA post setup and check one.

4.4.6.2 Den Locations in and near the RSA, 2012

Two active wolverine dens were observed during baseline studies conducted in 2012 (Figure 4.4-5). Both active dens were observed along glacial-fluvial benches. The first active wolverine den was discovered during the wolverine DNA study and was located in cell 48, approximately three km from proposed site infrastructure at Goose camp. Fresh tracks were detected around the den confirming the den was active. The second active den site had scat and prey remains around it and was observed during breeding bird surveys. The denning site was located outside the Wolverine DNA study grid, just south of cell 48 and was approximately 1 km from proposed infrastructure at Goose camp. Productivity at these sites was not confirmed. Den sites did not overlap any of the minimum areas used by wolverines during DNA surveys (Figure 4.4-3).

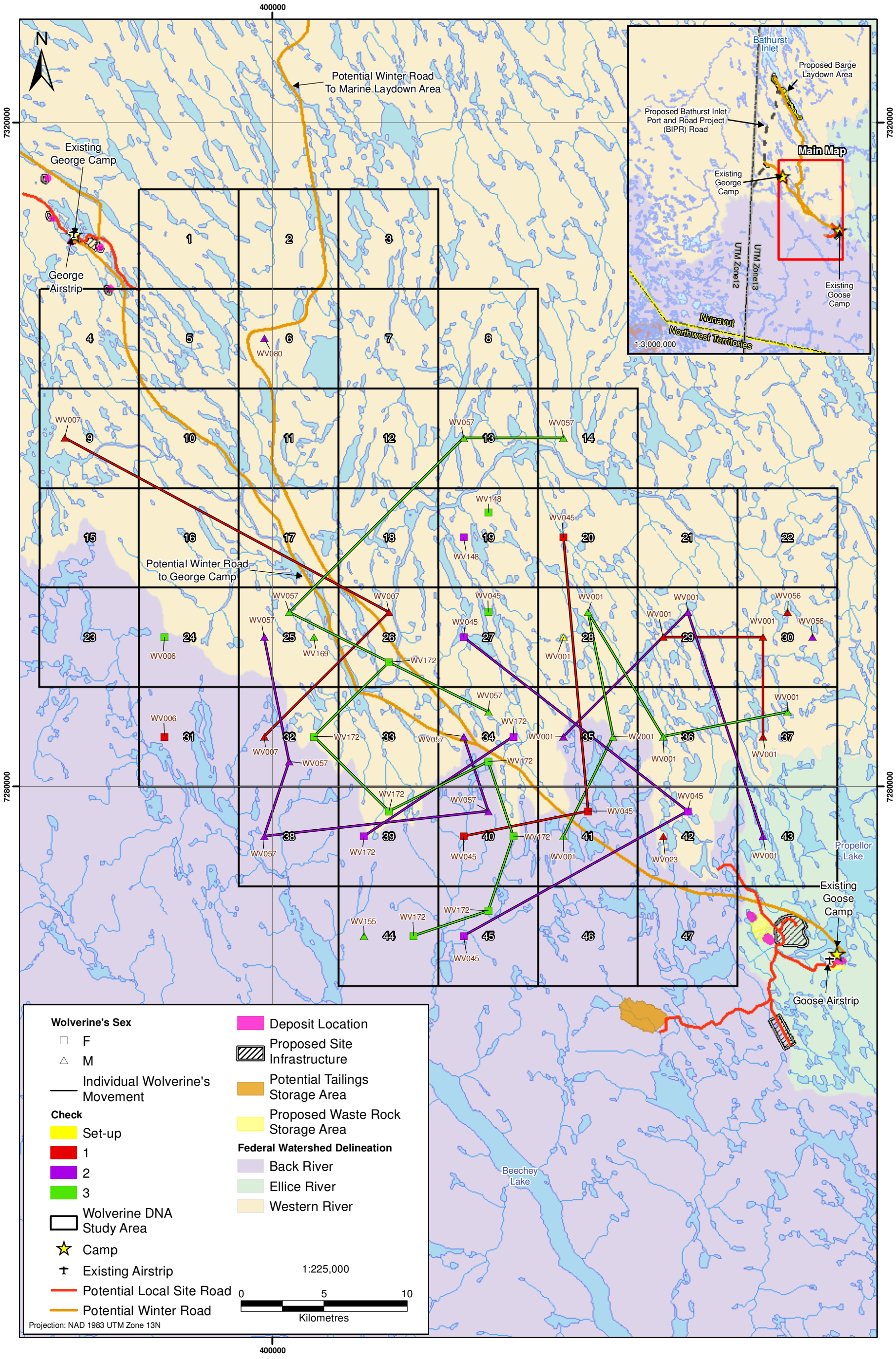


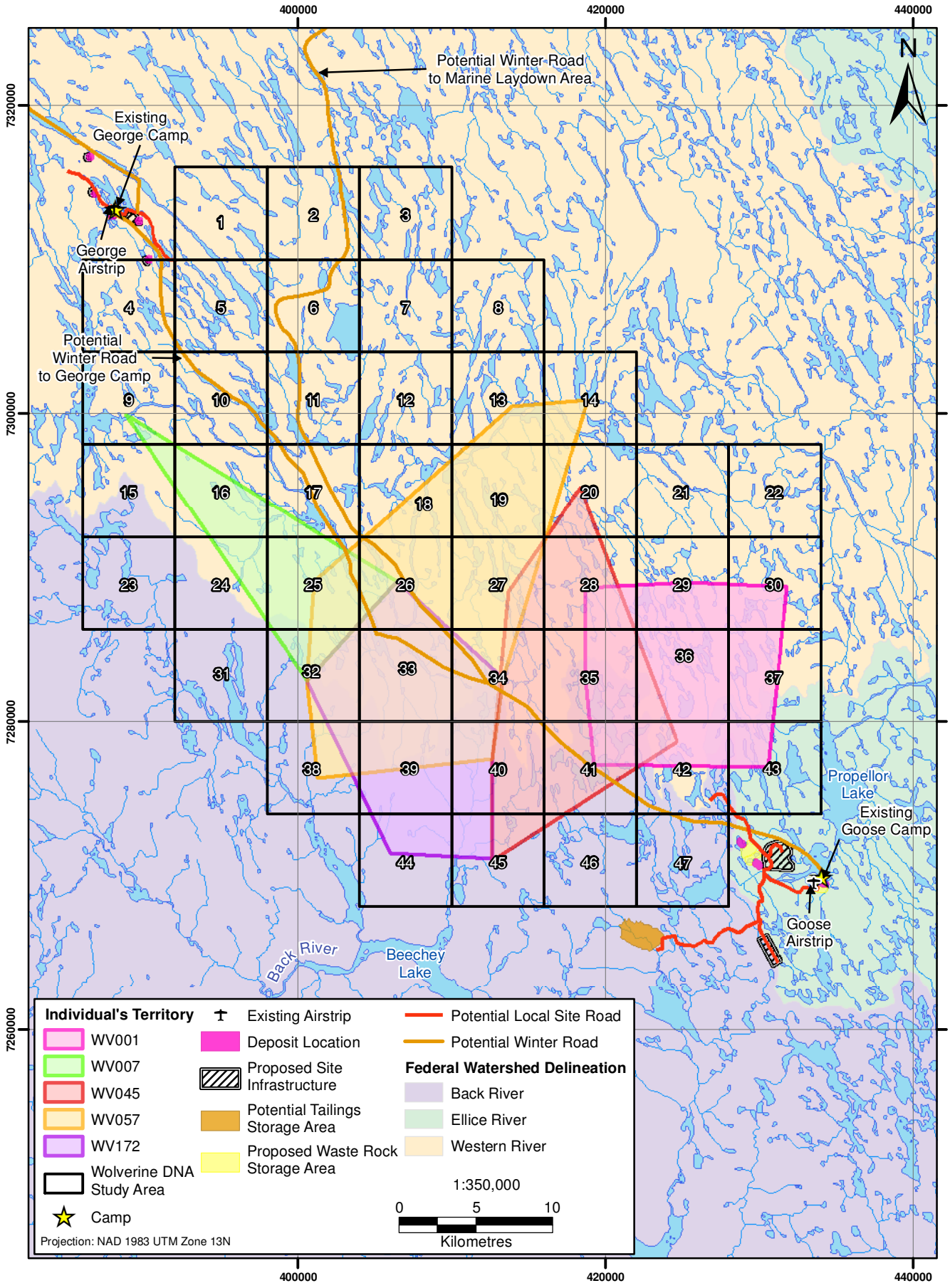
Figure 5.4-2

Sabina GOLD & SILVER CORP.

Wolverine DNA Hair Capture Locations, Back River Project, 2012

Figure 4.4-2

Rescan™ Engineers & Scientists

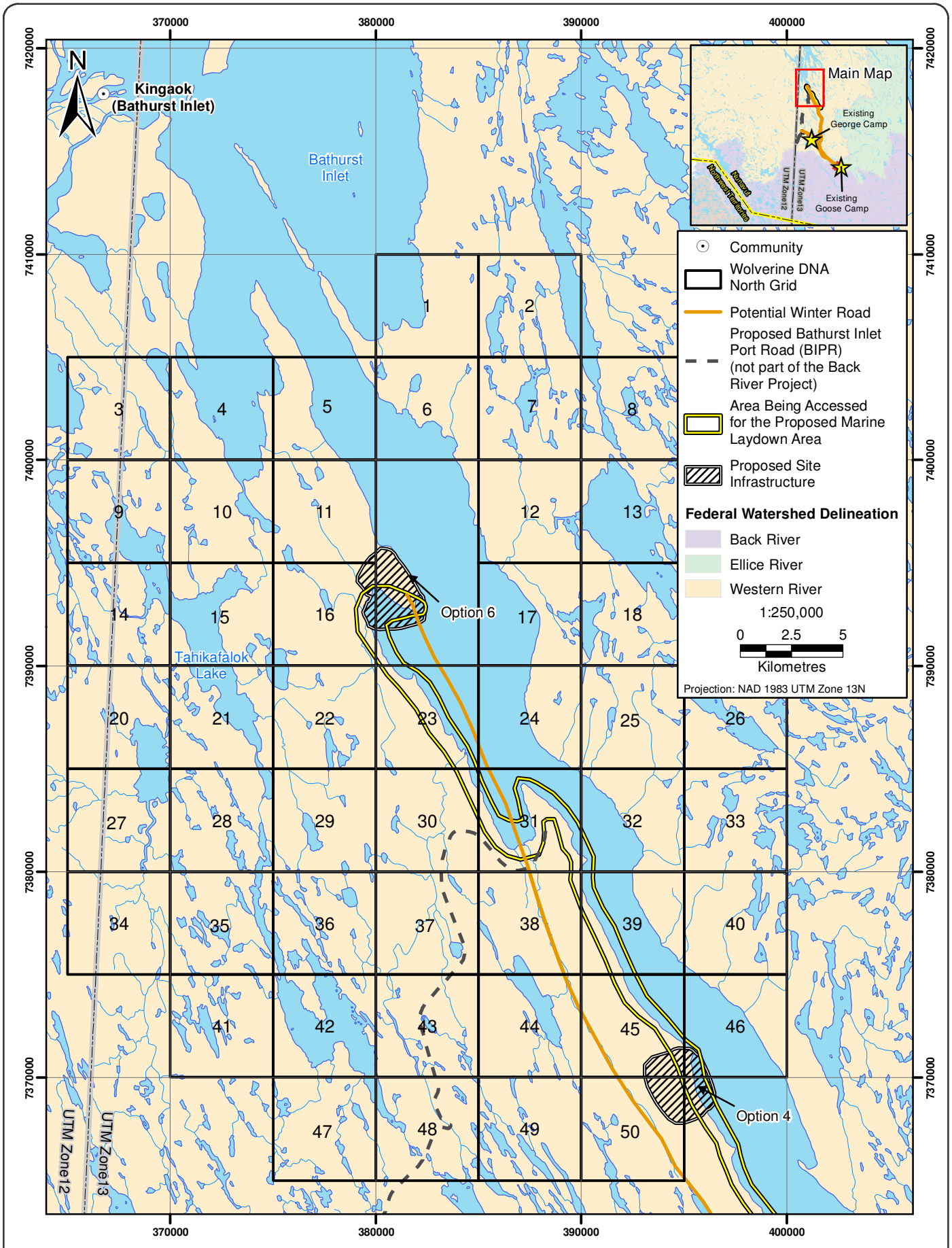


Sabina GOLD & SILVER CORP.

Minimum Area Used by Individual Wolverines during DNA Surveys, 2012

Figure 4.4-3

Rescan™ Engineers & Scientists



Sabina GOLD & SILVER CORP.

Figure 4.4-4

Wolverine DNA North Study Grid, Back River, 2013

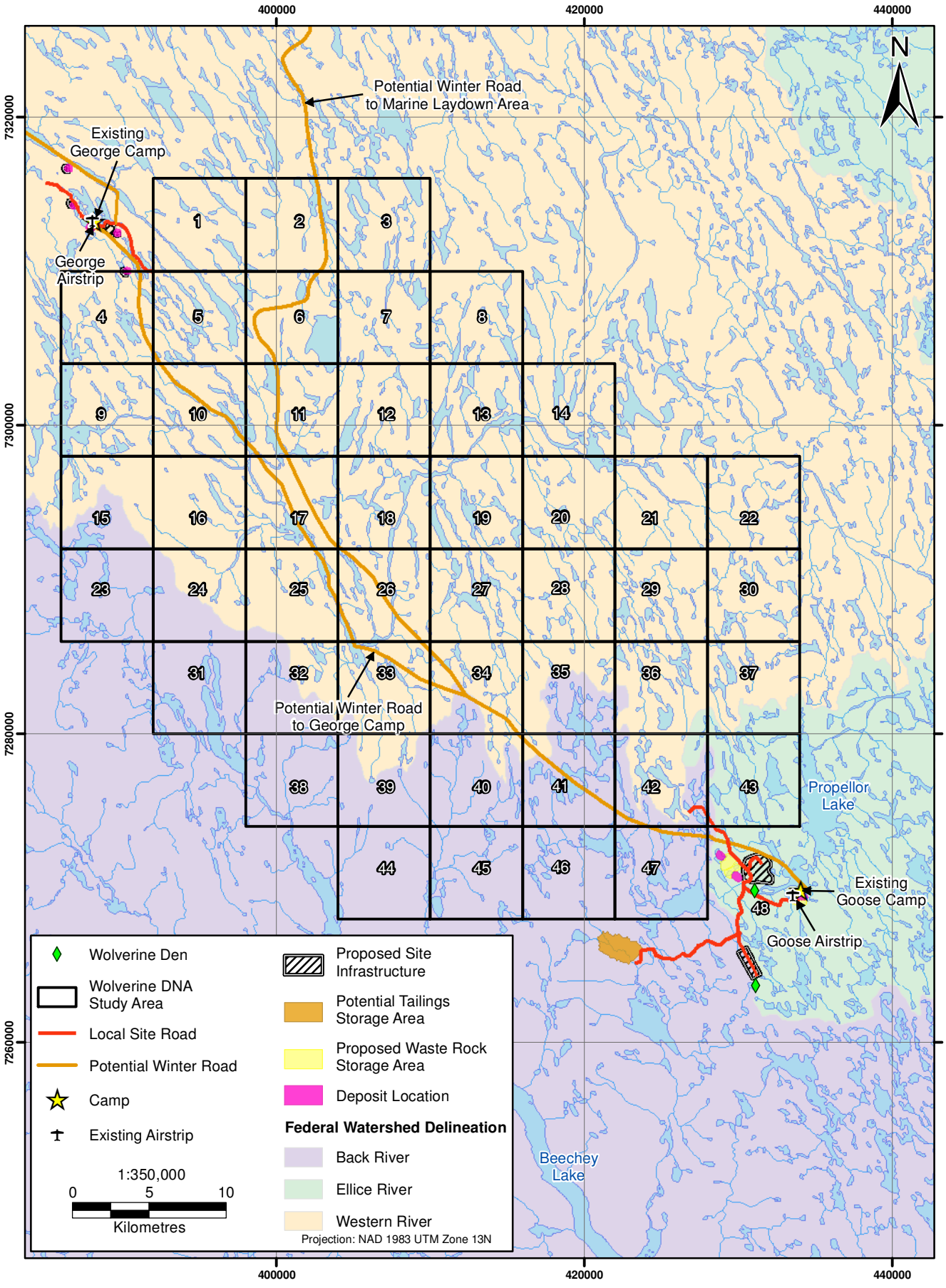
Rescan™ Engineers & Scientists

Table 4.4-3. Summary of Wolverine and Incidental Carnivores Detected by Remote Digital Cameras Deployed Near DNA Posts, 2012

		Check #1 April 5-8				Check #2 April 16-17				Check #3 April 26-27			
Camera ID	Cell #	# of Individual Wolverine Detected	# of Individual Wolverine Climbing Post	Incidental Carnivores Detected	#	# of Individual Wolverine Detected	# of Individual Wolverine Climbing Post	Incidental Carnivores Detected	#	# of Individual Wolverine Detected	# of Individual Wolverine Climbing Post	Incidental Carnivores Detected	#
1	47	0	0	-	-	0	0	-	-	0	0	-	-
2	43	0	0	Arctic fox	6	2	1	-	-	2	2	Arctic fox	1
3	41	5	3	-	-	5	2	Grey wolf	3	2	1	Arctic fox	2
4	38	1	1	Grey wolf	7	4	3	-	-	2	1	-	-
6	34	1	0	-	-	10	1	-	-	0	0	-	-
7	26	3	1	Grey wolf	4	0	0	Grey wolf	1	5	1	Arctic fox	1
8	29	6	3	Grey wolf	1	2	1	-	-	2	2	-	-
9	22	0	0	-	-	0	0	-	-	0	0	-	-
10	16	0	0	Grey wolf	5	0	0	-	-	0	0	-	-
11	9	2	1	Arctic fox	2	0	0	Arctic fox	2	0	0	-	-
12	10	0	0	Grey wolf	3	0	0	Grey wolf	1	0	0	-	-
13	7	0	0	-	-	0	0	-	-	0	0	-	-
14	4	0	0	Arctic fox	1	0	0	-	-	5	1	Grey wolf	1
				Grey wolf	3			-	-			-	-
15	1	0	0	-	-	1	0	-	-	0	0	-	-
Total		**18**	**9**		**32**	**24**	**8**		**7**	**18**	**8**		**5**

Plate 4.4-1. Wolverine approaching a baited post for DNA study on March 29, 2012.

Plate 4.4-2. Wolverine climbing a baited post for DNA study on March 28, 2012.



Sabina GOLD & SILVER CORP.

Wolverine Den Locations Observed in Back River, 2012

Figure 4.4-5

Rescan™ Engineers & Scientists

4.4.6.3 Incidental Wolverine Sightings in the RSA, 2012

Four wolverines were observed incidentally during baseline field surveys conducted in 2012. Incidental observations of single wolverines occurred in May and June during the grizzly bear DNA survey, raptor and carnivore den survey, and marine mammal surveys.

4.5 DISCUSSION

Wolverine DNA was successfully extracted from 38% (N=74) of all collected hair samples. DNA analyses identified 12 individual wolverines (4F, 8M) from a study area of approximately 1,692 km^2. Individuals that were detected at multiple post sites had linear movement distances ranging from 12 km to 42 km (or 1 to 4 km per day) and an average minimum use area of 162 km^2. The majority of wolverine detections were in the southern half of the DNA study area, particularly in the southwest and central cells along the proposed winter road. Data from remote digital cameras confirmed that these areas were more frequently used by wolverines. Despite limitations, remote cameras also provided data that posts were typically detecting individuals visiting a post. Incidental observations included 2 active den sites in proximity to proposed mine infrastructure to the west and southwest of Goose Camp, and 4 individual wolverines in the RSA.

Some samples were excluded during sub-sampling and a small number were from other species; exposure to sunlight or moisture, which can degrade DNA samples, likely did not contribute to the low extraction success rates. For wolverines, in particular, low extraction rates may be due to wolverines' only leaving strands of hair and not large clumps of hair like grizzly bear. A low extraction rate can subsequently result in an underestimate in the number of wolverines using the study area. It is unknown how many wolverines may be missed, if any, when DNA extraction fails, but this potential systematic bias will need to be addressed in future field sampling decisions and population modelling.

Given the wolverine study area does not represent a geographically closed population, a density estimate could not be generated for the Back River area. The results do suggest, however, that in terms of individual detections, approximately 12 individual wolverines may be detected for every 1,692 km^2 sampled. Wolverine densities in Nunavut are reported to be low to moderate, with an estimated abundance of 2,000-2,500 resident wolverines (Slough 2007). In comparison to higher density areas throughout the Northwest Territories and Yukon (Slough 2007), the Back River area does appear to support a moderately sized wolverine population. For example, Mulders et al. (2007) estimated a density of 17.2/1,000 km^2 individuals in Arctic habitat in the NWT, and Golden et al. (Golden et al. 2007) derived a density estimate of 9.75/1,000 km^2 in northern Yukon, both of which appear to be higher than the apparent abundance found in the Back River study area. If the Back River population was closed then density would be about 7/1,000 km^2 though this estimate is biased low as detection of individuals is incomplete. Wolverine density is expected to be lower in Arctic tundra habitat in comparison to taiga and mountain areas because of decreased food resources; however, seasonal pulses of food in tundra habitats from migratory birds and carrion left by other top carnivores can sustain local wolverine populations (Samelius et al. 2002; Slough 2007).

Wolverines occupying tundra habitat in Nunavut and the Northwest Territories have been reported to have long-range dispersal movements (Mulders 2000) and thus high movement rates (Inman et al. 2012). Average daily movement rates of 1.3 km^2-hr have been documented, which equate to a wolverine traversing the width of their home range every two days (Inman et al. 2012b). Home range sizes of both sexes were also found to be large with estimates of 126 km^2 for females and 404 km^2 for males (Mulders 2000). Linear movements of wolverines in the wolverine DNA study area were much smaller than this though estimates are not from satellite tracking collars which would permit for more precise movement data. Movements and minimum use areas of wolverines in the study area are likely a function of prey availability, habitat quality (i.e, suitable denning habitat) and intraspecific competition (Gardener 1985; Vangen et al. 2001).

The majority of wolverine detections were in the southern portion of the DNA study area. Results from the collected hair samples and the aerial distribution analysis all indicated that the southwestern cells in particular and those along the potential winter road had a higher frequency of wolverine use when compared to the other sampled areas. It is not clear why these areas were more frequently occupied by individuals than cells in the northern part of the grid, but limitations such as food availability, suitable denning habitat, and/or overall habitat quality are likely contributing factors. Furthermore, two active wolverine denning sites were detected in the southern half of the DNA study area and in proximity to Goose Camp infrastructure and wolverine occurrence was also confirmed in cells adjacent to Goose camp.

In most cases, remote digital camera data allowed us to confirm that DNA posts were recording the instances where individuals visited a post. However, digital camera data typically did not allow one to differentiate between individual wolverines unless a visible diagnostic feature was present on an individual. As a result, implementing remote camera's as a QA/QC method still cannot completely confirm if multiple individuals visit a post or not and the number of individuals that actually leave behind a hair sample. For example, there were at least 8 instances where individuals climbed posts but no hair samples were recorded (1 DNA hit:3 Camera detections, N=3; 0 DNA hit:1 Camera detections, N=2; and 1 DNA hit:2 Camera detections, N=3). Remote cameras are most accurate at validating DNA data when one unique hair sample(s) is associated with one picture series. Despite an image sampling protocol, uncertainty will still exist when more than one sequence of pictures are associated with one unique hair sample(s) as it is unknown if it is, in fact, repeated observations of the same individual or actually more than one individual with one failing to leave a hair sample. Nonetheless, remote digital camera data may still be an effective method to be used in conjunction with bait posts as it serves to validate the DNA data in most cases, but it also contributes supplementary information on wolverine behaviour, temporal activity patterns, and identifies individuals that fail to climb a post that would otherwise go undetected.

Incidental observations during baseline studies identified two active wolverine den sites. Wolverines may use two types of dens for reproduction – natal dens, where the young are born, and maternal dens, where the mother may move the kits if the conditions at the natal den are no longer suitable (Magoun and Copeland 1998). Both of the denning sites that were detected in the RSA were located in the vicinity of site infrastructure at Goose camp. Human disturbance has been shown to be a factor influencing den abandonment by the mother. As a result, it has been suggested that the protection of wolverine denning habitat, especially natal denning habitat, from human disturbance may be critical for the persistence of wolverine populations (Magoun and Copeland 1998). In addition, wolverines will often use the same den site or general location (within 1 to 2 km of the original den site) in multiple years (Lee and Niptanatiak 1996; Magoun and Copeland 1998). Incidental observations of individual wolverines are useful data as they provide information on the spatial and temporal distribution of individuals; however, they must not be solely relied upon as they are a poor reflection of population status. For example, a single individual may be incidentally recorded on multiple occasions and often only those animals that are close to mine infrastructure are likely to be observed. DNA inventories remove this bias and can provide a reliable indication of population trend.

By combining results from 2012 and 2013, a mark-recapture analysis can be conducted to estimate the wolverine superpopulation for the Back River study area. The end result will establish baseline wolverine abundance in the study area that will enable monitoring of relative changes over time. Assumptions about population closure are relaxed under a trend monitoring objective and the study area size is determined relative to expected encounters rather than conditions that satisfy geographic or demographic closure (Apps 2010). As designed, the program will establish the minimum sampling conditions to move forward under a trend monitoring objective should the Project resume as planned.

References

Rescan™
Engineers and Scientists

References

Definitions of the acronyms and abbreviations used in this reference list can be found in the Glossary and Abbreviations section.

Apps, C. 2010. *Grizzly bear population inventory and monitoring strategy for British Columbia*. Victoria, British Columbia.

Apps, C. D. and B. N. McLellan. 2006. Factors influencing the dispersion and fragmentation of endangered mountain caribou populations. *Biol Conservat*, 130 (1): 84-97.

Banci, V. 1994. Wolverine. In *The Scientific Basis for Conserving Forest Carnivores*: *American marten, fisher, lynx, and wolverine in the Western United States*. Eds. L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski. 99-127. USDA Forest Service. General Technical Report RM- 254.

Boulanger, J., B. N. McLellan, J. G. Woods, M. F. Proctor, and C. Strobeck. 2004. Sampling design and bias in DNA-based capture-mark-recapture population and density estimates of grizzly bears. *Journal of Wildlife Management*, 68 (3): 457-69.

Boulanger, J., G. C. White, B. N. McLellan, J. G. Woods, M. F. Proctor, and S. Himmer. 2002. A meta-analysis of grizzly bear DNA mark-recapture projects in British Columbia. *Ursus*, 13: 137-52.

CESCC. 2005. *Nunavut Ranking WildSpecies Canada*.

CESCC. 2010. *Wild Species 2010*: *The General Status of Species in Canada*. Canadian Endangered Species Conservation Council. http://www.wildspecies.ca/searchtool.cfm?lang=e (accessed November 2011).

COSEWIC. 2003. *COSEWIC assessment and update status report on the wolverine* (*Gulo gulo*) *in Canada*. Ottawa: COSEWIC.

Environment Canada. 2000. *Terrestrial Ecozones and Ecoregions of Canada*. Environment Canada. www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taishdwe.cfm. (accessed November, 2011).

Gardener, C. L. 1985. The ecology of wolverines in southcentral Alaska. M. Sc. diss., University of Alaska, Fairbanks.

Gau, R. J. 1998. Food habits, body condition, and habitat of the barren-ground grizzly bear. M.Sc. diss., University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Golden, H., J. D. Henry, E. F. Becker, M. I. Goldstein, J. M. Morton, D. Frost, Sr., and A. J. Poe. 2007. Estimating wolverine population size using quadrat sampling of tracks in snow. *Wildlife Biology*, 13: 52-61.

Higuchi, R., C. H. von Beroldingen, G. F. Sensabaugh, and H. A. Erlich. 1988. DNA typing from single hairs. *Nature*, 332: 543–46.

Inman, R. M., A. J. Magoun, J. Persson, and J. Mattisson. 2012a. The wolverine's niche: linking reproductive chronology, caching, competition, and climate. *Journal of Mammalogy*, 93 (3): 634-44.

Inman, R. M., A. J. Magoun, J. Persson, and J. Mattisson. 2012b. The wolverine's niche: linking reproductive chronology, caching, competition, and climate. *Journal of Mammology*, 93 (3): 634-44.

Kendall, W. L. 1999. Robustness of closed capture-recapture methods to violations of the closure assumption. *Ecology*, 80: 2517-25.

Lee, J. and A. Niptanatiak. 1996. Observation of repeated use of a wolverine, *Gulo gulo*, den on the tundra of the Northwest Territories. *Canadian Field Naturalist*, 110: 349-50.

Mace, R. D., T. L. Manley, and K. E. Aune. 1994. Estimating grizzly bear population size using camera sightings. *Wildlife Society Bulletin* 22: 74-83.

Magoun, A. J. and J. P. Copeland. 1998. Characteristics of wolverine reproductive den sites. *Journal of Wildlife Management*, 62 (4): 1313-20.

McLoughlin, P. D., R. L. Case, R. J. Gau, S. H. Ferguson, and F. Messier. 1999. Annual and Seasonal Movement Patterns of Barren-Ground Grizzly Bears in the Central Northwest Territories. *Ursus*, 11: 79-86.

McLoughlin, P. D., H. D. Cluff, R. J. Gau, R. Mulders, R. L. Case, and F. Messier. 2003. Effect of spatial differences in habitat on home ranges of grizzly bears. *Ecoscience*, 10 (1): 11-16.

McLoughlin, P. D. and F. Messier. 2001. *The Demography of Barren-ground Grizzly Bears* (*Ursus Arctos*) *in Nunavut and the Northwest Territories*. Prepared for the Government of the Northwest Territories Department of Resources, Wildlife, and Economic Development by the University of Saskatchewan, Department of Biology: Yellowknife, NT.

Miller, S. D., G. C. White, R. A. Sellers, H. V. Reynolds, J. W. Schoen, K. Titus, V. G. J. Barnes, R. B. Smith, R. R. Nelson, W. W. Ballard, and C. C. Schwartz. 1997. Brown and black bear density estimation in Alaska using radiotelemetry and replicated mark-resight techniques. *Wildlife Monographs*, 133:

Mowat, G. and C. Strobeck. 2000. Estimating population size of grizzly bears using hair capture, DNA profiling, and mark-recapture analysis. *Journal of Wildlife Management*, 64 (1): 183-93.

Mulders, R. 2000. *Wolverine Ecology, Distribution, and Productivity in the Slave Geological Province*.

Mulders, R., J. Boulanger, and D. Paetkau. 2007. Estimation of population size for wolverines *Gulo gulo* at Daring Lake, Northwest Territories, using DNA based mark-recapture methods. *Wildlife Biology*, 13 (Suppl.2): 38-51.

NRC. 2007. *Forest Ecosystems of Canada*. Natural Resources Canada. http//ecosys.cfl.scf.rncan.gc.ca/classification/classif08-eng.asp (accessed October, 2010).

Paetkau, D. 2003. An empirical exploration of data quality in DNA-based population inventories. *Molecular Ecology*, 2003 (12): 1375-87.

Paetkau, D., L. P. Waits, P. L. Clarkson, L. Craighead, E. Vyse, R. Ward, and C. Strobeck. 1998. Variation in Genetic Diversity across the Range of North American Brown Bears. *Conservation Biology*, 12 (2): 418-29.

Persson, J., P. Wedholm, and P. Segerstrom. 2010. Space use and territoriality of wolverines (Gulo gulo) in northern Scandinavia. *European Journal of Wildlife Research*, 56 (1): 49-57.

Poole, K. G., G. Mowat, and D. A. Fear. 2001. DNA-based population estimate for grizzly bears Ursus arctos in northeastern British Columbia, Canada. p105-15. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Proctor, M. F., B. N. McLellan, J. Boulanger, C. Apps, G. Stenhouse, D. Paetkau, and G. Mowat. 2010. Ecological investigations of grizzly bears in Canada using DNA from hair, 1995-2005: a review of methods and progress. *Ursus*, 21: 169-88.

Proctor, M. F., C. Servheen, S. D. Miller, W. F. Kasworm, and W. L. Wakkinen. 2005. Genetic analysis reveals demographic fragmentation of grizzly bears yielding vulnerably small populations. *Proceedings of the Royal Society Bulletin* 272: 2409-16.

Rescan. 2011a. *Back River and Hackett River Projects*: *2010 Caribou and Muskox Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, British Columbia.

Rescan. 2011b. *Doris North Project*: *Wildlife Mitigation and monitoring program*, *2011*.

Rescan. 2012. *Hackett River Project*: *wildlife baseline report 2012*. Vancouver, BC.

Rescan. 2013a. *Back River Project*: *Wildlife Baseline Report 2012*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013b. *Ekati Diamond Mine*: *2013 Grizzly Bear DNA Report*. In prep. Prepared for Dominion Diamond Ekati Corporation by Rescan Environmental Services Ltd: Yellowknife, NWT.

Royle, J. A., A. J. Magoun, B. Gardner, P. Valkenburg, and R. E. Lowell. 2011. Density Estimation in a Wolverine Population Using Spatial Capture-Recapture Models. *Journal of Wildlife Management*, 75 (3): 604-11.

Samelius, G., R. T. Alisauskas, S. Lariviere, C. Bergman, C. J. Hendrickson, K. Phipps, and C. Wood. 2002. Foraging behaviours of wolverines at a large arctic goose colony. *Arctic*, 55 (2): 148-50.

Slough, B. 2007. Status of the wolverine Gulo gulo in Canada. p76-82. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Strong, W. and S. C. Zoltai. 1989. *Ecoclimatic regions of Canada*: *first approximation*. Ecoregions Working Group of the Canada Committee on Ecological Land Classification. Ecological Land Classification and Sustainable Development Branch, Canadian Wildlife Service, Environment Canada: Ottawa, ON.

Thorpe, N. L., N. Eyegetok, N. Hakongak, and Q. Elders. 2001. *The Tuktu and Nogak Project*: *a caribou chronicle*. Yellowknife, NWT: Final Report of the West Kitikmeot Slave/Study Society.

Vangen, K. M., J. Persson, A. Landa, R. Andersen, and P. Segerström. 2001. Characteristics of dispersal in wolverines. *Canadian Jounal of Zoology*, 79: 1641-49.

White, G. C., D. R. Anderson, a. K. P. Burnham, and D. L. Otis. 1982. *Capture-recapture and removal methods for sampling closed populations*. Los Alamos National Laboratories: Los Alamos, NM.

Woods, J. G., D. Paetkau, D. Lewis, B.N. McLellan, a. M. Proctor, and C. Strobeck. 1999. Genetic tagging of free-ranging black and brown bears. *Wildlife Society Bulletin*, 27: 616–27.

Map Pocket

Rescan™
Engineers and Scientists

Grizzly Bear DNA Hair Capture Locations, 2012

Figure 3.4-2

Sex
- Female
- Male
- Individual Bear's Movement

Session Number
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- Back River Grizzly Bear DNA Study Area
- Adjacent Grizzly Bear DNA Study Area

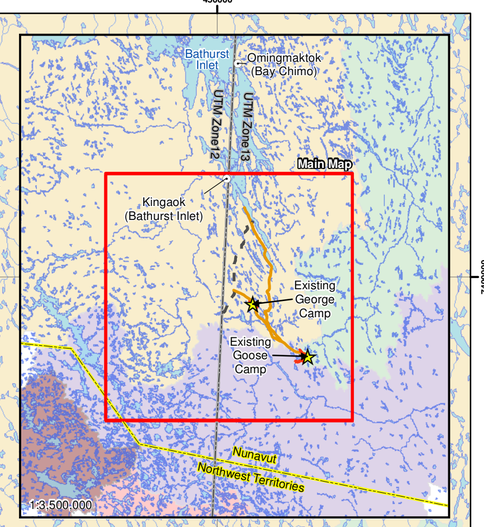
- Camp
- Potential Local Site Road
- Potential Winter Road
- Proposed Bathurst Inlet Port Road (BIPR) (not part of the Back River Project)
- Area Being Accessed for the Proposed Marine Laydown Area
- Deposit Location
- Proposed Site Infrastructure
- Potential Tailings Storage Area
- Proposed Waste Rock Storage Area

Federal Watershed Delineation
- Back River
- Ellice River
- Western River

1:350,000
0 10 20
Kilometres

GIS #.: BAC-23-127
Date: July 22, 2013
Projct: 0194096-0017
Projection: NAD 1983 UTM Zone 13N

Sabina Gold & Silver Corp.
Rescan™ Engineers & Scientists



Bathurst Inlet
Tahikafalok Lake
Option 6
Option 4
Bathurst Lake
Wesleh River
Existing George Camp
Existing Goose Camp
Propellor Lake
Beechey Lake
Nose Lake
Back River
Nunavut
Northwest Territories
UTM Zone12
UTM Zone13

300000 350000 400000 450000
7400000 7350000 7300000 7250000

Appendix 1

Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears

Rescan™
Engineers and Scientists

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
1	sample	1	P1-1a	1	H6	6/6/2012	Posts weren't baited prior to check 1.	8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
2	Xsubselect		P2-1a	1	H6	6/6/2012		0											
3	sample	1	P2-1b	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
4	Xsubselect		P2-2a	1	H6	6/6/2012		0											
5	sample	1	P2-2b	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
6	Xsubselect		P2-2c	1	H6	6/6/2012		0											
7	sample	1	P2-3a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
8	sample	1	G-1a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
9	sample	1	G-2a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
10	sample	1	G-3a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
11	Xinadequate		P1-1a	1	H32	6/7/2012		0											
12	sample	12	P1-2a	1	H32	6/7/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
13	sample	13	P1-3a	1	H32	6/7/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
14	Xinadequate		P2-1a	1	H32	6/7/2012		0											
15	sample	13	G-1a	1	H32	6/7/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
16	sample	16	P1-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
17	Xbomb		P1-2a	1	H40	6/7/2012		2	40.40	149.149			190.190	210.14	55.155				50.50
18	sample	16	P2-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
19	Xsubselect		P2-1b	1	H40	6/7/2012		0											
20	sample	16	P2-2a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
21	sample	16	P2-3a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
22	sample	22	P3-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
23	Xbomb		P1-1a	1	H20	6/8/2012		0					80.80						50.250
24	sample	24	P1-2a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
25	Xsubselect		P1-2b	1	H20	6/8/2012		0											
26	sample	24	P1-3a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
27	sample	24	P1-4a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
28	Xsubselect		P1-5a	1	H20	6/8/2012		0											
29	sample	24	P1-5b	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
30	sample	24	P2-1a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
31	Xsubselect		P2-1b	1	H20	6/8/2012		0											
32	Xsubselect		P2-2a	1	H20	6/8/2012		0											
33	sample	24	P2-3a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
34	Xinadequate		P1-1a	2	H32	6/19/2012		0											
35	sample	35	P2-1a	2	H32	6/19/2012		8	152.160	149.151	176.178	231.231	190.196	210.214	151.155				250.250
36	Xinadequate		G-1a	2	H32	6/19/2012		0											
37	Xinadequate		P3-1a	2	H32	6/19/2012		0											
38	sample	38	P1-1a	2	H43	6/20/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
39	Xsubselect		P1-1b	2	H43	6/20/2012		0											
40	Xinadequate		P2-1a	2	H43	6/20/2012		0											
41	sample	38	P2-2a	2	H43	6/20/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
42	sample	38	P2-3a	2	H43	6/20/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
43	Xsubselect		P2-3b	2	H43	6/20/2012		0											
44	Xinadequate		P1-1a	2	H65	6/20/2012		0											
45	Xsubselect		P1-1a	2	H59	6/20/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
46	Xsubselect		P1-1b	2	H59	6/20/2012		0											
47	sample	47	P1-1c	2	H59	6/20/2012		8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				204.250
48	sample	47	P1-2a	2	H59	6/20/2012		8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				204.250
49	sample	47	P2-1a	2	H59	6/20/2012		8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				204.250
50	sample	47	P3-1a	2	H59	6/20/2012		8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				204.250
51	sample	47	P3-2a	2	H59	6/20/2012		8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				204.250
52	sample	16	P1-1a	2	H36	6/20/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
53	sample	16	P1-2a	2	H36	6/20/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
54	Xsubselect		P1-2b	2	H36	6/20/2012		0											
55	Xsubselect		P2-1a	2	H36	6/20/2012		0											
56	sample	16	P2-1b	2	H36	6/20/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
57	sample	16	P2-2a	2	H36	6/20/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
58	sample	60	P3-1a	2	H36	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
59	Xbomb		P1-1a	2	H24	6/20/2012		2					202.202						250.250
60	sample	60	P1-1a	2	H14	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
61	sample	61	P3-2b	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
62	Xsubselect		P1-1a	2	H46	6/20/2012		0											
63	Xbomb		P1-1b	2	H46	6/20/2012		2	150.150				180.80						250.250
64	Xsubselect		P1-1c	2	H46	6/20/2012		0											
65	Xsubselect		P1-1a	2	H6	6/21/2012		0											
66	sample	66	P1-1b	2	H6	6/21/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
67	Xsubselect		P1-1c	2	H6	6/21/2012		0											
68	Xbomb		P1-2a	2	H6	6/21/2012		3	56.56	155.161	178.84	231.231	190.94.96						204.250
69	sample	66	P1-3a	2	H6	6/21/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
70	sample	70	P2-1a	2	H6	6/21/2012		8	158.160	151.161	178.184	231.231	186.186	210.214	161.161				204.250
71	Xbomb		P2-2a	2	H6	6/21/2012		2	140.56	153.55	174.178	21.231	190.196		59.161				250.50
72	Xsubselect		P2-3a	2	H6	6/21/2012		0											
73	Xbomb		P2-3b	2	H6	6/21/2012		1		55.155		31.31	190.196						50.50
74	Xsubselect		P3-1a	2	H6	6/21/2012		0											
75	sample	70	P3-1b	2	H6	6/21/2012		8	158.160	151.161	178.184	231.231	186.186	210.214	161.161				204.250
76	sample	66	P3-2a	2	H6	6/21/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
77	Xsubselect		P3-2b	2	H6	6/21/2012	Written as P3-2c	0											
78	Xsubselect		P1-1a	2	H15	6/21/2012		0											
79	sample	24	P1-1b	2	H15	6/21/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
80	Xbomb		P1-1c	2	H15	6/21/2012		3	160.160	149.55	76.184	221.233	186.190	10.210	55.65				04.250
81	Xsubselect		P1-1d	2	H15	6/21/2012		0											
82	Xsubselect		P2-1a	2	H15	6/21/2012		0											
83	sample	24	P2-1b	2	H15	6/21/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
84	Xsubselect		P2-1c	2	H15	6/21/2012		0											
85	sample	24	P3-1a	2	H15	6/21/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
86	Xsubselect		P1-1a	2	H30	6/21/2012		0											
87	sample	60	P1-1b	2	H30	6/21/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
88	Xbomb		P1-2a	2	H30	6/21/2012		0	40.160	55.55	74.186		180.90	10.210	53.153				250.50
89	sample	89	G-1a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
90	sample	89	G-2a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
91	sample	89	P1-1a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
92	Xsubselect		P2-1a	2	H55	6/21/2012		0											
93	sample	89	P2-1b	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
94	Xsubselect		P2-1c	2	H55	6/21/2012		0											
95	sample	89	P2-1d	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
96	Xsubselect		P2-1e	2	H55	6/21/2012		0											
97	sample	89	P2-2a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
98	Xsubselect		P2-2b	2	H55	6/21/2012		0											
99	sample	89	P2-3a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
100	Xbomb		P2-4a	2	H55	6/21/2012		3		157.159			186.190	208.210					204.50
101	Xsubselect		P2-4b	2	H55	6/21/2012		0											
102	Xsubselect		P3-1a	2	H55	6/21/2012		0											
103	Xbomb		P3-1b	2	H55	6/21/2012		3	60.60	157.159			186.190		153.165				
104	sample	89	P3-2a	2	H55	6/21/2012		8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				204.250
105	sample	105	P1-1a	3	H51	6/29/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
106	sample	105	P2-1b	3	H51	6/29/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
107	Xsubselect		P2-1a	3	H51	6/29/2012		0											
108	Xsubselect		P2-1c	3	H51	6/29/2012		0											
109	sample	105	P2-1d	3	H51	6/29/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
110	sample	105	P3-1a	3	H51	6/29/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
111	Xinadequate		P3-2a	3	H51	6/29/2012		0											
112	Xinadequate		P3-3a	3	H51	6/29/2012		0											
113	Xbomb		P1-1a	3	H41	6/29/2012		1					205.205						
114	Xinadequate		P2-1a	3	H41	6/29/2012		0											
115	Xinadequate		P3-1a	3	H41	6/29/2012		0											
116	Xinadequate		G-1a	3	H41	6/29/2012		0											
117	Xinadequate		P1-1a	3	H36	6/30/2012		0											
118	Xinadequate		P1-1b	3	H36	6/30/2012		0											
119	Xbomb		P2-1a	3	H36	6/30/2012		3	140.60	49.149	174.174	21.233	190.190	210.214	155.57.61				04.250
120	Xinadequate		P3-1a	3	H36	6/30/2012		0											
121	Xinadequate		G-1a	3	H36	6/30/2012		0											
122	sample	60	G-2a	3	H36	6/30/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
123	Xinadequate		P1-1a	3	H35	6/30/2012		0											
124	Xsubselect		P1-2a	3	H35	6/30/2012		0											
125	sample	125	P1-2b	3	H35	6/30/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
126	Xsubselect		P1-2c	3	H35	6/30/2012		0											
127	sample	125	P2-1a	3	H35	6/30/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
128	Xsubselect		P2-1b	3	H35	6/30/2012		0											
129	sample	125	P2-2a	3	H35	6/30/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
130	sample	130	P2-3a	3	H35	6/30/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
131	sample	130	P3-1a	3	H35	6/30/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
132	sample	130	P3-2a	3	H35	6/30/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
133	Xsubselect		P3-3a	3	H35	6/30/2012		0											
134	sample	130	P3-3b	3	H35	6/30/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
135	Xmixed		G-1a	3	H35	6/30/2012		4	152.152	159.53.61	176.78.86	221.231	80.86.190	208.208	139.41.61				250.250
136	Xmixed		P1-1a	3	H29	6/30/2012		4	152.56.58	51.63.155	172.76.86	221.31.37	186.190	208.210	161.161				204.250
137	sample	137	P1-2a	3	H29	6/30/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
138	sample	138	P1-3a	3	H29	6/30/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
139	sample	137	P2-1a	3	H29	6/30/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
140	sample	137	P2-2a	3	H29	6/30/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
141	Xsubselect		P3-1a	3	H29	6/30/2012		0											
142	Xbomb		P3-1b	3	H29	6/30/2012		6	152.156	161.51.63	172.176	221.221	186.90	208.210	161.161				204.250
143	Xsubselect		P3-1c	3	H29	6/30/2012		0											
144	Xinadequate		P1-1a	3	H14	6/30/2012		0											
145	Xinadequate		P1-2a	3	H14	6/30/2012		0											
146	sample	61	P2-1a	3	H14	6/30/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
147	Xbomb		P2-2a	3	H14	6/30/2012		7	140.160	151.151	176.86	221.233	180.190	208.210	153.161				204.250
148	sample	60	G-1a	3	H14	6/30/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
149	Xbomb		P1-1a	3	H7	6/30/2012		3	60.160	49.149	78.184	221.221	186.190	208.210	61.165				04.50
150	Xbomb		P1-2a	3	H7	6/30/2012		2		149.61			186.186		161.165				
151	sample	151	P1 -3a	3	H7	6/30/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
152	sample	152	P2-1a	3	H7	6/30/2012		8	160.160	149.149	184.186	221.237	186.190	210.210	155.161				250.250
153	sample	152	P3-1a	3	H7	6/30/2012		8	160.160	149.149	184.186	221.237	186.190	210.210	155.161				250.250
154	sample	154	P3-2a	3	H7	6/30/2012		8	156.160	149.161	178.186	221.237	186.186	208.210	161.165				204.250
155	sample	151	P3-3a	3	H7	6/30/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
156	Xsubselect		P3-3b	3	H7	6/30/2012		0											
157	Xmixed		P3-4a	3	H7	6/30/2012		5	160.160	149.61.63	178.184	221.221	186.190	210.210	155.61.165				04.250
158	sample	151	G-1a	3	H7	6/30/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
159	Xbomb		G-2a	3	H7	6/30/2012		2	60.160	47.149	78.178	221.237	186.190	10.210	55.63.65				50.250
160	Xbomb		G -3a	3	H7	6/30/2012		1					186.186						
161	sample	161	P1-1a	3	H15	6/30/2012		8	152.152	155.159	176.178	221.233	186.196	210.210	141.155				204.250
162	Xbomb		P2-1a	3	H15	6/30/2012		1	40.152	155.51.59	76.78.84	221.31.33	186.90.96	10.210	141.155				04.250
163	Xinadequate		P2 -2a	3	H15	6/30/2012		0											
164	sample	164	P2-3a	3	H15	6/30/2012		8	140.160	151.159	172.178	221.233	190.190	210.210	141.155				250.250
165	Xsubselect		P3-1a	3	H15	6/30/2012		0											
166	Xsubselect		P3-1b	3	H15	6/30/2012		0											
167	sample	167	P3-1c	3	H15	6/30/2012		8	140.152	151.155	178.184	221.231	186.190	210.210	139.155				250.250
168	Xmixed		P3-2a	3	H15	6/30/2012		3	40.60.152	155.51.59	72.76.178	221.233	186.90.96	210.210	141.155				04.250
169	Xsubselect		P3-2b	3	H15	6/30/2012		0											
170	sample	161	P3-3a	3	H15	6/30/2012		8	152.152	155.159	176.178	221.233	186.196	210.210	141.155				204.250
171	Xmixed		G-1a	3	H15	6/30/2012		3	140.52.60	49.51.55.59	178.72.84	221.233	86.94.96.19	210.210	141.155				04.250
172	Xinadequate		P1-1a	3	H20	6/30/2012		0											
173	sample	173	P2-1a	3	H20	6/30/2012		8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				250.250
174	Xsubselect		P2-2a	3	H20	6/30/2012		0											
175	Xsubselect		P2-2b	3	H20	6/30/2012		0											
176	Xsubselect		P2-2c	3	H20	6/30/2012		0											
177	sample	173	P2-2d	3	H20	6/30/2012		8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				250.250
178	Xbomb		P1-1a	3	H30	6/30/2012		2			74.74	36.52	180.190	10.10					250.250
179	sample	60	P2-1a	3	H30	6/30/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
180	sample	180	P1-1a	3	H31	6/30/2012		8	156.160	151.155	172.172	221.221	190.190	208.210	161.161				204.250
181	sample	180	P1-2a	3	H31	6/30/2012		8	156.160	151.155	172.172	221.221	190.190	208.210	161.161				204.250
182	Xbomb		P1 -1a	3	H12	6/30/2012		1	40.160	49.51.157	178.83	21.221	186.190	10.10	153.55.65				
183	sample	183	P1-2a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
184	Xbomb		P1-3a	3	H12	6/30/2012		3	140.60	149.151			186.190	10.10	153.155				
185	sample	183	P2-1a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
186	Xsubselect		P2-2a	3	H12	6/30/2012		0											
187	sample	183	P2-2b	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
188	sample	188	P2-3a	3	H12	6/30/2012		8	140.140	149.151	178.180	221.221	180.190	210.210	153.155				204.250
189	sample	183	P3-1a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
190	Xinadequate		P3-2a	3	H12	6/30/2012		0											
191	sample	183	G-1a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
192	sample	183	G-2a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
193	sample	183	G-3a	3	H12	6/30/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
194	Xinadequate		P1-1a	3	H6	6/30/2012		0											
195	Xinadequate		P1-2a	3	H6	6/30/2012		0											
196	sample	1	P2-1a	3	H6	6/30/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
197	sample	1	P2-2a	3	H6	6/30/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
198	sample	208	P2-3a	3	H6	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
199	Xsubselect		P2-3b	3	H6	6/30/2012		0											
200	Xinadequate		P2-4a	3	H6	6/30/2012		0											
201	sample	208	P3-1a	3	H6	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
202	Xsubselect		P3-1b	3	H6	6/30/2012		0											
203	Xbomb		P3-2a	3	H6	6/30/2012		2	60.60	149.155			190.190		61.161				
204	sample	208	P3-3a	3	H6	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
205	sample	208	P3-4a	3	H6	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
206	Xbomb		G-1a	3	H6	6/30/2012		0		55.55					53.61				
207	Xsubselect		P1-1a	3	H5	6/30/2012		0											
208	sample	208	P1-1b	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
209	sample	208	P1-2a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
210	Xsubselect		P1-2b	3	H5	6/30/2012		0											
211	Xsubselect		P1-2c	3	H5	6/30/2012		0											
212	sample	208	P1-3a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
213	sample	208	P2-1a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
214	sample	208	P2-2a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
215	sample	208	P2-3a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
216	Xinadequate		P3-1a	3	H5	6/30/2012		0											
217	sample	208	P3-2a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
218	sample	208	G-1a	3	H5	6/30/2012		8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				250.250
219	sample	219	P1-1a	3	H17	7/1/2012		8	140.152	149.155	178.186	221.231	190.190	210.214	155.155				250.250
220	sample	220	P1-2a	3	H17	7/1/2012		8	140.160	149.155	176.178	221.231	180.190	210.214	155.155				204.250
221	Xbomb		P1-3a	3	H17	7/1/2012		1		149.53.55	70.178	31.231	180.190		55.155				04.250
222	Xbomb		P2-2a	3	H17	7/1/2012		3	160.52.62	155.155	4.76.70.84.(	231.33	190.190	210.12.14	155.157				50.250
223	sample	223	P2-4a	3	H17	7/1/2012		8	152.160	155.155	176.186	231.231	190.190	210.214	155.155				250.250
224	Xinadequate		P2-5a	3	H17	7/1/2012		0											
225	Xinadequate		P3-1a	3	H17	7/1/2012		0											
226	sample	219	P3-2a	3	H17	7/1/2012		8	140.152	149.155	178.186	221.231	190.190	210.214	155.155				250.250
227	Xinadequate		P3-3a	3	H17	7/1/2012		0											
228	sample	223	G-1a	3	H17	7/1/2012		8	152.160	155.155	176.186	231.231	190.190	210.214	155.155				250.250
229	sample	219	G-2a	3	H17	7/1/2012		8	140.152	149.155	178.186	221.231	190.190	210.214	155.155				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
230	sample	230	P1-1a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
231	sample	230	P1-2a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
232	sample	230	P1-3a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
233	Xsubselect		P1-3b	3	H16	7/1/2012		0											
234	sample	230	P2-1a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
235	sample	230	P2-2a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
236	sample	230	P2-3a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
237	sample	230	P2-4a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
238	Xsubselect		P3-1a	3	H16	7/1/2012		0											
239	Xbomb		P2-3a	3	H17	7/1/2012		2					201.203		47.47				250.250
240	sample	223	P2-1a	3	H17	7/1/2012		8	152.160	155.155	176.186	231.231	190.190	210.214	155.155				250.250
241	sample	230	P3-1b	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
242	Xsubselect		P3-1c	3	H16	7/1/2012		0											
243	sample	230	P3-2a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
244	sample	230	G-1a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
245	sample	230	G-2a	3	H16	7/1/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
246	Xinadequate		P1-1a	3	H26	7/1/2012		0											
247	Xbomb		P1-2a	3	H26	7/1/2012		7	152.160	49.155	178.186	231.231	190.190	210.214	155.155				250.250
248	Xsubselect		P1 -3a	3	H26	7/1/2012		0											
249	sample	13	P1-3b	3	H26	7/1/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
250	Xsubselect		P1-3c	3	H26	7/1/2012		0											
251	sample	12	P2-1a	3	H26	7/1/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
252	Xbomb		P3-1a	3	H26	7/1/2012		1		149.55			190.190		55.155				
253	sample	13	P3-2a	3	H26	7/1/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
254	sample	35	G-1a	3	H26	7/1/2012		8	152.160	149.151	176.178	231.231	190.196	210.214	151.155				250.250
255	Xbomb		G-2a	3	H26	7/1/2012		5	52.60	149.51.55	176.178	231.231	190.196	210.214	151.155				50.250
256	sample	256	P1-1a	3	H44	7/2/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
257	sample	257	P1-2a	3	H44	7/2/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
258	Xsubselect		P1-2b	3	H44	7/2/2012		0											
259	sample	257	P1-2c	3	H44	7/2/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
260	Xsubselect		P1-2d	3	H44	7/2/2012		0											
261	Xsubselect		P2-1a	3	H44	7/2/2012		0											
262	sample	262	P2-1b	3	H44	7/2/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
263	Xsubselect		P2-1c	3	H44	7/2/2012	Written as P2-2c	0											
264	sample	257	P3-1a	3	H44	7/2/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
265	sample	256	P3-2a	3	H44	7/2/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
266	sample	262	P3-3a	3	H44	7/2/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
267	sample	256	G-1a	3	H44	7/2/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
268	Xbomb		G-2a	3	H44	7/2/2012		3	60.60	149.51.55	172.76.86	221.37	180.186	210.210	153.161				
269	sample	164	P1-1a	3	H50	7/2/2012		8	140.160	151.159	172.178	221.233	190.190	210.210	141.155				250.250
270	sample	164	P1-2a	3	H50	7/2/2012		8	140.160	151.159	172.178	221.233	190.190	210.210	141.155				250.250
271	sample	164	P1-3a	3	H50	7/2/2012		8	140.160	151.159	172.178	221.233	190.190	210.210	141.155				250.250
272	sample	161	P2-1a	3	H50	7/2/2012		8	152.152	155.159	176.178	221.233	186.196	210.210	141.155				204.250
273	Xbomb		P2-2a	3	H50	7/2/2012		0		151.55			186.96.190		139.55				
274	sample	274	P1-1a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
275	sample	274	P1-2a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
276	sample	274	P2-1a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
277	sample	274	P2-2a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
278	sample	274	P2-3a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
279	sample	274	P3-1a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
280	sample	274	G-1a	3	H62	7/2/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
281	Xsubselect		P1-1a	3	H55	7/2/2012		0											
282	sample	262	P1-1b	3	H55	7/2/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
283	Xsubselect		P1-1c	3	H55	7/2/2012		0											
284	sample	262	P1-2a	3	H55	7/2/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
285	Xsubselect		P1-2b	3	H55	7/2/2012		0											
286	Xinadequate		P2-1a	3	H55	7/2/2012		0											
287	sample	257	P2-2a	3	H55	7/2/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
288	sample	256	G-1a	3	H55	7/2/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
289	sample	289	T-1a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
290	sample	289	P1-1a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
291	Xsubselect		P1-1b	4	H35	7/13/2012		0											
292	Xsubselect		P1-1c	4	H35	7/13/2012		0											
293	sample	289	P1-2a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
294	sample	289	P1-3a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
295	Xsubselect		P1-3b	4	H35	7/13/2012		0											
296	Xsubselect		P2-1a	4	H35	7/13/2012		0											
297	Xsubselect		P2-1b	4	H35	7/13/2012		0											
298	sample	289	P2-1c	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
299	Xsubselect		P2-2a	4	H35	7/13/2012		0											
300	sample	289	P2-2b	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
301	sample	289	P3-1a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
302	sample	289	P3-2a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
303	sample	289	P3-3a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
304	sample	289	G-1a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
305	sample	289	G-2a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
306	sample	289	G-3a	4	H35	7/13/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
307	Xbomb		G-1a	4	lCamera	7/14/2012		0					94.94						
308	sample	60	P1-1a	4	H41	7/14/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
309	Xbomb		P1-1b	4	H41	7/14/2012		0			186.88								
310	Xinadequate		P1-1c	4	H41	7/14/2012		0											
311	Xsubselect		P1-1d	4	H41	7/14/2012		0											
312	sample	60	P2-1a	4	H41	7/14/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
313	sample	60	P2-2a	4	H41	7/14/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
314	Xsubselect		P2-2b	4	H41	7/14/2012		0											
315	Xsubselect		P2-2c	4	H41	7/14/2012		0											
316	Xbomb		P2-3a	4	H41	7/14/2012		1					180.180	10.210	53.153				
317	Xbomb		P3-1a	4	H41	7/14/2012		1	60.60	49.55.57	86.186	221.33.39	180.190	10.210	153.55.61				50.50
318	Xinadequate		P3-2a	4	H41	7/14/2012		0											
319	Xinadequate		P1-1a	4	H46	7/14/2012		0											
320	sample	105	P1-1a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
321	sample	105	P1-2a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
322	Xsubselect		P2-2b	4	H52	7/14/2012		0											
323	sample	105	P2-2c	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
324	Xsubselect		P2-2d	4	H52	7/14/2012		0											
325	sample	105	P2-2e	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
326	Xsubselect		P2-2f	4	H52	7/14/2012		0											
327	sample	105	P1-3a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
328	Xsubselect		P1-3b	4	H52	7/14/2012		0											
329	sample	105	P2-1a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
330	Xsubselect		P2-1b	4	H52	7/14/2012		0											
331	sample	105	P2-2a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
332	Xinadequate		P2-3a	4	H52	7/14/2012		0											
333	Xinadequate		P2-3b	4	H52	7/14/2012		0											
334	Xinadequate		P2-4a	4	H52	7/14/2012		0											
335	Xsubselect		P3-1a	4	H52	7/14/2012		0											
336	sample	105	P3-1b	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
337	Xsubselect		P3-1c	4	H52	7/14/2012		0											
338	sample	105	P3-2a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
339	Xsubselect		P3-2b	4	H52	7/14/2012		0											
340	Xsubselect		P3-2c	4	H52	7/14/2012		0											
341	sample	105	P3-2d	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
342	sample	342	P3-3a	4	H52	7/14/2012		8	140.152	149.151	172.176	221.221	180.186	210.210	155.161				204.250
343	sample	105	G-1a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
344	sample	105	G-2a	4	H52	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
345	Xsubselect		P1-1a	4	H58	7/14/2012		0											
346	sample	257	P1-1b	4	H58	7/14/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
347	Xinadequate		P1-1c	4	H58	7/14/2012		0											
348	sample	262	P1-2a	4	H58	7/14/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
349	Xbomb		P1-3a	4	H58	7/14/2012		7	158.160	149.155	72.186	221.221	180.186	210.210	153.161				250.250
350	sample	256	P2-1a	4	H58	7/14/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
351	sample	257	P2-2a	4	H58	7/14/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
352	Xbomb		P2-3a	4	H58	7/14/2012		0					201.03.05						
353	Xinadequate		P3-1a	4	H58	7/14/2012		0											
354	Xsubselect		P3-2a	4	H58	7/14/2012		0											
355	sample	262	P3-2b	4	H58	7/14/2012		8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				250.250
356	sample	256	P3-3a	4	H58	7/14/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
357	Xbomb		P3-4a	4	H58	7/14/2012		5	158.160	149.51.55	172.76.86	221.37	180.186	210.210	153.161				250.250
358	sample	256	G-1a	4	H58	7/14/2012		8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				250.250
359	sample	257	G-2a	4	H58	7/14/2012		8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				250.250
360	Xbomb		G-3a	4	H58	7/14/2012		6	40.58.160	49.45.51.5	172.176	221.221	180.186	210.210	153.161				250.250
361	Xbomb		P1-1a	4	H59	7/14/2012		3	152.56.58			21.233	186.196	12.214	157.161				250.250
362	Xsubselect		P1-1a	4	H51	7/14/2012		0											
363	sample	105	P1-1b	4	H51	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
364	sample	105	P2-1a	4	H51	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
365	Xinadequate		P2-2a	4	H51	7/14/2012		0											
366	Xsubselect		P2-3a	4	H51	7/14/2012		0											
367	sample	105	P2-3b	4	H51	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
368	sample	105	P3-1a	4	H51	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
369	Xbomb		P3-2a	4	H51	7/14/2012		4	140.52.60	149.149	172.76.84	221.233	180.186	08.210	161.161				04.250
370	sample	105	G-1a	4	H51	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
371	sample	105	P1-1a	4	H56	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
372	Xsubselect		P1-1b	4	H56	7/14/2012		0											
373	Xsubselect		P1-1c	4	H56	7/14/2012		0											
374	Xsubselect		P1-1d	4	H56	7/14/2012		0											
375	Xsubselect		P1-1e	4	H56	7/14/2012		0											
376	sample	105	P1-1f	4	H56	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
377	sample	105	P2-1a	4	H56	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
378	sample	105	P3-1a	4	H56	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
379	sample	105	P3-2a	4	H56	7/14/2012		8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				250.250
380	Xsubselect		P3-2b	4	H56	7/14/2012		0											
381	Xsubselect		P1-1a	4	H47	7/14/2012		0											
382	sample	173	P1-1b	4	H47	7/14/2012		8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				250.250
383	Xsubselect		P1-1c	4	H47	7/14/2012		0											
384	Xbomb		P1-1d	4	H47	7/14/2012		6	140.160	153.155	172.78.86	221.33	186.186	208.208	141.153				250.250
385	sample	173	G-1a	4	H47	7/14/2012		8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				250.250
386	Xbomb		G-2a	4	H47	7/14/2012		2					213.213						250.250
387	Xbomb		G-1a	4	H40	7/14/2012		0						08.08					50.250
388	sample	388	P1-1a	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
389	Xsubselect		P1-1b	4	H62	7/14/2012		0											
390	Xinadequate		P1-1c	4	H62	7/14/2012		0											
391	sample	388	P1-1d	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
392	sample	388	P1-2a	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
393	sample	388	P1-3a	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
394	Xsubselect		P2-1a	4	H62	7/14/2012		0											
395	sample	388	P2-1b	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
396	Xinadequate		P2-1c	4	H62	7/14/2012		0											
397	sample	388	P2-2a	4	H62	7/14/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
398	Xinadequate		P1-1a	4	H21	7/15/2012		0											
399	Xbomb		P1-1b	4	H21	7/15/2012		5	40.160	149.149	178.86	221.221	186.190	210.214	155.165				04.250
400	Xbomb		P1-2a	4	H21	7/15/2012		6	140.160	149.149	178.186	221.221	186.190	210.214	155.65				04.250
401	sample	289	P1-1a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
402	Xbomb		P1-1b	4	H45	7/15/2012		6	140.160	149.149	174.184	221.233	186.80.90	208.210	151.55.61				250.250
403	Xinadequate		P1-1c	4	H45	7/15/2012		0											
404	Xsubselect		P1-1d	4	H45	7/15/2012		0											
405	sample	289	P1-2a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
406	Xsubselect		P1-2b	4	H45	7/15/2012		0											
407	Xsubselect		P1-2c	4	H45	7/15/2012		0											
408	Xnotfound		-	4	H45	7/15/2012		0											
409	Xsubselect		P2-1a	4	H45	7/15/2012		0											
410	Xsubselect		P2-1b	4	H45	7/15/2012		0											
411	sample	289	P2-1c	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
412	sample	22	P2-2a	4	H45	7/15/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
413	Xinadequate		P3-1a	4	H45	7/15/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
414	sample	289	P3-2a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
415	Xbomb		G-1a	4	H45	7/15/2012		6	140.160	149.149	174.184	221.233	180.86.90	208.210	51.55.161				250.250
416	Xbomb		G-2a	4	H45	7/15/2012		5	140.160	149.149	174.84	221.233	180.86.90	208.210	51.55.161				250.250
417	sample	289	G-3a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
418	sample	22	G-4a	4	H45	7/15/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
419	sample	289	G-5a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
420	sample	289	G-6a	4	H45	7/15/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
421	sample	421	P2-1a	4	H21	7/15/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
422	Xsubselect		P2-1b	4	H21	7/15/2012		0											
423	sample	421	P3-1a	4	H21	7/15/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
424	Xbomb		P3-2a	4	H21	7/15/2012		6	40.160	149.149	178.186	221.221	186.190	210.214	155.165				04.250
425	sample	421	P3-3a	4	H21	7/15/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
426	sample	426	P1-1a	4	H13	7/16/2012		8	152.160	155.159	178.184	233.237	186.190	210.214	155.155				250.250
427	Xinadequate		P1-1b	4	H13	7/16/2012		0											
428	sample	426	P1-2a	4	H13	7/16/2012		8	152.160	155.159	178.184	233.237	186.190	210.214	155.155				250.250
429	Xsubselect		P2-1a	4	H13	7/16/2012		0											
430	sample	426	P2-1b	4	H13	7/16/2012		8	152.160	155.159	178.184	233.237	186.190	210.214	155.155				250.250
431	Xsubselect		P2-1c	4	H13	7/16/2012		0											
432	sample	426	P2-2a	4	H13	7/16/2012		8	152.160	155.159	178.184	233.237	186.190	210.214	155.155				250.250
433	Xsubselect		P2-2b	4	H13	7/16/2012		0											
434	sample	66	P1-1a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
435	sample	66	P1-1b	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
436	Xinadequate		P1-1c	4	H6	7/16/2012		0											
437	Xsubselect		P1-1d	4	H6	7/16/2012		0											
438	Xinadequate		P1-1e	4	H6	7/16/2012		0											
439	sample	66	P1-2a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
440	sample	66	P2-1a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
441	Xsubselect		P1-1b	2	H14	6/20/2012		0											
442	Xsubselect		P1-1c	2	H14	6/20/2012		0											
443	sample	60	P2-1a	2	H14	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
444	sample	60	P2-2a	2	H14	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
445	sample	60	P3-1a	2	H14	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
446	sample	60	G-1a	2	H14	6/20/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
447	Xinadequate		P1-1a	2	H21	6/20/2012		0											
448	sample	61	P1-1a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
449	Xsubselect		P1-1b	2	H41	6/20/2012		0											
450	sample	61	P2-1a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
451	sample	61	P2-2a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
452	Xsubselect		P2-2b	2	H41	6/20/2012		0											
453	Xsubselect		P2-2c	2	H41	6/20/2012		0											
454	Xbomb		P2-3a	2	H41	6/20/2012		0	60.60	51.151			80.190		49.53.55				50.50
455	Xsubselect		P3-1a	2	H41	6/20/2012		0											
456	sample	61	P3-1b	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
457	sample	61	G-1a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
458	sample	61	G-2a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
459	sample	61	G-3a	2	H41	6/20/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
460	Xsubselect		P3-2a	2	H41	6/20/2012		0											
461	Xinadequate		P2-2a	4	H6	7/16/2012		0											
462	sample	66	P2-2b	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
463	sample	66	P2-2c	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
464	Xsubselect		P2-2d	4	H6	7/16/2012		0											
465	sample	66	P3-1a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
466	sample	66	P3-2a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
467	Xinadequate		P3-3a	4	H6	7/16/2012		0											
468	sample	66	P3-4a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
469	Xsubselect		P3-4b	4	H6	7/16/2012		0											
470	Xsubselect		P3-5a	4	H6	7/16/2012		0											
471	sample	66	P3-5b	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
472	sample	66	G-1a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
473	sample	66	G-2a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
474	sample	66	G-3a	4	H6	7/16/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
475	sample	183	P1-1a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
476	Xinadequate		P1-1b	4	H5	7/16/2012		0											
477	sample	183	P1-1c	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
478	Xsubselect		P1-1d	4	H5	7/16/2012		0											
479	sample	183	P1-2a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
480	sample	183	P2-1a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
481	Xsubselect		P1-1A	4	H27	7/16/2012		0											
482	Xbomb		P1-1b	4	H27	7/16/2012		2	52.152		74.78.186	21.231	190.196	02.210	155.161				50.250
483	Xsubselect		P1-1c	4	H27	7/16/2012		0											
484	Xsubselect		P1-1d	4	H27	7/16/2012		0											
485	Xbomb		P1-1e	4	H27	7/16/2012		1					190.196						
486	Xsubselect		P1-2a	4	H27	7/16/2012		0											
487	Xsubselect		P1-2b	4	H27	7/16/2012		0											
488	sample	488	P1-2c	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
489	sample	488	P2-1a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
490	sample	488	P2-2a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
491	Xbomb		P2-3a	4	H27	7/16/2012		2	52.152	149.155		31.231	190.196	10.210	53.55				
492	sample	488	P2-4a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
493	sample	488	P3-1a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
494	sample	488	P3-2a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
495	Xbomb		P3-3a	4	H27	7/16/2012		0				39.39	190.96		59.161				
496	Xsubselect		P3-4a	4	H27	7/16/2012		0											
497	Xbomb		P3-4b	4	H27	7/16/2012		2		49.49	78.178	231.233	190.196		149.61				
498	sample	488	P3-5a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
499	Xsubselect		P3-5b	4	H27	7/16/2012		0											
500	sample	488	G-1a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
501	Xbomb		G-2a	4	H27	7/16/2012		3		49.49	178.186	231.231	190.196	10.10	47.161				50.250
502	sample	488	G-3a	4	H27	7/16/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
503	Xbomb		G-4a	4	H27	7/16/2012		0	52.52			31.31	90.94.96.0	10.210	55.55				
504	Xbomb		G-5a	4	H27	7/16/2012		3		149.155	78.78	231.231	190.196	10.10	55.61				
505	Xbomb		G-6a	4	H27	7/16/2012		0				31.31	190.96		55.55				

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
									Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
506	sample	183	P2-2a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
507	sample	183	P3-1a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
508	Xsubselect		P3-1b	4	H5	7/16/2012		0											
509	Xsubselect		P3-1c	4	H5	7/16/2012		0											
510	Xbomb		P3-1d	4	H5	7/16/2012		5	140.160	149.57.151	180.183	221.221	186.190	210.210	.153.57.63.65				04.250
511	Xbomb		P3-2a	4	H5	7/16/2012		5	140.160	149.57.151	78.80.183	221.221	186.190	210.210	53.65.57.155				250.250
512	sample	183	G-1a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
513	sample	183	G-2a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
514	sample	183	G-3a	4	H5	7/16/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
515	Xbomb		G-4a	4	H5	7/16/2012		2			78.183	221.23	186.190	210.210	153.65				50.250
516	Xsubselect		P1-1a	5	H35	7/23/2012		0											
517	sample	60	P1-1b	5	H35	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
518	Xsubselect		P1-1c	5	H35	7/23/2012		0											
519	sample	60	P1-1d	5	H35	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
520	Xinadequate		P1-2a	5	H35	7/23/2012		0											
521	Xinadequate		P1-3a	5	H35	7/23/2012		0											
522	Xinadequate		P1-3b	5	H35	7/23/2012		0											
523	Xbomb		P2-1a	5	H35	7/23/2012		3	140.160	149.155	174.86	233.252	180.86.90	210.12	151.61				04.250
524	sample	60	P2-2a	5	H35	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
525	Xinadequate		P3-1a	5	H35	7/23/2012		0											
526	sample	60	P3-2a	5	H35	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
527	Xbomb		T-1a	5	H35	7/23/2012		7	140.160	149.155	174.186	233.252	180.86.90	210.210	153.161				250.250
528	sample	289	G-1a	5	H35	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
529	Xinadequate		P1-1a	5	H48	7/23/2012		0											
530	Xinadequate		P1-2a	5	H48	7/23/2012		0											
531	Xinadequate		P2-1a	5	H48	7/23/2012		0											
532	Xinadequate		P3-1a	5	H48	7/23/2012		0											
533	sample	289	T-1	5	H45	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
534	Xinadequate		T-2	5	H45	7/23/2012		0											
535	sample	289	P1-1a	5	H45	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
536	sample	22	P1-2a	5	H45	7/23/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
537	Xsubselect		P2-1a	5	H45	7/23/2012		0											
538	sample	289	P2-1b	5	H45	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
539	Xsubselect		P2-1c	5	H45	7/23/2012		0											
540	sample	289	P2-1d	5	H45	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
541	Xsubselect		P2-1e	5	H45	7/23/2012		0											
542	Xbomb		P2-2a	5	H45	7/23/2012		3	40.40	49.149	74.174	221.27.33	180.186	208.210	151.59				250.250
543	sample	22	P3-1a	5	H45	7/23/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
544	sample	289	P3-2a	5	H45	7/23/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
545	Xsubselect		P3-2b	5	H45	7/23/2012		0											
546	sample	60	P1-1a	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
547	sample	60	P1-2a	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
548	sample	60	P1-T	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
549	Xsubselect		P2-1a	5	H41	7/23/2012		0											
550	sample	60	P2-1b	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
551	Xbomb		P2-2a	5	H41	7/23/2012		0	40.40	55.155	74.186	21.33.252	80.90.95.97		61.161				50.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
552	sample	60	P2-3a	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
553	Xsubselect		P2-4a	5	H41	7/23/2012		0											
554	Xsubselect		P2-4b	5	H41	7/23/2012		0											
555	sample	60	P2-4c	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
556	sample	60	P2-5a	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
557	Xsubselect		P3-1a	5	H41	7/23/2012		0											
558	sample	60	P3-1b	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
559	sample	60	P3-2a	5	H41	7/23/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
560	sample	274	P1-1a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
561	Xsubselect		P1-1b	5	H64	7/24/2012		0											
562	sample	274	P1-1c	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
563	Xsubselect		P1-1d	5	H64	7/24/2012		0											
564	Xsubselect		P1-1e	5	H64	7/24/2012		0											
565	Xsubselect		P1-1f	5	H64	7/24/2012		0											
566	sample	274	P1-1g	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
567	Xsubselect		P1-2a	5	H64	7/24/2012		0											
568	Xsubselect		P1-2b	5	H64	7/24/2012		0											
569	sample	274	P1-2c	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
570	sample	274	P1-3a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
571	sample	274	P2-1a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
572	Xsubselect		P2-1b	5	H64	7/24/2012		0											
573	Xsubselect		P2-1c	5	H64	7/24/2012		0											
574	sample	274	P2-2a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
575	sample	274	P2-3a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
576	sample	274	P3-1a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
577	sample	274	P3-2a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
578	sample	274	P3-3a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
579	Xsubselect		P3-3b	5	H64	7/24/2012		0											
580	Xsubselect		P3-4a	5	H64	7/24/2012		0											
581	sample	274	P3-4b	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
582	sample	274	P3-5a	5	H64	7/24/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
583	sample	583	P1-1a	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
584	sample	583	P1-1b	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
585	Xsubselect		P1-1c	5	H60	7/24/2012		0											
586	Xsubselect		P1-1d	5	H60	7/24/2012		0											
587	Xsubselect		P1-2a	5	H60	7/24/2012		0											
588	sample	583	P1-2b	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
589	Xsubselect		P1-2c	5	H60	7/24/2012		0											
590	Xbomb		P1-3a	5	H60	7/24/2012		1					180.80	208.208	39.39				
591	Xsubselect		P2-1a	5	H60	7/24/2012		0											
592	sample	583	P2-1b	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
593	Xsubselect		P2-1c	5	H60	7/24/2012		0											
594	sample	583	P2-1d	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
595	Xsubselect		P2-2a	5	H60	7/24/2012		0											
596	sample	583	P2-2b	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
597	sample	583	P3-1a	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
598	Xsubselect		P3-1b	5	H60	7/24/2012		0											
599	Xsubselect		P3-1c	5	H60	7/24/2012		0											
600	sample	583	P3-2a	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
601	Xbomb		P3-3a	5	H60	7/24/2012		2	56.58		74.174	243.245	91.95.01.03						250.250
602	sample	583	G-1a	5	H60	7/24/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
603	Xbomb		G-2a	5	H60	7/24/2012		2			80.88	21.21	180.186	208.210	53.153				50.250
604	Xinadequate		P1-1a	5	H59	7/24/2012		0											
605	sample	605	P1-2a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
606	sample	605	P1-3a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
607	sample	605	P2-1a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
608	sample	605	P2-2a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
609	Xsubselect		P2-2b	5	H59	7/24/2012		0											
610	Xsubselect		P2-2c	5	H59	7/24/2012		0											
611	sample	605	P2-3a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
612	sample	605	P2-4a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
613	sample	605	P3-1a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
614	sample	605	P3-2a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
615	sample	605	P3-4a	5	H59	7/24/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
616	Xsubselect		P3-4b	5	H59	7/24/2012		0											
617	Xinadequate		P1-1a	5	H26	7/25/2012		0											
618	sample	13	P1-2a	5	H26	7/25/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
619	Xsubselect		P1-3a	5	H26	7/25/2012		0											
620	sample	13	P1-3b	5	H26	7/25/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
621	sample	35	P2-1a	5	H26	7/25/2012		8	152.160	149.151	176.178	231.231	190.196	210.214	151.155				250.250
622	Xbomb		P2-2a	5	H26	7/25/2012		1	50.50		77.177	23.223	190.190	08.210	47.49.55.61				50.250
623	Xinadequate		P2-3a	5	H26	7/25/2012		0											
624	sample	13	P3-1a	5	H26	7/25/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
625	Xsubselect		P3-1b	5	H26	7/25/2012		0											
626	sample	13	P3-2a	5	H26	7/25/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
627	Xbomb		P3-3a	5	H26	7/25/2012		0	52.60	149.55	84.86	31.31	190.96	210.06.14	155.61				50.250
628	Xbomb		P1-1a	5	H21	7/25/2012		1	56.56	149.149		21.23.27.29	86.186	10.12.214	55.55				
629	sample	421	P2-1a	5	H21	7/25/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
630	Xsubselect		P2-1b	5	H21	7/25/2012		0											
631	sample	421	P2-2a	5	H21	7/25/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
632	sample	421	P3-1a	5	H21	7/25/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
633	sample	421	P3-2a	5	H21	7/25/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
634	sample	421	P3-3a	5	H21	7/25/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
635	sample	635	P1-1a	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
636	Xsubselect		P1-1b	5	H11	7/25/2012		0											
637	Xsubselect		P1-1c	5	H11	7/25/2012		0											
638	sample	635	P1-1d	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
639	sample	635	P1-2a	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
640	Xsubselect		P1-2b	5	H11	7/25/2012		0											
641	Xsubselect		P2-1a	5	H11	7/25/2012		0											
642	sample	635	P2-1b	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
643	sample	635	P2-3a	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
644	sample	635	P3-1a	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
645	sample	635	P2-T	5	H11	7/25/2012		8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				250.250
646	sample	646	G-1a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
647	sample	646	G-2a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
648	sample	646	G-3a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
649	Xbomb		P1-1a	5	H7	7/26/2012		7	40.160	149.155	174.186	221.231	186.190	210.214	161.165				250.250
650	sample	646	P1-2a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
651	Xsubselect		P2-1a	5	H7	7/26/2012		0											
652	sample	646	P2-1b	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
653	Xsubselect		P2-1c	5	H7	7/26/2012		0											
654	Xsubselect		P2-2a	5	H7	7/26/2012		0											
655	Xsubselect		P2-2b	5	H7	7/26/2012		0											
656	sample	646	P2-2c	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
657	sample	646	P2-3a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
658	Xinadequate		P3-1a	5	H7	7/26/2012		0											
659	Xsubselect		P3-2a	5	H7	7/26/2012		0											
660	Xbomb		P3-2b	5	H7	7/26/2012		3	140.160	149.149	75.86.184	21.21	190.190	10.210	61.161				50.250
661	sample	646	P3-3a	5	H7	7/26/2012		8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				250.250
662	Xbomb		G-1a	5	H5	7/26/2012		5	140.160	151.53.57	178.178	21.21	186.190	210.210	153.165				250.50
663	sample	60	P1-1a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
664	sample	60	P1-2a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
665	sample	60	P1-3a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
666	sample	60	P2-1a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
667	sample	60	P3-1a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
668	sample	60	P3-2a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
669	sample	60	P3-3a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
670	sample	60	G-1a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
671	sample	60	G-2a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
672	sample	60	G-3a	6	H36	8/3/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
673	sample	673	P1-1a	6	H7	8/4/2012		8	160.160	149.155	177.186	231.233	180.190	210.210	161.161				250.250
674	sample	674	G-1a	6	H7	8/4/2012		8	140.160	149.155	174.177	223.231	190.190	210.210	161.161				250.250
675	Xbomb		T-1a	6	H7	8/4/2012		3	40.58.160	49.155	74.86.177	233.233	80.190	210.210	61.161				250.250
676	sample	676	P1-1a	6	H1	8/4/2012		8	160.160	151.159	177.186	221.221	186.196	208.214	153.161				250.250
677	sample	677	P2-1a	6	H1	8/4/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
678	sample	677	P2-2a	6	H1	8/4/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
679	sample	679	P2-3a	6	H1	8/4/2012		8	140.160	149.151	177.177	221.233	186.190	208.210	161.161				204.250
680	sample	677	P3-1a	6	H1	8/4/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
681	sample	677	P3-2a	6	H1	8/4/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
682	sample	677	P3-3a	6	H1	8/4/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
683	sample	183	P1-1a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
684	sample	183	P1-2a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
685	sample	183	P1-3a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
686	sample	686	P1-4a	6	H5	8/4/2012		8	140.160	149.151	180.183	221.221	186.190	210.210	153.155				250.250
687	sample	183	P2-1a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
688	sample	183	P2-2a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
689	sample	183	P2-3a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
690	sample	183	P3-1a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
691	sample	183	G-1a	6	H5	8/4/2012		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				250.250
692	Xbomb		G-2a	6	H5	8/4/2012		1	58.160	57.57		21.237	186.190						50.250
693	sample	693	P1-1a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
694	sample	693	P1-2a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
695	sample	693	P1-3a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
696	sample	693	P1-4a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
697	sample	693	P1-5a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
698	sample	698	P1-6a	6	H6	8/4/2012		8	160.160	155.161	172.176	233.237	186.196	210.214	139.155				204.250
699	sample	693	P2-1a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
700	Xsubselect		P2-1b	6	H6	8/4/2012		0											
701	sample	693	P2-2a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
702	sample	693	P2-3a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
703	sample	693	P2-4a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
704	sample	693	P3-1a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
705	Xsubselect		P3-1b	6	H6	8/4/2012		0											
706	sample	693	P3-2a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
707	sample	693	G-1a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
708	sample	66	G-2a	6	H6	8/4/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
709	Xbomb		G-3a	6	H6	8/4/2012		2	40.40	53.59.161	172.174	21.221	186.186	208.10	139.53				04.250
710	sample	693	G-4a	6	H6	8/4/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
711	sample	711	P1-1a	6	H12	8/4/2012		8	140.160	149.153	177.184	221.233	190.190	210.214	155.161				204.250
712	sample	711	P1-2a	6	H12	8/4/2012		8	140.160	149.153	177.184	221.233	190.190	210.214	155.161				204.250
713	Xbomb		P2-1a	6	H12	8/4/2012		0						94.96					50.50
714	Xbomb		G-1a	6	H12	8/4/2012		0							49.49				
715	Xbomb		G-2a	6	H12	8/4/2012		1					190.190	10.210	61.161				
716	sample	711	G-3a	6	H12	8/4/2012		8	140.160	149.153	177.184	221.233	190.190	210.214	155.161				204.250
717	sample	151	P1-1a	6	H9	8/4/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
718	sample	151	P1-2a	6	H9	8/4/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
719	sample	154	P2-1a	6	H9	8/4/2012		8	156.160	149.161	178.186	221.237	186.186	208.210	161.165				204.250
720	Xsubselect		P2-1b	6	H9	8/4/2012		0											
721	sample	154	P3-1a	6	H9	8/4/2012		8	156.160	149.161	178.186	221.237	186.186	208.210	161.165				204.250
722	Xbomb		P3-2a	6	H9	8/4/2012		3	60.160	149.61.63	184.78.86	221.237	186.190	210.210	55.65.161				04.250
723	Xmixed		P3-3a	6	H9	8/4/2012		4	160.160	49.57.61.6	178.84.86	221.237	186.190	210.210	155.61.65				04.250
724	sample	151	P3-4a	6	H9	8/4/2012		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				250.250
725	Xbomb		P3-5a	6	H9	8/4/2012		6	160.160	149.149	184.78.86	221.237	186.190	210.210	155.61.65				250.250
726	sample	13	P1-1a	6	H21	8/4/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
727	Xsubselect		P3-1a	6	H21	8/4/2012		0											
728	sample	12	P3-1b	6	H21	8/4/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
729	Xbomb		G-1a	6	H21	8/4/2012		0											
730	sample	421	G-2a	6	H21	8/4/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
731	Xbomb		P1-1a	5	H52	7/24/2012		2		149.149	71.74.178		186.80.90	208.208	59.67.161				
732	sample	732	P1-1a	6	H25	8/4/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
733	sample	732	P1-2a	6	H25	8/4/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
734	sample	732	P2-1a	6	H25	8/4/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
735	sample	289	P1-1a	6	H35	8/5/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
736	sample	289	G-1a	6	H35	8/5/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
737	sample	289	P2-1a	6	H35	8/5/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
738	sample	289	P3-1a	6	H35	8/5/2012		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				250.250
739	Xbomb		P3-2a	6	H35	8/5/2012		0			72.75.80.86		186.90.95.97		153.55				
740	sample	22	G-2a	6	H35	8/5/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
741	sample	138	P1-1a	6	H50	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
742	sample	138	P2-1a	6	H50	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
743	sample	138	P1-1a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
744	Xsubselect		P1-2a	6	H49	8/5/2012		0											
745	sample	138	P1-2b	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
746	Xsubselect		P1-2c	6	H49	8/5/2012		0											
747	sample	138	P1-3a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
748	sample	138	P1-4a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
749	Xsubselect		P1-4b	6	H49	8/5/2012		0											
750	sample	138	P1-5a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
751	sample	138	P2-1a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
752	sample	138	G-1a	6	H49	8/5/2012		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				204.250
753	sample	137	P1-1a	6	H62	8/5/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
754	sample	137	P1-2a	6	H62	8/5/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
755	Xbomb		P1-3a	6	H62	8/5/2012		3	152.54.58	55.155	72.76.186	231.37	186.190	208.210	61.161				204.250
756	sample	137	P2-1a	6	H62	8/5/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
757	sample	137	P2-2a	6	H62	8/5/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
758	sample	137	P3-1a	6	H62	8/5/2012		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				204.250
759	Xbomb		P3-2a	6	H62	8/5/2012		3			172.186	231.35.37	186.190	08.210	65.161				204.250
760	sample	388	P1-1a	6	H56	8/5/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
761	Xsubselect		P1-1b	6	H56	8/5/2012		0											
762	sample	388	P1-2a	6	H56	8/5/2012		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				250.250
763	sample	61	P1-1a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
764	Xsubselect		P1-2a	6	H57	8/5/2012		0											
765	sample	61	P1-2b	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
766	sample	61	P1-3a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
767	sample	61	P2-1a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
768	sample	61	P2-2a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
769	sample	61	P2-3a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
770	sample	61	P3-1a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
771	sample	61	P3-2a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
772	sample	61	P3-3a	6	H57	8/5/2012		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				204.250
773	Xbomb		G-1a	6	H51	8/5/2012		0	56.58	49.149			186.80.90	10.210	51.151				04.250
774	Xsubselect		P1-1a	6	H27	8/5/2012		0											
775	sample	775	P1-1b	6	H27	8/5/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				204.250
776	Xsubselect		P1-1c	6	H27	8/5/2012		0											
777	sample	775	P1-2a	6	H27	8/5/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				204.250
778	Xbomb		P2-1a	6	H27	8/5/2012		7	152.152	149.155	78.186	231.231	190.196	210.210	155.161				250.250
779	Xbomb		T-1a	6	H27	8/5/2012		6	156.160	159.159	178.184	233.237	).86.90.01.(	208.210	161.161				04.250
780	sample	488	P3-1a	6	H27	8/5/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
781	Xbomb		P3-2a	6	H27	8/5/2012		2	152.54.56	49.155	86.186	27.31	190.196	10.210	155.61				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
782	sample	732	P1-1a	6	H30	8/5/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
783	sample	732	P1-2a	6	H30	8/5/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
784	sample	732	P2-1a	6	H30	8/5/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
785	sample	732	P3-1a	6	H30	8/5/2012		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				204.250
786	Xsubselect		P3-1b	6	H30	8/5/2012		0											
787	Xbomb		G-1a	6	H30	8/5/2012		4	56.40.58.6	49.51.55.61	176.186	221.231	80.86.190	210.210	161.161				04.250
788	sample	583	T-1a	6	H42	8/6/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
789	sample	583	P1-1a	6	H42	8/6/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
790	sample	583	P1-1a	6	H60	8/6/2012		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				250.250
791	Xbomb		G-1a	6	H60	8/6/2012		1				223.223	83.87.189						
792	Xbomb		G-2a	6	H60	8/6/2012		0											
793	Xbomb		G-3a	6	H60	8/6/2012		2		47.147			187.187						204.250
794	sample	794	P1-1a	6	H58	8/6/2012		8	140.152	149.153	184.186	221.221	180.186	210.214	155.165				204.250
795	sample	794	P2-1a	6	H58	8/6/2012		8	140.152	149.153	184.186	221.221	180.186	210.214	155.165				204.250
796	Xbomb		P1-1a	6	H53	8/6/2012		2	56.56			21.221	201.203		57.61				250.250
797	Xbomb		G-1a	6	H53	8/6/2012		2		59.59			201.203	04.204	51.59				250.250
798	Xbomb		P1-1a	7	H38	8/15/2012		1	50.50				183.87.89	04.06.212					250.250
799	sample	60	P1-1a	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
800	Xsubselect		P1-2a	7	H36	8/15/2012		0											
801	sample	60	P1-2b	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
802	Xsubselect		P2-1a	7	H36	8/15/2012		0											
803	sample	60	P2-1b	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
804	Xsubselect		P2-1c	7	H36	8/15/2012		0											
805	sample	60	P2-2a	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
806	sample	60	P3-1a	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
807	sample	60	P3-2a	7	H36	8/15/2012		8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				250.250
808	Xsubselect		P3-2b	7	H36	8/15/2012		0											
809	Xinadequate		P1-1a	7	H11	8/18/2012		0											
810	Xbomb		T-1	7	H11	8/18/2012		0					86.87.194						04.250
811	sample	66	P1-1a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
812	Xsubselect		P1-1b	7	H6	8/18/2012		0											
813	Xinadequate		P1-2a	7	H6	8/18/2012		0											
814	sample	66	P1-2b	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
815	Xinadequate		P1-3a	7	H6	8/18/2012		0											
816	sample	66	P1 -4a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
817	sample	66	P1 -5a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
818	sample	66	P2 -1a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
819	sample	66	P2-2a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
820	sample	66	P2-3a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
821	sample	66	P2-4a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
822	sample	66	P2 -5a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
823	sample	66	P3-1a	7	H6	8/18/2012		8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				204.250
824	Xbomb		P1 -1a	7	H5	8/18/2012		5	52.160	151.153	177.180	221.221	186.186	02.08.210	9.63.65.161				250.250
825	Xsubselect		P1-1a	7	H27	8/18/2012		0											
826	Xbomb		P1-1b	7	H27	8/18/2012		0	152.60	49.51.155	77.78.186	31.231	190.96	210.12	155.61				50.50
827	Xsubselect		P1-1c	7	H27	8/18/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA												
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores											
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
828	sample	13	P1-2a	7	H27	8/18/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
829	Xsubselect		P1-3a	7	H27	8/18/2012		0											
830	Xbomb		P1-3b	7	H27	8/18/2012		1	50.50	51.151		25.225	87.196		53.57				250.250
831	sample	12	P2-1a	7	H27	8/18/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
832	Xinadequate		P3-1a	7	H27	8/18/2012		0											
833	Xbomb		G-1	7	H27	8/18/2012		0					90.190						
834	Xbomb		T-1	7	H27	8/18/2012		3	152.160	149.51.55	77.178.186	231.231	190.96	210.214	155.61				04.250
835	sample	13	P1-1a	7	H17	8/18/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
836	Xbomb		P2-1a	7	H17	8/18/2012		1					187.187	12.12					
837	sample	12	P3-1a	7	H17	8/18/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
838	Xbomb		P1-1a	7	H9	8/18/2012		2		149.149	76.77.178	21.23.31.5	186.190	10.214	155.65				04.250
839	sample	421	P1-2a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
840	sample	421	P1-3a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
841	sample	421	P2-1a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
842	Xbomb		P2-2a	7	H9	8/18/2012		7	160.160	149.149	77.78.186	221.233	186.190	210.214	155.165				250.250
843	sample	421	P2-3a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
844	Xbomb		P2-4a	7	H9	8/18/2012		1		149.149	78.178		85.86.190		51.61				
845	sample	845	P3-1a	7	H9	8/18/2012		8	152.160	149.149	178.180	221.221	180.186	210.214	155.155				250.250
846	sample	421	P3-2a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
847	sample	421	P3-3a	7	H9	8/18/2012		8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				250.250
848	Xbomb		G -1	7	H9	8/18/2012		0					201.03.05						50.250
849	Xsubselect		P1-1a	7	H1	8/19/2012		0											
850	sample	676	P1 -1b	7	H1	8/19/2012		8	160.160	151.159	177.186	221.221	186.196	208.214	153.161				250.250
851	sample	679	P1-2a	7	H1	8/19/2012		8	140.160	149.151	177.177	221.233	186.190	208.210	161.161				204.250
852	Xinadequate		P1-3a	7	H1	8/19/2012		0											
853	sample	677	P2-1a	7	H1	8/19/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
854	Xsubselect		P3-1a	7	H1	8/19/2012		0											
855	Xsubselect		P3-1b	7	H1	8/19/2012		0											
856	Xsubselect		P3-1c	7	H1	8/19/2012		0											
857	Xinadequate		P3-1d	7	H1	8/19/2012		0											
858	sample	676	P3-1e	7	H1	8/19/2012		8	160.160	151.159	177.186	221.221	186.196	208.214	153.161				250.250
859	sample	677	P3-1f	7	H1	8/19/2012		8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				204.250
860	sample	860	P1-1a	7	H7	8/19/2012		8	160.160	149.155	174.186	221.231	186.190	210.214	161.165				250.250
861	Xsubselect		P1 -1b	7	H7	8/19/2012		0											
862	Xinadequate		P2-1a	7	H7	8/19/2012		0											
863	Xbomb		P1-1a	7	H57	8/19/2012		1				221.221	94.196		61.61				04.50
br1	sample	775	P1-1a	1	B3	6/8/2012		11	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184	129.129	239.239	204.250
br2	Xsubselect		P1-1b	1	B3	6/8/2012		0											
br3	sample	775	P1-2a	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br4	Xsubselect		P1-2b	1	B3	6/8/2012		0											
br5	sample	775	P1-2d	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br6	Xsubselect		P1-2c	1	B3	6/8/2012		0											
br7	sample	775	P1-3a	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br8	Xbomb		P2-1a	1	B3	6/8/2012		3		159.159	178.84		186.190	08.10	61.161	184.184			
br9	sample	775	P2-2a	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br10	Xsubselect		P2-2b	1	B3	6/8/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br11	Xsubselect		P2-2c	1	B3	6/8/2012		0											
br12	sample	775	P2-3a	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br13	sample	775	P2-4a	1	B3	6/8/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161	84.184			204.250
br14	sample	775	P2-5a	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br15	sample	775	G-1	1	B3	6/8/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br16	Xsubselect		G-2	1	B3	6/8/2012		0											
br17	Xsubselect		G-3	1	B3	6/8/2012		0											
br18	sample	775	G-4	1	B3	6/8/2012		11	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184	129.129	239.239	204.250
br19	Xsubselect		G-5	1	B3	6/8/2012		0											
br20	Xsubselect		G-6	1	B3	6/8/2012		0											
br21	Xsubselect		P1-1A	1	B7	6/9/2012		0											
br22	Xbomb		P1-1B	1	B7	6/9/2012		2		153.159	172.78.84		190.190	208.10	61.161	184.94			
br23	sample	br23	P1-2A	1	B7	6/9/2012		9	154.160	153.159	172.184	221.221	190.190	208.210	161.161	184.184			204.250
br24	sample	br23	P1-3A	1	B7	6/9/2012		9	154.160	153.159	172.184	221.221	190.190	208.210	161.161	184.184			204.250
br25	Xbomb		P1-4A	1	B7	6/9/2012		4		153.55.159	172.78.84	221.233	86.190	208.210	161.161	184.184			04.50
br26	sample	br26	P2-1A	1	B7	6/9/2012		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161	184.194			204.250
br27	Xmixed		P2-2A	1	B7	6/9/2012		6	154.40.60	153.55.59	172.178	221.221	190.190	208.10.214	161.161	184.194			204.250
br28	Xsubselect		P2-3A	1	B7	6/9/2012		0											
br29	Xbomb		P1-1A	1	B5	6/9/2012		0											
br30	Xbomb		P1-2A	1	B5	6/9/2012		3		151.153			186.186			184.184			
br31	Xsubselect		P1-2B	1	B5	6/9/2012		0											
br32	Xsubselect		P1-2C	1	B5	6/9/2012		0											
br33	sample	br33	P1-2D	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br34	Xsubselect		P1-2E	1	B5	6/9/2012		0											
br35	sample	br33	P1-3A	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br36	Xbomb		P1-4A	1	B5	6/9/2012		1		151.151									
br37	Xsubselect		P1-4B	1	B5	6/9/2012		0											
br38	sample	br33	P1-5A	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br39	Xbomb		P1-6A	1	B5	6/9/2012		2		51.151			186.190			184.184			
br40	sample	br33	P2-1A	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br41	Xsubselect		P2-2A	1	B5	6/9/2012		0											
br42	Xsubselect		P3-1A	1	B5	6/9/2012		0											
br43	sample	br33	P3-2A	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br44	Xsubselect		P3-2B	1	B5	6/9/2012		0											
br45	Xsubselect		P3-2C	1	B5	6/9/2012		0											
br46	sample	br33	P3-2D	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br47	Xsubselect		P3-2E	1	B5	6/9/2012		0											
br48	sample	br33	G-1	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br49	Xsubselect		G-2	1	B5	6/9/2012		0											
br50	Xsubselect		G-3	1	B5	6/9/2012		0											
br51	sample	br33	G-4	1	B5	6/9/2012		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			250.250
br52	sample	775	P1-1A	1	B13	6/9/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br53	sample	775	P1-2A	1	B13	6/9/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br54	Xinadequate		P1-3A	1	B13	6/9/2012		0											
br55	sample	775	P2-1A	1	B13	6/9/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br56	Xbomb		P2-2A	1	B13	6/9/2012		2		49.53.159			186.190		55.161	184.184			

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br57	Xsubselect		P2-2B	1	B13	6/9/2012		0											
br58	Xsubselect		P2-2C	1	B13	6/9/2012		0											
br59	sample	775	P2-2D	1	B13	6/9/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br60	Xbomb		P3-1A	1	B13	6/9/2012		3		149.53.59	77.78.184	233.21.37	86.190	210.214	55.65.161	184.184			204.250
br61	Xsubselect		P3-1B	1	B13	6/9/2012		0											
br62	Xsubselect		P3-2A	1	B13	6/9/2012		0											
br63	sample	711	P3-2B	1	B13	6/9/2012		11	140.160	149.153	177.184	221.233	190.190	210.214	155.161	184.184	127.129	229.249	204.250
br64	Xsubselect		P3-2C	1	B13	6/9/2012		0											
br65	sample	775	G-1	1	B13	6/9/2012		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184			204.250
br66	sample	br66	P1-1a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br67	Xsubselect		P1-1b	1	B16	6/9/2012		0											
br68	sample	br66	G-1	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br69	sample	br66	P1-2a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br70	sample	br66	G-2	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br71	sample	br66	P1-3a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br72	sample	br66	P1-4a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br73	sample	br66	P1-5a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br74	sample	br66	G-3	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br75	sample	br66	P2-1a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br76	sample	br66	P2-2a	1	B16	6/9/2012		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			250.250
br77	sample	br77	P1-1A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br78	Xinadequate		P2-1A	1	B17	6/9/2012		0											
br79	Xinadequate		P2-1B	1	B17	6/9/2012		0											
br80	Xinadequate		P2-1C	1	B17	6/9/2012		0											
br81	Xinadequate		P2-2A	1	B17	6/9/2012		0											
br82	sample	br77	P3-1A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br83	sample	br77	P3-1B	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br84	Xsubselect		P3-1C	1	B17	6/9/2012		0											
br85	Xsubselect		P3-1D	1	B17	6/9/2012		0											
br86	sample	br77	P3-2A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br87	sample	br77	P3-3A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br88	sample	br77	P3-4A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br89	sample	br77	P3-5A	1	B17	6/9/2012		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			204.250
br90	Xinadequate		P1-1A	1	B22	6/10/2012		0											
br91	sample	br91	P1-2A	1	B22	6/10/2012		11	152.156	153.155	174.178	221.233	186.190	210.210	165.165	184.184	127.133	223.229	204.250
br92	Xinadequate		P2-1A	1	B22	6/10/2012		0											
br93	sample	br91	P3-1A	1	B22	6/10/2012		9	152.156	153.155	174.178	221.233	186.190	210.210	165.165	184.184			204.250
br94	sample	br91	G-1	1	B22	6/10/2012		9	152.156	153.155	174.178	221.233	186.190	210.210	165.165	184.184			204.250
br95	Xsubselect		G-2	1	B22	6/10/2012		0											
br96	Xsubselect		G-3	1	B22	6/10/2012		0											
br97	sample	br97	G-4	1	B22	6/10/2012		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165	184.184			250.250
br98	Xsubselect		G-5	1	B22	6/10/2012		0											
br99	Xinadequate		P3-2A	1	B22	6/10/2012		0											
br100	Xinadequate		P3-3A	1	B22	6/10/2012		0											
br101	sample	br101	P1-1A	1	B37	6/10/2012		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			204.250
br102	Xbomb		P1-2A	1	B37	6/10/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br103	Xsubselect		P1-2B	1	B37	6/10/2012		0											
br104	sample	br101	P1-3A	1	B37	6/10/2012		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			204.250
br105	Xbomb		P1-4A	1	B37	6/10/2012		3		149.153	76.78		190.190		61.65	184.184			
br106	Xinadequate		P2-1B	1	B37	6/10/2012		0											
br107	Xbomb		P2-1A	1	B37	6/10/2012		1					190.190			84.184			
br108	Xbomb		P1-1A	1	B59	6/11/2012		2		59.61			180.196			184.184			
br109	sample	br109	P1-2A	1	B59	6/11/2012		9	160.162	159.161	176.186	233.237	180.196	208.210	141.161	184.184			204.250
br110	Xinadequate		P2-1A	1	B59	6/11/2012		0											
br111	Xinadequate		P3-1A	1	B59	6/11/2012		0											
br112	sample	br109	G-1	1	B59	6/11/2012		9	160.162	159.161	176.186	233.237	180.196	208.210	141.161	184.184			204.250
br113	Xsubselect		G-2	1	B59	6/11/2012		0											
br114	Xsubselect		G-3	1	B59	6/11/2012		0											
br115	sample	br115	P1-1A	1	B58	6/11/2012		9	140.140	149.151	174.177	231.233	186.186	210.210	139.155	184.194			204.250
br116	Xbomb		P1-2A	1	B58	6/11/2012		3		151.53	72.76.184	223.225	01.211	208.210	51.151	83.95			250.250
br117	Xinadequate		P2-1A	1	B58	6/11/2012		0											
br118	Xsubselect		P3-1A	1	B58	6/11/2012		0											
br119	sample	br115	P3-1B	1	B58	6/11/2012		9	140.140	149.151	174.177	231.233	186.186	210.210	139.155	184.194			204.250
br120	Xbomb		G-1	1	B58	6/11/2012		2		51.151	174.75.76	31.231	186.186	210.212		84.84			04.50
br121	Xsubselect		G-2	1	B58	6/11/2012		0											
br122	Xsubselect		G-3	1	B58	6/11/2012		0											
br123	Xbomb		G-4	1	B58	6/11/2012		1		55.55	72.176		87.203	14.14	53.57.61	81.81			250.250
br124	Xsubselect		G-5	1	B58	6/11/2012		0											
br125	sample	br125	P1-1A	1	B56	6/11/2012		9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			204.250
br126	sample	br125	P1-2A	1	B56	6/11/2012		9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			204.250
br127	Xinadequate		P1-3A	1	B56	6/11/2012		0											
br128	Xinadequate		P2-1A	1	B56	6/11/2012		0											
br129	Xinadequate		P2-2A	1	B56	6/11/2012		0											
br130	Xinadequate		P3-1A	1	B56	6/11/2012		0											
br131	sample	br125	P3-3A	1	B56	6/11/2012		9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			204.250
br132	Xinadequate		P3-2A	1	B56	6/11/2012		0											
br133	sample	br125	G-1	1	B56	6/11/2012		9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			204.250
br134	Xsubselect		G-2	1	B56	6/11/2012		0											
br135	Xsubselect		G-3	1	B56	6/11/2012		0											
br136	sample	br125	G-4	1	B56	6/11/2012		9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			204.250
br137	sample	488	P1-2A	2	B13	6/19/2012		11	152.152	149.155	178.186	231.231	190.196	210.210	155.161	184.194	127.127	229.239	250.250
br138	Xinadequate		P1-1A	2	B13	6/19/2012		0											
br139	sample	488	P2-1A	2	B13	6/19/2012		9	152.152	149.155	178.186	231.231	190.196	210.210	155.161	184.194			250.250
br140	Xbomb		P2-2A	2	B13	6/19/2012		8	152.152	149.155	178.186	31.231	190.196	210.210	155.161	184.194			250.250
br141	Xbomb		G-1	2	B13	6/19/2012		1								184.184			
br142	Xinadequate		P1-1A	2	B5	6/19/2012		0											
br143	sample	br143	P1-2A	2	B5	6/19/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br144	Xinadequate		P1-3A	2	B5	6/19/2012		0											
br145	Xinadequate		P1-3B	2	B5	6/19/2012		0											
br146	sample	br146	P1-3C	2	B5	6/19/2012		9	158.160	151.153	178.186	221.231	186.190	210.210	161.161	184.184			250.250
br147	sample	br146	P1-4A	2	B5	6/19/2012		9	158.160	151.153	178.186	221.231	186.190	210.210	161.161	184.184			250.250
br148	sample	br143	P2-1A	2	B5	6/19/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br149	sample	br143	P2-2A	2	B5	6/19/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br150	sample	br146	P3-1A	2	B5	6/19/2012		9	158.160	151.153	178.186	221.231	186.190	210.210	161.161	184.184			250.250
br151	sample	br143	P3-2A	2	B5	6/19/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br152	sample	br143	G-1	2	B5	6/19/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br153	Xsubselect		G-2	2	B5	6/19/2012		0											
br154	Xsubselect		G-3	2	B5	6/19/2012		0											
br155	sample	br155	P1-1A	2	B7	6/19/2012		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			250.250
br156	sample	br26	P1-2A	2	B7	6/19/2012		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161	184.194			204.250
br157	Xbomb		P1-3A	2	B7	6/19/2012		3		153.55	172.178			208.214	61.161	184.184			
br158	sample	br155	P2-1A	2	B7	6/19/2012		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			250.250
br159	Xbomb		P2-2A	2	B7	6/19/2012		1		55.55	178.84.182	25.27.231	87.90.03.11	02.214	49.61	81.181			250.250
br160	Xbomb		P2-3A	2	B7	6/19/2012		5	140.160	49.55.59	184.184	223.233	86.90.03.11	208.214	47.55.161	81.184			250.250
br161	Xsubselect		P2-3B	2	B7	6/19/2012		0											
br162	sample	br155	P2-4A	2	B7	6/19/2012		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			250.250
br163	Xbomb		P2-5A	2	B7	6/19/2012		3	140.54.60	155.59	72.178.184	221.233	186.190	208.210	61.161	184.94			04.250
br164	Xinadequate		P3-1A	2	B7	6/19/2012		0											
br165	Xinadequate		P3-2A	2	B7	6/19/2012		0											
br166	sample	br155	G-1	2	B7	6/19/2012		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			250.250
br167	Xsubselect		G-2	2	B7	6/19/2012		0											
br168	Xsubselect		G-3	2	B7	6/19/2012		0											
br169	sample	br170	P1-1A	2	B6	6/19/2012		8	140.140	151.159	178.178	221.233	190.190	208.210	153.161	84.184			250.250
br170	sample	br170	P2-1A	2	B6	6/19/2012		9	140.140	151.159	178.178	221.233	190.190	208.210	153.161	184.184			250.250
br171	Xbomb		P2-2A	2	B6	6/19/2012		8	140.140	151.159	178.178	221.233	86.190	208.210	153.161	184.184			250.250
br172	sample	br172	P1-1A	2	B10	6/19/2012		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161	184.194			204.250
br173	Xbomb		P1-2A	2	B10	6/19/2012		5	40.160	149.155	172.176	221.52	180.90.186	210.214	139.53.161	184.194			204.250
br174	sample	br174	P2-1A	2	B10	6/19/2012		9	140.140	151.151	178.186	221.252	190.190	210.210	153.161	184.184			204.250
br175	Xbomb		P3-1A	2	B10	6/19/2012		4	140.160	149.55.151	72.76.78.8	221.52	180.86.90	210.214	139.53.161	184.194			204.250
br176	Xmixed		P3-2A	2	B10	6/19/2012		5	140.160	149.55.151	72.76.78.8	221.252	180.86.90	210.214	39.53.161	184.194			204.250
br177	sample	br174	P3-3A	2	B10	6/19/2012		9	140.140	151.151	178.186	221.252	190.190	210.210	153.161	184.184			204.250
br178	sample	br174	P3-4A	2	B10	6/19/2012		9	140.140	151.151	178.186	221.252	190.190	210.210	153.161	184.184			204.250
br179	sample	br179	P1-1a	2	B11	6/19/2012		9	140.140	151.153	184.186	221.233	186.190	208.210	139.161	184.184			250.250
br180	Xinadequate		P2-1a	2	B11	6/19/2012		0											
br181	Xinadequate		P3-1a	2	B11	6/19/2012		0											
br182	Xinadequate		P3-2A	2	B11	6/19/2012		0											
br183	Xinadequate		P3-3A	2	B11	6/19/2012		0											
br184	Xinadequate		G-1	2	B11	6/19/2012		0											
br185	Xbomb		P1-1A	2	B12	6/19/2012		8	160.160	155.161	172.176	233.21.37	186.196	210.214	139.155	184.184			204.250
br186	sample	698	P1-2A	2	B12	6/19/2012		11	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184	129.133	223.249	204.250
br187	sample	698	P1-3A	2	B12	6/19/2012		8	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.94			204.250
br188	sample	698	P2-1A	2	B12	6/19/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br189	Xsubselect		P2-1B	2	B12	6/19/2012		0											
br190	sample	698	P3-1A	2	B12	6/19/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br191	sample	698	P3-2A	2	B12	6/19/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br192	sample	698	P3-3A	2	B12	6/19/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br193	sample	698	G-1	2	B12	6/19/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br194	Xinadequate		P1-1A	2	B18	6/19/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br195	sample	br195	P2-1A	2	B18	6/19/2012		11	152.160	151.151	174.176	221.221	186.190	210.210	151.161	184.184	123.127	229.229	250.250
br196	Xinadequate		P2-2A	2	B18	6/19/2012		0											
br197	Xinadequate		P3-1A	2	B18	6/19/2012		0											
br198	Xinadequate		P3-2A	2	B18	6/19/2012		0											
br199	sample	br199	P1-1A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br200	Xsubselect		P1-1B	2	B16	6/19/2012		0											
br201	Xsubselect		P1-1C	2	B16	6/19/2012		0											
br202	sample	br199	P1-2A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br203	Xinadequate		P1-2B	2	B16	6/19/2012		0											
br204	sample	br199	P1-2C	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br205	Xinadequate		P1-2D	2	B16	6/19/2012		0											
br206	sample	br199	P2-1A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br207	sample	br199	P2-2A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br208	sample	br199	P2-3A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br209	sample	br199	P3-1A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br210	sample	br199	P3-2A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br211	sample	br199	P3-3A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br212	Xinadequate		P3-3B	2	B16	6/19/2012		0											
br213	sample	br199	P3-4A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br214	sample	br199	P3-5A	2	B16	6/19/2012		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			250.250
br215	Xbomb		P1-1A	2	B29	6/19/2012		7	160.160	51.159.161	174.176	231.21.37	186.190	210.210	155.161	184.184			250.250
br216	Xbomb		P1-2A	2	B29	6/19/2012		4	160.66	151.59.61	176.186	37.221.231	186.190	210.210	55.161	184.184			50.250
br217	Xinadequate		P1-3A	2	B29	6/19/2012		0											
br218	sample	br218	P2-1A	2	B29	6/19/2012		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161	184.184			250.250
br219	sample	br219	G-1	2	B29	6/19/2012		9	160.160	151.161	176.186	221.231	186.190	210.210	161.161	184.184			250.250
br220	sample	br220	P1-1A	2	B41	6/20/2012		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			250.250
br221	sample	br220	P1-2A	2	B41	6/20/2012		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			250.250
br222	sample	br220	P1-3A	2	B41	6/20/2012		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			250.250
br223	sample	br220	P1-4A	2	B41	6/20/2012		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			250.250
br224	Xsubselect		P1-4B	2	B41	6/20/2012		0											
br225	Xsubselect		P1-4C	2	B41	6/20/2012		0											
br226	sample	br220	P2-1A	2	B41	6/20/2012		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			250.250
br227	sample	br220	P2-2A	2	B41	6/20/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br228	Xinadequate		P3-1A	2	B41	6/20/2012		0											
br229	Xbomb		P1-1A	2	B27	6/20/2012		2	42.54.56.62		176.90		87.90.201	210.210	5.149.47.5	95.195			250.250
br230	Xsubselect		P1-1B	2	B27	6/20/2012		0											
br231	Xbomb		P1-2A	2	B27	6/20/2012		0											
br232	Xinadequate		P1-2B	2	B27	6/20/2012		0											
br233	Xsubselect		P1-2C	2	B27	6/20/2012		0											
br234	Xinadequate		P2-1A	2	B27	6/20/2012		0											
br235	Xbomb		P2-2A	2	B27	6/20/2012		0											
br236	Xbomb		P2-2C	2	B27	6/20/2012		0											
br237	sample	br237	P1-1A	2	B51	6/20/2012		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184			250.250
br238	sample	br237	P1-2A	2	B51	6/20/2012		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184			250.250
br239	Xsubselect		P1-2B	2	B51	6/20/2012		0											
br240	Xbomb		P2-2B	2	B27	6/20/2012		0		53.53	74.174		87.98.201	208.04.14	49.49	95.195			

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br241	Xinadequate		P1-1A	2	B34	6/20/2012		0											
br242	Xinadequate		P1-2A	2	B34	6/20/2012		0											
br243	Xinadequate		P1-3A	2	B34	6/20/2012		0											
br244	sample	br244	P2-1A	2	B34	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br245	sample	br244	P2-2A	2	B34	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br246	sample	br244	P2-3A	2	B34	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br247	Xinadequate		P3-2A	2	B34	6/20/2012		0											
br248	Xinadequate		P1-3A	2	B51	6/20/2012		0											
br249	Xinadequate		P2-1A	2	B51	6/20/2012		0											
br250	sample	br237	P3-1A	2	B34	6/20/2012		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184			250.250
br251	Xbomb		P2-2A	2	B51	6/20/2012		0											
br252	sample	br244	P2-3A	2	B51	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br253	Xsubselect		P2-3B	2	B51	6/20/2012		0											
br254	Xsubselect		P2-3C	2	B51	6/20/2012		0											
br255	Xbomb		P2-4A	2	B51	6/20/2012		0											
br256	Xinadequate		P3-1A	2	B51	6/20/2012		0											
br257	sample	br244	P3-2A	2	B51	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br258	Xinadequate		P3-3A	2	B51	6/20/2012		0											
br259	Xinadequate		P3-3B	2	B51	6/20/2012		0											
br260	Xinadequate		P3-4A	2	B51	6/20/2012		0											
br261	Xsubselect		G-1	2	B51	6/20/2012		0											
br262	sample	br244	G-2	2	B51	6/20/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br263	Xinadequate		P1-1A	2	B56	6/21/2012		0											
br264	Xinadequate		P2-1A	2	B56	6/21/2012		0											
br265	sample	br237	P2-2A	2	B56	6/21/2012		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184			250.250
br266	Xinadequate		P2-3A	2	B56	6/21/2012		0											
br267	sample	br244	P2-4A	2	B56	6/21/2012		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			204.250
br268	Xinadequate		P3-1A	2	B56	6/21/2012		0											
br269	Xinadequate		P3-2A	2	B56	6/21/2012		0											
br270	sample	br101	P1-1A	2	B59	6/21/2012		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			204.250
br271	Xinadequate		P1-2A	2	B59	6/21/2012		0											
br272	Xinadequate		P1-3A	2	B59	6/21/2012		0											
br273	Xinadequate		P2-1A	2	B59	6/21/2012		0											
br274	sample	br101	P2-2A	2	B59	6/21/2012		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			204.250
br275	Xbomb		P2-3A	2	B59	6/21/2012		1			176.178								
br276	sample	br101	P3-1A	2	B59	6/21/2012		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			204.250
br277	Xinadequate		P1-1A	2	B64	6/22/2012		0											
br278	Xinadequate		P1-2A	2	B64	6/22/2012		0											
br279	Xinadequate		P1-1A	3	B3	6/28/2012		0											
br280	Xinadequate		P1-2A	3	B3	6/28/2012		0											
br281	Xinadequate		P2-1A	3	B3	6/28/2012		0											
br282	Xinadequate		P2-2A	3	B3	6/28/2012		0											
br283	Xinadequate		P2-2B	3	B3	6/28/2012		0											
br284	Xinadequate		P2-2C	3	B3	6/28/2012		0											
br285	Xinadequate		P2-3A	3	B3	6/28/2012		0											
br286	Xinadequate		P3-1A	3	B3	6/28/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br287	Xinadequate		P3-2A	3	B3	6/28/2012		0											
br288	Xinadequate		P3-2B	3	B3	6/28/2012		0											
br289	Xinadequate		P3-3A	3	B3	6/28/2012		0											
br290	Xbomb		P1-1A	3	B1	6/28/2012		1		51.51	176.80.88		187.91	)6.210.12.1·	149.51.53				250.250
br291	Xbomb		P1-1A	3	B4	6/28/2012		1			75.176.82.88		80.85.90.0	96.04.08.14					250.250
br292	Xinadequate		P1-1A	3	B5	6/28/2012		0											
br293	Xinadequate		P1-2A	3	B5	6/28/2012		0											
br294	Xinadequate		P1-3A	3	B5	6/28/2012		0											
br295	Xinadequate		P1-3B	3	B5	6/28/2012		0											
br296	Xinadequate		P2-1A	3	B5	6/28/2012		0											
br297	Xinadequate		P2-2A	3	B5	6/28/2012		0											
br298	Xinadequate		P3-1A	3	B5	6/28/2012		0											
br299	sample	br143	G-1	3	B5	6/28/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br300	sample	br143	G-2	3	B5	6/28/2012		9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			204.250
br301	Xinadequate		P1-1A	3	B6	6/28/2012		0											
br302	Xinadequate		P2-1A	3	B6	6/28/2012		0											
br303	Xinadequate		P1-1A	3	B7	6/28/2012		0											
br304	Xinadequate		P2-1A	3	B7	6/28/2012		0											
br305	Xinadequate		P2-2A	3	B7	6/28/2012		0											
br306	Xinadequate		P2-3A	3	B7	6/28/2012		0											
br307	Xinadequate		P3-1A	3	B7	6/28/2012		0											
br308	Xinadequate		P3-2A	3	B7	6/28/2012		0											
br309	Xinadequate		P3-3A	3	B7	6/28/2012		0											
br310	Xsubselect		P3-3B	3	B7	6/28/2012		0											
br311	Xbomb		P3-3C	3	B7	6/28/2012		0			74.172.80.86		187.89	194.12.16		90.190			
br312	Xinadequate		P3-3D	3	B7	6/28/2012		0											
br313	sample	br155	G-1	3	B7	6/28/2012		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			250.250
br314	sample	br314	T-1	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br315	sample	br314	P1-1A	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br316	Xinadequate		P1-1B	3	B12	6/28/2012		0											
br317	Xinadequate		P1-1C	3	B12	6/28/2012		0											
br318	Xinadequate		P1-2A	3	B12	6/28/2012		0											
br319	Xinadequate		P1-2B	3	B12	6/28/2012		0											
br320	Xinadequate		P1-3A	3	B12	6/28/2012		0											
br321	Xinadequate		P1-4A	3	B12	6/28/2012		0											
br322	sample	br314	P2-1A	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br323	Xbomb		P2-2A	3	B12	6/28/2012		7	140.152	155.159	174.176	221.233	186.190	)8.210.12.1·	139.161	84.184			250.250
br324	Xinadequate		P2-2B	3	B12	6/28/2012		0											
br325	sample	br314	P2-3A	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br326	sample	br314	P2-4A	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br327	sample	br314	P3-1A	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br328	sample	br314	P3-1B	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br329	Xinadequate		P3-1C	3	B12	6/28/2012		0											
br330	Xsubselect		P3-1D	3	B12	6/28/2012		0											
br331	Xinadequate		P3-2A	3	B12	6/28/2012		0											
br332	Xinadequate		P3-2B	3	B12	6/28/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
									Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br333	Xbomb		T-2	3	B12	6/28/2012		0		49.59.155			186.87.90			82.84			
br334	sample	br314	G-1	3	B12	6/28/2012		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			250.250
br335	Xsubselect		G-2	3	B12	6/28/2012		0											
br336	Xsubselect		G-3	3	B12	6/28/2012		0											
br337	sample	698	G-4	3	B12	6/28/2012		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184			204.250
br338	Xsubselect		G-5	3	B12	6/28/2012		0											
br339	Xinadequate		P1-1A	3	B11	6/29/2012		0											
br340	Xinadequate		P1-1A	3	B10	6/29/2012		0											
br341	Xinadequate		P1-2A	3	B10	6/29/2012		0											
br342	Xinadequate		P1-2B	3	B10	6/29/2012		0											
br343	Xinadequate		P2-1A	3	B10	6/29/2012		0											
br344	Xinadequate		P2-2A	3	B10	6/29/2012		0											
br345	Xinadequate		P3-1A	3	B10	6/29/2012		0											
br346	Xinadequate		P3-2A	3	B10	6/29/2012		0											
br347	Xinadequate		P3-3A	3	B10	6/29/2012		0											
br348	sample	711	P1-1A	3	B13	6/29/2012		9	140.160	149.153	177.184	221.233	190.190	210.214	155.161	184.184			204.250
br349	sample	711	P2-1A	3	B13	6/29/2012		9	140.160	149.153	177.184	221.233	190.190	210.214	155.161	184.184			204.250
br350	sample	br350	P2-2A	3	B13	6/29/2012		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161	184.194			250.250
br351	Xsubselect		P2-2B	3	B13	6/29/2012		0											
br352	sample	br350	P2-3A	3	B13	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br353	Xsubselect		P2-3B	3	B13	6/29/2012		0											
br354	Xinadequate		P3-1A	3	B13	6/29/2012		0											
br355	Xinadequate		P3-2A	3	B13	6/29/2012		0											
br356	Xbomb		P3-2B	3	B13	6/29/2012		7	140.160	149.153	177.184	21.233	190.190	210.214	155.161				204.250
br357	Xsubselect		G-1	3	B13	6/29/2012		0											
br358	Xbomb		G-2	3	B13	6/29/2012		0											
br359	Xinadequate		P1-1A	3	B16	6/29/2012		0											
br360	Xinadequate		P1-2A	3	B16	6/29/2012		0											
br361	Xbomb		T-1	3	B16	6/29/2012		7	140.154	55.161	177.177	233.233	180.186	208.210	139.155				250.250
br362	Xinadequate		P1-1A	3	B17	6/29/2012		0											
br363	Xbomb		P1-1B	3	B17	6/29/2012		6	140.60.62		176.184	221.233	186.190	208.210	151.161				250.250
br364	Xsubselect		P1-1C	3	B17	6/29/2012		0											
br365	sample	br365	P1-1D	3	B17	6/29/2012		8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				250.250
br366	Xinadequate		P1-2A	3	B17	6/29/2012		0											
br367	sample	br365	P1-2B	3	B17	6/29/2012		8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				250.250
br368	Xinadequate		P2-1A	3	B17	6/29/2012		0											
br369	sample	br365	P2-1B	3	B17	6/29/2012		8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				250.250
br370	Xsubselect		P2-1C	3	B17	6/29/2012		0											
br371	sample	br365	P2-2A	3	B17	6/29/2012		8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				250.250
br372	Xinadequate		P2-3A	3	B17	6/29/2012		0											
br373	Xinadequate		P2-4A	3	B17	6/29/2012		0											
br374	sample	br365	P2-5A	3	B17	6/29/2012		8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				250.250
br375	Xinadequate		P1-1A	3	B18	6/29/2012		0											
br376	Xinadequate		P1-2A	3	B18	6/29/2012		0											
br377	Xinadequate		P1-2B	3	B18	6/29/2012		0											
br378	Xinadequate		P2-1A	3	B18	6/29/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br379	Xinadequate		P2-1B	3	B18	6/29/2012		0											
br380	Xbomb		P1-1A	3	B22	6/29/2012		2					189.191						250.250
br381	Xinadequate		P2-1A	3	B22	6/29/2012		0											
br382	Xinadequate		P2-2A	3	B22	6/29/2012		0											
br383	Xbomb		G-1	3	B22	6/29/2012		1		53.153	180.76.82			210.214	149.55				
br384	Xsubselect		G-2	3	B22	6/29/2012		0											
br385	sample	br350	P1-1A	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br386	Xsubselect		P1-1B	3	B25	6/29/2012		0											
br387	Xsubselect		P1-1C	3	B25	6/29/2012		0											
br388	sample	br350	P1-1D	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br389	Xinadequate		P1-2A	3	B25	6/29/2012		0											
br390	sample	br350	P2-1A	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br391	sample	br350	P2-2A	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br392	Xsubselect		P2-3A	3	B25	6/29/2012		0											
br393	sample	583	P2-3B	3	B25	6/29/2012		10	140.152	151.153	174.176	221.221	180.186	208.210	139.153		127.129	229.229	250.250
br394	Xinadequate		P3-1A	3	B25	6/29/2012		0											
br395	sample	br350	P3-2A	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br396	Xsubselect		P3-2B	3	B25	6/29/2012		0											
br397	Xsubselect		P3-2C	3	B25	6/29/2012		0											
br398	sample	br350	P3-2D	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br399	sample	br350	P3-3A	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br400	Xsubselect		P3-3B	3	B25	6/29/2012		0											
br401	sample	br350	G-1	3	B25	6/29/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br402	Xsubselect		G-2	3	B25	6/29/2012		0											
br403	Xsubselect		G-3	3	B25	6/29/2012		0											
br404	Xbomb		P1-1A	3	B26	6/29/2012		2	50.150				90.190	212.214					250.250
br405	Xinadequate		P2-1A	3	B26	6/29/2012		0											
br406	Xbomb		P1-1A	3	B27	6/29/2012		0					01.01	12.212					
br407	Xsubselect		P1-1B	3	B27	6/29/2012		0											
br408	Xbomb		P1-2A	3	B27	6/29/2012		0				37.37	01.01	00.210	53.153				50.250
br409	Xsubselect		P1-2B	3	B27	6/29/2012		0											
br410	Xinadequate		P2-1A	3	B27	6/29/2012		0											
br411	Xinadequate		P2-1B	3	B27	6/29/2012		0											
br412	Xinadequate		P2-1C	3	B27	6/29/2012		0											
br413	Xinadequate		P2-2A	3	B27	6/29/2012		0											
br414	Xinadequate		P2-2B	3	B27	6/29/2012		0											
br415	Xbomb		P2-3A	3	B27	6/29/2012		0					90.01						50.250
br416	Xinadequate		P1-1A	3	B29	6/30/2012		0											
br417	Xinadequate		P1-2A	3	B29	6/30/2012		0											
br418	Xinadequate		P1-1A	3	B37	6/30/2012		0											
br419	sample	br101	P1-1A	3	B45	6/30/2012		8	140.156	149.153	176.178	221.237	190.190	210.210	161.165				204.250
br420	Xbomb		P1-1A	3	B36	6/30/2012		1	50.54				86.186						250.250
br421	Xbomb		P1-2A	3	B36	6/30/2012		2	150.154										250.250
br422	Xinadequate		P1-1A	3	B35	6/30/2012		0											
br423	sample	br423	P1-1A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br424	Xsubselect		P1-1B	3	B34	6/30/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br425	Xsubselect		P1-1C	3	B34	6/30/2012		0											
br426	sample	br423	P1-2A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br427	Xsubselect		P1-2B	3	B34	6/30/2012		0											
br428	Xsubselect		P1-2C	3	B34	6/30/2012		0											
br429	Xinadequate		P1-3A	3	B34	6/30/2012		0											
br430	sample	br423	P1-3B	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br431	sample	br423	P2-1A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br432	sample	br423	P2-2A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br433	sample	br423	P2-3A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br434	sample	br423	P2-4A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br435	sample	br423	P3-1A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br436	sample	br423	P3-2A	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br437	Xsubselect		P3-2B	3	B34	6/30/2012		0											
br438	Xbomb		P3-3A	3	B34	6/30/2012		7	152.160	155.159	174.176	31.51.237	190.190	210.214	155.161				250.250
br439	sample	br423	G-1	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br440	Xsubselect		G-2	3	B34	6/30/2012		0											
br441	Xsubselect		G-3	3	B34	6/30/2012		0											
br442	sample	br423	G-4	3	B34	6/30/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br443	Xsubselect		G-5	3	B34	6/30/2012		0											
br444	Xinadequate		P1-1A	3	B33	6/30/2012		0											
br445	Xinadequate		P1-1B	3	B33	6/30/2012		0											
br446	Xinadequate		P1-2A	3	B33	6/30/2012		0											
br447	Xinadequate		P2-1A	3	B33	6/30/2012		0											
br448	Xbomb		G-1	3	B33	6/30/2012		3		153.153	84.186	21.21	190.190	10.210	139.151				204.50
br449	Xsubselect		G-2	3	B33	6/30/2012		0											
br450	sample	274	P1-1A	3	B48	6/30/2012		10	140.160	155.159	178.183	231.233	186.196	208.210	161.161		127.139	229.239	204.250
br451	Xsubselect		P1-1B	3	B48	6/30/2012		0											
br452	Xinadequate		P1-2A	3	B48	6/30/2012		0											
br453	Xinadequate		P1-2B	3	B48	6/30/2012		0											
br454	sample	274	P1-2C	3	B48	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br455	Xinadequate		P1-2D	3	B48	6/30/2012		0											
br456	sample	274	P2-1A	3	B48	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br457	Xsubselect		P2-1B	3	B48	6/30/2012		0											
br458	Xinadequate		P2-2A	3	B48	6/30/2012		0											
br459	sample	274	P2-3A	3	B48	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br460	Xinadequate		P3-1A	3	B48	6/30/2012		0											
br461	sample	274	P3-1B	3	B48	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br462	Xinadequate		P3-2A	3	B48	6/30/2012		0											
br463	sample	274	P3-2B	3	B48	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br464	Xinadequate		P1-1A	3	B49	6/30/2012		0											
br465	Xinadequate		P1-2A	3	B49	6/30/2012		0											
br466	Xinadequate		P1-3A	3	B49	6/30/2012		0											
br467	sample	274	P2-1A	3	B49	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br468	sample	274	P2-2A	3	B49	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br469	Xsubselect		P2-2B	3	B49	6/30/2012		0											
br470	sample	274	G-1	3	B49	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
									Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br471	Xsubselect		G-2	3	B49	6/30/2012		0											
br472	Xinadequate		P1-1A	3	B50	6/30/2012		0											
br473	sample	274	P1-2A	3	B50	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br474	Xsubselect		P1-3A	3	B50	6/30/2012		0											
br475	sample	274	P1-3B	3	B50	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br476	sample	274	G-1	3	B50	6/30/2012		8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				204.250
br477	Xinadequate		P1-1A	3	B64	7/1/2012		0											
br478	Xinadequate		P1-1A	3	B61	7/1/2012		0											
br479	Xinadequate		P1-2A	3	B61	7/1/2012		0											
br480	Xinadequate		P1-1A	4	B2	7/10/2012		0											
br481	Xinadequate		P1-1B	4	B2	7/10/2012		0											
br482	Xinadequate		P1-1C	4	B2	7/10/2012		0											
br483	Xinadequate		P1-1D	4	B2	7/10/2012		0											
br484	Xbomb		P2-1A	4	B2	7/10/2012		0			72.76.82.84		89.90		45.53				
br485	Xinadequate		P2-2A	4	B2	7/10/2012		0											
br486	sample	br486	P2-3A	4	B2	7/10/2012		8	152.160	155.155	178.186	221.221	190.196	210.210	153.161				204.250
br487	Xinadequate		P3-1A	4	B2	7/10/2012		0											
br488	sample	br486	P3-1B	4	B2	7/10/2012		8	152.160	155.155	178.186	221.221	190.196	210.210	153.161				204.250
br489	Xsubselect		P3-1C	4	B2	7/10/2012		0											
br490	Xsubselect		P3-1D	4	B2	7/10/2012		0											
br491	Xinadequate		P1-1A	4	B3	7/10/2012		0											
br492	Xinadequate		P1-2A	4	B3	7/10/2012		0											
br493	Xinadequate		P1-1A	4	B6	7/10/2012		0											
br494	Xinadequate		P2-1A	4	B6	7/10/2012		0											
br495	sample	br146	P1-1A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br496	sample	br146	P1-2A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br497	Xbomb		P1-3A	4	B5	7/10/2012		0											
br498	Xsubselect		P1-3B	4	B5	7/10/2012		0											
br499	Xsubselect		P1-3C	4	B5	7/10/2012		0											
br500	sample	br146	P1-4A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br501	Xsubselect		P1-4B	4	B5	7/10/2012		0											
br502	Xsubselect		P1-4C	4	B5	7/10/2012		0											
br503	sample	br146	P3-1A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br504	Xinadequate		P3-1B	4	B5	7/10/2012		0											
br505	sample	br146	P3-2A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br506	Xinadequate		P2-1B	4	B5	7/10/2012		0											
br507	Xinadequate		P2-1C	4	B5	7/10/2012		0											
br508	Xinadequate		P2-2A	4	B5	7/10/2012		0											
br509	sample	br146	P3-2B	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br510	Xsubselect		P3-2C	4	B5	7/10/2012		0											
br511	Xinadequate		P3-3A	4	B5	7/10/2012		0											
br512	sample	br146	P2-3A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br513	Xinadequate		P3-4A	4	B5	7/10/2012		0											
br514	sample	br174	P2-1A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br515	Xsubselect		P2-1B	4	B10	7/10/2012		0											
br516	Xsubselect		P2-1C	4	B10	7/10/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br517	sample	br174	P2-1D	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br518	Xsubselect		P2-1E	4	B10	7/10/2012		0											
br519	Xsubselect		P2-1F	4	B10	7/10/2012		0											
br520	sample	br146	P2-1A	4	B5	7/10/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br521	Xsubselect		P1-1A	4	B10	7/10/2012		0											
br522	sample	br174	P1-1B	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br523	sample	br174	P1-2A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br524	sample	br174	P1-3A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br525	Xsubselect		P1-3B	4	B10	7/10/2012		0											
br526	sample	br174	P1-4A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br527	sample	br174	P3-1A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br528	sample	br174	P3-2A	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br529	sample	br174	P3-1B	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br530	sample	br174	P3-1C	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br531	Xsubselect		P3-2B	4	B10	7/10/2012		0											
br532	Xsubselect		P3-2C	4	B10	7/10/2012		0											
br533	sample	br174	P3-2D	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br534	Xsubselect		P1-1A	4	B11	7/10/2012		0											
br535	sample	br179	P1-1B	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br536	Xsubselect		P1-1C	4	B11	7/10/2012		0											
br537	Xsubselect		P1-1D	4	B11	7/10/2012		0											
br538	Xsubselect		P1-1E	4	B11	7/10/2012		0											
br539	sample	br179	P1-1F	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br540	sample	br179	P1-1G	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br541	Xinadequate		P2-1A	4	B11	7/10/2012		0											
br542	sample	br179	P1-1H	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br543	sample	br179	P3-1A	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br544	Xinadequate		P3-2A	4	B11	7/10/2012		0											
br545	Xbomb		P2-1A	4	B13	7/11/2012		5	152.60	155.155	174.176	21.31.37.41	87.190	208.214	155.161				250.250
br546	Xsubselect		P2-1B	4	B13	7/11/2012		0											
br547	sample	br179	P2-2A	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br548	Xinadequate		P1-1A	4	B13	7/11/2012		0											
br549	Xinadequate		P1-1B	4	B13	7/11/2012		0											
br550	Xinadequate		P1-1C	4	B13	7/11/2012		0											
br551	Xbomb		P1-2A	4	B13	7/11/2012		0											
br552	Xbomb		P1-3A	4	B13	7/11/2012		1			180.186		90.90		53.153				
br553	Xsubselect		P1-4A	4	B13	7/11/2012		0											
br554	Xbomb		P1-4B	4	B13	7/11/2012		8	152.160	151.155	176.176	221.231	190.190	208.214	155.161				250.250
br555	Xinadequate		P2-1D	4	B11	7/10/2012		0											
br556	Xinadequate		P2-1C	4	B11	7/10/2012		0											
br557	sample	br179	P2-1B	4	B11	7/10/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br558	Xinadequate		P2-1I	4	B10	7/10/2012		0											
br559	sample	br174	P2-1H	4	B10	7/10/2012		8	140.140	151.151	178.186	221.252	190.190	210.210	153.161				204.250
br560	Xsubselect		P2-1G	4	B10	7/10/2012		0											
br561	Xbomb		P1-3B	4	B13	7/11/2012		2	150.160	55.155	172.176				155.57.61				
br562	sample	br350	G-1	4	B13	7/11/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br563	Xmixed		P1-1A	4	B17	7/11/2012		4	40.160	49.51.59.61	174.76.86	21.31.37.52	186.190	210.210	155.161				250.250
br564	Xbomb		P1-2A	4	B17	7/11/2012		3	160.160	159.51.61	74.76.186	231.21.57	186.190	10.210	55.161				250.250
br565	Xinadequate		P1-3A	4	B17	7/11/2012		0											
br566	Xinadequate		P1-4A	4	B17	7/11/2012		0											
br567	sample	br195	P1-5A	4	B17	7/11/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br568	Xinadequate		P3-1A	4	B17	7/11/2012		0											
br569	sample	br218	P3-1B	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br570	Xsubselect		P3-1C	4	B17	7/11/2012		0											
br571	Xbomb		P3-2A	4	B17	7/11/2012		6	160.160	159.51.61	74.176	231.237	186.190	210.210	155.161				250.250
br572	Xinadequate		P2-1A	4	B17	7/11/2012		0											
br573	Xinadequate		P2-1B	4	B17	7/11/2012		0											
br574	Xinadequate		P2-2A	4	B17	7/11/2012		0											
br575	sample	br218	P2-3A	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br576	sample	br218	P2-2B	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br577	sample	br218	G-1	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br578	Xinadequate		P3-3A	4	B17	7/11/2012		0											
br579	sample	br218	P3-3B	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br580	Xinadequate		P3-3C	4	B17	7/11/2012		0											
br581	sample	br218	G-2	4	B17	7/11/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br582	Xbomb		P1-1A	4	B19	7/11/2012		0		55.155	175.80.88	23.229	85.189	196.08.206	55.55				50.250
br583	Xinadequate		P1-1A	4	B28	7/11/2012		0											
br584	sample	br584	P1-1B	4	B28	7/11/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br585	sample	br584	P3-1A	4	B28	7/11/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br586	Xsubselect		P3-1B	4	B28	7/11/2012		0											
br587	Xbomb		P3-2A	4	B28	7/11/2012		2	140.52.58	149.53.55	174.77.79	21.23.231	186.186	210.212	139.45.47				50.250
br588	Xsubselect		P3-2B	4	B28	7/11/2012		0											
br589	Xinadequate		P2-1A	4	B29	7/11/2012		0											
br590	Xmixed		P2-1B	4	B29	7/11/2012		5	140.152	49.155	174.186	231.21.33	186.186	210.210	139.61.65				250.250
br591	sample	br584	P2-1A	4	B28	7/11/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br592	Xsubselect		P2-1B	4	B28	7/11/2012		0											
br593	Xsubselect		P2-1C	4	B28	7/11/2012		0											
br594	Xinadequate		P2-1D	4	B28	7/11/2012		0											
br595	Xsubselect		P2-1E	4	B28	7/11/2012		0											
br596	sample	br584	P2-1F	4	B28	7/11/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br597	Xinadequate		P2-1D	4	B29	7/11/2012		0											
br598	sample	br598	P2-2A	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br599	Xsubselect		P2-2B	4	B29	7/11/2012		0											
br600	Xinadequate		P2-1C	4	B29	7/11/2012		0											
br601	Xbomb		P1-1A	4	B29	7/11/2012		6	40.152	155.155	174.186	231.21.33	186.186	210.210	161.165				250.250
br602	Xinadequate		P1-1B	4	B29	7/11/2012		0											
br603	Xsubselect		P1-1C	4	B29	7/11/2012		0											
br604	sample	br598	P1-1D	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br605	Xsubselect		P1-1E	4	B29	7/11/2012		0											
br606	Xsubselect		P1-1F	4	B29	7/11/2012		0											
br607	Xmixed		P1-1G	4	B29	7/11/2012		5	152.152	155.155	174.186	231.21.33	186.186	210.210	161.39.165				04.250
br608	sample	br598	P1-2A	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br609	sample	br598	P1-3A	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br610	sample	br598	P3-1A	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br611	Xbomb		P3-2A	4	B29	7/11/2012		1				233.235	89.86.90		55.55				50.250
br612	sample	br584	P3-3A	4	B29	7/11/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br613	sample	br220	P1-1A	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br614	sample	br220	P2-1A	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br615	sample	br598	G-1	4	B29	7/11/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br616	Xsubselect		G-2	4	B29	7/11/2012		0											
br617	Xsubselect		G-3	4	B29	7/11/2012		0											
br618	sample	br220	P1-1B	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br619	Xinadequate		P1-2A	4	B34	7/12/2012		0											
br620	Xinadequate		P1-3A	4	B34	7/12/2012		0											
br621	Xinadequate		P1-4A	4	B34	7/12/2012		0											
br622	Xinadequate		P1-5A	4	B34	7/12/2012		0											
br623	Xinadequate		P3-1A	4	B34	7/12/2012		0											
br624	sample	br220	P3-1B	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br625	Xsubselect		P2-1B	4	B34	7/12/2012		0											
br626	Xbomb		P2-1C	4	B34	7/12/2012		1		59.159	78.178	21.221	190.190	08.208	39.61				
br627	Xsubselect		P2-1D	4	B34	7/12/2012		0											
br628	Xinadequate		P1-1A	4	B54	7/12/2012		0											
br629	Xbomb		P1-1B	4	B54	7/12/2012		0					188.90						
br630	Xinadequate		P1-1A	4	B49	7/12/2012		0											
br631	Xinadequate		P1-1A	4	B45	7/13/2012		0											
br632	sample	br220	P3-1C	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br633	Xinadequate		P3-1D	4	B34	7/12/2012		0											
br634	Xsubselect		P3-1E	4	B34	7/12/2012		0											
br635	sample	br220	P3-1F	4	B34	7/12/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br636	Xinadequate		P3-1G	4	B34	7/12/2012		0											
br637	Xinadequate		P3-1H	4	B34	7/12/2012		0											
br638	Xinadequate		P3-1I	4	B34	7/12/2012		0											
br639	Xsubselect		P2-1A	4	B48	7/13/2012		0											
br640	Xsubselect		P2-1B	4	B48	7/13/2012		0											
br641	sample	130	P2-1C	4	B48	7/13/2012		10	152.154	153.159	176.186	221.221	180.186	208.210	141.161	129.133	223.239		250.250
br642	sample	130	P2-2A	4	B48	7/13/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
br643	sample	125	P2-3A	4	B48	7/13/2012		10	152.152	153.161	178.186	221.231	180.190	208.208	139.161	127.133	239.239		250.250
br644	sample	125	P2-4A	4	B48	7/13/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
br645	sample	130	P3-1A	4	B48	7/13/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
br646	Xinadequate		P1-1A	4	B48	7/13/2012		0											
br647	Xinadequate		P1-2A	4	B48	7/13/2012		0											
br648	Xinadequate		P1-2B	4	B48	7/13/2012		0											
br649	sample	125	P1-3A	4	B48	7/13/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
br650	sample	130	P3-2A	4	B48	7/13/2012		8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				250.250
br651	Xinadequate		P3-3A	4	B48	7/13/2012		0											
br652	Xbomb		G-2	4	B48	7/13/2012		2		159.161			186.190		139.41				
br653	Xbomb		P1-1A	4	B64	7/13/2012		1		49.55	177.177		87.187	14.214	47.47				04.250
br654	Xinadequate		P1-1A	5	B10	7/23/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br655	sample	125	P1-3B	4	B48	7/13/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
br656	sample	125	G-1	4	B48	7/13/2012		8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				250.250
br657	Xinadequate		P1-1A	4	B56	7/13/2012		0											
br658	sample	br658	P1-2A	4	B56	7/13/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br659	Xinadequate		P1-3A	4	B56	7/13/2012		0											
br660	sample	br658	P2-1A	4	B56	7/13/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br661	sample	br146	P2-1A	5	B10	7/23/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br662	Xinadequate		P2-1B	5	B10	7/23/2012		0											
br663	sample	br146	P3-1A	5	B10	7/23/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br664	sample	br146	P3-2A	5	B10	7/23/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br665	sample	br146	P3-3A	5	B10	7/23/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br666	sample	br146	G-1	5	B10	7/23/2012		8	158.160	151.153	178.186	221.231	186.190	210.210	161.161				250.250
br667	Xsubselect		G-2	5	B10	7/23/2012		0											
br668	Xinadequate		P1-1A	5	B3	7/23/2012		0											
br669	Xbomb		P1-2A	5	B3	7/23/2012		0					09.09	08.14					50.50
br670	Xbomb		P1-3A	5	B3	7/23/2012		1		149.159					57.157				50.50
br671	Xbomb		P1-4A	5	B3	7/23/2012		1		157.59			90.190	210.210	153.61				
br672	Xinadequate		P2-2A	5	B3	7/23/2012		0											
br673	Xinadequate		P1-1A	5	B1	7/23/2012		0											
br674	Xinadequate		P2-1A	5	B3	7/23/2012		0											
br675	Xbomb		G-1	5	B5	7/24/2012		1	58.58	151.53	178.88	221.231	86.190	10.210	57.61				50.250
br676	Xsubselect		G-2	5	B5	7/24/2012		0											
br677	sample	br155	P1-1A	5	B7	7/24/2012		8	140.160	155.159	178.184	221.233	186.190	208.210	161.161				250.250
br678	Xinadequate		P1-2A	5	B7	7/24/2012		0											
br679	sample	br26	P2-1A	5	B7	7/24/2012		8	140.154	153.155	172.178	221.221	190.190	208.214	161.161				204.250
br680	sample	br155	P2-2A	5	B7	7/24/2012		8	140.160	155.159	178.184	221.233	186.190	208.210	161.161				250.250
br681	Xinadequate		P2-3A	5	B7	7/24/2012		0											
br682	Xbomb		P3-1A	5	B7	7/24/2012		3	140.54.60	153.59.155	172.78.84	221.233	86.190	208.10.214	161.161				204.250
br683	sample	br155	G-1	5	B7	7/24/2012		8	140.160	155.159	178.184	221.233	186.190	208.210	161.161				250.250
br684	Xinadequate		P1-1A	5	B11	24_Jul-27		0											
br685	Xinadequate		P1-2A	5	B11	24_Jul-27		0											
br686	Xinadequate		P2-1A	5	B11	24_Jul-27		0											
br687	Xinadequate		P3-1A	5	B11	24_Jul-27		0											
br688	sample	br66	P3-1B	5	B11	24_Jul-27		8	140.152	153.161	184.184	221.233	186.196	208.210	139.155				250.250
br689	Xinadequate		P3-2A	5	B11	24_Jul-27		0											
br690	Xbomb		G-1	5	B11	24_Jul-27		3	40.140	151.153	174.174		186.190	208.10	39.51.59.61				50.250
br691	Xsubselect		G-2	5	B11	24_Jul-27		0											
br692	Xsubselect		G-3	5	B11	24_Jul-27		0											
br693	Xinadequate		P1-1A	5	B17	24_Jul-27		0											
br694	Xinadequate		Camera1-	5	B17	24_Jul-27		0											
br695	Xinadequate		P1-1A	5	B19	24_Jul-27		0											
br696	sample	br696	P1-1A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br697	Xsubselect		P1-1B	5	B22	24_Jul-27		0											
br698	Xsubselect		P1-1C	5	B22	24_Jul-27		0											
br699	sample	br696	P1-2A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br700	sample	br696	P1-3A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br701	Xsubselect		P1-3B	5	B22	24_Jul-27		0											
br702	Xsubselect		P1-3C	5	B22	24_Jul-27		0											
br703	sample	br696	P1-3D	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br704	sample	br696	P1-4A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br705	Xsubselect		P1-4B	5	B22	24_Jul-27		0											
br706	sample	br696	P1-5A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br707	Xsubselect		P1-5B	5	B22	24_Jul-27		0											
br708	Xsubselect		P2-1A	5	B22	24_Jul-27		0											
br709	sample	br696	P2-1B	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br710	Xsubselect		P2-1C	5	B22	24_Jul-27		0											
br711	sample	br696	P2-2A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br712	sample	br696	P2-3A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br713	sample	br696	P2-4A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br714	sample	br696	P3-1A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br715	sample	br696	P3-2A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br716	sample	br696	P3-3A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br717	sample	br696	P3-4A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br718	Xsubselect		P3-5A	5	B22	24_Jul-27		0											
br719	sample	br696	P3-5B	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br720	sample	br696	P3-6A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br721	sample	br696	P3-7A	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br722	sample	br696	G-1	5	B22	24_Jul-27		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br723	Xsubselect		G-2	5	B22	24_Jul-27		0											
br724	Xsubselect		G-3	5	B22	24_Jul-27		0											
br725	Xinadequate		P1-1A	5	B23	24_Jul-12		0											
br726	sample	br726	P1-1B	5	B23	24_Jul-12		8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				250.250
br727	Xsubselect		P1-1C	5	B23	24_Jul-13		0											
br728	Xinadequate		P1-2A	5	B23	24_Jul-14		0											
br729	sample	br726	P1-2B	5	B23	24_Jul-15		8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				250.250
br730	sample	br726	P1-3A	5	B23	24_Jul-16		8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				250.250
br731	Xinadequate		P1-4A	5	B23	24_Jul-17		0											
br732	Xinadequate		P1-4B	5	B23	24_Jul-18		0											
br733	sample	br726	P2-1B	5	B23	24_Jul-19		8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				250.250
br734	Xsubselect		P2-1A	5	B23	24_Jul-20		0											
br735	Xsubselect		P2-1C	5	B23	24_Jul-21		0											
br736	Xinadequate		P2-2A	5	B23	24_Jul-22		0											
br737	Xinadequate		P2-3A	5	B23	24_Jul-23		0											
br738	Xinadequate		P3-1A	5	B23	24_Jul-24		0											
br739	Xinadequate		P3-1B	5	B23	24_Jul-25		0											
br740	sample	br726	P3-1C	5	B23	24_Jul-26		8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				250.250
br741	Xinadequate		P1-1A	5	B30	7/24/2012		0											
br742	Xbomb		P2-1A	5	B30	7/24/2012		3	60.60	149.155			180.186		139.161				
br743	Xbomb		P2-2A	5	B30	7/24/2012		3		149.155			180.186		139.161				
br744	Xbomb		P2-3A	5	B30	7/24/2012		3	60.60	149.155		21.21	180.186		139.161				
br745	sample	br172	P3-1A	5	B30	7/24/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br746	Xbomb		P3-2A	5	B30	7/24/2012		1					180.186						

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br747	sample	br172	P3-3A	5	B30	7/24/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br748	sample	br172	P3-4A	5	B30	7/24/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br749	Xsubselect		P3-5A	5	B30	7/24/2012		0											
br750	Xbomb		P3-5B	5	B30	7/24/2012		0											
br751	Xsubselect		P3-5C	5	B30	7/24/2012		0											
br752	sample	br172	P3-6A	5	B30	7/24/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br753	Xbomb		P3-7A	5	B30	7/24/2012		0											
br754	Xbomb		G-1	5	B30	7/24/2012		0											
br755	Xsubselect		G-2	5	B30	7/24/2012		0											
br756	Xinadequate		P1-1A	5	B58	7/25/2012		0											
br757	Xbomb		P1-1B	5	B58	7/25/2012		0					186.96						
br758	sample	br758	P1-2A	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br759	sample	br758	P1-3A	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br760	sample	br758	P1-4A	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br761	Xinadequate		P1-5A	5	B58	7/25/2012		0											
br762	sample	br758	P1-5B	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br763	Xinadequate		P2-1A	5	B58	7/25/2012		0											
br764	Xsubselect		P2-2A	5	B58	7/25/2012		0											
br765	sample	br758	P2-2B	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br766	Xsubselect		P2-2C	5	B58	7/25/2012		0											
br767	Xinadequate		P2-2D	5	B58	7/25/2012		0											
br768	sample	br758	P2-2E	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br769	Xsubselect		P2-2F	5	B58	7/25/2012		0											
br770	Xbomb		P2-2G	5	B58	7/25/2012		0											
br771	Xbomb		P3-1A	5	B58	7/25/2012		2		155.159			186.196						
br772	sample	br758	G-1	5	B58	7/25/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br773	Xinadequate		P1-1A	5	B59	7/25/2012		0											
br774	sample	br774	P1-1B	5	B59	7/25/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br775	sample	br774	P1-2A	5	B59	7/25/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br776	sample	br774	P2-3A	5	B59	7/25/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br777	Xinadequate		P2-1A	5	B59	7/25/2012		0											
br778	sample	br774	P3-1A	5	B59	7/25/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br779	sample	br598	P1-1A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br780	Xinadequate		P1-2A	5	B29	7/25/2012		0											
br781	sample	br781	P1-1A	5	B39	7/25/2012		8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				250.250
br782	Xsubselect		P1-1B	5	B39	7/25/2012		0											
br783	Xinadequate		P1-2A	5	B39	7/25/2012		0											
br784	sample	br781	P2-1A	5	B39	7/25/2012		8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				250.250
br785	Xsubselect		P2-1B	5	B39	7/25/2012		0											
br786	Xbomb		P3-1A	5	B39	7/25/2012		2		153.157			186.190		41.55				
br787	sample	br781	P3-2A	5	B39	7/25/2012		8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				250.250
br788	sample	br781	P3-3A	5	B39	7/25/2012		8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				250.250
br789	sample	br781	G-1	5	B39	7/25/2012		8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				250.250
br790	Xinadequate		P1-1A	5	B38	7/25/2012		0											
br791	sample	br101	P1-2A	5	B38	7/25/2012		8	140.156	149.153	176.178	221.237	190.190	210.210	161.165				204.250
br792	sample	br101	P1-3A	5	B38	7/25/2012		8	140.156	149.153	176.178	221.237	190.190	210.210	161.165				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br793	Xbomb		P2-1A	5	B38	7/25/2012		0		53.153			86.190						
br794	sample	br598	P1-3A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br795	sample	br598	P1-4A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br796	Xinadequate		P1-5A	5	B29	7/25/2012		0											
br797	Xinadequate		P1-6A	5	B29	7/25/2012		0											
br798	Xinadequate		P1-7A	5	B29	7/25/2012		0											
br799	sample	br598	P2-1A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br800	Xinadequate		P2-2A	5	B29	7/25/2012		0											
br801	sample	br598	P2-3A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br802	Xinadequate		P2-4A	5	B29	7/25/2012		0											
br803	sample	br598	P2-5A	5	B29	7/25/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br804	Xinadequate		P3-1A	5	B29	7/25/2012		0											
br805	Xbomb		P3-2A	5	B29	7/25/2012		2	52.160	151.55.59	176.86	221.231	186.90	06.210	61.161				250.250
br806	Xbomb		G-1	5	B29	7/25/2012		3	52.152	55.155	174.186	233.233	186.186		61.63.65				50.250
br807	Xsubselect		G-2	5	B29	7/25/2012		0											
br808	sample	br350	P1-1A	5	B28	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br809	Xsubselect		P1-1B	5	B28	7/25/2012		0											
br810	Xbomb		P1-2A	5	B28	7/25/2012		8	152.160	151.155	174.176	231.231	190.190	208.214	155.161				250.250
br811	Xsubselect		P1-2B	5	B28	7/25/2012		0											
br812	Xbomb		P1-3A	5	B28	7/25/2012		0											
br813	Xbomb		P1-4A	5	B28	7/25/2012		0											
br814	Xbomb		P2-1A	5	B28	7/25/2012		0											
br815	Xbomb		P2-2A	5	B28	7/25/2012		3	52.52	49.51.155	174.176	231.21.35	190.190	208.214	57.57				50.250
br816	Xsubselect		P2-2B	5	B28	7/25/2012		0											
br817	Xsubselect		P2-2C	5	B28	7/25/2012		0											
br818	Xsubselect		P2-2D	5	B28	7/25/2012		0											
br819	Xbomb		P2-2E	5	B28	7/25/2012		7	152.160	9.51.53.15	174.176	221.231	190.190	208.214	155.161				250.250
br820	Xsubselect		P2-2F	5	B28	7/25/2012		0											
br821	Xsubselect		P2-2G	5	B28	7/25/2012		0											
br822	sample	br350	P2-2H	5	B28	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br823	Xsubselect		P2-2I	5	B28	7/25/2012		0											
br824	sample	br350	P2-3A	5	B28	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br825	Xsubselect		P2-3B	5	B28	7/25/2012		0											
br826	Xbomb		P3-1A	5	B28	7/25/2012		0											
br827	sample	br350	P3-2A	5	B28	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br828	Xbomb		P3-3A	5	B28	7/25/2012		3	152.60	151.53.55	174.176		190.190	208.214	159.55.61				
br829	Xbomb		P3-4A	5	B28	7/25/2012		7	152.160	151.155	174.176	1.221.43.4	190.190	208.214	155.161				250.250
br830	Xbomb		G-1	5	B28	7/25/2012		0					90.90						
br831	Xsubselect		G-2	5	B28	7/25/2012		0											
br832	Xsubselect		G-3	5	B28	7/25/2012		0											
br833	sample	br423	P1-1A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br834	sample	br423	P1-2A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br835	sample	br423	P1-3A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br836	sample	br423	P1-4A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br837	sample	br423	P1-5A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br838	Xsubselect		P2-1A	5	B27	7/25/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br839	sample	br423	P2-1B	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br840	Xbomb		P2-3A	5	B27	7/25/2012		7	152.160	155.159	174.176	231.37	190.190	210.214	155.161				250.250
br841	sample	br423	P2-4A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br842	sample	br423	P3-1A	5	B27	7/25/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br843	sample	br350	P1-1A	5	B25	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br844	Xbomb		P1-2A	5	B25	7/25/2012		7	152.160	151.155	174.176	221.231	190.190	208.214	139.55.61				250.250
br845	sample	br220	P1-3A	5	B25	7/25/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br846	sample	br220	P1-4A	5	B25	7/25/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br847	sample	br220	P1-5A	5	B25	7/25/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br848	sample	br350	P2-1A	5	B25	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br849	sample	br350	P2-2A	5	B25	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br850	Xsubselect		P2-2B	5	B25	7/25/2012		0											
br851	Xsubselect		P2-2C	5	B25	7/25/2012		0											
br852	sample	br350	P3-1A	5	B25	7/25/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br853	Xsubselect		P3-1B	5	B25	7/25/2012		0											
br854	sample	br220	P3-2A	5	B25	7/25/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br855	Xinadequate		P3-3A	5	B25	7/25/2012		0											
br856	Xbomb		G-1	5	B25	7/25/2012		2	52.60	45.51.155	176.84.86		190.190	08.214	155.59.61				204.250
br857	sample	br244	P1-1A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br858	Xinadequate		P1-2A	5	B42	7/26/2012		0											
br859	Xinadequate		P1-3A	5	B42	7/26/2012		0											
br860	sample	br237	P1-4A	5	B42	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br861	sample	br244	P2-1A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br862	sample	br244	P2-2A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br863	sample	br244	P2-3A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br864	sample	br244	P2-4A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br865	sample	br244	P3-1A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br866	Xsubselect		P3-1B	5	B42	7/26/2012		0											
br867	sample	br244	P3-2A	5	B42	7/26/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br868	sample	br237	P1-1A	5	B50	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br869	sample	br237	P1-2A	5	B50	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br870	sample	br237	P1-3A	5	B50	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br871	Xinadequate		P1-4A	5	B50	7/26/2012		0											
br872	sample	br237	P2-1A	5	B50	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br873	Xinadequate		P3-1A	5	B50	7/26/2012		0											
br874	Xbomb		G-1	5	B50	7/26/2012		3	52.52		174.182	41.243	87.203		145.149				250.250
br875	sample	br220	P1-2A	5	B33	7/26/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br876	Xinadequate		P1-1A	6	B30	8/3/2012		0											
br877	sample	br237	G-2	5	B50	7/26/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br878	Xinadequate		P1-2A	6	B30	8/3/2012		0											
br879	Xinadequate		P1-3A	6	B30	8/3/2012		0											
br880	Xbomb		P1-4A	6	B30	8/3/2012		0											
br881	sample	br220	P1-1A	5	B33	7/26/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br882	Xinadequate		P2-1A	5	B33	7/26/2012		0											
br883	Xinadequate		P2-2A	5	B33	7/26/2012		0											
br884	Xinadequate		P3-1A	5	B33	7/26/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br885	sample	br220	G-1	5	B33	7/26/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br886	sample	br172	P2-1A	6	B30	8/3/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br887	Xinadequate		P2-2A	6	B30	8/3/2012		0											
br888	sample	693	P1-1A	6	B28	8/3/2012		10	140.160	153.161	172.174	221.221	186.186	208.210	139.153		123.145	225.229	204.250
br889	Xsubselect		P1-1B	6	B28	8/3/2012		0											
br890	Xsubselect		P1-1C	6	B28	8/3/2012		0											
br891	sample	693	P1-1D	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br892	Xsubselect		P1-1E	6	B28	8/3/2012		0											
br893	sample	693	P1-2A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br894	sample	693	P1-3A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br895	Xbomb		P2-1A	6	B28	8/3/2012		6	140.52.60	153.161	172.174	221.31	186.186	208.210	139.153				204.250
br896	Xsubselect		P2-1B	6	B28	8/3/2012		0											
br897	Xsubselect		P2-1C	6	B28	8/3/2012		0											
br898	sample	693	P2-2A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br899	Xbomb		P2-3A	6	B28	8/3/2012		0											
br900	Xsubselect		P2-3B	6	B28	8/3/2012		0											
br901	Xbomb		P3-1A	6	B28	8/3/2012		0											
br902	Xbomb		P3-2A	6	B28	8/3/2012		3	140.60	151.153	172.74.84	221.233	186.90	208.210	139.53.61				04.250
br903	sample	693	P3-3A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br904	sample	693	P3-4A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br905	sample	693	P3-5A	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br906	Xinadequate		P3-6A	6	B28	8/3/2012		0											
br907	Xbomb		G-1	6	B28	8/3/2012		3	140.52.60	153.49.61	172.174	221.231	186.90	208.210	39.153				04.250
br908	Xsubselect		G-2	6	B28	8/3/2012		0											
br909	Xsubselect		G-3	6	B28	8/3/2012		0											
br910	Xbomb		G-4	6	B28	8/3/2012		3		151.153	72.184	21.221	186.190	208.210	39.39				50.50
br911	Xsubselect		G-5	6	B28	8/3/2012		0											
br912	Xsubselect		G-6	6	B28	8/3/2012		0											
br913	sample	693	G-7	6	B28	8/3/2012		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				204.250
br914	sample	br423	P1-1A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br915	sample	br423	P1-2A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br916	sample	br423	P1-3A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br917	Xsubselect		P1-3B	6	B27	8/3/2012		0											
br918	sample	br423	P1-4A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br919	sample	br423	P1-5A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br920	sample	br423	P2-1A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br921	sample	br423	P2-2A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br922	sample	br423	P2-3A	6	B27	8/3/2012		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				250.250
br923	Xbomb		G-1	6	B27	8/3/2012		3		153.47.57	76.176	231.237	86.90.03	212.214	55.61				250.250
br924	Xsubselect		P1-1A	6	B25	8/3/2012		0											
br925	Xsubselect		P1-1B	6	B25	8/3/2012		0											
br926	sample	br926	P1-1C	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br927	sample	br926	P1-1D	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br928	sample	br926	P1-2A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br929	Xsubselect		P1-2B	6	B25	8/3/2012		0											
br930	Xsubselect		P1-2C	6	B25	8/3/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br931	sample	br926	P2-1A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br932	Xsubselect		P2-1B	6	B25	8/3/2012		0											
br933	Xsubselect		P2-2A	6	B25	8/3/2012		0											
br934	Xsubselect		P2-2B	6	B25	8/3/2012		0											
br935	sample	br926	P2-2C	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br936	sample	br926	P2-3A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br937	Xsubselect		P2-4A	6	B25	8/3/2012		0											
br938	sample	br926	P3-1A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br939	sample	br926	P3-2A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br940	sample	br926	P3-3A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br941	Xinadequate		P3-4A	6	B25	8/3/2012		0											
br942	sample	br926	P3-4B	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br943	Xsubselect		P3-4C	6	B25	8/3/2012		0											
br944	sample	br926	P3-4D	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br945	Xbomb		P3-5A	6	B25	8/3/2012		5	152.160	155.49.59	174.178	21.31.33.37	190.190	208.210	139.161				04.250
br946	Xinadequate		P3-5B	6	B25	8/3/2012		0											
br947	sample	br926	P3-6A	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br948	sample	br926	G-1	6	B25	8/3/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br949	Xsubselect		G-2	6	B25	8/3/2012		0											
br950	Xsubselect		G-3	6	B25	8/3/2012		0											
br951	Xbomb		G-4	6	B25	8/3/2012		0		43.149									
br952	sample	br952	P1-1A	6	B19	8/3/2012		8	140.140	161.161	186.186	231.233	186.186	210.210	155.161				204.250
br953	Xbomb		P2-1A	6	B19	8/3/2012		1		51.151	81.181		01.201						250.250
br954	sample	br350	P2-2B	6	B19	8/3/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br955	sample	br350	P2-3A	6	B19	8/3/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br956	sample	br952	P3-1A	6	B19	8/3/2012		8	140.140	161.161	186.186	231.233	186.186	210.210	155.161				204.250
br957	sample	br952	P3-2A	6	B19	8/3/2012		8	140.140	161.161	186.186	231.233	186.186	210.210	155.161				204.250
br958	Xsubselect		P3-2B	6	B19	8/3/2012		0											
br959	sample	br350	G-1	6	B19	8/3/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br960	Xsubselect		G-2	6	B19	8/3/2012		0											
br961	Xinadequate		P1-1A	6	B13	8/3/2012		0											
br962	sample	br962	P2-1A	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br963	sample	br962	P2-2A	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br964	Xsubselect		P2-2B	6	B13	8/3/2012		0											
br965	sample	br962	P2-3A	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br966	sample	br962	P2-4A	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br967	sample	br91	P3-1A	6	B13	8/3/2012		8	152.156	153.155	174.178	221.233	186.190	210.210	165.165				204.250
br968	sample	br962	P3-2A	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br969	sample	br91	P3-3A	6	B13	8/3/2012		8	152.156	153.155	174.178	221.233	186.190	210.210	165.165				204.250
br970	Xsubselect		G-1	6	B13	8/3/2012		0											
br971	sample	br962	G-2	6	B13	8/3/2012		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				250.250
br972	Xsubselect		G-3	6	B13	8/3/2012		0											
br973	Xsubselect		P1-1A	6	B7	8/4/2012		0											
br974	sample	br974	P1-1B	6	B7	8/4/2012		8	140.160	151.161	176.184	231.233	186.190	208.214	155.161				250.250
br975	Xsubselect		P1-1C	6	B7	8/4/2012		0											
br976	Xinadequate		P2-1A	6	B7	8/4/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br977	sample	br974	P3-1A	6	B7	8/4/2012		8	140.160	151.161	176.184	231.233	186.190	208.214	155.161				250.250
br978	sample	br155	G-1	6	B7	8/4/2012		8	140.160	155.159	178.184	221.233	186.190	208.210	161.161				250.250
br979	sample	br979	P1-1A	6	B4	8/4/2012		10	150.152	151.159	176.184	221.231	190.190	210.210	155.155		129.145	223.225	250.250
br980	Xsubselect		P1-1B	6	B4	8/4/2012		0											
br981	Xsubselect		P1-1C	6	B4	8/4/2012		0											
br982	sample	br979	P2-1A	6	B4	8/4/2012		8	150.152	151.159	176.184	221.231	190.190	210.210	155.155				250.250
br983	Xsubselect		P2-1B	6	B4	8/4/2012		0											
br984	sample	br979	T-1	6	B4	8/4/2012	Top of post	8	150.152	151.159	176.184	221.231	190.190	210.210	155.155				250.250
br985	sample	br979	G-1	6	B4	8/4/2012		8	150.152	151.159	176.184	221.231	190.190	210.210	155.155				250.250
br986	sample	br926	P1-1A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br987	Xsubselect		P1-2A	6	B8	8/4/2012		0											
br988	sample	br926	P1-2B	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br989	sample	br926	P1-3A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br990	sample	br926	G-1	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br991	Xsubselect		G-2	6	B8	8/4/2012		0											
br992	sample	br926	P2-1A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br993	Xsubselect		P2-1B	6	B8	8/4/2012		0											
br994	Xsubselect		P2-2A	6	B8	8/4/2012		0											
br995	Xsubselect		P2-2B	6	B8	8/4/2012		0											
br996	sample	br926	P2-2C	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br997	Xsubselect		P2-2D	6	B8	8/4/2012		0											
br998	Xsubselect		P2-2E	6	B8	8/4/2012		0											
br999	Xbomb		P2-2F	6	B8	8/4/2012		3		149.155	176.178		90.90	210.210	61.161				
br1000	sample	br926	P2-2G	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1001	Xsubselect		P2-2H	6	B8	8/4/2012		0											
br1002	Xsubselect		P2-2I	6	B8	8/4/2012		0											
br1003	sample	br926	P2-3A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1004	sample	br926	P2-4A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1005	Xsubselect		G-5	6	B8	8/4/2012		0											
br1006	sample	br926	G-4	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1007	Xsubselect		G-3	6	B8	8/4/2012		0											
br1008	Xbomb		T-1	6	B8	8/4/2012	Top of post	5	152.60	149.155	176.178	231.33	190.190	210.210	161.161				04.50
br1009	sample	br926	P3-1A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1010	sample	br926	P3-2A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1011	Xsubselect		P3-3A	6	B8	8/4/2012		0											
br1012	Xsubselect		P3-3B	6	B8	8/4/2012		0											
br1013	sample	br926	P3-3C	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1014	sample	br926	P3-4A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1015	sample	br926	P3-5A	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1016	sample	br926	G-6	6	B8	8/4/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1017	Xbomb		P1-1A	6	B9	8/4/2012		3		151.53	178.186	221.31.33	186.190	210.214	61.161				50.250
br1018	Xinadequate		P2-1A	6	B9	8/4/2012		0											
br1019	Xbomb		P3-1A	6	B9	8/4/2012		1		151.151									
br1020	sample	br33	P3-2A	6	B9	8/4/2012		8	160.160	151.151	178.186	221.233	186.190	210.214	161.161				250.250
br1021	sample	br143	P3-3A	6	B9	8/4/2012		8	158.160	151.153	178.186	223.233	186.186	210.214	161.161				204.250
br1022	Xinadequate		P1-1A	6	B11	8/4/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1023	Xinadequate		P1-2A	6	B11	8/4/2012		0											
br1024	sample	br66	P2-1A	6	B11	8/4/2012		8	140.152	153.161	184.184	221.233	186.196	208.210	139.155				250.250
br1025	Xinadequate		P2-2A	6	B11	8/4/2012		0											
br1026	Xinadequate		P2-3A	6	B11	8/4/2012		0											
br1027	sample	br179	P2-4A	6	B11	8/4/2012		8	140.140	151.153	184.186	221.233	186.190	208.210	139.161				250.250
br1028	Xinadequate		P3-1A	6	B11	8/4/2012		0											
br1029	Xbomb		G-1	6	B11	8/4/2012		0	40.140	151.53	184.77.186			208.10	139.61				
br1030	sample	775	P1-1A	6	B22	8/4/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				204.250
br1031	Xbomb		P1-2A	6	B22	8/4/2012		2	56.60	53.159	178.184			208.210					
br1032	Xbomb		P1-3A	6	B22	8/4/2012		2	56.60	53.159	178.184			208.210	61.161				
br1033	Xsubselect		P1-3B	6	B22	8/4/2012		0											
br1034	Xsubselect		P1-3C	6	B22	8/4/2012		0											
br1035	sample	775	P1-4A	6	B22	8/4/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				204.250
br1036	Xinadequate		P2-1A	6	B22	8/4/2012		0											
br1037	Xsubselect		G-1	6	B22	8/4/2012		0											
br1038	Xsubselect		G-2	6	B22	8/4/2012		0											
br1039	sample	br696	G-3	6	B22	8/4/2012		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br1040	sample	br696	G-4	6	B22	8/4/2012		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br1041	sample	br195	P1-1A	6	B17	8/4/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1042	Xinadequate		P2-1A	6	B17	8/4/2012		0											
br1043	sample	br195	P2-2A	6	B17	8/4/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1044	sample	br195	P3-1A	6	B17	8/4/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1045	sample	br195	P3-2A	6	B17	8/4/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1046	Xsubselect		G-1	6	B17	8/4/2012		0											
br1047	sample	br696	G-2	6	B17	8/4/2012		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br1048	Xsubselect		G-3	6	B17	8/4/2012		0											
br1049	Xsubselect		G-4	6	B17	8/4/2012		0											
br1050	Xsubselect		G-5	6	B17	8/4/2012		0											
br1051	sample	br696	G-6	6	B17	8/4/2012		8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				204.250
br1052	sample	br195	G-7	6	B17	8/4/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1053	sample	br218	P1-1A	6	B24	8/4/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br1054	sample	br219	P2-1A	6	B24	8/4/2012		8	160.160	151.161	176.186	221.231	186.190	210.210	161.161				250.250
br1055	Xinadequate		P3-1A	6	B24	8/4/2012		0											
br1056	Xinadequate		P3-2A	6	B24	8/4/2012		0											
br1057	sample	br218	G-1	6	B24	8/4/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br1058	sample	br199	P1-1A	6	B36	8/4/2012		8	140.140	155.161	174.177	221.233	180.186	210.210	139.155				250.250
br1059	sample	br199	P1-2A	6	B36	8/4/2012		8	140.140	155.161	174.177	221.233	180.186	210.210	139.155				250.250
br1060	Xinadequate		P1-3A	6	B36	8/4/2012		0											
br1061	sample	br199	P1-4A	6	B36	8/4/2012		8	140.140	155.161	174.177	221.233	180.186	210.l210	139.155				250.250
br1062	sample	br199	P2-1A	6	B36	8/4/2012		8	140.140	155.161	174.177	221.233	180.186	210.210	139.155				250.250
br1063	sample	230	P1-1A	6	B35	8/4/2012		10	140.152	149.149	178.180	221.221	180.190	210.210	155.155	129.129	239.249		204.250
br1064	sample	230	P1-2A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1065	sample	230	P1-3A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1066	sample	230	P1-4A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1067	sample	230	P2-1A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1068	sample	230	P3-1A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1069	sample	230	P3-2A	6	B35	8/4/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1070	Xsubselect		P3-2B	6	B35	8/4/2012		0											
br1071	Xinadequate		P1-1A	6	B33	8/4/2012		0											
br1072	sample	br220	P2-1A	6	B33	8/4/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br1073	sample	br220	P2-2A	6	B33	8/4/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br1074	sample	br220	G-1	6	B33	8/4/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br1075	sample	br195	P1-1A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1076	Xsubselect		P1-1B	6	B18	8/5/2012		0											
br1077	Xsubselect		P1-1C	6	B18	8/5/2012		0											
br1078	sample	br195	P1-1D	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1079	sample	br195	P1-2A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1080	sample	br195	P2-1A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1081	sample	br195	P2-2A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1082	sample	br195	P2-3A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1083	sample	br195	P3-1A	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1084	sample	br195	G-1	6	B18	8/5/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1085	Xsubselect		G-2	6	B18	8/5/2012		0											
br1086	sample	br1086	P1-1A	6	B45	8/5/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1087	Xsubselect		P1-2A	6	B45	8/5/2012		0											
br1088	sample	br1088	P1-2B	6	B45	8/5/2012		8	140.160	153.155	178.178	221.221	186.186	210.214	153.165				250.250
br1089	Xsubselect		P1-2C	6	B45	8/5/2012		0											
br1090	Xbomb		P1-2D	6	B45	8/5/2012		5	140.52.60	153.155	74.178	221.233	186.186	210.214	153.61.65				250.250
br1091	sample	br1088	P1-3A	6	B45	8/5/2012		8	140.160	153.155	178.178	221.221	186.186	210.214	153.165				250.250
br1092	Xsubselect		P1-3B	6	B45	8/5/2012		0											
br1093	Xsubselect		P1-3C	6	B45	8/5/2012		0											
br1094	Xbomb		P1-4A	6	B45	8/5/2012		7	140.152	153.155	174.178	221.233	186.186	210.14	153.161				250.250
br1095	Xbomb		G-1	6	B45	8/5/2012		5	140.52.60	153.155	74.178	221.233	186.186	210.214	153.61.63.65				250.250
br1096	sample	br1086	G-2	6	B45	8/5/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1097	sample	br1086	P2-1A	6	B45	8/5/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1098	sample	br1086	P2-2A	6	B45	8/5/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1099	sample	br1088	P3-1A	6	B45	8/5/2012		8	140.160	153.155	178.178	221.221	186.186	210.214	153.165				250.250
br1100	Xsubselect		P3-1B	6	B45	8/5/2012		0											
br1101	sample	br1086	G-3	6	B45	8/5/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1102	sample	br237	P1-1A	6	B41	8/5/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br1103	Xbomb		P2-1A	6	B41	8/5/2012		6	152.160	155.159	174.86.178	221.237	190.190	208.210	139.161				04.250
br1104	sample	br244	P3-1A	6	B41	8/5/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br1105	sample	br220	G-1	6	B41	8/5/2012		8	152.160	155.159	174.178	221.237	190.190	208.210	139.161				250.250
br1106	Xsubselect		G-2	6	B41	8/5/2012		0											
br1107	Xsubselect		G-3	6	B41	8/5/2012		0											
br1108	Xbomb		G-4	6	B41	8/5/2012		1				221.221	187.91.03						50.250
br1109	Xinadequate		P1-1A	6	B48	8/5/2012		0											
br1110	Xsubselect		G-6	6	B52	8/5/2012		0											
br1111	Xbomb		G-1	6	B48	8/5/2012		1			81.181	27.227	190.03.11	208.10					250.250
br1112	Xsubselect		G-2	6	B48	8/5/2012		0											
br1113	Xsubselect		G-3	6	B48	8/5/2012		0											
br1114	Xbomb		G-4	6	B48	8/5/2012		1			74.76	33.252	87.89.03						250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1115	sample	38	P1-1A	6	B50	8/5/2012		10	152.160	159.159	172.176	231.233	190.196	210.210	141.153		129.129	223.223	204.250
br1116	Xsubselect		P1-1B	6	B50	8/5/2012		0											
br1117	Xbomb		G-1	6	B50	8/5/2012		2				237.237	).90.96.05.'	08.210					250.250
br1118	sample	38	P1-1C	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1119	Xsubselect		P1-1D	6	B50	8/5/2012		0											
br1120	sample	38	P2-1A	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1121	sample	38	P2-2A	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1122	sample	38	P3-1A	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1123	sample	38	P3-2A	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1124	sample	38	P3-4A	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1125	sample	38	G-2	6	B50	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1126	Xbomb		G-1	6	B51	8/5/2012		2			82.182	31.31	205.11	210.210					250.250
br1127	Xsubselect		G-2	6	B51	8/5/2012		0											
br1128	Xsubselect		G-3	6	B51	8/5/2012		0											
br1129	Xinadequate		G-4	6	B51	8/5/2012		0											
br1130	sample	br1130	P1-1A	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1131	sample	br1130	P1-2A	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1132	sample	br1130	P1-3A	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1133	sample	br1130	P1-4A	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1134	Xsubselect		P1-4B	6	B52	8/5/2012		0											
br1135	sample	br1130	G-1	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1136	Xsubselect		G-2	6	B52	8/5/2012		0											
br1137	Xsubselect		G-3	6	B52	8/5/2012		0											
br1138	sample	br1130	G-4	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1139	Xsubselect		G-5	6	B52	8/5/2012		0											
br1140	Xsubselect		P2-1A	6	B52	8/5/2012		0											
br1141	sample	br1130	P2-1B	6	B52	8/5/2012		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				250.250
br1142	Xbomb		P1-1A	6	B59	8/5/2012		7	140.160	149.149	177.186	233.233	180.190	208.210	63.161.63.65				204.250
br1143	sample	br658	P1-2A	6	B59	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1144	sample	br658	P1-3A	6	B59	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1145	sample	br658	P2-1A	6	B59	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1146	sample	38	P3-1A	6	B59	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1147	sample	38	P3-2A	6	B59	8/5/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
br1148	Xinadequate		P1-1A	6	B58	8/5/2012		0											
br1149	sample	230	P1-2A	6	B58	8/5/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1150	Xbomb		P1-3A	6	B58	8/5/2012		3		149.149	177.186	233.37	180.90.97	210.210					50.250
br1151	Xsubselect		P1-3B	6	B58	8/5/2012		0											
br1152	Xsubselect		G-1	6	B58	8/5/2012		0											
br1153	Xsubselect		G-2	6	B58	8/5/2012		0											
br1154	Xbomb		G-3	6	B58	8/5/2012		7	152.60	155.159	178.186	221.231	186.196	210.210	161.161				250.250
br1155	Xbomb		G-4	6	B58	8/5/2012		1		55.155	174.78.80	29.231	86.03.196		61.61				250.250
br1156	Xinadequate		P2-1A	6	B58	8/5/2012		0											
br1157	Xsubselect		G-5	6	B58	8/5/2012		0											
br1158	Xsubselect		G-6	6	B58	8/5/2012		0											
br1159	sample	230	P3-1A	6	B58	8/5/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1160	Xbomb		P1-1A	6	B57	8/5/2012		4	140.52.60	55.59.161	178.184	221.231	186.96.190	210.210	155.161				04.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1161	sample	br1161	P2-1A	6	B57	8/5/2012		8	140.160	161.161	178.184	221.221	186.190	210.210	155.161				204.250
br1162	sample	br1161	P2-2A	6	B57	8/5/2012		10	140.160	161.161	178.184	221.221	186.190	210.210	155.161		129.133	223.239	204.250
br1163	sample	br244	P2-3A	6	B57	8/5/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br1164	sample	br237	P2-4A	6	B57	8/5/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br1165	Xbomb		P2-5A	6	B57	8/5/2012		6	152.160	155.159	178.178	221.231	186.90.196	210.210	161.39.65				250.250
br1166	sample	br1161	P3-1A	6	B57	8/5/2012		8	140.160	161.161	178.184	221.221	186.190	210.210	155.161				204.250
br1167	Xsubselect		P3-1B	6	B57	8/5/2012		0											
br1168	Xsubselect		P3-1C	6	B57	8/5/2012		0											
br1169	sample	br758	P3-2A	6	B57	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1170	Xbomb		P3-3A	6	B57	8/5/2012		7	152.152	153.153	78.186	221.221	190.190	210.210	139.151				204.250
br1171	sample	br1161	P3-4A	6	B57	8/5/2012		8	140.160	161.161	178.184	221.221	186.190	210.210	155.161				204.250
br1172	Xsubselect		P3-4B	6	B57	8/5/2012		0											
br1173	sample	br658	P1-1A	6	B56	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1174	Xbomb		G-1	6	B56	8/5/2012		0				31.231	90.190	12.212					50.250
br1175	sample	br758	P1-1A	6	B62	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1176	Xinadequate		P1-2A	6	B62	8/5/2012		0											
br1177	sample	br758	P1-3A	6	B62	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1178	sample	br758	P2-1A	6	B62	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1179	sample	br758	P1-1A	6	B63	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1180	Xsubselect		P1-1B	6	B63	8/5/2012		0											
br1181	sample	br758	P1-2A	6	B63	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1182	Xinadequate		P2-1A	6	B63	8/5/2012		0											
br1183	sample	br758	P2-2A	6	B63	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1184	Xbomb		P3-1A	6	B63	8/5/2012		3	52.60	49.155	78.178	221.31	186.196	210.210					250.250
br1185	sample	br758	P3-2A	6	B63	8/5/2012		8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				250.250
br1186	Xbomb		T-1	6	B63	8/5/2012	Top of post	2			84.184		01.203	210.214					250.250
br1187	sample	br658	P1-1A	6	B65	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1188	sample	br658	P1-2A	6	B65	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1189	sample	br658	G-1	6	B65	8/5/2012		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				204.250
br1190	Xinadequate		Camera1-	6	B25	8/6/2012		0											
br1191	Xinadequate		P1-1A	7	B7	8/13/2012		0											
br1192	Xbomb		P1-2A	7	B7	8/13/2012		5	40.160	155.161	72.76.78.84	233.21.37	186.196	210.214	139.155				204.250
br1193	Xsubselect		P1-2B	7	B7	8/13/2012		0											
br1194	Xsubselect		P1-2C	7	B7	8/13/2012		0											
br1195	Xinadequate		P1-2D	7	B7	8/13/2012		0											
br1196	sample	698	P1-3A	7	B7	8/13/2012		8	160.160	155.161	172.176	233.237	186.196	210.214	139.155				204.250
br1197	Xinadequate		P1-1A	7	B3	8/13/2012		0											
br1198	Xinadequate		P1-2A	7	B3	8/13/2012		0											
br1199	Xinadequate		Camera2-	6	B25	8/6/2012		0											
br1200	sample	br926	P1-3A	7	B3	8/13/2012		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				204.250
br1201	Xinadequate		P2-1A	7	B7	8/13/2012		0											
br1202	Xbomb		P2-1B	7	B7	8/13/2012		2	60.60	151.155	76.176	37.237	186.96.01	212.214	55.55				04.04
br1203	Xinadequate		P2-2A	7	B7	8/13/2012		0											
br1204	sample	br23	P3-1A	7	B7	8/13/2012		8	154.160	153.159	172.184	221.221	190.190	208.210	161.161				204.250
br1205	Xinadequate		P3-2A	7	B7	8/13/2012		0											
br1206	Xinadequate		P1-1A	7	B5	8/13/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1207	Xinadequate		P1-1A	7	B4	8/13/2012		0											
br1208	Xinadequate		P1-2A	7	B4	8/13/2012		0											
br1209	Xinadequate		P1-1A	7	B8	8/13/2012		0											
br1210	Xinadequate		P1-2A	7	B8	8/13/2012		0											
br1211	Xinadequate		P1-3A	7	B8	8/13/2012		0											
br1212	sample	br143	P1-1A	7	B9	8/14/2012		8	158.160	151.153	178.186	223.233	186.186	210.214	161.161				204.250
br1213	Xinadequate		P2-1A	7	B8	8/13/2012		0											
br1214	Xinadequate		P2-2A	7	B8	8/13/2012		0											
br1215	Xinadequate		P1-2A	7	B9	8/14/2012		0											
br1216	Xinadequate		P1-3A	7	B9	8/14/2012		0											
br1217	Xinadequate		P1-4A	7	B9	8/14/2012		0											
br1218	Xbomb		P1-1A	7	B10	8/14/2012		3		151.153	86.86	221.233	86.90.201	14.214	61.61				250.250
br1219	Xsubselect		P1-2A	7	B10	8/14/2012		0											
br1220	Xbomb		P1-2B	7	B10	8/14/2012		1	58.58			39.239	86.201		61.61				250.250
br1221	Xinadequate		P1-3A	7	B10	8/14/2012		0											
br1222	Xinadequate		P1-4A	7	B10	8/14/2012		0											
br1223	Xbomb		P2-1A	7	B10	8/14/2012		2		151.153	178.186	221.31.33	86.90.201	210.14	61.61				50.250
br1224	Xinadequate		P2-2A	7	B10	8/14/2012		0											
br1225	Xinadequate		P2-3A	7	B10	8/14/2012		0											
br1226	Xinadequate		P2-4A	7	B10	8/14/2012		0											
br1227	Xbomb		G-1	7	B10	8/14/2012		2					201.201						250.250
br1228	Xsubselect		G-2	7	B10	8/14/2012		0											
br1229	Xsubselect		G-3	7	B10	8/14/2012		0											
br1230	Xbomb		G-4	7	B10	8/14/2012		0		151.53.55			186.90.01						
br1231	Xsubselect		G-5	7	B10	8/14/2012		0											
br1232	Xinadequate		P1-1A	7	B11	8/14/2012		0											
br1233	Xinadequate		P1-2A	7	B11	8/14/2012		0											
br1234	Xinadequate		P1-2B	7	B11	8/14/2012		0											
br1235	Xinadequate		P1-3A	7	B11	8/14/2012		0											
br1236	Xinadequate		P2-1A	7	B11	8/14/2012		0											
br1237	Xsubselect		P2-2A	7	B11	8/14/2012		0											
br1238	sample	br66	P2-2B	7	B11	8/14/2012		8	140.152	153.161	184.184	221.233	186.196	208.210	139.155				250.250
br1239	sample	br1239	P1-1A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1240	Xsubselect		P1-1B	7	B12	8/14/2012		0											
br1241	Xsubselect		P1-1C	7	B12	8/14/2012		0											
br1242	Xinadequate		P1-1D	7	B12	8/14/2012		0											
br1243	sample	br1239	P1-2A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1244	sample	br1239	P1-3A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1245	sample	br1239	P1-4A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1246	sample	br1239	P2-1A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1247	Xinadequate		P2-1B	7	B12	8/14/2012		0											
br1248	Xsubselect		P2-1C	7	B12	8/14/2012		0											
br1249	Xsubselect		P2-1D	7	B12	8/14/2012		0											
br1250	sample	br1239	P2-1E	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1251	sample	br1239	P2-1F	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1252	sample	br1239	P2-2A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1253	sample	br1239	P2-3A	7	B12	8/14/2012		8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				250.250
br1254	Xbomb		P2-4A	7	B12	8/14/2012		3	52.152	49.53	174.84	221.237	190.96	210.210	61.161				250.250
br1255	Xbomb		G-1	7	B12	8/14/2012		2		51.53	174.78.84	221.23.37	190.196	210.210					
br1256	sample	br1256	P3-1A	7	B12	8/14/2012		10	140.152	151.153	184.186	221.252	190.190	210.210	161.161		127.133	229.229	250.250
br1257	Xsubselect		P3-1B	7	B12	8/14/2012		0											
br1258	Xnosample		-		B		No sample	0											
br1259	Xinadequate		P1-1A	7	B18	8/14/2012		0											
br1260	Xnosample		-		B		No sample	0											
br1261	Xbomb		P1-2A	7	B18	8/14/2012		1		49.49	80.180		190.194	210.12.14					
br1262	Xinadequate		P1-3A	7	B18	8/14/2012		0											
br1263	Xinadequate		P1-4A	7	B18	8/14/2012		0											
br1264	sample	br195	G-1	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1265	sample	br195	P2-1A	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1266	sample	br195	P2-2A	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1267	Xinadequate		P2-3A	7	B18	8/14/2012		0											
br1268	sample	br195	P2-4A	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1269	Xinadequate		P3-1A	7	B18	8/14/2012		0											
br1270	Xinadequate		P3-2A	7	B18	8/14/2012		0											
br1271	sample	br195	P3-3A	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1272	sample	br195	P3-4A	7	B18	8/14/2012		8	152.160	151.151	174.176	221.221	186.190	210.210	151.161				250.250
br1273	Xsubselect		G-2	7	B18	8/14/2012		0											
br1274	Xsubselect		G-3	7	B18	8/14/2012		0											
br1275	Xbomb		G-4	7	B18	8/14/2012		7	140.52.60	151.151	176.186	221.253	190.190	210.210	151.161				250.250
br1276	sample	br172	P1-1A	7	B17	8/14/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br1277	Xinadequate		P1-2A	7	B17	8/14/2012		0											
br1278	Xinadequate		P1-3A	7	B17	8/14/2012		0											
br1279	sample	br172	P1-4A	7	B17	8/14/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br1280	sample	br172	P2-1A	7	B17	8/14/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br1281	Xinadequate		P2-2A	7	B17	8/14/2012		0											
br1282	sample	br172	P2-3A	7	B17	8/14/2012		8	160.160	149.155	172.176	221.221	180.186	210.214	139.161				204.250
br1283	Xinadequate		P1-1A	7	B16	8/14/2012		0											
br1284	sample	488	P1-1A	7	B13	8/14/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
br1285	Xbomb		P1-2A	7	B13	8/14/2012		3		151.55	178.186	231.231	190.196	06.210	151.55.61				50.250
br1286	Xbomb		P1-3A	7	B13	8/14/2012		2	52.52	149.149	76.78.186		190.94.96	204.14.212	153.155				50.250
br1287	sample	488	P1-4A	7	B13	8/14/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
br1288	sample	488	P2-1A	7	B13	8/14/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
br1289	Xinadequate		P2-2A	7	B13	8/14/2012		0											
br1290	Xinadequate		P2-2B	7	B13	8/14/2012		0											
br1291	Xinadequate		P2-3A	7	B13	8/14/2012		0											
br1292	Xinadequate		P2-4A	7	B13	8/14/2012		0											
br1293	Xinadequate		P2-4B	7	B13	8/14/2012		0											
br1294	Xinadequate		P2-4C	7	B13	8/14/2012		0											
br1295	Xbomb		P3-1A	7	B13	8/14/2012		3	56.56	159.159	178.184	37.237	186.190	08.210	61.161				204.50
br1296	sample	775	P3-2A	7	B13	8/14/2012		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				204.250
br1297	Xsubselect		P3-2B	7	B13	8/14/2012		0											
br1298	sample	488	P3-3A	7	B13	8/14/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1299	Xinadequate		P3-4A	7	B13	8/14/2012		0											
br1300	sample	488	P3-5A	7	B13	8/14/2012		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				250.250
br1301	Xsubselect		P3-3B	7	B13	8/14/2012		0											
br1302	Xinadequate		P3-6A	7	B13	8/14/2012		0											
br1303	Xsubselect		G-1	7	B13	8/14/2012		0											
br1304	Xbomb		G-2	7	B13	8/14/2012		1					11.211						250.250
br1305	Xsubselect		G-3	7	B13	8/14/2012		0											
br1306	sample	br350	G-4	7	B13	8/14/2012		8	152.160	151.155	174.176	221.231	190.190	208.214	155.161				250.250
br1307	Xinadequate		P1-1A	7	B19	8/14/2012		0											
br1308	Xbomb		P1-1A	7	B25	8/14/2012		1		49.151		223.33.39	86.201						250.250
br1309	Xinadequate		P1-1B	7	B25	8/14/2012		0											
br1310	Xinadequate		P1-2A	7	B25	8/14/2012		0											
br1311	Xinadequate		P1-2B	7	B25	8/14/2012		0											
br1312	Xspecies		P1-3A	7	B25	8/14/2012		0											
br1313	Xbomb		G-1	7	B25	8/14/2012		2		55.155			187.201						250.250
br1314	Xinadequate		P2-1A	7	B25	8/14/2012		0											
br1315	Xinadequate		P2-2A	7	B25	8/14/2012		0											
br1316	Xinadequate		P2-3A	7	B25	8/14/2012		0											
br1317	Xinadequate		P2-4A	7	B25	8/14/2012		0											
br1318	Xinadequate		P2-5A	7	B25	8/14/2012		0											
br1319	Xspecies		G-2	7	B25	8/14/2012		0											
br1320	Xbomb		G-3	7	B25	8/14/2012		0		45.145	76.176		86.01		151.57				50.250
br1321	Xsubselect		G-4	7	B25	8/14/2012		0											
br1322	Xbomb		G-5	7	B25	8/14/2012		1					01.201		51.51				250.250
br1323	sample	230	P1-1A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1324	sample	230	P1-2A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1325	Xbomb		P1-3A	7	B27	8/14/2012		3	152.40.60	155.49.59	174.178	221.237	80.190	208.210	139.55.61				04.250
br1326	Xsubselect		P2-1A	7	B27	8/14/2012		0											
br1327	sample	230	P2-1B	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1328	Xsubselect		P2-1C	7	B27	8/14/2012		0											
br1329	sample	230	P2-2A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1330	Xsubselect		P2-2B	7	B27	8/14/2012		0											
br1331	sample	230	P2-3A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1332	Xmixed		P2-4A	7	B27	8/14/2012		4	152.40.160	155.49.159	174.176	231.21.237	80.190	210.214	155.161				250.250
br1333	Xsubselect		P3-1A	7	B27	8/14/2012		0											
br1334	sample	230	P3-1B	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1335	sample	230	P3-2A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1336	Xsubselect		P3-2B	7	B27	8/14/2012		0											
br1337	sample	230	P3-3A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1338	Xspecies		P3-4A	7	B27	8/14/2012		0											
br1339	sample	230	G-1	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1340	sample	230	P3-5A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1341	sample	230	P3-6A	7	B27	8/14/2012		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				204.250
br1342	Xspecies		G-2	7	B27	8/14/2012		0											
br1343	Xinadequate		P1-1A	7	B28	8/14/2012		0											
br1344	Xinadequate		P1-2A	7	B28	8/14/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1345	Xinadequate		P1-3A	7	B28	8/14/2012		0											
br1346	Xinadequate		P1-1A	7	B23	8/14/2012		0											
br1347	Xinadequate		P1-1A	7	B24	8/14/2012		0											
br1348	Xinadequate		P1-1A	7	B29	8/14/2012		0											
br1349	Xinadequate		P1-2A	7	B29	8/14/2012		0											
br1350	Xinadequate		P1-3A	7	B29	8/14/2012		0											
br1351	Xinadequate		P2-1A	7	B29	8/14/2012		0											
br1352	sample	br1086	P1-1A	7	B30	8/14/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1353	Xsubselect		P1-1B	7	B30	8/14/2012		0											
br1354	Xsubselect		P1-1C	7	B30	8/14/2012		0											
br1355	sample	br1086	P1-1D	7	B30	8/14/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1356	Xinadequate		P1-1E	7	B30	8/14/2012		0											
br1357	Xinadequate		P1-2A	7	B30	8/14/2012		0											
br1358	sample	br598	P1-3A	7	B30	8/14/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br1359	sample	br598	P2-1A	7	B30	8/14/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br1360	Xmixed		P2-2A	7	B30	8/14/2012		5	152.160	155.159	174.76.86	231.33.37	186.190	210.210	55.65.161				250.250
br1361	Xsubselect		P2-2B	7	B30	8/14/2012		0											
br1362	sample	br598	P2-3A	7	B30	8/14/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br1363	sample	br598	P2-4A	7	B30	8/14/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250
br1364	Xsubselect		P3-1A	7	B30	8/14/2012		0											
br1365	sample	br1086	P3-1B	7	B30	8/14/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1366	sample	br1086	P3-2A	7	B30	8/14/2012		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				250.250
br1367	Xinadequate		P3-2B	7	B30	8/14/2012		0											
br1368	Xinadequate		P1-1A	7	B39	8/15/2012		0											
br1369	Xinadequate		P1-1A	7	B38	8/15/2012		0											
br1370	Xinadequate		P1-2A	7	B38	8/15/2012		0											
br1371	Xinadequate		P1-3A	7	B38	8/15/2012		0											
br1372	Xinadequate		P1-4A	7	B38	8/15/2012		0											
br1373	Xinadequate		P1-1A	7	B36	8/15/2012		0											
br1374	Xinadequate		P1-2A	7	B36	8/15/2012		0											
br1375	sample	br199	P1-3A	7	B36	8/15/2012		8	140.140	155.161	174.177	221.233	180.186	210.210	139.155				250.250
br1376	sample	br91	P1-1A	7	B35	8/15/2012		8	152.156	153.155	174.178	221.233	186.190	210.210	165.165				204.250
br1377	Xinadequate		P1-2A	7	B35	8/15/2012		0											
br1378	sample	br97	P1-3A	7	B35	8/15/2012		8	152.156	153.155	174.176	231.237	186.190	210.210	165.165				250.250
br1379	Xsubselect		P1-3B	7	B35	8/15/2012		0											
br1380	sample	br91	P2-1A	7	B35	8/15/2012		8	152.156	153.155	174.178	221.233	186.190	210.210	165.165				204.250
br1381	Xinadequate		P2-2A	7	B35	8/15/2012		0											
br1382	Xinadequate		P2-3A	7	B35	8/15/2012		0											
br1383	Xinadequate		P3-1A	7	B35	8/15/2012		0											
br1384	Xinadequate		P3-1B	7	B35	8/15/2012		0											
br1385	sample	br91	P3-1C	7	B35	8/15/2012		8	152.156	153.155	174.178	221.233	186.190	210.210	165.165				204.250
br1386	Xinadequate		P3-2A	7	B35	8/15/2012		0											
br1387	Xinadequate		P3-3A	7	B35	8/15/2012		0											
br1388	Xinadequate		P3-3B	7	B35	8/15/2012		0											
br1389	sample	br97	P3-4A	7	B35	8/15/2012		8	152.156	153.155	174.176	231.237	186.190	210.210	165.165				250.250
br1390	sample	br584	P1-1A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1391	Xsubselect		P1-1B	7	B34	8/15/2012		0											
br1392	Xsubselect		P1-1C	7	B34	8/15/2012		0											
br1393	Xinadequate		P1-2A	7	B34	8/15/2012		0											
br1394	sample	br584	P1-3A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1395	Xsubselect		P1-3B	7	B34	8/15/2012		0											
br1396	Xsubselect		P2-1A	7	B34	8/15/2012		0											
br1397	sample	br584	P2-1B	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1398	sample	br584	P2-2A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1399	Xsubselect		P2-2B	7	B34	8/15/2012		0											
br1400	Xbomb		P2-3A	7	B34	8/15/2012		7	140.152	149.155	174.174	221.235	186.186	210.210	.51.139.63.65				250.250
br1401	sample	br584	P3-1A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1402	sample	br584	P3-2A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1403	sample	br584	P3-3A	7	B34	8/15/2012		8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				250.250
br1404	Xinadequate		P3-4A	7	B34	8/15/2012		0											
br1405	Xbomb		P1-1A	7	B33	8/15/2012		2		157.159	178.180		87.190		139.47				
br1406	Xinadequate		P1-1B	7	B33	8/15/2012		0											
br1407	Xinadequate		P1-1A	7	B41	8/15/2012		0											
br1408	sample	br237	P1-2A	7	B41	8/15/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br1409	Xinadequate		P1-3A	7	B41	8/15/2012		0											
br1410	Xbomb		P2-1A	7	B41	8/15/2012		0		51.151			203.05	04.08.10.14					50.250
br1411	Xinadequate		P2-2A	7	B41	8/15/2012		0											
br1412	Xinadequate		P1-1A	7	B42	8/15/2012		0											
br1413	Xinadequate		P1-2A	7	B42	8/15/2012		0											
br1414	Xinadequate		P1-3A	7	B42	8/15/2012		0											
br1415	Xinadequate		P2-1A	7	B42	8/15/2012		0											
br1416	Xbomb		G-1	7	B42	8/15/2012		1		59.159		221.221	188.94.03	210.12					04.250
br1417	Xinadequate		P1-1A	7	B45	8/15/2012		0											
br1418	Xinadequate		P1-2A	7	B45	8/15/2012		0											
br1419	Xinadequate		P1-1A	7	B46	8/15/2012		0											
br1420	Xinadequate		P1-2A	7	B46	8/15/2012		0											
br1421	Xinadequate		P1-1A	7	B50	8/15/2012		0											
br1422	Xinadequate		P1-2A	7	B50	8/15/2012		0											
br1423	Xinadequate		P1-3A	7	B50	8/15/2012		0											
br1424	Xinadequate		P2-1A	7	B50	8/15/2012		0											
br1425	Xinadequate		P1-1A	7	B49	8/15/2012		0											
br1426	Xbomb		P1-1A	7	B56	8/15/2012		2					201.211						250.250
br1427	sample	br244	P1-2A	7	B56	8/15/2012		8	152.152	153.153	186.186	221.221	190.190	210.210	139.151				204.250
br1428	sample	br237	P1-3A	7	B56	8/15/2012		8	152.160	153.159	178.186	221.231	186.190	208.210	139.161				250.250
br1429	Xsubselect		P1-3B	7	B56	8/15/2012		0											
br1430	Xsubselect		G-1	7	B56	8/15/2012		0											
br1431	Xbomb		G-2	7	B56	8/15/2012		1				33.233	201.11	00.08.210					250.250
br1432	Xspecies		P2-1A	7	B56	8/15/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA											
									Genetic Markers and Corresponding Allele Scores										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Confidence Score (high is ≥5)	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1433	Xbomb		P2-2A	7	B56	8/15/2012		7	152.160	153.159	178.186	221.231	186.190	208.210	139.51.61				250.250
br1434	Xsubselect		G-3	7	B56	8/15/2012		0											
br1435	Xbomb		G-4	7	B56	8/15/2012		2			178.178		11.211						250.250
br1436	Xbomb		P1-1A	7	B57	8/15/2012		5	52.52	153.159	178.178	21.231	186.190	210.210	39.49.53.55				250.250
br1437	Xinadequate		P1-2A	7	B57	8/15/2012		0											
br1438	sample	br1161	P1-2B	7	B57	8/15/2012		8	140.160	161.161	178.184	221.221	186.190	210.210	155.161				204.250
br1439	Xmixed		P1-3A	7	B57	8/15/2012		4	152.40.60	153.153	178.84.86	221.221	190.190	210.210	39.51.55.61				04.250
br1440	Xbomb		G-1	7	B59	8/15/2012		0		51.53.55.57				14.16	61.61				
br1441	Xsubselect		G-2	7	B59	8/15/2012		0											
br1442	Xsubselect		G-3	7	B59	8/15/2012		0											
br1443	Xbomb		G-4	7	B59	8/15/2012		1					190.01.03						250.250
br1444	Xsubselect		G-5	7	B59	8/15/2012		0											
br1445	Xsubselect		G-6	7	B59	8/15/2012		0											
br1446	Xbomb		G-7	7	B59	8/15/2012		1					03.203	10.210					250.250
br1447	sample	br774	P1-1A	7	B59	8/15/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1448	Xbomb		P1-2A	7	B59	8/15/2012		7	152.60	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1449	Xbomb		P1-3A	7	B59	8/15/2012		1		151.155	78.178		90.190	10.210	49.155				
br1450	Xbomb		P2-1A	7	B59	8/15/2012		3		155.57.59	174.178	221.237	90.90	210.210	49.149				04.250
br1451	Xbomb		P2-2A	7	B59	8/15/2012		2	152.60	155.159	74.178	239.40	86.190	02.210	139.55				204.250
br1452	Xsubselect		G-9	7	B59	8/15/2012		0											
br1453	Xbomb		P2-3A	7	B59	8/15/2012		3	60.160		78.178		203.203	210.212	41.41				250.250
br1454	Xsubselect		G-8	7	B59	8/15/2012		0											
br1455	Xsubselect		P1-1A	7	B60	8/16/2012		0											
br1456	sample	605	P1-1B	7	B60	8/16/2012		10	156.158	151.151	186.186	221.237	186.190	210.210	161.161	127.129	223.249		204.250
br1457	Xinadequate		P1-2A	7	B60	8/16/2012		0											
br1458	sample	605	P1-3A	7	B60	8/16/2012		8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				204.250
br1459	Xsubselect		P1-3B	7	B60	8/16/2012		0											
br1460	Xinadequate		P1-1A	7	B63	8/16/2012		0											
br1461	Xbomb		P1-1B	7	B63	8/16/2012		6	152.160	155.159	74.77.178	223.231	186.190	210.210	139.155				04.250
br1462	sample	br774	P1-2A	7	B63	8/16/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1463	sample	br774	P1-3A	7	B63	8/16/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1464	sample	br774	P2-1A	7	B63	8/16/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1465	Xsubselect		P2-1B	7	B63	8/16/2012		0											
br1466	sample	br774	P2-2A	7	B63	8/16/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1467	sample	br774	P2-3A	7	B63	8/16/2012		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				204.250
br1468	Xbomb		P3-1A	7	B63	8/16/2012		0											
br1469	Xinadequate		P3-2A	7	B63	8/16/2012		0											
br1470	Xbomb		P3-3A	7	B63	8/16/2012		2		53.55.159	74.178	221.231	186.90.96	210.210	39.55.61.65				04.250
br1471	Xsubselect		G-1	7	B25	8/16/2012		0											
br1472	Xbomb		G-2	7	B25	8/16/2012		0											
br1473	Xsubselect		G-3	7	B25	8/16/2012		0											
br1474	Xspecies		G-4	7	B25	8/16/2012		0											

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2012

								GENETIC DATA										
								Confidence Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments		G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br1475	Xspecies		G-5	7	B25	8/16/2012		0											
br1476	sample	br218	P1-1A	7	B30	8/16/2012		8	160.160	159.161	174.176	231.237	186.190	210.210	155.161				250.250
br1477	sample	br219	P1-2A	7	B30	8/16/2012		8	160.160	151.161	176.186	221.231	186.190	210.210	161.161				250.250
br1478	sample	br219	P1-3A	7	B30	8/16/2012		8	160.160	151.161	176.186	221.231	186.190	210.210	161.161				250.250
br1479	sample	br219	P2-1A	7	B30	8/16/2012		8	160.160	151.161	176.186	221.231	186.190	210.210	161.161				250.250
br1480	sample	br598	P2-2A	7	B30	8/16/2012		8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				250.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 2

Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

Rescan™
Engineers and Scientists

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

			Captures							Genetic Data											
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
1	9	1; 3; 5; 7; 8; 9; 10; 196; 197;	1		1					8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				F	
12	5	12; 251; 728; 837; 831;	1		1			1	1	8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				M	
13	11	13; 15; 249; 253; 618; 620; 624; 626; 726; 835; 828;	1		1		1	1	1	8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				F	2MM:219; 223
16	8	16; 18; 20; 21; 52; 53; 56; 57;	1	1						8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				M	
22	6	22; 412; 418; 536; 543; 740;	1			1	1	1		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				F	
24	9	24; 26; 27; 29; 30; 33; 79; 83; 85;	1	1						8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				F	2MM:151; 152
35	3	35; 254; 621;		1	1		1			8	152.160	149.151	176.178	231.231	190.196	210.214	151.155				F	
38*	3	38; 41; 42;		1						8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				M	
38*	13	38; 41; 42; br1115; br1118; br1120; br1121; br1122; br1123; br1124; br1125; br1146; br1147;						1		1	10	152.160	159.159	172.176	231.233	190.196	210.210	141.153		129.129	223.223	M
47	5	47; 48; 49; 50; 51;		1						8	152.156	149.149	172.174	221.233	186.196	210.214	157.161				M	
60	42	60; 443; 444; 445; 446; 87; 58; 148; 179; 122; 308; 312; 313; 517; 519; 524; 526; 546; 547; 548; 550; 552; 555; 556; 558; 559; 663; 664; 665; 666; 667; 668; 669; 670; 671; 672; 799; 801; 803; 805; 806; 807;		1	1	1	1	1	1	8	140.160	149.155	174.186	233.252	180.190	210.210	153.161				F	
61	18	61; 448; 450; 451; 456; 457; 458; 459; 146; 763; 765; 766; 767; 768; 769; 770; 771; 772;		1	1			1		8	140.160	151.151	176.176	221.233	180.190	208.210	153.161				M	
66	27	66; 69; 76; 434; 435; 439; 440; 462; 463; 465; 466; 468; 471; 472; 473; 474; 708; 811; 814; 816; 817; 818; 819; 820; 821; 822; 823;		1		1		1	1	8	140.156	155.161	174.178	221.231	190.196	210.214	159.161				M	
70	2	70; 75;		1						8	158.160	151.161	178.184	231.231	186.186	210.214	161.161				M	
89	8	89; 90; 91; 93; 95; 97; 99; 104;		1						8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				M	
105	26	105; 106; 109; 110; 363; 364; 367; 368; 370; 320; 321; 323; 325; 327; 329; 331; 336; 338; 341; 343; 344; 371; 376; 377; 378; 379;			1	1				8	140.160	149.149	172.174	221.233	180.186	208.210	161.161				F	2MM:289
125*	3	125; 127; 129;			1					8	152.152	153.161	178.186	221.231	180.190	208.208	139.161				F	
125*	8	125; 127; 129; br643; br644; br649; br655; br656;				1				1	10	152.152	153.161	178.186	221.231	180.190	208.208	139.161		127.133	239.239	F
130*	4	130; 131; 132; 134;			1					8	152.154	153.159	176.186	221.221	180.186	208.210	141.161				F	
130*	8	130; 131; 132; 134; br641; br642; br645; br650;				1				1	10	152.154	153.159	176.186	221.221	180.186	208.210	141.161		129.133	223.239	F
137	8	137; 139; 140; 753; 754; 756; 757; 758;			1			1		8	152.158	151.155	172.186	231.237	186.190	208.210	161.161				M	
138	10	138; 743; 745; 747; 748; 750; 751; 752; 741; 742;			1			1		8	152.156	161.161	172.176	221.221	186.186	208.210	161.161				M	
151	6	151; 155; 158; 717; 718; 724;			1			1		8	160.160	149.149	178.184	221.221	186.190	210.210	155.165				F	2MM:24; 421
152	2	152; 153;			1					8	160.160	149.149	184.186	221.237	186.190	210.210	155.161				F	2MM:24
154	3	154; 719; 721;			1			1		8	156.160	149.161	178.186	221.237	186.186	208.210	161.165				M	
161	3	161; 170; 272;			1					8	152.152	155.159	176.178	221.233	186.196	210.210	141.155				M	
164	4	164; 269; 270; 271;			1					8	140.160	151.159	172.178	221.233	190.190	210.210	141.155				F	
167	1	167;			1					8	140.152	151.155	178.184	221.231	186.190	210.210	139.155				F	
173	4	173; 177; 382; 385;			1	1				8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				F	
180	2	180; 181;			1					8	156.160	151.155	172.172	221.221	190.190	208.210	161.161				M	
183	24	183; 185; 187; 189; 191; 192; 193; 475; 477; 479; 480; 506; 507; 512; 513; 514; 683; 684; 685; 687; 688; 689; 690; 691;			1	1		1		8	140.160	151.157	178.183	221.221	186.190	210.210	153.165				F	
188	1	188;			1					8	140.140	149.151	178.180	221.221	180.190	210.210	153.155				M	
208	12	208; 209; 212; 213; 214; 215; 217; 218; 198; 201; 204; 205;			1					8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				F	
219	3	219; 226; 229;			1					8	140.152	149.155	178.186	221.231	190.190	210.214	155.155				F	2MM:13
220	1	220;			1					8	140.160	149.155	176.178	221.231	180.190	210.214	155.155				M	
223	3	223; 228; 240;			1					8	152.160	155.155	176.186	231.231	190.190	210.214	155.155				F	2MM:13
230*	11	230; 231; 232; 234; 235; 236; 237; 241; 243; 244; 245;			1					8	140.152	149.149	178.180	221.221	180.190	210.210	155.155				M	
230*	31	230; 231; 232; 234; 235; 236; 237; 241; 243; 244; 245; br1063; br1064; br1065; br1066; br1067; br1068; br1069; br1149; br1159; br1323; br1324; br1327; br1329; br1331; br1334; br1335; br1337; br1339; br1340; br1341;						1	1	1	10	140.152	149.149	178.180	221.221	180.190	210.210	155.155		129.129	239.249	M
256	7	256; 265; 267; 288; 350; 356; 358;			1	1				8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				F	

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

			Captures							Genetic Data												
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
257	7	257; 259; 264; 287; 346; 351; 359;			1	1				8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				F	
262	6	262; 266; 282; 284; 348; 355;			1	1				8	152.160	151.155	172.172	221.237	180.186	210.210	161.161				F	
274*	20	274; 275; 276; 277; 278; 279; 280; 560; 562; 566; 569; 570; 571; 574; 575; 576; 577; 578; 581; 582;			1		1			8	140.160	155.159	178.183	231.233	186.196	208.210	161.161				M	
274*	32	274; 275; 276; 277; 278; 279; 280; 560; 562; 566; 569; 570; 571; 574; 575; 576; 577; 578; 581; 582; br450; br454; br456; br459; br461; br463; br467; br468; br470; br473; br475; br476;			1					1	10	140.160	155.159	178.183	231.233	186.196	208.210	161.161		127.139	229.239	M
289	29	289; 290; 293; 294; 298; 300; 301; 302; 303; 304; 305; 306; 401; 405; 411; 414; 417; 419; 420; 528; 533; 535; 538; 540; 544; 735; 736; 737; 738;				1	1	1		8	140.160	149.149	174.174	221.233	180.186	208.210	151.161				F	2MM:105
342	1	342;				1				8	140.152	149.151	172.176	221.221	180.186	210.210	155.161				M	
388	8	388; 391; 392; 393; 395; 397; 760; 762;				1		1		8	140.160	149.151	174.176	221.221	180.180	208.210	153.161				F	
421	15	421; 423; 425; 629; 631; 632; 633; 634; 730; 839; 840; 841; 843; 846; 847;				1	1	1	1	8	160.160	149.149	178.186	221.221	186.190	210.214	155.165				F	2MM:151
426	4	426; 428; 430; 432;				1				8	152.160	155.159	178.184	233.237	186.190	210.214	155.155				F	
488*	10	488; 489; 490; 492; 493; 494; 498; 500; 502; 780;				1		1		8	152.152	149.155	178.186	231.231	190.196	210.210	155.161				F	
488*	17	488; 489; 490; 492; 493; 494; 498; 500; 502; 780; br137; br139; br1284; br1287; br1288; br1298; br1300;		1					1	1	11	152.152	149.155	178.186	231.231	190.196	210.210	155.161	184.194	127.127	229.239	F
583*	12	583; 584; 588; 592; 594; 596; 597; 600; 602; 788; 789; 790;					1	1		8	140.152	151.153	174.176	221.221	180.186	208.210	139.153				F	
583*	13	583; 584; 588; 592; 594; 596; 597; 600; 602; 788; 789; 790; br393;			1					1	10	140.152	151.153	174.176	221.221	180.186	208.210	139.153		127.129	229.229	F
605*	9	605; 606; 607; 608; 611; 612; 613; 614; 615;					1			8	156.158	151.151	186.186	221.237	186.190	210.210	161.161				M	
605*	11	605; 606; 607; 608; 611; 612; 613; 614; 615; br1456; br1458;							1	1	10	156.158	151.151	186.186	221.237	186.190	210.210	161.161		127.129	223.249	M
635	7	635; 638; 639; 642; 643; 644; 645;					1			8	152.160	151.153	174.178	221.231	186.186	210.210	161.165				F	
646	8	646; 647; 648; 650; 652; 656; 657; 661;					1			8	140.160	149.149	184.186	221.231	190.190	210.210	161.161				F	
673	1	673;						1		8	160.160	149.155	177.186	231.233	180.190	210.210	161.161				F	
674	1	674;						1		8	140.160	149.155	174.177	223.231	190.190	210.210	161.161				F	
676	3	676; 850; 858;						1	1	8	160.160	151.159	177.186	221.221	186.196	208.214	153.161				F	
677	7	677; 678; 680; 681; 682; 853; 859;						1	1	8	140.160	153.159	177.177	221.221	186.190	208.210	161.161				M	2MM:679
679	2	679; 851;						1	1	8	140.160	149.151	177.177	221.233	186.190	208.210	161.161				M	2MM:677
686	1	686;						1		8	140.160	149.151	180.183	221.221	186.190	210.210	153.155				F	
693*	13	693; 694; 695; 696; 697; 699; 701; 702; 703; 704; 706; 707; 710;						1		8	140.160	153.161	172.174	221.221	186.186	208.210	139.153				M	
693*	22	693; 694; 695; 696; 697; 699; 701; 702; 703; 704; 706; 707; 710; br888; br891; br893; br894; br898; br903; br904; br905; br913;						1		1	10	140.160	153.161	172.174	221.221	186.186	208.210	139.153		123.145	225.229	M
698*	1	698;						1		8	160.160	155.161	172.176	233.237	186.196	210.214	139.155				M	
698*	10	698; br186; br187; br188; br190; br191; br192; br193; br337; br1196;		1	1				1	1	11	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184	129.133	223.249	M
711*	3	711; 712; 716;						1		8	140.160	149.153	177.184	221.233	190.190	210.214	155.161				M	
711*	6	711; 712; 716; br63; br348; br349;	1		1					1	11	140.160	149.153	177.184	221.233	190.190	210.214	155.161	184.184	127.129	229.249	M
732	7	732; 733; 734; 782; 783; 784; 785;						1		8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				M	
775*	2	775; 777;						1		8	156.160	159.159	178.184	233.237	186.190	208.210	161.161				M	
775*	20	775; 777; br1; br3; br5; br7; br9; br12; br13; br14; br15; br18; br52; br53; br55; br59; br65; br1030; br1035; br1296;	1					1	1	1	11	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184	129.129	239.239	M
794	2	794; 795;						1		8	140.152	149.153	184.186	221.221	180.186	210.214	155.165				M	
845	1	845;							1	8	152.160	149.149	178.180	221.221	180.186	210.214	155.155				F	
860	1	860;							1	8	160.160	149.155	174.186	221.231	186.190	210.214	161.165				F	
br101	8	br101; br104; br270; br274; br276; br419; br791; br792;	1	1	1		1				9	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184			M
br1086	9	br1086; br1096; br1097; br1098; br1101; br1352; br1355; br1365; br1366;						1	1		8	140.152	153.155	174.178	221.233	186.186	210.210	153.161				F
br1088	3	br1088; br1091; br1099;						1			8	140.160	153.155	178.178	221.221	186.186	210.214	153.165				F
br109	2	br109; br112;	1								9	160.162	159.161	176.186	233.237	180.196	208.210	141.161	184.184			M

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

			Captures							Genetic Data											
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
br1130	7	br1130; br1131; br1132; br1133; br1135; br1138; br1141;						1		8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				F
br115	2	br115; br119;	1							9	140.140	149.151	174.177	231.233	186.186	210.210	139.155	184.194			M
br1161	5	br1161; br1162; br1166; br1171; br1438;						1	1	10	140.160	161.161	178.184	221.221	186.190	210.210	155.161		129.133	223.239	M
br1239	9	br1239; br1243; br1244; br1245; br1246; br1250; br1251; br1252; br1253;							1	8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				F
br125	5	br125; br126; br131; br133; br136;	1							9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			M
br1256	1	br1256;							1	10	140.152	151.153	184.186	221.252	190.190	210.210	161.161		127.133	229.229	F
br143	9	br143; br148; br149; br151; br152; br299; br300; br1021; br1212;		1	1			1	1	9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			M
br146	16	br146; br147; br150; br495; br496; br500; br503; br505; br509; br512; br520; br661; br663; br664; br665; br666;		1		1	1			9	158.160	151.153	178.186	221.231	186.190	210.210	161.161	184.184			F
br155	9	br155; br158; br162; br166; br313; br677; br680; br683; br978;		1	1		1	1		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184			F
br170	2	br169; br170;		1						9	140.140	151.159	178.178	221.233	190.190	208.210	153.161	184.184			F
br172	10	br172; br745; br747; br748; br752; br886; br1276; br1279; br1280; br1282;		1			1	1	1	9	160.160	149.155	172.176	221.221	180.186	210.214	139.161	184.194			M
br174	15	br174; br177; br178; br514; br517; br522; br523; br524; br526; br527; br528; br529; br530; br533; br559;		1		1				9	140.140	151.151	178.186	221.252	190.190	210.210	153.161	184.184			M
br179	9	br179; br535; br539; br540; br542; br543; br547; br557; br1027;		1		1		1		9	140.140	151.153	184.186	221.233	186.190	208.210	139.161	184.184			F
br195	21	br195; br567; br1041; br1043; br1044; br1045; br1052; br1075; br1078; br1079; br1080; br1081; br1082; br1083; br1084; br1264; br1265; br1266; br1268; br1271; br1272;		1		1		1	1	11	152.160	151.151	174.176	221.221	186.190	210.210	151.161	184.184	123.127	229.229	F
br199	16	br199; br202; br204; br206; br207; br208; br209; br210; br211; br213; br214; br1058; br1059; br1061; br1062; br1375;		1				1	1	9	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194			F
br218	10	br218; br569; br575; br576; br577; br579; br581; br1053; br1057; br1476;		1		1		1	1	9	160.160	159.161	174.176	231.237	186.190	210.210	155.161	184.184			F
br219	5	br219; br1054; br1477; br1478; br1479;		1				1	1	9	160.160	151.161	176.186	221.231	186.190	210.210	161.161	184.184			F
br220	23	br220; br221; br222; br223; br226; br227; br613; br614; br618; br624; br632; br635; br845; br846; br847; br854; br875; br881; br885; br1072; br1073; br1074; br1105;		1		1	1	1		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194			F
br23	3	br23; br24; br1204;	1						1	9	154.160	153.159	172.184	221.221	190.190	208.210	161.161	184.184			M
br237	14	br237; br238; br250; br265; br860; br868; br869; br870; br872; br877; br1102; br1164; br1408; br1428;		1			1	1	1	9	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184			F
br244	17	br244; br245; br246; br252; br257; br262; br267; br857; br861; br862; br863; br864; br865; br867; br1104; br1163; br1427;		1			1	1	1	9	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184			M
br26	3	br26; br156; br679;	1	1			1			9	140.154	153.155	172.178	221.221	190.190	208.214	161.161	184.194			M
br314	8	br314; br315; br322; br325; br326; br327; br328; br334;			1					9	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184			F
br33	9	br33; br35; br38; br40; br43; br46; br48; br51; br1020;	1					1		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184			F
br350	23	br350; br352; br385; br388; br390; br391; br395; br398; br399; br401; br562; br808; br822; br824; br827; br843; br848; br849; br852; br954; br955; br959; br1306;			1	1	1	1	1	9	152.160	151.155	174.176	221.231	190.190	208.214	155.161	184.194			F
br365	5	br365; br367; br369; br371; br374;			1					8	140.152	159.161	176.184	221.233	186.190	208.210	155.161				F
br423	27	br423; br426; br430; br431; br432; br433; br434; br435; br436; br439; br442; br833; br834; br835; br836; br837; br839; br841; br842; br914; br915; br916; br918; br919; br920; br921; br922;			1		1	1		8	152.160	155.159	174.176	231.237	190.190	210.214	155.161				F
br486	2	br486; br488;				1				8	152.160	155.155	178.186	221.221	190.196	210.210	153.161				M
br584	12	br584; br585; br591; br596; br612; br1390; br1394; br1397; br1398; br1401; br1402; br1403;				1			1	8	140.152	149.155	174.174	221.231	186.186	210.210	139.165				F
br598	17	br598; br604; br608; br609; br610; br615; br779; br794; br795; br799; br801; br803; br1358; br1359; br1362; br1363; br1480;				1	1		1	8	152.152	155.155	174.186	231.233	186.186	210.210	161.165				F
br658	9	br658; br660; br1143; br1144; br1145; br1173; br1187; br1188; br1189;				1		1		8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				M

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates

			Captures							Genetic Data											
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Session 7	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
br66	13	br66; br68; br69; br70; br71; br72; br73; br74; br75; br76; br688; br1024; br1238;	1				1	1	1		9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			F
br696	22	br696; br699; br700; br703; br704; br706; br709; br711; br712; br713; br714; br715; br716; br717; br719; br720; br721; br722; br1039; br1040; br1047; br1051;					1	1			8	140.158	151.153	172.178	223.231	186.190	210.210	161.161				M
br726	5	br726; br729; br730; br733; br740;					1				8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				F
br758	15	br758; br759; br760; br762; br765; br768; br772; br1169; br1175; br1177; br1178; br1179; br1181; br1183; br1185;					1	1			8	152.160	155.159	178.178	221.231	186.196	210.210	161.165				F
br77	7	br77; br82; br83; br86; br87; br88; br89;	1								9	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184			M
br774	10	br774; br775; br776; br778; br1447; br1462; br1463; br1464; br1466; br1467;					1		1		8	152.160	155.159	174.178	221.237	186.190	210.210	139.155				M
br781	5	br781; br784; br787; br788; br789;					1				8	160.160	153.157	176.176	233.237	186.190	210.210	141.155				F
br91	8	br91; br93; br94; br967; br969; br1376; br1380; br1385;	1					1	1		11	152.156	153.155	174.178	221.233	186.190	210.210	165.165	184.184	127.133	223.229	M
br926	30	br926; br927; br928; br931; br935; br936; br938; br939; br940; br942; br944; br947; br948; br986; br988; br989; br990; br992; br996; br1000; br1003; br1004; br1006; br1009; br1010; br1013; br1014; br1015; br1016; br1200;						1	1		8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				M
br952	3	br952; br956; br957;						1			8	140.140	161.161	186.186	231.233	186.186	210.210	155.161				M
br962	6	br962; br963; br965; br966; br968; br971;						1			8	152.160	155.155	176.186	231.233	190.190	210.210	155.161				F
br97	3	br97; br1378; br1389;	1						1		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165	184.184			F
br974	2	br974; br977;						1			8	140.160	151.161	176.184	231.233	186.190	208.214	155.161				F
br979	4	br979; br982; br984; br985;						1			10	150.152	151.159	176.184	221.231	190.190	210.210	155.155		129.145	223.225	F

Appendix 3

Distance Travelled by Individual Grizzly Bears per Session, 2012

Rescan™
Engineers and Scientists

Appendix 3. Distance Travelled by Individual Grizzly Bears per Session, 2012

Bear ID	Gender	Potential Family Unit	Session	Minimum Distance (km)
775	Male		1	42.0
60	Female		2	54.9
br237 and br244	Female and male	Yes	2	36.1
161 and 164	Male and female	Yes	3	84.8
274	Male		3	82.0
60	Female		3	54.9
256, 257, and 262	All female	Yes	3	26.3
br350	Female		3	24.4
208	Female		3	12.1
105	Female		4	29.3
289	Female		4	24.6
br584	Female		4	9.7
br350	Female		5	35.5
289	Female		5	24.6
br220	Female		5	17.0
br237	Female	Yes	5	10.9
693	Male		6	89.9
775	Male		6	62.7
br658	Male		6	50.8
38	Male		6	48.0
230	Male		6	38.8
583	Female		6	37.8
br237 and br244	Female and male	Yes	6	36.5
br926	Male		6	34.7
br758	Female		6	17.9
br696	Male		6	16.9
br195	Female		6	12.4
732	Male		6	12.2
br220	Female		6	11.7
138	Male		6	11.5
br237	Female	Yes	7	25.2
12 and 13	Male and female	Yes	7	24.0
br774	Male		7	20.2

Appendix 4

Distance Travelled by Individual Grizzly Bears during the 2012 Survey Period

Rescan™
Engineers and Scientists

Appendix 4. Distance Travelled by Individual Grizzly Bears during the 2012 Survey Period

Bear ID	Gender	Potential Family Group	Length (km)
161 and 164	Male and Female	Yes	84.8
125 and 130	Female and Female	Yes	67.6
br91 and br97	Male and Female	Yes	51.0
br237 and br244	Female and Male	Yes	39.9
256, 257, and 262	All Female	Yes	35.9
12 and 13	Male and Female	Yes	35.9
br218 and br219	Female and Female	Yes	30.3
22 and 289	Female and Female	Yes	24.6
60	Female		64.6
173	Female		64.2
br350	Female		46.0
583	Female		39.1
br199	Female		38.8
105	Female		27.1
488	Female		26.8
br220	Female		26.1
br584	Female		25.1
421	Female		24.2
151	Female		23.9
154	Female		23.9
br1086	Female		21.1
35	Female		17.0
br146	Female		15.2
br758	Female		14.1
br195	Female		12.4
183	Female		12.3
388	Female		12.1
208	Female		12.1
24	Female		12.1
br423	Female		11.3
br33	Female		10.9
br66	Female		10.9
230	Male		137.9
61	Male		96.8
605	Male		96.5
38	Male		92.9
693	Male		89.9
274	Male		81.9
137	Male		72.3
br926	Male		62.8
775	Male		62.7
698	Male		58.4
br172	Male		53.4
br658	Male		49.8
138	Male		49.4
711	Male		47.4
br101	Male		41.8
br774	Male		20.2
16	Male		17.1
br696	Male		16.8
732	Male		12.2
br143	Male		10.9

Appendix 5

Area Used by Individual Grizzly Bears during the 2012 Survey Period

Rescan™
Engineers and Scientists

Appendix 5. Area Used by Individual Grizzly Bears during the 2012 Survey Period

Bear ID	Gender	Potential Family Group	Area (km^2)
br91 and br97	Male and female	Yes	462.2
256, 257, and 262	All female	Yes	427.8
br237 and br244	Female and Male	Yes	418.7
12 and 13	Male and female	Yes	290.4
br218 and br219	Female and female	Yes	233.8
22 and 289	Female and female	Yes	0.5
br350	Female		496.0
583	Female		470.7
60	Female		360.4
br220	Female		230.7
br758	Female		92.6
105	Female		74.7
br584	Female		30.7
775	Male		1,278.6
61	Male		791.6
230	Male		781.2
38	Male		465.6
br926	Male		458.6
138	Male		275.2
br172	Male		209.8
br101	Male		206.9
274	Male		171.1
br658	Male		103.4
698	Male		2.6

Appendix 6

Remote Camera Grizzly Bear Observations, 2012

Rescan™
Engineers and Scientists

Appendix 6. Remote Camera Grizzly Bear Observations, 2012

Cell #	Camera #	Date	Session #	# Animals	Photos #	Comment
B13	1	6-Jun-12	1	2	594-595	Camera knocked over in 595 - 764. Bears appear just in 594.
B13	1	13-Jun-12	2	1	970	Sniffing grizzly tripod
B13	1	6-Jul-12	4	1	243-302	Rolling on ground
B13	1	25-Jul-12	6	1	1321-1770	-
B13	1	2-Aug-12	6	1	2258-2467	-
B13	1	3-Aug-12	6	1	2487-2676	-
B13	1	4-Aug-12	7	1	2816-2955	-
B13	1	5-Aug-12	7	1	3033-3102	-
B13	1	7-Aug-12	7	1	3369	-
B13	1	8-Aug-12	7	1	3476-3535	-
B13	1	12-Aug-12	7	1	3901-4060	-
B17	10	3-Jun-12	1	1	532-662	Bear investigated camera and then knocked bait tripod over, bit into triangle
B17	10	20-Jun-12	3	1	2041-2061	Bear investigated camera and knocked bait tripod over
B17	10	23-Jun-12	3	1	2180-2199	-
B17	10	24-Jun-12	3	1	2275-2324	-
B17	10	2-Jul-12	4	2	3586-3766	Mother Bear and Two Year Cub, Knocked bait tripod over
B17	10	5-Jul-12	4	4	3940-4080	Blond Mother Bear and Three Year Old Cubs
B17	10	17-Jul-12	5	1	4669-4748	Knocked over bait tripod without triggering camera
B17	10	27-Jul-12	6	1	5361-5460	Knocked over bait tripod
B17	10	27-Jul-12	6	1	5465-5514	Knocked over camera tripod
B17	10	7-Aug-12	7	1	6455-6554	Knocked bait tripod over
B19	4	25-Jul-12	6	1	1240-1249	Bear not in all photos
B19	4	26-Jul-12	6	1	1290-1329	Bear knocked down post
B25	2	26-Jun-12	3	1	1548	Grizzly bear knocked down grizzly tripod
B25	2	23-Jul-12	5	1	1191-1500	-
B25	2	25-Jul-12	6	1	1778-1907	-
B25	2	28-Jul-12	6	1	2227-2286	Bear knocked camera down at photo 2282 and subsequent photos up to 2693 are of the ground
B25	2	1-Aug-12	6	1	2551-2560	A nose comes into fuzzy view in photo 2552
B27	6	17-Jul-12	2	1	847-926	Knocks down bear tripod, interested in camera, lots of super closeups
B27	6	1-Aug-12	6	1	1823-2043	Scratching at post for about 10 triggers, plays with camera and knocks everything down
B27	6	4-Aug-12	7	1	2379-2388	Knocks down camera again
B27	6	7-Aug-12	7	1	2648-2674	Knocks down camera again

Appendix 6. Remote Camera Grizzly Bear Observations, 2012

Cell #	Camera #	Date	Session #	# Animals	Photos #	Comment
B30	24	17-Jul-12	5	1	3149-3178	Photo 3169 bear knocks down bear post
B30	24	23-Jul-12	5	1	3552-3611	Photo 3592 bear knocks down bear post
B30	24	28-Jul-12	6	1	3896-4055	Bear post still knocked down and camera knocked sideways
B30	24	28-Jul-12	6	2	4059-4299	Photo 4225 camera knocked on ground
B30	24	6-Aug-12	7	1	4909-4928	Photo 4909 bear post knocked down
B30	24	8-Aug-12	7	2	5039-5318	Photo 5139 camera knocked down
B30	24	8-Aug-12	7	1	5346-5435	Only saw bear paw, camera still knocked down
B35	13	7-Jun-12	1	2	707	-
B35	13	7-Jun-12	1	1	791-830	-
B35	13	27-Jul-12	6	1	3611-3670	-
B35	13	6-Aug-12	7	1	4221-4260	-
B35	13	7-Aug-12	7	1	4277-4296	-
B45	18	24-Jun-12	3	1	1812-1831	-
B45	18	31-Jul-12	6	4	3921-4140	Knock down of camera at photo 4031. Photos 3922, 3931-3950, 3962, 3977, 3998 Good Photos.
B50	11	27-Jun-12	3	1	1755-1814	-
B50	11	13-Jul-12	5	1	2863-2872	Bear pushed camera down
B50	11	22-Jul-12	5	1	3348-3427	Can only see some hair and claws in the right corner of the camera
B50	11	28-Jul-12	6	1	3901-3951	Bear knocked camera down
B51	29	17-Jun-12	2	2	1372-1651	Bear post knocked down.
B51	29	29-Jul-12	6	1	3997-4167	Bear post knocked down.
B59	25	6-Jun-12	1	1	820-839	Removes bear post, repaired June 11 at 11:00:00
B59	25	8-Jun-12	1	1	1068	-
B59	25	17-Jun-12	2	1	1534-1583	Removes bear post, repaired June 21 at 13:33:22
B59	25	21-Jul-12	5	1	3543	-
B59	25	27-Jul-12	6	1	3895-3914	Camera seems wonky.
B59	25	1-Aug-12	6	1	4182-4201	-
B59	25	6-Aug-12	6	1	4472-4485	Knocks camera to ground and removes post.
B59	25	9-Aug-12	7	1	4718-4779	Bear walks in front of camera, playing with posts
B59	25	9-Aug-12	7	1	4797-4806	Could be same bear as earlier in the morning
B59	25	10-Aug-12	7	1	4886	Bear walking away, camera still down

Appendix 7

Detailed Field Hair Collection and Genetic Marker Data for Wolverines

Rescan™
Engineers and Scientists

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

			Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual	Date	Cell #	Check #	Sample Location	#G	#U	Comments	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex	Species
BR_WV_2012_00001	sample	BR_WV_2012_00001	3/24/2012	28	0	Aground		30	Ground	8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00002	Xinadequate		3/24/2012	28	0	Cground				0											
BR_WV_2012_00003	Xbomb		3/25/2012	46	0	Mid1		30		1	2.02			71.171						250.25	
BR_WV_2012_00004	sample	BR_WV_2012_00006	4/5/2012	31	1	B1	1			8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.25	
BR_WV_2012_00005	Xsubselect		4/5/2012	31	1	B2			5 uf	0											
BR_WV_2012_00006	sample	BR_WV_2012_00006	4/5/2012	31	1	Ground 1	1		Ground	10	202.202	157.161	139.141	171.171	134.136	133.137	172.172	175.183	252.252	250.25	
BR_WV_2012_00007	sample	BR_WV_2012_00007	4/5/2012	32	1	A1	2			8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.25	
BR_WV_2012_00008	Xinadequate		4/5/2012	32	1	B1				0											
BR_WV_2012_00009	Xsubselect		4/5/2012	32	1	B2			5 uf	0											
BR_WV_2012_00010	Xbomb		4/5/2012	32	1	B3		5		1	6.06	155.47.57	41.47	71.171	36.136	27.133	168.168			4.25	
BR_WV_2012_00011	sample	BR_WV_2012_00007	4/5/2012	32	1	C1	2	5		10	206.206	147.157	141.147	171.171	136.136	127.133	168.168	183.199	252.252	204.25	
BR_WV_2012_00012	Xinadequate		4/5/2012	36	1	A1				0											
BR_WV_2012_00013	Xbomb		4/5/2012	36	1	A2	1		Small root	2	0	59.159	129.139	71.173	34.134		170.17			50.25	
BR_WV_2012_00014	Xsubselect		4/5/2012	37	1	A1			1 sm gh	0											
BR_WV_2012_00015	sample	BR_WV_2012_00001	4/5/2012	37	1	A2		5		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00016	Xinadequate		4/5/2012	37	1	B1				0											
BR_WV_2012_00017	sample	BR_WV_2012_00001	4/5/2012	37	1	B2	4			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00018	sample	BR_WV_2012_00045	4/5/2012	40	1	B1	1			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00019	Xsubselect		4/5/2012	40	1	B2				0											
BR_WV_2012_00020	Xinadequate		4/5/2012	40	1	B3				0											
BR_WV_2012_00021	sample	BR_WV_2012_00045	4/5/2012	41	1	A1		5		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00022	sample	BR_WV_2012_00045	4/5/2012	41	1	B1		15		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00023	sample	BR_WV_2012_00023	4/5/2012	42	1	A1	1			10	198.202	147.159	129.145	171.175	134.136	135.135	168.172	183.183	252.272	204.25	
BR_WV_2012_00024	Xbomb		4/5/2012	43	1	A1		15		1										250.25	
BR_WV_2012_00025	Xspecies		4/5/2012	43	1	B1		30	Light with dark tips.	1										250.25	red fox
BR_WV_2012_00026	Xsubselect		4/5/2012	43	1	B2			White, a few banded hairs.	0											
BR_WV_2012_00027	sample	BR_WV_2012_00007	4/8/2012	9	1	C1		5		8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.25	
BR_WV_2012_00028	Xbomb		4/8/2012	13	1	A1	3	15		0										50.25	
BR_WV_2012_00029	Xsubselect		4/8/2012	13	1	A2				0											
BR_WV_2012_00030	Xsubselect		4/8/2012	13	1	A3				0											
BR_WV_2012_00031	Xsubselect		4/8/2012	13	1	A4				0											
BR_WV_2012_00032	Xsubselect		4/8/2012	13	1	B1				0											
BR_WV_2012_00033	Xsubselect		4/8/2012	13	1	B2				0											
BR_WV_2012_00034	Xsubselect		4/8/2012	13	1	B3				0											
BR_WV_2012_00035	Xsubselect		4/8/2012	13	1	B4				0											
BR_WV_2012_00036	Xspecies		4/8/2012	13	1	B5	7	20	Light with dark tips.	1										250.25	red fox
BR_WV_2012_00037	Xsubselect		4/8/2012	13	1	B6				0											
BR_WV_2012_00038	Xsubselect		4/8/2012	13	1	C1				0											
BR_WV_2012_00039	Xbomb		4/8/2012	13	1	C2	3	15		1										250.25	
BR_WV_2012_00040	Xinadequate		4/8/2012	14	1	A1				0											
BR_WV_2012_00041	Xinadequate		4/8/2012	14	1	A2				0											

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

			Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual	Date	Cell #	Check #	Sample Location	#G	#U	Comments	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex	Species
BR_WV_2012_00042	Xbomb		4/8/2012	14	1	B1	1	5		1										250.25	
BR_WV_2012_00043	Xinadequate		4/8/2012	14	1	C1				0											
BR_WV_2012_00044	Xbomb		4/8/2012	20	1	B1	1			0										50.5	
BR_WV_2012_00045	sample	BR_WV_2012_00045	4/8/2012	20	1	Ground 1		5	Ground	8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00046	Xinadequate		4/8/2012	25	1	B1				0											
BR_WV_2012_00047	Xinadequate		4/8/2012	26	1	A1				0											
BR_WV_2012_00048	sample	BR_WV_2012_00007	4/8/2012	26	1	C1	1			8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.25	
BR_WV_2012_00049	Xinadequate		4/8/2012	28	1	A1				0											
BR_WV_2012_00050	Xinadequate		4/8/2012	29	1	A1				0											
BR_WV_2012_00051	sample	BR_WV_2012_00001	4/8/2012	29	1	B1		30		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00052	Xbomb		4/8/2012	29	1	C1	1			2	198.00.206	159.161	29.39.141	71.171	134.136	33.133	168.7			4.25	
BR_WV_2012_00053	Xinadequate		4/8/2012	30	1	A1				0											
BR_WV_2012_00054	Xinadequate		4/8/2012	30	1	A2				0											
BR_WV_2012_00055	sample	BR_WV_2012_00001	4/8/2012	30	1	B1	1			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00056	sample	BR_WV_2012_00056	4/8/2012	30	1	C1	5			8	206.206	147.159	139.141	171.171	134.134	133.137	168.174			204.25	
BR_WV_2012_00057	sample	BR_WV_2012_00057	4/16/2012	38	2	A1	10			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00058	Xsubselect		4/16/2012	38	2	A2				0											
BR_WV_2012_00059	Xsubselect		4/16/2012	38	2	A3				0											
BR_WV_2012_00060	Xsubselect		4/16/2012	38	2	B1				0											
BR_WV_2012_00061	sample	BR_WV_2012_00057	4/16/2012	38	2	B2		30		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00062	Xsubselect		4/16/2012	38	2	B3				0											
BR_WV_2012_00063	sample	BR_WV_2012_00057	4/16/2012	38	2	C1	3	5		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00064	Xsubselect		4/16/2012	39	2	A1				0											
BR_WV_2012_00065	Xsubselect		4/16/2012	39	2	A2				0											
BR_WV_2012_00066	Xbomb		4/16/2012	39	2	A3	2	5		5	202.206	159.61.65	129.145	171.175	134.136	133.27.135	170.172			4.25	
BR_WV_2012_00067	sample	BR_WV_2012_00172	4/16/2012	39	2	B1		30		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00068	Xsubselect		4/16/2012	40	2	A1				0											
BR_WV_2012_00069	sample	BR_WV_2012_00057	4/16/2012	40	2	A2		15		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00070	sample	BR_WV_2012_00057	4/16/2012	40	2	B1	1			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00071	Xinadequate		4/16/2012	41	2	A1				0											
BR_WV_2012_00072	Xinadequate		4/16/2012	42	2	A1				0											
BR_WV_2012_00073	sample	BR_WV_2012_00045	4/16/2012	42	2	A2	4			10	200.206	159.159	129.139	171.173	134.134	133.133	170.172	183.187	268.272	250.25	
BR_WV_2012_00074	sample	BR_WV_2012_00045	4/16/2012	42	2	B1		5		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00196	sample	BR_WV_2012_00045	4/16/2012	42	2	A1		10		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00075	sample	BR_WV_2012_00001	4/16/2012	43	2	A1	1			10	198.206	161.161	139.141	171.171	136.136	131.133	168.168	179.187	252.252	204.25	
BR_WV_2012_00076	Xinadequate		4/16/2012	45	2	A1				0											
BR_WV_2012_00077	sample	BR_WV_2012_00045	4/16/2012	45	2	A2		5		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00078	Xinadequate		4/16/2012	45	2	B1				0											
BR_WV_2012_00079	Xbomb		4/16/2012	45	2	C1	1			3	200.206	59.59	129.39	171.73	134.134	133.35	170.172				
BR_WV_2012_00080	sample	BR_WV_2012_00080	4/17/2012	6	2	A1		5		10	200.206	147.159	141.145	169.171	136.138	133.137	168.168	191.203	252.272	204.25	
BR_WV_2012_00081	Xinadequate		4/17/2012	6	2	A2				0											

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

			Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual	Date	Cell #	Check #	Sample Location	#G	#U	Comments	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex	Species
BR_WV_2012_00082	Xsubselect		4/17/2012	6	2	A3				0											
BR_WV_2012_00083	sample	BR_WV_2012_00080	4/17/2012	6	2	B1		10		8	200.206	147.159	141.145	169.171	136.138	133.137	168.168			204.25	
BR_WV_2012_00084	Xinadequate		4/17/2012	6	2	B2				0											
BR_WV_2012_00085	Xbomb		4/17/2012	13	2	A1		5		0											
BR_WV_2012_00086	Xinadequate		4/17/2012	13	2	A2				0											
BR_WV_2012_00087	Xinadequate		4/17/2012	13	2	A3				0											
BR_WV_2012_00088	Xsubselect		4/17/2012	13	2	B1				0											
BR_WV_2012_00089	Xsubselect		4/17/2012	13	2	B2				0											
BR_WV_2012_00090	Xbomb		4/17/2012	13	2	B3		10		0		55.55			38.38					50.5	
BR_WV_2012_00091	Xbomb		4/17/2012	13	2	C1		5		0											
BR_WV_2012_00092	Xinadequate		4/17/2012	14	2	A1				0											
BR_WV_2012_00093	Xbomb		4/17/2012	14	2	A2	3		Long, thin	0		55.155								50.5	
BR_WV_2012_00094	Xsubselect		4/17/2012	19	2	A1				0											
BR_WV_2012_00095	sample	BR_WV_2012_00148	4/17/2012	19	2	A2		5		8	204.206	147.147	129.129	171.171	134.136	131.133	168.17	83.83	52.264	250.25	
BR_WV_2012_00096	Xinadequate		4/17/2012	19	2	A3				0											
BR_WV_2012_00097	Xbomb		4/17/2012	19	2	B1	1			0	6.06	47.147	29.129		36.36						
BR_WV_2012_00098	sample	BR_WV_2012_00148	4/17/2012	19	2	C1	1			8	204.206	147.147	129.129	171.171	134.136	131.133	168.17			250.25	
BR_WV_2012_00099	sample	BR_WV_2012_00148	4/17/2012	19	2	Ground 1	1			8	204.206	147.147	129.129	171.171	134.136	131.133	168.17			250.25	
BR_WV_2012_00100	sample	BR_WV_2012_00057	4/17/2012	25	2	A1	5			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00101	Xinadequate		4/17/2012	25	2	B1				0											
BR_WV_2012_00102	sample	BR_WV_2012_00057	4/17/2012	25	2	B2	2			10	198.206	159.165	139.143	169.175	134.136	133.137	168.17	191.195	256.268	204.25	
BR_WV_2012_00103	sample	BR_WV_2012_00045	4/17/2012	27	2	B1	1			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00104	Xinadequate		4/17/2012	28	2	A1				0											
BR_WV_2012_00105	sample	BR_WV_2012_00001	4/17/2012	29	2	B1	1			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00106	sample	BR_WV_2012_00056	4/17/2012	30	2	B1	10			10	206.206	147.159	139.141	171.171	134.134	133.137	168.174	179.183	252.252	204.25	
BR_WV_2012_00107	Xsubselect		4/17/2012	30	2	C1				0											
BR_WV_2012_00108	Xsubselect		4/17/2012	30	2	C2				0											
BR_WV_2012_00109	sample	BR_WV_2012_00056	4/17/2012	30	2	C3	10			8	206.206	147.159	139.141	171.171	134.134	133.137	168.174			204.25	
BR_WV_2012_00110	sample	BR_WV_2012_00057	4/17/2012	32	2	A1	5			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00111	Xsubselect		4/17/2012	32	2	A2				0											
BR_WV_2012_00112	sample	BR_WV_2012_00057	4/17/2012	32	2	B1	5	20		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00113	Xsubselect		4/17/2012	32	2	B2				0											
BR_WV_2012_00114	Xsubselect		4/17/2012	32	2	B3				0											
BR_WV_2012_00115	Xinadequate		4/17/2012	34	2	A1				0											
BR_WV_2012_00116	sample	BR_WV_2012_00057	4/17/2012	34	2	A2	3			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00117	sample	BR_WV_2012_00057	4/17/2012	34	2	B1	10			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00118	sample	BR_WV_2012_00172	4/17/2012	34	2	C1	4	25		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00119	Xinadequate		4/17/2012	35	2	A1				0											
BR_WV_2012_00120	Xinadequate		4/17/2012	35	2	B1				0											
BR_WV_2012_00121	sample	BR_WV_2012_00001	4/17/2012	35	2	B2		5		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00122	Xinadequate		4/17/2012	36	2	A1				0											

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

			Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual	Date	Cell #	Check #	Sample Location	#G	#U	Comments	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex	Species
BR_WV_2012_00123	Xinadequate		4/17/2012	36	2	A2				0											
BR_WV_2012_00124	Xinadequate		4/17/2012	36	2	A3				0											
BR_WV_2012_00125	Xinadequate		4/26/2012	4	3	A1				0											
BR_WV_2012_00126	Xinadequate		4/26/2012	4	3	A2				0											
BR_WV_2012_00127	Xbomb		4/26/2012	4	3	A3		5		3	198.06	159.165	39.143	69.175	134.136	33.137	168.17			4.25	
BR_WV_2012_00128	Xinadequate		4/26/2012	4	3	B1				0											
BR_WV_2012_00129	Xbomb		4/26/2012	12	3	C1		30		0		47.47								50.25	
BR_WV_2012_00130	Xsubselect		4/26/2012	12	3	C2				0											
BR_WV_2012_00131	sample	BR_WV_2012_00057	4/26/2012	13	3	B1		15		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00132	Xinadequate		4/26/2012	13	3	C1				0											
BR_WV_2012_00133	Xsubselect		4/26/2012	13	3	C2				0											
BR_WV_2012_00134	Xsubselect		4/26/2012	13	3	C3			okay	0											
BR_WV_2012_00135	Xsubselect		4/26/2012	13	3	C4			1 gh	0											
BR_WV_2012_00136	Xsubselect		4/26/2012	13	3	C5			okay	0											
BR_WV_2012_00137	Xsubselect		4/26/2012	13	3	C6				0											
BR_WV_2012_00138	Xbomb		4/26/2012	13	3	C7		30		0										50.25	
BR_WV_2012_00139	sample	BR_WV_2012_00057	4/26/2012	14	3	A1	4	10		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00140	sample	BR_WV_2012_00057	4/26/2012	14	3	B1		10		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00141	Xinadequate		4/26/2012	14	3	B2				0											
BR_WV_2012_00142	Xinadequate		4/26/2012	14	3	B3				0											
BR_WV_2012_00143	sample	BR_WV_2012_00057	4/26/2012	14	3	C1	2			8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00144	Xinadequate		4/26/2012	14	3	C2				0											
BR_WV_2012_00145	Xinadequate		4/26/2012	19	3	A1				0											
BR_WV_2012_00146	Xsubselect		4/26/2012	19	3	B1				0											
BR_WV_2012_00147	Xsubselect		4/26/2012	19	3	B2				0											
BR_WV_2012_00148	sample	BR_WV_2012_00148	4/26/2012	19	3	B3	5			10	204.206	147.147	129.129	171.171	134.136	131.133	168.17	179.183	252.264	250.25	
BR_WV_2012_00149	sample	BR_WV_2012_00172	4/26/2012	44	3	A1		15		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00150	Xinadequate		4/26/2012	44	3	A2				0											
BR_WV_2012_00151	Xsubselect		4/26/2012	44	3	A3				0											
BR_WV_2012_00152	Xsubselect		4/26/2012	44	3	A4				0											
BR_WV_2012_00153	Xsubselect		4/26/2012	44	3	B1				0											
BR_WV_2012_00154	Xsubselect		4/26/2012	44	3	B2				0											
BR_WV_2012_00155	sample	BR_WV_2012_00155	4/26/2012	44	3	B3	5	10		10	204.206	161.165	145.145	171.171	134.136	127.133	170.172	183.183	252.268	204.25	
BR_WV_2012_00156	sample	BR_WV_2012_00155	4/26/2012	44	3	C1	1			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.25	
BR_WV_2012_00157	sample	BR_WV_2012_00172	4/26/2012	45	3	A1		5		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00158	sample	BR_WV_2012_00172	4/26/2012	45	3	B1		5		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00159	Xinadequate		4/26/2012	45	3	B2				0											
BR_WV_2012_00160	Xsubselect		4/26/2012	45	3	B3				0											
BR_WV_2012_00161	sample	BR_WV_2012_00172	4/26/2012	45	3	C1		30		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00162	Xsubselect		4/26/2012	45	3	C2				0											
BR_WV_2012_00163	sample	BR_WV_2012_00006	4/27/2012	24	3	A1		10		8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.25	

Appendix 7. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

			Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual	Date	Cell #	Check #	Sample Location	#G	#U	Comments	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex	Species
BR_WV_2012_00164	Xsubselect		4/27/2012	24	3	A2				0											
BR_WV_2012_00165	Xbomb		4/27/2012	24	3	B1	1	5		0		61.161								50.25	
BR_WV_2012_00166	Xinadequate		4/27/2012	24	3	C1				0											
BR_WV_2012_00167	sample	BR_WV_2012_00057	4/27/2012	25	3	A1	1		Small root	8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00168	Xinadequate		4/27/2012	25	3	A2				0											
BR_WV_2012_00169	sample	BR_WV_2012_00169	4/27/2012	25	3	B1		5		10	204.206	147.157	129.129	171.171	134.136	131.135	168.172	183.191	252.272	204.25	
BR_WV_2012_00170	Xbomb		4/27/2012	25	3	C1	1			3	4.06	147.57	129.129	71.71	134.136	131.35	168.168			50.25	
BR_WV_2012_00171	Xsubselect		4/27/2012	25	3	Cground				0											
BR_WV_2012_00172	sample	BR_WV_2012_00172	4/27/2012	26	3	A1		5		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00173	sample	BR_WV_2012_00172	4/27/2012	26	3	B1		5		10	202.206	159.159	129.129	171.175	134.136	133.135	170.172	179.183	268.268	250.25	
BR_WV_2012_00174	Xbomb		4/27/2012	26	3	C1		5		2	6.206	59.159	129.129	71.71	136.136	133.35	70.17			50.25	
BR_WV_2012_00175	sample	BR_WV_2012_00045	4/27/2012	27	3	A1	1			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.25	
BR_WV_2012_00176	Xinadequate		4/27/2012	27	3	B1				0											
BR_WV_2012_00177	sample	BR_WV_2012_00001	4/27/2012	28	3	A1		5		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00178	Xbomb		4/27/2012	31	3	C1		10		3	2.202	57.157	139.141	71.171	134.36	133.137	172.172			50.25	
BR_WV_2012_00179	Xsubselect		4/27/2012	32	3	A1				0											
BR_WV_2012_00180	Xsubselect		4/27/2012	32	3	A2				0											
BR_WV_2012_00181	sample	BR_WV_2012_00172	4/27/2012	32	3	A3		30		9	202.206	159.159	129.129	171.175	134.136	133.135	170.172		268.268	250.25	
BR_WV_2012_00182	sample	BR_WV_2012_00172	4/27/2012	32	3	B1		15		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00183	Xsubselect		4/27/2012	32	3	B2				0											
BR_WV_2012_00184	Xbomb		4/27/2012	33	3	A1		5		0		57.59	29.29			27.127				50.25	
BR_WV_2012_00185	sample	BR_WV_2012_00057	4/27/2012	34	3	B1		5		8	198.206	159.165	139.143	169.175	134.136	133.137	168.17			204.25	
BR_WV_2012_00186	sample	BR_WV_2012_00172	4/27/2012	34	3	Cground	2	30		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00187	sample	BR_WV_2012_00001	4/27/2012	35	3	A1	2			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00188	Xinadequate		4/27/2012	35	3	C1				0											
BR_WV_2012_00189	Xbomb		4/27/2012	36	3	A1	1			2	2.02	59.161	139.141	71.71	36.136	33.133	68.168			204.25	
BR_WV_2012_00190	sample	BR_WV_2012_00001	4/27/2012	36	3	B1	1			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00191	sample	BR_WV_2012_00001	4/27/2012	37	3	A1	5			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00192	sample	BR_WV_2012_00001	4/27/2012	37	3	B1	1			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	
BR_WV_2012_00193	sample	BR_WV_2012_00172	4/27/2012	39	3	B1		5		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00194	sample	BR_WV_2012_00172	4/27/2012	40	3	C1	2			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.25	
BR_WV_2012_00195	sample	BR_WV_2012_00001	4/27/2012	41	3	C1		5		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.25	

Appendix 8

Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Rescan™
Engineers and Scientists

Appendix 8. Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Individual	Corresponding Samples		Genetic Data									
	#	List of Samples	# Loci	*Gg-4*	*Gg-7*	*Ggu101*	*Ggu216*	*Ma-2*	*Mvis075*	*Tt-4*	*MP0182*	*MP0197*	Sex
BR_WV_2012_00172	13	BR_WV_2012_00067; BR_WV_2012_00118; BR_WV_2012_00149; BR_WV_2012_00157; BR_WV_2012_00158; BR_WV_2012_00161; BR_WV_2012_00172; BR_WV_2012_00173; BR_WV_2012_00181; BR_WV_2012_00182; BR_WV_2012_00186; BR_WV_2012_00193; BR_WV_2012_00194;	10	202.206	159.159	129.129	171.175	134.136	133.135	170.172	179.183	268.268	250.25
BR_WV_2012_00169	1	BR_WV_2012_00169;	10	204.206	147.157	129.129	171.171	134.136	131.135	168.172	183.191	252.272	204.25
BR_WV_2012_00155	2	BR_WV_2012_00155; BR_WV_2012_00156;	10	204.206	161.165	145.145	171.171	134.136	127.133	170.172	183.183	252.268	204.25
BR_WV_2012_00148	4	BR_WV_2012_00095; BR_WV_2012_00098; BR_WV_2012_00099; BR_WV_2012_00148	10	204.206	147.147	129.129	171.171	134.136	131.133	168.17	179.183	252.264	250.25
BR_WV_2012_00080	2	BR_WV_2012_00080; BR_WV_2012_00083	10	200.206	147.159	141.145	169.171	136.138	133.137	168.168	191.203	252.272	204.25
BR_WV_2012_00057	17	BR_WV_2012_00057; BR_WV_2012_00061; BR_WV_2012_00063; BR_WV_2012_00069; BR_WV_2012_00070; BR_WV_2012_00100; BR_WV_2012_00102; BR_WV_2012_00110; BR_WV_2012_00112; BR_WV_2012_00116; BR_WV_2012_00117; BR_WV_2012_00131; BR_WV_2012_00139; BR_WV_2012_00140; BR_WV_2012_00143; BR_WV_2012_00167; BR_WV_2012_00185	10	198.206	159.165	139.143	169.175	134.136	133.137	168.17	191.195	256.268	204.25
BR_WV_2012_00056	3	BR_WV_2012_00056; BR_WV_2012_00106; BR_WV_2012_00109	10	206.206	147.159	139.141	171.171	134.134	133.137	168.174	179.183	252.252	204.25
BR_WV_2012_00045	10	BR_WV_2012_00018; BR_WV_2012_00021; BR_WV_2012_00022; BR_WV_2012_00045; BR_WV_2012_00073; BR_WV_2012_00074; BR_WV_2012_00077; BR_WV_2012_00103; BR_WV_2012_00175; BR_WV_2012_00196	10	200.206	159.159	129.139	171.173	134.134	133.133	170.172	183.187	268.272	250.25
BR_WV_2012_00023	1	BR_WV_2012_00023	10	198.202	147.159	129.145	171.175	134.136	135.135	168.172	183.183	252.272	204.25
BR_WV_2012_00007	4	BR_WV_2012_00007; BR_WV_2012_00011; BR_WV_2012_00027; BR_WV_2012_00048	10	206.206	147.157	141.147	171.171	136.136	127.133	168.168	183.199	252.252	204.25
BR_WV_2012_00006	3	BR_WV_2012_00004; BR_WV_2012_00006; BR_WV_2012_00163	10	202.202	157.161	139.141	171.171	134.136	133.137	172.172	175.183	252.252	250.25
BR_WV_2012_00001	14	BR_WV_2012_00001; BR_WV_2012_00015; BR_WV_2012_00017; BR_WV_2012_00051; BR_WV_2012_00055; BR_WV_2012_00075; BR_WV_2012_00105; BR_WV_2012_00121; BR_WV_2012_00177; BR_WV_2012_00187; BR_WV_2012_00190; BR_WV_2012_00191; BR_WV_2012_00192; BR_WV_2012_00195	10	198.206	161.161	139.141	171.171	136.136	131.133	168.168	179.187	252.252	204.25

Appendix V5-6B

Back River Project: Grizzly Bear and Wolverine DNA Report, 2013

Sabina
GOLD & SILVER CORP.

Sabina Gold & Silver Corp.

BACK RIVER PROJECT
Grizzly Bear and Wolverine DNA Report, 2013

Rescan Environmental Services Ltd., an ERM company
Rescan Building, Fifteenth Floor - 1111 West Hastings Street
Vancouver, BC Canada V6E 2J3
Tel: (604) 689-9460 Fax: (604) 687-4277

May 2014

BACK RIVER PROJECT

GRIZZLY BEAR AND WOLVERINE DNA REPORT, 2013

May 2014
Project #0234411-0004

Citation:
Rescan. 2014. *Back River Project: Grizzly Bear and Wolverine DNA Report, 2013*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd., an ERM company.

Prepared for:

Sabina Gold & Silver Corp.

Prepared by:

Rescan™ Environmental Services Ltd., an ERM company
Vancouver, British Columbia

Executive Summary

Rescan™
an ERM company

Executive Summary

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) in the West Kitikmeot Region of Nunavut. This report presents final results from grizzly bear and wolverine DNA studies as part of the 2013 wildlife baseline program, and is the second year of the two year DNA study for grizzly bears and wolverine. The objectives for 2013 were to calculate total number of grizzly bears and wolverines that currently use the DNA study areas and to record the movement of individual bears and wolverines. Results from the two year study were analyzed together for grizzly bears in order to estimate a super-population.

In 2013, the grizzly bear DNA study was conducted from early May through mid-August. Hair collection posts were set up and baited in 129 12 km X 12 km cells within the study grid and visited seven times over the study period to collect hair and re-bait the posts. A total of 3,624 hair samples were collected during the 2013 grizzly bear DNA survey period. Of these samples, a total of 109 grizzly bear individuals were identified through DNA hair analysis—48 males and 61 females. Four potential family groups were detected. A total of 71 grizzly bears detected in 2013 were previously detected in the study area in 2012. One grizzly bear was also detected in a previous DNA study conducted approximately 200 km northwest of the Project.

Overall, the frequency of grizzly bears detected appeared to be fairly evenly distributed within the Grizzly Bear DNA Study Area with a slightly higher detection in the northern portion of the grid near waterbodies such as major river systems (Western River, Burnside River) and near the larger tributaries of the Back River. The average distance travelled by male grizzly bears (over approximately a 75 day period) was approximately twice (49.1 km) that travelled by female bears (27.2 km) and bears travelling as potential family groups (20.5 km), although the largest distance travelled during this period was similar between male and female bears (109.2 km and 112.6 km, respectively). In addition, areas used within the DNA study grid were on average, much greater for male bears (726.3 km^2) relative to female bears (245.0 km^2), and potential family groups (94.3 km^2). The largest area used within the DNA study grid by a grizzly bear during the survey period was 2,572.0 km^2.

DNA data collected in 2012 and 2013 within the Grizzly Bear DNA Study Area was combined in order to generate a population estimate for the area. For the combined DNA dataset, the mean capture probability in the DNA Study Area was 0.25 in 2012, and 0.33 in 2013. The total number of grizzly bears estimated to be in the study area in 2012 was 72 females and 52 males. In 2013, the super-population over the combined study area was estimated to be 64 females and 54 males. These results indicate a detection frequency of approximately 6–8 grizzly bears/1000 km^2. A density estimate cannot be determined from this study as the true spatial extent of the super-population, which is outside of the DNA Study Area, and the individual residency times are not known. However, the density estimate is typically lower than the detection frequency, and is likely comparable to other nearby density estimates for grizzly bears in the central barrens of the mainland of Nunavut.

The wolverine DNA study was conducted from late March through early May, 2013. Hair collection posts were set up in 97 6-km x 6-km cells within two study grids: the south study grid (47 cells) located between the Goose and George Property Areas, and the north study grid (50 cells) located at southern Bathurst Inlet near the Marine Laydown Area. A total of 496 hair samples were collected across three sampling sessions. DNA analyses of these samples identified 19 individual wolverines (8 males and 11 females). Of these, eleven individuals were recorded only within the south study grid, seven were recorded only within the north study grid, and one male wolverine was detected within both study

grids. Eight individuals recorded during the 2012 wolverine DNA study were recaptured in 2013, including four males and four females.

Spatially, wolverine capture frequencies were higher in the south study grid compared to the north study grid with the highest capture frequencies (three separate individuals) located within three cells in the south study grid (one cell directly south of the George Property Area, one cell in the centre of the grid, and one cell in the southwestern portion of the grid). Within a single check (10 to 14 day period), minimum straight line distances between multiple hair collection posts visited by an individual were generally less than 50 km for both male and female wolverine. However, one male wolverine, WV057, travelled between the south and north grids, representing a straight line distance of approximately 140 km. In general, male wolverines used larger areas within the DNA grids (415 km^2) relative to females (80 km^2) over the entire survey period, although the average area used by males after excluding the exceptionally large area used by the male wolverine (WV057) who travelled between the north and south grids was 128 km^2.

Despite using standard methods for mark-recapture analysis in wolverine, an estimate for the overall super-populations of wolverine using the northern and southern study areas was not obtained because an insufficient number of wolverine were captured and recaptured for reliable estimates.

Acknowledgements

Rescan™
an ERM company

Acknowledgements

This report was prepared for Sabina Gold & Silver Corp. (Sabina) by Rescan Environmental Services Ltd., an ERM company (Rescan). Fieldwork was conducted by Andrea Buckman (Ph.D.), Christine Kent (B.A.), Christine Rock (M.Sc.), Kate Fremlin (B.Sc, R.P.Bio), and Julia Shewan (B.Sc.). Extensive field support was kindly provided by Sabina logistics team and camp management, Sabina Environmental Coordinators Merle Keefe and Mylaine Mageau, as well as Northern Air Support Helicopters, and Det'On Cho Expediting. Fieldwork was conducted with the assistance of Sabina personnel Merle Keefe, Mylaine Mageau, Robert Maksagak, Mark Wasiuta, Colin Matomiak, Paul Iblauk, Austin Porter, AJ Porter. Report writing was conducted by Brian Milakovic (Ph.D.), Julia Shewan, Tracey Zacharias (B.Sc.) and reviewed by Andrea Buckman (Ph.D.), Greg Sharam (Ph.D.), and Deborah Muggli (Ph.D., M.Sc., R.P.Bio).

Table of Contents

Rescan™
an ERM company

BACK RIVER PROJECT
GRIZZLY BEAR AND WOLVERINE DNA REPORT, 2013

Table of Contents

Executive Summary i

Acknowledgements iii

Table of Contents v

List of Figures vi

List of Tables vii

List of Plates vii

List of Appendices viii

Glossary and Abbreviations ix

1. Introduction 1-1

2. Study Areas 2-1

3. Grizzly Bear DNA 3-1

3.1 Introduction 3-1

3.2 Objectives 3-2

3.3 Methods 3-2

3.3.1 Grizzly Bear Study Area 3-2

3.3.2 Hair Collection 3-5

3.3.3 Remote Cameras 3-6

3.3.4 Laboratory Analysis 3-6

3.3.4.1 Database Management and DNA Extraction 3-6

3.3.4.2 Microsatellite Genotyping 3-7

3.3.4.3 Population Analysis 3-7

3.4 Results 3-8

3.4.1 Summary 3-8

3.4.2 2013 DNA Results 3-9

3.4.2.1 Spatial Distribution in Frequency of Grizzly Bear Captures 3-10

3.4.2.2 Temporal Distribution in Frequency of Grizzly Bear Captures 3-13

3.4.2.3 Grizzly Bear Movement in the DNA Study Grid 3-13

3.4.3 Population Analysis 3-14

3.4.4 Field Observations, 2013 3-14

3.5 Discussion 3-14

4. Wolverine DNA 4-1
4.1 Introduction 4-1
4.2 Objectives 4-1
4.3 Methods 4-2
4.3.1 Post Set-up 4-2
4.3.2 Hair Collection 4-8
4.3.3 Remote Cameras 4-8
4.3.4 Laboratory Analysis 4-9
4.3.4.1 DNA Extraction 4-9
4.3.4.2 Microsatellite Genotyping 4-9
4.3.5 Data Analysis 4-10
4.3.5.1 Field and Laboratory Analysis, 2013 4-10
4.3.5.2 Population Analysis, 2012 and 2013 4-10
4.4 Results 4-10
4.4.1 Summary 4-10
4.4.2 2013 DNA Results 4-12
4.4.2.1 Spatial Distribution in Frequency of Wolverine Captures 4-13
4.4.2.2 Temporal Distribution in Frequency of Wolverine Captures 4-13
4.4.2.3 Wolverine Movement in the DNA Study Grids 4-14
4.4.3 Population Analysis, 2012 and 2013 4-23
4.4.4 Remote Camera and Incidental Observations 4-23
4.4.4.1 Remote Camera Detections 4-23
4.4.4.2 Den Locations in and near the RSA 4-24
4.4.4.3 Incidental Wolverine Sightings in the RSA 4-24
4.5 Discussion 4-25
4.5.1 Wolverine DNA Analysis 4-25
4.5.2 Wolverine Movements in the DNA Study Grids 4-25
4.5.3 Population Analysis 4-26
4.5.4 Remote Cameras and Incidental Observations 4-27

References R-1

List of Figures

FIGURE **PAGE**

Figure 1-1. Back River Project Location 1-2

Figure 2-1. Wildlife Baseline Study Areas, Back River Project, 2013 2-2

Figure 3.3-1. Grizzly Bear DNA Combined Survey Grid and Post Locations, 2013 3-3

Figure 3.4-1. Capture Frequency of Grizzly Bear Individuals at Tripod Locations, 2013 3-11

Figure 3.4-2. Identification of Individual Grizzly Bears at Hair Snag Locations, 2013 ..... map pocket

Figure 3.4-3. Grizzly Bear Area Used during DNA Surveys, 2013 3-15

Figure 4.3-1. Wolverine DNA South Study Grid and Post Locations, 2013 4-3

Figure 4.3-2. Wolverine DNA North Study Grid and Post Locations, 2013 4-5

Figure 4.4-1. Capture Frequency of Individual Wolverine in the South Study Grid, 2013 4-15

Figure 4.4-2. Capture Frequency of Individual Wolverine in the North Study Grid, 2013 4-17

Figure 4.4-3. Minimum Area Used by Individual Wolverines in the South Study Grid, 2013..... 4-19

Figure 4.4-4. Minimum Area Used by Individual Wolverines in the North Study Grid, 2013..... 4-21

List of Tables

TABLE **PAGE**

Table 3.4-1. Summary of Grizzly Bear Hair Samples Collected in the Field, 2013.....3-8

Table 3.4-2. Potential Family Units Identified within the Combined DNA Study Area 3-10

Table 3.4-3. Distance Travelled and Area Used by Grizzly Bears, 2013 3-13

Table 3.4-4. Number of Female and Male Grizzly Bears Estimated in the DNA Study Area Using Mark-Recapture Analysis 3-14

Table 4.4-1. Summary of Wolverine Hair Samples Collected and Number of Individuals Detected, 2013 4-11

Table 4.4-2. Individual Wolverine Identified through DNA Analysis, 2013 4-12

Table 4.4-3. Summary of Distances Travelled and Minimum Area Used for Wolverines Detected Among Multiple Hair Collection Posts, 2012 4-14

Table 4.4-4. Comparison of Wolverine Detected by Remote Cameras Deployed At Hair Collection Posts and Individuals Identified through DNA Analysis, 2013 4-23

List of Plates

PLATE **PAGE**

Plate 3.3-1. Example of barbed wire tripod used to snag grizzly bear hairs during DNA study. 3-5

Plate 3.4-1. Example of a hair cluster sample collected during DNA surveys. 3-9

Plate 3.4-2. Photos of grizzly bears at tripod stations taken by remote cameras. 3-10

Plate 4.3-1. Field crews adding wolverine lure to a post in the north study grid on March 23, 2013.....4-7

Plate 4.3-2. A camera set up at wolverine post in the south study grid.....4-7

Plate 4.4-1. Wolverine climbing post and taking food reward at Post 41S just shortly after post deployment (March 25)..... 4-24

List of Appendices

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Appendix 3. Distance Travelled by Individual Grizzly Bears during the 2013 Survey Period

Appendix 4. Area Used by Individual Grizzly Bears during the 2013 Survey Period

Appendix 5. Remote Camera Grizzly Bear Observations, 2013

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

Appendix 7. Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Appendix 8. Distance Travelled by Individual Wolverine during Checks, 2013

Appendix 9. Wolverine Minimum Use Area and Areas of Overlap between Minimum Use Areas, 2013

Appendix 10. Remote Camera Wolverine Observations, 2013

Glossary and Abbreviations

Rescan™
an ERM company

Glossary and Abbreviations

Terminology used in this document is defined where it is first used. The following list will assist readers who may choose to review only portions of the document.

Carnivore	An animal that feeds on flesh
CESCC	Canadian Endangered Species Conservation Council
Correlation	Statistical relationship between two factors.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada - A federal committee of experts that assesses and designates the level of threat to wildlife and vegetation species in Canada.
Ecosystem	A volume of earth-space that is composed of non-living parts (climate, geologic materials, groundwater, and soils) and living or biotic parts, which are all constantly in a state of motion, transformation, and development. No size or scale is inferred.
Ecozone	The ecozone lies at the top of the ecological hierarchy, and therefore it defines, on a subcontinental scale, the major physiographic features of the country
GN-DOE	Government of Nunavut Department of Environment
GPS	Global Positioning System
Habitat	Land and water surface used by wildlife. This may include biotic and abiotic aspects such as vegetation, exposed bedrock, water and topography.
Hectare (ha)	10,000 m^2 or 0.01 km^2 or 2.47 acres
NU	Nunavut
NWMB	Nunavut Wildlife Management Board
NWT	Northwest Territories
RSA	Regional Study Area
Slave Geological Province	A geological formation extending from Great Slave Lake to the Coronation Gulf, which lies between Victoria Island and mainland Nunavut
Topography	The configuration of a surface, including its relief and the position of its natural and person-made features

1. Introduction

1. Introduction

The Back River Project (the Project) is an exploration gold project owned by Sabina Gold & Silver Corp. (Sabina) located in the West Kitikmeot region of Nunavut (Figure 1-1). This report presents the results from the 2013 Grizzly Bear and Wolverine DNA study conducted during the 2013 baseline program. The 2013 grizzly bear and wolverine DNA studies were conducted to support the assessment of potential Project effects on wildlife VECs (DEIS; Volume 5, Chapters 5 to 10). Data from 2012 and 2013 were combined to model a super-population estimate for both grizzly bears and wolverines, which is also presented in this report.

The objective of the 2013 DNA program was to calculate the total number of grizzly bears and wolverines that currently use the Back River Project study area. Additional objectives achieved only by combining the results across multiple sampling sessions and years in order to obtain sufficient captures and recaptures required for statistical analysis included the following:

- generate a super-population estimate for grizzly bears and wolverines for the Back River Project study area as a potential baseline for trend monitoring;
- describe the spatial and temporal distribution of grizzly bears and wolverines on site; and
- identify grizzly bears and wolverines that were detected in areas outside of the Back River Project study area by other DNA surveys.

Figure 1-1

Back River Project Location

Sabina GOLD & SILVER CORP.

Rescan an ERM company

2. Study Areas

2. Study Areas

There are two separate study areas used for the DNA studies: a Grizzly Bear DNA Study Area and a Wolverine DNA Study Area (Figure 2-1). The Grizzly Bear DNA Study Area is approximately 1,900,800 hectares (ha), encompasses a portion of the terrestrial Regional Study Area (RSA), and extends outside to the west of the terrestrial RSA. The wolverine DNA survey area is split into two grids and covers a combined area of approximately 349,200 ha. The northern portion (180,000 ha) is roughly centered over the Marine Laydown Area (MLA) within Bathurst Inlet and the southern half of the study area is centered between Goose and George Properties within the terrestrial RSA (169,200 ha).

The wildlife study areas are all located within the Southern Arctic Ecozone. Ecozones are broad scale landscape units with similar abiotic and biotic factors including climate, geography, and vegetation (Strong and Zoltai 1989; Environment Canada 2000). The Southern Arctic Ecozone extends across much of the southern portion of continental Nunavut, and is bordered by the Northern Arctic Ecozone to the north. The southern border of the Southern Arctic Ecozone is defined by a lack of full-size trees. Stunted forms of tree species, such as dwarf birch (*Betula nana*), green alder (*Alnus viridis* spp. *crispa*), and many species of willow (*Salix* sp.) grow throughout the ecozone, with stunted white spruce (*Picea glauca*) and black spruce (*P. mariana*) present in the south. Much of the area is dominated by sedge fens, cottongrass tussock tundra, and heath. Sparsely vegetated areas, such as the wind-swept crests of eskers, are also common (NRC 2007).

PROJECT # 023441-0004 GIS # BAC-23-310 February 13, 2014

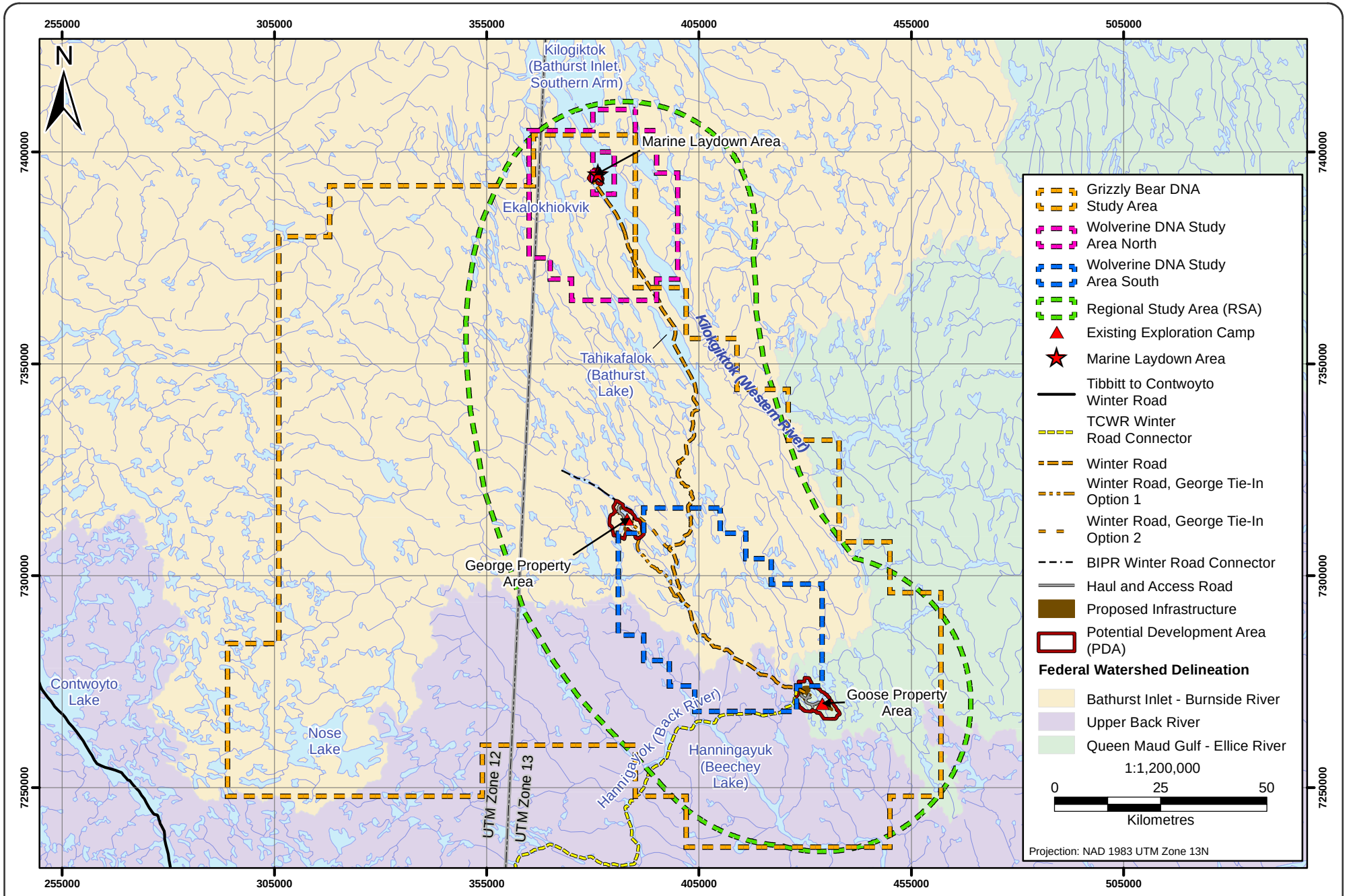


Figure 2-1

Sabina GOLD & SILVER CORP

Wildlife Baseline Study Areas, Back River Project, 2013

Figure 2-1

Rescan an ERM company

3. Grizzly Bear DNA

3. Grizzly Bear DNA

3.1 INTRODUCTION

The grizzly bear (*Ursus arctos*) is a species of conservation concern that occurs within the Project Area. Grizzly bears are federally considered a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Nunavut currently does not have a species ranking program administered by the NWMB, and thus the CESCC designations for Nunavut were used to assess the status of grizzly bears in the territory (CESCC 2010). Grizzly bears are listed as Sensitive by the Canadian Endangered Species Conservation Council (CESCC).

Barren ground grizzly bears occur at low densities and roam over larger areas. Home ranges average 2,100 km^2 for females and 7,200 km^2 for males, which are the largest home ranges for grizzly bears in North America (McLoughlin et al. 1999; McLoughlin et al. 2003). In general, barren ground grizzly bears select home ranges with a large proportion of eskers for denning (McLoughlin et al. 2003). Males emerge from their dens the last week of April and females the first week of May, often returning to den at the end of October. The dens typically are associated with adjacent tussock tundra, lichen veneer, birch seep, and tall shrub plant communities that can provide suitable forage. Barren-ground grizzly bears can also be carnivorous and caribou (*Rangifer tarandus*) can make up a large part of their annual diet (Gau 1998). Other available protein sources in the region are northern red-backed voles (*Myodes rutilus*), ptarmigan (*Lagopus* spp.), arctic ground squirrel (*Uroceitellus parryii*), and fish. The bears supplement their diet with succulent vegetation in early summer and berries in the late summer and fall (Gau 1998).

Barren ground grizzly bears are at the most northern and eastern limits of the continental grizzly bear range, thereby reducing overall population connectivity (McLoughlin and Messier 2001). Genetic diversity has been demonstrated to be comparatively low for grizzly bears in the Arctic as a result of this relative isolation from other bears (Paetkau et al. 1998). Furthermore, the Arctic tundra environment consists of harsh climates and low productivity that contribute to low reproductive rates and smaller average litter sizes (McLoughlin and Messier 2001; McLoughlin et al. 2003), which may make northern grizzly bear populations particularly sensitive to disturbance.

In order to census bears, researchers have used live captures to mark bears and then recaptured bears using camera stations (Mace 1994) and aerial survey. Most recently, hair removal and DNA fingerprinting have been used to mark and recapture bears (Woods et al. 1999; Mowat and Strobeck 2000; Poole, Mowat, and Fear 2001; Boulanger et al. 2002; Proctor et al. 2005; Apps and McLellan 2006; Rescan 2011c). This method has several benefits because live capture of bears is unnecessary, individuals can be identified with a small risk of error, and hair removal sites are faster to set up and are checked less often than live-capture sites (Mowat and Strobeck 2000). Roots of mammalian hair contain sufficient DNA for analysis (Higuchi et al. 1988). In traditional mark-recapture studies, an initial population sample is captured, marked, and released. The population is then resampled during ≥ 1 additional sessions (Woods et al. 1999). Bears are marked by collecting DNA from their hairs and recording the individuals present at the beginning of the sampling season. The ratio of newly captured animals to recaptures is then used to compute a population estimate (White et al. 1982).

Bears can traverse in and out of study areas during sampling, which violates the assumption of geographic closure in most studies that use mark-recapture or related methods (S. D. Miller et al. 1997). Abundance estimates derived from mark-recapture correspond to the "super-population" if movement is random across grid boundaries (William L. Kendall 1999). In the context of mark-

recapture DNA studies, the super-population is defined as the number of animals that inhabit the sampling grid and surrounding area (as opposed to the grid alone; Boulanger et al. 2004). While the super-population estimate represents the number of animals that traverse an area, the estimate is compromised by the undefined sampling area and therefore cannot be used to estimate density (Boulanger et al. 2004). Under a trend monitoring objective, however, an absolute abundance or density estimate is not necessary, and the assumptions of population closure can be relaxed (Apps 2010). In this case, the initial super-population estimate can be used as the basis for monitoring relative changes over the long term.

This report presents the 2013 results from Grizzly Bear DNA studies as part of the wildlife baseline program and discusses the overall super-population results derived from both the 2012 and 2013 data collected during the two years of study.

3.2 OBJECTIVES

The objectives for the 2013 program are to:

- calculate the total number of grizzly bears that currently use the DNA Study Area; and
- record movements trends for grizzly bears within the DNA Study Area.

The objectives of the overall DNA program (2-year study) are to:

- generate a super-population estimate of grizzly bears for the DNA Study Area as potential baseline data for trend monitoring;
- describe the spatial and temporal distribution of grizzly bears in the DNA Study Area; and
- identify overlap with grizzly bears that were sampled in areas outside of the DNA Study Area by other regional grizzly bear DNA programs.

These overall objectives can only be achieved by combining the results across multiple sampling sessions and years to obtain sufficient captures and recaptures required for statistical analyses.

3.3 METHODS

3.3.1 Grizzly Bear Study Area

The DNA study grid consisted of 132 grid cells and encompassed the Back River Project terrestrial RSA (67 cells), monitored by Sabina for the Back River Project and an adjacent area to the west of the terrestrial RSA (65 cells) monitored by a separate proponent where an additional mining development has been proposed. Grizzly bear DNA was analyzed within the combined DNA Study Area to ensure sufficient numbers of captures of bears given the large home ranges and low densities of grizzly bears in the north. Within the grizzly bear DNA Study Area, 129 of the 132 cells were sampled for grizzly bear hair (Figure 3.3-1). Three cells were excluded because of close proximity to exploration camps. Each cell was 12 km by 12 km (144 km^2). Cell size was dependent on several factors, including the need to maximize capture probabilities (i.e., the likelihood of obtaining a hair sample), minimizing capture heterogeneity (i.e., variation in capture rates by sex and age class), and logistics. The cell size was chosen so that it was not larger than the expected area used by an individual bear over a sampling period, and it was assumed that a bear traveling through a cell had an equal probability of encountering a tripod as any other bear (Apps 2010).

PROJECT #0234411-0004 GIS # BAC-23-306 June 03 2014

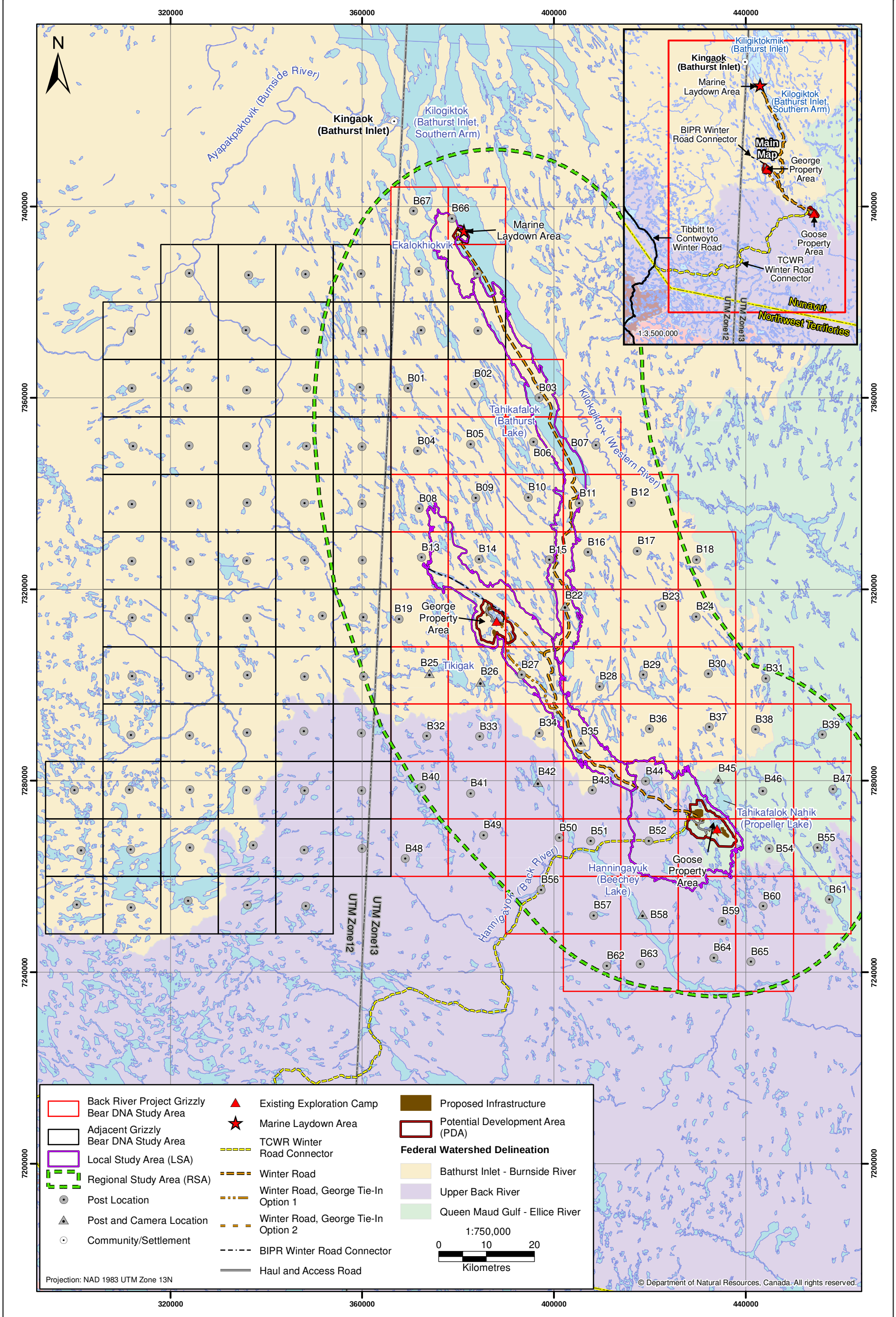


Figure 3.3-1

Sabina GOLD & SILVER CORP.

Grizzly Bear DNA Combined Survey Grid and Post Locations, 2013

Figure 3.3-1

Rescan an ERM company

3.3.2 Hair Collection

One wooden tripod wrapped in barbed wire was used to collect grizzly bear hair (Plate 3.3-1) in a given cell, and the tripod remained at that location for the duration of the sampling season. Tripod locations were recorded by a handheld GPS (Figure 3.3-1). Within each cell, the tripod was located in an area of high quality grizzly bear habitat (e.g., esker, riparian area, upland meadow, wetland meadow) to increase the likelihood of "capturing" hair from a bear. Short-distance, non-reward lures (e.g., cured cow's blood, fish oil, castor oil, and sweeter scents like bergamot oil) was used to attract bears to the tripods. The lures were poured on the top of the tripods, down the legs (posts), and in the centre on the ground to encourage a bear to squeeze between the legs.

Plate 3.3-1. Example of barbed wire tripod used to snag grizzly bear hairs during DNA study.

There were seven sampling periods (sessions) between May 27 and August 18, 2013 at approximately 10 to 12 day intervals; however half of the cells to the west side of the DNA grid were excluded during the last session due to logistical reasons. Most studies in British Columbia opt for three to four sessions (Apps 2010); however, given the relatively low densities of grizzly bears in the Arctic, and their large home ranges (~2,000 km^2 for females) and movement patterns, it was decided that more sessions were required to ensure sufficient captures and recaptures of individuals for population analyses.

During field sample collection, the barbed wire along the posts of the tripod, the ground under the tripod, and vegetation adjacent to the tripod were all searched for bear hair. Each clump of hair that was found was placed in a separate labelled coin envelope. Samples were then air dried for 48 hours and stored in paper bags for subsequent analysis. For each tripod, the three posts were arbitrarily selected as post 1, 2, or 3. Hair samples were labelled according to which post they were found on, or if they were collected off the ground. For subsampling purposes, hair samples along a post were grouped into clusters. A cluster is defined as a series of hair samples from consecutive barbs and a new cluster is identified following an empty barb.

After hair samples were collected, all barbs on which hair was found were burned with a propane torch to prevent double counting in the following session. In addition, tripods were moved a few meters after the check if hair had been collected from the ground to ensure grizzly hair from the current session would not contaminate future session samples.

Studies have suggested that moving tripods between sessions improves precision in population estimates (Boulanger et al. 2004); however, this is not logistically feasible in larger northern study areas. As a result, tripods were re-baited with a novel scent lure after each collection event to minimize acclimation by bears to sampling locations.

3.3.3 Remote Cameras

Reconyx PC800 Professional digital cameras were placed facing the DNA tripods in 7 of the cells in the eastern portion of the study area (B22, B25, B26, B35, B42, B45, and B58; Figure 3.3-1). Remote cameras were used to determine capture failure (i.e., whether some grizzly bears visiting a tripod were not leaving behind hair samples), and for those posts with hair samples, to determine whether DNA analyses were recording the correct number of grizzly bears visiting tripods (i.e., number of individuals identified by DNA matched the number observed by camera to have rubbed against the posts).

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a tripod, which was secured with rocks to prevent it from being knocked over when encountered by wildlife. Energizer® Lithium batteries were used to maintain camera performance at low-temperatures. Each camera was programmed to take a photograph every 30 minutes, in addition to being triggered by motion in the infrared spectrum. Motion in front of the camera would trigger the camera to take 10 photos at 1-second intervals. Along with each photo, the cameras would record the date, time, type of trigger (i.e., time [T] or motion [M]), number of triggered photos taken (i.e., 1/10 - 10/10), temperature, and camera number. Cameras were programmed to immediately record a second set of 10 photos upon re-triggering. Remote cameras and DNA tripods were set-up at the same time. During each hair sample check, the cameras were also examined to ensure they were properly working.

A protocol was developed to ascertain if individual grizzly bears visiting DNA tripods were the same individual or multiple individuals to remove duplicate bears for comparison with the WGI data. First, when multiple photo series were triggered, the photos recorded during the second and subsequent triggers were considered part of the same series if they were taken less than 5 minutes apart. Second, if both timed and triggered photos were taken within 5 minutes of each other, they were initially recorded separately but were then combined and reviewed to remove any duplicates. Next, all data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as carnivores may spend more than 5 minutes at a site. If a photo series (motion or time triggered) were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were from the same animal. Observations of carnivores were considered a duplicate if it was not possible to tell individuals apart within the 24 hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series. Finally, photographs were reviewed to ascertain if the grizzly bear interacted with the DNA tripod (i.e., rubbed against the post and thus potentially left a DNA sample).

3.3.4 Laboratory Analysis

3.3.4.1 Database Management and DNA Extraction

Genetic analyses on collected hair samples were conducted by Wildlife Genetics International (WGI) in Nelson, British Columbia. Sub-selection rules were provided that attempted to balance budgetary

considerations with sample size and hair sample quality. Three criteria were used to exclude samples from DNA extraction. First, samples containing less than two guard hair roots and less than 30 underfur were set aside. This is a higher quality threshold than is typically used, and was applied in response to the lower extraction success rates in other northern projects. Second, a 1-in-3 selection rule was applied, where the analysis was limited to one of every three samples from a series of adjacent samples, biasing towards samples of higher quality for samples collected during sessions 1, 2, and 5; ground samples were also limited to one sample per cell in each session. The analysis for samples collected during sessions 3, 4, and 6 were more stringent; one sample per post was selected, as well as one ground and one top sample, where applicable, with the selection focused on higher quality samples. Finally, samples with an appearance inconsistent with grizzly bear hair and samples labelled as setup or incidental were excluded samples from session 7 were not analysed due to logistical reasons. Leftover hair was archived at WGI.

DNA was extracted using QIAGEN's DNeasy Tissue kits, and followed the manufacturer's instructions (for details see http://www.qiagen.com). WGI aimed to use 10 guard hair roots where available. When underfurs were used, the number of roots used in the analysis was an estimate because entire clumps of whole underfur were extracted rather than clipping individual roots.

3.3.4.2 Microsatellite Genotyping

The analysis of individual identity was based on a gender marker, plus the eight microsatellite markers that have been used in grizzly bear projects from the Kitikmeot region of Nunavut. The 9-locus analysis of individual identity followed a 3-phase approach, which started with a first pass of all nine markers on all extracted samples. After the first pass, mixed and hopeless samples were set aside, with 'hopeless' being defined as having produced high-confidence data scores for less than or equal to four of nine markers during the first pass. The first pass was followed by a clean-up phase in which data points that were weak or difficult to read the first time were re-analyzed. In some cases multiple rounds of re-analysis were used when it appeared that there was potential to upgrade a sample to a high-confidence 9-locus score.

The last phase of analysis was error-checking which followed published protocol for selective data re-analysis (D Paetkau 2003). Genotyping errors, which can lead to false individuals being recognized, normally create pairs of genotypes that match at all but one or two markers. Typically, such 1MM- and 2MM-pairs are sought out, and rule out genotyping error by re-analyzing the mismatching markers in each pair.

3.3.4.3 Population Analysis

Grizzly bear capture information from 2013 was combined with data from 2012 to generate a population estimate for the combined DNA Study Area. The super-population (N^) was modelled using a robust design with a Huggins estimator in program MARK. The super-population is the total number of bears that are expected to use the study area over the sampling period and is based on the relative probabilities of detecting and recapturing individuals. The robust design assumes that the active sampling period within a season or year (i.e., secondary sessions) is short enough to approximate closed population dynamics (no births, deaths, immigration, or emigration), but an open population dynamic is assumed during the interval between sampling years (i.e., primary sessions).

Candidate models were assessed for providing the best population estimate using Akaike's Information Criterion (AIC), a metric that provides the relative likelihood of any model given the available data (Burnham and Anderson, 2002). Survival was assumed to be equal for males and females. Individual heterogeneity in capture/recapture probabilities was assessed, but did not rank in the top candidate models. Additional individual covariates were not incorporated into the models.

Precision in population estimates require that all individuals have an equal likelihood of being detected, and that detection probabilities are sufficiently high to ensure an adequate portion of the target population is being sampled. For grizzly bears, the target detection probability is 0.20.

3.4 RESULTS

3.4.1 Summary

Samples were collected in the field during seven sessions from May 27 to August 18, 2013. A total of 3,624 hair samples were collected within the combined DNA study grid (Back River Project terrestrial RSA and adjacent area to the west) during the first six sessions and sent for DNA analysis to WGI (Table 3.4-1 and Plate 3.4-1). The seventh session was omitted from DNA analysis due to logistical reasons. Of the 3,624 samples collected in the combined DNA study grid, 922 (25%) were successfully extracted and assigned to 109 grizzly bear individuals (48 males and 61 females). Four potential family units were identified. A total of 71 bears detected in 2013 were also detected in 2012. One grizzly bear detected in this study in 2013 was detected in a DNA study conducted in 2011 approximately 200 km northwest; other bears detected during the 2013 survey were not identified elsewhere.

Table 3.4-1. Summary of Grizzly Bear Hair Samples Collected in the Field, 2013

Session	Date Range	Type of Bait Used	Number of Cells with Capture	Number of Samples Taken	Number of Successful Hair Extractions	Number of Individual Bears Detected
Set-up tripods	May 27 - June 2	Blood	-	-	-	-
Session #1	June 11 - 14	Fish oil or seal oil	57	550	163	32 (17M:15F)
Session #2	June 20 - 24	Blood	43	537	183	39 (15M:24F)
Session #3	July 1 - 6	Fish oil or seal oil	48	433	97	37 (15M:22F)
Session #4	July 11 - 15	Beaver castor	61	659	111	37 (13M:24F)
Session #5	July 23 - 27	Blood	57	709	254	51 (19M:32F)
Session #6	August 3 - 9	Cranberry, raspberry and bergamot oils	67	736	114	53 (21M:32F)
Session #7 (Take down tripods)	August 16 - 18	n/a	24	-	-	-
Total			118	3,624	922	109 (48M:61F)

The average distance travelled by male grizzly bears (over approximately a 75 day period) was approximately twice (49.1 km) that travelled by female bears (27.2 km) and bears travelling as potential family groups (20.5 km), although the largest distance travelled during this period was similar between male and female bears (109.2 km and 112.6 km, respectively). In addition, areas used within the DNA study grid were on average, much greater for male bears (726.3 km^2) relative to female bears (245.0 km^2), and potential family groups (94.3 km^2). The largest area used within the DNA study grid by a grizzly bear during the survey period was 2,572.0 km^2.

Combined results from 2012 and 2013 indicate the mean capture probability in the DNA Study Area was 0.25 in 2012, and 0.33 in 2013. The total number of grizzly bears estimated to be in the study area in 2012 was 72 females and 52 males. In 2013, the super-population over the combined study area was

estimated to be 64 females and 54 males. These results indicate a detection frequency of approximately 6 – 8 grizzly bears / 1,000 km^2.

Plate 3.4-1. Example of a hair cluster sample collected during DNA surveys.

Remote cameras placed in 7 grid cells at DNA hair capture posts in 2013 recorded a maximum of 22 bears. Camera and DNA analysis were consistent in four of these cells. Hair analysis detected one bear in one cell while remote cameras did not capture an image of a grizzly bear and the number of bears detected by DNA in the remaining two cells was less than the number of grizzly bear recorded by remote cameras. Two family units were identified by images recorded by these cameras and consisted of a female bear with one cub and a female with two cubs, respectively.

3.4.2 2013 DNA Results

The 3,624 records in the 2013 grizzly bear database were classified as follows:

1. *Successful samples* (25.4%): 922 samples that were assigned to individuals.
2. *Inadequate samples* (17.8%): 645 samples that lacked sufficient hair follicles for DNA extraction.
3. *Sub-selected samples* (43.2%): 1,564 samples that were excluded due to sub-selection rules/criteria.
4. *Bombed samples* (12.5%): 452 samples that failed during microsatellite analysis.
5. *Mixed samples* (0.1%): 3 samples that showed evidence of ≥ 3 alleles per marker.
6. *Non-target samples* (1.1%): 38 samples did not appear to be from bears.

Successful DNA extraction was relatively good (73%) compared to other barren ground grizzly bear work and similar to the previous year (75%; Rescan 2013b). Despite stricter subselection rules, the success

rate of the adjacent western cell samples (61%) was less than it was the previous year (80%). As expected, samples from the ground had a lower success rate than samples collected from the tripod due to the lack of guard hair roots.

Variation in success rates were also noted between specific sessions. In particular, the adjacent western cell samples collected during session 6 were less successful than the other sessions. After the last phase of analysis of hair samples collected, there were 9 2MM-pairs and 1 2MM-pair; this is likely due to a higher than average degree of relationship within the population sampled. The detailed genetic marker data are presented in Appendix 1.

The 922 good samples were assigned to 109 grizzly bears; 48 males and 61 females (Plate 3.4-2). Four potential family units were identified (Table 3.4-2). Grizzly bears were categorized as a potential family unit when bears were observed during >1 session at ≥2 cells. A total of 71 bears detected in 2013 were also detected in 2012. One grizzly bear was also detected in a previous DNA study approximately 200 km northwest of the Project.

Plate 3.4-2. Photos of grizzly bears at tripod stations taken by remote cameras.

Table 3.4-2. Potential Family Units Identified within the Combined DNA Study Area

Bear ID in Potential Family Unit	Gender of Bears	Session (and Cell) Captured Together
hr13 and hr35	Female and female	2 (H27); 3 (H21)
hr105, hr1449, and hr342	Female, female, and male	Bears hr105 and hr342 in 1 (H61); All bears in 2 (H50); All bears in 4 (H56)
hr188 and hr686	Male and female	2 (H5); 5 (H5); 6(H12)
hr646 and hr860	Female and female	3 (H14); 5 (H14)

3.4.2.1 Spatial Distribution in Frequency of Grizzly Bear Captures

The largest number of individual bears was detected in cell B48 located between two larger tributaries of the Back River, where nine different grizzly bears were identified (Figure 3.4-1). Cells B12, H04, and H14 had the second largest number of grizzly bears detected (N = 8); B12 was located along the Western River, H04 was along the northern boundary of the Study Area, and H14 was located along in the northwestern portion of the Study Area near the Burnside River. Overall, grizzly bear capture frequency appears evenly distributed across the DNA Study Area.

PROJECT #0234411-0004 GIS # BAC-23-307 June 03 2014

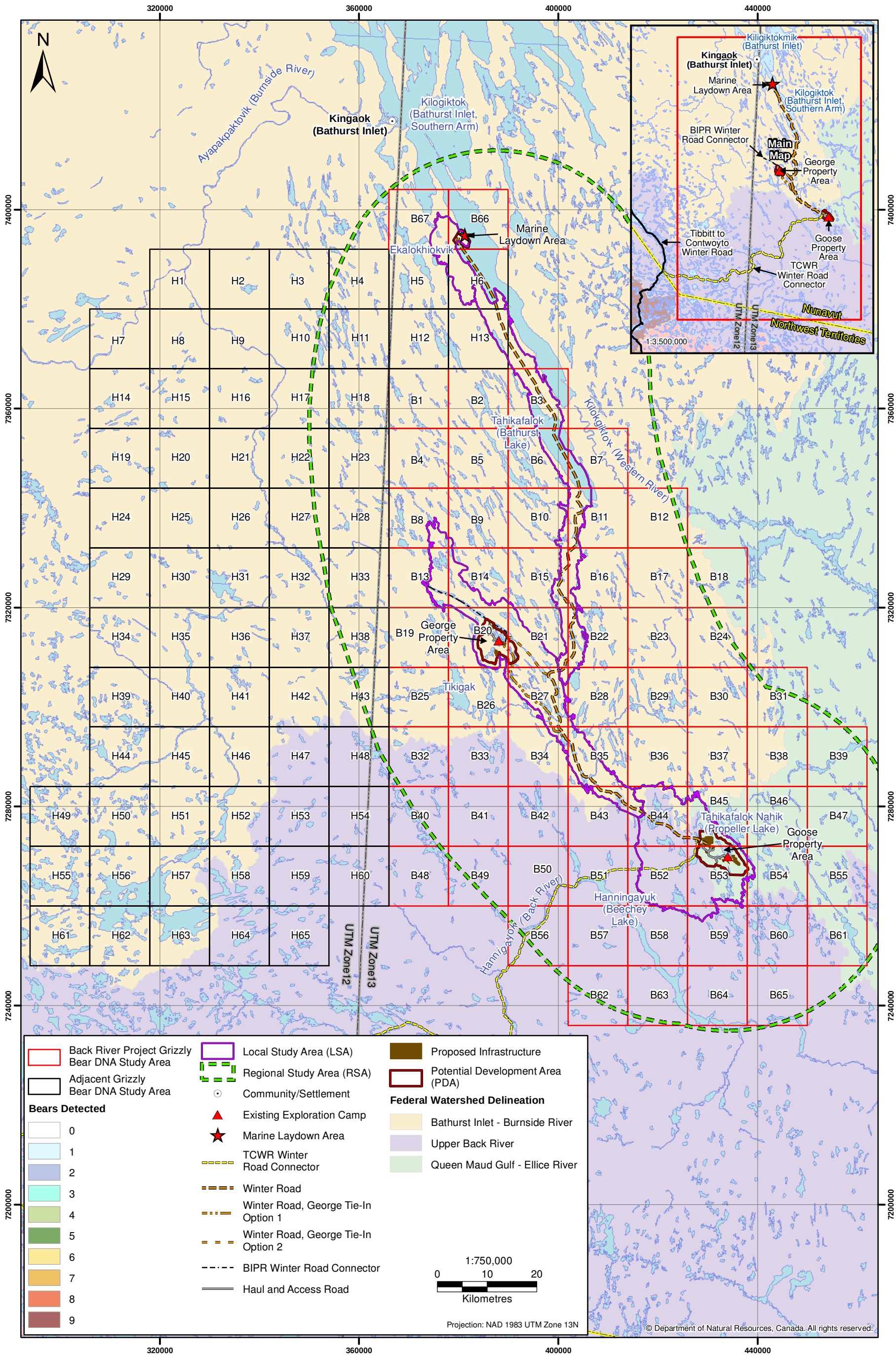


Figure 3.4-1

Sabina GOLD & SILVER CORP.

Capture Frequency of Grizzly Bear Individuals at Tripod Locations, 2013

Figure 3.4-1

Rescan an ERM company

3.4.2.2 Temporal Distribution in Frequency of Grizzly Bear Captures

While there were some cases where multiple samples from a single sampling period were tied to the same bear, there were also many bears that were detected across multiple sampling sessions. Seventy-three individuals were recaptured during at least one session. Of these, five bears were detected in five sessions, 15 bears in four sessions, 22 bears in three sessions, and 31 bears were detected in two sessions. Seven individuals were new captures during the sixth sampling session. A summary of individual bear genotypes and capture/recapture rates for 2013 is included in Appendix 2.

Some grizzly bears were detected in the same sampling cell on multiple occasions. Two female grizzly bears (IDs hr219 and hr860) were detected in the same cell during four sessions (Figure 3.4-2). Bear hr219 was found in cell H17 and bear hr860 was in cell H14. Eleven bears (3M:8F) were found within the same cell during three sessions and 37 bears (14M:23F) were identified in the same cells during two sessions. These multiple recaptures are possibly indicative of high habitat value in these cells within the respective grizzly bear home ranges.

3.4.2.3 Grizzly Bear Movement in the DNA Study Grid

The average distance travelled by male grizzly bears during the first six sessions (i.e., over approximately 75 days) was 49.1 km, whereas females averaged 27.2 km and potential family groups averaged 20.5 km (Table 3.4-3). Only four potential family groups were identified and the majority of individuals were females. The distance travelled by a family member was used when calculating the average, as it was assumed that potential family members travelled together although they were not always detected through hair analysis. The largest distance travelled by an individual female grizzly bear was 112.6 km (bear ID br199) and the largest distance travelled by an individual male was 109.2 km (bear ID hr2428; Appendix 3). Potential family unit hr13 and hr35 travelled 26.7 km. The topography and presence of waterbodies between many of the cells would result in actual distances travelled between points to be considerably higher.

Table 3.4-3. Distance Travelled and Area Used by Grizzly Bears, 2013

Parameter	Sex	Average Distance Travelled or Area Used	Range of Distance Travelled or Area Used
Distance travelled during entire survey period	Female	27.2 km	6.6 – 112.6 km
	Male	49.1 km	10.9 – 109.2 km
	Potential family unit	20.5 km	12.3 - 26.7 km
Area used during entire survey period	Female	245.0 km2	50.0 – 1,169.5 km2
	Male	726.3 km2	3.3 – 2,572.0 km2
	Potential family unit	94.3 km2	69.7 – 142.3 km2

A total of 37 bears were detected at three or more different tripods, including 16 males, 14 females, and 7 bears from three potential family groups (Appendix 4 and Figure 3.4-3). Although four potential family groups have been identified in the Project Area, only three groups were detected at three or more different tripod locations. On average, female bears used an area of 245.0 km^2, males used an average of 726.3 km^2, and family groups used an average of 94.3 km^2 (Table 3.4-3). The largest area recorded to be used during the survey period by an individual male grizzly bear was 2,572.0 km^2 (ID hr38; Figure 3.4-3). The largest area used by an individual female grizzly bear was 1,169.5 km^2 (ID br199); bear br199 also had the largest distance travelled by a grizzly bear during the survey period. The largest area used by a potential family group was 94.3 km^2 (hr105, hr342, and hr1449).

3.4.3 Population Analysis

A total of 19 candidate models were ranked using AIC. The top model was a time dependent model where capture probabilities (p) were assumed equal to recapture probabilities (c) across individuals, but differed by sex and varied across sessions and years. The model is of the form ($N\hat{}_{(t)}$, $p_{(t)} = c_{(t)}$).

For the combined DNA dataset, the mean capture probability in the DNA Study Area was 0.25 (range 0.10 – 0.39) in 2012, and 0.33 (range 0.24 – 0.50) in 2013. The total number of grizzly bears estimated to be in the DNA Study Area in 2012 was 72 females (95% C.I. 68 – 81) and 52 males (95% C.I. 48 – 62; Table 3.4-4). In 2013, the super-population over the combined study area was estimated to be 64 females (95% C.I. 62 – 71) and 54 males (95% C.I. 50 – 64; Table 3.4-4).

Table 3.4-4. Number of Female and Male Grizzly Bears Estimated in the DNA Study Area Using Mark-Recapture Analysis

Sex	Year	$\hat{N}$	S.E.	Lower 95% CI	Upper 95% CI
Females	2012	72	3.2	68	81
Males	2012	52	3.1	48	62
Females	2013	64	2.0	62	71
Males	2013	54	3.3	50	64

$\hat{N}$ represents super-population estimate

These results suggest a detection frequency of approximately 6–8 grizzly bears/1,000 km^2. A density estimate is not possible because the true spatial extent of the super-population, which lies outside the study grid, and individual residency times are both unknown parameters.

3.4.4 Field Observations, 2013

Remote cameras were positioned facing grizzly bear tripods in 7 sampling cells in 2013. Remote camera data detected a maximum of 22 individual grizzly bears (some may have been repeat visitors between sessions; Appendix 5). Camera and DNA analysis found the same results in four cells; cells B22 and B45 did not detect grizzly bears, B58 had one detection, and B26 had 3 detections. Hair analysis detected one bear in cell B42 while remote cameras did not capture an image of a grizzly bear. The number of bear detections in the remaining two cells (B25 and B35) was less than the number of grizzly bear captures through remote cameras. Remote cameras captured potential family units in both cells. A total of two potential family groups (5 individuals) were recorded in cells B25 and B35 by remote cameras during session 6 that were not detected by DNA results. The families consisted of a mother with two cubs and a mother with one cub.

3.5 DISCUSSION

The objective of the DNA study for 2013 was to estimate the number of grizzly bears that currently use the study area and generate a population estimate using combined data collected in 2012 and 2013. The DNA analyses resulted in a total of 109 grizzly bears (48 males and 61 females) within the 19,008 km^2 study area in 2013, which was very similar to the previous year (111 individuals). In 2013, one of the grizzly bears detected was previously identified approximately 200 km northwest of the Project Area (Rescan 2011b) and four of the grizzly bears identified in 2012 were also detected in a study centred on the Lac de Gras region to the south (Rescan 2013d). This demonstrates the large movements of barren ground grizzly bears and the large territories they may utilize in a given year.

PROJECT #0234411-0004 GIS # BAC-23-309 June 03 2014

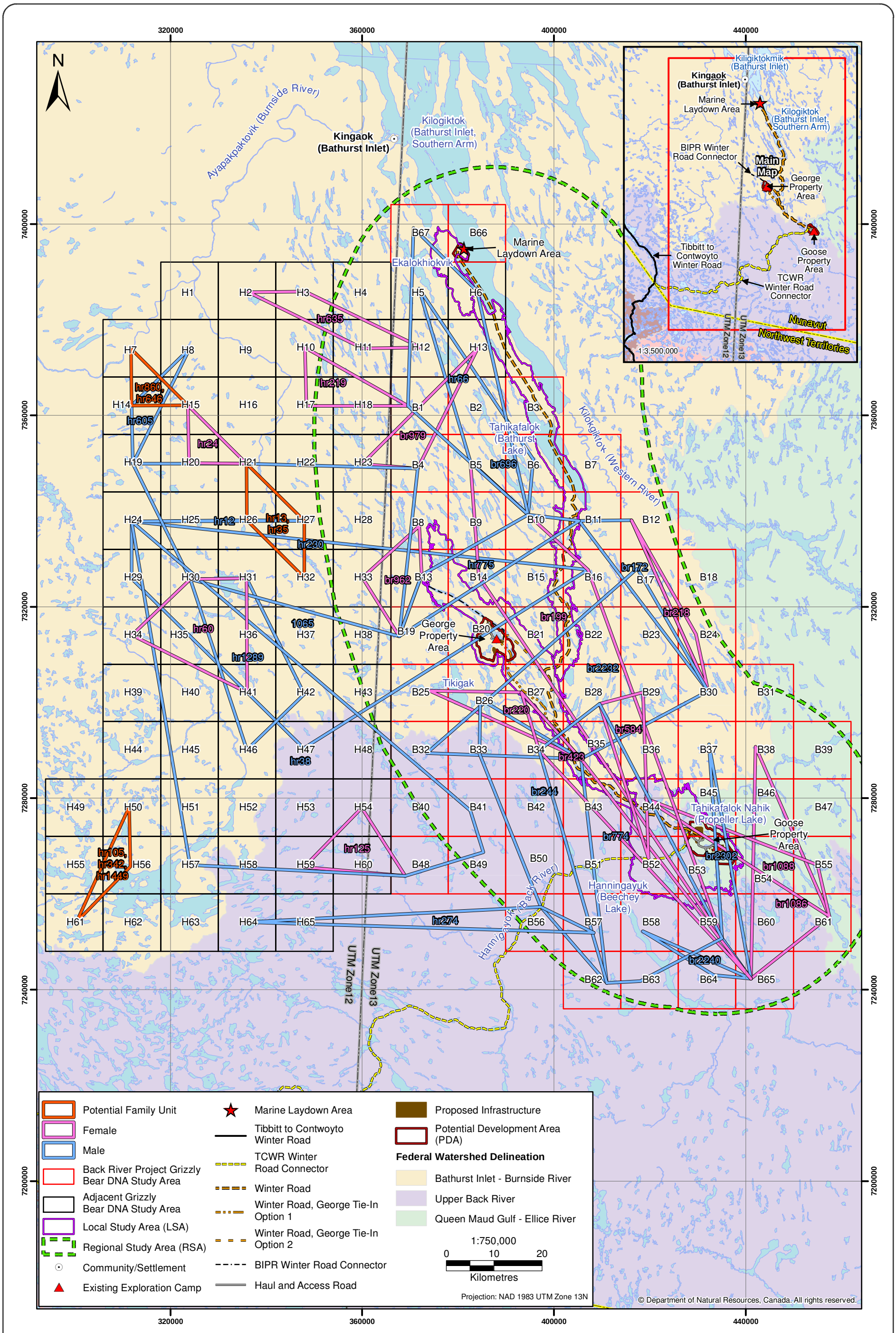


Figure 3.4-3

Sabina GOLD & SILVER CORP.

Grizzly Bear Area Used during DNA Surveys, 2013

Figure 3.4-3

Rescan an ERM company

The overall rate of successful DNA extraction from samples collected in the Back River Project Grizzly Bear DNA Study Area was relatively good (73%) when compared to other grizzly bear work in similar areas.

However, the success rate was lower in the adjacent western cell samples (61%) and when compared to 2012 results (Rescan 2013c). The success rate of extracting DNA from underfur samples was poor in comparison to samples that used ≥2 guard hair roots, which may have contributed to the lower success rate. New underfur growth does not generally occur until late summer or fall, such that underfur collected in the spring or early summer are remnants from the previous year that may have naturally degraded. Sub-selection rules were then applied only to high quality samples that remained in each cluster after pre-screening. Samples from the same cluster were assumed to be from the same individual. This reduced the potential to miss individuals due to sampling bias, and hence potentially underestimate the number of animals on the study area. Samples collected during sessions 3, 4, and 6 had more stringent rules compared to samples from sessions 1, 2, and 5; only one sample per post, one ground sample, and one top sample were selected. Samples chosen were biased towards higher quality samples. Samples collected from session 7 were not analysed due to logistical reasons.

Grizzly bear tripods were deployed in a total of 129 cells; tripods were not placed near camp or the Project location in order to reduce the potential for human and bear interactions. The minimum area used by grizzly bears was determined for approximately one-third of the bears identified through DNA analyses. Over the approximately 75 day study, males had larger ranges (largest range recorded was 2,570 km^2) within the DNA Study Area compared to female bears and potential family units (largest ranges recorded were 1,170 km^2 and 142 km^2, respectively). In 2013, a larger maximum territory for both females and males and larger average territory for males was observed relative to 2012. However, the area used by families was less than reported for 2012, likely due to the limited number of potential family units being detected in 2013 (3 potential) relative to the eight detected in 2012 (Rescan 2013c). Although four potential family groups were detected through DNA analysis in 2013, only three groups were identified at three or more different cells, allowing area to be calculated. On average, males can range over 7,000 km^2 per year (McLoughlin et al. 1999; McLoughlin et al. 2003), which may cause male grizzly bears to appear transient. As such, they are less likely to be encountered repeatedly. Female grizzly bears tend to have smaller home ranges and demonstrate high fidelity to those home ranges (McLoughlin et al. 1999; McLoughlin et al. 2003). Only 18 grizzly bears were common to both the Back River Project DNA Study Area and the adjacent western cells.

The average maximum distance travelled by female grizzly bears (27.2 km) during the 2013 survey period was approximately half the average distance for male bears (49.1 km). However, the maximum distance recorded for male bears (109.2 km) was slightly less than the maximum distance of female bears (112.6 km). The average distance is consistent with the notion that male movement rates are higher than females and average an extra 2-3 km/day during the summer and late summer periods (McLoughlin et al. 1999). These trends were similar to those observed in the 2012 DNA Study (Rescan 2013c).

Four potential family units were identified through mapping the movements of individual grizzly bears identified by DNA analysis. Grizzly bears were categorized as a potential family unit when bears were observed during greater than one session at two or more cells. One female bear was assumed to be in a family unit in both 2012 and 2013 (br13). Two additional potential family units were also identified through camera data, though they were not identified through DNA hair analysis. Hair from cubs does not snag on the barbed wire as easily as adult hair, which could explain why camera data identified potential family units where DNA analysis did not.

Remote cameras were placed in 7 cells within the eastern portion of the Grizzly Bear DNA Study Area. A maximum of 22 grizzly bears were photographed by the cameras; however, some of the images were likely repeat observations of the same bear so the total number would be less than the reported

number. There were four occasions where the number of grizzly bears identified by cameras was not equal to the number of individuals identified through DNA analysis. Some of the hair samples collected were determined to be inadequate, failed during microsatellite analysis, or were excluded due to sub-selection rules. Again, this may be due to the fact that first year cub hair does not catch on the barbed wire as easily as adult bears, or wind may have blown the hair off the barb wire; families were identified on camera during two of the four these occasions.

A total of 71 bears detected in 2013 were also detected in 2012. The two years of DNA study suggests that this area in Nunavut is productive for grizzly bears. Population analysis suggested a detection frequency of approximately 6 to 8 bears per 1,000 km^2. The Grizzly Bear DNA Study Area supports a large number of grizzly bears, potentially because of the prevalence of esker habitats for secure denning, potential seasonal access to caribou, fish resources in the abundant lakes and streams in the area, productive forage in riparian zones, and the relatively low level of hunting in this area. A density estimate was not possible due to two unknown parameters; the true spatial extent of the super-population, which is outside of the DNA Study Area, and the individual residency times. The density estimate would be lower than the detection frequency, but comparable to other nearby density estimates. In the central barrens of the mainland of Nunavut and the Northwest Territories, the density of barren ground grizzly bears was estimated to be 3.5 bears per 1,000 km^2 (McLoughlin and Messier 2001) and eight bears per 1,000 km^2 in the coastal region of the West Kitikmeot (M. Dumond, GN-DOE, pers. comm., 2010).

4. Wolverine DNA

4. Wolverine DNA

4.1 INTRODUCTION

Wolverine (*Gulo gulo*) populations in the central Arctic are federally listed as stable (COSEWIC 2003) and listed as secure in Nunavut (CESCC 2010), while the western Canadian wolverine population (which includes part of Nunavut) is federally listed as a species of Special Concern (COSEWIC 2003). Wolverines have been documented in the terrestrial Regional Study Area (RSA) during baseline studies conducted for the Project in most years since 2010 (Rescan 2011a, 2012, 2013b, 2014).

Wolverines are culturally and economically important to the Inuit and are highly respected by Inuit people for their cunning ability to fool hunters (Thorpe et al. 2001). Wolverine pelts are also highly valued for their frost-resistant properties and used as trim and lining for clothing, including parkas and mittens.

Home range sizes for wolverines in the Slave Geologic Province average 126 km^2 for adult females and 404 km^2 for adult males (Mulders 2000). Food availability is the dominant factor influencing movement patterns and home range selection by wolverines (Banci 1994). Their primary food source is caribou supplemented with a variety of other species, such as large mammals (muskox or moose), carnivores (wolverine, red fox, Arctic fox, and ermine), small mammals (lemmings, voles, Arctic ground squirrels, and hares), marine mammals, and fish (Mulders 2000).

Wolverines are challenging to study due to their large home ranges, low population densities, and solitary natures (Persson, Wedholm, and Segerstrom 2010; Inman et al. 2012); however, recent advances in camera trapping and DNA analysis have resulted in new information on population dynamics, including more rigorous estimates of population densities (Mulders, Boulanger, and Paetkau 2007; Royle et al. 2011).

Wolverines traverse in and out of grid areas during sampling, which violates the assumption of geographic closure in most studies that use mark-recapture or related methods (S.D. Miller et al. 1997). Abundance estimates derived from mark-recapture correspond to the "super-population" if movement is random across grid boundaries (W.L. Kendall 1999). In the context of mark-recapture DNA studies, the super-population is defined as the number of animals that inhabit the sampling grid and surrounding area (as opposed to the grid area alone; Boulanger et al. 2004). While the super-population estimate represents the number of animals that traverse an area, the estimate is compromised by the undefined sampling area and therefore cannot be used to estimate density (Boulanger et al. 2004). Under a trend monitoring objective, however, an absolute abundance or density estimate is not necessary, and the assumptions of population closure can be relaxed (Apps 2010). In this case, the super-population estimate can be used as the basis for monitoring relative changes over the long term.

The second year of a two-year assessment of wolverine abundance and distribution using a DNA hair-capture study (2012 to 2013) was conducted in 2013. Results of the 2012 study program are presented in Rescan (2013a). The results of the 2013 study program are presented in the current report and were combined with the results from 2012 in order to conduct a population analysis.

4.2 OBJECTIVES

The objectives of wolverine DNA baseline studies conducted for the Project in 2013 were to:

- calculate the number of individual wolverine present within the northern and southern study areas through genetic analysis of collected hair samples, and

- describe the spatial distribution of wolverines across the northern and southern study areas.

The data collected in 2013 feeds into a larger two-year study that commenced in 2012. The overall objectives of the wolverine baseline studies (2012 and 2013) for the Project are to:

- collect baseline data with the aim of generating a super-population estimate for wolverine in the Back River Project study area as a potential for trend monitoring;
- describe the spatial and temporal distribution of wolverine in the DNA Study Area; and
- identify wolverine that were sampled in areas outside of the Back River Project study area in nearby study areas (e.g. Hackett River Project study area).

4.3 METHODS

The study area for the wolverine DNA program in 2013 was comprised of two study grids within the Back River Project terrestrial RSA, a southern study grid and a northern study grid. The south study grid measured 169,200 ha and was roughly centered between the Goose and George Property Areas (Figure 4.3-1). The total area of the south study grid was divided into 47 cells, each measuring 6 km x 6 km. The north study grid measured 180,000 ha, and was roughly centred over the Marine Laydown Area (MLA) within Bathurst Inlet (Figure 4.3-2). The area of the north study grid was divided into 50 cells, each measuring 6 km x 6 km, except for portions of the study grid where the majority of the cell would be composed of water. For this reason, no cell was placed over the MLA, and within the area to the north of the MLA (Figure 4.3-2). Wolverines that may use these areas are assumed to be likely captured in adjacent cells.

The deployment of sampling stations within a cell was designed to ensure that no posts were positioned or baited closer than 5 km from camps located in the Goose and George Property Areas to avoid attracting animals into the camps.

4.3.1 Post Set-up

Within each cell, a five-foot-long 4” x 4” post wrapped with barbed wire was positioned and secured with rocks placed on a four-foot-long 1” x 4” cross-plank base. A long-distance (strong-smelling) lure was used to attract wolverines to the post and a piece of meat (fish or bison) placed at the top of each post provided incentive to climb the posts (Plate 4.3-1). The lures were poured on the top and sides of the posts, while the meat was nailed to the top of the post. Posts were set up in the south study grid from March 19 to March 25, and posts were set up in the north study grid from March 25 to March 31, 2013.

Wolverine posts were placed at the approximate centre of each cell (Figures 4.3-1 and 4.3-2). The exact location was determined by habitat and topography likely to attract wolverine, such as valleys and on the edges of waterbodies based on evidence that wolverines feed in these areas (Rescan 2013a).

The northern study grid was a shared study between the Back River Project and another development located to the west of the Back River Project with a port site proposed at Bathurst Inlet within Cell 31N. In two cells in the north study grid, Cell 31N and Cell 39N, additional hair collection posts were deployed. Within Cell 31N, three wolverine posts installed. These additional posts were placed within Cell 31N to increase the overall capture effort within this cell. Within Cell 39N, two posts were set up as this cell was the only cell within the study grid that encompassed nearly equal amounts of terrestrial habitat on the east and west side of Bathurst Inlet (Figure 4.3-2). These posts were set up to determine whether Bathurst Inlet acts as a barrier to movement for wolverines in the winter.

PROJECT # 0194096-0005 GIS # BAC-23-303 February 04 2014

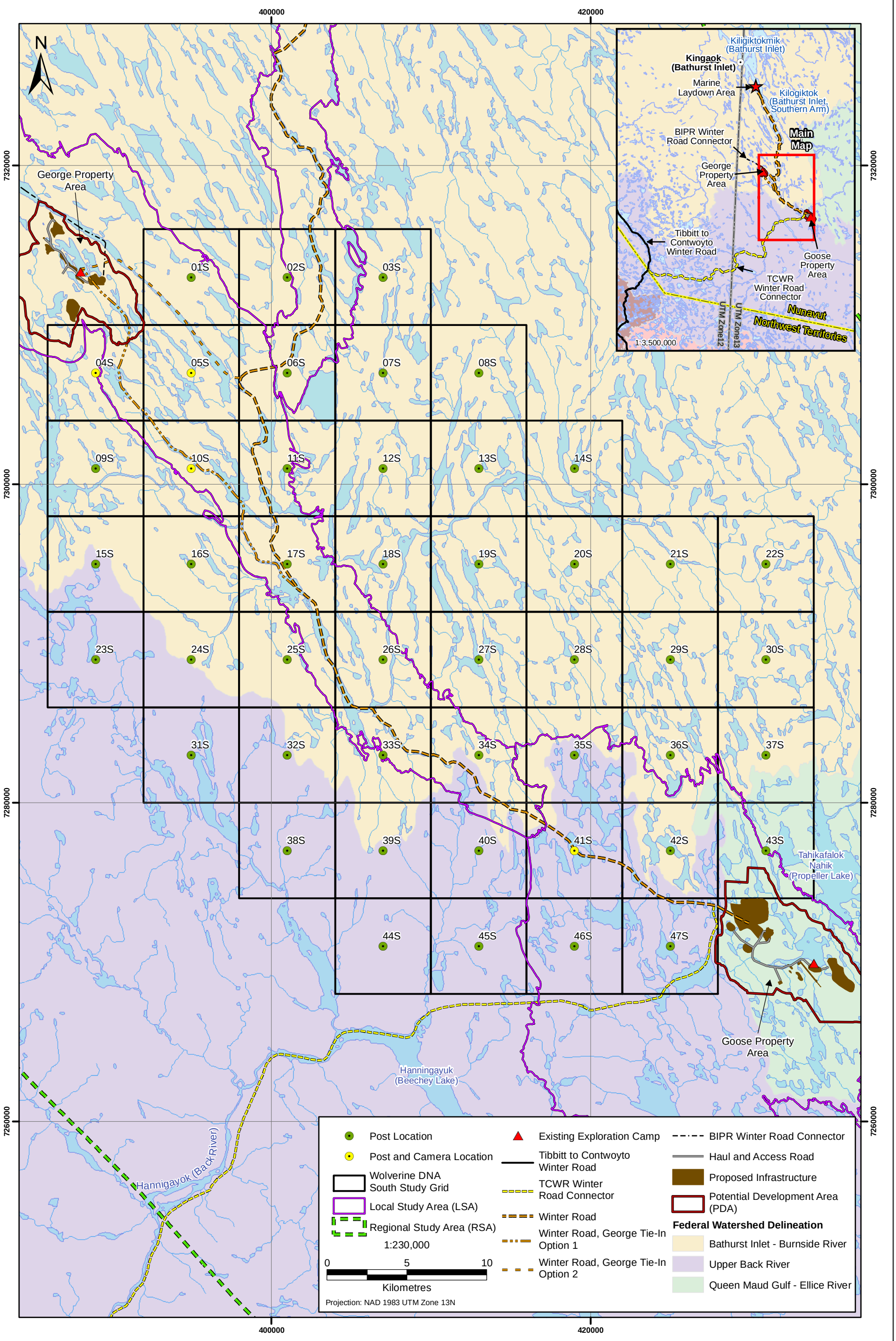


Figure 4.3-1

Sabina GOLD & SILVER CORP.

Wolverine DNA South Study Grid and Post Locations, 2013

Figure 4.3-1

Rescan an ERM company

PROJECT #0194096-0005 GIS # BAC-23-300 February 05 2014

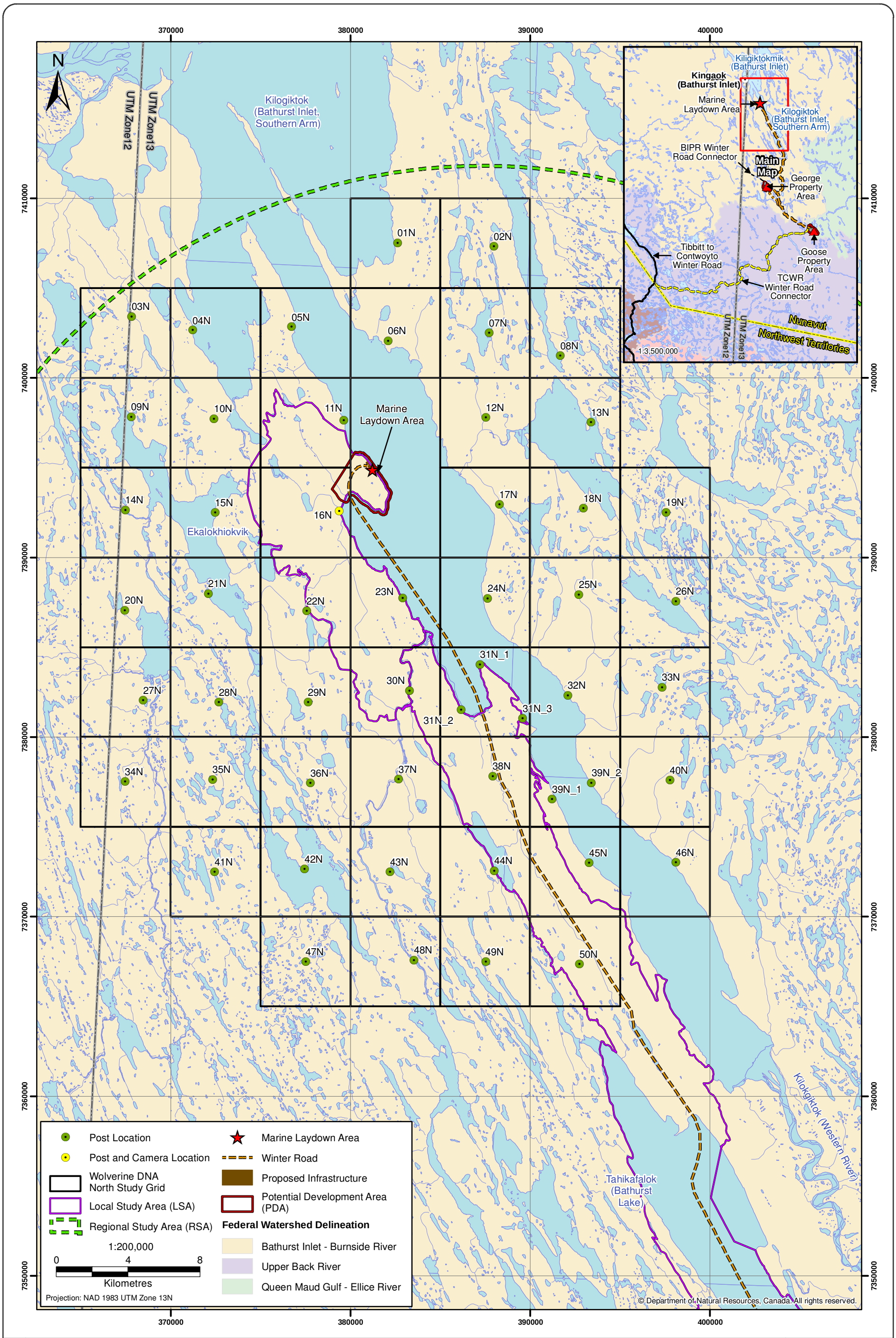


Figure 4.3-2

Sabina GOLD & SILVER CORP.

Wolverine DNA North Study Grid and Post Locations, 2013

Figure 4.3-2

Rescan an ERM company

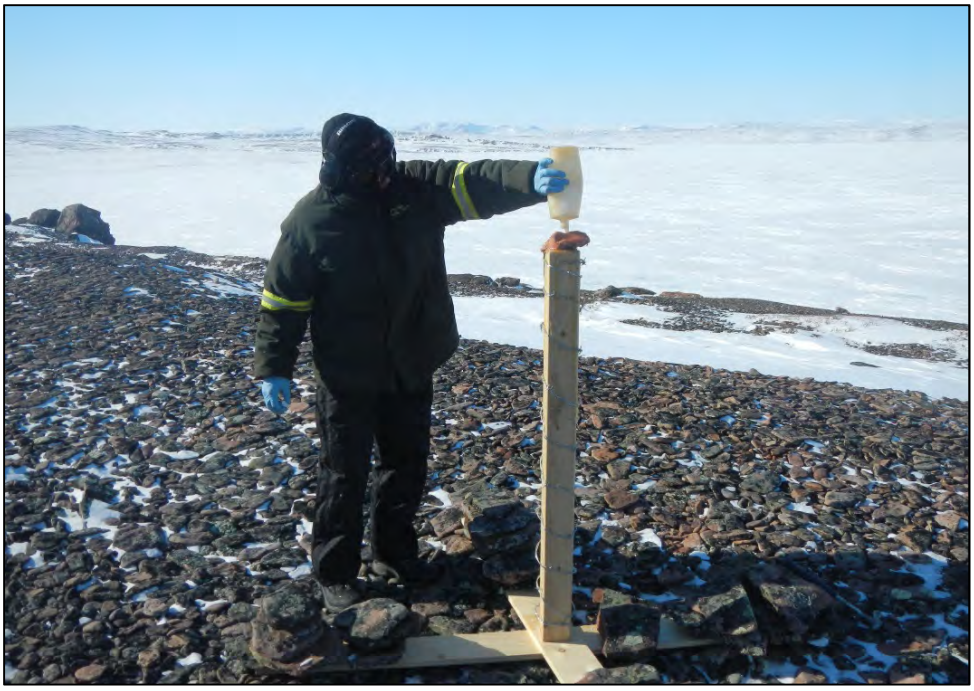


Plate 4.3-1. Field crews adding wolverine lure to a post in the north study grid on March 23, 2013.

Data collected during post set-up included date, habitat type, UTM coordinates, lure and bait used, wildlife sign observed, and whether a remote camera was placed at the site. In 2013, 5 remote cameras were set up at select wolverine posts to record wildlife visits and behaviour at the posts (Plate 4.3-2).

Plate 4.3-2. A camera set up at wolverine post in the south study grid.

4.3.2 Hair Collection

Three sampling sessions (checks) were conducted to collect hair samples, spaced 10 to 14 days apart. Lure and bait were provided during set-up and the first two checks. At the final check, hair samples were collected, and the posts were disassembled and removed from the tundra. As posts in the northern grid were set up roughly a week later relative to the south study grid, check dates varied between the two study areas. Poor weather prevented safe helicopter access to Bathurst Inlet on a number of occasions during the study period, which resulted in delays between checks in the north study grid.

The first check in the south study grid occurred from April 4 to April 8, the second on April 14 and April 15, and the final check and post removal was conducted on April 28 and April 29. The first check in the north study grid occurred from April 11 to April 13, the second on April 21, 22, 26, and 27, and the final check and post removal was conducted on April 31, May 1, 7, 9, and 10.

Each hair sample collected from a barb was placed into a coin envelope and was given a unique identification (ID) number. The coin envelope was labeled with the date, cell number, sample location (where on the post it was found), and the unique ID number. For each post, the sides of the post were arbitrarily selected as side A, B, C or D. Hair samples were labelled according to which side of the post they were found on. For subsampling purposes, hair samples along a side were grouped into clusters. A cluster is defined as a series of hair samples from consecutive barbs. A new cluster is identified following an empty barb. Samples within a cluster were assumed to be from the same individual. All coin envelopes containing the hair samples from one post (one cell) were then stored inside a letter-sized envelope labeled with the cell number, date, and number of samples collected at that post. Hair samples were air dried for 48 hours and stored in envelopes for shipping to the laboratory.

Data collected during hair collection checks included date, post condition, lure and bait used, wildlife sign, number of hair samples collected, and photo numbers.

4.3.3 Remote Cameras

Reconyx PC800 Professional digital cameras were placed at five wolverine hair collection posts (Figure 4.3-1) to determine capture failure (i.e., whether some wolverine visiting a post were not leaving behind hair samples), and for those posts with hair samples, to determine whether DNA analyses were recording the correct number of wolverines visiting posts (i.e., number of individuals identified by DNA matched the number observed by camera to have climbed the posts). Remote digital cameras recorded observations of wolverines and other wildlife across the survey period (late March through early May).

Remote cameras were mounted inside a heavy-duty security enclosure to prevent damage from wildlife. The cameras were mounted on a tripod, which was secured with rocks to prevent it from being knocked over when encountered by wildlife (Plate 4.3-2). Energizer® Lithium batteries were used to maintain camera performance at low-temperatures. Each camera was programmed to take a photograph every 30 minutes, in addition to being triggered by motion in the infrared spectrum. Motion in front of the camera would trigger the camera to take 10 photos at one-second intervals. Along with each photo, the cameras would record the date, time, type of trigger (i.e., time [T] or motion [M]), number of triggered photos taken (i.e., 1/10 - 10/10), temperature, and camera number. Cameras were programmed to immediately record a second set of 10 photos upon re-triggering. Memory cards from these remote digital cameras were collected during the final wolverine DNA check.

A protocol was developed to ascertain if individual wolverines visiting DNA posts were the same individual or multiple individuals to remove duplicate wolverines for comparison with the WGI data.

First, when multiple photo series were triggered, the photos recorded during the second and subsequent triggers were considered part of the same series if they were taken less than 5 minutes apart. Second, if both timed and triggered photos were taken within 5 minutes of each other, they were initially recorded separately but were then combined and reviewed to remove any duplicates. Next, all data was reviewed a second time to eliminate any possible duplicate recordings of the same individual as carnivores may spend more than 5 minutes at a site. If a photo series (motion or time triggered) were taken less than 24 hours apart, the photos were reviewed and analyzed to determine if they were from the same animal. Observations of carnivores were considered a duplicate if it was not possible to tell individuals apart within the 24 hour period and the maximum number of animals observed in an individual frame was considered the final animal count for that series. Finally, photographs were reviewed to ascertain if the wolverine interacted with the DNA post (i.e., climbed the post and thus potentially left a DNA sample).

4.3.4 Laboratory Analysis

4.3.4.1 DNA Extraction

All hair samples were submitted to Wildlife Genetics International (WGI) in Nelson, British Columbia for analysis. WGI analyzed only the most promising single sample from each unique cell/check/cluster combination, with a minimum quality threshold of one guard hair root or five underfur hair samples. Samples that were excluded by the sub-selection rule (i.e., that were not the most promising sample in their cell/check/cluster) were classified *Xsubselect*, while those that fell below the quality threshold were classed *Xinadequate*. DNA was extracted using QIAGEN's spin columns. The DNA extraction process followed the manufacturer's instructions and was consistent with past projects, with the goal of using 10 guard hair roots when available. The amount of material leftover for potential re-extraction was classified as A (excellent) through C (none).

4.3.4.2 Microsatellite Genotyping

Microsatellite genotyping was used to identify individual wolverines. DNA extracted from samples went directly through a multi-locus analysis of individual identity with no initial single-locus prescreen for sample quality or species. This analysis used eight standard markers applied to other wolverine projects in the Arctic, including a *ZFX/ZFY* gender marker and seven microsatellite markers.

Genotyping followed a standard 3-phase approach, starting with a first pass of all eight markers for the samples analyzed. After the first pass, samples that produced high-confidence genotype scores (based on peak height and appearance of sample) for three or less of the eight markers were set aside and classified as *Xbomb*. The first pass was followed by a cleanup phase in which WGI reanalyzed data points that were weak or difficult to read the first time.

The third phase of analysis included error-checking, and followed WGI's published protocol of reanalyzing the mismatched markers in pairs of genotypes that match at all-but-one or all-but-two markers (D. Paetkau 2003). For the error-check, WGI compared the Back River Project samples against 641 genotypes from other Nunavut and NWT wolverine studies, checking for errors that might have caused a particular animal to receive slightly different genotype scores in different study areas. During this phase, WGI analyzed an additional two markers per individual, so that comparisons among study areas (including those Projects outside of the terrestrial RSA) could be based on 10 markers, instead of eight. Once the genotyping was completed, WGI defined an individual for each unique multi-locus genotype.

4.3.5 Data Analysis

4.3.5.1 Field and Laboratory Analysis, 2013

Wolverine field and laboratory data analyzed in 2013 were summarized in order to determine the total number of individuals recorded across the entire study period, as well as the spatial and temporal trends in wolverine captures. A wolverine capture is defined as a collection of a hair sample that is identified to an individual. Thus, an individual can be captured on one check, and then be recaptured on a subsequent check.

To control for increased sampling effort within the two cells in the north study grid where more than one hair collection post was located, the number of individuals detected within those cells was calculated as the average number of individuals detected, rounded up to the nearest whole number.

Wolverine field and laboratory data was also analyzed to calculate the movements of individual wolverine within and across all checks, as well as the minimum area used by individuals across the entire study period. Movements were calculated as the straight line distances between hair collection posts visited by individual wolverine, and the minimum area utilized by individual wolverine was represented as a minimum convex polygon. Minimum convex polygons were generated for individuals detected at three or more posts.

4.3.5.2 Population Analysis, 2012 and 2013

Wolverine capture information from 2013 was combined with data from 2012 in the northern and southern study areas to generate a population estimate. A robust design with a Huggins estimator in program MARK was applied to the data to model the super-population, the total number of wolverine that are expected to use the study area over the sampling period, and is based on the relative probabilities of detecting and recapturing individuals. The robust design assumes that the active sampling period within a season or year (i.e., secondary sessions) is short enough to approximate closed population dynamics (no births, deaths, immigration, or emigration), but an open population dynamic is assumed during the interval between sampling years (i.e., primary sessions). Precision in population estimates require that all individuals have an equal likelihood of being detected, and that detection probabilities are sufficiently high to ensure an adequate portion of the target population is being sampled. For wolverine, the target detection probability is 0.50 (R. Mulders, GNWT-ENR, pers. comm., 2013).

4.4 RESULTS

4.4.1 Summary

The 2013 wolverine DNA study was conducted between mid to late March through the beginning of May. One hundred wolverine hair collection posts were set-up and checked for hair samples during three sessions from March 19 to May 10, 2013. A total of 496 wolverine hair samples were collected during this period and 494 were submitted to WGI for DNA analysis. Of the total number of samples collected and analyzed, 179 samples (36%) were successfully extracted and assigned to 19 independent individuals (Table 4.4-1), including eight identified during previous wolverine studies in 2012. One wolverine was recorded within both the south and north study grids across the study period; this individual was also recorded during wolverine DNA studies in 2012 (Rescan 2013a). Another individual was previously detected in a DNA study conducted at a diamond mine approximately 225 km to the southwest of the Back River Project south study grid. This same individual was also recorded during wolverine DNA studies in 2012 (Rescan 2013a).

Table 4.4-1. Summary of Wolverine Hair Samples Collected and Number of Individuals Detected, 2013

Check No.	Date Range	Lure Used	Food Reward Used	No. Cells with a Capture	No. Samples	No. Successful Hair Extractions	No. of Individual Wolverines Detected*
South Study Grid							
Set-up	March 19 - 25	4 oz Skunk Essence, 200 ml Seal Oil	Fish	-	-	-	-
Check No. 1	April 4, 5, 7, 8	4 oz Wolverine Essence, 200 ml Seal Oil	Fish	28	64	22	6 (2M:4F)
Check No. 2	April 14 - 15	4 oz Predator LDC	Fish	25	65	38	9 (4M:5F)
Check No. 3	April 28 - 29	none	none	33	142	45	9 (5M:4F)
Total					**271**	**105**	**12 (5M:7F)**
North Study Grid							
Set-up	March 25 - 31	4 oz Skunk Essence, 200 ml Seal Oil	Bison	-	-	-	
Check No. 1	April 11 - 13	4 oz Wolverine Essence	Fish and Bison	14	39	14	4 (3M:1F)
Check No. 2	April 21, 22, 26, 27	4 oz Predator LDC, 200 ml Seal Oil	Bison	26	62	28	7 (3M:4F)
Check No. 3	April 30, May 1, 7, 9, 10	none	none	32	124	32	6 (4M:2F)
Total					**225****	**74**	**8 (4M:4F)**
Grand Total					**496****	**179**	**19 (8M:11F)**

** Some individuals were detected in more than one check.*

*** Two hair samples were collected in the north study grid, but were not submitted to WGI for analysis upon further examination, as they were unlikely to belong to a wolverine. Thus, 223 hair samples were submitted to the lab from the north study grid, and a total of 494 samples were analyzed between both grids.*

Spatially, wolverine capture frequencies were higher in the south study grid compared to the north study grid with the highest capture frequencies (three separate individuals) located within three cells in the south study grid (one cell directly south of the George Property Area, one cell in the centre of the grid, and one cell in the southwestern portion of the grid). Between two checks of the posts (10 to 14 day period), minimum straight line distances between multiple hair collection posts visited by an individual were generally less than 50 km for both male and female wolverine. However, one male wolverine, WV057, travelled between the south and north study grids, representing a straight line distance of approximately 140 km. In general, male wolverines used larger areas within the DNA grids (415 km^2) relative to females (80 km^2) over the entire survey period, although the average area used by males after excluding the exceptionally large area used by the male wolverine (WV057) who travelled between the north and south grids was 128 km^2.

Despite using standard methods for mark-recapture analysis in wolverine, an estimate for the overall super-populations of wolverine using the northern and southern study areas was not obtained because an insufficient number of wolverine were captured and recaptured for reliable estimates.

4.4.2 2013 DNA Results

A total of 496 hair samples were collected from 100 wolverine hair collection posts in the north and south wolverine DNA grids during the survey period from March 19 to May 10, 2013, and 494 of those were submitted to the WGI laboratory for DNA analysis (Table 4.4-1). The detailed field hair collection and genetic marker data are reported in Appendix 6. A summary of individual wolverine genotypes and capture/recapture rates for 2013 is included in Appendix 7.

The 494 hair samples recorded in the 2013 wolverine database were classified by WGI as follows:

1. *Successful samples* (36%): 179 samples that were assigned to individuals.
2. *Inadequate samples* (24%): 121 samples that lacked sufficient hair follicles for DNA extraction.
3. *Sub-selected samples* (13%): 66 samples that were excluded due to sub-selection rules.
4. *Bombed samples (*18%): 89 samples of unknown species that failed during microsatellite analysis.
5. *Non-target samples* (8%): 39 samples that were identified as belonging to non-target species, such as fox or grizzly bear.

The WGI lab extracted DNA from 309 samples (62% of samples submitted for analysis) due to samples that were either excluded because of inadequate hair follicles for DNA extraction or due to sub-selection rules. Of the samples extracted, 125 were further excluded from analysis due to having ≤3 microsatellite markers matching those indicative of wolverine samples or failed during the clean-up phase, leaving a total of 179 samples that had high confidence scores for the eight markers used for wolverine identification. From the 179 successfully analyzed hair samples, a total of 19 individuals were identified, including eleven females and eight males (Table 4.4-2).

Table 4.4-2. Individual Wolverine Identified through DNA Analysis, 2013

		Captured on Check			
Wolverine	Sex	Check No.1	Check No. 2	Check No. 3	Captured in 2012
WV001	M		X	X	X
WV006	F		X	X	X
WV007	M			X	X
WV045	F	X	X	X	X
WV057	M		X	X	X
WV148	F	X	X	X	X
WV155	M	X	X	X	X
WV172	F		X	X	X
WV255S	F	X			
WV256S	F	X			
WV350S	F		X		
WV432S	M	X	X	X	
WV183N	F	X	X	X	
WV28N	M	X	X	X	
WV30N	M	X		X	
WV33N	M	X	X	X	
WV50N	F		X	X	
WV52N	F		X		
WV68N	F		X		

Eight individuals identified through DNA analysis in 2013 are recaptures of wolverines detected during wolverine DNA studies in 2012 (Table 4.4-2; Rescan 2013a). These eight individuals include all four females recorded in 2012 and four of the eight males recorded in 2012.

One male (WV155) recorded in 2012 and 2013 during wolverine DNA studies was identified as a re-capture of a wolverine previously detected in the NWT during another monitoring study, approximately 225 km southwest of the Back River Project area.

4.4.2.1 Spatial Distribution in Frequency of Wolverine Captures

Two-thirds of cells within the two study grids (64 out of 97 cells) were visited by one or more individuals across the survey period. In general, higher capture frequencies were recorded within cells in the south study grid compared to cells within the north study grid (Figures 4.4-1 and 4.4-2).

Most cells (46 cells) were visited by just one individual, half of which (23 cells) were located in the south study grid and the other half in the north (Figures 4.4-1 and 4.4-2). The exception was Cell 31N, where two different individuals were recorded across the survey period. However, this cell had three hair collection posts active throughout the survey period. Thus, after accounting for the increased sampling effort, Cell 31N had 1 wolverine detected per post. The assumption of one individual within Cell 31N is further substantiated by the detections of wolverine within the cell across the study period. One individual was recorded on multiple checks at two of the three hair collection posts, and the second individual was only recorded on one check at one hair collection station. Thus, it is likely that if only one hair collection station were present in Cell 31N, the second individual would not have been detected.

A total of fifteen cells were visited by two different individuals, most of which (9 cells) were located in the south study grid (Figures 4.4-1 and 4.4-2). Cell 39N, with two posts had an average of 1.5 wolverine detected per post, after accounting for the increased sampling effort concentrated in this cell. Cell 39N recorded three separate individuals; two were recorded at the hair collection post on the east side of Bathurst Inlet and one was recorded at the post located on the west side. Thus, it is possible that only one individual would have been recorded if just one hair collection post was placed on the west side of Bathurst Inlet, or up to two individuals if only one post was placed on the east side of Bathurst Inlet. A conservative approach was taken when selecting to round the total number of individuals up to 2, rather than down to 1.

In three cells, hair collection posts were visited by three different wolverines, all of which were in the south study grid. One cell was located in the northern portion of the grid directly south of the George Property Area, another was located roughly in the centre of the grid, and the remaining cell was located in the southwestern portion of the grid (Figure 4.4-1).

One-third of the hair collection posts (33 out of 97 cells) were not visited at all during the study period. Most of these cells (66%) were located in the north study grid, particularly in the northern portion of the grid, and on the inland areas of the north study grid (Figures 4.4-1 and 4.4-2). Posts that were not visited by wolverine in the south study grid were primarily located in the northern portion of the grid (Figure 4.4-1).

4.4.2.2 Temporal Distribution in Frequency of Wolverine Captures

Of the 19 individuals identified in this study, a number were detected across multiple sampling sessions. Seven individuals were captured on the first check and were recaptured on all subsequent checks (Table 4.4-2). Of these seven individuals, four (2M:2F) were captured within the south study grid, and the other three (2M:1F) were recorded in the north study grid.

Six individuals were recaptured at least once across sampling sessions (Table 4.4-2). Half of these (1M:2F) were only detected within the south study grid, and two individuals (1M:1F) were only recorded within the north study grid. The remaining individual (WV057), a male, was recorded in the north and south study grids twice, both on the second and third checks.

The remaining six individuals were only captured once, primarily on the first and second checks (Table 4.4-2). Most of these individuals (1M:3F) were detected within the south study grid. The remaining two individuals, both female, were recorded within the north study grid during the second check.

4.4.2.3 Wolverine Movement in the DNA Study Grids

A number of individuals, including seven males and eight females, were captured frequently across the survey period. Within a single 10-14 day sampling period, the cumulative straight line distance between multiple hair collection posts visited by an individual ranged from 5 to 47 km for females and 5 to 140 km for males (Table 4.4-3; Appendix 8). Across the entire survey period, the longest straight line distance between the furthest two posts visited by an individual was 118 km, travelled by the male wolverine WV057 between the north and south study grids. Within a single study grid, the longest straight line distance travelled by an individual across the entire survey period was 30.2 km (male WV432S, south study grid). Given the topography and presence of waterbodies between many of the cells, the actual distances travelled between hair collection stations are likely considerably higher.

Table 4.4-3. Summary of Distances Travelled and Minimum Area Used for Wolverines Detected Among Multiple Hair Collection Posts, 2012

Parameter	Sex	Average Distance Travelled or Area Used	Range of Distance Travelled or Area Used
Distance travelled during a check	Female	16.6 km	4.6 – 47.0 km
	Male	35.4 km	5.1– 140.2 km
Area used during entire survey period	Female	79.9 km^2	18.0 – 126.0 km^2
	Male	415.2 km^2	54 – 1,852.6 km^2

A total of 11 individuals, including 6 males and 5 females, were recorded at three or more hair collection posts throughout the survey period. Minimum convex polygons were developed for these individuals, seven of which were located within the south study grid, three within the north study grid, and one (belonging to WV057) spanned the north and south study grids (Figures 4.4-3 and 4.4-4).

Minimum recorded area estimates for individual wolverines (represented by minimum convex polygons) ranged from 18 km^2 to 1,853 km^2, with an average area of 263 km^2 (Appendix 9). Male wolverines had larger areas of use than females; the average size of minimum convex polygons for females was 80 km^2, compared to 415 km^2 for those developed for males (Table 4.4-3). The relatively large minimum area recorded in 2013 (1,853 km^2) was primarily a result of male WV057 travelling between the two study grids. Minimum areas used by wolverines within a single study grid ranged from 18 km^2 to 260 km^2, with an average area of 104 km^2.

There were several cases where minimum convex polygons overlapped with each other. The largest spatial overlap in the south study grid was 102 km^2 between a male (WV155) and a female (WV172; Appendix 9). The largest overlap in the north study grid was a male (WV057) and a female (WV183N), constituting 100 km^2 of overlap (Appendix 9). Cell 40S in the south study grid had three intersecting minimum convex polygons (two male and one female), and Cell 39N in the north study grid had three intersecting minimum convex polygons between two males and one female (Figures 4.4-3 and 4.4-4).

PROJECT # 0194096-0005 GIS # BAC-23-304 February 05 2014

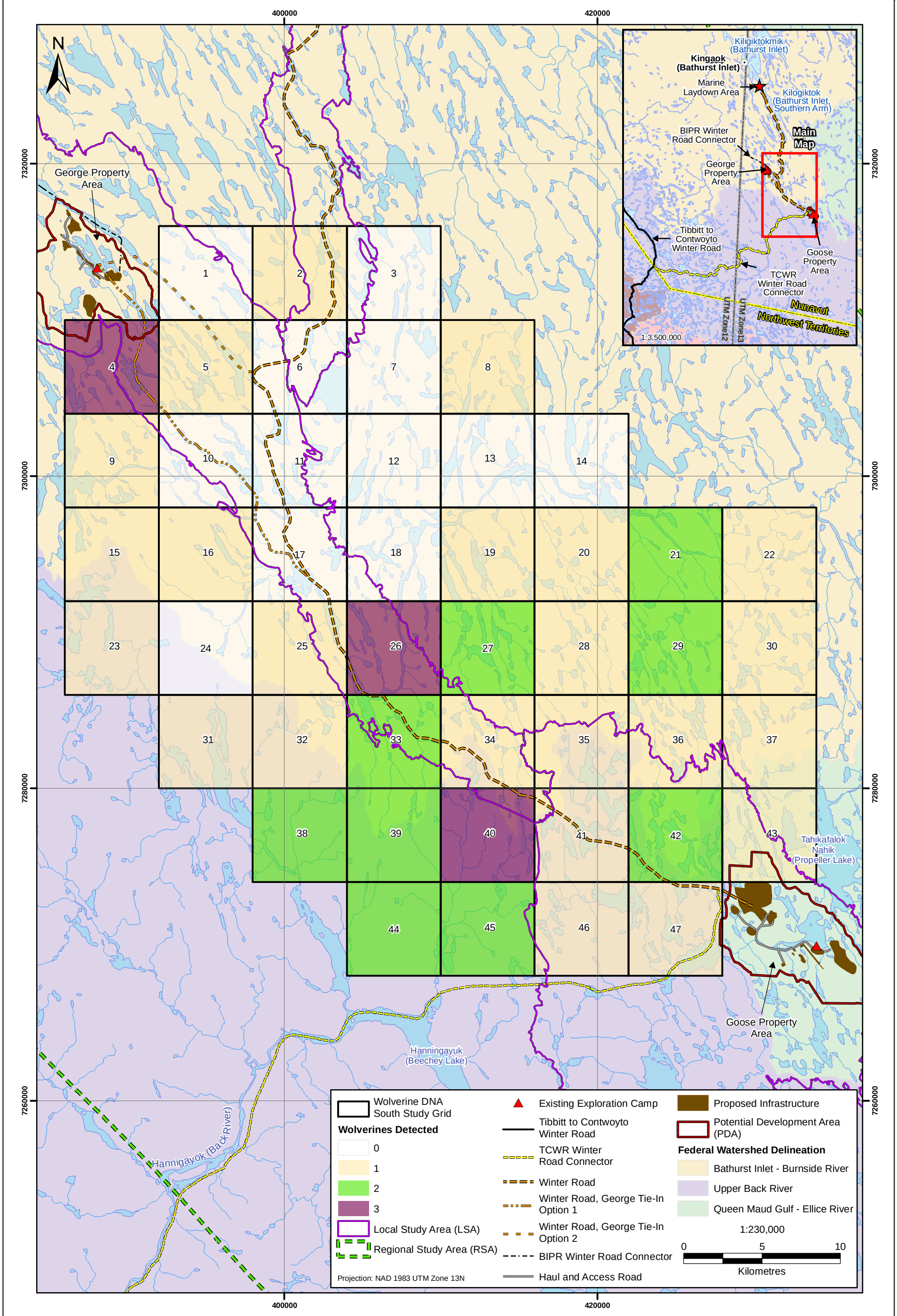


Figure 4.4-1

Sabina GOLD & SILVER CORP.

Capture Frequency of Individual Wolverine in the South Study Grid, 2013

Figure 4.4-1

Rescan an ERM company

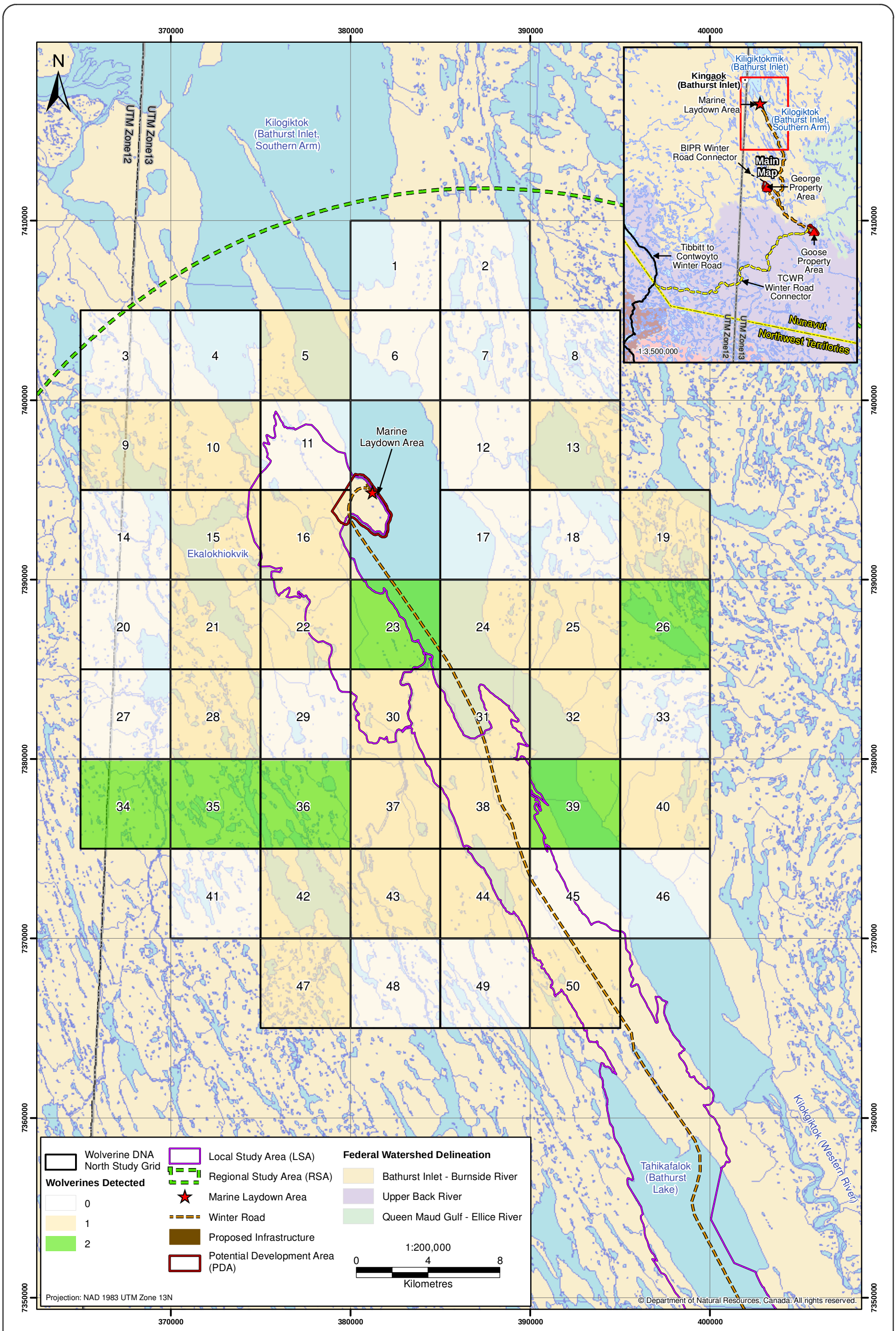


Figure 4.4-2

Sabina GOLD & SILVER CORP.

Capture Frequency of Individual Wolverine in the North Study Grid, 2013

Figure 4.4-2

Rescan an ERM company

PROJECT # 0194096-0005 GIS # BAC-23-305 February 05 2014

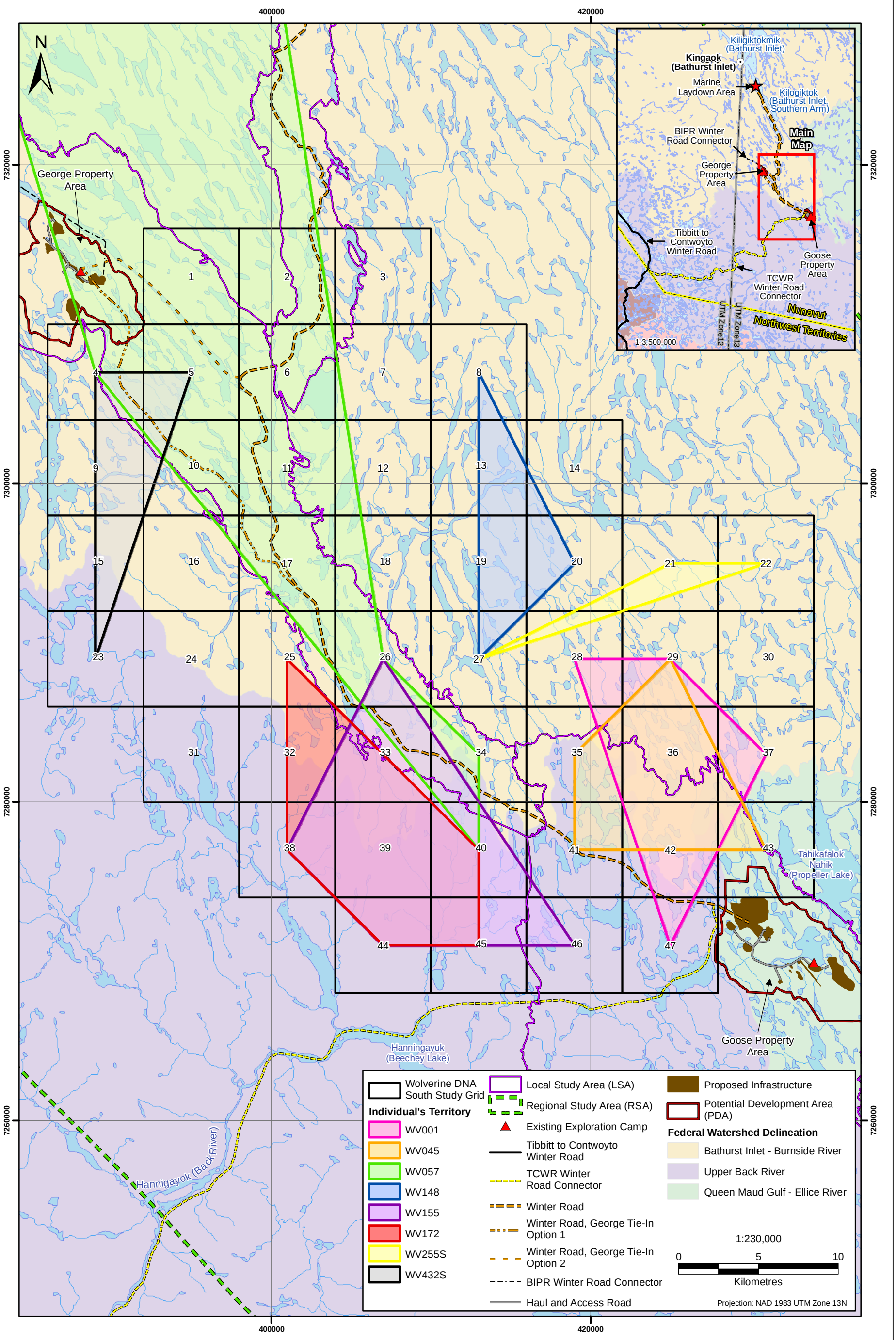


Figure 4.4-3

Sabina GOLD & SILVER CORP.

Minimum Area Used by Individual Wolverines in the South Study Grid, 2013

Figure 4.4-3

Rescan an ERM company

PROJECT #0194096-0005 GIS # BAC-23-302 February 04 2014

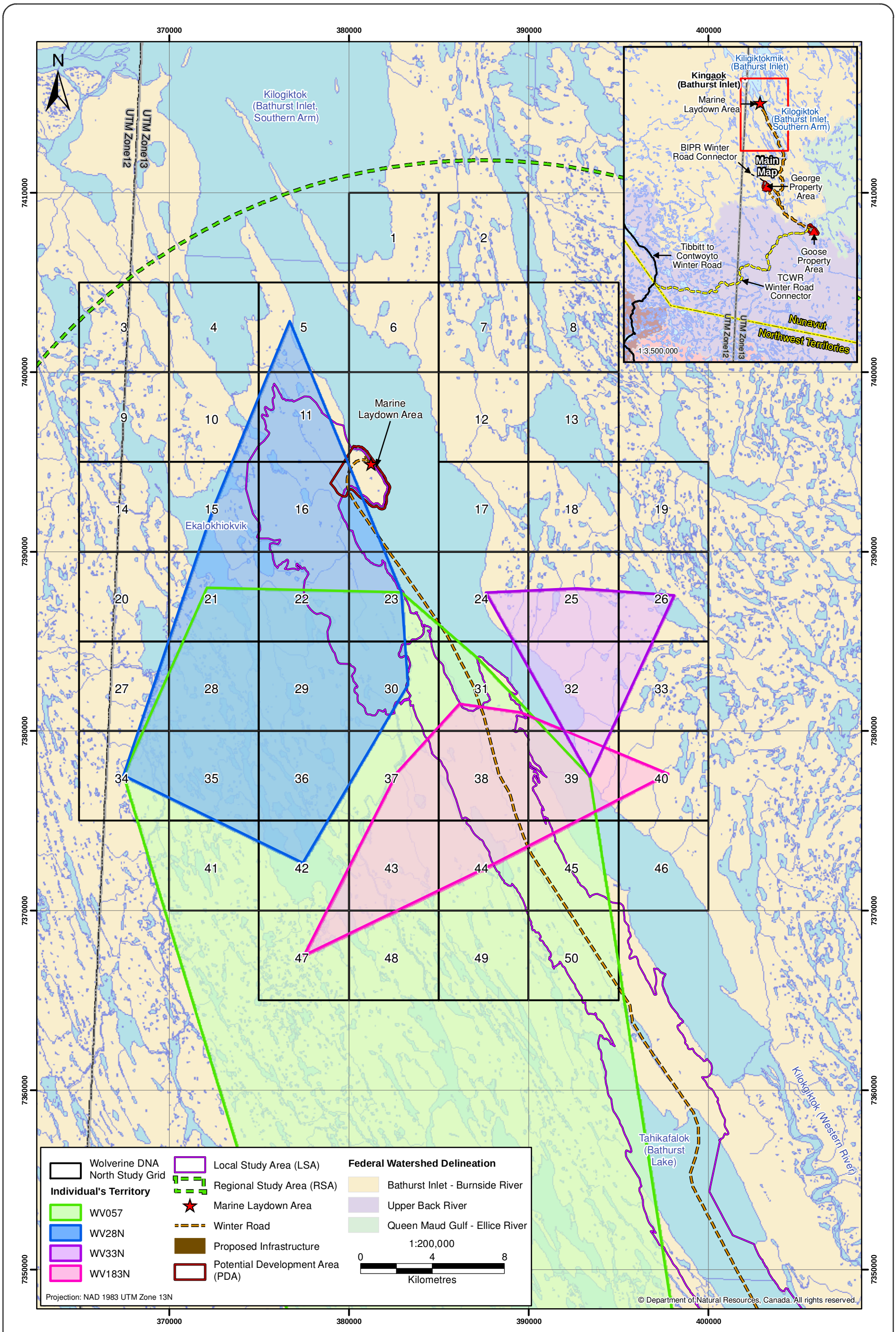


Figure 4.4-4

Sabina GOLD & SILVER CORP.

Minimum Area Used by Individual Wolverines in the North Study Grid, 2013

Figure 4.4-4

Rescan an ERM company

4.4.3 Population Analysis, 2012 and 2013

An estimate for the overall super-populations of wolverine using the northern and southern study areas could not be conducted because an insufficient number of wolverine were captured and recaptured for reliable estimates. Precise population estimates are dependent on initial capture and subsequent recapture probabilities, and with few individuals and capture events, these parameters are difficult to calculate reliably.

4.4.4 Remote Camera and Incidental Observations

4.4.4.1 Remote Camera Detections

Cameras were placed in four cells in the south study grid (Cells 04S, 05S, 10S, and 41S) and in one cell in the north study grid (Cell 16N; Figures 4.3-1 and 4.3-2). Remote digital images of wolverines were recorded at four of the five remote digital cameras set up at hair collection posts (Table 4.4-4; Appendix 10). Cameras in Cells 04S and 41S detected the most wolverines compared with all other cameras, and the camera in Cell 05S did not record any photos of wolverine. These findings are consistent with DNA results which indicated that Cell 04S had one of the highest number of wolverine captures across the study grid (Figure 4.4-1).

Table 4.4-4. Comparison of Wolverine Detected by Remote Cameras Deployed At Hair Collection Posts and Individuals Identified through DNA Analysis, 2013

Camera ID	Cell	No. Wolverine Observed On Camera	No. Wolverine Climbing Post	Hair Collected?	No. Wolverines Identified through DNA Analysis
Check No.1					
6	10S	-	-	No	-
7	04S	2	2	Yes	1 (WV432S)
8	05S	-	-	Yes	-
19	41S	6	2	No	-
27	16N	2	1	No	-
Check No. 2					
6	10S	-	-	No	-
7	04S	1	1	Yes	1 (WV432S)
8	05S	-	-	No	-
19	41S	1	1	Yes	1 (WV045)
27	16N	1	1	Yes	1 (WV28N)
Check No.3					
6	10S	2	-	No	-
7	04S	4	2	Yes	2 (WV007, WV057)
8	05S	-	-	Yes	1 (WV432S)
19	41S	2	1	Yes	-
27	16N	-	-	No	-

A total of 21 wolverine photo series were detected whereby wolverines were observed approaching a post, although only 12 of these events resulted in a wolverine climbing the DNA post with the possibility of leaving a hair sample throughout all check periods (Table 4.4-4; Plate 4.4-1). The highest number of observations was recorded during the time period spanning the time between when posts were set up, and the first check. During this time period there were ten instances where a wolverine

was captured on images of the wolverine DNA post recorded by the camera, eight of which the wolverine also interacted (climbed) with the DNA post. The time period spanning the second and third check had eight instances where a wolverine was recorded on images of a DNA post; in three of these instances the wolverine also interacted with the DNA post. All observations were of adult wolverines only. Wolverine pups were likely still in their natal dens.

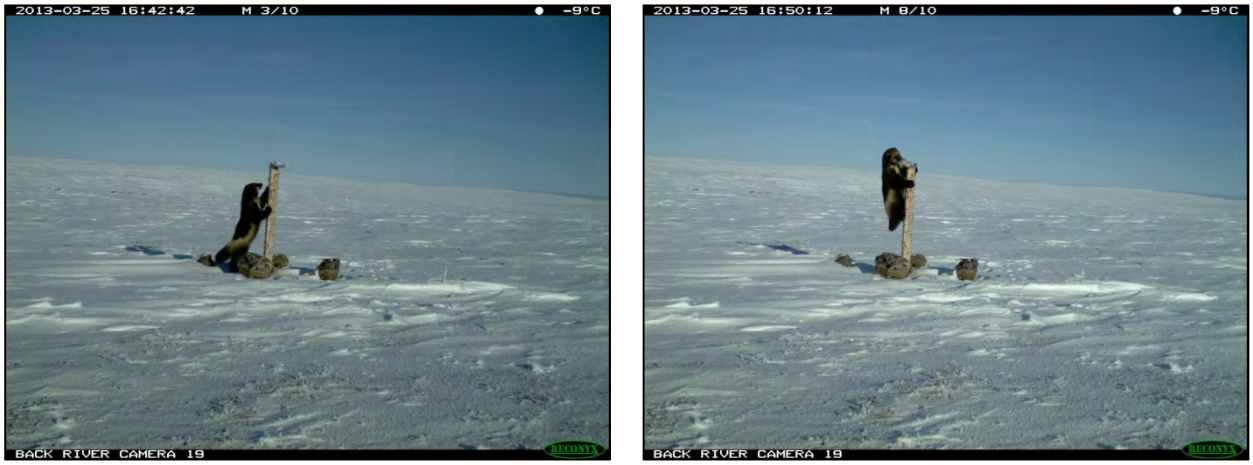


Plate 4.4-1. Wolverine climbing post and taking food reward at Post 41S just shortly after post deployment (March 25).

The cameras confirmed that in most cases (66%) the same number of wolverines that climbed the posts were identified by DNA samples, 25% were over-reported, and 6% were underreported. The one instance where wolverine numbers were underreported was at the camera in Cell 05S. This camera was often impaired by fog or snow for long periods of time and thus, may have missed wolverine activity.

Grey wolves (n=3), red fox (n=7), and Arctic fox (n=10) were the only other carnivores detected by remote digital cameras during the wolverine DNA study. Observations of fox species captured by remote camera were spread throughout the study period, but grey wolves were only recorded after the first check.

4.4.4.2 Den Locations in and near the RSA

An active wolverine den was observed within the "Goose Neck" of Goose Lake during the deployment of wolverine posts in the south study grid in March, 2013. This den site was first documented in 2012 (refer to Figure 4.4-5 in Rescan 2013a for the location) and the site was re-checked for activity in 2013 during set up of the wolverine posts. The wolverine den was confirmed occupied with one adult and one juvenile, both of which were observed on the Goose Property Area early in 2013. Many wolverine tracks belonging to adult and juvenile wolverine were also visible in the snow leading to the den entrance, and on several occasions during the wolverine DNA study, an adult wolverine was observed at the den site.

4.4.4.3 Incidental Wolverine Sightings in the RSA

Seven wolverines were observed during baseline field surveys conducted in 2013, including six adults and one juvenile. Two of these individuals (one adult and one juvenile) were recorded at the active den located within the Goose Neck. The remaining wolverines were recorded as single individuals during May (remote camera study and raptor survey; four individuals) and in August (remote camera survey; 2 individuals).

4.5 DISCUSSION

4.5.1 Wolverine DNA Analysis

Wolverine baseline studies at the Back River Project were conducted from late March to early May, 2013. DNA analyses of collected hair samples identified 19 individual wolverines (8M:11F), which is higher than that recorded in 2012 (12 individuals). However, a larger study area encompassing the north and south study grids was used in 2013, which may account for the larger number of individuals recorded.

Wolverine capture frequencies were the highest in the south study grid, with three-quarters of all cells (35 of 47) recording one, two, or three wolverine across the study period. By comparison, capture frequencies were lower in the north study grid, with just over half (29 of 50) cells capturing from one to two wolverine during the study. Spatially, the cells with the highest capture frequencies (three separate wolverine) were located within the northern, central, and southwestern portion of the south study grid. It is not clear why these areas were more frequently occupied by individuals than other cells, but limitations such as food availability, suitable denning habitat, and/or overall habitat quality are likely contributing factors.

Between the two years of study (2012 and 2013), a total of 23 unique individuals (12M, 11F) have been recorded, of which fifteen were recorded in the south study grid (8M:7F), seven (3M:4F) in the north study grid, and one male within both grids. Although it appears that more wolverine are present in the south between the Goose and George Property Areas compared to the north study grid, two years of study have been conducted in the south grid, and only one year of study conducted in the north. Thus, this trend in abundance should be interpreted with caution as the lower number of wolverine recorded in the north may be an artefact of a lower sampling effort.

Given the wolverine study area (north study grid and south study grid) does not represent a geographically closed population, a density estimate could not be generated for the study grids. Wolverine densities in Nunavut are reported to be low to moderate, with an estimated abundance of 2,000-2,500 resident wolverines (Slough 2007). In comparison to higher density areas throughout the Northwest Territories and Yukon (Slough 2007), the area surrounding the Back River Project does appear to support a moderately sized wolverine population. For example, Mulders, Boulanger, and Paetkau (2007) estimated a density of 17.2/1,000 km^2 individuals in Arctic habitat in the NWT, and Golden et al. (2007) derived a density estimate of 9.8/1,000 km^2 in northern Yukon, both of which appear to be higher than the apparent abundance found at the Back River Project. If the Back River Project wolverine study area population was closed then density would be 7.1/1,000km^2 in the south study grid and 4.4/1,000 km^2 in the north study grid. These estimates are biased to be low as detection of individuals is incomplete due to potentially lower DNA extraction rates with wolverine hair. In many instances, wolverine only leave strands of hair rather than large clumps, thus reducing the chance of samples containing sufficient number of hair roots for DNA extraction. However, wolverine density is expected to be lower in Arctic tundra habitat compared to taiga and mountain areas because of decreased food resources. Seasonal pulses of food in tundra habitats from migratory birds and carrion left by other top carnivores can sustain local wolverine populations (Samelius et al. 2002; Slough 2007).

4.5.2 Wolverine Movements in the DNA Study Grids

Individuals that were detected at multiple post sites had linear movement distances ranging from 5 km to 140 km, and an average minimum use area of approximately 104 km^2 (without male WV057 who travelled between study grids) and 263 km^2 (including male WV057).

Wolverines occupying tundra habitat in Nunavut and the Northwest Territories have been reported to have long-range dispersal movements (Mulders 2000) and thus high movement rates (Inman et al. 2012). Average daily movement rates of 1.3 km^2-hr have been documented, which equate to a wolverine traversing the width of their home range every two days (Inman et al. 2012). Home range sizes of both sexes were also found to be large, with estimates of 126 km^2 for females and 404 km^2 for males (Mulders 2000). Minimum areas used by wolverines in 2013 in the Back River Project study grids are generally much smaller than those recorded by Mulders (2000), though estimates are not from satellite tracking collars which would permit for more precise movement data. However, the minimum area used by male WV057 is two-fold bigger than that recorded for males by Mulders (2000), though the precise movement of this individual between the north and south study grid cannot be ascertained with the current data. This individual traveled a minimum of 140 km between the south and north study grid in the time period around Check 2, and returned the same approximate distance to the south study grid by the time of Check 3 (within the south study grid). Since no other wolverine detected in the study had movements similar to WV057, these large scale movements are expected to be rare among the wolverine population at the Back River Project.

4.5.3 Population Analysis

Several factors may account for the low number of detections, such as trap avoidance, inability to climb the posts, insufficient baits or lures, sampling posts being located in lower quality habitat, loss of samples due to wind or other weather events, and inappropriate timing for sampling. The sampling protocols used in this study followed those of a long-term wolverine hair sampling program in the central barrens of the Northwest Territories (Mulders, Boulanger, and Paetkau 2007). The main difference between the two studies was the choice of cell size within the sampling grid. Mulders, Boulanger, and Paetkau (2007) used a 3x3 km cell size, whereas a 6x6 km grid was chosen for the Back River Project study to maximize the study area. Results from a wolverine program approximately 200 km west of the Back River Project that used a 5x5 km cell size (K. Poole, unpublished data) had a detection rate and density estimate similar to that obtained by Mulders, Boulanger, and Paetkau (2007). Power analyses presented at a technical wildlife workshop in Yellowknife November 25-29, 2013 concluded that sufficient detection rates and reliable wolverine population estimates could be obtained on a grid with cell sizes of 5x5 km (J. Boulanger, pers. comm., Yellowknife 2013). It is unlikely that significant differences in detection rates would occur between 5x5 km and 6x6 km grid cell sizes given the large home ranges and movement rates of wolverine relative to these cell sizes.

The low detection rates may more likely reflect low densities of wolverine in the Back River Project region. Both the northern and southern study areas were approximately 1,800 km^2 in size. In comparison, on three adjacent study areas in the central Arctic of the Northwest Territories, Boulanger and Mulders (2007) detected as many as 38 wolverine at Daring Lake (2,556 km^2), 24 on the Diavik study area (1,269 km^2), and 21 on the Ekati study area (1,062 km^2). These numbers were comparable to the number of individuals detected in the western Kitikmeot (K. Poole, unpublished data). The central Arctic and western Kitikmeot study areas have ready and abundant access to caribou throughout the year, which may partially explain differences in wolverine densities. The Back River Project terrestrial RSA does not overlap with the seasonal ranges or migration routes of the Bathurst herd, and only marginally overlaps a portion of the summer range of the Beverly herd. In a wolverine study on the east side of Bathurst Inlet, a total of 11 wolverine were detected over two years of sampling on a 925 km^2 study area (Rescan, 2011 unpublished data). Similar to the Back River Project region, caribou are not abundant in area where wolverine studies were conducted, and typically, only individuals of the Dolphin-Union herd are occasionally observed. While wolverine can exploit a diverse diet, caribou has been found to be the primary food item in the central Arctic year round (Mulders 2000).

4.5.4 Remote Cameras and Incidental Observations

In most cases, the remote digital camera data confirmed that DNA posts were recording the instances where individuals visited a post. Possible explanations for the discrepancies between the number of wolverine observed climbing posts (by camera) and the number of individuals identified through DNA analysis include the possibility that wolverines detected at remote cameras and recorded as unique individuals may have been repeat observations of the same animal at the same camera or at multiple cameras. In addition, the hair samples that were collected may have been inadequate for DNA analysis, such that they did not contain enough genetic material to identify individuals or failed during laboratory analysis (Section 4.4.3). This may have been the case for Cell 41S during the third check, where wolverine activity was recorded at the post and hair samples were collected, but no individual was positively identified (Table 4.4-2).

Digital camera data typically did not allow one to differentiate between individual wolverines unless a visible diagnostic feature was present on an individual. As a result, implementing remote cameras as a QA/QC method still cannot completely confirm if multiple individuals visit a post or not and the number of individuals that actually leave behind a hair sample. Remote cameras are most accurate at validating DNA data when one unique hair sample(s) is associated with one picture series. Nonetheless, remote digital camera data may still be an effective method to be used in conjunction with bait posts as it serves to validate the DNA data in most cases, but it also contributes supplementary information on wolverine behaviour, temporal activity patterns, and identifies individuals that fail to climb a post that would otherwise go undetected.

Incidental observations during baseline studies identified one active wolverine den site within the Goose Property Area. This site was also active in 2012, indicating that is likely reused on an annual basis as a natal or maternal den. Wolverines may use two types of dens for reproduction – natal dens, where the young are born, and maternal dens, where the mother may move the kits if the conditions at the natal den are no longer suitable (Magoun and Copeland 1998). Annual reoccupation of den sites, or use of alternate denning locations separated by a few kilometers between years, has been well documented (Lee and Niptanatiak 1996; Magoun and Copeland 1998). The den site located in the Goose Neck of Goose Lake, is in the vicinity of existing and proposed site infrastructure at the Goose Property Area.

A total of seven wolverines were incidentally observed recorded in 2013, most of which occurred in early 2013 (April and May). Incidental observations of individual wolverines are useful data as they provide information on the spatial and temporal distribution of individuals; however, they must not be solely relied upon as they are a poor reflection of population status. For example, a single individual may be incidentally recorded on multiple occasions and often only those animals that are close to mine infrastructure are likely to be observed.

References

References

Apps, C. D. 2010. *Grizzly bear population inventory and monitoring strategy for British Columbia*. Victoria, British Columbia.

Apps, C. D. and B. N. McLellan. 2006. Factors influencing the dispersion and fragmentation of endangered mountain caribou populations. *Biol Conservat*, 130 (1): 84-97.

Banci, V. 1994. Wolverine. In *The Scientific Basis for Conserving Forest Carnivores: American marten, fisher, lynx, and wolverine in the Western United States*. Eds. L. F. Ruggiero, K. B. Aubry, S. W. Buskirk, L. J. Lyon, and W. J. Zielinski. 99-127. Ft. Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 184. General Technical Report RM- 254.

Boulanger, J., B. N. McLellan, J. G. Woods, M. F. Proctor, and C. Strobeck. 2004. Sampling design and bias in DNA-based capture-mark-recapture population and density estimates of grizzly bears. *Journal of Wildlife Management*, 68 (3): 457-69.

Boulanger, J. and R. Mulders. 2007. *Analysis of 2005 and 2006 Wolverine DNA Mark-Recapature Sampling at Daring Lake, Ekati, Diavik, and Kennedy Lake, Northwest Territories. Draft-October 1, 2007*. Integrated Ecological Design.: Nelson, B.C.

Boulanger, J., G. C. White, B. N. McLellan, J. G. Woods, M. F. Proctor, and S. Himmer. 2002. A meta-analysis of grizzly bear DNA mark-recapture projects in British Columbia. *Ursus*, 13: 137-52.

CESCC. 2010. *Wild Species 2010: The General Status of Species in Canada*. Canadian Endangered Species Conservation Council. http://www.wildspecies.ca/searchtool.cfm?lang=e (accessed November 2011).

COSEWIC. 2003. *COSEWIC assessment and update status report on the wolverine Gulo gulo in Canada*. Committee on the Status of Endangered Wildlife in Canada: Ottawa, ON.

Environment Canada. 2000. *Terrestrial Ecozones and Ecoregions of Canada*. Environment Canada. www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taishdwe.cfm. (accessed November, 2011).

Gau, R. J. 1998. Food habits, body condition, and habitat of the barren-ground grizzly bear. M.Sc. diss., University of Saskatchewan, Saskatoon, Saskatchewan, Canada.

Golden, H., J. D. Henry, E. F. Becker, M. I. Goldstein, J. M. Morton, D. Frost, Sr., and A. J. Poe. 2007. Estimating wolverine population size using quadrat sampling of tracks in snow. *Wildlife Biology*, 13: 52-61.

Higuchi, R., C. H. von Beroldingen, G. F. Sensabaugh, and H. A. Erlich. 1988. DNA typing from single hairs. *Nature*, 332: 543–46.

Inman, R. M., A. J. Magoun, J. Persson, and J. Mattisson. 2012. The wolverine's niche: linking reproductive chronology, caching, competition, and climate. *Journal of Mammology*, 93 (3): 634-44.

Kendall, W. L. 1999. Robustness of closed capture-recapture methods to violations of the closure assumption. *Ecology*, 80: 2517-25.

Kendall, W. L. 1999. Robustness of closed capture-recapture methods to violations of the closure assumption. *Ecology*, 80: 2517-25.

Lee, J. and A. Niptanatiak. 1996. Observation of repeated use of a wolverine, *Gulo gulo*, den on the tundra of the Northwest Territories. *Canadian Field Naturalist*, 110: 349-50.

Mace, R. D., T. L. Manley, and K. E. Aune. 1994. Estimating grizzly bear population size using camera sightings. *Wildlife Society Bulletin* 22: 74-83.

Magoun, A. J. and J. P. Copeland. 1998. Characteristics of wolverine reproductive den sites. *The Journal of Wildlife Management*, 62: 1313-20.

McLoughlin, P. D., R. L. Case, R. J. Gau, S. H. Ferguson, and F. Messier. 1999. Annual and Seasonal Movement Patterns of Barren-Ground Grizzly Bears in the Central Northwest Territories. *Ursus*, 11: 79-86.

McLoughlin, P. D., H. D. Cluff, R. J. Gau, R. Mulders, R. L. Case, and F. Messier. 2003. Effect of spatial differences in habitat on home ranges of grizzly bears. *Ecoscience*, 10 (1): 11-16.

McLoughlin, P. D. and F. Messier. 2001. *The Demography of Barren-ground Grizzly Bears (Ursus Arctos) in Nunavut and the Northwest Territories*. Prepared for the Government of the Northwest Territories Department of Resources, Wildlife, and Economic Development by the University of Saskatchewan, Department of Biology: Yellowknife, NT.

Miller, S. D., G. C. White, R. A. Sellers, H. V. Reynolds, J. W. Schoen, K. Titus, V. G. J. Barnes, R. B. Smith, R. R. Nelson, W. B. Ballard, and C. C. Schwartz. 1997. Brown and black bear density estiation in Alaska using radiotelemetry and replicated mark-resight techniques. *Wildlife Monographs*, 133: 3-55.

Miller, S. D., G. C. White, R. A. Sellers, H. V. Reynolds, J. W. Schoen, K. Titus, V. G. J. Barnes, R. B. Smith, R. R. Nelson, W. W. Ballard, and C. C. Schwartz. 1997. Brown and black bear density estimation in Alaska using radiotelemetry and replicated mark-resight techniques. *Wildlife Monographs*, 133:

Mowat, G. and C. Strobeck. 2000. Estimating population size of grizzly bears using hair capture, DNA profiling, and mark-recapture analysis. *Journal of Wildlife Management*, 64 (1): 183-93.

Mulders, R. 2000. *Wolverine Ecology, Distribution, and Productivity in the Slave Geological Province*. Final report to the West Kitikmeot / Slave Study Society:

Mulders, R., J. Boulanger, and D. Paetkau. 2007. Estimation of population size for wolverines *Gulo gulo* at Daring Lake, Northwest Territories, using DNA based mark-recapture methods. *Wildlife Biology*, 13 (Suppl.2): 38-51.

NRC. 2007. *Forest Ecosystems of Canada*. Natural Resources Canada. http//ecosys.cfl.scf.rncan.gc.ca/classification/classif08-eng.asp (accessed October, 2010).

Paetkau, D. 2003. An empirical exploration of data quality in DNA-based population inventories. *Molecular Ecology*, 2003 (12): 1375-87.

Paetkau, D. 2003. An empirical exploration of data quality in DNA-based population inventories. *Molecular Ecology*, 12 (6): 1375-87.

Paetkau, D., L. P. Waits, P. L. Clarkson, L. Craighead, E. Vyse, R. Ward, and C. Strobeck. 1998. Variation in Genetic Diversity across the Range of North American Brown Bears. *Conservation Biology*, 12 (2): 418-29.

Persson, J., P. Wedholm, and P. Segerstrom. 2010. Space use and territoriality of wolverines (Gulo gulo) in northern Scandinavia. *European Journal of Wildlife Research*, 56 (1): 49-57.

Poole, K. G., G. Mowat, and D. A. Fear. 2001. DNA-based population estimate for grizzly bears Ursus arctos in northeastern British Columbia, Canada. p105-15. On file with BC Geological Survey, Ministry of Energy, Mines, and Petroleum Resources.

Proctor, M. F., C. Servheen, S. D. Miller, W. F. Kasworm, and W. L. Wakkinen. 2005. Genetic analysis reveals demographic fragmentation of grizzly bears yielding vulnerably small populations. *Proceedings of the Royal Society Bulletin* 272: 2409-16.

Rescan. 2011a. *Back River and Hackett River Projects: 2010 Caribou and Muskox Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, British Columbia.

Rescan. 2011b. *Doris North Gold Mine Project: Interim Grizzly Bear DNA Report, 2011*. Prepared for Hope Bay Mining Limited by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2011c. *Doris North Project: Wildlife Mitigation and monitoring program, 2011*.

Rescan. 2012. *Back River Project: Wildlife Baseline Report 2011*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013a. *Back River Project: 2012 Grizzly Bear and Wolverine DNA Baseline Report*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC.

Rescan. 2013b. *Back River Project: Wildlife Baseline Report 2012*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013c. *Back River Project: Wolverine and Grizzly Bear DNA Report 2012*. Prepared for Sabina Gold and Silver Corp. by Rescan Environmental Services Ltd: Vancouver, BC.

Rescan. 2013d. *Ekati Diamond Mine: 2013 Grizzly Bear DNA Report*. In prep. Prepared for Dominion Diamond Ekati Corporation by Rescan Environmental Services Ltd: Yellowknife, NWT.

Rescan. 2014. *Back River Project: Wildlife Baseline Report 2013*. Prepared for Sabina Gold & Silver Corp. by Rescan Environmental Services Ltd.: Vancouver, BC (In Prep).

Royle, J. A., A. J. Magoun, B. Gardner, P. Valkenburg, and R. E. Lowell. 2011. Density estimation in a wolverine population using spatial capture-recapture models. *The Journal of Wildlife Management*, 75 (3): 604-11.

Samelius, G., R. T. Alisauskas, S. Lariviere, C. Bergman, C. J. Hendrickson, K. Phipps, and C. Wood. 2002. Foraging behaviours of wolverines at a large arctic goose colony. *Arctic*, 55 (2): 148-50.

Slough, B. 2007. Status of the wolverine Gulo gulo in Canada. *Wildlife Biology*, 13: 76-82.

Strong, W. and S. C. Zoltai. 1989. *Ecoclimatic regions of Canada: first approximation*. Ecoregions Working Group of the Canada Committee on Ecological Land Classification. Ecological Land Classification and Sustainable Development Branch, Canadian Wildlife Service, Environment Canada: Ottawa, ON.

Thorpe, N. L., N. Eyegetok, N. Hakongak, and Qitirmuit Elders. 2001. *The Tuktu and Nogak Project: a caribou chronicle*. Final Report of the West Kitikmeot Slave/Study Society: Yellowknife, NT.

White, G. C., D. R. Anderson, a. K. P. Burnham, and D. L. Otis. 1982. *Capture-recapture and removal methods for sampling closed populations*. Los Alamos National Laboratories: Los Alamos, NM.

Woods, J. G., D. Paetkau, D. Lewis, B.N. McLellan, a. M. Proctor, and C. Strobeck. 1999. Genetic tagging of free-ranging black and brown bears. *Wildlife Society Bulletin*, 27: 616–27.

Personal Communication

M. Dumond, GN-DOE, pers. comm., 2010.

Map Pocket

Rescan™
an ERM company

Individual Grizzly Bears at Hair Snag Locations, 2013

Figure 3.4-2

Sex
- Female
- Male
- Individual Bear's Movement

Session Number
- 1
- 2
- 3
- 4
- 5
- 6
- Back River Project Grizzly Bear DNA Study Area
- Adjacent Grizzly Bear DNA Study Area
- Marine Laydown Area
- Existing Exploratrion Camp

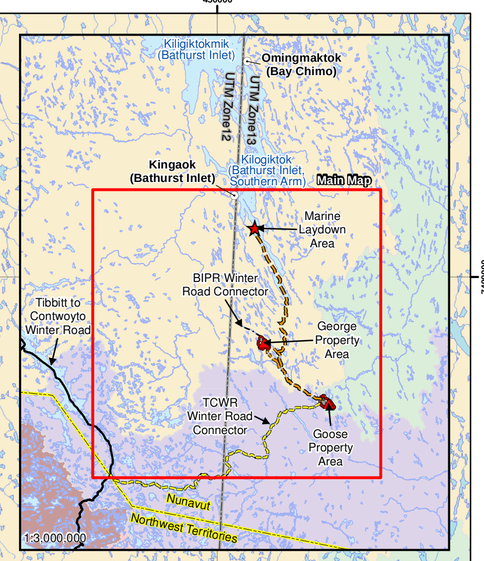
- Tibbitt to Contwoyto Winter Road
- TCWR Winter Road Connector
- Winter Road
- Winter Road, George Tie-In Option 1
- Winter Road, George Tie-In Option 2
- BIPR Winter Road Connector
- Haul and Access Road
- Proposed Infrastructure
- Potential Development Area (PDA)

Federal Watershed Delineation
- Bathurst Inlet - Burnside River
- Upper Back River
- Queen Maud Gulf - Ellice River

1:350,000
0 10 20
Kilometres

GIS #.: BAC-23-308
Date: June 03, 2014
Proejct: 0234411-0004
Projection: NAD 1983 UTM Zone 13N

Sabina GOLD & SILVER CORP. | Rescan an ERM company



© Department of Natural Resources. Canada. All rights reserved.

Appendix 1

Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Rescan™
an ERM company

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
1	sample	1	P1-1a	1	H6	6/6/2012	Posts weren't baited prior to check 1.	8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
2	Xsubselect		P2-1a	1	H6	6/6/2012		0											
3	sample	1	P2-1b	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
4	Xsubselect		P2-2a	1	H6	6/6/2012		0											
5	sample	1	P2-2b	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
6	Xsubselect		P2-2c	1	H6	6/6/2012		0											
7	sample	1	P2-3a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
8	sample	1	G-1a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
9	sample	1	G-2a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
10	sample	1	G-3a	1	H6	6/6/2012		8	152.160	151.153	183.186	221.223	186.190	210.212	153.161				250.250
11	Xinadequate		P1-1a	1	H32	6/7/2012		0											
12	sample	12	P1-2a	1	H32	6/7/2012		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161				204.250
13	sample	13	P1-3a	1	H32	6/7/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
14	Xinadequate		P2-1a	1	H32	6/7/2012		0											
15	sample	13	G-1a	1	H32	6/7/2012		8	152.160	149.155	178.186	231.231	190.190	210.214	155.155				250.250
16	sample	16	P1-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
17	Xbomb		P1-2a	1	H40	6/7/2012		2	40.40	149.149			190.190	210.14	55.155				50.50
18	sample	16	P2-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
19	Xsubselect		P2-1b	1	H40	6/7/2012		0											
20	sample	16	P2-2a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
21	sample	16	P2-3a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				204.250
22	sample	22	P3-1a	1	H40	6/7/2012		8	140.160	149.149	174.184	221.233	186.190	208.210	155.161				250.250
23	Xbomb		P1-1a	1	H20	6/8/2012		0					80.80						50.250
24	sample	24	P1-2a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
25	Xsubselect		P1-2b	1	H20	6/8/2012		0											
26	sample	24	P1-3a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
27	sample	24	P1-4a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
28	Xsubselect		P1-5a	1	H20	6/8/2012		0											
29	sample	24	P1-5b	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
30	sample	24	P2-1a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
31	Xsubselect		P2-1b	1	H20	6/8/2012		0											
32	Xsubselect		P2-2a	1	H20	6/8/2012		0											
33	sample	24	P2-3a	1	H20	6/8/2012		8	160.160	149.149	184.186	221.233	186.190	210.210	155.165				250.250
34	Xinadequate		P1-1a	2	H32	6/19/2012		0											
35	sample	35	P2-1a	2	H32	6/19/2012		8	152.160	149.151	176.178	231.231	190.196	210.214	151.155				250.250
36	Xinadequate		G-1a	2	H32	6/19/2012		0											
37	Xinadequate		P3-1a	2	H32	6/19/2012		0											
38	sample	38	P1-1a	2	H43	6/20/2012		8	152.160	159.159	172.176	231.233	190.196	210.210	141.153				204.250
39	Xsubselect		P1-1b	2	H43	6/20/2012		0											
br2121	Xsubselect		P3-2a	1	B10	6/11/2013		0											
br2122	sample	br696	P3-2b	1	B10	6/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2123	Xsubselect		P3-2c	1	B10	6/11/2013		0											
br2124	Xsubselect		P3-2d	1	B10	6/11/2013		0											
br2125	sample	br696	P3-2	1	B10	6/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2126	Xsubselect		P3-2f	1	B10	6/11/2013		0											
br2127	Xsubselect		P3-2g	1	B10	6/11/2013		0											
br2128	Xsubselect		P3-2h	1	B10	6/11/2013		0											
br2129	sample	br696	P3-2i	1	B10	6/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2130	Xsubselect		G-1	1	B10	6/11/2013		0											
br2131	Xbomb		G-2	1	B10	6/11/2013		1	140.58	151.153			86.90	10.10	61.61				
br2132	Xsubselect		G-3	1	B10	6/11/2013		0											
br2133	sample	br365	P1-1a	1	B12	6/11/2013		9	140.152	159.161	176.184	221.233	186.190	208.210	155.161			229.249	250.250
br2134	Xsubselect		P1-1b	1	B12	6/11/2013		0											
br2135	Xsubselect		P1-1c	1	B12	6/11/2013		0											
br2136	Xsubselect		P1-1d	1	B12	6/11/2013		0											
br2137	sample	hr698	P1-1	1	B12	6/11/2013		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155			223.249	204.250
br2138	Xinadequate		P2-1a	1	B12	6/11/2013		0											
br2139	Xsubselect		P3-1a	1	B12	6/11/2013		0											
br2140	Xbomb		P3-1b	1	B12	6/11/2013		0		53.159.161			86.90						
br2141	Xsubselect		P3-1c	1	B12	6/11/2013		0											
br2142	sample	br195	P1-1a	1	B18	6/11/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br2143	Xbomb		P1-2a	1	B18	6/11/2013		2		149.51.53		21.23.231	186.190	10.210	151.161				04.250
br2144	Xbomb		P1-2b	1	B18	6/11/2013		4	152.58.60	151.151		21.23.231	186.190	210.210	151.161			29.229	
br2145	Xsubselect		P1-2c	1	B18	6/11/2013		0											
br2146	Xinadequate		P1-2d	1	B18	6/11/2013		0											
br2147	Xinadequate		P1-2	1	B18	6/11/2013		0											
br2148	sample	br195	P1-3a	1	B18	6/11/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br2149	Xbomb		P2-1a	1	B18	6/11/2013		4	40.52.58.6(	151.53	74.78	221.23	186.190	210.210	151.161			229.239	50.50
br2150	Xinadequate		P2-1b	1	B18	6/11/2013		0											
br2151	Xinadequate		P2-2a	1	B18	6/11/2013		0											
br2152	Xinadequate		P2-2b	1	B18	6/11/2013		0											
br2153	Xbomb		P2-2c	1	B18	6/11/2013		1		49.151		221.21	186.190		151.61				04.250
br2154	Xinadequate		P2-3a	1	B18	6/11/2013		0											
br2155	Xinadequate		P3-1a	1	B18	6/11/2013		0											
br2156	sample	br77	P1-1a	1	B24	6/11/2013		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161			225.249	204.250
br2157	Xsubselect		P1-1b	1	B24	6/11/2013		0											
br2158	Xinadequate		P2-1a	1	B24	6/11/2013		0											
br2159	Xbomb		P2-1b	1	B24	6/11/2013		4	140.160	159.61	174.176	221.21	186.96	208.210	141.161			225.49	04.50
br2175	Xsubselect		P2-1c	1	B24	6/11/2013		0											
br2176	sample	br77	P2-1d	1	B24	6/11/2013		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161			225.249	204.250
br2177	Xbomb		P3-1a	1	B24	6/11/2013		6	140.160	159.161	174.176	221.31	186.196	208.210	141.161			225.29.49	204.50
br2178	Xsubselect		P3-1b	1	B24	6/11/2013		0											
br2179	sample	br77	P3-2a	1	B24	6/11/2013		9	140.160	159.161	174.176	221.231	186.196	208.210	141.161			225.249	204.250
br2180	Xsubselect		P3-2b	1	B24	6/11/2013		0											
br2181	Xbomb		P1-1a	1	B26	6/11/2013		3	152.60	149.55	74.78	221.31.37	190.190	208.210	139.49.61			23.29.239	250.250
br2182	Xbomb		P1-2a	1	B26	6/11/2013		4	40.52.58.6(	49.51.155	74.178	221.37	190.190	208.210	139.161			223.229	04.250
br2183	sample	br220	P1-3a	1	B26	6/11/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br2193	Xinadequate		P2-2a	1	B26	6/11/2013		0											
br2194	Xsubselect		G-1	1	B26	6/11/2013		0											
br2195	Xbomb		G-2	1	B26	6/11/2013		3	152.58.60		74.78	221.31.37	190.190	208.210	139.161			223.39	250.50
br2196	sample	br584	P1-1a	1	B29	6/11/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br2197	Xinadequate		P1-1b	1	B29	6/11/2013		0											
br2198	sample	br2198	P1-2a	1	B29	6/11/2013		9	140.140	149.153	174.176	221.221	186.190	210.210	139.165			225.229	250.250
br2199	sample	br584	P1-3a	1	B29	6/11/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br2200	sample	br101	P2-1a	1	B29	6/11/2013		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165			229.229	204.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2201	Xsubselect		P2-2a	1	B29	6/11/2013		0											
br2202	Xspecies		P2-3a	1	B29	6/11/2013		0											
br2203	Xsubselect		P3-1a	1	B29	6/11/2013		0											
br2204	sample	br584	P3-2a	1	B29	6/11/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br2205	Xsubselect		P1-3b	1	B29	6/11/2013		0											
br2206	Xbomb		G-1	1	B29	6/11/2013		3	140.56	149.149		231.37	190.190	10.210	161.165			29.29	
br2207	Xspecies		G-2	1	B29	6/11/2013		0											
br2208	Xinadequate		P1-1a	1	B34	6/12/2013		0											
br2209	Xinadequate		P1-1b	1	B34	6/12/2013		0											
br2210	Xinadequate		P1-1c	1	B34	6/12/2013		0											
br2211	sample	br774	P1-1d	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2212	sample	br774	P1-1	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2213	sample	br774	P1-2a	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2214	sample	br774	P2-1a	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2215	sample	br774	P2-2a	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2216	Xinadequate		P2-3a	1	B34	6/12/2013		0											
br2217	sample	br774	P2-3b	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2218	Xinadequate		P2-3c	1	B34	6/12/2013		0											
br2219	sample	br774	P3-1a	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2220	Xsubselect		P3-1b	1	B34	6/12/2013		0											
br2221	Xsubselect		P3-1c	1	B34	6/12/2013		0											
br2222	Xsubselect		P3-1d	1	B34	6/12/2013		0											
br2223	sample	br774	P3-1	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2224	Xinadequate		P3-1f	1	B34	6/12/2013		0											
br2225	sample	br774	G-1	1	B34	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2226	Xsubselect		G-2	1	B34	6/12/2013		0											
br2227	Xsubselect		G-3	1	B34	6/12/2013		0											
br2228	Xsubselect		P1-1a	1	B35	6/12/2013		0											
br2229	Xbomb		P1-1b	1	B35	6/12/2013		3	160.162	151.151		37.237	180.186	208.10.16	139.53.63			223.23	
br2230	Xsubselect		P1-1c	1	B35	6/12/2013		0											
br2231	Xinadequate		P1-1d	1	B35	6/12/2013		0											
br2232	sample	br2232	P1-1	1	B35	6/12/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2233	Xinadequate		P1-1f	1	B35	6/12/2013		0											
br2234	Xbomb		P1-2a	1	B35	6/12/2013		8	160.162	151.151	174.186	21.23.31.3	180.186	208.216	139.153			223.239	204.250
br2235	Xbomb		P2-1a	1	B35	6/12/2013		3	160.162	151.151	72.74.186	221.21	180.186	04.08.216	139.59.153			223.29.35.3	204.50
br2236	Xinadequate		P2-1b	1	B35	6/12/2013		0											
br2237	Xsubselect		P2-1c	1	B35	6/12/2013		0											
br2238	Xinadequate		P3-1a	1	B35	6/12/2013		0											
br2239	sample	br2232	P3-1b	1	B35	6/12/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2240	sample	br2240	P1-1a	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2241	Xinadequate		P1-1b	1	B58	6/12/2013		0											
br2242	Xsubselect		P1-1c	1	B58	6/12/2013		0											
br2243	sample	br2240	P1-1d	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2244	Xinadequate		P2-1a	1	B58	6/12/2013		0											
br2245	Xinadequate		P2-2a	1	B58	6/12/2013		0											
br2246	sample	br2240	P2-2b	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2247	sample	br2240	P2-2c	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2248	Xinadequate		P2-2d	1	B58	6/12/2013		0											
br2249	Xinadequate		P2-2	1	B58	6/12/2013		0											
br2250	Xinadequate		P3-1a	1	B58	6/12/2013		0											
br2251	sample	br2240	P3-1b	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2252	Xinadequate		P3-1c	1	B58	6/12/2013		0											
br2253	sample	br2240	P3-2a	1	B58	6/12/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br2254	Xinadequate		P3-2b	1	B58	6/12/2013		0											
br2255	Xbomb		P3-2c	1	B58	6/12/2013		2		53.55.59			190.190		155.155				
br2256	Xinadequate		P3-2d	1	B58	6/12/2013		0											
br2257	Xsubselect		P1-1a	1	B63	6/12/2013		0											
br2258	sample	br774	P1-1b	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2259	sample	br774	P1-2a	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2260	sample	br2302	P3-4a	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2261	Xspecies		P1-1a	1	B39	6/12/2013		0											
br2262	sample	br1088	P1-1a	1	B44	6/12/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2263	Xinadequate		P1-1b	1	B44	6/12/2013		0											
br2264	Xsubselect		P1-1c	1	B44	6/12/2013		0											
br2265	Xbomb		P1-1d	1	B44	6/12/2013		0					86.96						
br2266	Xinadequate		P1-2a	1	B44	6/12/2013		0											
br2267	sample	br1088	P1-2b	1	B44	6/12/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2268	Xsubselect		P2-1a	1	B44	6/12/2013		0											
br2269	Xbomb		P2-1b	1	B44	6/12/2013		2	140.160	153.55.57		221.21	186.186	12.12				29.29	
br2270	Xsubselect		P2-1c	1	B44	6/12/2013		0											
br2271	Xbomb		P3-1a	1	B44	6/12/2013		1	52.160	153.155			186.96	210.14	53.53			29.29	
br2272	Xinadequate		P3-1b	1	B44	6/12/2013		0											
br2273	Xbomb		P3-1c	1	B44	6/12/2013		1	152.62	153.155			186.96		139.39			29.229	
br2274	Xinadequate		P3-1d	1	B44	6/12/2013		0											
br2275	sample	br1088	G-1	1	B44	6/12/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2276	Xsubselect		G-2	1	B44	6/12/2013		0											
br2277	Xinadequate		P1-1a	1	B65	6/12/2013		0											
br2278	sample	br2302	P1-1b	1	B65	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2279	Xinadequate		P1-1c	1	B65	6/12/2013		0											
br2280	Xsubselect		P1-1d	1	B65	6/12/2013		0											
br2281	Xinadequate		P1-1	1	B65	6/12/2013		0											
br2282	sample	br2302	P1-1f	1	B65	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2283	Xbomb		P2-1a	1	B65	6/12/2013		1		149.149		233.35	180.90		153.65				
br2284	sample	br2302	P2-2a	1	B65	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2285	Xsubselect		P2-2b	1	B65	6/12/2013		0											
br2286	Xinadequate		P2-3a	1	B65	6/12/2013		0											
br2287	Xinadequate		P3-1a	1	B65	6/12/2013		0											
br2288	sample	br2302	P3-1b	1	B65	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2289	Xsubselect		P3-1c	1	B65	6/12/2013		0											
br2290	Xbomb		P3-1d	1	B65	6/12/2013		4	140.60	149.151	176.186	21.33	180.90	210.214				229.229	
br2291	Xsubselect		P3-1	1	B65	6/12/2013		0											
br2292	Xsubselect		P3-1f	1	B65	6/12/2013		0											
br2293	sample	br2302	P3-2a	1	B65	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2294	Xbomb		P3-1g	1	B65	6/12/2013		4	140.60	149.151	76.186	221.233	180.190	210.14	155.65			229.229	
br2295	sample	br2302	P1-1a	1	B59	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2296	Xbomb		P2-1a	1	B59	6/12/2013		4	140.60	149.151		21.21	180.190	210.210	153.165			29.229	
br2297	Xinadequate		P2-1b	1	B59	6/12/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2298	Xsubselect		P2-1c	1	B59	6/12/2013		0											
br2299	Xsubselect		P2-1d	1	B59	6/12/2013		0											
br2300	Xsubselect		P3-1c	1	B35	6/12/2013		0											
br2301	Xbomb		P3-1d	1	B35	6/12/2013		1	160.62	49.151	74.74	221.35	180.186		37.39.53.55			223.29	50.50
br2302	sample	br2302	P1-1a	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2303	Xsubselect		P1-1b	1	B37	6/12/2013		0											
br2304	Xinadequate		P1-1c	1	B37	6/12/2013		0											
br2305	sample	br2302	P1-1d	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2306	Xsubselect		P1-1	1	B37	6/12/2013		0											
br2307	Xsubselect		P1-1f	1	B37	6/12/2013		0											
br2308	Xsubselect		P1-1g	1	B37	6/12/2013		0											
br2309	sample	br2302	P1-1h	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2310	Xsubselect		P1-1i	1	B37	6/12/2013		0											
br2311	sample	br2302	P1-1j	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2312	Xsubselect		P2-1a	1	B37	6/12/2013		0											
br2313	sample	br2302	P2-1b	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2314	sample	br2302	P2-2a	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2315	Xsubselect		P2-2b	1	B37	6/12/2013		0											
br2316	sample	br2302	P2-3a	1	B37	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2317	Xinadequate		P3-1a	1	B37	6/12/2013		0											
br2318	Xinadequate		P3-2a	1	B37	6/12/2013		0											
br2319	Xinadequate		P3-3a	1	B37	6/12/2013		0											
br2320	sample	br2302	P2-1	1	B59	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2321	sample	br2302	P2-2a	1	B59	6/12/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2322	Xsubselect		P3-1a	1	B59	6/12/2013		0											
br2323	Xbomb		P3-1b	1	B59	6/12/2013		3		49.149			180.190	210.210				229.229	
br2324	Xbomb		G-1	1	B59	6/12/2013		2		49.51.155		33.33	180.190	210.214	53.55.63.65			23.229	
br2325	Xbomb		P1-1d	1	B57	6/12/2013		6	140.160	155.59	178.183	231.233	186.196	208.12.210	161.161			229.239	04.250
br2326	Xinadequate		P1-2a	1	B57	6/12/2013		0											
br2327	Xinadequate		P1-2b	1	B57	6/12/2013		0											
br2328	sample	hr274	P1-2c	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2329	Xsubselect		P1-2d	1	B57	6/12/2013		0											
br2330	sample	hr274	P1-2	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2331	sample	hr274	P2-1a	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2332	Xsubselect		P2-2a	1	B57	6/12/2013		0											
br2333	sample	hr274	P2-2b	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2334	sample	hr274	P2-3a	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2335	Xbomb		P3-1a	1	B57	6/12/2013		4	140.160	53.55.159	178.183	31.33	186.96	208.210	61.161			229.239	
br2336	Xinadequate		P3-2a	1	B57	6/12/2013		0											
br2337	sample	hr274	P3-2b	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2338	Xsubselect		P3-2c	1	B57	6/12/2013		0											
br2339	sample	hr274	P3-2d	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2340	Xsubselect		P1-2b	1	B63	6/12/2013		0											
br2341	sample	br774	P2-1a	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2342	sample	br774	P3-1a	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2343	Xsubselect		P3-1b	1	B63	6/12/2013		0											
br2344	Xsubselect		P3-1c	1	B63	6/12/2013		0											
br2345	sample	br774	P3-2a	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2346	Xsubselect		G-1	1	B63	6/12/2013		0											
br2347	sample	br774	G-2	1	B63	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2348	sample	br774	P1-1a	1	B62	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2349	Xinadequate		P1-2a	1	B62	6/12/2013		0											
br2350	Xinadequate		P1-3a	1	B62	6/12/2013		0											
br2351	sample	br774	P2-1a	1	B62	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2352	Xsubselect		P2-2a	1	B62	6/12/2013		0											
br2353	Xsubselect		P2-2b	1	B62	6/12/2013		0											
br2354	sample	br774	P2-2c	1	B62	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2355	Xinadequate		P2-3a	1	B62	6/12/2013		0											
br2356	sample	br774	P3-1a	1	B62	6/12/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2357	Xinadequate		P1-1a	1	B57	6/12/2013		0											
br2358	Xinadequate		P1-1b	1	B57	6/12/2013		0											
br2359	sample	hr274	P1-1c	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2360	sample	hr274	P3-3a	1	B57	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2361	Xsubselect		P3-3b	1	B57	6/12/2013		0											
br2362	sample	hr274	P1-1a	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2363	sample	hr274	P1-2a	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2364	Xsubselect		P1-2b	1	B56	6/12/2013		0											
br2365	Xsubselect		P1-2c	1	B56	6/12/2013		0											
br2366	sample	hr274	P2-1a	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2367	Xsubselect		P2-2b	1	B56	6/12/2013		0											
br2368	Xinadequate		P2-2c	1	B56	6/12/2013		0											
br2369	sample	hr274	P2-2d	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2370	Xsubselect		P2-2	1	B56	6/12/2013		0											
br2371	Xsubselect		P2-2f	1	B56	6/12/2013		0											
br2372	sample	hr274	P2-2g	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2373	Xinadequate		P2-2h	1	B56	6/12/2013		0											
br2374	Xinadequate		P2-2i	1	B56	6/12/2013		0											
br2375	Xsubselect		P3-1a	1	B56	6/12/2013		0											
br2376	Xsubselect		P3-1b	1	B56	6/12/2013		0											
br2377	sample	hr274	P3-1c	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2378	sample	hr274	P3-2a	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2379	sample	hr274	G-1	1	B56	6/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
br2380	Xinadequate		P1-1a	1	B49	6/12/2013		0											
br2381	Xsubselect		P1-2a	1	B49	6/12/2013		0											
br2382	sample	br2382	P1-2b	1	B49	6/12/2013		9	160.160	149.151	176.178	221.221	186.186	210.214	161.165			229.229	204.250
br2383	Xsubselect		P1-2c	1	B49	6/12/2013		0											
br2384	Xsubselect		P2-1a	1	B49	6/12/2013		0											
br2385	Xsubselect		P2-1b	1	B49	6/12/2013		0											
br2386	Xbomb		P2-1c	1	B49	6/12/2013		3	60.160	149.151		221.221	186.186	210.14	161.63.65			29.229	04.50
br2387	Xinadequate		P3-1a	1	B49	6/12/2013		0											
br2388	sample	br2388	P1-1a	2	B67	6/20/2013	Set-up and 1st bait on June 11	9	152.156	155.159	178.186	221.221	186.190	210.210	161.161			229.239	250.250
br2389	sample	br962	P1-1a	2	B13	6/21/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2390	Xinadequate		P1-1b	2	B13	6/21/2013		0											
br2391	Xbomb		P2-1a	2	B13	6/21/2013		3		155.155	176.186		90.190	210.210				229.39	
br2392	sample	br962	P3-1a	2	B13	6/21/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2393	sample	br962	P3-2a	2	B13	6/21/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2394	Xinadequate		P3-3a	2	B13	6/21/2013		0											
br2395	Xinadequate		P1-1a	2	B1	6/21/2013		0											
br2396	Xinadequate		P1-2a	2	B1	6/21/2013		0											
br2397	sample	hr66	P1-2b	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2398	Xsubselect		P1-2c	2	B1	6/21/2013		0											
br2399	Xsubselect		P1-2d	2	B1	6/21/2013		0											
br2400	sample	hr66	P1-2	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2401	Xsubselect		P1-2f	2	B1	6/21/2013		0											
br2402	Xbomb		P1-2g	2	B1	6/21/2013		6	140.56	155.161	174.178	221.231	190.196	210.214	159.161			223.39	04.250
br2403	sample	hr66	P2-1a	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2404	Xsubselect		P2-1b	2	B1	6/21/2013		0											
br2405	Xsubselect		P2-1c	2	B1	6/21/2013		0											
br2406	sample	hr66	P2-1d	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2407	Xsubselect		P2-1	2	B1	6/21/2013		0											
br2408	Xsubselect		P2-1f	2	B1	6/21/2013		0											
br2409	Xinadequate		P2-1g	2	B1	6/21/2013		0											
br2410	Xsubselect		P2-1h	2	B1	6/21/2013		0											
br2411	sample	hr66	P2-1i	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2412	Xinadequate		P3-1a	2	B1	6/21/2013		0											
br2413	Xinadequate		P3-1b	2	B1	6/21/2013		0											
br2414	sample	hr66	P3-1c	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2415	Xsubselect		P3-1d	2	B1	6/21/2013		0											
br2416	Xspecies		P3-1	2	B1	6/21/2013		0											
br2417	sample	hr66	P3-1f	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2418	Xsubselect		P3-1g	2	B1	6/21/2013		0											
br2419	sample	hr66	P3-1h	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2420	Xsubselect		P3-1i	2	B1	6/21/2013		0											
br2421	sample	hr66	P3-1j	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2422	Xinadequate		P3-2a	2	B1	6/21/2013		0											
br2423	Xinadequate		P3-2b	2	B1	6/21/2013		0											
br2424	Xinadequate		P3-2c	2	B1	6/21/2013		0											
br2425	sample	hr66	P3-2d	2	B1	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2426	Xbomb		G-1	2	B1	6/21/2013		1		155.161			90.96						
br2427	Xsubselect		G-2	2	B1	6/21/2013		0											
br2428	sample	br155	P1-1a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2429	Xbomb		P1-2a	2	B7	6/21/2013		4	140.160	155.51.59	178.184	21.233	86.90	208.210	61.163			223.249	
br2430	Xsubselect		P1-2b	2	B7	6/21/2013		0											
br2431	Xinadequate		P1-2c	2	B7	6/21/2013		0											
br2432	sample	br155	P1-2d	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2433	sample	br155	P1-3a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2434	sample	br155	P2-1a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2435	Xsubselect		P2-1b	2	B7	6/21/2013		0											
br2436	sample	br155	P2-1c	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2437	Xsubselect		P2-1d	2	B7	6/21/2013		0											
br2438	sample	br155	P2-2a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2439	Xsubselect		P2-2b	2	B7	6/21/2013		0											
br2440	Xinadequate		P2-2c	2	B7	6/21/2013		0											
br2441	sample	br155	P2-3a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2442	sample	br155	P3-1a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2443	sample	br155	P3-2a	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2444	Xsubselect		P3-2b	2	B7	6/21/2013		0											
br2445	Xsubselect		P3-2c	2	B7	6/21/2013		0											
br2446	Xbomb		P3-2d	2	B7	6/21/2013		2		155.159			186.190		61.161				
br2447	Xsubselect		P3-2	2	B7	6/21/2013		0											
br2448	sample	br155	G-1	2	B7	6/21/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br2449	sample	br33	P1-1a	2	B9	6/21/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br2450	Xinadequate		P1-2a	2	B9	6/21/2013		0											
br2451	Xbomb		P1-2b	2	B9	6/21/2013		3		151.153			186.190	10.210	161.161				
br2452	Xsubselect		P1-3a	2	B9	6/21/2013		0											
br2453	sample	br33	P1-3b	2	B9	6/21/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br2454	Xsubselect		P1-3c	2	B9	6/21/2013		0											
br2455	sample	br33	P2-1a	2	B9	6/21/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br2456	Xinadequate		P2-1b	2	B9	6/21/2013		0											
br2457	Xinadequate		P2-2a	2	B9	6/21/2013		0											
br2458	Xinadequate		P2-2b	2	B9	6/21/2013		0											
br2459	Xbomb		P2-2c	2	B9	6/21/2013		0											
br2460	sample	br33	P2-2d	2	B9	6/21/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br2461	Xinadequate		P2-2	2	B9	6/21/2013		0											
br2462	Xinadequate		P3-1a	2	B9	6/21/2013		0											
br2463	Xinadequate		P3-2a	2	B9	6/21/2013		0											
br2464	sample	br146	G-1	2	B9	6/21/2013		9	158.160	151.153	178.186	221.231	186.190	210.210	161.161			229.249	250.250
br2465	Xsubselect		P3-1c	2	B10	6/21/2013		0											
br2466	sample	br696	P3-2a	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2467	Xsubselect		P3-2b	2	B10	6/21/2013		0											
br2468	Xinadequate		P3-2c	2	B10	6/21/2013		0											
br2469	Xsubselect		P1-1a	2	B10	6/21/2013		0											
br2470	sample	br696	P1-1b	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2471	sample	br696	P1-1c	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2472	Xinadequate		P1-1d	2	B10	6/21/2013		0											
br2473	Xbomb		P1-2a	2	B10	6/21/2013		2	140.52.58	51.153	172.74.78	23.231	186.190	210.210	39.65.161			23.229.239	04.50
br2474	Xinadequate		P2-1a	2	B10	6/21/2013		0											
br2475	sample	br696	P2-1b	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2476	Xsubselect		P2-2a	2	B10	6/21/2013		0											
br2477	sample	br696	P2-2b	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2478	Xinadequate		P3-1a	2	B10	6/21/2013		0											
br2479	sample	hr66	P3-1b	2	B10	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br2480	Xinadequate		P3-2d	2	B10	6/21/2013		0											
br2481	Xbomb		P3-2	2	B10	6/21/2013		1		151.153									
br2482	Xsubselect		P3-2f	2	B10	6/21/2013		0											
br2483	sample	br696	P3-2g	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2484	sample	br696	P3-3a	2	B10	6/21/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2485	sample	br2508	P1-1a	2	B11	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2486	Xsubselect		P1-1b	2	B11	6/21/2013		0											
br2487	Xinadequate		P1-2a	2	B11	6/21/2013		0											
br2488	Xbomb		P2-1a	2	B11	6/21/2013		0											
br2489	Xsubselect		P2-1b	2	B11	6/21/2013		0											
br2490	Xsubselect		P2-1c	2	B11	6/21/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2491	Xsubselect		P2-1d	2	B11	6/21/2013		0											
br2492	sample	br2508	P2-1	2	B11	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2493	Xsubselect		P2-1f	2	B11	6/21/2013		0											
br2494	Xbomb		P2-1g	2	B11	6/21/2013		3		153.155			186.186		139.153				
br2495	sample	br2495	P2-2a	2	B11	6/21/2013		9	152.152	153.155	178.178	221.221	186.186	210.214	139.153			229.229	204.250
br2496	Xsubselect		P2-2b	2	B11	6/21/2013		0											
br2497	Xinadequate		P3-1a	2	B11	6/21/2013		0											
br2498	sample	br2508	P3-1b	2	B11	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2499	Xinadequate		P3-1c	2	B11	6/21/2013		0											
br2500	sample	br2508	P3-1d	2	B11	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2501	Xinadequate		P3-1	2	B11	6/21/2013		0											
br2502	Xsubselect		P3-1f	2	B11	6/21/2013		0											
br2503	Xbomb		P3-1g	2	B11	6/21/2013		8	40.156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2504	Xinadequate		P3-1h	2	B11	6/21/2013		0											
br2505	Xsubselect		P3-1i	2	B11	6/21/2013		0											
br2506	Xbomb		P3-1j	2	B11	6/21/2013		1		151.153			186.96		139.53.61				
br2507	Xinadequate		P3-1k	2	B11	6/21/2013		0											
br2508	sample	br2508	G-1	2	B11	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2509	sample	br2508	P1-1a	2	B12	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2510	Xsubselect		P1-1b	2	B12	6/21/2013		0											
br2511	Xinadequate		P1-1c	2	B12	6/21/2013		0											
br2512	Xinadequate		P1-1d	2	B12	6/21/2013		0											
br2513	Xinadequate		P1-1	2	B12	6/21/2013		0											
br2514	Xinadequate		P1-1f	2	B12	6/21/2013		0											
br2515	Xbomb		P1-1g	2	B12	6/21/2013		7	156.160	153.161	176.178	221.221	80.186.190	210.210	153.161			23.229.239	204.250
br2516	Xsubselect		P1-1h	2	B12	6/21/2013		0											
br2517	sample	br172	P1-1i	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2518	Xsubselect		P2-1a	2	B12	6/21/2013		0											
br2519	sample	br172	P2-1b	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2520	Xsubselect		P2-1c	2	B12	6/21/2013		0											
br2521	Xsubselect		P2-1d	2	B12	6/21/2013		0											
br2522	sample	br172	P2-1	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2523	Xsubselect		P2-1f	2	B12	6/21/2013		0											
br2524	sample	br172	P2-1g	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2525	Xinadequate		P3-1a	2	B12	6/21/2013		0											
br2526	Xmixed		P3-2a	2	B12	6/21/2013		2	56.60	49.53.55.67	2.176.178	221.221	80.86.190	210.12	39.53.161			23.29.239	204.250
br2527	sample	br172	P2-2a	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2528	Xsubselect		P2-2b	2	B12	6/21/2013		0											
br2529	Xsubselect		P2-2c	2	B12	6/21/2013		0											
br2530	sample	br172	P2-2	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2531	Xsubselect		P2-2d	2	B12	6/21/2013		0											
br2532	Xsubselect		P3-3a	2	B12	6/21/2013		0											
br2533	sample	br2508	P3-3b	2	B12	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2534	Xsubselect		P3-3c	2	B12	6/21/2013		0											
br2535	Xsubselect		P3-3d	2	B12	6/21/2013		0											
br2536	sample	br2508	P3-3	2	B12	6/21/2013		9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	204.250
br2537	sample	br172	G-1	2	B12	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2538	Xsubselect		G-2	2	B12	6/21/2013		0											
br2539	Xinadequate		P1-1a	2	B16	6/21/2013		0											
br2540	Xinadequate		P1-1b	2	B16	6/21/2013		0											
br2541	Xinadequate		P1-2a	2	B16	6/21/2013		0											
br2542	sample	br199	P1-2b	2	B16	6/21/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br2543	sample	br774	P1-1a	2	B28	6/21/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2544	sample	br774	P1-2a	2	B28	6/21/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2545	sample	br774	P2-1a	2	B28	6/21/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2546	sample	br774	P2-2a	2	B28	6/21/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2547	Xinadequate		P2-3a	2	B28	6/21/2013		0											
br2548	Xinadequate		P1-1a	2	B29	6/21/2013		0											
br2549	Xinadequate		P1-1a	2	B30	6/21/2013		0											
br2550	Xsubselect		P1-1b	2	B30	6/21/2013		0											
br2551	sample	br172	P1-1c	2	B30	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2552	Xsubselect		P1-1d	2	B30	6/21/2013		0											
br2553	Xinadequate		P1-1	2	B30	6/21/2013		0											
br2554	Xbomb		P1-1f	2	B30	6/21/2013		5	160.162	151.55	174.76.86	221.237	180.186	08.10.16.11	39.61.153			223.239	204.250
br2555	Xsubselect		P1-1g	2	B30	6/21/2013		0											
br2556	Xbomb		P1-1h	2	B30	6/21/2013		5	160.160	149.51.55	172.176	221.37	180.186	210.16.214	139.53.61			223.239	204.250
br2557	sample	br172	P1-2a	2	B30	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2558	Xsubselect		P2-1a	2	B30	6/21/2013		0											
br2559	Xbomb		P2-1b	2	B30	6/21/2013		3	160.62	149.51.55	72.74.76.8	221.37	180.186	08.10.14.1	139.53.61			223.239	204.250
br2560	Xsubselect		P2-1c	2	B30	6/21/2013		0											
br2561	sample	br2232	P2-1d	2	B30	6/21/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2562	sample	br2232	P2-2a	2	B30	6/21/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2563	Xsubselect		P2-2b	2	B30	6/21/2013		0											
br2564	Xsubselect		P2-2c	2	B30	6/21/2013		0											
br2565	Xbomb		P2-2d	2	B30	6/21/2013		2	60.60	149.51.55	74.76.186	221.37	180.186	08.10.14.1	139.53.61			223.239	04.50
br2566	Xsubselect		P2-2f	2	B30	6/21/2013		0											
br2567	Xinadequate		P2-2	2	B30	6/21/2013		0											
br2568	sample	br172	P2-2g	2	B30	6/21/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2569	Xinadequate		P2-2h	2	B30	6/21/2013		0											
br2570	Xsubselect		P3-1a	2	B30	6/21/2013		0											
br2571	sample	br2232	P3-1b	2	B30	6/21/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2572	Xsubselect		P3-1c	2	B30	6/21/2013		0											
br2573	sample	br2232	P3-1d	2	B30	6/21/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2574	Xsubselect		P3-1	2	B30	6/21/2013		0											
br2575	Xsubselect		P3-1f	2	B30	6/21/2013		0											
br2576	Xinadequate		P3-1g	2	B30	6/21/2013		0											
br2577	sample	br2232	P3-1h	2	B30	6/21/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2578	Xinadequate		P3-1i	2	B30	6/21/2013		0											
br2579	Xsubselect		G-1	2	B30	6/21/2013		0											
br2580	Xbomb		G-2	2	B30	6/21/2013		6	160.160	149.51.55	172.176	221.37	180.186	210.214	139.53.61			223.239	204.250
br2581	Xinadequate		P1-1a	2	B27	6/21/2013		0											
br2582	Xinadequate		P1-1b	2	B27	6/21/2013		0											
br2583	Xinadequate		P1-2a	2	B27	6/21/2013		0											
br2584	Xinadequate		P1-3a	2	B27	6/21/2013		0											
br2585	Xsubselect		P1-4a	2	B27	6/21/2013		0											
br2586	sample	br220	P1-4b	2	B27	6/21/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br2587	sample	br244	P1-1a	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2588	Xinadequate		P1-1b	2	B34	6/22/2013		0											
br2589	Xsubselect		P1-1c	2	B34	6/22/2013		0											
br2590	sample	br244	P1-1d	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2591	Xinadequate		P1-1	2	B34	6/22/2013		0											
br2592	sample	br244	P2-1a	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2593	Xinadequate		P2-1b	2	B34	6/22/2013		0											
br2594	Xsubselect		P2-1c	2	B34	6/22/2013		0											
br2595	Xsubselect		P2-1d	2	B34	6/22/2013		0											
br2596	sample	br244	P2-1	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2597	Xinadequate		P2-1f	2	B34	6/22/2013		0											
br2598	sample	br244	P2-1g	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2599	Xsubselect		P3-1a	2	B34	6/22/2013		0											
br2600	sample	br244	P3-1b	2	B34	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2601	sample	br774	P1-1a	2	B44	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2602	sample	br774	P1-2a	2	B44	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2603	Xinadequate		P1-2b	2	B44	6/22/2013		0											
br2604	sample	br774	P2-1a	2	B44	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2605	Xinadequate		P2-2a	2	B44	6/22/2013		0											
br2606	Xbomb		P3-1a	2	B44	6/22/2013		0											
br2607	Xbomb		P3-2a	2	B44	6/22/2013		1	152.60	155.159		221.35	90.90	10.210	39.155			23.229	
br2608	Xbomb		G-1	2	B44	6/22/2013		1		59.159	174.86		86.90	210.210	39.55			23.29	
br2609	sample	br1088	P1-1a	2	B61	6/22/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2610	Xinadequate		P1-1b	2	B61	6/22/2013		0											
br2611	Xinadequate		P1-1c	2	B61	6/22/2013		0											
br2612	Xinadequate		P1-1d	2	B61	6/22/2013		0											
br2613	Xinadequate		P1-1	2	B61	6/22/2013		0											
br2614	Xsubselect		P1-2a	2	B61	6/22/2013		0											
br2615	sample	br1086	P1-2b	2	B61	6/22/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2616	Xinadequate		P1-2c	2	B61	6/22/2013		0											
br2617	Xbomb		P1-2d	2	B61	6/22/2013		3	140.160	153.55		221.33	186.186	210.214	153.65			29.229	250.50
br2618	sample	br1088	P2-1a	2	B61	6/22/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2619	Xsubselect		P2-1b	2	B61	6/22/2013		0											
br2620	Xsubselect		P2-1c	2	B61	6/22/2013		0											
br2621	sample	br1088	P2-1d	2	B61	6/22/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br2622	Xsubselect		P2-1	2	B61	6/22/2013		0											
br2623	Xsubselect		P2-1f	2	B61	6/22/2013		0											
br2624	Xsubselect		P2-1g	2	B61	6/22/2013		0											
br2625	Xbomb		P2-1h	2	B61	6/22/2013		4	140.160	153.55	178.78	221.221	86.186	10.214	153.165			229.239	50.50
br2626	Xsubselect		P3-1a	2	B61	6/22/2013		0											
br2627	Xsubselect		P2-1i	2	B61	6/22/2013		0											
br2628	Xsubselect		P3-1b	2	B61	6/22/2013		0											
br2629	sample	br1086	P3-1c	2	B61	6/22/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2630	Xsubselect		P3-1d	2	B61	6/22/2013		0											
br2631	Xsubselect		P3-1	2	B61	6/22/2013		0											
br2632	sample	br1086	P3-1f	2	B61	6/22/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2633	Xbomb		P3-1g	2	B61	6/22/2013		0	40.160			21.21			153.61				
br2634	Xinadequate		P3-1h	2	B61	6/22/2013		0											
br2635	Xinadequate		P3-1i	2	B61	6/22/2013		0											
br2636	Xsubselect		P3-1j	2	B61	6/22/2013		0											
br2637	sample	br1086	P3-1k	2	B61	6/22/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2638	Xsubselect		G-1	2	B61	6/22/2013		0											
br2639	Xbomb		G-2	2	B61	6/22/2013		4	140.40	153.155		233.233	186.186	10.210	153.161				50.250
br2640	Xbomb		P1-1a	2	B59	6/22/2013		1	40.140	149.51			180.190	10.14	47.47				
br2641	sample	br774	P2-1a	2	B59	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2642	Xinadequate		P1-1a	2	B63	6/22/2013		0											
br2643	sample	br774	P1-2a	2	B63	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2644	Xsubselect		P1-2b	2	B63	6/22/2013		0											
br2645	Xsubselect		P1-2c	2	B63	6/22/2013		0											
br2646	Xsubselect		P1-2d	2	B63	6/22/2013		0											
br2647	sample	br774	P1-2	2	B63	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2648	Xinadequate		P1-2f	2	B63	6/22/2013		0											
br2649	Xinadequate		P2-1a	2	B63	6/22/2013		0											
br2650	sample	br774	G-1	2	B63	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2651	Xbomb		P1-1a	2	B62	6/22/2013		6	152.152	153.153	74.78.186	221.221	190.190	210.210	139.55.151			223.29.227	204.250
br2652	Xsubselect		P1-1b	2	B62	6/22/2013		0											
br2653	Xsubselect		P1-2a	2	B62	6/22/2013		0											
br2654	sample	br774	P1-2b	2	B62	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2655	Xsubselect		P1-2c	2	B62	6/22/2013		0											
br2656	sample	br774	P1-3a	2	B62	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2657	Xinadequate		P1-3b	2	B62	6/22/2013		0											
br2658	Xinadequate		P2-1a	2	B62	6/22/2013		0											
br2659	sample	br244	P2-1b	2	B62	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2660	Xsubselect		P2-1c	2	B62	6/22/2013		0											
br2661	sample	br244	P2-1d	2	B62	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2662	sample	br774	P1-4a	2	B62	6/22/2013		9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	204.250
br2663	Xsubselect		P3-1a	2	B62	6/22/2013		0											
br2664	Xsubselect		P3-1b	2	B62	6/22/2013		0											
br2665	sample	br244	P3-1c	2	B62	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2666	Xsubselect		P3-1d	2	B62	6/22/2013		0											
br2667	sample	br244	P3-1	2	B62	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2668	Xbomb		P3-2a	2	B62	6/22/2013		6	152.52	153.153	86.186	221.21	190.190	210.210	139.151			223.227	204.250
br2669	Xbomb		P3-3a	2	B62	6/22/2013		8	152.152	153.153	86.186	221.221	190.190	210.210	139.151			223.227	204.250
br2670	sample	br244	P1-1a	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2671	Xsubselect		P1-1b	2	B57	6/22/2013		0											
br2672	Xinadequate		P1-1c	2	B57	6/22/2013		0											
br2673	Xinadequate		P1-2a	2	B57	6/22/2013		0											
br2674	Xinadequate		P1-2b	2	B57	6/22/2013		0											
br2675	Xinadequate		P1-2c	2	B57	6/22/2013		0											
br2676	sample	br244	P1-2d	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2677	sample	br244	P1-2	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2678	Xinadequate		P1-2f	2	B57	6/22/2013		0											
br2679	Xinadequate		P1-2g	2	B57	6/22/2013		0											
br2680	sample	br244	P2-1a	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2681	Xinadequate		P2-1b	2	B57	6/22/2013		0											
br2682	sample	br244	P2-1c	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2683	Xsubselect		P2-1d	2	B57	6/22/2013		0											
br2684	Xinadequate		P2-2a	2	B57	6/22/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2685	Xinadequate		P2-3a	2	B57	6/22/2013		0											
br2686	sample	br244	P3-1a	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2687	sample	br244	P3-2a	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2688	sample	br244	P3-3a	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2689	Xbomb		P3-4a	2	B57	6/22/2013		4	152.152	153.153	86.186		190.90	210.210	139.51			223.227	
br2690	Xinadequate		P3-5a	2	B57	6/22/2013		0											
br2691	sample	br244	P1-1d	2	B57	6/22/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2692	Xbomb		G-1	2	B57	6/22/2013		6	140.52.60	155.159	178.183	21.231.233	186.90.96	208.210	161.161			229.239	204.250
br2693	Xsubselect		G-2	2	B57	6/22/2013		0											
br2694	sample	br237	P1-1a	2	B51	6/22/2013		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161			223.239	250.250
br2695	Xsubselect		P1-1a	2	B48	6/23/2013		0											
br2696	Xsubselect		P1-1b	2	B48	6/23/2013		0											
br2697	Xbomb		P1-1c	2	B48	6/23/2013		4	152.160	159.159			190.196	10.210	141.153				
br2698	Xsubselect		P1-1d	2	B48	6/23/2013		0											
br2699	sample	hr130	P1-1	2	B48	6/23/2013		9	152.154	153.159	176.186	221.221	180.186	208.210	141.161			223.239	250.250
br2700	Xsubselect		P1-1f	2	B48	6/23/2013		0											
br2701	Xinadequate		P1-2a	2	B48	6/23/2013		0											
br2702	Xinadequate		P1-2b	2	B48	6/23/2013		0											
br2703	sample	hr38	P1-2c	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2704	sample	hr125	P1-2d	2	B48	6/23/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
br2705	Xinadequate		P2-1a	2	B48	6/23/2013		0											
br2706	Xsubselect		P2-1b	2	B48	6/23/2013		0											
br2707	sample	hr38	P2-1c	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2708	Xinadequate		P2-1d	2	B48	6/23/2013		0											
br2709	Xbomb		P2-1	2	B48	6/23/2013		0											
br2710	Xsubselect		P2-1f	2	B48	6/23/2013		0											
br2711	Xsubselect		P2-1g	2	B48	6/23/2013		0											
br2712	sample	hr38	P2-1h	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2713	Xsubselect		P2-1i	2	B48	6/23/2013		0											
br2714	sample	hr38	P2-1j	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2715	Xsubselect		P2-1k	2	B48	6/23/2013		0											
br2716	Xsubselect		P3-1a	2	B48	6/23/2013		0											
br2717	sample	hr38	P3-1b	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2718	Xsubselect		P3-1c	2	B48	6/23/2013		0											
br2719	sample	hr125	P3-1d	2	B48	6/23/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
br2720	Xsubselect		P3-1	2	B48	6/23/2013		0											
br2721	Xinadequate		P3-1f	2	B48	6/23/2013		0											
br2722	Xsubselect		P3-1g	2	B48	6/23/2013		0											
br2723	sample	hr38	P3-1h	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2724	sample	hr38	P3-2a	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2725	sample	hr38	G-1	2	B48	6/23/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br2726	Xspecies		P1-1a	3	B1	7/1/2013		0											
br2727	Xsubselect		G-2	2	B48	6/23/2013		0											
br2728	Xspecies		P1-1b	3	B1	7/1/2013		0											
br2729	Xspecies		P1-2a	3	B1	7/1/2013		0											
br2730	Xsubselect		P1-1a	3	B2	7/1/2013		0											
br2731	Xbomb		P1-1b	3	B2	7/1/2013		1		153.57.59	84.184	233.37	90.190	08.210	155.155			39.249	50.250
br2732	Xsubselect		P2-1a	3	B2	7/1/2013		0											
br2733	sample	br2733	P2-2a	3	B2	7/1/2013		9	152.152	153.159	184.184	233.237	190.190	208.210	155.155			239.249	250.250
br2734	Xbomb		G-1	3	B2	7/1/2013		1		153.59		233.35.37	86.190		155.57			39.249	250.250
br2735	Xsubselect		G-2	3	B2	7/1/2013		0											
br2736	Xsubselect		P1-1a	3	B67	7/1/2013		0											
br2737	sample	br2737	P1-1b	3	B67	7/1/2013		10	160.160	149.151	176.177	221.231	190.190	210.214	153.161		127.133	239.239	250.250
br2738	Xsubselect		P1-1c	3	B67	7/1/2013		0											
br2739	Xsubselect		P1-2a	3	B67	7/1/2013		0											
br2740	Xsubselect		P1-2b	3	B67	7/1/2013		0											
br2741	Xsubselect		P2-1a	3	B67	7/1/2013		0											
br2742	Xbomb		P2-1b	3	B67	7/1/2013		7	160.160	149.151	176.177	221.231	190.86.96	210.214	153.161			23.49.239	250.250
br2743	sample	br2737	P3-1a	3	B67	7/1/2013		9	160.160	149.151	176.177	221.231	190.190	210.214	153.161			239.239	250.250
br2744	sample	hr698	P1-1a	3	B3	7/1/2013		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155			223.249	204.250
br2745	Xsubselect		P1-1b	3	B3	7/1/2013		0											
br2746	sample	hr698	P2-1a	3	B3	7/1/2013		9	160.160	155.161	172.176	233.237	186.196	210.214	139.155			223.249	204.250
br2747	Xsubselect		P2-2a	3	B3	7/1/2013		0											
br2748	Xsubselect		P2-3a	3	B3	7/1/2013		0											
br2749	Xsubselect		P1-1a	3	B5	7/1/2013		0											
br2750	Xsubselect		P1-1b	3	B5	7/1/2013		0											
br2751	sample	br2733	P1-1c	3	B5	7/1/2013		9	152.152	153.159	184.184	233.237	190.190	208.210	155.155			239.249	250.250
br2752	sample	hr220	P1-1a	3	B9	7/1/2013		9	140.160	149.155	176.178	221.231	180.190	210.214	155.155			239.249	204.250
br2753	Xsubselect		P1-2a	3	B9	7/1/2013		0											
br2754	Xsubselect		P1-3a	3	B9	7/1/2013		0											
br2755	sample	hr220	P2-1a	3	B9	7/1/2013		9	140.160	149.155	176.178	221.231	180.190	210.214	155.155			239.249	204.250
br2756	Xsubselect		P1-1a	3	B10	7/1/2013		0											
br2757	sample	hr775	P1-1b	3	B10	7/1/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br2758	Xsubselect		P1-2a	3	B10	7/1/2013		0											
br2759	sample	hr775	P2-1a	3	B10	7/1/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br2760	Xsubselect		P2-2a	3	B10	7/1/2013		0											
br2761	Xsubselect		P2-3a	3	B10	7/1/2013		0											
br2762	sample	hr775	P3-1a	3	B10	7/1/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br2763	Xsubselect		P3-2a	3	B10	7/1/2013		0											
br2764	sample	br2764	P1-1a	3	B11	7/1/2013		9	152.160	149.161	176.184	221.221	186.196	208.214	139.161			239.239	204.250
br2765	sample	br2764	P2-1a	3	B11	7/1/2013		9	152.160	149.161	176.184	221.221	186.196	208.214	139.161			239.239	204.250
br2766	Xsubselect		P1-1a	3	B12	7/2/2013		0											
br2767	Xsubselect		P1-1b	3	B12	7/2/2013		0											
br2768	sample	br172	P1-2a	3	B12	7/2/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2769	sample	br172	P2-2b	3	B12	7/2/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2770	Xsubselect		P2-1a	3	B12	7/2/2013		0											
br2771	Xsubselect		P2-2a	3	B12	7/2/2013		0											
br2772	Xsubselect		P3-1a	3	B12	7/2/2013		0											
br2773	sample	br218	P3-1b	3	B12	7/2/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br2774	Xsubselect		P1-1c	3	B12	7/2/2013		0											
br2775	sample	hr775	P1-1a	3	B19	7/2/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br2776	Xsubselect		P1-2a	3	B19	7/2/2013		0											
br2777	Xsubselect		P1-2b	3	B19	7/2/2013		0											
br2778	Xsubselect		P2-1a	3	B19	7/2/2013		0											
br2779	Xbomb		P2-1b	3	B19	7/2/2013		8	156.160	159.159	178.184	33.237	186.190	208.210	161.161			239.239	204.250
br2780	Xsubselect		P2-2a	3	B19	7/2/2013		0											
br2781	Xinadequate		P3-1a	3	B19	7/2/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2782	Xinadequate		P1-1a	3	B30	7/2/2013		0											
br2783	sample	br2198	P1-1a	3	B29	7/2/2013		9	140.140	149.153	174.176	221.221	186.190	210.210	139.165			225.229	250.250
br2784	Xinadequate		P2-1a	3	B29	7/2/2013		0											
br2785	sample	br2785	P3-1a	3	B29	7/2/2013		9	140.152	149.155	174.176	221.237	186.190	210.210	139.165			223.229	204.250
br2786	sample	br2198	G-1	3	B29	7/2/2013		9	140.140	149.153	174.176	221.221	186.190	210.210	139.165			225.229	250.250
br2787	Xsubselect		G-2	3	B29	7/2/2013		0											
br2788	sample	br97	P1-1a	3	B28	7/2/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br2789	Xsubselect		P1-1b	3	B28	7/2/2013		0											
br2790	sample	br584	P2-1a	3	B28	7/2/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br2791	Xinadequate		P2-2a	3	B28	7/2/2013		0											
br2792	sample	br584	P3-1a	3	B28	7/2/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br2793	Xsubselect		P3-2a	3	B28	7/2/2013		0											
br2794	Xsubselect		P3-3a	3	B28	7/2/2013		0											
br2795	Xspecies		P1-1a	4	B1	7/11/2013		0											
br2796	Xinadequate		P1-2a	4	B1	7/11/2013		0											
br2797	Xspecies		P1-3a	4	B1	7/11/2013		0											
br2798	sample	hr1	P1-1a	4	B66	7/11/2013	Set-up and 1st bait on June 11	9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br2799	sample	hr1	P2-1a	4	B66	7/11/2013		9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br2800	sample	br244	P1-3a	3	B33	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2801	sample	br244	P2-1a	3	B33	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2802	Xsubselect		P2-2a	3	B33	7/2/2013		0											
br2803	sample	br244	P3-1a	3	B33	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2804	Xsubselect		P3-2a	3	B33	7/2/2013		0											
br2805	sample	br244	P1-1a	3	B34	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2806	sample	br244	P2-1a	3	B34	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2807	sample	br244	P3-1a	3	B34	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2808	Xsubselect		P1-1a	3	B35	7/2/2013		0											
br2809	Xinadequate		P1-1b	3	B33	7/2/2013		0											
br2810	Xsubselect		P1-2a	3	B35	7/2/2013		0											
br2811	sample	br244	P1-2b	3	B35	7/2/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2812	Xsubselect		P1-2c	3	B35	7/2/2013		0											
br2813	Xsubselect		P2-1a	3	B35	7/2/2013		0											
br2814	Xsubselect		P2-1b	3	B35	7/2/2013		0											
br2815	Xbomb		P2-2a	3	B35	7/2/2013		6	160.52.62	51.151	174.186	221.237	180.90.186	208.216	139.153			223.239	204.250
br2816	Xinadequate		P3-1a	3	B35	7/2/2013		0											
br2817	Xsubselect		P3-1b	3	B35	7/2/2013		0											
br2818	Xbomb		P3-2a	3	B35	7/2/2013		1	52.52	151.53	74.186	221.37	80.86.190	208.10.16	139.51.53			223.27.39	204.250
br2819	Xsubselect		P3-3a	3	B35	7/2/2013		0											
br2820	Xsubselect		P1-1a	3	B32	7/2/2013		0											
br2821	Xsubselect		P1-1b	3	B32	7/2/2013		0											
br2822	Xsubselect		P1-2a	3	B32	7/2/2013		0											
br2823	Xsubselect		P1-2b	3	B32	7/2/2013		0											
br2824	sample	br2232	P1-3a	3	B32	7/2/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2825	Xsubselect		P2-1a	3	B32	7/2/2013		0											
br2826	Xsubselect		P2-2a	3	B32	7/2/2013		0											
br2827	sample	br2232	P2-3a	3	B32	7/2/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2828	Xsubselect		P2-3b	3	B32	7/2/2013		0											
br2829	Xsubselect		P2-3c	3	B32	7/2/2013		0											
br2830	Xsubselect		P2-3d	3	B32	7/2/2013		0											
br2831	Xsubselect		G-1	3	B32	7/2/2013		0											
br2832	Xsubselect		P3-1a	3	B32	7/2/2013		0											
br2833	sample	br2232	P3-2a	3	B32	7/2/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2834	Xsubselect		P3-2b	3	B32	7/2/2013		0											
br2835	sample	br2232	G-2	3	B32	7/2/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br2836	Xsubselect		G-3	3	B32	7/2/2013		0											
br2837	Xsubselect		P1-1a	3	B33	7/2/2013		0											
br2838	Xsubselect		P1-2a	3	B33	7/2/2013		0											
br2839	Xsubselect		P1-2b	3	B33	7/2/2013		0											
br2840	Xsubselect		P3-3b	3	B35	7/2/2013		0											
br2841	Xsubselect		P2-3b	3	B48	7/2/2013		0											
br2842	Xbomb		P3-1a	3	B48	7/2/2013		6	152.158	151.155	172.186	231.37	186.190	208.210	59.161			223.47	204.250
br2843	sample	br758	P1-1a	3	B63	7/3/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br2844	sample	br758	P2-1a	3	B63	7/3/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br2845	sample	br758	P3-1a	3	B63	7/3/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br2846	Xinadequate		P2-2a	4	B66	7/11/2013		0											
br2847	Xinadequate		P3-1a	4	B66	7/11/2013		0											
br2848	Xsubselect		P3-2a	4	B66	7/11/2013		0											
br2849	Xsubselect		P3-2b	4	B66	7/11/2013		0											
br2850	Xinadequate		P3-3a	4	B66	7/11/2013		0											
br2851	sample	hr1	P3-4a	4	B66	7/11/2013		9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br2852	Xbomb		P1-1a	4	B67	7/11/2013		4	54.160	149.151	76.177	21.21	190.190	210.214	153.161			39.39	04.250
br2853	Xinadequate		P1-2a	4	B67	7/11/2013		0											
br2854	Xbomb		G-1	4	B67	7/11/2013		0	52.58.60	49.151			90.190	206.10.14	153.61				
br2855	Xspecies		G-1	4	B2	7/11/2013		0											
br2856	Xinadequate		P1-1a	4	B3	7/11/2013		0											
br2857	Xsubselect		P1-1b	4	B3	7/11/2013		0											
br2858	sample	br974	P1-2a	4	B3	7/11/2013		9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	250.250
br2859	Xsubselect		P1-2b	4	B3	7/11/2013		0											
br2860	Xsubselect		P1-1a	3	B44	7/2/2013		0											
br2861	sample	br97	P1-1b	3	B44	7/2/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br2862	Xsubselect		P1-2a	3	B44	7/2/2013		0											
br2863	sample	br97	P2-1a	3	B44	7/2/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br2864	Xsubselect		P2-2a	3	B44	7/2/2013		0											
br2865	Xsubselect		P1-1a	3	B50	7/2/2013		0											
br2866	Xsubselect		P1-1b	3	B50	7/2/2013		0											
br2867	Xsubselect		P1-2a	3	B50	7/2/2013		0											
br2868	sample	br237	P1-2b	3	B50	7/2/2013		9	152.160	153.159	178.186	221.231	186.190	208.210	139.161			223.239	250.250
br2869	Xsubselect		P1-1a	3	B59	7/3/2013		0											
br2870	sample	br2302	P1-1b	3	B59	7/3/2013		9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	204.250
br2871	Xsubselect		P1-1a	3	B56	7/3/2013		0											
br2872	Xsubselect		P1-1b	3	B56	7/3/2013		0											
br2873	Xsubselect		P1-1c	3	B56	7/3/2013		0											
br2874	sample	hr137	P1-2a	3	B56	7/3/2013		9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	204.250
br2875	Xsubselect		P1-2b	3	B56	7/3/2013		0											
br2876	Xinadequate		P2-1a	3	B56	7/3/2013		0											
br2877	Xinadequate		P3-1a	3	B56	7/3/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2878	Xinadequate		P3-1b	3	B56	7/3/2013		0											
br2879	Xbomb		P3-2a	3	B56	7/3/2013		1					186.196	210.12	61.161				
br2880	Xsubselect		P1-1a	3	B38	7/2/2013		0											
br2881	Xsubselect		P1-1b	3	B38	7/2/2013		0											
br2882	Xsubselect		P1-2a	3	B38	7/2/2013		0											
br2883	Xsubselect		P1-3a	3	B38	7/2/2013		0											
br2884	sample	br1086	P1-3b	3	B38	7/2/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2885	Xsubselect		P1-3c	3	B38	7/2/2013		0											
br2886	Xsubselect		P2-1a	3	B38	7/2/2013		0											
br2887	Xbomb		P2-1b	3	B38	7/2/2013		3		153.155			186.186		153.161				
br2888	Xsubselect		P2-2a	3	B38	7/2/2013		0											
br2889	sample	br1086	P3-1a	3	B38	7/2/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br2890	Xsubselect		P3-1b	3	B38	7/2/2013		0											
br2891	Xsubselect		P3-2a	3	B38	7/2/2013		0											
br2892	Xsubselect		P1-1a	3	B48	7/2/2013		0											
br2893	Xsubselect		P1-2a	3	B48	7/2/2013		0											
br2894	sample	hr137	P1-3a	3	B48	7/2/2013		9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	204.250
br2895	Xsubselect		P1-3b	3	B48	7/2/2013		0											
br2896	Xsubselect		P2-1a	3	B48	7/2/2013		0											
br2897	sample	hr137	P2-2a	3	B48	7/2/2013		9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	204.250
br2898	Xsubselect		P2-2b	3	B48	7/2/2013		0											
br2899	Xsubselect		P2-3a	3	B48	7/2/2013		0											
br2900	Xsubselect		P2-1a	4	B3	7/11/2013		0											
br2901	sample	br974	P2-2a	4	B3	7/11/2013		9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	250.250
br2902	Xsubselect		P3-1a	4	B3	7/11/2013		0											
br2903	sample	br974	P3-1b	4	B3	7/11/2013		9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	250.250
br2904	Xsubselect		P1-1a	4	B5	7/11/2013		0											
br2905	Xsubselect		P1-1b	4	B5	7/11/2013		0											
br2906	Xsubselect		P1-1c	4	B5	7/11/2013		0											
br2907	sample	br696	P1-1d	4	B5	7/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2908	Xsubselect		P1-1	4	B5	7/11/2013		0											
br2909	Xsubselect		P1-2a	4	B5	7/11/2013		0											
br2910	Xsubselect		P2-1a	4	B5	7/11/2013		0											
br2911	Xsubselect		P2-1b	4	B5	7/11/2013		0											
br2912	Xsubselect		P1-3a	4	B5	7/11/2013		0											
br2913	Xsubselect		P2-2a	4	B5	7/11/2013		0											
br2914	Xsubselect		P2-2b	4	B5	7/11/2013		0											
br2915	Xsubselect		P2-2c	4	B5	7/11/2013		0											
br2916	sample	br696	P2-2d	4	B5	7/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2917	Xsubselect		P2-2	4	B5	7/11/2013		0											
br2918	Xinadequate		P3-1a	4	B5	7/11/2013		0											
br2919	sample	br696	P3-1b	4	B5	7/11/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2920	Xinadequate		P1-1a	4	B8	7/11/2013		0											
br2921	sample	br962	P1-2a	4	B8	7/11/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2922	Xsubselect		P1-2b	4	B8	7/11/2013		0											
br2923	Xsubselect		G-1	4	B8	7/11/2013		0											
br2924	Xsubselect		P2-1a	4	B8	7/11/2013		0											
br2925	Xsubselect		P2-2b	4	B8	7/11/2013		0											
br2926	sample	br962	P2-2a	4	B8	7/11/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2927	Xbomb		G-2	4	B8	7/11/2013		5	40.152.160	155.155	176.78.186	23.231.233	86.190	210.210	155.161			229.239	250.250
br2928	Xinadequate		P1-1a	4	B9	7/11/2013		0											
br2929	Xbomb		P1-2a	4	B9	7/11/2013		0											
br2930	Xinadequate		P2-1a	4	B9	7/11/2013		0											
br2931	Xinadequate		T-1	4	B9	7/11/2013		0											
br2932	Xbomb		P3-1a	4	B9	7/11/2013		0			78.178		180.90		155.61			49.49	250.50
br2933	Xsubselect		P1-1a	4	B13	7/12/2013		0											
br2934	Xsubselect		P1-1b	4	B13	7/12/2013		0											
br2935	Xsubselect		P1-2a	4	B13	7/12/2013		0											
br2936	sample	br962	P1-2b	4	B13	7/12/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2937	Xsubselect		P1-2c	4	B13	7/12/2013		0											
br2938	Xsubselect		P2-1a	4	B13	7/12/2013		0											
br2939	sample	br962	P2-1b	4	B13	7/12/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2940	Xsubselect		P2-2a	4	B13	7/12/2013		0											
br2941	Xsubselect		P2-2b	4	B13	7/12/2013		0											
br2942	Xsubselect		P2-2c	4	B13	7/12/2013		0											
br2943	Xsubselect		P2-2d	4	B13	7/12/2013		0											
br2944	sample	br962	P3-1a	4	B13	7/12/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br2945	Xsubselect		P3-1b	4	B13	7/12/2013		0											
br2946	Xinadequate		P3-2a	4	B13	7/12/2013		0											
br2947	Xsubselect		P1-1a	4	B10	7/12/2013		0											
br2948	sample	br696	P1-1b	4	B10	7/12/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2949	Xinadequate		P1-1a	4	B15	7/12/2013		0											
br2950	Xsubselect		P1-1c	4	B10	7/12/2013		0											
br2951	Xsubselect		P1-2a	4	B10	7/12/2013		0											
br2952	Xsubselect		P1-2b	4	B10	7/12/2013		0											
br2953	Xsubselect		P1-3a	4	B10	7/12/2013		0											
br2954	Xsubselect		P1-4a	4	B10	7/12/2013		0											
br2955	Xsubselect		P1-4b	4	B10	7/12/2013		0											
br2956	sample	br696	G-1	4	B10	7/12/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2957	Xsubselect		P2-1a	4	B10	7/12/2013		0											
br2958	sample	br696	P2-1b	4	B10	7/12/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2959	sample	br696	P3-1a	4	B10	7/12/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br2960	Xsubselect		P2-2a	4	B10	7/12/2013		0											
br2961	Xsubselect		P2-2b	4	B10	7/12/2013		0											
br2962	sample	br172	P1-1a	4	B11	7/12/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2963	Xsubselect		P2-1a	4	B11	7/12/2013		0											
br2964	Xsubselect		P2-2a	4	B11	7/12/2013		0											
br2965	sample	br172	P2-2b	4	B11	7/12/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2966	sample	br172	P3-1a	4	B11	7/12/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br2967	Xsubselect		P3-2a	4	B11	7/12/2013		0											
br2968	Xbomb		G-1	4	B11	7/12/2013		4	152.160	149.161			186.196		139.161				
br2969	Xinadequate		P1-1a	4	B12	7/12/2013		0											
br2970	Xbomb		P1-2a	4	B12	7/12/2013		3	60.160	149.55	172.76	21.21	180.186	210.214	139.161				
br2971	Xsubselect		G-1	1	B12	6/12/2013		0											
br2972	Xbomb		G-2	1	B12	6/12/2013		3		149.155		221.21	180.186		139.161				
br2973	sample	1065	P1-1a	4	B16	7/12/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
br2974	Xsubselect		P1-2a	4	B16	7/12/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br2975	Xsubselect		P1-3a	4	B16	7/12/2013		0											
br2976	Xsubselect		P1-1a	4	B18	7/12/2013		0											
br2977	sample	br195	P1-2a	4	B18	7/12/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br2978	sample	br195	P2-1a	4	B18	7/12/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br2979	sample	1065	P2-1a	4	B16	7/12/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
br2980	Xsubselect		G-1	4	B48	7/12/2013		0											
br2981	Xinadequate		P1-1a	4	B48	7/12/2013		0											
br2982	Xinadequate		P1-2a	4	B48	7/12/2013		0											
br2983	Xinadequate		P1-3a	4	B48	7/12/2013		0											
br2984	sample	hr137	G-3	4	B48	7/12/2013		9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	204.250
br2985	Xsubselect		G-2	4	B48	7/12/2013		0											
br2986	Xbomb		P1-1a	4	B33	7/12/2013		4	52.152	153.153	86.186	221.221	190.190	10.210	39.151			223.27	204.250
br2987	Xinadequate		P1-2a	4	B33	7/12/2013		0											
br2988	Xinadequate		P1-2b	4	B33	7/12/2013		0											
br2989	Xinadequate		P2-1a	4	B33	7/12/2013		0											
br2990	sample	br244	P3-1a	4	B33	7/12/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br2991	sample	br220	P1-1a	4	B25	7/12/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br2992	Xsubselect		P1-1b	4	B25	7/12/2013		0											
br2993	Xsubselect		P1-2a	4	B25	7/12/2013		0											
br2994	Xsubselect		P1-2b	4	B25	7/12/2013		0											
br2995	sample	br220	P2-1a	4	B25	7/12/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br2996	Xsubselect		P2-1b	4	B25	7/12/2013		0											
br2997	Xsubselect		P3-1a	4	B25	7/12/2013		0											
br2998	Xsubselect		P3-2a	4	B25	7/12/2013		0											
br2999	Xsubselect		P3-2b	4	B25	7/12/2013		0											
br3000	Xsubselect		P3-2c	4	B25	7/12/2013		0											
br3001	sample	br220	P3-3a	4	B25	7/12/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br3002	Xsubselect		P3-3b	4	B25	7/12/2013		0											
br3003	Xsubselect		P3-3c	4	B25	7/12/2013		0											
br3005	sample	br244	P1-1a	4	B26	7/12/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3006	Xsubselect		P1-1b	4	B26	7/12/2013		0											
br3007	sample	br2240	P1-1a	4	B65	7/13/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br3008	Xbomb		P2-1a	4	B65	7/13/2013		6	140.152	153.155	174.178	221.233	186.90	210.210	153.53.61			223.229	04.250
br3009	Xsubselect		P2-1b	4	B65	7/13/2013		0											
br3010	Xinadequate		P2-2a	4	B65	7/13/2013		0											
br3011	Xinadequate		P2-2b	4	B65	7/13/2013		0											
br3012	Xsubselect		P3-1a	4	B65	7/13/2013		0											
br3013	sample	br1086	P3-2a	4	B65	7/13/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3014	Xsubselect		P3-3a	4	B65	7/13/2013		0											
br3015	Xinadequate		P1-1a	4	B64	7/13/2013		0											
br3016	Xinadequate		P1-2a	4	B64	7/13/2013		0											
br3017	Xinadequate		P1-1a	4	B63	7/13/2013		0											
br3018	Xsubselect		G-1	4	B63	7/13/2013		0											
br3019	Xbomb		G-2	4	B63	7/13/2013		2	152.160		78.178		186.196	06.210	55.61.163				250.50
br3020	Xbomb		P1-1a	4	B56	7/13/2013		1	46.150		78.84.86							33.233	250.250
br3021	Xbomb		G-1	4	B56	7/13/2013		1	46.150										250.250
br3022	Xbomb		T-1	4	B57	7/13/2013		2		155.59				210.210	59.161			29.37.239	250.250
br3023	Xinadequate		P1-1a	4	B59	7/13/2013		0											
br3024	Xsubselect		P1-2a	4	B59	7/13/2013		0											
br3025	Xbomb		P1-3a	4	B59	7/13/2013		4	140.160	149.151		221.221	180.190	210.12	153.65			29.229	
br3026	Xsubselect		P1-1a	4	B55	7/13/2013		0											
br3027	sample	br1088	P1-2a	4	B55	7/13/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3028	Xsubselect		P1-2b	4	B55	7/13/2013		0											
br3029	Xsubselect		P2-1a	4	B55	7/13/2013		0											
br3030	Xbomb		P2-1b	4	B55	7/13/2013		4	140.160	153.155	78.78	221.21	186.186	210.14	153.165				
br3031	Xsubselect		P3-1a	4	B55	7/13/2013		0											
br3032	Xsubselect		P3-1b	4	B55	7/13/2013		0											
br3033	sample	br1088	P3-2a	4	B55	7/13/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3034	Xsubselect		P3-3a	4	B55	7/13/2013		0											
br3035	Xsubselect		P3-3b	4	B55	7/13/2013		0											
br3036	Xinadequate		P3-4a	4	B55	7/13/2013		0											
br3037	Xsubselect		G-1	4	B55	7/13/2013		0											
br3038	sample	br1088	G-2	4	B55	7/13/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3039	Xsubselect		G-3	4	B55	7/13/2013		0											
br3040	Xinadequate		P1-1a	4	B23	7/14/2013		0											
br3041	Xinadequate		P1-1b	4	B23	7/14/2013		0											
br3042	Xinadequate		P1-2a	4	B23	7/14/2013		0											
br3043	Xinadequate		P1-3a	4	B23	7/14/2013		0											
br3044	Xbomb		P2-1a	4	B23	7/14/2013		0										223.23	
br3045	Xinadequate		P2-2a	4	B23	7/14/2013		0											
br3046	Xinadequate		P2-3a	4	B23	7/14/2013		0											
br3047	Xinadequate		P2-4a	4	B23	7/14/2013		0											
br3048	Xsubselect		P1-1a	4	B24	7/14/2013		0											
br3049	Xsubselect		P1-1b	4	B24	7/14/2013		0											
br3050	Xsubselect		P1-1c	4	B24	7/14/2013		0											
br3051	sample	br218	P1-2a	4	B24	7/14/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3052	Xsubselect		P1-2b	4	B24	7/14/2013		0											
br3053	Xsubselect		P1-3a	4	B24	7/14/2013		0											
br3054	Xsubselect		P1-3b	4	B24	7/14/2013		0											
br3055	Xsubselect		P2-1a	4	B24	7/14/2013		0											
br3056	Xsubselect		P2-1b	4	B24	7/14/2013		0											
br3057	Xsubselect		P2-2a	4	B24	7/14/2013		0											
br3058	Xsubselect		P2-2b	4	B24	7/14/2013		0											
br3059	Xsubselect		P2-2c	4	B24	7/14/2013		0											
br3060	Xsubselect		P2-3a	4	B24	7/14/2013		0											
br3061	sample	br218	P2-3b	4	B24	7/14/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3062	sample	br218	G-1	4	B24	7/14/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3063	Xsubselect		G-2	4	B24	7/14/2013		0											
br3064	Xsubselect		G-3	4	B24	7/14/2013		0											
br3065	Xsubselect		G-4	4	B24	7/14/2013		0											
br3066	Xsubselect		G-5	4	B24	7/14/2013		0											
br3067	Xinadequate		P1-1a	4	B31	7/14/2013		0											
br3068	Xinadequate		P1-1a	4	B29	7/14/2013		0											
br3069	Xsubselect		G-1	4	B29	7/14/2013		0											
br3070	sample	br2198	G-2	4	B29	7/14/2013		9	140.140	149.153	174.176	221.221	186.190	210.210	139.165			225.229	250.250
br3071	Xinadequate		P1-1a	4	B42	7/14/2013		0											
br3072	Xbomb		T-1	4	B35	7/14/2013		1	52.152		86.86	221.21	86.190		139.151				04.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3073	Xinadequate		T-2	4	B35	7/14/2013		0											
br3075	Xspecies		P1-1a	4	B37	7/14/2013		0											
br3076	Xspecies		P1-1b	4	B37	7/14/2013		0											
br3077	Xspecies		P2-1a	4	B37	7/14/2013		0											
br3078	Xspecies		P2-1b	4	B37	7/14/2013		0											
br3079	Xspecies		P2-1c	4	B37	7/14/2013		0											
br3080	Xspecies		P2-2a	4	B37	7/14/2013		0											
br3083	Xspecies		P3-1a	4	B37	7/14/2013		0											
br3084	sample	br598	P1-1a	4	B38	7/15/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3085	Xsubselect		P1-2a	4	B38	7/15/2013		0											
br3086	Xsubselect		P1-2b	4	B38	7/15/2013		0											
br3087	Xsubselect		P1-2c	4	B38	7/15/2013		0											
br3088	sample	br598	P2-1a	4	B38	7/15/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3089	Xsubselect		P2-2a	4	B38	7/15/2013		0											
br3090	Xinadequate		P2-2b	4	B38	7/15/2013		0											
br3091	Xsubselect		P3-1a	4	B38	7/15/2013		0											
br3092	sample	br598	P3-1b	4	B38	7/15/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3093	Xsubselect		P3-1c	4	B38	7/15/2013		0											
br3094	Xsubselect		P3-2a	4	B38	7/15/2013		0											
br3095	Xinadequate		P3-2b	4	B38	7/15/2013		0											
br3096	Xbomb		G-1	4	B38	7/15/2013		1	52.52	155.155			86.186		141.65				250.50
br3097	Xinadequate		P1-1a	5	B7	7/24/2013		0											
br3098	Xbomb		G-1	5	B7	7/24/2013		5	140.52.160	155.159	4.176.84.17	221.233	186.190	208.210	39.161			223.29.49	250.250
br3099	sample	br314	P1-2a	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3100	sample	br423	P1-1a	4	B27	7/13/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3101	Xsubselect		P1-1b	4	B27	7/13/2013		0											
br3102	Xinadequate		P1-1c	4	B27	7/13/2013		0											
br3103	Xinadequate		P1-1d	4	B27	7/13/2013		0											
br3104	Xinadequate		P2-1a	4	B27	7/13/2013		0											
br3105	Xsubselect		P2-1b	4	B27	7/13/2013		0											
br3106	Xsubselect		P2-1c	4	B27	7/13/2013		0											
br3107	Xsubselect		P2-2a	4	B27	7/13/2013		0											
br3108	Xbomb		P2-2b	4	B27	7/13/2013		8	152.160	155.159	174.176	231.237	190.190	210.214	39.55.159			223.229	250.250
br3109	Xbomb		P3-1a	4	B27	7/13/2013		1	152.60	155.59		221.237	90.190	10.10	39.161			223.23	250.50
br3110	Xsubselect		P3-1b	4	B27	7/13/2013		0											
br3111	Xsubselect		G-1	4	B28	7/13/2013		0											
br3112	Xsubselect		G-2	4	B28	7/13/2013		0											
br3113	Xsubselect		G-3	4	B28	7/13/2013		0											
br3114	Xsubselect		G-4	4	B28	7/13/2013		0											
br3115	sample	br584	G-5	4	B28	7/13/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br3118	Xsubselect		G-2	5	B7	7/24/2013		0											
br3119	Xinadequate		P1-2b	5	B7	7/24/2013		0											
br3120	Xsubselect		P1-2c	5	B7	7/24/2013		0											
br3121	sample	br155	P1-2d	5	B7	7/24/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br3122	Xinadequate		P2-1a	5	B7	7/24/2013		0											
br3123	Xsubselect		P2-1b	5	B7	7/24/2013		0											
br3124	sample	br314	P2-1c	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3125	Xsubselect		P2-1d	5	B7	7/24/2013		0											
br3126	sample	br314	P3-1a	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3127	sample	br314	P2-1	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3128	Xsubselect		P3-1b	5	B7	7/24/2013		0											
br3129	Xsubselect		P2-1f	5	B7	7/24/2013		0											
br3130	sample	br314	P3-2a	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3131	Xsubselect		P2-1g	5	B7	7/24/2013		0											
br3132	Xbomb		P3-3a	5	B7	7/24/2013		7	140.52.60	155.159	74.178.84	221.233	186.190	208.210	161.161			223.249	250.250
br3133	sample	br314	P2-1h	5	B7	7/24/2013		9	140.152	155.159	174.176	221.233	186.190	208.210	139.161			223.229	250.250
br3134	Xbomb		P3-3b	5	B7	7/24/2013		5	140.52.60	155.159	174.78.184	221.233	186.190	208.210	39.161			223.29.49	250.250
br3135	Xinadequate		P2-2a	5	B7	7/24/2013		0											
br3136	Xinadequate		P3-3c	5	B7	7/24/2013		0											
br3137	Xinadequate		P3-3d	5	B7	7/24/2013		0											
br3138	Xinadequate		P3-4a	5	B7	7/24/2013		0											
br3140	sample	hr66	P1-1a	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3141	Xinadequate		P1-1b	5	B67	7/23/2013		0											
br3142	Xinadequate		P1-1c	5	B67	7/23/2013		0											
br3143	Xinadequate		P1-1d	5	B67	7/23/2013		0											
br3144	Xinadequate		P2-1a	5	B67	7/23/2013		0											
br3145	Xinadequate		P2-1b	5	B67	7/23/2013		0											
br3146	Xinadequate		P2-1c	5	B67	7/23/2013		0											
br3147	Xbomb		P2-1d	5	B67	7/23/2013		0											
br3148	Xsubselect		P2-1	5	B67	7/23/2013		0											
br3149	Xinadequate		P2-1f	5	B67	7/23/2013		0											
br3150	sample	hr66	P2-1g	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3151	sample	hr66	P2-1h	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3152	Xbomb		T-1	5	B67	7/23/2013		4	40.52.56.6(	151.153	83.186	221.223	86.96.190	210.212	153.59.61			23.239	250.250
br3153	Xinadequate		P2-1i	5	B67	7/23/2013		0											
br3154	sample	hr66	P3-1a	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3155	Xsubselect		P3-1b	5	B67	7/23/2013		0											
br3156	Xsubselect		P3-1c	5	B67	7/23/2013		0											
br3157	sample	hr66	P3-1d	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3158	Xsubselect		P3-1	5	B67	7/23/2013		0											
br3159	Xsubselect		P3-1f	5	B67	7/23/2013		0											
br3160	Xsubselect		G-3	5	B7	7/24/2013		0											
br3161	Xsubselect		P1-1a	5	B11	7/24/2013		0											
br3162	Xsubselect		P1-1b	5	B11	7/24/2013		0											
br3163	sample	hr775	P1-1c	5	B11	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3164	Xsubselect		P1-1d	5	B11	7/24/2013		0											
br3165	Xbomb		P1-1	5	B11	7/24/2013		3	56.60	49.157.59	78.178	33.233	186.190	208.210	161.161			237.39	04.250
br3166	Xsubselect		P1-1f	5	B11	7/24/2013		0											
br3167	sample	hr775	P1-1g	5	B11	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3168	Xsubselect		P1-1h	5	B11	7/24/2013		0											
br3169	Xsubselect		P2-1a	5	B11	7/24/2013		0											
br3170	Xbomb		P2-1b	5	B11	7/24/2013		4	40.140	153.161	82.84	221.233	186.196	208.210	39.155				50.250
br3171	Xsubselect		P2-1c	5	B11	7/24/2013		0											
br3172	Xbomb		P2-1d	5	B11	7/24/2013		0							139.61				
br3173	Xbomb		P2-2a	5	B11	7/24/2013		1		59.159	75.80		186.190		61.161				
br3174	Xbomb		P3-1a	5	B11	7/24/2013		0				231.35	186.90	208.22					50.250
br3175	Xsubselect		P3-1b	5	B11	7/24/2013		0											

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3176	Xinadequate		P3-1c	5	B11	7/24/2013		0											
br3177	sample	hr775	P3-1d	5	B11	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3178	Xsubselect		G-1	5	B11	7/24/2013		0											
br3179	Xbomb		P3-2a	5	B11	7/24/2013		2	156.60	49.57.159		235.37	186.190	08.208	161.161			35.239	50.250
br3180	Xbomb		G-1	5	B26	7/25/2013		0						10.210					
br3181	Xbomb		P1-1a	5	B26	7/25/2013		2		155.59	74.174	21.37	90.190	208.210				223.239	50.250
br3182	Xsubselect		P1-1b	5	B26	7/25/2013		0											
br3183	Xsubselect		P1-1c	5	B26	7/25/2013		0											
br3184	Xbomb		P1-2a	5	B26	7/25/2013		1		155.57.59	174.78		190.190	194.08.10	161.63				
br3185	sample	br220	P1-3a	5	B26	7/25/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br3186	Xsubselect		P1-3b	5	B26	7/25/2013		0											
br3187	Xbomb		P2-1a	5	B26	7/25/2013		0											
br3188	Xbomb		P2-2a	5	B26	7/25/2013		0			84.84	25.25							204.50
br3189	Xinadequate		P2-2b	5	B26	7/25/2013		0											
br3190	Xinadequate		P2-3a	5	B26	7/25/2013		0											
br3191	Xinadequate		P2-3b	5	B26	7/25/2013		0											
br3192	sample	br220	P2-3c	5	B26	7/25/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br3193	Xbomb		P2-3d	5	B26	7/25/2013		1		49.153		21.21			149.161			223.23	50.250
br3194	Xbomb		T-1	5	B26	7/25/2013		1				223.23	178.78		139.155				
br3195	sample	br220	P3-1a	5	B26	7/25/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br3196	Xinadequate		P3-1b	5	B26	7/25/2013		0											
br3197	Xinadequate		P3-1c	5	B26	7/25/2013		0											
br3198	Xinadequate		G-2	5	B26	7/25/2013		0											
br3199	Xinadequate		P1-1a	5	B28	7/28/2013		0											
br3200	Xsubselect		P3-2b	5	B11	7/24/2013		0											
br3201	sample	hr775	G-2	5	B11	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3202	sample	hr775	P3-2c	5	B11	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3203	Xsubselect		P3-2d	5	B11	7/24/2013		0											
br3204	sample	br2764	T-1	5	B11	7/24/2013		9	152.160	149.161	176.184	221.221	186.196	208.214	139.161			239.239	204.250
br3205	Xsubselect		P3-2	5	B11	7/24/2013		0											
br3206	sample	br146	P1-1a	5	B10	7/24/2013		9	158.160	151.153	178.186	221.231	186.190	210.210	161.161			229.249	250.250
br3207	Xbomb		P2-1a	5	B10	7/24/2013		2		151.151			86.186	14.214	61.161			23.223	204.250
br3208	Xinadequate		P1-1a	5	B9	7/24/2013		0											
br3209	Xsubselect		P1-2a	5	B9	7/24/2013		0											
br3210	Xsubselect		P2-1a	5	B9	7/24/2013		0											
br3211	Xsubselect		P1-2b	5	B9	7/24/2013		0											
br3212	Xbomb		G-1	5	B9	7/24/2013		3		151.151	178.86	231.33	90.190	14.214	161.161			223.223	50.250
br3213	sample	br33	P1-2c	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3214	sample	br33	P3-1a	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3215	sample	br33	P2-1b	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3216	Xsubselect		P2-1c	5	B9	7/24/2013		0											
br3217	Xsubselect		P3-1b	5	B9	7/24/2013		0											
br3218	Xsubselect		P3-1c	5	B9	7/24/2013		0											
br3219	sample	br33	P3-1d	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3220	Xsubselect		P3-1	5	B9	7/24/2013		0											
br3221	sample	br33	P3-2a	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3222	sample	br33	P3-3a	5	B9	7/24/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3223	Xinadequate		P1-1a	5	B8	7/24/2013		0											
br3224	Xinadequate		P1-2a	5	B8	7/24/2013		0											
br3225	Xinadequate		P2-1a	5	B8	7/24/2013		0											
br3226	Xinadequate		P3-1a	5	B8	7/24/2013		0											
br3227	sample	hr488	G-1	5	B8	7/24/2013		9	152.152	149.155	178.186	231.231	190.196	210.210	155.161			229.239	250.250
br3228	Xsubselect		G-1	5	B13	7/24/2013		0											
br3229	Xsubselect		G-2	5	B13	7/24/2013		0											
br3230	Xsubselect		P1-1a	5	B13	7/24/2013		0											
br3231	sample	hr775	P1-1b	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3232	Xsubselect		P1-1c	5	B13	7/24/2013		0											
br3233	Xsubselect		P1-1d	5	B13	7/24/2013		0											
br3234	sample	hr775	G-3	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3235	sample	hr775	P1-1	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3236	Xsubselect		P2-1a	5	B13	7/24/2013		0											
br3237	Xsubselect		P1-1f	5	B13	7/24/2013		0											
br3238	Xsubselect		P1-1g	5	B13	7/24/2013		0											
br3239	sample	hr775	P2-1b	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3240	Xsubselect		P2-1c	5	B13	7/24/2013		0											
br3241	Xsubselect		P1-1h	5	B13	7/24/2013		0											
br3242	Xbomb		P2-1d	5	B13	7/24/2013		6	152.160	151.155	176.84	21.231	186.186	210.210	141.161			223.29	204.250
br3243	sample	hr775	P1-1i	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3244	Xbomb		P2-2a	5	B13	7/24/2013		2	56.56	159.159	84.84		186.190	208.10	53.161			39.239	204.50
br3245	Xsubselect		P1-1j	5	B13	7/24/2013		0											
br3246	Xsubselect		P2-2b	5	B13	7/24/2013		0											
br3247	Xsubselect		P1-1k	5	B13	7/24/2013		0											
br3248	Xsubselect		P2-2c	5	B13	7/24/2013		0											
br3249	Xbomb		P2-2d	5	B13	7/24/2013		1		153.153			186.90						
br3250	sample	hr775	P1-1l	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3251	sample	hr775	P3-1a	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3252	Xsubselect		P3-1b	5	B13	7/24/2013		0											
br3253	Xsubselect		P3-1c	5	B13	7/24/2013		0											
br3254	sample	hr775	P3-1d	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3255	sample	hr775	P3-2a	5	B13	7/24/2013		9	156.160	159.159	178.184	233.237	186.190	208.210	161.161			239.239	204.250
br3256	Xinadequate		P3-2b	5	B13	7/24/2013		0											
br3257	Xinadequate		P1-1a	5	B14	7/24/2013		0											
br3258	Xinadequate		P1-1b	5	B14	7/24/2013		0											
br3259	Xinadequate		P1-2a	5	B14	7/24/2013		0											
br3260	Xsubselect		P3-1g	5	B67	7/23/2013		0											
br3261	sample	hr66	P3-1h	5	B67	7/23/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
br3262	Xsubselect		P3-1i	5	B67	7/23/2013		0											
br3263	sample	br26	T-1	5	B3	7/23/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
br3264	Xbomb		P1-1a	5	B3	7/23/2013		8	40.158.160	151.161	176.178	223.231	186.190	208.210	161.161			229.239	250.250
br3265	sample	br26	P2-1a	5	B3	7/23/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
br3266	Xsubselect		P2-1b	5	B3	7/23/2013		0											
br3267	Xinadequate		P2-2a	5	B3	7/23/2013		0											
br3268	sample	br3268	P2-2b	5	B3	7/23/2013		9	158.160	151.161	176.178	223.231	186.190	208.210	161.161			229.239	250.250
br3269	Xsubselect		P2-3a	5	B3	7/23/2013		0											
br3270	sample	br26	P2-3b	5	B3	7/23/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
br3271	sample	br26	P3-1a	5	B3	7/23/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
br3272	Xsubselect		P3-1b	5	B3	7/23/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3273	Xsubselect		P3-1c	5	B3	7/23/2013		0											
br3274	Xsubselect		P1-1a	5	B2	7/23/2013		0											
br3275	Xbomb		P1-1b	5	B2	7/23/2013		2	40.58	151.53	72.178	23.221.231	186.190	208.10	161.161			39.239	50.250
br3276	Xsubselect		P1-1c	5	B2	7/23/2013		0											
br3277	Xsubselect		P1-1d	5	B2	7/23/2013		0											
br3278	sample	br696	P1-1	5	B2	7/23/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br3279	Xsubselect		P1-1f	5	B2	7/23/2013		0											
br3280	Xinadequate		P2-1a	5	B28	7/25/2013		0											
br3281	Xinadequate		T-1	5	B48	7/25/2013		0											
br3282	sample	hr38	P1-1a	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3283	Xinadequate		P1-1b	5	B48	7/25/2013		0											
br3284	sample	hr38	P1-1c	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3285	Xinadequate		P1-1d	5	B48	7/25/2013		0											
br3286	sample	hr38	P1-1	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3287	Xsubselect		P1-1f	5	B48	7/25/2013		0											
br3288	Xinadequate		P1-1g	5	B48	7/25/2013		0											
br3289	Xinadequate		P1-1h	5	B48	7/25/2013		0											
br3290	Xinadequate		P1-1i	5	B48	7/25/2013		0											
br3291	Xinadequate		P1-2a	5	B48	7/25/2013		0											
br3292	sample	hr38	P1-3a	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3293	sample	hr38	G-1	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3294	Xsubselect		P2-1a	5	B48	7/25/2013		0											
br3295	Xsubselect		G-2	5	B48	7/25/2013		0											
br3296	sample	hr38	P2-1b	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3297	Xsubselect		G-3	5	B48	7/25/2013		0											
br3298	sample	hr38	P2-2a	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3299	Xsubselect		P2-2b	5	B48	7/25/2013		0											
br3300	sample	br244	P3-1d	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3301	Xinadequate		P3-1f	5	B56	7/26/2013		0											
br3302	Xsubselect		P3-1g	5	B56	7/26/2013		0											
br3303	Xsubselect		P3-1h	5	B56	7/26/2013		0											
br3304	Xinadequate		P3-1i	5	B56	7/26/2013		0											
br3305	Xbomb		P3-1j	5	B56	7/26/2013		0				221.21	90.190		39.151			223.31	204.50
br3306	Xsubselect		P3-1k	5	B56	7/26/2013		0											
br3307	Xbomb		P3-1l	5	B56	7/26/2013		2		53.153		221.221	90.90	210.210	151.53.55				
br3308	Xinadequate		P3-1m	5	B56	7/26/2013		0											
br3309	Xinadequate		P3-2a	5	B56	7/26/2013		0											
br3310	Xbomb		T-1	5	B57	7/26/2013		0		51.155	76.176	31.31	86.186						
br3311	sample	br758	P1-1a	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3312	Xsubselect		P1-2a	5	B57	7/26/2013		0											
br3313	sample	br758	P1-2b	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3314	Xsubselect		P1-2c	5	B57	7/26/2013		0											
br3315	Xbomb		P1-2d	5	B57	7/26/2013		4		155.59.61	78.178	221.231	186.196	210.210	161.63.65			229.29	250.250
br3316	Xsubselect		G-1	5	B57	7/26/2013		0											
br3317	Xsubselect		P2-1a	5	B57	7/26/2013		0											
br3318	sample	br758	P2-1b	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3319	Xsubselect		P2-1c	5	B57	7/26/2013		0											
br3320	Xsubselect		P2-1d	5	B57	7/26/2013		0											
br3321	sample	br758	P2-1	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3322	sample	br758	G-2	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3323	Xinadequate		P3-1a	5	B57	7/26/2013		0											
br3324	Xinadequate		P3-2a	5	B57	7/26/2013		0											
br3325	sample	br758	P3-2b	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3326	Xinadequate		P3-2c	5	B57	7/26/2013		0											
br3327	sample	br758	P3-2d	5	B57	7/26/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3328	Xsubselect		P3-2	5	B57	7/26/2013		0											
br3329	Xsubselect		G-3	5	B57	7/26/2013		0											
br3330	Xspecies		P1-1a	5	B58	7/26/2013		0											
br3331	Xspecies		P1-1b	5	B58	7/26/2013		0											
br3332	sample	br3332	P1-1a	5	B65	7/26/2013		9	160.160	151.157	183.186	221.221	186.190	210.210	153.153			229.239	204.250
br3333	Xsubselect		P1-1b	5	B65	7/26/2013		0											
br3334	Xinadequate		P1-1c	5	B65	7/26/2013		0											
br3335	sample	br3332	P1-1d	5	B65	7/26/2013		9	160.160	151.157	183.186	221.221	186.190	210.210	153.153			229.239	204.250
br3336	sample	br423	P2-1a	5	B65	7/26/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3337	Xsubselect		P1-1	5	B65	7/26/2013		0											
br3338	Xinadequate		P1-1f	5	B65	7/26/2013		0											
br3339	Xbomb		P1-1g	5	B65	7/26/2013		1		151.157				10.10	153.55.61			229.29	04.04
br3340	Xinadequate		P2-3a	5	B48	7/25/2013		0											
br3341	Xsubselect		G-4	5	B48	7/25/2013		0											
br3342	Xbomb		G-5	5	B48	7/25/2013		4	152.54.60	53.159	172.176	21.31.233	180.86.90	210.210	141.53.61			223.223	204.250
br3343	sample	hr38	P2-3b	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3344	Xinadequate		P2-3c	5	B48	7/25/2013		0											
br3345	sample	hr38	P2-3d	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3346	Xsubselect		P2-3	5	B48	7/25/2013		0											
br3347	Xsubselect		P3-1a	5	B48	7/25/2013		0											
br3348	sample	hr38	P3-1b	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3349	Xinadequate		P3-1c	5	B48	7/25/2013		0											
br3350	sample	hr38	P3-1d	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3351	Xsubselect		P3-1	5	B48	7/25/2013		0											
br3352	Xsubselect		P3-1f	5	B48	7/25/2013		0											
br3353	Xbomb		P3-1g	5	B48	7/25/2013		4	152.54	153.159	176.186	221.31	30.90.96.1[illegible]	208.210	141.53.161			223.239	04.250
br3354	Xinadequate		P3-1h	5	B48	7/25/2013		0											
br3355	Xinadequate		P3-1i	5	B48	7/25/2013		0											
br3356	Xbomb		P3-1j	5	B48	7/25/2013		6	152.54.60	53.159	172.176	231.233	).86.190.1[illegible]	210.210	141.153			223.223	204.250
br3357	Xinadequate		P3-1k	5	B48	7/25/2013		0											
br3358	Xinadequate		P3-1l	5	B48	7/25/2013		0											
br3359	Xinadequate		P3-1m	5	B48	7/25/2013		0											
br3360	Xinadequate		P1-1h	5	B65	7/26/2013		0											
br3361	Xsubselect		P2-1b	5	B65	7/26/2013		0											
br3362	Xsubselect		P2-1c	5	B65	7/26/2013		0											
br3363	Xsubselect		P2-1d	5	B65	7/26/2013		0											
br3364	sample	br423	P2-1	5	B65	7/26/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3365	Xsubselect		P2-1f	5	B65	7/26/2013		0											
br3366	Xsubselect		P2-1g	5	B65	7/26/2013		0											
br3367	Xbomb		P2-1h	5	B65	7/26/2013		4	56.160	151.53.57	83.186	221.21	186.190	210.210	153.153			29.239	204.250
br3368	Xsubselect		P2-1i	5	B65	7/26/2013		0											
br3369	Xinadequate		P2-1j	5	B65	7/26/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3370	Xbomb		P2-1k	5	B65	7/26/2013		1							53.153				204.250
br3371	Xinadequate		P2-1l	5	B65	7/26/2013		0											
br3372	Xbomb		P3-1a	5	B65	7/26/2013		0		155.59		221.31.37	86.190		153.55.61				04.250
br3373	Xsubselect		P3-1b	5	B65	7/26/2013		0											
br3374	Xmixed		P3-2a	5	B65	7/26/2013		4	152.160	51.55.57.57	4.78.83.8	221.37	186.190	210.210	39.53.155			223.29.39	204.250
br3375	Xinadequate		P3-3a	5	B65	7/26/2013		0											
br3376	Xinadequate		P1-1a	5	B61	7/26/2013		0											
br3377	sample	br1086	G-1	5	B61	7/26/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3378	Xsubselect		G-3	5	B55	7/26/2013		0											
br3379	Xsubselect		G-2	5	B55	7/26/2013		0											
br3380	Xinadequate		P2-1a	5	B14	7/24/2013		0											
br3381	Xinadequate		P2-2a	5	B14	7/24/2013		0											
br3382	sample	br199	P3-1a	5	B14	7/24/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3383	sample	br199	T-1	5	B14	7/24/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3384	sample	br172	P1-1a	5	B17	7/24/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br3385	sample	br172	P2-1a	5	B17	7/24/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br3386	Xsubselect		P2-2a	5	B17	7/24/2013		0											
br3387	sample	br172	P2-2b	5	B17	7/24/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br3388	sample	br172	P3-1a	5	B17	7/24/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br3389	sample	br172	P3-2a	5	B17	7/24/2013		9	160.160	149.155	172.176	221.221	180.186	210.214	139.161			223.239	204.250
br3390	Xinadequate		T-1	5	B17	7/24/2013		0											
br3391	Xbomb		T-2	5	B17	7/24/2013		3	60.160	149.53.55	172.176	21.21		210.214	61.161			223.239	
br3392	Xbomb		P1-1a	5	B18	7/24/2013		2		151.151	76.76	31.31	186.190		151.59.61				
br3393	Xbomb		P1-2a	5	B18	7/24/2013		0			172.72		178.86						
br3394	Xbomb		P1-3a	5	B18	7/24/2013		2		151.151	174.176		78.86.190	10.210	51.161			29.229	250.50
br3395	sample	br195	P1-4a	5	B18	7/24/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br3396	Xinadequate		P2-1a	5	B18	7/24/2013		0											
br3397	Xsubselect		P2-1b	5	B18	7/24/2013		0											
br3398	Xbomb		P2-1c	5	B18	7/24/2013		4		151.151	176.186	221.52	190.92	210.210	151.55.61			229.229	250.50
br3399	Xinadequate		T-1	5	B18	7/24/2013		0											
br3400	Xbomb		T-1	5	B4	7/23/2013		5	150.152	51.149.155	78.176.184	221.231	80.190	210.210	155.155			223.225	04.250
br3401	Xsubselect		P3-1a	5	B4	7/23/2013		0											
br3402	sample	br979	P3-1b	5	B4	7/23/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
br3403	Xsubselect		P3-2a	5	B4	7/23/2013		0											
br3404	sample	hr230	P3-2b	5	B4	7/23/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
br3405	Xinadequate		P1-1a	5	B5	7/23/2013		0											
br3406	sample	br199	P1-2a	5	B5	7/23/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3407	Xbomb		P1-3a	5	B5	7/23/2013		0		43.153									50.50
br3408	Xinadequate		P2-2a	5	B5	7/23/2013		0											
br3409	sample	br199	P2-1a	5	B5	7/23/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3410	sample	br199	P3-1a	5	B5	7/23/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3411	sample	br598	G-1	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3412	sample	br598	P1-1a	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3413	Xsubselect		P1-1b	5	B29	7/24/2013		0											
br3414	sample	br598	P1-1c	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3415	Xsubselect		P1-1d	5	B29	7/24/2013		0											
br3416	Xinadequate		P2-1a	5	B29	7/24/2013		0											
br3417	sample	br598	P2-1b	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3418	Xsubselect		P2-1c	5	B29	7/24/2013		0											
br3419	sample	br598	P2-1d	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3420	Xbomb		P1-1g	5	B2	7/23/2013		1		61.63			186.89		161.161				50.50
br3421	Xbomb		P1-2a	5	B2	7/23/2013		1		53.151.61			186.90		159.161			29.29	50.50
br3422	Xsubselect		P2-1a	5	B2	7/23/2013		0											
br3423	sample	hr2467	P2-1b	5	B2	7/23/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
br3424	Xsubselect		P2-1c	5	B2	7/23/2013		0											
br3425	Xmixed		P2-1d	5	B2	7/23/2013		1	152.60	153.63.155	172.78.184	221.37.233	86.190.196	208.10	155.161			39.225.49.22	04.250
br3426	Xsubselect		P2-1	5	B2	7/23/2013		0											
br3427	Xsubselect		P2-1f	5	B2	7/23/2013		0											
br3428	Xsubselect		P2-1g	5	B2	7/23/2013		0											
br3429	sample	hr2467	P2-1h	5	B2	7/23/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
br3430	Xsubselect		P2-2a	5	B2	7/23/2013		0											
br3431	Xbomb		P2-2b	5	B2	7/23/2013		0	52.52	63.163			96.96						
br3432	Xsubselect		P2-2c	5	B2	7/23/2013		0											
br3433	Xinadequate		P2-3a	5	B2	7/23/2013		0											
br3434	Xbomb		P2-4a	5	B2	7/23/2013		0					186.94		59.161			23.223	04.04
br3435	sample	br2733	P3-1a	5	B2	7/23/2013		9	152.152	153.159	184.184	233.237	190.190	208.210	155.155			239.249	250.250
br3436	Xsubselect		P3-1b	5	B2	7/23/2013		0											
br3437	Xsubselect		P3-1c	5	B2	7/23/2013		0											
br3438	sample	hr2467	P3-1d	5	B2	7/23/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
br3439	Xsubselect		P3-1	5	B2	7/23/2013		0											
br3440	sample	hr38	P3-1n	5	B48	7/25/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3442	Xinadequate		P1-1a	5	B42	7/25/2013		0											
br3443	sample	br244	P1-1b	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3444	sample	br244	P1-1c	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3445	Xinadequate		P1-1d	5	B42	7/25/2013		0											
br3446	Xsubselect		G-1	5	B42	7/25/2013		0											
br3447	sample	br244	P2-1a	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3448	Xbomb		P1-2a	5	B42	7/25/2013		4		153.153	86.186	221.21	190.190	210.210	39.151			223.27	204.250
br3449	Xsubselect		P2-1b	5	B42	7/25/2013		0											
br3450	Xsubselect		P1-2b	5	B42	7/25/2013		0											
br3451	Xsubselect		P2-1c	5	B42	7/25/2013		0											
br3452	sample	br244	P2-1d	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3453	Xinadequate		P1-3a	5	B42	7/25/2013		0											
br3454	Xinadequate		P2-2a	5	B42	7/25/2013		0											
br3455	Xinadequate		P1-3b	5	B42	7/25/2013		0											
br3456	sample	br244	P3-1a	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3457	Xinadequate		P1-3c	5	B42	7/25/2013		0											
br3458	Xinadequate		P3-1b	5	B42	7/25/2013		0											
br3459	sample	br244	P1-4a	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3460	sample	br3460	G-1	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3461	Xbomb		T-1	5	B55	7/26/2013		4	140.60	153.55	178.178	221.221	186.96	210.214	153.39.65			23.229.239	250.250
br3462	Xinadequate		P1-1a	5	B55	7/26/2013		0											
br3463	Xsubselect		P1-1b	5	B55	7/26/2013		0											
br3464	Xbomb		P1-1c	5	B55	7/26/2013		6	140.52	155.155	178.178	221.33	186.196	210.210	139.153			223.239	50.250
br3465	sample	br3460	P1-1d	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3466	Xinadequate		P1-1	5	B55	7/26/2013		0											
br3467	sample	br3460	P1-1f	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data: Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores: G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3468	Xinadequate		P1-1g	5	B55	7/26/2013		0											
br3469	sample	br1088	P1-2a	5	B55	7/26/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3470	sample	br1088	P2-4a	5	B55	7/26/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3471	sample	br3460	P2-1a	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3472	Xinadequate		P2-1b	5	B55	7/26/2013		0											
br3473	Xinadequate		P2-1c	5	B55	7/26/2013		0											
br3474	Xbomb		P2-1d	5	B55	7/26/2013		2		55.155	78.178	221.21	186.96.01	10.10	139.53			223.239	250.250
br3475	Xsubselect		P2-1	5	B55	7/26/2013		0											
br3476	Xinadequate		P2-1f	5	B55	7/26/2013		0											
br3477	Xbomb		P2-1g	5	B55	7/26/2013		3		155.155			186.196		139.153				50.250
br3478	Xinadequate		P2-2a	5	B55	7/26/2013		0											
br3479	sample	br1088	P2-2b	5	B55	7/26/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3480	Xinadequate		P2-3a	5	B55	7/26/2013		0											
br3481	sample	br1088	P2-3b	5	B55	7/26/2013		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	250.250
br3482	Xsubselect		P2-3c	5	B55	7/26/2013		0											
br3483	Xbomb		P2-3d	5	B55	7/26/2013		1		153.155	78.178		86.86	210.14	39.153			23.29.239	50.50
br3484	Xsubselect		P3-1a	5	B55	7/26/2013		0											
br3485	sample	br3460	P3-1b	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3486	Xinadequate		P3-1c	5	B55	7/26/2013		0											
br3487	Xbomb		P3-1d	5	B55	7/26/2013		2		155.155			186.196		139.53				
br3488	Xsubselect		P3-1	5	B55	7/26/2013		0											
br3489	Xsubselect		P3-1f	5	B55	7/26/2013		0											
br3490	sample	br3460	P3-1g	5	B55	7/26/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3491	Xinadequate		P3-1h	5	B55	7/26/2013		0											
br3492	Xbomb		T-1	5	B47	7/26/2013		0			76.176	221.31	186.86	10.210	141.61			29.229	04.250
br3493	Xinadequate		P1-1a	5	B47	7/26/2013		0											
br3494	Xinadequate		P1-1b	5	B47	7/26/2013		0											
br3495	Xinadequate		P1-1c	5	B47	7/26/2013		0											
br3496	sample	hr2428	P1-1d	5	B47	7/26/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
br3497	sample	hr2428	P1-1	5	B47	7/26/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
br3498	Xbomb		P1-1f	5	B47	7/26/2013		3		151.155			186.186		141.161				
br3499	Xinadequate		P1-1g	5	B47	7/26/2013		0											
br3500	Xinadequate		P1-1h	5	B47	7/26/2013		0											
br3501	Xbomb		P1-1i	5	B47	7/26/2013		1		151.155	76.176	221.31	86.186	06.210	141.61				50.250
br3502	Xinadequate		P1-1j	5	B47	7/26/2013		0											
br3503	Xinadequate		P1-1k	5	B47	7/26/2013		0											
br3504	Xsubselect		P2-1a	5	B47	7/26/2013		0											
br3505	sample	hr2428	P2-1b	5	B47	7/26/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
br3506	Xinadequate		P2-1c	5	B47	7/26/2013		0											
br3507	Xinadequate		P2-2a	5	B47	7/26/2013		0											
br3508	Xbomb		P2-2b	5	B47	7/26/2013		4		51.155	174.76	221.231	186.186	10.210	141.61			223.229	204.250
br3509	Xsubselect		P2-2c	5	B47	7/26/2013		0											
br3510	Xsubselect		P2-2d	5	B47	7/26/2013		0											
br3511	sample	hr2428	P2-2	5	B47	7/26/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
br3512	Xsubselect		P2-2f	5	B47	7/26/2013		0											
br3513	Xsubselect		P2-2g	5	B47	7/26/2013		0											
br3514	sample	hr2428	P2-2h	5	B47	7/26/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
br3515	Xinadequate		P2-2i	5	B47	7/26/2013		0											
br3516	Xbomb		P3-1a	5	B47	7/26/2013		0		153.55	78.78		86.186	10.210	153.61				
br3517	Xsubselect		P3-2a	5	B47	7/26/2013		0											
br3518	Xbomb		P3-2b	5	B47	7/26/2013		2		151.55.59	174.176	221.31	86.186	210.210	41.161			223.29	04.250
br3519	Xsubselect		P3-2c	5	B47	7/26/2013		0											
br3520	Xbomb		P3-1a	5	B18	7/24/2013		4	52.60	151.151	174.176	221.21		210.210	53.161			229.229	250.50
br3521	sample	br218	P1-1a	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3522	Xsubselect		P1-1b	5	B24	7/24/2013		0											
br3523	sample	br218	P1-2a	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3524	Xsubselect		P1-2b	5	B24	7/24/2013		0											
br3525	sample	br218	T-1	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3526	sample	br218	P2-1a	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3527	Xsubselect		P2-1b	5	B24	7/24/2013		0											
br3528	sample	br218	G-1	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3529	Xsubselect		G-2	5	B24	7/24/2013		0											
br3530	Xsubselect		P2-1c	5	B24	7/24/2013		0											
br3531	Xsubselect		G-3	5	B24	7/24/2013		0											
br3532	sample	br195	P2-2a	5	B24	7/24/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br3533	Xsubselect		P2-2b	5	B24	7/24/2013		0											
br3534	Xsubselect		P2-2c	5	B24	7/24/2013		0											
br3535	Xsubselect		P2-2d	5	B24	7/24/2013		0											
br3536	sample	br218	P2-2	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3537	Xsubselect		P3-1a	5	B24	7/24/2013		0											
br3538	Xbomb		P3-1b	5	B24	7/24/2013		4	52.160	151.61	174.176	221.31.37	186.190	210.210	151.55.161			229.23.49	250.250
br3539	Xsubselect		P3-1c	5	B24	7/24/2013		0											
br3540	Xsubselect		P3-1d	5	B24	7/24/2013		0											
br3541	sample	br195	P3-1	5	B24	7/24/2013		9	152.160	151.151	174.176	221.221	186.190	210.210	151.161			229.229	250.250
br3542	Xinadequate		P3-1f	5	B24	7/24/2013		0											
br3543	Xsubselect		P3-1g	5	B24	7/24/2013		0											
br3544	Xbomb		P3-1h	5	B24	7/24/2013		2		51.161	76.176	221.231	86.190	10.210	151.55.61			223.29.49	250.250
br3545	Xsubselect		P3-1i	5	B24	7/24/2013		0											
br3546	sample	br218	P3-1j	5	B24	7/24/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3547	Xsubselect		P3-1k	5	B24	7/24/2013		0											
br3548	sample	br598	P2-2a	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3549	Xinadequate		P2-2b	5	B29	7/24/2013		0											
br3550	Xsubselect		P2-2c	5	B29	7/24/2013		0											
br3551	sample	br598	P2-2d	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3552	Xinadequate		P3-1a	5	B29	7/24/2013		0											
br3553	sample	br598	P3-1b	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3554	Xsubselect		P3-1c	5	B29	7/24/2013		0											
br3555	Xsubselect		P3-1d	5	B29	7/24/2013		0											
br3556	sample	br598	P3-1	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3557	sample	br598	P3-2a	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3558	sample	br598	P3-3a	5	B29	7/24/2013		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	250.250
br3559	Xbomb		G-1	5	B38	7/24/2013		3		55.155		33.233	186.186	210.210	61.165				250.250
br3560	sample	br1086	P1-1a	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3561	Xsubselect		P1-1b	5	B46	7/27/2013		0											
br3562	Xsubselect		P1-1c	5	B46	7/27/2013		0											
br3563	Xsubselect		P1-1d	5	B46	7/27/2013		0											
br3564	sample	br1086	P1-1	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3565	Xsubselect		P1-1f	5	B46	7/27/2013		0											
br3566	sample	br1086	T-1	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3567	sample	br1086	P2-1a	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3568	Xsubselect		P2-1b	5	B46	7/27/2013		0											
br3569	sample	br1086	P2-1c	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3570	Xsubselect		P2-1d	5	B46	7/27/2013		0											
br3571	Xsubselect		P2-2a	5	B46	7/27/2013		0											
br3572	sample	br1086	P2-2b	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3573	Xsubselect		T-2	5	B46	7/27/2013		0											
br3574	Xinadequate		P3-1a	5	B46	7/27/2013		0											
br3575	Xinadequate		P3-1b	5	B46	7/27/2013		0											
br3576	sample	br1086	P3-1c	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3577	Xinadequate		P3-1d	5	B46	7/27/2013		0											
br3578	sample	br1086	P3-1	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3579	Xsubselect		P3-1f	5	B46	7/27/2013		0											
br3580	sample	br1086	P3-1g	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3581	sample	br1086	P3-1h	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3582	Xinadequate		P3-1i	5	B46	7/27/2013		0											
br3583	Xinadequate		P3-1j	5	B46	7/27/2013		0											
br3584	Xinadequate		P3-1k	5	B46	7/27/2013		0											
br3585	Xsubselect		P3-2a	5	B46	7/27/2013		0											
br3586	sample	br1086	P3-2b	5	B46	7/27/2013		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	250.250
br3587	Xsubselect		P3-2c	5	B46	7/27/2013		0											
br3588	Xsubselect		P1-1a	6	B66	8/3/2013		0											
br3589	sample	hr70	P1-1b	6	B66	8/3/2013		9	158.160	151.161	178.184	231.231	186.186	210.214	161.161			239.249	204.250
br3590	sample	hr70	P2-1a	6	B66	8/3/2013		9	158.160	151.161	178.184	231.231	186.186	210.214	161.161			239.249	204.250
br3591	Xinadequate		P3-1a	6	B66	8/3/2013		0											
br3592	sample	hr1	P1-2b	6	B67	8/3/2013		9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br3593	Xsubselect		P1-1b	6	B67	8/3/2013		0											
br3594	Xsubselect		P1-2a	6	B67	8/3/2013		0											
br3595	Xsubselect		P1-1c	6	B67	8/3/2013		0											
br3596	Xsubselect		P1-1a	6	B67	8/3/2013		0											
br3597	Xsubselect		P2-1a	6	B67	8/3/2013		0											
br3598	sample	hr1	P2-1b	6	B67	8/3/2013		9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br3599	Xsubselect		P3-1a	6	B67	8/3/2013		0											
br3600	sample	hr219	P3-2c	5	B1	7/23/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
br3601	Xinadequate		P3-2d	5	B1	7/23/2013		0											
br3602	sample	br979	P1-1a	5	B4	7/23/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
br3603	Xsubselect		P1-1b	5	B4	7/23/2013		0											
br3604	Xsubselect		P1-1c	5	B4	7/23/2013		0											
br3605	Xbomb		G-1	5	B4	7/23/2013		8	140.152	149.149	178.180	221.221	180.190	210.210	155.155			25.223.239.2	204.250
br3606	Xsubselect		P1-1d	5	B4	7/23/2013		0											
br3607	Xbomb		P1-1	5	B4	7/23/2013		4	140.152	149.149		21.21	180.190	10.210	155.155				
br3608	Xsubselect		P1-1f	5	B4	7/23/2013		0											
br3609	Xsubselect		P1-1h	5	B4	7/23/2013		0											
br3610	Xsubselect		P1-1i	5	B4	7/23/2013		0											
br3611	Xsubselect		P1-1j	5	B4	7/23/2013		0											
br3612	sample	hr230	P1-1k	5	B4	7/23/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
br3613	Xbomb		P2-1a	5	B4	7/23/2013		4	150.152	149.51.59	8.176.80.8	221.31	180.190	210.210	155.155			25.223.49.2	04.250
br3614	Xsubselect		P2-1b	5	B4	7/23/2013		0											
br3615	Xsubselect		P2-2a	5	B4	7/23/2013		0											
br3616	Xsubselect		P2-2b	5	B4	7/23/2013		0											
br3617	sample	br979	P2-2c	5	B4	7/23/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
br3618	Xsubselect		P2-2d	5	B4	7/23/2013		0											
br3619	sample	br979	P2-2	5	B4	7/23/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
br3620	Xsubselect		P3-1f	5	B2	7/23/2013		0											
br3621	Xbomb		P3-1g	5	B2	7/23/2013		8	140.52.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br3622	Xinadequate		P3-1h	5	B2	7/23/2013		0											
br3623	Xsubselect		P3-1i	5	B2	7/23/2013		0											
br3624	sample	hr219	T-1	5	B1	7/23/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
br3625	sample	hr219	P1-1a	5	B1	7/23/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
br3626	Xsubselect		P1-1b	5	B1	7/23/2013		0											
br3627	Xsubselect		P1-1c	5	B1	7/23/2013		0											
br3628	Xbomb		P1-2a	5	B1	7/23/2013		1				31.231						37.237	250.250
br3629	Xsubselect		P1-2b	5	B1	7/23/2013		0											
br3630	sample	hr219	P1-2c	5	B1	7/23/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
br3631	Xinadequate		P1-2d	5	B1	7/23/2013		0											
br3632	Xsubselect		G-1	5	B1	7/23/2013		0											
br3633	Xbomb		G-2	5	B1	7/23/2013		0											04.250
br3634	sample	hr219	P2-1a	5	B1	7/23/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
br3635	Xbomb		P3-1a	5	B1	7/23/2013		0		49.149									50.250
br3636	Xbomb		P3-2a	5	B1	7/23/2013		1	40.40	49.155		21.231	190.190	210.12.14	53.155			33.39.237	50.250
br3637	sample	hr230	P1-1g	5	B4	7/23/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
br3638	Xsubselect		P3-2b	5	B1	7/23/2013		0											
br3639	sample	hr2467	G-1	5	B2	7/23/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
br3640	sample	hr1	P3-1b	6	B67	8/3/2013		9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	250.250
br3641	Xsubselect		P3-2a	6	B67	8/3/2013		0											
br3642	Xsubselect		P1-1a	6	B3	8/3/2013		0											
br3643	Xbomb		P1-1b	6	B3	8/3/2013		7	40.158.160	151.161	176.178	223.231	186.190	208.210	161.161			229.239	04.50.250
br3644	Xsubselect		P2-1a	6	B3	8/3/2013		0											
br3645	Xinadequate		P2-1b	6	B3	8/3/2013		0											
br3646	sample	br974	P2-2a	6	B3	8/3/2013		9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	250.250
br3647	Xbomb		P3-1a	6	B3	8/3/2013		1	140.60	51.161	176.84	23.231.233	86.190	208.10.14	155.161			239.49	04.250
br3648	Xsubselect		P3-2a	6	B3	8/3/2013		0											
br3649	sample	br974	T-1	6	B3	8/3/2013		9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	250.250
br3650	Xbomb		G-1	6	B3	8/3/2013		8	140.160	151.161	176.184	231.233	186.190	208.214	155.161			23.37.239.4	250.250
br3651	Xsubselect		P1-1a	6	B7	8/3/2013		0											
br3652	Xsubselect		P1-1b	6	B7	8/3/2013		0											
br3653	Xsubselect		P1-1c	6	B7	8/3/2013		0											
br3654	sample	br155	P1-1d	6	B7	8/3/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br3655	Xsubselect		P1-2a	6	B7	8/3/2013		0											
br3656	Xsubselect		P1-2b	6	B7	8/3/2013		0											
br3657	Xsubselect		P1-3a	6	B7	8/3/2013		0											
br3658	Xsubselect		P2-1a	6	B7	8/3/2013		0											
br3659	sample	br155	P2-1b	6	B7	8/3/2013		9	140.160	155.159	178.184	221.233	186.190	208.210	161.161			223.249	250.250
br3660	Xsubselect		P2-2a	6	B7	8/3/2013		0											
br3661	Xspecies		P3-1a	6	B7	8/3/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3662	sample	br696	P1-1a	6	B6	8/4/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
br3663	Xsubselect		P1-1b	6	B6	8/4/2013		0											
br3664	Xsubselect		P1-2a	6	B6	8/4/2013		0											
br3665	Xinadequate		P1-2b	6	B6	8/4/2013		0											
br3666	sample	hr426	P2-1a	6	B6	8/4/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
br3667	Xsubselect		P2-1b	6	B6	8/4/2013		0											
br3668	Xsubselect		P2-2a	6	B6	8/4/2013		0											
br3669	Xsubselect		P3-1a	6	B6	8/4/2013		0											
br3670	sample	br3670	P3-2a	6	B6	8/4/2013		9	140.152	151.159	178.184	223.233	190.190	210.214	155.161			229.239	204.250
br3671	Xspecies		P1-1a	6	B5	8/4/2013		0											
br3672	Xspecies		P1-1b	6	B5	8/4/2013		0											
br3673	Xinadequate		P1-1a	6	B10	8/4/2013		0											
br3674	Xinadequate		P2-1a	6	B10	8/4/2013		0											
br3675	Xsubselect		P2-2a	6	B10	8/4/2013		0											
br3676	sample	br33	P2-3a	6	B10	8/4/2013		9	160.160	151.151	178.186	221.233	186.190	210.214	161.161			223.249	250.250
br3677	Xinadequate		P1-1a	6	B11	8/4/2013		0											
br3678	sample	br2764	P1-2a	6	B11	8/4/2013		9	152.160	149.161	176.184	221.221	186.196	208.214	139.161			239.239	204.250
br3679	Xsubselect		P1-2b	6	B11	8/4/2013		0											
br3680	Xsubselect		P2-1a	6	B11	8/4/2013		0											
br3681	Xsubselect		P2-1b	6	B11	8/4/2013		0											
br3682	Xbomb		P2-2a	6	B11	8/4/2013		1	152.58.60	49.51.61.6	176.78.84	221.31	186.90.96	208.10.14	39.161			23.29.39.24	204.250
br3683	Xsubselect		P1-1a	6	B12	8/4/2013		0											
br3684	Xspecies		P1-2a	6	B12	8/4/2013		0											
br3685	sample	br3685	P1-3a	6	B12	8/4/2013		9	140.152	151.153	178.184	221.231	186.196	210.210	161.161			229.239	204.250
br3686	sample	br3686	P2-1a	6	B12	8/4/2013		9	152.158	151.153	174.178	223.237	186.190	210.210	139.161			229.239	250.250
br3687	Xinadequate		P2-2a	6	B12	8/4/2013		0											
br3688	Xbomb		P3-1a	6	B12	8/4/2013		4	40.152	151.153	174.78.84	221.31.37	86.90.196	210.210	139.161			229.239	04.250
br3689	Xsubselect		P3-2a	6	B12	8/4/2013		0											
br3690	Xsubselect		P3-3a	6	B12	8/4/2013		0											
br3691	Xsubselect		P1-1a	6	B17	8/4/2013		0											
br3692	Xsubselect		P1-2a	6	B17	8/4/2013		0											
br3693	sample	br2232	P1-3a	6	B17	8/4/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br3694	Xsubselect		P2-1a	6	B17	8/4/2013		0											
br3695	Xsubselect		P2-2a	6	B17	8/4/2013		0											
br3696	sample	br2232	P2-3a	6	B17	8/4/2013		9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	204.250
br3697	sample	br962	P1-1a	6	B13	8/4/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br3698	Xsubselect		P1-1b	6	B13	8/4/2013		0											
br3699	Xsubselect		P1-1c	6	B13	8/4/2013		0											
br3700	Xsubselect		P1-1d	6	B13	8/4/2013		0											
br3701	Xsubselect		P1-1	6	B13	8/4/2013		0											
br3702	sample	br962	P2-1a	6	B13	8/4/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br3703	Xsubselect		P2-2a	6	B13	8/4/2013		0											
br3704	Xsubselect		P2-2b	6	B13	8/4/2013		0											
br3705	Xsubselect		P2-3a	6	B13	8/4/2013		0											
br3706	Xbomb		G-1	6	B13	8/4/2013		0											
br3707	Xbomb		P3-1a	6	B13	8/4/2013		0	52.52										
br3708	Xsubselect		P3-1b	6	B13	8/4/2013		0											
br3709	Xsubselect		P3-2a	6	B13	8/4/2013		0											
br3710	Xsubselect		P3-2b	6	B13	8/4/2013		0											
br3711	Xsubselect		P1-1a	6	B19	8/4/2013		0											
br3712	Xsubselect		P1-1b	6	B19	8/4/2013		0											
br3713	sample	hr230	P1-1c	6	B19	8/4/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
br3714	Xsubselect		P1-2a	6	B19	8/4/2013		0											
br3715	Xsubselect		P1-2b	6	B19	8/4/2013		0											
br3716	Xinadequate		P2-1a	6	B19	8/4/2013		0											
br3717	Xsubselect		P2-2a	6	B19	8/4/2013		0											
br3718	sample	br962	P2-3a	6	B19	8/4/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
br3719	Xbomb		T-1	6	B19	8/4/2013		1	58.60	155.155		31.31	90.190		55.155				250.50
br3720	Xsubselect		P1-1a	6	B25	8/4/2013		0											
br3721	Xsubselect		P1-1b	6	B25	8/4/2013		0											
br3722	Xinadequate		P1-2a	6	B25	8/4/2013		0											
br3723	Xsubselect		P1-2b	6	B25	8/4/2013		0											
br3724	Xsubselect		P1-2c	6	B25	8/4/2013		0											
br3725	sample	br350	P1-3a	6	B25	8/4/2013		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161			229.239	250.250
br3726	Xsubselect		P2-1a	6	B25	8/4/2013		0											
br3727	Xsubselect		P2-1b	6	B25	8/4/2013		0											
br3728	Xsubselect		P2-2a	6	B25	8/4/2013		0											
br3729	sample	br350	P2-2b	6	B25	8/4/2013		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161			229.239	250.250
br3730	Xsubselect		P2-2c	6	B25	8/4/2013		0											
br3731	sample	br350	P3-1a	6	B25	8/4/2013		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161			229.239	250.250
br3732	Xsubselect		P3-2a	6	B25	8/4/2013		0											
br3733	Xsubselect		P3-3a	6	B25	8/4/2013		0											
br3734	Xsubselect		P1-1a	6	B27	8/4/2013		0											
br3735	sample	br350	P1-2a	6	B27	8/4/2013		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161			229.239	250.250
br3736	Xsubselect		P1-3a	6	B27	8/4/2013		0											
br3737	Xsubselect		P2-1a	6	B27	8/4/2013		0											
br3738	Xsubselect		P2-2a	6	B27	8/4/2013		0											
br3739	sample	br3739	P2-2b	6	B27	8/4/2013		10	160.160	149.151	176.177	221.231	190.190	210.214	161.161	129.129		229.239	250.250
br3740	sample	br350	P3-1a	6	B27	8/4/2013		9	152.160	151.155	174.176	221.231	190.190	208.214	155.161			229.239	250.250
br3741	Xinadequate		P3-1b	6	B27	8/4/2013		0											
br3742	Xspecies		P1-1a	6	B54	8/4/2013		0											
br3743	Xspecies		P1-2a	6	B54	8/4/2013		0											
br3744	sample	br3460	P1-1a	6	B55	8/4/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3745	Xsubselect		P1-1b	6	B55	8/4/2013		0											
br3746	Xsubselect		P1-2a	6	B55	8/4/2013		0											
br3747	sample	br3460	P2-1a	6	B55	8/4/2013		9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	250.250
br3748	Xsubselect		P2-1b	6	B55	8/4/2013		0											
br3749	Xsubselect		P2-2a	6	B55	8/4/2013		0											
br3750	Xsubselect		P2-3a	6	B55	8/4/2013		0											
br3751	Xinadequate		P3-1a	6	B55	8/4/2013		0											
br3752	Xsubselect		P1-1a	6	B38	8/4/2013		0											
br3753	sample	br781	P1-2a	6	B38	8/4/2013		9	160.160	153.157	176.176	233.237	186.190	210.210	141.155			229.249	250.250
br3754	Xsubselect		P1-2b	6	B38	8/4/2013		0											
br3755	Xsubselect		P1-2c	6	B38	8/4/2013		0											
br3756	Xsubselect		P1-2d	6	B38	8/4/2013		0											
br3757	Xsubselect		P2-1a	6	B38	8/4/2013		0											
br3758	Xsubselect		P2-2a	6	B38	8/4/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3759	sample	br781	P2-3a	6	B38	8/4/2013		9	160.160	153.157	176.176	233.237	186.190	210.210	141.155			229.249	250.250
br3760	Xsubselect		P2-1c	6	B64	8/5/2013		0											
br3761	Xsubselect		P2-2a	6	B64	8/5/2013		0											
br3762	sample	br2240	P2-2b	6	B64	8/5/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br3763	Xsubselect		P2-3a	6	B64	8/5/2013		0											
br3764	Xsubselect		P2-3b	6	B64	8/5/2013		0											
br3765	Xinadequate		P1-1a	6	B59	8/5/2013		0											
br3766	Xsubselect		P1-2a	6	B59	8/5/2013		0											
br3767	Xsubselect		P1-2b	6	B59	8/5/2013		0											
br3768	sample	br199	P1-2c	6	B59	8/5/2013		9	140.140	155.161	174.177	221.233	180.186	210.210	139.155			225.249	250.250
br3769	sample	br758	P1-1a	6	B63	8/5/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3770	Xsubselect		P1-2a	6	B63	8/5/2013		0											
br3771	Xsubselect		P2-1a	6	B63	8/5/2013		0											
br3772	Xsubselect		P2-1b	6	B63	8/5/2013		0											
br3773	sample	br758	P2-2a	6	B63	8/5/2013		9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	250.250
br3774	Xsubselect		P1-1a	6	B52	8/5/2013		0											
br3775	Xsubselect		P1-2a	6	B52	8/5/2013		0											
br3776	sample	br584	P1-3a	6	B52	8/5/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br3777	Xinadequate		P2-1a	6	B52	8/5/2013		0											
br3778	sample	br584	P2-1b	6	B52	8/5/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br3779	Xsubselect		P2-2a	6	B52	8/5/2013		0											
br3780	sample	br244	P3-2a	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3781	Xsubselect		G-2	5	B42	7/25/2013		0											
br3782	sample	br244	G-3	5	B42	7/25/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3783	sample	br244	P1-1a	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3784	Xsubselect		P1-2a	5	B56	7/26/2013		0											
br3785	Xinadequate		P1-2b	5	B56	7/26/2013		0											
br3786	sample	br244	P1-2c	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3787	Xbomb		P1-2d	5	B56	7/26/2013		2			86.86	21.231	90.190	210.210	139.151				204.50
br3788	Xinadequate		P1-2	5	B56	7/26/2013		0											
br3789	sample	br244	P2-1a	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3790	Xsubselect		P2-1b	5	B56	7/26/2013		0											
br3791	Xinadequate		P2-1c	5	B56	7/26/2013		0											
br3792	sample	br244	P2-1d	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3793	sample	br244	P2-1	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3794	Xinadequate		P2-1f	5	B56	7/26/2013		0											
br3795	Xinadequate		P2-1g	5	B56	7/26/2013		0											
br3796	sample	br244	P2-2a	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3797	Xinadequate		P3-1a	5	B56	7/26/2013		0											
br3798	sample	br244	P3-1b	5	B56	7/26/2013		9	152.152	153.153	186.186	221.221	190.190	210.210	139.151			223.227	204.250
br3799	Xinadequate		P3-1c	5	B56	7/26/2013		0											
br3800	sample	br584	T-1	6	B52	8/5/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br3801	sample	br584	P3-1a	6	B52	8/5/2013		9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	250.250
br3802	Xsubselect		P3-2a	6	B52	8/5/2013		0											
br3803	Xsubselect		P3-3a	6	B52	8/5/2013		0											
br3804	Xsubselect		P1-1a	6	B57	8/5/2013		0											
br3805	Xsubselect		P1-1b	6	B57	8/5/2013		0											
br3806	Xsubselect		P1-2a	6	B57	8/5/2013		0											
br3807	Xsubselect		P1-3a	6	B57	8/5/2013		0											
br3808	Xbomb		P1-3b	6	B57	8/5/2013		2		151.155		31.231	186.96	10.10	65.165				250.250
br3809	Xbomb		P2-1a	6	B57	8/5/2013		0	52.60	155.59	78.78		86.86	10.210	161.65				
br3810	Xsubselect		P1-1a	6	B49	8/5/2013		0											
br3811	Xinadequate		P1-2a	6	B49	8/5/2013		0											
br3812	Xinadequate		P1-2b	6	B49	8/5/2013		0											
br3813	sample	hr38	P1-2c	6	B49	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3814	Xsubselect		P1-3a	6	B49	8/5/2013		0											
br3815	Xsubselect		P2-1a	6	B49	8/5/2013		0											
br3816	Xsubselect		P2-1b	6	B49	8/5/2013		0											
br3817	Xsubselect		P2-1c	6	B49	8/5/2013		0											
br3818	Xsubselect		P2-2a	6	B49	8/5/2013		0											
br3819	Xsubselect		P2-2b	6	B49	8/5/2013		0											
br3820	sample	hr38	P2-2c	6	B49	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3821	Xsubselect		P2-2d	6	B49	8/5/2013		0											
br3822	sample	hr38	P3-1a	6	B49	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3823	Xsubselect		P3-1b	6	B49	8/5/2013		0											
br3824	Xsubselect		P3-1c	6	B49	8/5/2013		0											
br3825	Xsubselect		P1-1a	6	B48	8/5/2013		0											
br3826	Xinadequate		P1-2a	6	B48	8/5/2013		0											
br3827	sample	hr38	P1-2b	6	B48	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3828	Xsubselect		P1-3a	6	B48	8/5/2013		0											
br3829	Xsubselect		P1-3b	6	B48	8/5/2013		0											
br3830	Xsubselect		P3-1a	6	B48	8/5/2013		0											
br3831	sample	hr1586	P3-2a	6	B48	8/5/2013		9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	250.250
br3832	Xsubselect		P3-3a	6	B48	8/5/2013		0											
br3833	sample	br3833	T-1	6	B48	8/5/2013		9	152.160	155.155	172.178	221.237	180.186	210.210	161.161			229.249	250.250
br3834	Xsubselect		P1-1a	6	B41	8/5/2013		0											
br3835	sample	hr38	P1-1b	6	B41	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3836	Xsubselect		P2-1a	6	B48	8/5/2013		0											
br3837	Xsubselect		P2-1b	6	B48	8/5/2013		0											
br3838	Xsubselect		P2-2a	6	B48	8/5/2013		0											
br3839	sample	hr38	P2-3a	6	B48	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3840	sample	hr38	P2-1a	6	B41	8/5/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
br3841	sample	br97	P1-1a	6	B44	8/5/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br3842	sample	br97	P2-1a	6	B44	8/5/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br3843	sample	br97	P3-1a	6	B44	8/5/2013		9	152.156	153.155	174.176	231.237	186.190	210.210	165.165			223.229	250.250
br3844	Xbomb		G-1	6	B44	8/5/2013		0		153.55		31.37						223.23	250.50
br3860	Xsubselect		P3-1a	6	B38	8/4/2013		0											
br3861	Xbomb		P3-1b	6	B38	8/4/2013		3	140.160	153.55	76.178	221.33.37	186.90	210.214	41.65.53.55			229.39.49	250.250
br3862	Xsubselect		P3-2a	6	B38	8/4/2013		0											
br3863	Xsubselect		P1-1a	6	B30	8/4/2013		0											
br3864	Xbomb		P1-2a	6	B30	8/4/2013		3	160.160	149.55.59	172.176	221.31.37	180.86.90	210.214	139.55.61			223.39	04.250
br3865	sample	br218	P2-1a	6	B30	8/4/2013		9	160.160	159.161	174.176	231.237	186.190	210.210	155.161			223.249	250.250
br3866	Xsubselect		P3-3a	6	B38	8/4/2013		0											
br3867	sample	br423	P1-1a	6	B34	8/4/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3868	Xsubselect		P1-2a	6	B34	8/4/2013		0											
br3869	Xsubselect		P1-3a	6	B34	8/4/2013		0											
br3870	Xsubselect		P2-1a	6	B34	8/4/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
br3871	sample	br423	P2-1b	6	B34	8/4/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3872	Xsubselect		P2-2a	6	B34	8/4/2013		0											
br3873	sample	br423	G-1	6	B34	8/4/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3874	Xsubselect		P3-1a	6	B34	8/4/2013		0											
br3875	sample	br423	P3-1b	6	B34	8/4/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3876	Xsubselect		P1-1a	6	B35	8/4/2013		0											
br3877	sample	br220	P1-1b	6	B35	8/4/2013		9	152.160	155.159	174.178	221.237	190.190	208.210	139.161			223.239	250.250
br3878	Xsubselect		P1-2a	6	B35	8/4/2013		0											
br3879	Xsubselect		P1-2b	6	B35	8/4/2013		0											
br3880	Xsubselect		P1-2c	6	B35	8/4/2013		0											
br3881	Xsubselect		P1-3a	6	B35	8/4/2013		0											
br3882	Xbomb		G-1	6	B35	8/4/2013		0											04.50
br3883	Xsubselect		P2-1a	6	B35	8/4/2013		0											
br3884	Xsubselect		P2-1b	6	B35	8/4/2013		0											
br3885	sample	br423	P2-1c	6	B35	8/4/2013		9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	250.250
br3886	Xsubselect		P2-1d	6	B35	8/4/2013		0											
br3887	Xsubselect		P3-1a	6	B35	8/4/2013		0											
br3888	Xsubselect		P3-1b	6	B35	8/4/2013		0											
br3889	Xsubselect		P3-1c	6	B35	8/4/2013		0											
br3890	sample	br2785	P3-2a	6	B35	8/4/2013		9	140.152	149.155	174.176	221.237	186.190	210.210	139.165			223.229	204.250
br3891	Xsubselect		P3-3a	6	B35	8/4/2013		0											
br3892	sample	br101	P1-1a	6	B65	8/5/2013		9	140.156	149.153	176.178	221.237	190.190	210.210	161.165			229.229	204.250
br3893	Xsubselect		P1-2a	6	B65	8/5/2013		0											
br3894	Xinadequate		P2-1a	6	B65	8/5/2013		0											
br3895	Xsubselect		P1-1a	6	B64	8/5/2013		0											
br3896	sample	br2240	P1-2a	6	B64	8/5/2013		9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	204.250
br3897	Xsubselect		P1-3a	6	B64	8/5/2013		0											
br3898	Xsubselect		P2-1a	6	B64	8/5/2013		0											
br3899	Xsubselect		P2-1b	6	B64	8/5/2013		0											
hr1199	Xinadequate		P1-1a	1	H36	6/12/2013		0											
hr1212	Xinadequate		P1-2a	1	H36	6/12/2013		0											
hr1213	Xinadequate		P1-3a	1	H36	6/12/2013		0											
hr1214	Xinadequate		P1-4a	1	H36	6/12/2013		0											
hr1215	Xinadequate		P3-1a	1	H36	6/12/2013		0											
hr1216	Xbomb		P1-1a	1	H35	6/12/2013		1	.40.50.58.	151.153			90.90	)2.04.08.1(	51.61			23.223	
hr1217	Xinadequate		P1-2a	1	H35	6/12/2013		0											
hr1218	Xinadequate		P1-2b	1	H35	6/12/2013		0											
hr1219	sample	hr1219	P1-2c	1	H35	6/12/2013		9	160.160	149.155	172.186	221.233	190.190	210.214	153.161			239.247	204.250
hr1220	Xinadequate		P1-3a	1	H35	6/12/2013		0											
hr1221	Xinadequate		P2-1a	1	H35	6/12/2013		0											
hr1222	Xinadequate		P2-2a	1	H35	6/12/2013		0											
hr1223	Xinadequate		P2-3a	1	H35	6/12/2013		0											
hr1224	Xbomb		P3-1a	1	H35	6/12/2013		1		43.49.51.55		221.31.37	190.190		53.55.59.61				
hr1225	Xsubselect		P3-2a	1	H35	6/12/2013		0											
hr1226	Xbomb		P3-2b	1	H35	6/12/2013		0	140.60	45.49.55	74.74	221.35	90.90	)8.10.14.1(	61.161			223.45.47	
hr1227	Xbomb		P3-3a	1	H35	6/12/2013		1	140.56.60	149.53.55	72.174	221.23.37	90.190	)4.08.10.1(	153.161			223.47.239	04.250
hr1228	Xsubselect		P3-3b	1	H35	6/12/2013		0											
hr1229	Xbomb		P3-4a	1	H35	6/12/2013		8	40.160	149.155	172.186	221.233	190.190	210.214	153.161			239.247	204.250
hr1230	Xsubselect		G-1	1	H35	6/12/2013		0											
hr1231	Xbomb		G-2	1	H35	6/12/2013		1	40.52.160	43.43	175.75		90.195	204.06.08	153.61			223.239	04.04
hr1232	Xbomb		P1-1a	1	H24	6/12/2013		0			77.78.77.78		89.189						
hr1233	Xinadequate		P3-1a	1	H24	6/12/2013		0											
hr1234	Xinadequate		P3-2a	1	H24	6/12/2013		0											
hr1235	sample	hr1242	P1-1a	1	H14	6/12/2013		9	140.140	149.153	174.184	221.233	180.190	210.210	151.155			229.239	250.250
hr1236	Xinadequate		P1-2a	1	H14	6/12/2013		0											
hr1237	Xbomb		P2-1a	1	H14	6/12/2013		3	140.160	35.49.53.5(	174.186	221.31	80.86.190	210.214	55.61.165			29.229	50.250
hr1238	Xbomb		P2-2a	1	H14	6/12/2013		2	40.160	149.149	86.86	31.31	190.190	96.96	61.161				50.250
hr1239	Xinadequate		P2-2b	1	H14	6/12/2013		0											
hr1240	Xbomb		G-1	1	H14	6/12/2013		8	140.140	149.153	174.184	221.233	180.190	210.210	151.55.61			229.239	250.250
hr1241	Xbomb		G-2	1	H14	6/12/2013		2	140.140	31.49.153	74.174	33.33	180.190	10.210	149.51.55			39.39	50.50
hr1242	sample	hr1242	G-3	1	H14	6/12/2013		9	140.140	149.153	174.184	221.233	180.190	210.210	151.155			229.239	250.250
hr1243	Xbomb		P3-1a	1	H14	6/12/2013		2	140.60	149.149			190.190		45.161				50.50
hr1244	Xbomb		G-4	1	H14	6/12/2013		2	140.160	149.155	174.86		80.86.190	210.14	51.61.165				50.50
hr1245	Xbomb		G-5	1	H14	6/12/2013		3	140.140	45.49.153	174.84		180.190	10.210	151.155			29.39	
hr1246	Xinadequate		P3-2a	1	H14	6/12/2013		0											
hr1247	Xinadequate		P3-3a	1	H14	6/12/2013	Could be 2b (? on env)	0											
hr1248	sample	hr677	P1-1a	1	H7	6/12/2013		9	140.160	153.159	177.177	221.221	186.190	208.210	161.161			223.249	204.250
hr1249	Xbomb		P1-2a	1	H7	6/12/2013		1	40.40	49.51	77.79.77.79		186.190	08.10	61.161			23.23	04.250
hr1250	Xbomb		P1-3a	1	H7	6/12/2013		7	140.160	51.53.57.5(	177.177	221.221	186.190	208.210	161.161			23.229.47.2(	204.250
hr1251	Xbomb		P1-4a	1	H7	6/12/2013		0			179.79		90.90					245.47	04.250
hr1252	Xbomb		P1-5a	1	H7	6/12/2013		5	140.160	53.159	177.84	221.221	186.190	208.10	161.161			47.49	204.250
hr1253	Xbomb		P1-6a	1	H7	6/12/2013		3	60.60	49.53.159		221.221	186.196		153.61.63			23.29	250.250
hr1254	sample	hr677	G-1	1	H7	6/12/2013		9	140.160	153.159	177.177	221.221	186.190	208.210	161.161			223.249	204.250
hr1255	Xsubselect		P2-1a	1	H7	6/12/2013		0											
hr1256	Xinadequate		P2-1b	1	H7	6/12/2013		0											
hr1257	Xbomb		P2-1c	1	H7	6/12/2013		0	60.160	149.51.59	77.86	21.21	86.86					123.29	50.50
hr1258	Xinadequate		P2-2a	1	H7	6/12/2013		0											
hr1259	sample	hr677	P2-2b	1	H7	6/12/2013		9	140.160	153.159	177.177	221.221	186.190	208.210	161.161			223.249	204.250
hr1260	Xinadequate		P2-2c	1	H7	6/12/2013		0											
hr1261	Xinadequate		P2-3a	1	H7	6/12/2013		0											
hr1262	Xbomb		P3-1a	1	H7	6/12/2013		1	60.160	149.53.55	77.177	21.31.233	80.86.190	10.210	161.161			23.249	04.250
hr1263	Xbomb		P3-2a	1	H7	6/12/2013		2	50.56	35.45			190.190						250.250
hr1264	Xsubselect		P3-2b	1	H7	6/12/2013		0											
hr1265	Xbomb		P3-3a	1	H7	6/12/2013		5	60.160	49.149	177.186	231.233	76.180.19(	210.210	161.161			49.249	250.250
hr1266	Xinadequate		P3-4a	1	H7	6/12/2013		0											
hr1267	Xbomb		G-2	1	H7	6/12/2013		7	140.160	49.153.15(	77.177	221.221	186.190	208.210	161.161			223.249	204.250
hr1268	Xinadequate		P1-1a	1	H1	6/12/2013		0											
hr1269	Xinadequate		P1-2a	1	H1	6/12/2013		0											
hr1270	Xinadequate		P2-1a	1	H1	6/12/2013		0											
hr1271	Xinadequate		P3-1a	1	H1	6/12/2013		0											
hr1272	Xspecies		G-1	1	H1	6/12/2013		0											
hr1273	Xbomb		G-2	1	H1	6/12/2013		0					87.95						
hr1274	sample	hr1289	P1-1a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1275	sample	hr1289	G-1	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1276	sample	hr1289	P1-2a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1277	sample	hr1289	G-2	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1278	Xbomb		P1-3a	1	H31	6/12/2013		5	140.160	151.155	176.78	21.233	190.196	210.210	151.161			223.25	04.250
hr1279	Xsubselect		G-3	1	H31	6/12/2013		0											
hr1280	sample	hr1289	P1-4a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1281	sample	hr1289	P2-1a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1282	sample	hr1289	P2-2a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1283	Xsubselect		G-4	1	H31	6/12/2013		0											
hr1284	sample	hr1289	P3-1a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1285	sample	hr1289	P3-2a	1	H31	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1286	Xinadequate		P3-3a	1	H31	6/12/2013		0											
hr1287	Xinadequate		P3-4a	1	H31	6/12/2013		0											
hr1288	Xsubselect		G-5	1	H31	6/12/2013		0											
hr1289	sample	hr1289	P1-1a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1290	sample	hr1289	P1-2a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1291	sample	hr1289	P1-3a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1292	sample	hr1289	P1-4a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1293	Xbomb		P2-1a	1	H30	6/12/2013		0	60.160	49.55.57.6	176.78	221.21	190.95	10.210	151.61			23.225	04.250.04.250
hr1294	sample	hr1289	P2-2a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1295	Xinadequate		P2-2b	1	H30	6/12/2013		0											
hr1296	Xbomb		P2-3a	1	H30	6/12/2013		4	160.160	31.53.155	176.178	21.233	90.92.196	210.210	151.61			223.223	204.50
hr1297	sample	hr1289	P3-1a	1	H30	6/12/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1298	Xinadequate		P3-2a	1	H30	6/12/2013		0											
hr1299	Xbomb		P3-3a	1	H30	6/12/2013		3	58.160	149.53.57	176.78	221.33	190.96.07	210.210	151.161			223.225	04.50
hr1300	Xbomb		P3-4a	1	H30	6/12/2013		4	60.160	151.155	76.176	221.233	190.196	10.210	151.161			223.25	04.50
hr1301	Xbomb		P1-1a	1	H25	6/12/2013		0	62.62	57.59		23.23	30.86.94.97		41.47.53.65				04.250
hr1302	Xinadequate		P3-1a	1	H25	6/12/2013		0											
hr1303	Xbomb		P3-2a	1	H25	6/12/2013		0											
hr1304	Xsubselect		P1-1a	1	H20	6/12/2013		0											
hr1305	Xbomb		P1-1b	1	H20	6/12/2013		1	60.60	49.149			80.86.190		155.165				04.250
hr1306	sample	hr24	P1-2a	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1307	Xsubselect		P1-2b	1	H20	6/12/2013		0											
hr1308	Xbomb		P1-3a	1	H20	6/12/2013		2	60.160	49.149	184.86	21.233	186.190	10.210	155.65			29.229	250.250
hr1309	Xsubselect		P1-3b	1	H20	6/12/2013		0											
hr1310	Xsubselect		P1-3c	1	H20	6/12/2013		0											
hr1311	Xbomb		P1-4a	1	H20	6/12/2013		2	48.48	49.149			186.190		155.165				50.250
hr1312	Xsubselect		P1-4b	1	H20	6/12/2013		0											
hr1313	Xsubselect		P1-5a	1	H20	6/12/2013		0											
hr1314	Xinadequate		P1-5b	1	H20	6/12/2013		0											
hr1315	Xbomb		P1-5c	1	H20	6/12/2013		3	60.160	49.49	80.84	221.233	186.190	10.10	155.165			29.29	50.250
hr1316	sample	hr24	P2-1a	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1317	sample	hr24	P2-2a	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1318	Xsubselect		P2-1b	1	H20	6/12/2013		0											
hr1319	sample	hr24	P2-3a	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1320	Xbomb		P2-4a	1	H20	6/12/2013		2	60.160	149.149	184.86		186.190	10.210				29.229	
hr1321	sample	hr24	G-1	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1322	Xsubselect		P3-1a	1	H20	6/12/2013		0											
hr1323	Xbomb		P3-1b	1	H20	6/12/2013		2	60.160	149.149			186.190	10.10					
hr1324	Xbomb		P3-1c	1	H20	6/12/2013		1		49.149			180.186						
hr1325	Xinadequate		P3-1d	1	H20	6/12/2013		0											
hr1326	Xsubselect		P3-2a	1	H20	6/12/2013		0											
hr1327	sample	hr24	P3-2b	1	H20	6/12/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1328	Xbomb		P3-3a	1	H20	6/12/2013		1				229.31	30.86.90.97						204.250
hr1329	Xbomb		P3-4a	1	H20	6/12/2013		1					186.190	13.13	39.55.161				
hr1330	Xbomb		P3-5a	1	H20	6/12/2013		1	58.60	49.149	74.21	221.221	186.90	08.10	57.65				50.250
hr1331	Xinadequate		P1-1a	1	H15	6/12/2013		0											
hr1332	sample	hr860	P1-2a	1	H15	6/12/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1333	sample	hr860	P2-1a	1	H15	6/12/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1334	Xinadequate		P2-2b	1	H15	6/12/2013		0											
hr1335	Xbomb		P2-3a	1	H15	6/12/2013		2	60.160	149.51	184.86	221.33	186.190	10.210	155.165				50.250
hr1335	Xinadequate		P1-1a	1	H16	6/13/2013		0											
hr1336	Xbomb		P2-4a	1	H15	6/12/2013		3	58.160	149.149	184.186	221.33	186.190	10.210	45.55.165			29.29	50.250
hr1337	Xbomb		P2-5a	1	H15	6/12/2013		0		49.149			190.99	18.18					04.04
hr1338	Xbomb		P2-6a	1	H15	6/12/2013		2	60.160	49.149	84.86	221.23.33	186.190	10.10	155.165			29.29	50.250
hr1339	Xinadequate		P2-7a	1	H15	6/12/2013		0											
hr1346	sample	hr860	P3-1a	1	H15	6/12/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1347	Xsubselect		P3-1b	1	H15	6/12/2013		0											
hr1348	Xsubselect		P1-1a	1	H32	6/13/2013		0											
hr1349	Xbomb		P1-1b	1	H32	6/13/2013		0		37.45.51.53				10.210					
hr1350	Xbomb		P1-1c	1	H32	6/13/2013		1		49.49					151.55			231.239	
hr1351	Xsubselect		P1-1d	1	H32	6/13/2013		0											
hr1352	Xbomb		P2-1a	1	H32	6/13/2013		5	152.160	151.155	77.178	231.231	190.196	210.210	155.61			239.47.49	04.250
hr1353	Xsubselect		P2-1b	1	H32	6/13/2013		0											
hr1354	Xinadequate		P2-2a	1	H32	6/13/2013		0											
hr1356	sample	hr1356	P1-1a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1357	sample	hr1356	P1-2a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1358	sample	hr1356	P1-3a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1359	Xinadequate		P1-4a	1	H9	6/13/2013		0											
hr1360	sample	hr1356	P2-1a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1361	Xsubselect		P2-1b	1	H9	6/13/2013		0											
hr1362	Xinadequate		P2-2a	1	H9	6/13/2013		0											
hr1363	Xbomb		P2-3a	1	H9	6/13/2013		1		49.51.49.51		27.237	186.89.94	204.06	61.63				250.250
hr1364	sample	hr1356	P3-1a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1365	sample	hr1356	P3-2a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1366	Xsubselect		P3-2b	1	H9	6/13/2013		0											
hr1367	sample	hr1356	P3-3a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1368	sample	hr1356	P3-4a	1	H9	6/13/2013		9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	204.250
hr1369	Xbomb		G-1	1	H3	6/13/2013		2	156.58	47.147	72.172	227.229	186.90.94		41.45.157				204.250
hr1370	Xinadequate		P2-1a	1	H3	6/13/2013		0											
hr1371	Xinadequate		P2-2a	1	H3	6/13/2013		0											
hr1372	Xbomb		P1-1a	1	H27	6/13/2013		1	42.50	45.45			195.197		45.51.61.65				50.250
hr1373	sample	br962	P1-1a	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
hr1374	sample	br962	P1-2a	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
hr1375	sample	br962	P1-3a	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
hr1376	Xsubselect		P2-1a	1	H33	6/13/2013		0											
hr1377	sample	br962	P2-1b	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
hr1378	Xinadequate		P2-1c	1	H33	6/13/2013		0											
hr1379	sample	br962	P2-1d	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250
hr1380	sample	br962	P2-2a	1	H33	6/13/2013		9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	250.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1381	Xbomb		P2-3a	1	H33	6/13/2013		2	60.60	155.155		27.31.233	190.190	94.210	155.59			29.29	50.250
hr1382	Xinadequate		P3-1a	1	H33	6/13/2013		0											
hr1383	Xbomb		P3-1b	1	H33	6/13/2013		3	152.160	153.55.65	76.176	21.31.233	190.190	10.210	155.161				04.250.04.250
hr1384	Xinadequate		P1-1a	1	H28	6/13/2013		0											
hr1385	Xspecies		P1-1a	1	H18	6/13/2013		0											
hr1386	Xinadequate		P2-1a	1	H18	6/13/2013		0											
hr1387	Xinadequate		P3-1a	1	H18	6/13/2013		0											
hr1388	Xbomb		P2-2a	1	H18	6/13/2013		0					88.88						
hr1389	Xinadequate		P1-2a	1	H18	6/13/2013		0											
hr1390	Xinadequate		P1-1a	1	H11	6/13/2013		0											
hr1391	Xinadequate		P1-1b	1	H11	6/13/2013		0											
hr1392	Xbomb		P1-2a	1	H11	6/13/2013		0				31.31	78.85.88						04.250.04.250
hr1393	Xinadequate		P2-1a	1	H11	6/13/2013		0											
hr1394	Xinadequate		P2-2a	1	H11	6/13/2013		0											
hr1395	sample	br696	P1-1a	1	H5	6/13/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
hr1396	sample	br696	P1-2a	1	H5	6/13/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
hr1397	sample	br696	P1-3a	1	H5	6/13/2013		9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	204.250
hr1398	Xinadequate		P1-4a	1	H5	6/13/2013		0											
hr1399	Xbomb		P2-1a	1	H5	6/13/2013		3	140.158	151.53	172.178	23.231	186.190	10.210	53.61.63			29.39	204.50
hr1400	Xbomb		P3-1a	1	H5	6/13/2013		2	40.40	47.51.153			186.190	10.10	59.161			229.239	04.50.04.50
hr1401	Xsubselect		P3-1b	1	H5	6/13/2013		0											
hr1402	Xinadequate		P3-1c	1	H5	6/13/2013		0											
hr1403	Xinadequate		P3-2a	1	H5	6/13/2013		0											
hr1404	Xbomb		G-1	1	H6	6/13/2013		2	158.160	47.151	72.72	23.231	186.190	208.10.18	61.161			229.49	04.250
hr1405	sample	hr1405	G-2	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1406	Xbomb		G-3	1	H6	6/13/2013		1	158.160	149.51.53			186.94.190		61.161			29.31	204.
hr1407	Xinadequate		P1-1a	1	H6	6/13/2013		0											
hr1408	sample	hr1405	P1-1b	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1409	Xbomb		P1-2a	1	H6	6/13/2013		1			72.72	23.223	86.190		161.161				
hr1410	sample	hr1405	P1-3a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1411	Xinadequate		P1-4a	1	H6	6/13/2013		0											
hr1412	sample	hr1405	P2-1a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1413	sample	hr1405	P2-2a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1414	sample	hr1405	P2-3a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1415	Xbomb		P3-1a	1	H6	6/13/2013		3	58.60	51.151		223.231	186.190	08.10.08.1(	41.161			29.229	204.250
hr1416	sample	hr1405	P3-2a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1417	sample	hr1405	P3-3a	1	H6	6/13/2013		9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	204.250
hr1418	Xbomb		P1-1a	1	H54	6/14/2013		3	40.58.146		174.76		80.82.88.9(	208.210				223.223	250.250
hr1419	Xinadequate		P1-1a	1	H59	6/14/2013		0											
hr1420	Xinadequate		P1-1a	1	H13	6/14/2013		0											
hr1421	sample	hr635	P1-1a	1	H12	6/14/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1422	Xbomb		P3-1a	1	H12	6/14/2013		2	140.60	31.49.51.5	78.80	221.221	186.90	10.210	53.55.163				250.250
hr1423	sample	hr686	P3-2a	1	H12	6/14/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr1424	Xbomb		P3-3a	1	H12	6/14/2013		3	40.40	37.149		221.221	186.190		153.155				50.250
hr1425	sample	hr686	G-1	1	H12	6/14/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr1426	Xbomb		P1-2a	1	H12	6/14/2013		1	152.58.60	41.51.153	174.76	21.231	186.186	10.10	41.51.61.65				50.250
hr1427	Xinadequate		P1-3a	1	H12	6/14/2013		0											
hr1428	Xsubselect		G-1	1	H59	6/14/2013	Letter envelope = cell 29	0											
hr1429	Xbomb		G-2	1	H59	6/14/2013		2	140.56.58	151.151	74.174		186.190	08.10.16.2	61.161			223.39	
hr1430	Xbomb		G-1	1	H42	6/14/2013		0		35.35				208.10	53.57			223.37.39	
hr1431	Xsubselect		G-2	1	H42	6/14/2013		0											
hr1432	Xbomb		G-3	1	H42	6/14/2013		1	140.58	49.149	74.84.74.8	21.33.241	190.190	.08.10.12.	155.61.65			223.29.39	50.250
hr1433	Xsubselect		G-4	1	H42	6/14/2013	no sample ID written on envelope	0											
hr1434	Xinadequate		P1-1a	1	H41	6/14/2013		0											
hr1435	Xinadequate		P2-1a	1	H41	6/14/2013		0											
hr1436	Xinadequate		P1-1a	1	H46	6/14/2013		0											
hr1437	Xbomb		G-1	1	H57	6/14/2013		1	40.140		74.174		87.87	06.210	147.147			223.37.39	50.250
hr1438	Xsubselect		G-2	1	H57	6/14/2013		0											
hr1439	Xbomb		G-1	1	H51	6/14/2013		0	140.58		174.74		190.03	206.08.10				23.27.37.3(	50.250
hr1440	Xsubselect		G-2	1	H51	6/14/2013		0											
hr1441	Xsubselect		G-1	1	H45	6/14/2013		0											
hr1442	Xbomb		G-2	1	H45	6/14/2013		1	140.58.60		74.174			04.08.10.1(	155.57.61			231.237	50.250
hr1443	Xsubselect		G-3	1	H45	6/14/2013		0											
hr1444	Xbomb		G-4	1	H45	6/14/2013		6	40.52.58	151.155	172.74.86	231.237	186.190	208.210	161.161			223.39.47	204.250
hr1445	Xinadequate		P1-1a	1	H50	6/14/2013		0											
hr1446	Xbomb		P1-1a	1	H56	6/14/2013		1	140.52	149.51.55	172.74.76	221.33	180.86.88	206.08.10	155.57			223.229	04.250
hr1447	Xinadequate		P1-2a	1	H56	6/14/2013		0											
hr1448	Xbomb		P1-3a	1	H56	6/14/2013		8	40.52.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr1449	sample	hr1449	P1-4a	1	H56	6/14/2013		9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr1450	Xinadequate		P2-1a	1	H56	6/14/2013		0											
hr1451	Xbomb		P2-2a	1	H56	6/14/2013		0	40.40		74.174	21.21		98.00.08.1(	57.65			223.25.39	50.50
hr1452	Xinadequate		P2-2b	1	H56	6/14/2013		0											
hr1453	Xbomb		P3-1a	1	H56	6/14/2013		1	140.52.60	149.51.53	174.76.80	221.33	6.180.01.1	206.08.10	155.61.63			223.229	04.250
hr1454	sample	hr1449	P3-2a	1	H56	6/14/2013		9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr1455	Xbomb		P3-3a	1	H56	6/14/2013		3	40.140	151.53.55	72.74.76	231.233	180.84.188	208.210	161.161			39.239	50.250
hr1456	Xinadequate		P3-4a	1	H56	6/14/2013		0											
hr1457	Xsubselect		G-1	1	H56	6/14/2013		0											
hr1458	Xbomb		G-2	1	H56	6/14/2013		2	140.52	131.49.51	172.74.76	21.221	180.186	02.210	155.157			223.29	04.50
hr1459	Xsubselect		G-3	1	H56	6/14/2013		0											
hr1460	Xbomb		P1-1a	1	H62	6/14/2013		2	140.58.60	151.151	76.176	21.233	180.86.90	208.210	53.55.59.61			25.229	04.250
hr1461	Xinadequate		P1-1b	1	H62	6/14/2013		0											
hr1462	Xsubselect		P1-1c	1	H62	6/14/2013		0											
hr1463	sample	hr61	P1-2a	1	H62	6/14/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr1464	sample	hr61	P1-3a	1	H62	6/14/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr1465	Xspecies		P2-1a	1	H62	6/14/2013		0											
hr1466	Xbomb		P2-1b	1	H62	6/14/2013		3	140.160	151.151	176.76	21.233	180.86.90	208.10	153.55.61			225.27.29	204.250
hr1467	Xbomb		P2-2a	1	H62	6/14/2013		1	140.54.60	43.151	76.76	221.31.33	80.86.190	08.210	53.55.61.65			223.225	50.250
hr1468	sample	hr61	P3-1a	1	H62	6/14/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr1469	sample	hr61	P3-2a	1	H62	6/14/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr1470	sample	hr61	G-1	1	H62	6/14/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr1471	sample	hr105	P1-1a	1	H61	6/14/2013		9	140.160	149.149	172.174	221.233	180.186	208.210	161.161			223.229	250.250
hr1472	sample	hr105	P1-2a	1	H61	6/14/2013		9	140.160	149.149	172.174	221.233	180.186	208.210	161.161			223.229	250.250
hr1473	sample	hr342	P2-1a	1	H61	6/14/2013		9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	204.250
hr1474	sample	hr342	P3-1a	1	H61	6/14/2013		9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	204.250
hr1475	Xinadequate		P3-2a	1	H61	6/14/2013		0											

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1476	sample	hr342	P3-2b	1	H61	6/14/2013		9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	204.250
hr1477	Xinadequate		P2-2a	1	H61	6/14/2013		0											
hr1478	Xinadequate		P3-3a	1	H61	6/14/2013		0											
hr1479	Xinadequate		P3-4a	1	H61	6/14/2013		0											
hr1480	sample	hr105	G-1	1	H61	6/14/2013		9	140.160	149.149	172.174	221.233	180.186	208.210	161.161			223.229	250.250
hr1481	Xbomb		T-1	2	H35	6/21/2013		0					95.95	08.210	53.53				
hr1482	Xbomb		P1-1a	2	H29	6/21/2013		1	150.62									23.223	250.250
hr1483	Xbomb		P2-1a	2	H29	6/21/2013		4	150.156	49.49	72.72	221.231	80.86.90.9(	212.16	155.159			27.27	250.250
hr1484	Xbomb		P2-2a	2	H29	6/21/2013		2	50.50		75.87	221.33	86.90.95.99		155.157			223.29.37	250.250
hr1485	Xinadequate		P1-1a	2	H14	6/21/2013		0											
hr1486	Xinadequate		P1-1b	2	H14	6/21/2013		0											
hr1487	Xsubselect		P1-1c	2	H14	6/21/2013		0											
hr1488	Xbomb		P1-1d	2	H14	6/21/2013		2	60.160	49.51.155	74.86	221.29.31	186.190	210.214	.55.59.61.65			29.229	04.250
hr1489	Xinadequate		P1-2a	2	H14	6/21/2013		0											
hr1490	Xsubselect		P1-2b	2	H14	6/21/2013		0											
hr1491	sample	hr860	P1-2c	2	H14	6/21/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1492	Xsubselect		P1-2d	2	H14	6/21/2013		0											
hr1493	sample	hr860	P1-3a	2	H14	6/21/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1494	sample	hr860	P2-1a	2	H14	6/21/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1495	Xsubselect		P2-1b	2	H14	6/21/2013		0											
hr1496	Xsubselect		P3-1a	2	H14	6/21/2013		0											
hr1497	sample	hr860	P3-1b	2	H14	6/21/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1498	Xbomb		T-1	2	H14	6/21/2013		8	40.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1499	Xbomb		T-1	2	H7	6/21/2013		2	58.160	49.51.159		21.33.35.3	4.186.95.9	208.214	.51.53.57.61			223.229	50.250
hr1500	sample	hr60	P1-1a	2	H30	6/21/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr1501	sample	hr60	P1-2a	2	H30	6/21/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr1502	Xbomb		P2-1a	2	H30	6/21/2013		3	140.160	149.55	86.87.86.8	21.33.252	180.190	210.210	53.161			223.31.39	50.250
hr1503	Xbomb		P3-1a	2	H30	6/21/2013		2	40.40	149.149	176.78.89	229.31	80.86.90.95		151.57.65			223.225	04.250.04.250
hr1504	sample	hr60	P1-3a	2	H30	6/21/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr1505	Xbomb		P1-1a	2	H26	6/21/2013		8	154.160	153.159	172.184	221.221	86.190	208.210	161.161			223.249	204.250
hr1506	sample	br23	P1-2a	2	H26	6/21/2013		9	154.160	153.159	172.184	221.221	190.190	208.210	161.161			223.249	204.250
hr1507	Xinadequate		P1-3a	2	H26	6/21/2013		0											
hr1508	Xbomb		P2-1a	2	H26	6/21/2013		1	52.52	131.49.55		221.31.33	186.190		55.57.61.63			21.25.21.2	04.250
hr1509	Xinadequate		P2-1b	2	H26	6/21/2013		0											
hr1510	Xinadequate		P3-1a	2	H26	6/21/2013		0											
hr1511	Xinadequate		P3-2a	2	H26	6/21/2013		0											
hr1512	sample	br23	T-1	2	H26	6/21/2013		9	154.160	153.159	172.184	221.221	190.190	208.210	161.161			223.249	204.250
hr1513	Xbomb		P1-1a	2	H27	6/21/2013		8	152.160	49.51.53.5	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr1514	sample	hr13	P1-2a	2	H27	6/21/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1515	Xsubselect		P1-2b	2	H27	6/21/2013		0											
hr1516	Xspecies		P1-3a	2	H27	6/21/2013		0											
hr1517	sample	hr35	P1-3b	2	H27	6/21/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr1518	Xsubselect		P1-3c	2	H27	6/21/2013		0											
hr1519	Xinadequate		P2-1a	2	H27	6/21/2013		0											
hr1520	Xbomb		P2-2a	2	H27	6/21/2013		1	52.60	151.151		31.231	186.90.97	210.14.16	151.55.57			39.239	04.250
hr1521	Xbomb		P2-3a	2	H27	6/21/2013		1	140.48.60		72.89	21.221	80.186	10.13	151.57.61			229.229	50.250
hr1522	sample	hr13	P2-4a	2	H27	6/21/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1523	sample	hr35	T-1	2	H27	6/21/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr1524	Xsubselect		T-2	2	H27	6/21/2013		0											
hr1525	Xsubselect		T-3	2	H27	6/21/2013		0											
hr1526	Xbomb		P1-1a	2	H21	6/21/2013		7	140.152	149.149	178.179	221.29.231	180.190	210.210	155.155			23.239	204.250
hr1527	Xbomb		P1-2b	2	H21	6/21/2013		7	140.152	149.149	178.180	221.33	180.86.90	210.210	155.155			239.249	204.250
hr1528	Xinadequate		P1-2a	2	H21	6/21/2013		0											
hr1529	Xbomb		P2-1a	2	H21	6/21/2013		2	52.152	149.149	174.178	21.33.21.3	180.86.90	10.210	155.61.63			237.39.49	04.250
hr1530	Xsubselect		P3-1a	2	H21	6/21/2013		0											
hr1531	Xbomb		P3-1b	2	H21	6/21/2013		1		149.149				16.16					50.50
hr1532	sample	hr230	P3-2a	2	H21	6/21/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
hr1533	Xinadequate		P3-3a	2	H21	6/21/2013		0											
hr1534	Xinadequate		P1-1a	2	H9	6/21/2013		0											
hr1535	Xinadequate		P1-2a	2	H9	6/21/2013		0											
hr1536	Xinadequate		P2-1a	2	H9	6/21/2013		0											
hr1537	sample	hr635	P1-1a	2	H2	6/21/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1538	Xsubselect		P1-1b	2	H2	6/21/2013		0											
hr1539	Xinadequate		P1-1c	2	H2	6/21/2013		0											
hr1540	sample	hr60	P1-1a	2	H36	6/21/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr1541	Xinadequate		P1-2a	2	H36	6/21/2013		0											
hr1542	Xinadequate		T-1	2	H36	6/21/2013		0											
hr1543	sample	hr635	P2-1a	2	H2	6/21/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1544	Xsubselect		P2-1b	2	H2	6/21/2013		0											
hr1545	Xsubselect		P2-1c	2	H2	6/21/2013		0											
hr1546	sample	hr188	P1-1a	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1547	Xsubselect		P1-1b	2	H5	6/21/2013		0											
hr1548	Xsubselect		P1-1c	2	H5	6/21/2013		0											
hr1549	sample	hr686	P1-2a	2	H5	6/21/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr1550	Xsubselect		P1-2b	2	H5	6/21/2013		0											
hr1551	Xinadequate		P1-2c	2	H5	6/21/2013		0											
hr1552	Xsubselect		T-1	2	H5	6/21/2013		0											
hr1553	Xsubselect		P2-1a	2	H5	6/21/2013		0											
hr1554	sample	hr686	P2-1b	2	H5	6/21/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr1555	sample	hr686	P2-2a	2	H5	6/21/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr1556	Xsubselect		P2-3a	2	H5	6/21/2013		0											
hr1557	Xbomb		P2-3b	2	H5	6/21/2013		7	140.140	149.151	178.180	221.221	180.86.90	210.210	153.155			29.39.249	204.250
hr1558	Xbomb		P2-4a	2	H5	6/21/2013		8	140.140	149.151	178.180	221.31	180.190	210.210	153.155			239.249	204.250
hr1559	sample	hr188	P3-1a	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1560	sample	hr188	P3-2a	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1561	sample	hr188	P3-3a	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1562	Xinadequate		P3-4a	2	H5	6/21/2013		0											
hr1563	sample	hr188	P3-5a	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1564	sample	hr188	T-2	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1565	sample	hr188	G-1	2	H5	6/21/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr1566	Xsubselect		G-2	2	H5	6/21/2013		0											
hr1567	sample	hr66	P1-1a	2	H12	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr1568	Xsubselect		P1-1b	2	H12	6/21/2013		0											
hr1569	sample	hr66	P1-2a	2	H12	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr1570	Xsubselect		P2-1a	2	H12	6/21/2013		0											
hr1571	sample	hr183	P2-1b	2	H12	6/21/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1572	Xsubselect		P2-1c	2	H12	6/21/2013		0											

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1573	sample	hr66	P2-2a	2	H12	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr1574	sample	hr66	P2-3a	2	H12	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr1575	Xsubselect		P2-3b	2	H12	6/21/2013		0											
hr1576	Xsubselect		P2-4a	2	H12	6/21/2013		0											
hr1577	Xsubselect		P2-4b	2	H12	6/21/2013		0											
hr1578	sample	hr66	P2-4c	2	H12	6/21/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr1579	sample	hr183	P3-1a	2	H12	6/21/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1580	Xsubselect		P3-2a	2	H12	6/21/2013		0											
hr1581	Xsubselect		P3-2b	2	H12	6/21/2013		0											
hr1582	sample	hr183	P3-2c	2	H12	6/21/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1583	sample	hr183	P3-4a	2	H12	6/21/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1584	sample	hr183	P3-5a	2	H12	6/21/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1585	Xbomb		P3-6a	2	H12	6/21/2013		3	140.56.60	.55.57.61.	174.78.83	221.231	186.90.96	210.214	53.59.161			223.29.39	204.250
hr1586	sample	hr1586	P1-1a	2	H60	6/22/2013		9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	250.250
hr1587	Xsubselect		P1-2a	2	H60	6/22/2013		0											
hr1588	sample	hr1586	P1-2b	2	H60	6/22/2013		9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	250.250
hr1589	Xsubselect		P1-2c	2	H60	6/22/2013		0											
hr1590	sample	hr1586	P1-3a	2	H60	6/22/2013		9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	250.250
hr1591	Xbomb		P1-4a	2	H60	6/22/2013		7	40.152	159.161	176.186	221.231	186.190	208.208	141.61			223.239	250.250
hr1592	sample	hr1586	P2-1a	2	H60	6/22/2013		9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	250.250
hr1593	Xsubselect		P2-1b	2	H60	6/22/2013		0											
hr1594	Xinadequate		P2-2a	2	H60	6/22/2013		0											
hr1595	Xinadequate		P3-1a	2	H60	6/22/2013	Duplicate P1-1a	0											
hr1596	Xsubselect		P1-1a	2	H62	6/22/2013		0											
hr1597	sample	hr388	P1-1b	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1598	Xsubselect		P1-1c	2	H62	6/22/2013		0											
hr1599	sample	hr388	P1-2a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1600	sample	hr388	P1-3a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1601	sample	hr388	P1-4a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1602	sample	hr388	P2-1a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1603	Xinadequate		P2-2a	2	H62	6/22/2013		0											
hr1604	sample	hr388	P2-3a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1605	Xbomb		P2-4a	2	H62	6/22/2013		3	140.140	49.149	172.176	21.221	180.86.88	208.10	153.55.57			229.229	50.250
hr1606	sample	hr388	P3-1a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1607	Xsubselect		P3-1b	2	H62	6/22/2013		0											
hr1608	Xbomb		P3-2a	2	H62	6/22/2013		3	140.58.60	149.51	174.176	221.221	180.86	208.10	153.61.63			229.229	50.250
hr1609	sample	hr388	P3-3a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1610	Xsubselect		P3-3b	2	H62	6/22/2013		0											
hr1611	sample	hr388	P3-4a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1612	sample	hr388	P1-5a	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1613	sample	hr388	T-1	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1614	sample	hr388	G-1	2	H62	6/22/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr1615	Xsubselect		G-2	2	H62	6/22/2013		0											
hr1616	Xsubselect		P1-1a	2	H42	6/23/2013		0											
hr1617	Xsubselect		P1-1b	2	H42	6/23/2013		0											
hr1618	sample	hr1289	P1-1c	2	H42	6/23/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1619	Xinadequate		P2-1a	2	H42	6/23/2013		0											
hr1620	Xinadequate		T-1	2	H42	6/23/2013		0											
hr1621	Xinadequate		T-2	2	H42	6/23/2013		0											
hr1622	sample	hr1289	P1-1a	2	H46	6/23/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1623	Xbomb		P1-1b	2	H46	6/23/2013		1		35.37.53.55		21.29.21.2	186.90.96	04.04	49.51.161			223.29	204.250
hr1624	Xsubselect		P1-1c	2	H46	6/23/2013		0											
hr1625	Xsubselect		P1-1d	2	H46	6/23/2013		0											
hr1626	Xsubselect		P1-1	2	H46	6/23/2013		0											
hr1627	Xsubselect		P1-1f	2	H46	6/23/2013		0											
hr1628	Xinadequate		P1-2a	2	H46	6/23/2013		0											
hr1629	Xsubselect		P2-1a	2	H46	6/23/2013	Same cluster # as WGI 1632	0											
hr1630	Xsubselect		P2-1b	2	H46	6/23/2013		0											
hr1631	sample	hr1289	P2-1c	2	H46	6/23/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1632	sample	hr1289	P2-1d	2	H46	6/23/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1633	Xsubselect		P2-1e	2	H46	6/23/2013		0											
hr1634	Xbomb		P2-2a	2	H46	6/23/2013		1					80.86.190		149.53.57			23.223	250.250
hr1635	Xbomb		P3-1a	2	H46	6/23/2013		3		151.155		221.31.33	186.190		49.51.57.61			223.225	04.250
hr1636	sample	hr1289	G-1	2	H46	6/23/2013		9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	204.250
hr1637	Xbomb		T-1	2	H46	6/23/2013		0	40.160	47.151		221.29	186.90.94	10.10	153.61.65			27.227	50.250
hr1638	Xbomb		P1-1a	2	H50	6/23/2013		3	40.42.52	149.61	78.80	221.31.33	180.186	208.210	53.57.59.61			223.229	04.250
hr1639	Xinadequate		P1-2a	2	H50	6/23/2013		0											
hr1640	sample	hr1449	P1-2b	2	H50	6/23/2013		9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr1641	Xbomb		P1-3a	2	H50	6/23/2013		1	40.52.160	35.49	72.174.180	221.33	180.86.05	210.210	155.61			23.229	04.250
hr1642	Xsubselect		P1-3b	2	H50	6/23/2013		0											
hr1643	Xinadequate		P1-4a	2	H50	6/23/2013		0											
hr1644	Xsubselect		P2-1a	2	H50	6/23/2013		0											
hr1645	sample	hr105	P2-1b	2	H50	6/23/2013		9	140.160	149.149	172.174	221.233	180.186	208.210	161.161			223.229	250.250
hr1646	Xsubselect		P2-1c	2	H50	6/23/2013		0											
hr1647	sample	hr342	P2-2a	2	H50	6/23/2013		9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	204.250
hr1648	Xsubselect		P2-3a	2	H50	6/23/2013		0											
hr1649	sample	hr1449	P2-3b	2	H50	6/23/2013		9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr1650	Xbomb		P3-1a	2	H50	6/23/2013		3	160.162			221.229						223.229	04.250
hr1651	Xsubselect		P3-2a	2	H50	6/23/2013		0											
hr1652	Xbomb		P3-2b	2	H50	6/23/2013		4	40.140	149.151	172.80	221.233	80.186	208.210	49.55.59.61			23.229	204.250
hr1653	Xsubselect		P3-3a	2	H50	6/23/2013		0											
hr1654	sample	hr1654	P3-3b	2	H50	6/23/2013		9	140.160	149.151	172.180	221.233	180.180	208.210	155.161			229.229	204.250
hr1655	sample	hr223	P1-1a	2	H23	6/23/2013		9	152.160	155.155	176.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1656	Xsubselect		P1-1b	2	H23	6/23/2013		0											
hr1657	sample	hr223	P1-2a	2	H23	6/23/2013		10	152.160	155.155	176.186	231.231	190.190	210.214	155.155		127.127	229.239	250.250
hr1658	Xinadequate		P1-2b	2	H23	6/23/2013		0											
hr1659	Xinadequate		P1-3a	2	H23	6/23/2013		0											
hr1660	Xsubselect		P1-1c	2	H23	6/23/2013		0											
hr1661	sample	hr223	P2-1a	2	H23	6/23/2013		9	152.160	155.155	176.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1662	Xinadequate		P2-2a	2	H23	6/23/2013		0											
hr1663	Xinadequate		P1-1a	2	H17	6/23/2013		0											
hr1664	Xbomb		P2-1a	2	H17	6/23/2013		0			86.86	229.31.33	88.91		53.55.57.59				
hr1665	Xinadequate		P2-1b	2	H17	6/23/2013		0											
hr1666	Xinadequate		P2-1c	2	H17	6/23/2013		0											
hr1667	Xinadequate		P3-1a	2	H17	6/23/2013		0											
hr1668	Xbomb		T-1	2	H17	6/23/2013		0		45.153	177.79.89	21.231	178.90		55.59.61.63				04.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1669	Xsubselect		T-2	2	H17	6/23/2013		0											
hr1670	Xbomb		P1-1a	2	H11	6/24/2013		3	152.160	51.153	174.78	221.31.33	186.186	210.210	63.61.63.65			229.39	04.250
hr1671	sample	hr635	P1-2b	2	H11	6/24/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1672	Xsubselect		P2-1a	2	H11	6/24/2013		0											
hr1673	Xsubselect		P2-1c	2	H11	6/24/2013		0											
hr1674	sample	hr635	P2-1	2	H11	6/24/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1675	Xsubselect		P1-2a	2	H11	6/24/2013		0											
hr1676	Xbomb		P1-3a	2	H11	6/24/2013		0		151.53		19.27.33.3	80.86.190	208.10	63.59.61.65				50.250
hr1677	Xsubselect		P2-1b	2	H11	6/24/2013		0											
hr1678	Xbomb		P2-1d	2	H11	6/24/2013		8	152.160	151.153	174.178	221.231	186.186	210.210	63.57.61.65			229.239	250.250
hr1679	Xinadequate		P1-1a	3	H54	7/2/2013		0											
hr1680	Xinadequate		P1-2a	3	H54	7/2/2013	Data book and letter env = "54"; sample env = "47"	0											
hr1681	Xinadequate		P2-1a	3	H54	7/2/2013	Data book and letter env = "54"; sample env = "47"	0											
hr1682	sample	hr125	P2-2a	3	H54	7/2/2013	Data book and letter env = "54"; sample env = "47"	9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr1683	Xsubselect		P1-1a	3	H60	7/2/2013		0											
hr1684	sample	hr130	P1-1b	3	H60	7/2/2013		9	152.154	153.159	176.186	221.221	180.186	208.210	141.161			223.239	250.250
hr1685	Xinadequate		P1-2a	3	H60	7/2/2013		0											
hr1686	Xsubselect		P1-3a	3	H60	7/2/2013		0											
hr1687	Xinadequate		P2-1a	3	H60	7/2/2013		0											
hr1688	sample	hr130	P2-2a	3	H60	7/2/2013		9	152.154	153.159	176.186	221.221	180.186	208.210	141.161			223.239	250.250
hr1689	Xinadequate		P2-2b	3	H60	7/2/2013		0											
hr1690	sample	hr130	P3-1a	3	H60	7/2/2013		9	152.154	153.159	176.186	221.221	180.186	208.210	141.161			223.239	250.250
hr1691	Xsubselect		P1-1a	3	H23	7/4/2013		0											
hr1692	Xsubselect		P1-1b	3	H23	7/4/2013		0											
hr1693	Xsubselect		P1-1c	3	H23	7/4/2013		0											
hr1694	Xinadequate		P1-1f	3	H23	7/4/2013		0											
hr1695	sample	br979	P1-1d	3	H23	7/4/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr1696	Xsubselect		P1-1	3	H23	7/4/2013		0											
hr1697	Xsubselect		P1-2a	3	H23	7/4/2013		0											
hr1698	Xsubselect		P2-1a	3	H23	7/4/2013		0											
hr1699	Xsubselect		P2-1b	3	H23	7/4/2013		0											
hr1700	sample	br979	P2-1c	3	H23	7/4/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr1701	Xsubselect		P2-1d	3	H23	7/4/2013		0											
hr1702	Xsubselect		P2-1	3	H23	7/4/2013		0											
hr1703	Xsubselect		P2-1f	3	H23	7/4/2013		0											
hr1704	Xsubselect		P2-1g	3	H23	7/4/2013		0											
hr1705	Xinadequate		P2-1h	3	H23	7/4/2013		0											
hr1706	Xsubselect		P2-1i	3	H23	7/4/2013		0											
hr1707	Xinadequate		P2-2a	3	H23	7/4/2013		0											
hr1708	Xsubselect		P3-1a	3	H23	7/4/2013		0											
hr1709	sample	br979	P3-1b	3	H23	7/4/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr1710	Xsubselect		P3-2a	3	H23	7/4/2013		0											
hr1711	Xsubselect		P3-2b	3	H23	7/4/2013		0											
hr1712	Xbomb		G-1	3	H23	7/4/2013		8	150.152	151.159	176.184	221.21	190.190	210.210	155.155			223.225	250.250
hr1713	sample	hr13	P1-1a	3	H26	7/4/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1714	Xsubselect		P2-1a	3	H26	7/4/2013		0											
hr1715	Xsubselect		P2-1b	3	H26	7/4/2013		0											
hr1716	Xsubselect		P2-1c	3	H26	7/4/2013		0											
hr1717	sample	hr13	P2-2a	3	H26	7/4/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1718	Xsubselect		P2-2b	3	H26	7/4/2013		0											
hr1719	Xsubselect		P3-1a	3	H26	7/4/2013		0											
hr1720	sample	hr13	P3-2a	3	H26	7/4/2013		10	152.160	149.155	178.186	231.231	190.190	210.214	155.155		127.145	229.239	250.250
hr1721	Xbomb		P1-1a	3	H36	7/4/2013		1	60.60	149.51	172.76.78		186.96	210.210	151.55.61			47.249	04.04
hr1722	Xsubselect		P1-1b	3	H36	7/4/2013		0											
hr1723	Xbomb		P2-1a	3	H36	7/4/2013		0		149.51.63	76.176	31.31	186.95.96	210.10	51.61			23.39.49.5	50.50
hr1724	Xinadequate		P2-1b	3	H36	7/4/2013		0											
hr1725	Xsubselect		P1-1a	3	H13	7/4/2013		0											
hr1726	Xsubselect		P1-1b	3	H13	7/4/2013		0											
hr1727	Xsubselect		P1-2a	3	H13	7/4/2013		0											
hr1728	sample	hr426	P1-2b	3	H13	7/4/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr1729	Xsubselect		P1-2c	3	H13	7/4/2013		0											
hr1730	sample	hr426	P2-1a	3	H13	7/4/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr1731	Xsubselect		P2-1b	3	H13	7/4/2013		0											
hr1732	Xsubselect		P2-2a	3	H13	7/4/2013		0											
hr1733	Xsubselect		P2-2b	3	H13	7/4/2013		0											
hr1734	sample	hr426	P3-1a	3	H13	7/4/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr1735	Xsubselect		P3-1b	3	H13	7/4/2013		0											
hr1736	Xinadequate		P1-1a	3	H38	7/4/2013		0											
hr1737	Xsubselect		P1-1a	3	H33	7/5/2013		0											
hr1738	Xsubselect		P1-2a	3	H33	7/5/2013		0											
hr1739	Xsubselect		P1-2b	3	H33	7/5/2013		0											
hr1740	Xsubselect		P1-1a	3	H6	7/4/2013		0											
hr1741	sample	br26	P1-1b	3	H6	7/4/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr1742	Xsubselect		P1-1c	3	H6	7/4/2013		0											
hr1743	Xsubselect		P1-2a	3	H6	7/4/2013		0											
hr1744	Xsubselect		P1-2b	3	H6	7/4/2013		0											
hr1745	Xinadequate		P1-2c	3	H6	7/4/2013		0											
hr1746	Xsubselect		P2-1a	3	H6	7/4/2013		0											
hr1747	Xsubselect		P2-1b	3	H6	7/4/2013		0											
hr1748	Xsubselect		P2-1c	3	H6	7/4/2013		0											
hr1749	sample	br26	P2-2a	3	H6	7/4/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr1750	Xsubselect		P2-2b	3	H6	7/4/2013		0											
hr1751	Xsubselect		P2-2c	3	H6	7/4/2013		0											
hr1752	Xsubselect		P2-2d	3	H6	7/4/2013		0											
hr1753	Xsubselect		P2-2	3	H6	7/4/2013		0											
hr1754	Xsubselect		P3-1a	3	H6	7/4/2013		0											
hr1755	Xsubselect		P3-2a	3	H6	7/4/2013		0											
hr1756	Xsubselect		P3-2b	3	H6	7/4/2013		0											
hr1757	Xsubselect		P3-2c	3	H6	7/4/2013		0											
hr1758	Xsubselect		P3-2d	3	H6	7/4/2013		0											
hr1759	sample	br26	P3-2	3	H6	7/4/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1760	Xsubselect		P3-2f	3	H6	7/4/2013		0											
hr1761	Xinadequate		P1-1a	3	H5	7/4/2013		0											
hr1762	Xbomb		P1-2a	3	H5	7/4/2013		1	38.40.160	149.51.57	74.74	21.21	186.190	08.210				23.29.237	50.50
hr1763	Xsubselect		P1-2b	3	H5	7/4/2013		0											
hr1764	Xsubselect		P1-3a	3	H5	7/4/2013		0											
hr1765	Xbomb		P2-1a	3	H5	7/4/2013		3		51.53.159		221.221	186.190		153.63.65			29.229	250.250
hr1766	Xsubselect		P2-1b	3	H5	7/4/2013		0											
hr1767	Xsubselect		P2-1c	3	H5	7/4/2013		0											
hr1768	Xsubselect		P2-3a	3	H5	7/4/2013		0											
hr1769	sample	hr183	P3-1a	3	H5	7/4/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr1770	Xsubselect		P3-1b	3	H5	7/4/2013		0											
hr1771	Xsubselect		P1-1a	3	H12	7/4/2013		0											
hr1772	Xbomb		P1-2a	3	H12	7/4/2013		3	56.60		174.176	21.221	90.190	210.210	55.57.55.57			37.237	204.250
hr1773	Xinadequate		P2-1a	3	H12	7/4/2013		0											
hr1774	Xsubselect		P1-2c	3	H33	7/5/2013		0											
hr1775	Xbomb		P1-2d	3	H33	7/5/2013		1	152.56	149.61.155	178.186	31.231	186.90.96	08.210	53.55.161			229.39	04.250
hr1776	Xsubselect		P1-2	3	H33	7/5/2013		0											
hr1777	Xsubselect		P1-2f	3	H33	7/5/2013		0											
hr1778	Xsubselect		P1-2g	3	H33	7/5/2013		0											
hr1779	sample	hr1779	P2-1a	3	H33	7/5/2013		9	152.160	155.159	178.184	231.237	186.190	210.210	161.161			239.239	204.250
hr1780	Xsubselect		P2-2a	3	H33	7/5/2013		0											
hr1781	Xinadequate		P2-3a	3	H33	7/5/2013		0											
hr1782	Xsubselect		P2-3b	3	H33	7/5/2013		0											
hr1783	Xinadequate		P2-3c	3	H33	7/5/2013		0											
hr1784	Xsubselect		G-1	3	H33	7/5/2013		0											
hr1785	Xbomb		G-2	3	H33	7/5/2013		3	152.56.60	153.55.59	178.86	231.231	186.90.96	210.210	55.161			229.39.49	204.250
hr1786	sample	hr35	P1-1a	3	H21	7/5/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr1787	Xinadequate		P1-2a	3	H21	7/5/2013		0											
hr1788	Xinadequate		P1-2b	3	H21	7/5/2013		0											
hr1789	Xsubselect		P1-2c	3	H21	7/5/2013		0											
hr1790	Xsubselect		P1-3a	3	H21	7/5/2013		0											
hr1791	sample	hr13	P2-1a	3	H21	7/5/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr1792	Xinadequate		P2-2a	3	H21	7/5/2013		0											
hr1793	Xspecies		P2-2b	3	H21	7/5/2013		0											
hr1794	Xbomb		P3-1a	3	H21	7/5/2013		1	52.60	41.149	176.178	31.231	84.90.196	214.16	155.57.59			29.229	
hr1795	Xsubselect		P3-1b	3	H21	7/5/2013		0											
hr1796	Xinadequate		P1-1a	3	H17	7/5/2013		0											
hr1797	Xinadequate		P1-2a	3	H17	7/5/2013		0											
hr1798	Xinadequate		P1-1b	3	H17	7/5/2013		0											
hr1799	Xsubselect		P2-1a	3	H17	7/5/2013		0											
hr1800	sample	hr219	P1-1a	3	H10	7/5/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr1801	sample	hr219	G-1	3	H10	7/5/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr1802	Xinadequate		P1-1b	3	H10	7/5/2013		0											
hr1803	Xsubselect		P1-2a	3	H10	7/5/2013		0											
hr1804	Xsubselect		P1-2b	3	H10	7/5/2013		0											
hr1805	Xsubselect		G-2	3	H10	7/5/2013		0											
hr1806	Xinadequate		P2-2a	3	H10	7/5/2013		0											
hr1807	sample	hr219	P2-2b	3	H10	7/5/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr1808	Xsubselect		P2-2c	3	H10	7/5/2013		0											
hr1809	sample	hr219	P3-1a	3	H10	7/5/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr1810	sample	hr635	P1-1a	3	H3	7/5/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1811	Xsubselect		P1-1b	3	H3	7/5/2013		0											
hr1812	Xsubselect		P1-1c	3	H3	7/5/2013		0											
hr1813	Xbomb		P1-2a	3	H3	7/5/2013		1				221.231	186.90.95		57.59.63.65			27.229	
hr1814	Xbomb		P2-1a	3	H3	7/5/2013		1		49.51.53.55		21.221	186.186					37.239	50.50
hr1815	Xinadequate		P1-2b	3	H3	7/5/2013		0											
hr1816	sample	hr635	T-1	3	H3	7/5/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1817	Xsubselect		P3-1a	3	H3	7/5/2013		0											
hr1818	Xsubselect		P3-1b	3	H3	7/5/2013		0											
hr1819	sample	hr635	P3-1c	3	H3	7/5/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr1820	Xbomb		P3-1d	3	H3	7/5/2013		3	152.160	151.153	174.76.78	221.31.35	186.186	10.210	161.63.65			229.39	04.250
hr1821	Xsubselect		P3-1	3	H3	7/5/2013		0											
hr1822	Xsubselect		P3-1f	3	H3	7/5/2013		0											
hr1823	Xbomb		P3-2a	3	H3	7/5/2013		1	140.52			221.221	186.90	208.10	151.61.63			23.25.43.45	
hr1824	Xsubselect		P1-1a	3	H7	7/5/2013		0											
hr1825	Xbomb		P1-2a	3	H7	7/5/2013		0		49.55.57									50.50
hr1826	Xinadequate		P1-2b	3	H7	7/5/2013		0											
hr1827	Xsubselect		P2-1a	3	H7	7/5/2013		0											
hr1828	Xinadequate		P2-2a	3	H7	7/5/2013		0											
hr1829	sample	hr674	P2-2b	3	H7	7/5/2013		9	140.160	149.155	174.177	231.233	190.190	210.210	161.161			225.249	250.250
hr1830	Xsubselect		P2-2c	3	H7	7/5/2013		0											
hr1831	Xsubselect		P1-1a	3	H8	7/5/2013		0											
hr1832	Xsubselect		P1-1b	3	H8	7/5/2013		0											
hr1833	sample	hr1833	P1-2a	3	H8	7/5/2013		9	158.160	153.155	174.174	231.231	186.190	208.210	153.161			225.247	204.250
hr1834	Xsubselect		P1-2b	3	H8	7/5/2013		0											
hr1835	Xsubselect		P1-2c	3	H8	7/5/2013		0											
hr1836	Xinadequate		P1-3a	3	H8	7/5/2013		0											
hr1837	Xsubselect		P2-1a	3	H8	7/5/2013		0											
hr1838	sample	hr1833	P2-1b	3	H8	7/5/2013		9	158.160	153.155	174.174	231.231	186.190	208.210	153.161			225.247	204.250
hr1839	Xspecies		P2-1c	3	H8	7/5/2013		0											
hr1840	Xinadequate		P2-1b	3	H17	7/5/2013		0											
hr1841	Xsubselect		P2-1c	3	H17	7/5/2013		0											
hr1842	Xsubselect		P2-1d	3	H17	7/5/2013		0											
hr1843	Xbomb		P2-1	3	H17	7/5/2013		1	52.60	51.155	86.186	29.29	86.190	206.10.14	155.61			229.229	204.50
hr1844	Xsubselect		P2-1f	3	H17	7/5/2013		0											
hr1845	Xsubselect		P2-2a	3	H17	7/5/2013		0											
hr1846	Xsubselect		P2-2b	3	H17	7/5/2013		0											
hr1847	Xsubselect		P3-1a	3	H17	7/5/2013		0											
hr1848	Xsubselect		P3-1b	3	H17	7/5/2013		0											
hr1849	sample	hr219	P3-1c	3	H17	7/5/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr1850	Xsubselect		P3-1d	3	H17	7/5/2013		0											
hr1851	Xsubselect		P3-1	3	H17	7/5/2013		0											
hr1852	Xinadequate		P3-1f	3	H17	7/5/2013		0											
hr1853	Xsubselect		P3-3a	3	H17	7/5/2013		0											
hr1854	Xsubselect		P2-1d	3	H8	7/5/2013		0											
hr1855	Xinadequate		P3-1a	3	H8	7/5/2013		0											
hr1856	Xsubselect		P3-1b	3	H8	7/5/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1857	sample	hr1833	P3-1c	3	H8	7/5/2013		9	158.160	153.155	174.174	231.231	186.190	208.210	153.161			225.247	204.250
hr1858	Xspecies		P3-1d	3	H8	7/5/2013		0											
hr1859	Xinadequate		P3-1	3	H8	7/5/2013		0											
hr1860	Xinadequate		T-1	3	H8	7/5/2013		0											
hr1861	Xsubselect		P1-1a	3	H14	7/5/2013		0											
hr1862	Xsubselect		P1-1b	3	H14	7/5/2013		0											
hr1863	Xsubselect		P1-2a	3	H14	7/5/2013		0											
hr1864	sample	hr646	P1-3a	3	H14	7/5/2013		9	140.160	149.149	184.186	221.231	190.190	210.210	161.161			229.249	250.250
hr1865	Xsubselect		P2-1a	3	H14	7/5/2013		0											
hr1866	Xsubselect		P2-1b	3	H14	7/5/2013		0											
hr1867	Xsubselect		P2-1c	3	H14	7/5/2013		0											
hr1868	Xsubselect		P2-1d	3	H14	7/5/2013		0											
hr1869	Xbomb		P2-1	3	H14	7/5/2013		2		45.51.155	174.175	221.27.31	86.186	200.08.10	153.59.61			223.229	04.250
hr1870	Xsubselect		P2-1f	3	H14	7/5/2013		0											
hr1871	Xsubselect		P2-1g	3	H14	7/5/2013		0											
hr1872	Xsubselect		P2-1h	3	H14	7/5/2013		0											
hr1873	Xsubselect		P2-1i	3	H14	7/5/2013		0											
hr1874	Xsubselect		P2-1j	3	H14	7/5/2013		0											
hr1875	Xsubselect		P3-1a	3	H14	7/5/2013		0											
hr1876	Xsubselect		P3-1b	3	H14	7/5/2013		0											
hr1877	Xsubselect		P3-1c	3	H14	7/5/2013		0											
hr1878	sample	hr860	P3-2a	3	H14	7/5/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1879	Xsubselect		P3-2b	3	H14	7/5/2013		0											
hr1880	Xsubselect		P3-2c	3	H14	7/5/2013		0											
hr1881	sample	hr646	T-1	3	H14	7/5/2013		9	140.160	149.149	184.186	221.231	190.190	210.210	161.161			229.249	250.250
hr1882	Xsubselect		G-1	3	H14	7/5/2013		0											
hr1883	sample	hr860	G-2	3	H14	7/5/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr1884	Xsubselect		G-3	3	H14	7/5/2013		0											
hr1885	Xbomb		T-1	3	H19	7/5/2013		1	40.52.56.58		74.174		86.90	208.208	53.67			23.229	
hr1886	Xsubselect		P1-1a	3	H19	7/5/2013		0											
hr1887	Xsubselect		P1-1b	3	H19	7/5/2013		0											
hr1888	Xsubselect		P1-1c	3	H19	7/5/2013		0											
hr1889	Xsubselect		P1-1d	3	H19	7/5/2013		0											
hr1890	Xsubselect		P1-1	3	H19	7/5/2013		0											
hr1891	Xsubselect		P1-1f	3	H19	7/5/2013		0											
hr1892	Xsubselect		P1-1g	3	H19	7/5/2013		0											
hr1893	Xsubselect		P1-1h	3	H19	7/5/2013		0											
hr1894	sample	hr1911	P1-1i	3	H19	7/5/2013		9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	204.250
hr1895	Xsubselect		P1-1j	3	H19	7/5/2013		0											
hr1896	Xsubselect		P1-1k	3	H19	7/5/2013		0											
hr1897	Xinadequate		P2-1a	3	H19	7/5/2013		0											
hr1898	Xsubselect		P2-1b	3	H19	7/5/2013		0											
hr1899	Xinadequate		P2-1c	3	H19	7/5/2013		0											
hr1900	Xsubselect		P2-1d	3	H19	7/5/2013		0											
hr1901	sample	hr1911	P2-1	3	H19	7/5/2013		9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	204.250
hr1902	Xinadequate		P2-1f	3	H19	7/5/2013		0											
hr1903	Xsubselect		P2-1g	3	H19	7/5/2013		0											
hr1904	Xsubselect		P2-1h	3	H19	7/5/2013		0											
hr1905	Xinadequate		P2-1i	3	H19	7/5/2013		0											
hr1906	Xsubselect		P2-1j	3	H19	7/5/2013		0											
hr1907	sample	hr1911	P3-1a	3	H19	7/5/2013		9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	204.250
hr1908	Xinadequate		P3-1b	3	H19	7/5/2013		0											
hr1909	Xsubselect		P1-1a	4	H65	7/12/2013		0											
hr1910	Xsubselect		P1-2a	4	H65	7/12/2013		0											
hr1911	sample	hr1911	G-1	3	H19	7/5/2013		9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	204.250
hr1912	Xsubselect		G-2	3	H19	7/5/2013		0											
hr1913	Xsubselect		P1-1a	3	H20	7/5/2013		0											
hr1914	Xsubselect		P1-1b	3	H20	7/5/2013		0											
hr1915	Xsubselect		P1-1c	3	H20	7/5/2013		0											
hr1916	Xsubselect		P1-1d	3	H20	7/5/2013		0											
hr1917	sample	hr24	P1-1	3	H20	7/5/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1918	Xsubselect		P1-1f	3	H20	7/5/2013		0											
hr1919	Xsubselect		P1-1g	3	H20	7/5/2013		0											
hr1920	Xinadequate		P1-1h	3	H20	7/5/2013		0											
hr1921	Xsubselect		P1-1i	3	H20	7/5/2013		0											
hr1922	Xinadequate		P1-1j	3	H20	7/5/2013		0											
hr1923	Xsubselect		P1-2a	3	H20	7/5/2013		0											
hr1924	Xsubselect		P1-2b	3	H20	7/5/2013		0											
hr1925	Xsubselect		P2-1a	3	H20	7/5/2013		0											
hr1926	Xsubselect		P2-1b	3	H20	7/5/2013		0											
hr1927	Xsubselect		P2-1c	3	H20	7/5/2013		0											
hr1928	Xsubselect		P2-1d	3	H20	7/5/2013		0											
hr1929	sample	hr24	P2-2a	3	H20	7/5/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1930	Xsubselect		P2-2b	3	H20	7/5/2013		0											
hr1931	Xsubselect		P3-1a	3	H20	7/5/2013		0											
hr1932	Xsubselect		P3-1b	3	H20	7/5/2013		0											
hr1933	sample	hr24	P3-1c	3	H20	7/5/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1934	Xsubselect		P3-1d	3	H20	7/5/2013		0											
hr1935	Xsubselect		P3-1	3	H20	7/5/2013		0											
hr1936	sample	hr24	T-1	3	H20	7/5/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr1937	sample	hr38	P1-1a	3	H57	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1938	sample	hr38	G-1	3	H57	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1939	Xsubselect		G-2	3	H57	7/6/2013		0											
hr1940	Xsubselect		G-3	3	H57	7/6/2013		0											
hr1941	sample	hr38	P2-1a	3	H57	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1942	Xsubselect		P2-1b	3	H57	7/6/2013		0											
hr1943	Xsubselect		P2-1c	3	H57	7/6/2013		0											
hr1944	sample	hr38	P3-1a	3	H57	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1945	Xsubselect		P3-1b	3	H57	7/6/2013		0											
hr1946	Xsubselect		P3-1c	3	H57	7/6/2013		0											
hr1947	Xsubselect		P3-1d	3	H57	7/6/2013		0											
hr1948	sample	hr38	P1-1a	3	H59	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1949	Xsubselect		P2-1a	3	H59	7/6/2013		0											
hr1950	Xsubselect		P2-2a	3	H59	7/6/2013		0											
hr1951	sample	hr38	P2-2b	3	H59	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1952	Xsubselect		P2-2c	3	H59	7/6/2013	Sample envelope = "1c"	0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr1953	Xsubselect		P2-2d	3	H59	7/6/2013		0											
hr1954	Xbomb		G-1	3	H59	7/6/2013		8	152.152	153.161	178.186	221.231	180.190	208.208	39.49.161			239.239	250.250
hr1955	sample	hr38	P3-1a	3	H59	7/6/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr1956	Xsubselect		P1-1a	3	H44	7/6/2013		0											
hr1957	Xbomb		P1-1b	3	H44	7/6/2013		3	46.158	149.57.159	77.177	23.223	190.96	208.208	141.161				250.250
hr1958	Xbomb		P2-1a	3	H44	7/6/2013		2		49.149		221.223	86.96		157.161			223.29	
hr1959	Xbomb		P1-1a	3	H50	7/6/2013		0			76.178								
hr1960	sample	hr274	P1-3a	4	H65	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1961	Xsubselect		P1-3b	4	H65	7/12/2013		0											
hr1962	Xsubselect		P1-3c	4	H65	7/12/2013		0											
hr1963	Xinadequate		T-1	4	H65	7/12/2013		0											
hr1964	sample	hr274	P2-1a	4	H65	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1965	Xsubselect		P2-2a	4	H65	7/12/2013		0											
hr1966	Xsubselect		P2-2b	4	H65	7/12/2013		0											
hr1967	sample	hr274	P3-1a	4	H65	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1968	Xsubselect		P1-1a	4	H64	7/12/2013		0											
hr1969	Xsubselect		P1-1b	4	H64	7/12/2013		0											
hr1970	Xsubselect		P1-1c	4	H64	7/12/2013		0											
hr1971	Xinadequate		P1-2a	4	H64	7/12/2013		0											
hr1972	sample	hr274	P1-2b	4	H64	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1973	sample	hr274	P2-1a	4	H64	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1974	Xsubselect		P2-1b	4	H64	7/12/2013		0											
hr1975	Xsubselect		P2-2a	4	H64	7/12/2013		0											
hr1976	Xsubselect		P2-3a	4	H64	7/12/2013		0											
hr1977	Xinadequate		P2-3b	4	H64	7/12/2013		0											
hr1978	Xinadequate		P2-3c	4	H64	7/12/2013		0											
hr1979	Xsubselect		P2-3d	4	H64	7/12/2013		0											
hr1980	Xsubselect		P3-1a	4	H64	7/12/2013		0											
hr1981	Xsubselect		P3-1b	4	H64	7/12/2013		0											
hr1982	Xsubselect		P3-1c	4	H64	7/12/2013		0											
hr1983	Xsubselect		P3-1d	4	H64	7/12/2013		0											
hr1984	sample	hr274	P3-2a	4	H64	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1985	Xsubselect		P3-2b	4	H64	7/12/2013		0											
hr1986	Xsubselect		P3-2c	4	H64	7/12/2013		0											
hr1987	Xsubselect		P3-2	4	H64	7/12/2013		0											
hr1988	Xsubselect		P3-2d	4	H64	7/12/2013		0											
hr1989	sample	hr274	G-1	4	H64	7/12/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr1991	Xsubselect		P1-1b	4	H56	7/12/2013		0											
hr1992	Xsubselect		P1-1c	4	H56	7/12/2013		0											
hr1993	Xsubselect		P1-2a	4	H56	7/12/2013		0											
hr1994	Xsubselect		P1-2b	4	H56	7/12/2013		0											
hr1995	Xsubselect		P1-2c	4	H56	7/12/2013		0											
hr1996	Xbomb		P1-2d	4	H56	7/12/2013		6	140.52.60	149.151	172.76.180	221.233	180.86	208.210	155.161			223.229	204.250
hr1997	sample	hr105	T-1	4	H56	7/12/2013		9	140.160	149.149	172.174	221.233	180.186	208.210	161.161			223.229	250.250
hr1998	Xsubselect		P2-1a	4	H56	7/12/2013		0											
hr1999	Xsubselect		P2-2a	4	H56	7/12/2013		0											
hr2000	Xsubselect		P1-2b	4	H40	7/13/2013		0											
hr2001	Xinadequate		P1-2c	4	H40	7/13/2013		0											
hr2002	sample	hr289	P1-2d	4	H40	7/13/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2003	Xsubselect		P1-3a	4	H40	7/13/2013		0											
hr2004	Xsubselect		P1-4a	4	H40	7/13/2013		0											
hr2005	Xsubselect		P2-1a	4	H40	7/13/2013	WGI 2006 is P1-1b	0											
hr2006	Xsubselect		P1-1b	4	H40	7/13/2013		0											
hr2007	Xsubselect		P2-1c	4	H40	7/13/2013	WGI 2006 is P1-1b	0											
hr2008	Xsubselect		P2-2a	4	H40	7/13/2013		0											
hr2009	sample	hr289	P2-2b	4	H40	7/13/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2010	Xsubselect		P2-2c	4	H40	7/13/2013		0											
hr2011	Xsubselect		P2-2d	4	H40	7/13/2013		0											
hr2012	Xsubselect		P2-2	4	H40	7/13/2013		0											
hr2013	Xsubselect		P2-2f	4	H40	7/13/2013		0											
hr2014	Xinadequate		P3-1a	4	H40	7/13/2013		0											
hr2015	Xinadequate		P3-1b	4	H40	7/13/2013		0											
hr2016	Xinadequate		P3-1c	4	H40	7/13/2013		0											
hr2017	Xinadequate		P3-1d	4	H40	7/13/2013		0											
hr2018	Xinadequate		P3-2a	4	H40	7/13/2013		0											
hr2019	Xinadequate		P3-2b	4	H40	7/13/2013		0											
hr2020	Xsubselect		P1-1a	4	H36	7/13/2013		0											
hr2021	Xsubselect		P1-2a	4	H36	7/13/2013		0											
hr2022	sample	hr38	P1-2b	4	H36	7/13/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr2023	Xsubselect		P1-2c	4	H36	7/13/2013		0											
hr2024	Xinadequate		P1-3a	4	H36	7/13/2013		0											
hr2025	Xsubselect		P1-4a	4	H36	7/13/2013		0											
hr2026	Xsubselect		P1-4b	4	H36	7/13/2013		0											
hr2027	sample	hr38	P2-1a	4	H36	7/13/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr2028	Xinadequate		P2-2a	4	H36	7/13/2013		0											
hr2029	sample	hr38	P3-1a	4	H36	7/13/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr2030	Xsubselect		P3-2f	4	H36	7/13/2013	Corrected sample ID - was a repeat	0											
hr2031	Xsubselect		P3-2a	4	H36	7/13/2013		0											
hr2032	Xsubselect		P3-2b	4	H36	7/13/2013		0											
hr2033	Xsubselect		P3-2c	4	H36	7/13/2013		0											
hr2034	Xsubselect		P3-2d	4	H36	7/13/2013		0											
hr2035	Xinadequate		P3-2	4	H36	7/13/2013		0											
hr2036	Xsubselect		P1-1a	4	H35	7/13/2013		0											
hr2037	sample	hr60	P1-1b	4	H35	7/13/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2038	Xsubselect		P1-2a	4	H35	7/13/2013		0											
hr2039	Xsubselect		P1-2b	4	H35	7/13/2013		0											
hr2040	Xsubselect		P1-2c	4	H35	7/13/2013		0											
hr2041	Xsubselect		P1-2d	4	H35	7/13/2013		0											
hr2042	sample	hr60	T-1	4	H35	7/13/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2043	Xinadequate		P2-1a	4	H35	7/13/2013		0											
hr2044	Xinadequate		P2-1b	4	H35	7/13/2013		0											
hr2045	Xbomb		P2-2a	4	H35	7/13/2013		2		153.155	72.82.186	221.31	190.03	208.10.14	149.53.55			229.37.39	250.250
hr2046	Xsubselect		P2-2b	4	H35	7/13/2013		0											
hr2047	Xinadequate		P2-2c	4	H35	7/13/2013		0											
hr2048	Xbomb		P3-1a	4	H35	7/13/2013		0		45.47	74.76.78.84	21.21	78.80.88	6.08.10.21	51.53			23.227.39.3	50.250
hr2049	Xinadequate		P3-2a	4	H35	7/13/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2050	Xsubselect		P1-1a	4	H34	7/13/2013		0											
hr2051	Xspecies		P1-1b	4	H34	7/13/2013		0											
hr2052	Xsubselect		P1-1c	4	H34	7/13/2013		0											
hr2053	Xsubselect		P1-1d	4	H34	7/13/2013		0											
hr2054	Xsubselect		P1-1	4	H34	7/13/2013		0											
hr2055	Xsubselect		P1-1f	4	H34	7/13/2013		0											
hr2056	sample	br486	P1-2a	4	H34	7/13/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2057	Xinadequate		P1-3a	4	H34	7/13/2013		0											
hr2058	Xsubselect		P2-1a	4	H34	7/13/2013		0											
hr2059	Xsubselect		P2-2a	4	H34	7/13/2013		0											
hr2060	Xinadequate		P1-1c	4	H21	7/13/2013		0											
hr2061	sample	hr24	P1-1d	4	H21	7/13/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2062	Xinadequate		P1-1	4	H21	7/13/2013		0											
hr2063	Xinadequate		P2-1a	4	H21	7/13/2013		0											
hr2064	Xsubselect		P2-1b	4	H21	7/13/2013		0											
hr2065	Xinadequate		P2-1c	4	H21	7/13/2013		0											
hr2066	Xsubselect		P2-2a	4	H21	7/13/2013		0											
hr2067	Xinadequate		P2-2b	4	H21	7/13/2013		0											
hr2068	sample	hr24	P2-3a	4	H21	7/13/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2069	Xsubselect		P2-4a	4	H21	7/13/2013		0											
hr2070	Xsubselect		P2-4b	4	H21	7/13/2013		0											
hr2071	sample	hr24	G-1	4	H21	7/13/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2072	Xbomb		T-1	4	H21	7/13/2013		2			174.78.86	21.221	180.05	210.212	45.45			229.41	250.250
hr2073	Xsubselect		P1-1a	4	H20	7/13/2013		0											
hr2074	Xsubselect		P1-2a	4	H20	7/13/2013		0											
hr2075	sample	hr24	P1-3a	4	H20	7/13/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2076	Xinadequate		P2-1a	4	H20	7/13/2013		0											
hr2077	Xinadequate		P2-1b	4	H20	7/13/2013		0											
hr2078	Xbomb		G-1	4	H20	7/13/2013		1			178.84	35.35	86.88	96.10.12	153.65				250.250
hr2079	Xbomb		T-1	4	H20	7/13/2013		1			78.178	21.221	180.88	06.12.210				39.239	250.250
hr2080	Xinadequate		P1-1a	4	H19	7/13/2013		0											
hr2081	sample	hr230	P2-1a	4	H19	7/13/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
hr2082	Xsubselect		P2-2a	4	H19	7/13/2013		0											
hr2083	Xsubselect		P2-3a	4	H19	7/13/2013		0											
hr2084	Xsubselect		P3-1a	4	H19	7/13/2013		0											
hr2085	Xsubselect		P3-2a	4	H19	7/13/2013		0											
hr2086	Xsubselect		P3-2b	4	H19	7/13/2013		0											
hr2087	Xsubselect		P3-2c	4	H19	7/13/2013		0											
hr2088	sample	hr230	P3-2d	4	H19	7/13/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
hr2089	Xsubselect		P3-2	4	H19	7/13/2013		0											
hr2090	Xsubselect		P3-3a	4	H19	7/13/2013		0											
hr2091	sample	hr230	G-1	4	H19	7/13/2013		9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
hr2092	Xsubselect		P1-1a	4	H14	7/14/2013		0											
hr2093	sample	hr605	P1-1b	4	H14	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2094	Xsubselect		P1-1c	4	H14	7/14/2013		0											
hr2095	Xsubselect		P1-1d	4	H14	7/14/2013		0											
hr2096	Xsubselect		P1-1	4	H14	7/14/2013		0											
hr2097	Xsubselect		P1-1f	4	H14	7/14/2013		0											
hr2098	Xsubselect		P1-2a	4	H14	7/14/2013		0											
hr2099	Xinadequate		P1-2b	4	H14	7/14/2013		0											
hr2100	Xinadequate		P1-1	4	H59	7/12/2013		0											
hr2101	sample	hr125	P1-1g	4	H59	7/12/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2102	Xinadequate		P1-1f	4	H59	7/12/2013		0											
hr2103	sample	hr125	P2-1a	4	H59	7/12/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2104	Xsubselect		P2-2a	4	H59	7/12/2013		0											
hr2105	Xsubselect		P2-3a	4	H59	7/12/2013		0											
hr2106	Xinadequate		P1-1a	4	H60	7/12/2013		0											
hr2107	Xsubselect		P1-1b	4	H60	7/12/2013		0											
hr2108	sample	hr130	P1-2a	4	H60	7/12/2013		9	152.154	153.159	176.186	221.221	180.186	208.210	141.161			223.239	250.250
hr2109	Xsubselect		P1-3a	4	H60	7/12/2013		0											
hr2110	Xsubselect		P1-4a	4	H60	7/12/2013		0											
hr2111	Xsubselect		P1-4b	4	H60	7/12/2013		0											
hr2112	Xsubselect		P1-4c	4	H60	7/12/2013		0											
hr2113	Xsubselect		P2-1a	4	H60	7/12/2013		0											
hr2114	Xbomb		P2-1b	4	H60	7/12/2013		7	140.152	151.153	174.176	221.221	180.90.186	208.210	139.153			23.229	250.250
hr2115	Xsubselect		P2-2a	4	H60	7/12/2013		0											
hr2116	Xsubselect		P2-3a	4	H60	7/12/2013		0											
hr2117	Xsubselect		P2-3b	4	H60	7/12/2013		0											
hr2118	Xinadequate		P3-1a	4	H60	7/12/2013		0											
hr2119	Xinadequate		P3-1b	4	H60	7/12/2013		0											
hr2120	Xsubselect		P2-2b	4	H34	7/13/2013		0											
hr2121	Xsubselect		P2-2c	4	H34	7/13/2013		0											
hr2122	sample	br486	P2-3a	4	H34	7/13/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2123	Xsubselect		P2-3b	4	H34	7/13/2013		0											
hr2124	Xsubselect		P2-3c	4	H34	7/13/2013		0											
hr2125	Xsubselect		P3-1a	4	H34	7/13/2013		0											
hr2126	Xinadequate		P3-2a	4	H34	7/13/2013		0											
hr2127	sample	br486	P3-3a	4	H34	7/13/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2128	Xsubselect		P3-3b	4	H34	7/13/2013		0											
hr2129	Xsubselect		P3-3c	4	H34	7/13/2013		0											
hr2130	Xsubselect		P3-3d	4	H34	7/13/2013		0											
hr2131	Xsubselect		P3-3	4	H34	7/13/2013		0											
hr2132	Xsubselect		P3-3f	4	H34	7/13/2013		0											
hr2133	Xbomb		T-1	4	H34	7/13/2013		3	40.140	49.153	174.178	21.221	180.90	208.210	53.53			239.239	50.250
hr2134	Xsubselect		P1-1a	4	H30	7/13/2013		0											
hr2135	Xsubselect		P1-1b	4	H30	7/13/2013		0											
hr2136	Xsubselect		P1-1c	4	H30	7/13/2013		0											
hr2137	Xsubselect		P1-1d	4	H30	7/13/2013		0											
hr2138	Xsubselect		P1-1	4	H30	7/13/2013		0											
hr2139	Xsubselect		P1-1f	4	H30	7/13/2013		0											
hr2140	Xsubselect		P2-3b	4	H56	7/12/2013		0											
hr2141	sample	hr1449	P2-3c	4	H56	7/12/2013		9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	250.250
hr2142	Xsubselect		G-1	4	H56	7/12/2013		0											
hr2143	Xsubselect		P3-1a	4	H56	7/12/2013		0											
hr2144	Xsubselect		P3-1b	4	H56	7/12/2013		0											
hr2145	sample	hr342	P3-1c	4	H56	7/12/2013		9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	204.250
hr2146	Xsubselect		P3-2a	4	H56	7/12/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2147	Xsubselect		P3-3a	4	H56	7/12/2013		0											
hr2148	Xbomb		G-2	4	H56	7/12/2013	Repeat	2	40.40	149.151	174.78.80	221.33	180.180	208.10.14	153.57.59			29.229	04.250
hr2149	Xinadequate		P1-1a	4	H57	7/12/2013		0											
hr2150	Xinadequate		P1-2a	4	H57	7/12/2013		0											
hr2151	Xinadequate		P2-1a	4	H57	7/12/2013		0											
hr2152	Xinadequate		P3-1a	4	H57	7/12/2013		0											
hr2153	Xbomb		P3-2a	4	H57	7/12/2013		4		45.147.149	..76.78.84.	23.223	180.186	208.210	151.57			223.223	250.250
hr2154	Xinadequate		T-1	4	H57	7/12/2013		0											
hr2155	Xsubselect		P1-1a	4	H59	7/12/2013		0											
hr2156	Xsubselect		P1-1b	4	H59	7/12/2013		0											
hr2157	Xinadequate		P1-1c	4	H59	7/12/2013		0											
hr2158	Xsubselect		P1-1d	4	H59	7/12/2013		0											
hr2159	Xsubselect		P2-3a	4	H56	7/12/2013		0											
hr2160	sample	hr583	P3-1c	4	H60	7/12/2013		9	140.152	151.153	174.176	221.221	180.186	208.210	139.153			229.229	250.250
hr2161	sample	hr583	T-1	4	H60	7/12/2013		9	140.152	151.153	174.176	221.221	180.186	208.210	139.153			229.229	250.250
hr2162	sample	hr583	G-1	4	H60	7/12/2013		9	140.152	151.153	174.176	221.221	180.186	208.210	139.153			229.229	250.250
hr2163	Xsubselect		P1-1b	4	H51	7/12/2013		0											
hr2164	Xsubselect		P1-1c	4	H51	7/12/2013		0											
hr2165	Xsubselect		P1-2a	4	H51	7/12/2013		0											
hr2166	Xsubselect		P1-2b	4	H51	7/12/2013		0											
hr2167	Xbomb		P2-1a	4	H51	7/12/2013		3	40.52	149.51.55	172.76.80	221.33	180.186	210.210	155.59.61			223.229	04.250
hr2168	Xsubselect		P2-1b	4	H51	7/12/2013		0											
hr2169	Xsubselect		P2-1c	4	H51	7/12/2013		0											
hr2170	Xinadequate		P3-1a	4	H51	7/12/2013		0											
hr2171	Xinadequate		P3-2a	4	H51	7/12/2013		0											
hr2172	Xinadequate		P3-2b	4	H51	7/12/2013		0											
hr2173	Xinadequate		P3-2c	4	H51	7/12/2013		0											
hr2174	Xinadequate		P1-1a	4	H47	7/13/2013		0											
hr2175	sample	1065	P1-2a	4	H47	7/13/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2176	Xinadequate		P2-1a	4	H47	7/13/2013		0											
hr2177	Xsubselect		P1-1a	4	H40	7/13/2013		0											
hr2178	Xsubselect		P1-2a	4	H40	7/13/2013		0											
hr2179	Xbomb		P1-1a	4	H51	7/12/2013		2		149.151	..76.82.84.	221.233	180.86	04.208.210	153.55			223.35.37	04.250
hr2180	Xsubselect		P1-2a	4	H30	7/13/2013		0											
hr2181	Xinadequate		P1-2b	4	H30	7/13/2013		0											
hr2182	Xsubselect		P2-1a	4	H30	7/13/2013		0											
hr2183	Xsubselect		P2-1b	4	H30	7/13/2013		0											
hr2184	Xsubselect		P2-1c	4	H30	7/13/2013		0											
hr2185	sample	hr2185	P2-1d	4	H30	7/13/2013		9	152.152	155.159	178.178	221.221	190.196	210.210	153.161			225.229	250.250
hr2186	Xsubselect		P2-1	4	H30	7/13/2013		0											
hr2187	Xsubselect		P2-1f	4	H30	7/13/2013		0											
hr2188	Xsubselect		P2-1g	4	H30	7/13/2013		0											
hr2189	Xsubselect		P2-1h	4	H30	7/13/2013		0											
hr2190	Xsubselect		P2-1i	4	H30	7/13/2013		0											
hr2191	Xsubselect		P2-1j	4	H30	7/13/2013		0											
hr2192	Xbomb		P1-2a	4	H30	7/13/2013		4	52.152	155.159	78.178	221.21	190.196	210.14	153.161			229.229	04.250
hr2193	Xsubselect		P3-1a	4	H30	7/13/2013		0											
hr2194	Xsubselect		P3-1b	4	H30	7/13/2013		0											
hr2195	Xsubselect		P3-1c	4	H30	7/13/2013		0											
hr2196	Xsubselect		P3-1d	4	H30	7/13/2013		0											
hr2197	Xsubselect		P3-1	4	H30	7/13/2013		0											
hr2198	Xsubselect		P3-1f	4	H30	7/13/2013		0											
hr2199	Xsubselect		P3-1g	4	H30	7/13/2013		0											
hr2200	sample	hr2185	P3-1h	4	H30	7/13/2013		9	152.152	155.159	178.178	221.221	190.196	210.210	153.161			225.229	250.250
hr2201	Xsubselect		P3-2a	4	H30	7/13/2013		0											
hr2202	Xbomb		G-1	4	H30	7/13/2013		0		155.59	..74.78.84.	21.221	90.190	02.210	153.57.59			21.23.27.29	50.50
hr2203	Xbomb		T-1	4	H30	7/13/2013		2		53.59	74.172.184	21.221	90.190	208.210	51.53.161			223.49	204.250
hr2204	Xsubselect		P1-1a	4	H24	7/13/2013		0											
hr2205	Xsubselect		P1-2a	4	H24	7/13/2013		0											
hr2206	sample	hr12	P1-2b	4	H24	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2207	Xsubselect		P1-2c	4	H24	7/13/2013		0											
hr2208	Xsubselect		P1-2h	4	H24	7/13/2013	Repeat Sample ID; so changed it.	0											
hr2209	Xinadequate		P1-2d	4	H24	7/13/2013		0											
hr2210	Xsubselect		P1-2	4	H24	7/13/2013		0											
hr2211	Xsubselect		P1-2f	4	H24	7/13/2013		0											
hr2212	Xsubselect		P1-2g	4	H24	7/13/2013		0											
hr2213	Xsubselect		P2-1a	4	H24	7/13/2013		0											
hr2214	Xsubselect		P2-1b	4	H24	7/13/2013		0											
hr2215	Xsubselect		P2-1c	4	H24	7/13/2013		0											
hr2216	sample	hr38	P2-1d	4	H24	7/13/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr2217	Xsubselect		P2-1	4	H24	7/13/2013		0											
hr2218	Xsubselect		P2-1f	4	H24	7/13/2013		0											
hr2219	Xsubselect		P2-1g	4	H24	7/13/2013		0											
hr2220	Xsubselect		P2-1h	4	H24	7/13/2013		0											
hr2221	sample	hr12	P3-1a	4	H24	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2222	Xsubselect		P3-1b	4	H24	7/13/2013		0											
hr2223	Xsubselect		P3-1c	4	H24	7/13/2013		0											
hr2224	Xsubselect		P3-1d	4	H24	7/13/2013		0											
hr2225	Xsubselect		P3-1	4	H24	7/13/2013		0											
hr2226	Xsubselect		P3-1f	4	H24	7/13/2013		0											
hr2227	Xsubselect		P3-1g	4	H24	7/13/2013		0											
hr2228	Xinadequate		P3-1h	4	H24	7/13/2013		0											
hr2229	Xinadequate		P3-1i	4	H24	7/13/2013		0											
hr2230	sample	hr38	G-1	4	H24	7/13/2013		9	152.160	159.159	172.176	231.233	190.196	210.210	141.153			223.223	204.250
hr2231	Xbomb		T-1	4	H24	7/13/2013		8	152.160	151.155	177.178	231.231	190.196	210.210	155.161			23.239.249	204.250
hr2232	Xsubselect		P1-1a	4	H26	7/13/2013		0											
hr2233	Xsubselect		P1-2a	4	H26	7/13/2013		0											
hr2234	Xbomb		P1-2b	4	H26	7/13/2013		0		135.49.51	76.184.186		88.90.94.94	4.210.12.214				23.39.229	04.250
hr2235	sample	hr12	P2-1a	4	H26	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2236	Xsubselect		P2-1b	4	H26	7/13/2013		0											
hr2237	Xinadequate		P2-1c	4	H26	7/13/2013		0											
hr2238	Xinadequate		P2-1d	4	H26	7/13/2013		0											
hr2239	Xsubselect		P2-1	4	H26	7/13/2013		0											
hr2240	Xinadequate		P2-1f	4	H26	7/13/2013		0											
hr2241	Xsubselect		P2-1g	4	H26	7/13/2013		0											
hr2242	Xsubselect		P2-2a	4	H26	7/13/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2243	Xsubselect		P3-1a	4	H26	7/13/2013		0											
hr2244	Xsubselect		P3-1b	4	H26	7/13/2013		0											
hr2245	Xsubselect		P3-2a	4	H26	7/13/2013		0											
hr2246	Xsubselect		P3-2b	4	H26	7/13/2013		0											
hr2247	Xsubselect		P3-3a	4	H26	7/13/2013		0											
hr2248	sample	hr12	P3-4a	4	H26	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2249	Xsubselect		P3-5a	4	H26	7/13/2013		0											
hr2250	sample	hr12	G-1	4	H26	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2251	sample	hr12	T-1	4	H26	7/13/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2252	Xinadequate		P1-1a	4	H23	7/13/2013		0											
hr2253	Xbomb		T-1	4	H23	7/13/2013		0			74.174		203.11	08.14					
hr2254	Xbomb		P2-1a	4	H23	7/13/2013		0			74.76.82.8(	221.31		208.10	153.55.61			23.29.239	50.250
hr2255	Xinadequate		P2-2a	4	H23	7/13/2013		0											
hr2256	Xinadequate		P3-1a	4	H23	7/13/2013		0											
hr2257	Xinadequate		P3-2a	4	H23	7/13/2013		0											
hr2258	Xsubselect		P1-1a	4	H21	7/13/2013		0											
hr2259	Xinadequate		P1-1b	4	H21	7/13/2013		0											
hr2260	Xsubselect		P2-1a	4	H14	7/14/2013		0											
hr2261	Xsubselect		P2-1b	4	H14	7/14/2013		0											
hr2262	Xsubselect		P2-1c	4	H14	7/14/2013		0											
hr2263	Xsubselect		P2-1d	4	H14	7/14/2013		0											
hr2264	Xsubselect		P2-1	4	H14	7/14/2013		0											
hr2265	sample	hr605	P2-2a	4	H14	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2266	Xsubselect		P2-3a	4	H14	7/14/2013		0											
hr2267	Xsubselect		P2-4a	4	H14	7/14/2013		0											
hr2268	Xsubselect		P2-4c	4	H14	7/14/2013		0											
hr2269	Xsubselect		P2-4b	4	H14	7/14/2013		0											
hr2270	sample	hr605	G-1	4	H14	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2271	Xinadequate		P3-1a	4	H14	7/14/2013		0											
hr2272	Xsubselect		P3-2a	4	H14	7/14/2013		0											
hr2273	sample	hr605	P3-3a	4	H14	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2274	Xinadequate		P3-3b	4	H14	7/14/2013		0											
hr2275	Xsubselect		P3-3c	4	H14	7/14/2013		0											
hr2276	Xsubselect		P3-3d	4	H14	7/14/2013		0											
hr2277	Xbomb		T-1	4	H14	7/14/2013		7	140.160	149.149	184.186	221.231	190.190	210.210	161.161			223.29.49	04.250
hr2278	Xbomb		P1-1a	4	H15	7/14/2013		8	160.160	149.53	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2279	Xsubselect		P1-2a	4	H15	7/14/2013		0											
hr2280	Xsubselect		P1-3a	4	H15	7/14/2013		0											
hr2281	Xsubselect		P1-3b	4	H15	7/14/2013		0											
hr2282	Xsubselect		P2-1a	4	H15	7/14/2013		0											
hr2283	Xsubselect		P2-2a	4	H15	7/14/2013		0											
hr2284	sample	hr24	P2-3a	4	H15	7/14/2013		9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	250.250
hr2285	Xinadequate		P2-4a	4	H15	7/14/2013		0											
hr2286	Xinadequate		P3-1a	4	H15	7/14/2013		0											
hr2287	Xinadequate		P3-1b	4	H15	7/14/2013		0											
hr2288	Xinadequate		P3-2a	4	H15	7/14/2013		0											
hr2289	Xinadequate		P3-3a	4	H15	7/14/2013		0											
hr2290	Xinadequate		T-1	4	H15	7/14/2013		0											
hr2291	Xsubselect		P1-1a	4	H17	7/14/2013		0											
hr2292	sample	hr219	P1-1b	4	H17	7/14/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2293	Xsubselect		P1-1c	4	H17	7/14/2013		0											
hr2294	Xsubselect		P1-1d	4	H17	7/14/2013		0											
hr2295	Xsubselect		P1-1	4	H17	7/14/2013		0											
hr2296	Xsubselect		P1-1f	4	H17	7/14/2013		0											
hr2297	Xsubselect		P1-1h	4	H17	7/14/2013	Repeat Sample ID; so changed it.	0											
hr2298	Xsubselect		P1-1g	4	H17	7/14/2013		0											
hr2299	Xinadequate		P2-1a	4	H17	7/14/2013		0											
hr2300	sample	hr219	P2-2a	4	H17	7/14/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2301	Xinadequate		P2-2b	4	H17	7/14/2013		0											
hr2302	Xinadequate		P2-3a	4	H17	7/14/2013		0											
hr2303	Xsubselect		P2-3b	4	H17	7/14/2013		0											
hr2304	sample	hr219	P3-1a	4	H17	7/14/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2305	Xsubselect		P3-1b	4	H17	7/14/2013		0											
hr2306	Xsubselect		P3-1c	4	H17	7/14/2013		0											
hr2307	Xsubselect		P3-1d	4	H17	7/14/2013		0											
hr2308	Xsubselect		P3-1	4	H17	7/14/2013		0											
hr2309	Xsubselect		P3-1f	4	H17	7/14/2013		0											
hr2310	Xsubselect		P3-1g	4	H17	7/14/2013		0											
hr2311	Xsubselect		P3-1h	4	H17	7/14/2013		0											
hr2312	Xsubselect		P3-1i	4	H17	7/14/2013		0											
hr2313	Xsubselect		P3-1j	4	H17	7/14/2013		0											
hr2314	Xsubselect		P3-1k	4	H17	7/14/2013		0											
hr2315	sample	hr219	T-1	4	H17	7/14/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2316	Xbomb		G-1	4	H17	7/14/2013		1		47.49.151	178.86	21.221	90.190	10.214	153.155			23.239	50.250
hr2317	sample	hr426	P1-1a	4	H13	7/14/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr2318	Xinadequate		P1-1b	4	H13	7/14/2013		0											
hr2319	Xsubselect		P1-2a	4	H13	7/14/2013		0											
hr2320	Xsubselect		P3-3a	4	H13	7/14/2013		0											
hr2321	sample	hr426	G-1	4	H13	7/14/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr2322	Xbomb		T-1	4	H13	7/14/2013		1		155.59	172.174	21.235	90.90		63.163				
hr2323	Xsubselect		P1-1a	4	H8	7/14/2013		0											
hr2324	Xsubselect		P1-2a	4	H8	7/14/2013		0											
hr2325	Xsubselect		P1-2b	4	H8	7/14/2013		0											
hr2326	Xsubselect		P1-2c	4	H8	7/14/2013		0											
hr2327	Xsubselect		P1-2d	4	H8	7/14/2013		0											
hr2328	Xsubselect		P1-2	4	H8	7/14/2013		0											
hr2329	sample	hr605	P1-2f	4	H8	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2330	Xsubselect		P1-2g	4	H8	7/14/2013		0											
hr2331	Xsubselect		P1-2h	4	H8	7/14/2013		0											
hr2332	Xsubselect		P1-2i	4	H8	7/14/2013		0											
hr2333	Xinadequate		P2-1a	4	H8	7/14/2013		0											
hr2334	Xsubselect		P2-1b	4	H8	7/14/2013		0											
hr2335	Xinadequate		P2-1c	4	H8	7/14/2013		0											
hr2336	Xsubselect		P2-2a	4	H8	7/14/2013		0											
hr2337	Xsubselect		P2-2b	4	H8	7/14/2013		0											
hr2338	Xsubselect		P2-3a	4	H8	7/14/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2339	sample	hr605	P2-3b	4	H8	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2340	Xsubselect		P2-3c	4	H8	7/14/2013		0											
hr2341	Xsubselect		P2-3d	4	H8	7/14/2013		0											
hr2342	Xsubselect		P3-1a	4	H8	7/14/2013		0											
hr2343	Xsubselect		P3-1b	4	H8	7/14/2013		0											
hr2344	Xsubselect		P3-1c	4	H8	7/14/2013		0											
hr2345	Xsubselect		P3-1d	4	H8	7/14/2013		0											
hr2346	Xsubselect		P3-1	4	H8	7/14/2013		0											
hr2347	Xsubselect		P3-1f	4	H8	7/14/2013		0											
hr2348	Xsubselect		P3-1g	4	H8	7/14/2013		0											
hr2349	Xsubselect		P3-1h	4	H8	7/14/2013		0											
hr2350	sample	hr605	P3-1i	4	H8	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2351	Xsubselect		P3-2a	4	H8	7/14/2013		0											
hr2352	Xsubselect		P3-3a	4	H8	7/14/2013		0											
hr2353	sample	hr605	G-1	4	H8	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2354	sample	hr605	T-1	4	H8	7/14/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2355	Xinadequate		P1-1a	4	H5	7/14/2013		0											
hr2356	Xinadequate		P1-1b	4	H5	7/14/2013		0											
hr2357	Xinadequate		P1-2a	4	H5	7/14/2013		0											
hr2358	sample	hr183	P1-2b	4	H5	7/14/2013	Duplicate	9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr2359	Xsubselect		P2-1a	4	H5	7/14/2013		0											
hr2360	Xsubselect		P2-1b	4	H5	7/14/2013		0											
hr2361	sample	hr183	P2-1c	4	H5	7/14/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr2362	Xsubselect		P2-1d	4	H5	7/14/2013		0											
hr2363	Xinadequate		P2-2a	4	H5	7/14/2013		0											
hr2364	Xsubselect		P2-3a	4	H5	7/14/2013		0											
hr2365	Xsubselect		P3-1a	4	H5	7/14/2013		0											
hr2366	Xinadequate		P3-2a	4	H5	7/14/2013		0											
hr2367	Xsubselect		P3-3a	4	H5	7/14/2013		0											
hr2368	Xsubselect		P3-4a	4	H5	7/14/2013		0											
hr2369	Xsubselect		P3-5a	4	H5	7/14/2013		0											
hr2370	sample	hr183	P3-6a	4	H5	7/14/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr2371	sample	hr183	T-1	4	H5	7/14/2013		9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	250.250
hr2372	Xbomb		P1-1b	5	H35	7/24/2013		2	38.42	149.55	174.84.176	221.233	186.90.96	208.210	55.161			223.49.225	04.250
hr2373	Xinadequate		P1-1a	5	H35	7/24/2013		0											
hr2374	Xinadequate		P1-1c	5	H35	7/24/2013		0											
hr2375	Xinadequate		P1-2a	5	H35	7/24/2013		0											
hr2376	sample	hr22	P2- 1a	5	H35	7/24/2013		9	140.160	149.149	174.184	221.233	186.190	208.210	155.161			223.249	250.250
hr2377	sample	hr2377	P3-1a	5	H35	7/24/2013		9	160.160	149.155	174.178	221.233	186.196	208.210	151.155			223.249	250.250
hr2378	Xsubselect		P3-1b	5	H35	7/24/2013		0											
hr2379	Xinadequate		T-1	5	H35	7/24/2013		0											
hr2380	Xsubselect		P1-1a	5	H34	7/24/2013		0											
hr2381	sample	hr60	P1-1b	5	H34	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2382	sample	hr60	P1-2a	5	H34	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2383	Xsubselect		P1-2b	5	H34	7/24/2013		0											
hr2384	Xbomb		P2-1a	5	H34	7/24/2013		2		149.155	86.86		180.190	10.210	153.61				50.50
hr2385	Xsubselect		P2-1b	5	H34	7/24/2013		0											
hr2386	Xbomb		P2-2a	5	H34	7/24/2013		1		155.155	74.86	221.52	180.86.90	08.10	45.153				50.250
hr2387	Xsubselect		P2-2b	5	H34	7/24/2013		0											
hr2388	sample	hr60	P2-3a	5	H34	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2389	sample	1065	P1-1a	5	H29	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2390	sample	1065	P1-2a	5	H29	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2391	sample	1065	P2-1a	5	H29	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2392	Xsubselect		P2-1b	5	H29	7/24/2013		0											
hr2393	sample	1065	P3-1a	5	H29	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2394	sample	1065	P2-1a	5	H24	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2395	sample	1065	P2-2a	5	H24	7/24/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2396	sample	hr605	P1-1a	5	H19	7/24/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2397	sample	hr605	P3-1a	5	H19	7/24/2013		9	156.158	151.151	186.186	221.237	186.190	210.210	161.161			223.249	204.250
hr2398	sample	hr646	P1- 1a	5	H14	7/24/2013		9	140.160	149.149	184.186	221.231	190.190	210.210	161.161			229.249	250.250
hr2399	sample	hr860	P2-1a	5	H14	7/24/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2400	sample	hr646	P2-2a	5	H14	7/24/2013		9	140.160	149.149	184.186	221.231	190.190	210.210	161.161			229.249	250.250
hr2401	sample	hr860	P1-1a	5	H7	7/24/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2402	sample	hr860	P2-1a	5	H7	7/24/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2403	sample	hr154	P2-1a	5	H1	7/24/2013		9	156.160	149.161	178.186	221.237	186.186	208.210	161.165			223.249	204.250
hr2404	Xbomb		P2-2a	5	H1	7/24/2013		2	156.58.6o	47.47	78.82	221.221	86.186	08.08	155.165			49.49	
hr2405	Xbomb		P3-1a	5	H1	7/24/2013		2	156.160	149.61	178.86.184	221.237	186.90	08.210	55.61.65			23.29.249	04.250
hr2406	Xsubselect		P3-1b	5	H1	7/24/2013		0											
hr2407	sample	hr151	P3-2a	5	H1	7/24/2013		9	160.160	149.149	178.184	221.221	186.190	210.210	155.165			229.249	250.250
hr2408	sample	hr35	P1-1a	5	H26	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2409	sample	hr35	P2-1a	5	H26	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2410	sample	hr35	P2-2a	5	H26	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2411	Xsubselect		P3-1a	5	H26	7/24/2013		0											
hr2412	Xsubselect		P3-1b	5	H26	7/24/2013		0											
hr2413	sample	hr35	P3-1c	5	H26	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2414	Xsubselect		P1-1a	5	H30	7/24/2013		0											
hr2415	sample	hr60	P1-1b	5	H30	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2416	sample	hr60	P1-1a	5	H31	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2417	sample	hr60	P1-2a	5	H31	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2418	sample	hr60	P1-3a	5	H31	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2419	Xbomb		P1-1a	5	H1	7/24/2013		5	60.160	149.149	184.86	221.29.37	186.190	210.210	155.161			223.49	250.250
hr2420	sample	hr60	P3-1a	5	H31	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2421	sample	hr60	P2-1a	5	H31	7/24/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2422	sample	hr13	P1-1a	5	H32	7/24/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr2423	Xbomb		P1-2a	5	H32	7/24/2013		5	52.58.60	149.155		223.29.31	190.190	210.214	155.155			223.229	50.250
hr2424	sample	hr13	P2-2a	5	H32	7/24/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr2425	sample	hr13	P2-1a	5	H32	7/24/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr2426	Xbomb		P1-1a	5	H33	7/24/2013		8	152.160	155.155	176.186	231.233	190.190	210.210	155.161			23.29.239	250.250
hr2427	Xbomb		P1-2a	5	H33	7/24/2013		4		151.155	74.76	21.221	186.186	210.14	141.141			223.29	204.250
hr2428	sample	hr2428	P2-1a	5	H33	7/24/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
hr2429	Xbomb		P2-2a	5	H33	7/24/2013		6	152.160	155.155	176.186	231.233	190.190	210.210	41.55.161			23.229.239	04.250
hr2430	sample	hr2428	P2-3a	5	H33	7/24/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
hr2431	sample	hr35	P1-1a	5	H21	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2432	sample	hr35	P2-1a	5	H21	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2433	sample	hr35	P2-2a	5	H21	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2434	sample	hr35	P2-3a	5	H21	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2435	sample	hr35	P3-1a	5	H21	7/24/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2436	Xsubselect		P3-2a	5	H21	7/24/2013		0											
hr2437	Xsubselect		P3-2b	5	H21	7/24/2013		0											
hr2438	Xbomb		P3-2c	5	H21	7/24/2013		2		149.51	176.78	31.231	190.196	10.214	149.51.55				250.250
hr2439	Xbomb		G-1	5	H32	7/24/2013		5		149.155		231.231	190.190	10.214	155.155			39.239	250.250
hr2440	Xsubselect		P1-2b	4	H13	7/14/2013		0											
hr2441	Xsubselect		P1-2c	4	H13	7/14/2013		0											
hr2442	Xsubselect		P1-2d	4	H13	7/14/2013		0											
hr2443	Xsubselect		P1-3a	4	H13	7/14/2013		0											
hr2444	Xsubselect		P1-4a	4	H13	7/14/2013		0											
hr2445	Xsubselect		P2-1a	4	H13	7/14/2013		0											
hr2446	Xinadequate		P2-2a	4	H13	7/14/2013		0											
hr2447	Xsubselect		P2-2b	4	H13	7/14/2013		0											
hr2448	sample	hr426	P2-2c	4	H13	7/14/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr2449	Xsubselect		P2-2d	4	H13	7/14/2013		0											
hr2450	Xinadequate		P2-2	4	H13	7/14/2013		0											
hr2451	Xinadequate		P2-2f	4	H13	7/14/2013		0											
hr2452	Xinadequate		P2-3a	4	H13	7/14/2013		0											
hr2453	Xsubselect		P3-1a	4	H13	7/14/2013		0											
hr2454	Xsubselect		P3-2a	4	H13	7/14/2013		0											
hr2455	Xsubselect		P3-2b	4	H13	7/14/2013		0											
hr2456	sample	hr426	P3-2c	4	H13	7/14/2013		9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	250.250
hr2457	Xinadequate		P3-2d	4	H13	7/14/2013		0											
hr2458	Xsubselect		P3-2	4	H13	7/14/2013		0											
hr2459	Xsubselect		P3-2f	4	H13	7/14/2013		0											
hr2460	sample	hr2467	P1-1a	5	H9	7/24/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
hr2461	Xsubselect		P1-1b	5	H9	7/24/2013		0											
hr2462	sample	hr2467	P1-2a	5	H9	7/24/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
hr2463	sample	hr2467	P1-3a	5	H9	7/24/2013	Entered as WGI 2493	9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
hr2464	Xbomb		P2-1a	5	H9	7/24/2013		0	52.52				78.91					29.229	50.50
hr2465	sample	hr2467	P2-2a	5	H9	7/24/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
hr2466	sample	hr2467	T-1	5	H9	7/24/2013		9	152.160	151.163	172.178	221.231	186.196	210.210	161.161			225.229	204.250
hr2467	sample	hr2467	G-1	5	H9	7/24/2013		10	152.160	151.163	172.178	221.231	186.196	210.210	161.161		127.129	225.229	204.250
hr2468	Xspecies		P1-1a	5	H3	7/24/2013		0											
hr2469	Xbomb		P1-2a	5	H3	7/24/2013		0											50.50
hr2470	Xbomb		P1-1a	5	H17	7/25/2013		0	140.52	149.53.55		221.31	90.190	10.210	49.155			39.39	
hr2471	Xsubselect		P1-2a	5	H17	7/25/2013		0											
hr2472	sample	hr219	P1-2b	5	H17	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2473	sample	hr219	P2-1a	5	H17	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2474	sample	hr219	P2-2a	5	H17	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2475	sample	hr219	P3-1a	5	H17	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2476	Xsubselect		P3-1b	5	H17	7/25/2013		0											
hr2477	sample	hr219	P3-3a	5	H17	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2478	Xbomb		P2- 3a	5	H17	7/25/2013		5	140.152	149.155	178.86	221.23.31	190.190	210.214	155.155			39.239	04.250
hr2479	Xsubselect		P1-1a	5	H5	7/25/2013		0											
hr2480	Xsubselect		P1-1b	5	H5	7/25/2013		0											
hr2481	sample	hr686	P1-1c	5	H5	7/25/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2482	Xsubselect		P1-1d	5	H5	7/25/2013		0											
hr2483	sample	hr188	P1-1e	5	H5	7/25/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr2484	Xsubselect		P1-1f	5	H5	7/25/2013		0											
hr2485	sample	hr188	P2-1a	5	H5	7/25/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr2486	Xsubselect		P2-2a	5	H5	7/25/2013		0											
hr2487	Xbomb		P2-2b	5	H5	7/25/2013		8	140.140	149.151	178.180	221.221	180.86.90	210.210	153.155			239.249	204.250
hr2488	Xsubselect		P3-1a	5	H5	7/25/2013		0											
hr2489	sample	hr686	P3-1b	5	H5	7/25/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2490	Xsubselect		P3-1c	5	H5	7/25/2013		0											
hr2491	Xbomb		P3-1d	5	H5	7/25/2013		5	140.160	149.151		221.221	186.80.90	210.210	153.155			229.39.49	50.50
hr2492	Xsubselect		P1-1a	5	H6	7/25/2013		0											
hr2493	sample	br26	P1-1b	5	H6	7/25/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr2494	sample	br26	P1-2a	5	H6	7/25/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr2495	sample	br26	P2-1a	5	H6	7/25/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr2496	sample	br26	P2-2a	5	H6	7/25/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr2497	Xbomb		P3-2a	5	H6	7/25/2013		0	46.46										50.50
hr2498	sample	br26	P3-1a	5	H6	7/25/2013		9	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	204.250
hr2499	Xsubselect		P1-1a	5	H18	7/25/2013		0											
hr2500	Xsubselect		P1-1b	5	H18	7/25/2013		0											
hr2501	Xbomb		P1-1c	5	H18	7/25/2013		0	40.140	149.41.55		21.231	90.190		155.59				04.250
hr2502	sample	hr219	P2-1a	5	H18	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2503	Xbomb		P2-2a	5	H18	7/25/2013		8	140.152	149.155	178.186	221.231	190.190	210.214	155.155			39.239	250.250
hr2504	sample	hr219	P3-1a	5	H18	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2505	Xsubselect		P3-1b	5	H18	7/25/2013		0											
hr2506	Xsubselect		P3-1c	5	H18	7/25/2013		0											
hr2507	sample	hr219	P3-2a	5	H18	7/25/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2508	sample	hr125	P1-2a	5	H60	7/25/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2509	sample	hr125	P2-2a	5	H60	7/25/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2510	sample	hr125	P3-1a	5	H60	7/25/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2511	sample	hr125	P3-2a	5	H60	7/25/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2512	sample	hr2512	P1-1a	5	H46	7/25/2013		9	140.160	151.161	172.186	221.231	180.190	208.210	161.165			223.239	204.250
hr2513	sample	hr2512	P3-1a	5	H46	7/25/2013		9	140.160	151.161	172.186	221.231	180.190	208.210	161.165			223.239	204.250
hr2514	Xbomb		T-1	5	H46	7/25/2013		3	140.60	151.161	172.186	221.31	180.88.90	208.210	161.65			223.39	204.50
hr2515	sample	hr60	P1-1a	5	H41	7/25/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2516	sample	hr60	P1-2a	5	H41	7/25/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2517	Xbomb		P1-3a	5	H41	7/25/2013		2		149.53.15	74.86		180.190	10.10	53.161			223.239	50.50
hr2518	sample	hr60	P2-1a	5	H41	7/25/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2519	sample	hr60	P3-1a	5	H41	7/25/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2520	sample	br486	P1-1a	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2521	Xsubselect		P1-1b	5	H42	7/25/2013		0											
hr2522	Xsubselect		P1-1c	5	H42	7/25/2013		0											
hr2523	sample	br486	P1-2a	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2524	sample	br486	P2-1a	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2525	Xsubselect		P2-1b	5	H42	7/25/2013		0											
hr2526	sample	br486	P2-2a	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2527	Xsubselect		P2-2b	5	H42	7/25/2013		0											
hr2528	sample	br486	T-1	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2529	sample	br486	G-1	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2530	Xsubselect		G-2	5	H42	7/25/2013		0											
hr2531	Xsubselect		G-3	5	H42	7/25/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data										
								Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores										
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2532	sample	br486	G-4	5	H42	7/25/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2533	Xsubselect		G-5	5	H42	7/25/2013		0											
hr2534	Xinadequate		P1-2a	5	H56	7/26/2013		0											
hr2535	Xinadequate		P2-2a	5	H56	7/26/2013		0											
hr2536	Xinadequate		P2-1a	5	H56	7/26/2013		0											
hr2537	sample	hr2537	P3-1a	5	H56	7/26/2013		9	158.160	151.155	172.176	221.231	180.186	208.210	153.161			223.229	250.250
hr2538	Xinadequate		P2-3a	5	H56	7/26/2013		0											
hr2539	Xinadequate		P1-1a	5	H56	7/26/2013		0											
hr2540	sample	hr388	P3-2a	5	H56	7/26/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr2541	sample	hr388	P3-3a	5	H56	7/26/2013		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	250.250
hr2542	Xsubselect		P1-1a	5	H51	7/26/2013		0											
hr2543	sample	hr61	P1-1b	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2544	sample	hr61	P2-1a	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2545	sample	hr61	P2-2a	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2546	Xinadequate		P3-1a	5	H51	7/26/2013		0											
hr2547	sample	hr61	P3-1b	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2548	sample	hr61	P3-2a	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2549	Xbomb		P3-3a	5	H51	7/26/2013		8	140.160	151.151	176.176	21.233	180.190	208.210	153.161			225.229	204.250
hr2550	Xbomb		G-1	5	H51	7/26/2013		1		53.53	86.88		87.03.05	208.210	45.49.51.57				50.250
hr2551	Xspecies		G-2	5	H51	7/26/2013		0											
hr2552	Xinadequate		G-3	5	H51	7/26/2013		0											
hr2553	Xspecies		G-4	5	H51	7/26/2013		0											
hr2554	Xbomb		P1-2a	5	H51	7/26/2013		3			72.74	21.231	203.205		57.59.65.67			229.237	250.250
hr2555	sample	hr61	T-1	5	H51	7/26/2013		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	204.250
hr2556	sample	hr2428	P3-1a	5	H33	7/24/2013		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	204.250
hr2557	Xbomb		P3-2a	5	H33	7/24/2013		3	38.42	151.55.61	76.78	21.231	186.90	210.210	141.161				204.250
hr2558	Xbomb		P3-3a	5	H33	7/24/2013		0											50.250
hr2559	Xinadequate		P1-1a	5	H40	7/27/2013		0											
hr2560	sample	hr289	G-2	5	H40	7/27/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2561	Xsubselect		G-3	5	H40	7/27/2013		0											
hr2562	Xsubselect		P2-3b	6	H1	8/7/2013		0											
hr2563	sample	hr154	T-1	6	H1	8/7/2013		9	156.160	149.161	178.186	221.237	186.186	208.210	161.165			223.249	204.250
hr2564	Xinadequate		P3-1a	6	H1	8/7/2013		0											
hr2565	Xinadequate		P3-2a	6	H1	8/7/2013		0											
hr2566	Xbomb		P3-2b	6	H1	8/7/2013		2	156.60.62	47.49.161	8.174.84.8	35.37	186.186	208.10	161.63.65			23.23	204.250
hr2567	Xsubselect		P3-3a	6	H1	8/7/2013		0											
hr2568	Xsubselect		P3-3b	6	H1	8/7/2013		0											
hr2569	Xsubselect		P3-3c	6	H1	8/7/2013		0											
hr2570	Xsubselect		P3-3d	6	H1	8/7/2013		0											
hr2571	Xsubselect		P3-3	6	H1	8/7/2013		0											
hr2572	Xbomb		G-1	6	H1	8/7/2013		1			178.186		78.80.185	208.10	61.161				50.250
hr2573	Xbomb		P1-1a	6	H3	8/7/2013		1	40.50	51.53	82.72.174	221.221		208.10.145	51.53.61.65				50.250
hr2574	Xsubselect		P1-1a	6	H4	8/7/2013		0											
hr2575	Xbomb		P1-1b	6	H4	8/7/2013		2			74.74	227.231	90.90	10.210	51.55.59.63			25.229	250.250
hr2576	Xsubselect		P2-1a	6	H4	8/7/2013		0											
hr2577	Xsubselect		P2-1b	6	H4	8/7/2013		0											
hr2578	Xbomb		P2-2a	6	H4	8/7/2013		1		61.63	180.84.86		78.80.95.9	208.10				35.35	250.250
hr2579	Xsubselect		P2-3a	6	H4	8/7/2013		0											
hr2580	Xbomb		P1-2a	5	H40	7/27/2013		5	40.60	149.149	174.174	221.233	180.86.90	208.210	51.55.161			223.49.239	250.250
hr2581	sample	hr289	P1-3a	5	H40	7/27/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2582	Xsubselect		P1-3b	5	H40	7/27/2013		0											
hr2583	Xsubselect		G-1	5	H40	7/27/2013		0											
hr2584	sample	hr289	P2-1a	5	H40	7/27/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2585	sample	hr289	P2-2a	5	H40	7/27/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2586	sample	hr289	P3-1a	5	H40	7/27/2013		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	250.250
hr2587	Xbomb		P3-2a	5	H40	7/27/2013		5	140.160	149.149	174.84	221.233	180.86.90	208.210	51.55.161			223.39.49	250.250
hr2588	Xinadequate		P1-1a	6	H42	8/6/2013		0											
hr2589	Xsubselect		P1-1b	6	H42	8/6/2013		0											
hr2590	Xbomb		P1-1c	6	H42	8/6/2013		2				221.37	190.96	10.210	153.161			29.229	204.250
hr2591	Xsubselect		P2-1b	6	H42	8/6/2013		0											
hr2592	Xinadequate		P2-2a	6	H42	8/6/2013		0											
hr2593	Xbomb		G-1	6	H42	8/6/2013		1	52.160	49.153	84.186		190.196	06.210	153.61.159			27.229	50.250
hr2594	sample	br486	T-1	6	H42	8/6/2013		9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	204.250
hr2595	Xsubselect		T-2	6	H42	8/6/2013		0											
hr2596	Xsubselect		G-2	6	H65	8/6/2013		0											
hr2597	sample	hr274	G-1	6	H65	8/6/2013		9	140.160	155.159	178.183	231.233	186.196	208.210	161.161			229.239	204.250
hr2598	sample	hr125	P1-1a	6	H60	8/6/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2599	Xbomb		P2-1a	6	H42	8/6/2013		1	52.54	153.55.61		21.227.231	186.88.90		149.155			23.223	
hr2600	Xsubselect		P1-1b	6	H60	8/6/2013		0											
hr2601	Xsubselect		P1-2a	6	H60	8/6/2013		0											
hr2602	Xinadequate		T-1	6	H60	8/6/2013		0											
hr2603	Xsubselect		G-1	6	H60	8/6/2013		0											
hr2604	Xinadequate		P3-1a	6	H60	8/6/2013		0											
hr2605	Xbomb		P3-1b	6	H60	8/6/2013		0											
hr2606	sample	hr125	G-2	6	H60	8/6/2013		9	152.152	153.161	178.186	221.231	180.190	208.208	139.161			239.239	250.250
hr2607	Xbomb		P1-1a	6	H54	8/6/2013		0			72.72	29.229	90.91	08.208	151.15			245.47	50.250
hr2608	Xsubselect		P1-1a	6	H1	8/7/2013		0											
hr2609	Xsubselect		P1-2a	6	H1	8/7/2013		0											
hr2610	Xbomb		P1-3a	6	H1	8/7/2013		2	60.160	149.149	178.84.86	21.221	186.190	10.210	53.55.61.65			223.49.229	50.250
hr2611	Xsubselect		P1-3b	6	H1	8/7/2013		0											
hr2612	Xsubselect		P1-4a	6	H1	8/7/2013		0											
hr2613	Xsubselect		P1-4b	6	H1	8/7/2013		0											
hr2614	Xsubselect		P2-1a	6	H1	8/7/2013		0											
hr2615	Xinadequate		P2-2a	6	H1	8/7/2013		0											
hr2616	Xsubselect		P2-2b	6	H1	8/7/2013		0											
hr2617	Xinadequate		P2-2c	6	H1	8/7/2013		0											
hr2618	Xbomb		P2-2d	6	H1	8/7/2013		2	60.160	149.149	74.174		186.190	10.210	155.63.65			223.25.29	50.250
hr2619	Xsubselect		P2-3a	6	H1	8/7/2013		0											
hr2620	Xsubselect		P3-1a	6	H4	8/7/2013		0											
hr2621	Xbomb		P3-2a	6	H4	8/7/2013		2		155.157	174.84.86		85.188.194	08.208	161.63			23.223	250.250
hr2622	Xinadequate		P3-2b	6	H4	8/7/2013		0											
hr2623	Xspecies		G-1	6	H4	8/7/2013		0											
hr2624	Xbomb		G-2	6	H4	8/7/2013		1		51.53	172.84.86		80.186.190					37.39	250.250
hr2625	sample	hr686	P1-1a	6	H5	8/7/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2626	Xbomb		T-1	6	H5	8/7/2013		2	140.58.60	151.151	80.183	21.221	186.190	08.10	153.59.155			29.29	50.250
hr2627	Xsubselect		P1-1b	6	H5	8/7/2013		0											
hr2628	Xsubselect		P1-1c	6	H5	8/7/2013		0											

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2629	Xsubselect		P1-1d	6	H5	8/7/2013		0											
hr2630	Xsubselect		P1-1	6	H5	8/7/2013		0											
hr2631	Xsubselect		P1-1f	6	H5	8/7/2013		0											
hr2632	Xsubselect		P1-1g	6	H5	8/7/2013		0											
hr2633	Xsubselect		P1-1h	6	H5	8/7/2013		0											
hr2634	Xsubselect		P1-1i	6	H5	8/7/2013		0											
hr2635	Xsubselect		P1-1j	6	H5	8/7/2013		0											
hr2636	Xsubselect		P1-1k	6	H5	8/7/2013		0											
hr2637	Xsubselect		P1-1l	6	H5	8/7/2013		0											
hr2638	Xsubselect		P1-1m	6	H5	8/7/2013		0											
hr2639	Xsubselect		P1-1n	6	H5	8/7/2013		0											
hr2640	Xsubselect		P1-2a	6	H5	8/7/2013		0											
hr2641	Xsubselect		P2-1a	6	H5	8/7/2013		0											
hr2642	Xinadequate		P2-1b	6	H5	8/7/2013		0											
hr2643	Xsubselect		P2-1c	6	H5	8/7/2013		0											
hr2644	Xsubselect		P2-1d	6	H5	8/7/2013		0											
hr2645	Xsubselect		P2-1	6	H5	8/7/2013		0											
hr2646	Xsubselect		P2-1f	6	H5	8/7/2013		0											
hr2647	Xsubselect		P2-1g	6	H5	8/7/2013		0											
hr2648	Xsubselect		P2-1h	6	H5	8/7/2013		0											
hr2649	Xbomb		P2-2a	6	H5	8/7/2013		3	140.58.160	49.149	180.183	21.221	186.190	08.210	153.155			229.47.49	50.250
hr2650	Xinadequate		P2-3a	6	H5	8/7/2013		0											
hr2651	Xsubselect		P3-1a	6	H5	8/7/2013		0											
hr2652	Xsubselect		P3-2a	6	H5	8/7/2013		0											
hr2653	Xsubselect		P3-2b	6	H5	8/7/2013		0											
hr2654	Xsubselect		P3-2c	6	H5	8/7/2013		0											
hr2655	Xsubselect		P3-2d	6	H5	8/7/2013	Changed from P2 to P3	0											
hr2656	Xsubselect		P3-2	6	H5	8/7/2013		0											
hr2657	Xsubselect		P3-2f	6	H5	8/7/2013		0											
hr2658	Xsubselect		P3-3a	6	H5	8/7/2013		0											
hr2659	Xbomb		P3-3b	6	H5	8/7/2013		1	40..58.160	151.151	78.84	31.231	186.90	210.14	61.161			39.239	04.250
hr2660	Xsubselect		P3-3c	6	H5	8/7/2013		0											
hr2661	Xsubselect		P3-4a	6	H5	8/7/2013		0											
hr2662	Xsubselect		P3-5a	6	H5	8/7/2013		0											
hr2663	Xsubselect		G-1	6	H5	8/7/2013		0											
hr2664	Xsubselect		G-2	6	H5	8/7/2013		0											
hr2665	sample	hr686	G-6	6	H5	8/7/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2666	Xsubselect		G-3	6	H5	8/7/2013		0											
hr2667	Xsubselect		G-4	6	H5	8/7/2013		0											
hr2668	Xsubselect		G-5	6	H5	8/7/2013		0											
hr2669	Xbomb		T-1	6	H6	8/7/2013		0	140.54	135.37	174.78	221.31	86.190	08.08	61.161			39.239	204.50
hr2670	Xsubselect		P1-1a	6	H6	8/7/2013		0											
hr2671	Xinadequate		P1-1b	6	H6	8/7/2013		0											
hr2672	Xinadequate		P1-1c	6	H6	8/7/2013		0											
hr2673	Xinadequate		P1-2a	6	H6	8/7/2013		0											
hr2674	Xinadequate		P1-3a	6	H6	8/7/2013		0											
hr2675	Xsubselect		P1-3b	6	H6	8/7/2013		0											
hr2676	Xbomb		P1-3c	6	H6	8/7/2013		3	140.154	153.155	72.172		190.190	08.14	61.161				
hr2677	Xinadequate		P2-1a	6	H6	8/7/2013		0											
hr2678	Xinadequate		P2-1b	6	H6	8/7/2013		0											
hr2679	Xinadequate		P2-1c	6	H6	8/7/2013		0											
hr2680	Xinadequate		P1-1a	6	H12	8/8/2013		0											
hr2681	Xsubselect		P1-1b	6	H12	8/8/2013		0											
hr2682	Xsubselect		P1-1c	6	H12	8/8/2013		0											
hr2683	Xsubselect		P1-1d	6	H12	8/8/2013		0											
hr2684	Xsubselect		P1-1	6	H12	8/8/2013		0											
hr2685	Xbomb		P1-1f	6	H12	8/8/2013		8	140.140	149.151	178.180	221.221	180.190	210.210	153.155			23.27.39.4	204.250
hr2686	Xsubselect		P1-1g	6	H12	8/8/2013		0											
hr2687	Xinadequate		P1-2a	6	H12	8/8/2013		0											
hr2688	Xsubselect		P1-3a	6	H12	8/8/2013		0											
hr2689	Xsubselect		P1-3b	6	H12	8/8/2013		0											
hr2690	Xinadequate		P2-2a	6	H6	8/7/2013		0											
hr2691	sample	hr66	P2-2b	6	H6	8/7/2013		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	204.250
hr2692	Xinadequate		P2-2c	6	H6	8/7/2013		0											
hr2693	Xsubselect		P2-3a	6	H6	8/7/2013		0											
hr2694	Xsubselect		P2-2d	6	H6	8/7/2013		0											
hr2695	Xsubselect		P3-1a	6	H6	8/7/2013		0											
hr2696	Xsubselect		P3-1b	6	H6	8/7/2013		0											
hr2697	Xinadequate		P3-1c	6	H6	8/7/2013		0											
hr2698	Xbomb		P3-1d	6	H6	8/7/2013		8	140.154	153.155	172.178	221.221	190.190	208.214	161.161			23.239.249	204.250
hr2699	Xbomb		G-1	6	H6	8/7/2013		1		51.151	172.180		180.89.95	04.210				225.29.31	50.250
hr2700	Xinadequate		P1-1a	6	H7	8/7/2013		0											
hr2701	Xinadequate		P1-1b	6	H7	8/7/2013		0											
hr2702	Xinadequate		P1-1c	6	H7	8/7/2013		0											
hr2703	Xsubselect		P1-1d	6	H7	8/7/2013		0											
hr2704	Xbomb		P1-2a	6	H7	8/7/2013		1	150.62.156				180.80					23.23	250.250
hr2705	Xsubselect		P1-3a	6	H7	8/7/2013		0											
hr2706	Xsubselect		P1-3b	6	H7	8/7/2013		0											
hr2707	Xsubselect		P1-3c	6	H7	8/7/2013		0											
hr2708	Xsubselect		P1-4a	6	H7	8/7/2013		0											
hr2709	Xsubselect		P1-4b	6	H7	8/7/2013		0											
hr2710	Xsubselect		P1-5a	6	H7	8/7/2013		0											
hr2711	Xbomb		T-1	6	H7	8/7/2013		8	40.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2712	sample	hr860	P2-1a	6	H7	8/7/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2713	Xsubselect		P2-1b	6	H7	8/7/2013		0											
hr2714	Xsubselect		P2-1c	6	H7	8/7/2013		0											
hr2715	Xsubselect		P2-1d	6	H7	8/7/2013		0											
hr2716	Xsubselect		P2-1	6	H7	8/7/2013		0											
hr2717	Xsubselect		P2-1f	6	H7	8/7/2013		0											
hr2718	Xsubselect		P2-1g	6	H7	8/7/2013		0											
hr2719	Xsubselect		P2-1h	6	H7	8/7/2013		0											
hr2720	Xsubselect		P2-1i	6	H7	8/7/2013		0											
hr2721	Xsubselect		P2-1j	6	H7	8/7/2013		0											
hr2722	Xsubselect		P2-1k	6	H7	8/7/2013		0											
hr2723	Xsubselect		P3-1a	6	H7	8/7/2013		0											
hr2724	Xbomb		P3-1b	6	H7	8/7/2013		0	40.46.160	49.149	177.86	29.231.233	186.90	10.210	161.61			229.49	04.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Genetic Data: Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores: G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2725	Xinadequate		P3-1c	6	H7	8/7/2013		0											
hr2726	Xsubselect		P3-2a	6	H7	8/7/2013		0											
hr2727	Xinadequate		P3-3a	6	H7	8/7/2013		0											
hr2728	Xinadequate		P3-3b	6	H7	8/7/2013		0											
hr2729	Xinadequate		P3-3c	6	H7	8/7/2013		0											
hr2730	Xsubselect		G-1	6	H7	8/7/2013		0											
hr2731	Xsubselect		G-2	6	H7	8/7/2013		0											
hr2732	Xbomb		G-3	6	H7	8/7/2013		0	60.60	49.159		21.221	186.94.96	08.14.08.14	51.53.161			223.23	04.50
hr2733	sample	hr860	T-1	6	H14	8/7/2013		9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2734	Xsubselect		P1-1a	6	H14	8/7/2013		0											
hr2735	Xbomb		P1-2a	6	H14	8/7/2013		1		149.49		31.31	190.95		159.61				250.250
hr2736	Xsubselect		P2-1a	6	H14	8/7/2013		0											
hr2737	Xbomb		P2-2a	6	H14	8/7/2013		8	160.160	47.155	174.186	221.231	186.190	210.214	161.165			229.229	250.250
hr2738	Xsubselect		P2-3a	6	H14	8/7/2013		0											
hr2739	Xsubselect		P2-3b	6	H14	8/7/2013	Corrected cell number from 17 to 14	0											
hr2740	Xinadequate		P3-1a	6	H14	8/7/2013		0											
hr2741	sample	hr1911	G-1	6	H19	8/7/2013		9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	204.250
hr2742	Xbomb		T-1	6	H24	8/7/2013		5	140.50.160	149.51.53	76.83	221.231	186.190	208.210	161.161			229.247	04.250
hr2743	Xinadequate		P1-1b	6	H19	8/7/2013		0											
hr2744	Xinadequate		P1-1a	6	H19	8/7/2013		0											
hr2745	Xinadequate		P2-1a	6	H19	8/7/2013		0											
hr2746	Xbomb		P3-1a	6	H19	8/7/2013		0	42.44.42.44	149.55.153		21.21	89.89		61.161				04.250
hr2747	Xsubselect		P1-1a	6	H24	8/7/2013		0											
hr2748	sample	1065	P1-2a	6	H24	8/7/2013		9	140.160	151.153	176.183	221.231	186.190	208.210	161.161			229.247	204.250
hr2749	Xsubselect		P1-3a	6	H24	8/7/2013		0											
hr2750	Xsubselect		P1-4a	6	H24	8/7/2013		0											
hr2751	Xsubselect		P1-1a	6	H29	8/8/2013		0											
hr2752	Xsubselect		P1-1b	6	H29	8/8/2013		0											
hr2753	sample	1065	P1-2a	6	H29	8/8/2013		11	140.160	151.153	176.183	221.231	186.190	208.210	161.161	184.184	133.139	229.247	204.250
hr2754	Xbomb		P2-1a	6	H29	8/8/2013		1			82.182			206.208	61.61				50.250
hr2755	Xbomb		G-1	6	H29	8/8/2013		1		45.49.51.53		221.231	190.95	210.14	149.57.61			29.229	50.50
hr2756	Xbomb		P3-1a	6	H29	8/8/2013		2	40.40	149.51.53	76.83	221.231	180.86.90	08.210	7.55.57.161			229.47	204.250
hr2757	Xbomb		P1-1a	6	H8	8/7/2013		0	56.56		186.88		88.90.95.99					33.33	
hr2758	Xbomb		G-1	6	H8	8/7/2013		3	156.158	149.51.53	86.186	221.37	186.190	10.210	53.161			223.49	204.250
hr2759	Xsubselect		P3-3a	6	H30	8/7/2013		0											
hr2760	sample	hr151	G-1	6	H9	8/7/2013		9	160.160	149.149	178.184	221.221	186.190	210.210	155.165			229.249	250.250
hr2761	Xsubselect		G-2	6	H9	8/7/2013		0											
hr2762	Xsubselect		G-3	6	H9	8/7/2013		0											
hr2763	Xsubselect		P1-1a	6	H9	8/7/2013		0											
hr2764	sample	hr151	P1-1b	6	H9	8/7/2013		10	160.160	149.149	178.184	221.221	186.190	210.210	155.165		129.129	229.249	250.250
hr2765	Xsubselect		P1-2a	6	H9	8/7/2013		0											
hr2766	Xsubselect		P1-2b	6	H9	8/7/2013		0											
hr2767	Xsubselect		P1-2c	6	H9	8/7/2013		0											
hr2768	Xsubselect		P1-3a	6	H9	8/7/2013		0											
hr2769	Xsubselect		P1-3b	6	H9	8/7/2013		0											
hr2770	Xsubselect		P1-3c	6	H9	8/7/2013		0											
hr2771	Xsubselect		P2-1a	6	H9	8/7/2013		0											
hr2772	sample	hr151	P2-2a	6	H9	8/7/2013		9	160.160	149.149	178.184	221.221	186.190	210.210	155.165			229.249	250.250
hr2773	Xsubselect		P2-2b	6	H9	8/7/2013		0											
hr2774	Xsubselect		P2-3a	6	H9	8/7/2013		0											
hr2775	sample	hr151	T-1	6	H9	8/7/2013		9	160.160	149.149	178.184	221.221	186.190	210.210	155.165			229.249	250.250
hr2776	Xinadequate		P3-1a	6	H9	8/7/2013		0											
hr2777	sample	hr151	P3-2a	6	H9	8/7/2013		9	160.160	149.149	178.184	221.221	186.190	210.210	155.165			229.249	250.250
hr2778	Xsubselect		G-4	6	H9	8/7/2013		0											
hr2779	Xbomb		G-1	6	H20	8/7/2013		0		53.53			94.95		47.147			23.223	50.250
hr2780	Xsubselect		G-1	6	H30	8/7/2013		0											
hr2781	Xsubselect		G-2	6	H30	8/7/2013		0											
hr2782	Xsubselect		P1-1a	6	H30	8/7/2013		0											
hr2783	Xsubselect		P1-2a	6	H30	8/7/2013		0											
hr2784	Xbomb		P1-3a	6	H30	8/7/2013		0							153.55.161				204.50
hr2785	Xsubselect		P1-3b	6	H30	8/7/2013		0											
hr2786	Xsubselect		P1-4a	6	H30	8/7/2013		0											
hr2787	sample	hr230	G-3	6	H30	8/7/2013	Changed from G2 to G3	9	140.152	149.149	178.180	221.221	180.190	210.210	155.155			239.249	204.250
hr2788	Xsubselect		G-4	6	H30	8/7/2013	Changed from G3 to G4	0											
hr2789	Xinadequate		P2-1a	6	H30	8/7/2013		0											
hr2790	Xsubselect		P2-1b	6	H30	8/7/2013		0											
hr2791	Xsubselect		P2-1c	6	H30	8/7/2013		0											
hr2792	Xbomb		P2-1d	6	H30	8/7/2013		0	40.140									35.239	
hr2793	Xsubselect		P2-1	6	H30	8/7/2013		0											
hr2794	Xsubselect		P2-1f	6	H30	8/7/2013		0											
hr2795	Xinadequate		P2-2a	6	H30	8/7/2013		0											
hr2796	sample	hr60	T-1	6	H30	8/7/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr2797	Xsubselect		P3-1a	6	H30	8/7/2013		0											
hr2798	Xsubselect		P3-2a	6	H30	8/7/2013		0											
hr2799	Xsubselect		P3-2b	6	H30	8/7/2013		0											
hr2800	Xsubselect		P3-2c	6	H30	8/7/2013		0											
hr2801	Xsubselect		P3-3b	6	H30	8/7/2013		0											
hr2802	Xinadequate		P3-3c	6	H30	8/7/2013		0											
hr2803	Xsubselect		P3-3d	6	H30	8/7/2013		0											
hr2804	Xbomb		P3-4a	6	H30	8/7/2013		1	40.40	35.149	78.80		180.90	10.210	55.155				204.250
hr2805	Xsubselect		P3-5a	6	H30	8/7/2013		0											
hr2806	Xbomb		P1-1a	6	H40	8/7/2013		1	40.40	149.153			186.90.95		151.55.161				04.250
hr2807	Xsubselect		P1-1b	6	H40	8/7/2013		0											
hr2808	Xbomb		G-1	6	H40	8/7/2013		3	40.40	143.149			80.186	06.206	151.161				250.250
hr2809	Xbomb		G-1	6	H34	8/7/2013		0	40.140	51.153	72.176.84	21.21	180.88.90	10.210	151.53.155				50.50
hr2810	Xsubselect		G-2	6	H34	8/7/2013		0											
hr2811	Xsubselect		G-3	6	H34	8/7/2013		0											
hr2812	Xsubselect		P1-1a	6	H34	8/7/2013		0											
hr2813	Xsubselect		P1-1b	6	H34	8/7/2013		0											
hr2814	sample	hr1242	P1-1c	6	H34	8/7/2013		9	140.140	149.153	174.184	221.233	180.190	210.210	151.155			229.239	250.250
hr2815	Xsubselect		P1-1d	6	H34	8/7/2013		0											
hr2816	Xinadequate		P1-1	6	H34	8/7/2013		0											
hr2817	Xsubselect		P1-1f	6	H34	8/7/2013		0											

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2818	Xsubselect		P1-1g	6	H34	8/7/2013		0											
hr2819	Xsubselect		P1-2a	6	H34	8/7/2013		0											
hr2820	Xsubselect		P2-1a	6	H34	8/7/2013		0											
hr2821	Xsubselect		P2-1b	6	H34	8/7/2013		0											
hr2822	Xsubselect		P2-1c	6	H34	8/7/2013		0											
hr2823	Xsubselect		P2-1d	6	H34	8/7/2013		0											
hr2824	Xsubselect		P2-1	6	H34	8/7/2013		0											
hr2825	Xsubselect		P2-1f	6	H34	8/7/2013		0											
hr2826	Xbomb		P2-1g	6	H34	8/7/2013		3	40.140	153.153	174.78	21.21	80.90.97	208.210	51.151			237.239	50.250
hr2827	Xsubselect		P2-1h	6	H34	8/7/2013		0											
hr2828	Xsubselect		P2-1i	6	H34	8/7/2013		0											
hr2829	Xsubselect		P2-1j	6	H34	8/7/2013		0											
hr2830	Xsubselect		P2-1k	6	H34	8/7/2013		0											
hr2831	Xsubselect		P2-1l	6	H34	8/7/2013		0											
hr2832	Xsubselect		P2-1m	6	H34	8/7/2013		0											
hr2833	Xsubselect		P3-1a	6	H34	8/7/2013		0											
hr2834	Xsubselect		P3-1b	6	H34	8/7/2013		0											
hr2835	Xsubselect		P3-1c	6	H34	8/7/2013		0											
hr2836	Xsubselect		P3-1d	6	H34	8/7/2013		0											
hr2837	Xsubselect		P3-1	6	H34	8/7/2013		0											
hr2838	Xsubselect		P3-1f	6	H34	8/7/2013		0											
hr2839	Xbomb		P3-1g	6	H34	8/7/2013		5	140.140	153.153	174.84	21.233	180.186	210.214	151.55.65			223.29.39	250.250
hr2840	Xsubselect		P3-1h	6	H34	8/7/2013		0											
hr2841	Xsubselect		P3-2a	6	H34	8/7/2013		0											
hr2842	Xsubselect		P3-2b	6	H34	8/7/2013		0											
hr2843	Xsubselect		P3-2c	6	H34	8/7/2013		0											
hr2844	Xsubselect		P3-2d	6	H34	8/7/2013		0											
hr2845	Xsubselect		P3-2	6	H34	8/7/2013		0											
hr2846	Xbomb		T-1	6	H34	8/7/2013		5	140.140	153.153	174.178	221.33	180.190	208.210	151.57.61			29.239	04.250
hr2847	sample	hr188	P3-4c	6	H12	8/8/2013		9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	204.250
hr2848	Xsubselect		P3-4d	6	H12	8/8/2013	Changed from 4o to 4d	0											
hr2849	Xsubselect		P3-4	6	H12	8/8/2013		0											
hr2850	Xbomb		T-1	6	H12	8/8/2013		2	140.60	47.149.151	180.83.85	221.221	80.186.19(	10.210	153.155			229.49	04.250
hr2851	Xsubselect		G-1	6	H12	8/8/2013		0											
hr2852	sample	hr686	G-2	6	H12	8/8/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2853	Xsubselect		G-3	6	H12	8/8/2013		0											
hr2854	sample	hr635	P1-1a	6	H11	8/8/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr2855	Xsubselect		P1-1b	6	H11	8/8/2013		0											
hr2856	Xsubselect		P1-1c	6	H11	8/8/2013		0											
hr2857	Xsubselect		P1-1d	6	H11	8/8/2013		0											
hr2858	Xsubselect		P1-1	6	H11	8/8/2013		0											
hr2859	Xsubselect		P1-1f	6	H11	8/8/2013		0											
hr2860	Xsubselect		P1-1g	6	H11	8/8/2013		0											
hr2861	Xsubselect		P1-1h	6	H11	8/8/2013		0											
hr2862	Xsubselect		P1-1i	6	H11	8/8/2013		0											
hr2863	Xsubselect		P1-1j	6	H11	8/8/2013		0											
hr2864	Xsubselect		P1-1k	6	H11	8/8/2013		0											
hr2865	Xsubselect		P1-1l	6	H11	8/8/2013		0											
hr2866	Xsubselect		P1-2a	6	H11	8/8/2013		0											
hr2867	Xsubselect		P1-2b	6	H11	8/8/2013		0											
hr2868	Xsubselect		P1-3a	6	H11	8/8/2013		0											
hr2869	sample	hr635	P2-1a	6	H11	8/8/2013	Changed from 2a to 1a	9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr2870	Xsubselect		P3-1a	6	H11	8/8/2013		0											
hr2871	Xsubselect		P3-1b	6	H11	8/8/2013		0											
hr2872	Xsubselect		P3-1c	6	H11	8/8/2013		0											
hr2873	Xsubselect		P3-2a	6	H11	8/8/2013		0											
hr2874	Xinadequate		P3-3a	6	H11	8/8/2013		0											
hr2875	sample	hr635	P3-3b	6	H11	8/8/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr2876	sample	hr635	T-1	6	H11	8/8/2013		9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	250.250
hr2877	Xbomb		G-1	6	H10	8/8/2013		1					190.190		55.55				
hr2878	Xbomb		P1-1a	6	H17	8/8/2013		2	140.56	149.51	178.86	221.21	190.190	210.14	49.155			39.239	250.250
hr2879	Xsubselect		P1-1b	6	H17	8/8/2013		0											
hr2880	Xsubselect		P1-1a	6	H13	8/8/2013		0											
hr2881	Xsubselect		P1-2a	6	H13	8/8/2013		0											
hr2882	sample	br979	P1-3a	6	H13	8/8/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr2883	Xsubselect		P1-3b	6	H13	8/8/2013		0											
hr2884	Xsubselect		P1-4a	6	H13	8/8/2013		0											
hr2885	Xinadequate		P1-5a	6	H13	8/8/2013		0											
hr2886	Xsubselect		P1-6a	6	H13	8/8/2013		0											
hr2887	Xinadequate		P1-7a	6	H13	8/8/2013	Changed from 6a to 7a	0											
hr2888	Xsubselect		P2-1a	6	H13	8/8/2013		0											
hr2889	Xsubselect		P2-2a	6	H13	8/8/2013		0											
hr2890	Xsubselect		P2-3a	6	H13	8/8/2013		0											
hr2891	sample	br979	P2-4a	6	H13	8/8/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr2892	Xinadequate		P3-1a	6	H13	8/8/2013		0											
hr2893	sample	br979	T-1	6	H13	8/8/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr2894	Xsubselect		G-1	6	H13	8/8/2013		0											
hr2895	Xsubselect		G-2	6	H13	8/8/2013		0											
hr2896	Xsubselect		G-3	6	H13	8/8/2013		0											
hr2897	sample	br979	G-4	6	H13	8/8/2013		9	150.152	151.159	176.184	221.231	190.190	210.210	155.155			223.225	250.250
hr2898	Xsubselect		G-5	6	H13	8/8/2013		0											
hr2899	Xsubselect		P2-1a	6	H12	8/8/2013		0											
hr2900	Xsubselect		P1-2a	6	H17	8/8/2013		0											
hr2901	Xsubselect		P1-2b	6	H17	8/8/2013		0											
hr2902	sample	hr219	T-1	6	H17	8/8/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2903	Xsubselect		P2-1a	6	H17	8/8/2013		0											
hr2904	Xsubselect		P2-1b	6	H17	8/8/2013		0											
hr2905	Xsubselect		P2-1c	6	H17	8/8/2013		0											
hr2906	Xbomb		P2-1d	6	H17	8/8/2013		1		141.57	172.174		87.180.95	10.210					
hr2907	Xsubselect		P3-1a	6	H17	8/8/2013		0											
hr2908	Xsubselect		P3-1b	6	H17	8/8/2013		0											
hr2909	sample	hr219	P3-1c	6	H17	8/8/2013		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	250.250
hr2910	Xsubselect		P2-1b	6	H12	8/8/2013		0											
hr2911	Xsubselect		P2-1c	6	H12	8/8/2013		0											

Notes:
Xinadequate: samples that lacked suitable material for DNA extraction
Xsubselect: samples that were excluded due to subselection rules
Xbomb: samples that failed during microsatellite analysis
Xmixed: samples that showed evidence of > 2 alleles per marker
Xspecies: samples did not appear to be from bears
samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr2912	Xinadequate		P2-1d	6	H12	8/8/2013		0											
hr2913	sample	hr686	P2-1	6	H12	8/8/2013		9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	250.250
hr2914	Xinadequate		P2-1f	6	H12	8/8/2013		0											
hr2915	Xsubselect		P2-1g	6	H12	8/8/2013		0											
hr2916	Xsubselect		P2-1h	6	H12	8/8/2013		0											
hr2917	Xsubselect		P2-1i	6	H12	8/8/2013		0											
hr2918	Xsubselect		P2-1j	6	H12	8/8/2013		0											
hr2919	Xsubselect		P2-1k	6	H12	8/8/2013		0											
hr2920	Xsubselect		P2-1l	6	H12	8/8/2013		0											
hr2921	Xsubselect		P2-1m	6	H12	8/8/2013		0											
hr2922	Xsubselect		P2-1n	6	H12	8/8/2013		0											
hr2923	Xsubselect		P2-1o	6	H12	8/8/2013		0											
hr2924	Xsubselect		P2-2a	6	H12	8/8/2013		0											
hr2925	Xsubselect		P3-1a	6	H12	8/8/2013		0											
hr2926	Xsubselect		P3-2a	6	H12	8/8/2013		0											
hr2927	Xsubselect		P3-3a	6	H12	8/8/2013		0											
hr2928	Xsubselect		P3-4a	6	H12	8/8/2013		0											
hr2929	Xsubselect		P3-4b	6	H12	8/8/2013		0											
hr2930	Xsubselect		P3-1d	6	H17	8/8/2013		0											
hr2931	Xsubselect		P3-1	6	H17	8/8/2013		0											
hr2932	Xsubselect		P3-1f	6	H17	8/8/2013		0											
hr2933	Xsubselect		P3-1g	6	H17	8/8/2013		0											
hr2934	Xinadequate		P3-1h	6	H17	8/8/2013		0											
hr2935	Xsubselect		P3-1i	6	H17	8/8/2013		0											
hr2936	Xsubselect		G-1	6	H17	8/8/2013		0											
hr2937	Xbomb		G-2	6	H17	8/8/2013		1	140.52.58	149.53.55	2.177.85.87		190.190	10.10	155.57				04.250
hr2938	Xsubselect		P1-1a	6	H18	8/8/2013		0											
hr2939	Xsubselect		P1-2a	6	H18	8/8/2013		0											
hr2940	Xsubselect		P1-3a	6	H18	8/8/2013		0											
hr2941	Xbomb		P1-3b	6	H18	8/8/2013		0		49.55		221.31	86.190		155.57			29.229	50.250
hr2942	Xsubselect		P1-4a	6	H18	8/8/2013		0											
hr2943	Xsubselect		P2-1a	6	H18	8/8/2013		0											
hr2944	Xsubselect		P2-2a	6	H18	8/8/2013	Changed from P1 to P2	0											
hr2945	Xbomb		P2-3a	6	H18	8/8/2013		2	140.152	149.55	72.178.186	221.29.31	190.190	210.12.14	155.57				04.250
hr2946	Xinadequate		P3-1a	6	H18	8/8/2013		0											
hr2947	Xinadequate		P3-2a	6	H18	8/8/2013		0											
hr2948	Xinadequate		P3-3a	6	H18	8/8/2013		0											
hr2949	Xbomb		P3-2b	6	H18	8/8/2013		1	40.40	49.149	78.78	221.21	86.190		155.155				50.250
hr2950	Xbomb		T-1	6	H18	8/8/2013		2				21.23.231	90.190		155.155			23.229.37.3	250.250
hr2951	Xbomb		G-1	6	H18	8/8/2013		5	140.152	149.51.55	78.86	231.47	190.190	210.214	155.155			23.239	250.250
hr2952	Xbomb		P1-1a	6	H21	8/8/2013		1		149.149			186.90	208.10					50.250
hr2953	Xinadequate		P1-2a	6	H21	8/8/2013		0											
hr2954	Xinadequate		P1-2b	6	H21	8/8/2013		0											
hr2955	Xinadequate		P2-1a	6	H21	8/8/2013		0											
hr2956	Xinadequate		P2-2a	6	H21	8/8/2013		0											
hr2957	sample	hr35	P3-1a	6	H21	8/8/2013		9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	250.250
hr2958	Xinadequate		P3-1b	6	H21	8/8/2013		0											
hr2959	Xinadequate		P3-1c	6	H21	8/8/2013		0											
hr2960	Xsubselect		P3-2a	6	H21	8/8/2013		0											
hr2961	Xbomb		G-1	6	H21	8/8/2013		1		149.149		27.227	186.95		55.151.165			23.23	50.250
hr2962	Xbomb		P1-1a	6	H26	8/8/2013		0	2.58.42.5	47.147			96.96	08.08	51.151			23.223	
hr2963	Xbomb		T-1	6	H26	8/8/2013		2		149.151								229.239	
hr2964	Xsubselect		P2-1a	6	H26	8/8/2013		0											
hr2965	Xsubselect		P2-2a	6	H26	8/8/2013		0											
hr2966	Xbomb		P2-3a	6	H26	8/8/2013		0				21.21			49.55.59.63			29.29	04.50
hr2967	Xsubselect		P2-4a	6	H26	8/8/2013		0											
hr2968	Xbomb		P3-1a	6	H26	8/8/2013		1	152.60	49.149	172.74.76							229.233	
hr2969	Xsubselect		P3-2a	6	H26	8/8/2013		0											
hr2970	Xsubselect		P3-3a	6	H26	8/8/2013		0											
hr2971	Xsubselect		G-1	6	H26	8/8/2013		0											
hr2972	sample	hr1654	T-1	6	H56	8/9/2013		9	140.160	149.151	172.180	221.233	180.180	208.210	155.161			229.229	204.250
hr2973	Xsubselect		P1-1a	6	H56	8/9/2013		0											
hr2974	sample	hr12	G-1	6	H27	8/8/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2975	Xsubselect		G-2	6	H27	8/8/2013		0											
hr2976	Xsubselect		P1-1a	6	H27	8/8/2013		0											
hr2977	Xsubselect		P1-1b	6	H27	8/8/2013		0											
hr2978	Xsubselect		P1-1c	6	H27	8/8/2013		0											
hr2979	Xsubselect		P1-1d	6	H27	8/8/2013		0											
hr2980	Xsubselect		P1-1	6	H27	8/8/2013		0											
hr2981	Xsubselect		P1-1f	6	H27	8/8/2013		0											
hr2982	Xinadequate		P1-1g	6	H27	8/8/2013		0											
hr2983	Xsubselect		P1-1h	6	H27	8/8/2013		0											
hr2984	sample	hr13	P1-1i	6	H27	8/8/2013		9	152.160	149.155	178.186	231.231	190.190	210.214	155.155			229.239	250.250
hr2985	Xsubselect		P2-1a	6	H27	8/8/2013		0											
hr2986	Xsubselect		P2-1b	6	H27	8/8/2013		0											
hr2987	Xsubselect		P2-1c	6	H27	8/8/2013		0											
hr2988	Xsubselect		P2-1d	6	H27	8/8/2013		0											
hr2989	Xsubselect		P2-1	6	H27	8/8/2013		0											
hr2990	Xsubselect		P2-1f	6	H27	8/8/2013		0											
hr2991	Xbomb		P2-2a	6	H27	8/8/2013		1	50.52				188.90.94		155.155				50.250
hr2992	Xsubselect		P2-3a	6	H27	8/8/2013		0											
hr2993	sample	hr12	T-1	6	H27	8/8/2013		9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2994	sample	hr12	G-2	6	H26	8/8/2013	found in H27 envelope	9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	204.250
hr2995	Xbomb		P1-2a	6	H56	8/9/2013		2		149.151		221.233	180.95.99		51.55.161			29.229	04.250
hr2996	Xsubselect		P2-1a	6	H56	8/9/2013		0											
hr2997	sample	hr1654	P2-1b	6	H56	8/9/2013		9	140.160	149.151	172.180	221.233	180.180	208.210	155.161			229.229	204.250
hr2998	Xsubselect		P2-2a	6	H56	8/9/2013		0											
hr2999	Xsubselect		P2-3a	6	H56	8/9/2013		0											
hr3000	Xsubselect		G-1	6	H56	8/9/2013		0											
hr3001	sample	hr1654	P3-1a	6	H56	8/9/2013		9	140.160	149.151	172.180	221.233	180.180	208.210	155.161			229.229	204.250
hr3002	Xsubselect		P3-1b	6	H56	8/9/2013		0											
hr3003	Xsubselect		P3-2a	6	H56	8/9/2013		0											
hr3004	Xsubselect		P3-3a	6	H56	8/9/2013		0											
hr3005	Xbomb		G-2	6	H56	8/9/2013		5	140.52.60	1.149.59.6	172.74.80	221.233	180.86	208.210	155.161			229.229	204.250
hr3006	Xbomb		G-1	6	H57	8/9/2013		1	152.58.60	51.157.159	172.74.76	29.231.233	88.90.196	210.12.14	7.141.53.55			23.223	250.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 1. Detailed Field Hair Collection and Genetic Marker Data for Grizzly Bears, 2013

								Genetic Data										
Sample ID	Class	Individual	Cluster ID	Session #	Cell ID	Collection Date	Comments	Score (high is ≥5)	Genetic Markers and Corresponding Allele Scores									
									G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex
hr3007	Xsubselect		P1-1a	6	H33	8/9/2013		0											
hr3008	Xsubselect		P1-2a	6	H33	8/9/2013		0											
hr3009	Xinadequate		P1-3a	6	H33	8/9/2013		0											
hr3010	sample	hr1779	P1-3b	6	H33	8/9/2013		9	152.160	155.159	178.184	231.237	186.190	210.210	161.161			239.239	204.250
hr3011	Xsubselect		P1-4a	6	H33	8/9/2013		0											
hr3012	Xinadequate		P2-1a	6	H33	8/9/2013		0											
hr3013	Xinadequate		P2-1b	6	H33	8/9/2013		0											
hr3014	Xsubselect		P2-1c	6	H33	8/9/2013		0											
hr3015	Xsubselect		P2-1d	6	H33	8/9/2013		0											
hr3016	Xbomb		P2-1	6	H33	8/9/2013		2	40.52.60	155.59	78.84	231.43.237	186.190	10.210	59.161			227.239	04.250
hr3017	Xsubselect		P2-2a	6	H33	8/9/2013		0											
hr3018	sample	hr488	T-1	6	H33	8/9/2013		9	152.152	149.155	178.186	231.231	190.196	210.210	155.161			229.239	250.250
hr3019	sample	hr1779	P3-1a	6	H33	8/9/2013		9	152.160	155.159	178.184	231.237	186.190	210.210	161.161			239.239	204.250
hr3020	Xinadequate		P3-1b	6	H33	8/9/2013		0											
hr3021	Xsubselect		P3-1c	6	H33	8/9/2013		0											
hr3022	Xsubselect		P3-1d	6	H33	8/9/2013		0											
hr3023	Xsubselect		P3-1	6	H33	8/9/2013		0											
hr3024	Xinadequate		P3-1f	6	H33	8/9/2013		0											
hr3025	Xsubselect		P3-1g	6	H33	8/9/2013		0											
hr3026	Xsubselect		P3-1h	6	H33	8/9/2013		0											
hr3027	Xsubselect		P3-1i	6	H33	8/9/2013		0											
hr3028	Xsubselect		P3-1j	6	H33	8/9/2013		0											
hr3029	Xsubselect		P3-1k	6	H33	8/9/2013		0											
hr3030	Xsubselect		P3-2a	6	H33	8/9/2013		0											
hr3031	Xsubselect		G-1	6	H33	8/9/2013	27 samples stated; 26 present	0											
hr3032	sample	hr488	G-2	6	H33	8/9/2013		9	152.152	149.155	178.186	231.231	190.196	210.210	155.161			229.239	250.250
hr3033	Xbomb		P1-1a	6	H32	8/9/2013		4		47.49.155	78.86	31.231	190.94	210.214	155.155			229.239	250.250
hr3034	Xsubselect		P1-2a	6	H32	8/9/2013		0											
hr3035	Xsubselect		P1-2b	6	H32	8/9/2013		0											
hr3036	Xsubselect		P1-3a	6	H32	8/9/2013		0											
hr3037	Xsubselect		P1-4a	6	H32	8/9/2013		0											
hr3038	Xsubselect		P1-4b	6	H32	8/9/2013		0											
hr3039	Xsubselect		P1-5a	6	H32	8/9/2013		0											
hr3040	Xsubselect		P1-6a	6	H32	8/9/2013		0											
hr3041	Xsubselect		P2-1a	6	H32	8/9/2013		0											
hr3042	Xbomb		P2-1b	6	H32	8/9/2013		1		55.155		223.229	90.94		151.53.155			225.31	
hr3043	Xsubselect		P2-2a	6	H32	8/9/2013		0											
hr3044	Xbomb		T-1	6	H32	8/9/2013		0	40.60		76.176		90.190	10.10				37.39	50.250
hr3045	Xbomb		G-1	6	H32	8/9/2013		1		49.153			190.90						204.250
hr3046	Xinadequate		P3-1a	6	H32	8/9/2013		0											
hr3047	Xinadequate		P3-2a	6	H32	8/9/2013		0											
hr3048	sample	hr60	P1-1a	6	H31	8/9/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3049	Xinadequate		P1-2a	6	H31	8/9/2013		0											
hr3050	Xsubselect		P1-3a	6	H31	8/9/2013		0											
hr3051	sample	hr60	P2-1a	6	H31	8/9/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3052	Xsubselect		P2-2a	6	H31	8/9/2013		0											
hr3053	Xspecies		P2-3a	6	H31	8/9/2013		0											
hr3054	Xbomb		T-1	6	H31	8/9/2013		2		149.55			180.190	10.10	153.59			23.23	250.250
hr3055	Xbomb		G-1	6	H31	8/9/2013		0		45.45					51.53			23.23	
hr3056	sample	hr60	P1-1a	6	H35	8/9/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3057	Xinadequate		P1-1b	6	H35	8/9/2013		0											
hr3058	Xsubselect		P1-1c	6	H35	8/9/2013		0											
hr3059	Xsubselect		P1-1d	6	H35	8/9/2013		0											
hr3060	Xsubselect		P2-1a	6	H35	8/9/2013		0											
hr3061	Xinadequate		P2-1b	6	H35	8/9/2013		0											
hr3062	sample	hr60	P2-1c	6	H35	8/9/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3063	Xsubselect		P1-2a	6	H35	8/9/2013	Changed from 2b to 2a	0											
hr3064	Xbomb		T-1	6	H35	8/9/2013		2		149.155		21.33.252	180.95.190		153.59.161				250.250
hr3065	sample	hr60	G-1	6	H35	8/9/2013		9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3066	Xsubselect		G-1	6	H41	8/9/2013		0											
hr3067	sample	hr60	G-2	6	H41	8/9/2013	Changed from G1 to G2	9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	250.250
hr3068	Xbomb		G-1	6	H46	8/9/2013		2				31.231	88.90		151.151			29.229	250.250

Notes:

Xinadequate: samples that lacked suitable material for DNA extraction

Xsubselect: samples that were excluded due to subselection rules

Xbomb: samples that failed during microsatellite analysis

Xmixed: samples that showed evidence of > 2 alleles per marker

Xspecies: samples did not appear to be from bears

samples: successful samples assigned to individuals (see Appendix 2)

Appendix 2

Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Rescan™
an ERM company

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
1065	17	1065; 1591; 1594; 1615; 1619; 2527; hr2175; hr2394; hr2395; hr2389; hr2390; hr2391; hr2393; hr2748; hr2753; br2973; br2979;				1			11	140.160	151.153	176.183	221.231	186.190	208.210	161.161	184.184	133.139	229.247	M	
1065	17	1065; 1591; 1594; 1615; 1619; 2527; hr2175; hr2394; hr2395; hr2389; hr2390; hr2391; hr2393; hr2748; hr2753; br2973; br2979;				1	1	1	11	140.160	151.153	176.183	221.231	186.190	208.210	161.161	184.184	133.139	229.247	M	
br101	10	br101; br104; br270; br274; br276; br419; br791; br792; br2200; br3892;	1					1	10	140.156	149.153	176.178	221.237	190.190	210.210	161.165	184.184		229.229	M	
br1086	28	br1086; br1096; br1097; br1098; br1101; br1352; br1355; br1365; br1366; br2615; br2629; br2632; br2637; br2884; br2889; br3013; br3560; br3564; br3567; br3569; br3572; br3576; br3578; br3580; br3581; br3586; br3566; br3377;		1	1	1	1		9	140.152	153.155	174.178	221.233	186.186	210.210	153.161			223.229	F	
br1088	16	br1088; br1091; br1099; br2275; br2262; br2267; br2609; br2618; br2621; br3038; br3027; br3033; br3469; br3479; br3481; br3470;	1	1		1	1		9	140.160	153.155	178.178	221.221	186.186	210.214	153.165			229.239	F	
br109	2	br109; br112;							9	160.162	159.161	176.186	233.237	180.196	208.210	141.161	184.184			M	
br1130	7	br1130; br1131; br1132; br1133; br1135; br1138; br1141;							8	152.160	149.149	178.186	221.231	180.186	210.210	161.161				F	2MM:20080872
br115	2	br115; br119;							9	140.140	149.151	174.177	231.233	186.186	210.210	139.155	184.194			M	
br1161	5	br1161; br1162; br1166; br1171; br1438;							10	140.160	161.161	178.184	221.221	186.190	210.210	155.161		129.133	223.239	M	
br1239	9	br1239; br1243; br1244; br1245; br1246; br1250; br1251; br1252; br1253;							8	152.152	151.153	174.184	221.237	190.196	210.210	139.161				F	
br125	5	br125; br126; br131; br133; br136;							9	154.160	155.155	172.172	221.233	186.190	210.210	155.161	184.184			M	
br1256	1	br1256;							10	140.152	151.153	184.186	221.252	190.190	210.210	161.161		127.133	229.229	F	
br143	9	br143; br148; br149; br151; br152; br299; br300; br1021; br1212;							9	158.160	151.153	178.186	223.233	186.186	210.214	161.161	184.184			M	
br146	18	br146; br147; br150; br495; br496; br500; br503; br505; br509; br512; br520; br661; br663; br664; br665; br666; br2464; br3206;		1			1		10	158.160	151.153	178.186	221.231	186.190	210.210	161.161	184.184		229.249	F	
br155	22	br155; br158; br162; br166; br313; br677; br680; br683; br978; br2448; br2428; br2432; br2433; br2434; br2436; br2438; br2441; br2442; br2443; br3121; br3654; br3659;		1			1	1	10	140.160	155.159	178.184	221.233	186.190	208.210	161.161	184.184		223.249	F	
br170	2	br169; br170;							9	140.140	151.159	178.178	221.233	190.190	208.210	153.161	184.184			F	
br172	30	br172; br745; br747; br748; br752; br886; br1276; br1279; br1280; br1282; br2537; br2517; br2519; br2522; br2524; br2527; br2530; br2551; br2557; br2568; br2768; br2769; br2962; br2965; br2966; br3384; br3385; br3387; br3388; br3389;		1	1	1	1		10	160.160	149.155	172.176	221.221	180.186	210.214	139.161	184.194		223.239	M	
br174	15	br174; br177; br178; br514; br517; br522; br523; br524; br526; br527; br528; br529; br530; br533; br559;							9	140.140	151.151	178.186	221.252	190.190	210.210	153.161	184.184			M	
br179	10	br179; br535; br539; br540; br542; br543; br547; br557; br1027; br2080;	1						10	140.140	151.153	184.186	221.233	186.190	208.210	139.161	184.184		229.239	F	
br195	28	br195; br567; br1041; br1043; br1044; br1045; br1052; br1075; br1078; br1079; br1080; br1081; br1082; br1083; br1084; br1264; br1265; br1266; br1268; br1271; br1272; br2142; br2148; br2977; br2978; br3395; br3532; br3541;	1			1	1		11	152.160	151.151	174.176	221.221	186.190	210.210	151.161	184.184	123.127	229.229	F	
br199	23	br199; br202; br204; br206; br207; br208; br209; br210; br211; br213; br214; br1058; br1059; br1061; br1062; br1375; br2542; br3406; br3409; br3410; br3382; br3383; br3768;		1			1	1	10	140.140	155.161	174.177	221.233	180.186	210.210	139.155	184.194		225.249	F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

			Captures						Genetic Data											
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
br218	22	br218; br569; br575; br576; br577; br579; br581; br1053; br1057; br1476; br2773; br3062; br3051; br3061; br3528; br3521; br3523; br3526; br3536; br3546; br3525; br3865;			1	1	1	1	10	160.160	159.161	174.176	231.237	186.190	210.210	155.161	184.184		223.249	F	
br219	5	br219; br1054; br1477; br1478; br1479;							9	160.160	151.161	176.186	221.231	186.190	210.210	161.161	184.184			F	2MM:hr732
br2198	4	br2198; br2786; br2783; br3070;	1		1	1			9	140.140	149.153	174.176	221.221	186.190	210.210	139.165			225.229	F	
br220	32	br220; br221; br222; br223; br226; br227; br613; br614; br618; br624; br632; br635; br845; br846; br847; br854; br875; br881; br885; br1072; br1073; br1074; br1105; br2183; br2586; br2991; br2995; br3001; br3185; br3192; br3195; br3877;	1	1		1	1	1	10	152.160	155.159	174.178	221.237	190.190	208.210	139.161	184.194		223.239	F	
br2232	13	br2232; br2239; br2561; br2562; br2571; br2573; br2577; br2835; br2824; br2827; br2833; br3693; br3696;	1	1	1			1	9	160.162	151.151	174.186	221.237	180.186	208.216	139.153			223.239	M	
br2240	9	br2240; br2243; br2246; br2247; br2251; br2253; br3007; br3896; br3762;	1			1		1	9	152.160	155.159	176.184	231.237	190.190	208.214	155.155			223.239	M	
br23	5	br23; br24; br1204; hr1506; hr1512;							10	154.160	153.159	172.184	221.221	190.190	208.210	161.161	184.184		223.249	M	
br23	5	br23; br24; br1204; hr1506; hr1512;		1					10	154.160	153.159	172.184	221.221	190.190	208.210	161.161			223.249	M	
br2302	17	br2302; br2305; br2309; br2311; br2313; br2314; br2316; br2260; br2295; br2320; br2321; br2278; br2282; br2284; br2288; br2293; br2870;	1		1				9	140.160	149.151	176.186	221.233	180.190	210.214	153.165			229.229	M	
br237	16	br237; br238; br250; br265; br860; br868; br869; br870; br872; br877; br1102; br1164; br1408; br1428; br2694; br2868;		1	1				10	152.160	153.159	178.186	221.231	186.190	208.210	139.161	184.184		223.239	F	
br2382	1	br2382;	1						9	160.160	149.151	176.178	221.221	186.186	210.214	161.165			229.229	M	
br2388	1	br2388;		1					9	152.156	155.159	178.186	221.221	186.190	210.210	161.161			229.239	F	
br244	61	br244; br245; br246; br252; br257; br262; br267; br857; br861; br862; br863; br864; br865; br867; br1104; br1163; br1427; br2587; br2590; br2592; br2596; br2598; br2600; br2670; br2691; br2676; br2677; br2680; br2682; br2686; br2687; br2688; br2659; br2661; br2665; br2667; br2800; br2801; br2803; br2805; br2806; br2807; br2811; br3005; br2990; br3782; br3443; br3444; br3459; br3447; br3452; br3456; br3780; br3783; br3786; br3789; br3792; br3793; br3796; br3798; br3300;		1	1	1	1		10	152.152	153.153	186.186	221.221	190.190	210.210	139.151	184.184		223.227	M	
br2495	1	br2495;		1					9	152.152	153.155	178.178	221.221	186.186	210.214	139.153			229.229	M	
br2508	8	br2508; br2485; br2492; br2498; br2500; br2509; br2533; br2536;		1					9	156.160	153.161	176.178	221.221	186.190	210.210	153.161			229.239	M	
br26	15	br26; br156; br679; hr1741; hr1749; hr1759; hr2493; hr2494; hr2495; hr2496; hr2498; br3265; br3270; br3271; br3263;					1		10	140.154	153.155	172.178	221.221	190.190	208.214	161.161	184.194		239.249	M	
br26	15	br26; br156; br679; hr1741; hr1749; hr1759; hr2493; hr2494; hr2495; hr2496; hr2498; br3265; br3270; br3271; br3263;			1		1		10	140.154	153.155	172.178	221.221	190.190	208.214	161.161			239.249	M	
br2733	3	br2733; br2751; br3435;			1		1		9	152.152	153.159	184.184	233.237	190.190	208.210	155.155			239.249	F	
br2737	2	br2737; br2743;			1				10	160.160	149.151	176.177	221.231	190.190	210.214	153.161		127.133	239.239	F	
br2764	4	br2764; br2765; br3204; br3678;			1		1	1	9	152.160	149.161	176.184	221.221	186.196	208.214	139.161			239.239	M	
br2785	2	br2785; br3890;			1			1	9	140.152	149.155	174.176	221.237	186.190	210.210	139.165			223.229	M	
br314	14	br314; br315; br322; br325; br326; br327; br328; br334; br3099; br3124; br3127; br3133; br3126; br3130;					1		10	140.152	155.159	174.176	221.233	186.190	208.210	139.161	184.184		223.229	F	
br3268	1	br3268;					1		9	158.160	151.161	176.178	223.231	186.190	208.210	161.161			229.239	F	
br33	20	br33; br35; br38; br40; br43; br46; br48; br51; br1020; br2449; br2453; br2455; br2460; br3213; br3215; br3214; br3219; br3221; br3222; br3676;		1			1	1	10	160.160	151.151	178.186	221.233	186.190	210.214	161.161	184.184		223.249	F	
br3332	2	br3332; br3335;					1		9	160.160	151.157	183.186	221.221	186.190	210.210	153.153			229.239	M	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

			Captures						Genetic Data												
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
br3460	8	br3460; br3465; br3467; br3471; br3485; br3490; br3744; br3747;					1	1	9	140.152	155.155	178.178	221.233	186.196	210.210	139.153			223.239	F	
br350	28	br350; br352; br385; br388; br390; br391; br395; br398; br399; br401; br562; br808; br822; br824; br827; br843; br848; br849; br852; br954; br955; br959; br1306; br3725; br3729; br3731; br3735; br3740;						1	10	152.160	151.155	174.176	221.231	190.190	208.214	155.161	184.194		229.239	F	
br365	6	br365; br367; br369; br371; br374; br2133;	1						9	140.152	159.161	176.184	221.233	186.190	208.210	155.161			229.249	F	
br3670	1	br3670;						1	9	140.152	151.159	178.184	223.233	190.190	210.214	155.161			229.239	M	
br3685	1	br3685;						1	9	140.152	151.153	178.184	221.231	186.196	210.210	161.161			229.239	M	
br3686	1	br3686;						1	9	152.158	151.153	174.178	223.237	186.190	210.210	139.161			229.239	F	
br3739	1	br3739;						1	10	160.160	149.151	176.177	221.231	190.190	210.214	161.161		129.129	229.239	F	
br3833	1	br3833;						1	9	152.160	155.155	172.178	221.237	180.186	210.210	161.161			229.249	F	
br423	35	br423; br426; br430; br431; br432; br433; br434; br435; br436; br439; br442; br833; br834; br835; br836; br837; br839; br841; br842; br914; br915; br916; br918; br919; br920; br921; br922; br3100; br3336; br3364; br3873; br3867; br3871; br3875; br3885;				1	1	1	9	152.160	155.159	174.176	231.237	190.190	210.214	155.161			223.229	F	
br486	13	br486; br488; hr2056; hr2122; hr2127; hr2529; hr2532; hr2520; hr2523; hr2524; hr2526; hr2528; hr2594;							9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	M	
br486	13	br486; br488; hr2056; hr2122; hr2127; hr2529; hr2532; hr2520; hr2523; hr2524; hr2526; hr2528; hr2594;				1	1	1	9	152.160	155.155	178.186	221.221	190.196	210.210	153.161			229.229	M	
br584	22	br584; br585; br591; br596; br612; br1390; br1394; br1397; br1398; br1401; br1402; br1403; br2196; br2199; br2204; br2790; br2792; br3115; br3776; br3778; br3801; br3800;	1		1	1		1	9	140.152	149.155	174.174	221.231	186.186	210.210	139.165			223.225	F	
br598	31	br598; br604; br608; br609; br610; br615; br779; br794; br795; br799; br801; br803; br1358; br1359; br1362; br1363; br1480; br3084; br3088; br3092; br3411; br3412; br3414; br3417; br3419; br3548; br3551; br3553; br3556; br3557; br3558;				1	1		9	152.152	155.155	174.186	231.233	186.186	210.210	161.165			223.223	F	
br658	9	br658; br660; br1143; br1144; br1145; br1173; br1187; br1188; br1189;							8	140.160	149.149	177.186	233.233	180.190	208.210	161.165				M	
br66	13	br66; br68; br69; br70; br71; br72; br73; br74; br75; br76; br688; br1024; br1238;							9	140.152	153.161	184.184	221.233	186.196	208.210	139.155	184.184			F	
br696	53	br696; br699; br700; br703; br704; br706; br709; br711; br712; br713; br714; br715; br716; br717; br719; br720; br721; br722; br1039; br1040; br1047; br1051; hr1395; hr1396; hr1397; br2100; br2102; br2105; br2108; br2112; br2114; br2117; br2119; br2120; br2122; br2125; br2129; br2470; br2471; br2475; br2477; br2466; br2483; br2484; br2907; br2916; br2919; br2956; br2948; br2958; br2959; br3278; br3662;	1	1		1	1	1	9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	M	
br696	53	br696; br699; br700; br703; br704; br706; br709; br711; br712; br713; br714; br715; br716; br717; br719; br720; br721; br722; br1039; br1040; br1047; br1051; hr1395; hr1396; hr1397; br2100; br2102; br2105; br2108; br2112; br2114; br2117; br2119; br2120; br2122; br2125; br2129; br2470; br2471; br2475; br2477; br2466; br2483; br2484; br2907; br2916; br2919; br2956; br2948; br2958; br2959; br3278; br3662;	1						9	140.158	151.153	172.178	223.231	186.190	210.210	161.161			229.239	M	
br726	5	br726; br729; br730; br733; br740;							8	154.160	153.161	174.178	221.221	180.190	208.210	139.161				F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
br758	27	br758; br759; br760; br762; br765; br768; br772; br1169; br1175; br1177; br1178; br1179; br1181; br1183; br1185; br2843; br2844; br2845; br3322; br3311; br3313; br3318; br3321; br3325; br3327; br3769; br3773;			1		1	1	9	152.160	155.159	178.178	221.231	186.196	210.210	161.165			229.239	F	
br77	10	br77; br82; br83; br86; br87; br88; br89; br2156; br2176; br2179;	1						10	140.160	159.161	174.176	221.231	186.196	208.210	141.161	184.184		225.249	M	
br774	43	br774; br775; br776; br778; br1447; br1462; br1463; br1464; br1466; br1467; br2225; br2211; br2212; br2213; br2214; br2215; br2217; br2219; br2223; br2348; br2351; br2354; br2356; br2347; br2258; br2259; br2341; br2342; br2345; br2543; br2544; br2545; br2546; br2601; br2602; br2604; br2641; br2654; br2656; br2662; br2650; br2643; br2647;	1	1					9	152.160	155.159	174.178	221.237	186.190	210.210	139.155			223.229	M	
br781	7	br781; br784; br787; br788; br789; br3753; br3759;						1	9	160.160	153.157	176.176	233.237	186.190	210.210	141.155			229.249	F	
br91	8	br91; br93; br94; br967; br969; br1376; br1380; br1385;							11	152.156	153.155	174.178	221.233	186.190	210.210	165.165	184.184	127.133	223.229	M	
br926	30	br926; br927; br928; br931; br935; br936; br938; br939; br940; br942; br944; br947; br948; br986; br988; br989; br990; br992; br996; br1000; br1003; br1004; br1006; br1009; br1010; br1013; br1014; br1015; br1016; br1200;							8	152.160	149.155	176.178	231.233	190.190	210.210	161.161				M	
br952	3	br952; br956; br957;							8	140.140	161.161	186.186	231.233	186.186	210.210	155.161				M	
br962	23	br962; br963; br965; br966; br968; br971; hr1373; hr1374; hr1375; hr1377; hr1379; hr1380; br2389; br2392; br2393; br2921; br2926; br2936; br2939; br2944; br3697; br3702; br3718;		1		1		1	9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	F	
br962	23	br962; br963; br965; br966; br968; br971; hr1373; hr1374; hr1375; hr1377; hr1379; hr1380; br2389; br2392; br2393; br2921; br2926; br2936; br2939; br2944; br3697; br3702; br3718;	1						9	152.160	155.155	176.186	231.233	190.190	210.210	155.161			229.239	F	
br97	9	br97; br1378; br1389; br2788; br2861; br2863; br3841; br3842; br3843;			1			1	10	152.156	153.155	174.176	231.237	186.190	210.210	165.165	184.184		223.229	F	
br974	7	br974; br977; br2858; br2901; br2903; br3646; br3649;				1		1	9	140.160	151.161	176.184	231.233	186.190	208.214	155.161			239.249	F	
br979	15	br979; br982; br984; br985; hr1695; hr1700; hr1709; hr2897; hr2882; hr2891; hr2893; br3602; br3617; br3619; br3402;					1		10	150.152	151.159	176.184	221.231	190.190	210.210	155.155		129.145	223.225	F	
br979	15	br979; br982; br984; br985; hr1695; hr1700; hr1709; hr2897; hr2882; hr2891; hr2893; br3602; br3617; br3619; br3402;			1			1	10	150.152	151.159	176.184	221.231	190.190	210.210	155.155		129.145	223.225	F	
hr1	15	hr1; hr3; hr5; hr7; hr8; hr9; hr10; hr196; hr197; br2798; br2799; br2851; br3592; br3598; br3640;				1		1	9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	F	
hr1	15	hr1; hr3; hr5; hr7; hr8; hr9; hr10; hr196; hr197; br2798; br2799; br2851; br3592; br3598; br3640;							9	152.160	151.153	183.186	221.223	186.190	210.212	153.161			239.239	F	
hr105	31	hr105; hr106; hr109; hr110; hr363; hr364; hr367; hr368; hr370; hr320; hr321; hr323; hr325; hr327; hr329; hr331; hr336; hr338; hr341; hr343; hr344; hr371; hr376; hr377; hr378; hr379; hr1480; hr1471; hr1472; hr1645; hr1997;	1	1		1			10	140.160	149.149	172.174	221.233	180.186	208.210	161.161		129.149	223.229	F	
hr12	14	hr12; hr251; hr728; hr837; hr831; hr2206; hr2221; hr2250; hr2235; hr2248; hr2251; hr2994; hr2974; hr2993;				1		1	9	152.160	151.155	177.178	231.231	190.196	210.210	155.161			239.249	M	
hr1219	3	hr1219; br2090; br2095;	1						9	160.160	149.155	172.186	221.233	190.190	210.214	153.161			239.247	M	
hr1219	3	hr1219; br2090; br2095;	1						9	160.160	149.155	172.186	221.233	190.190	210.214	153.161			239.247	M	
hr1242	3	hr1242; hr1235; hr2814;	1					1	9	140.140	149.153	174.184	221.233	180.190	210.210	151.155			229.239	F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
hr125	19	hr125; hr127; hr129; br643; br644; br649; br655; br656; hr1682; hr2101; hr2103; hr2508; hr2509; hr2510; hr2511; hr2606; hr2598; br2704; br2719;		1					10	152.152	153.161	178.186	221.231	180.190	208.208	139.161		127.133	239.239	F	
hr125	19	hr125; hr127; hr129; br643; br644; br649; br655; br656; hr1682; hr2101; hr2103; hr2508; hr2509; hr2510; hr2511; hr2606; hr2598; br2704; br2719;			1	1	1	1	10	152.152	153.161	178.186	221.231	180.190	208.208	139.161		127.133	239.239	F	
hr1289	20	hr1289; hr1290; hr1291; hr1292; hr1294; hr1297; hr1275; hr1277; hr1274; hr1276; hr1280; hr1281; hr1282; hr1284; hr1285; hr1618; hr1636; hr1622; hr1631; hr1632;	1	1					9	160.160	151.155	176.178	221.233	190.196	210.210	151.161			223.225	M	
hr13	21	hr13; hr15; hr249; hr253; hr618; hr620; hr624; hr626; hr726; hr835; hr828; hr1514; hr1522; hr1791; hr1713; hr1717; hr1720; hr2422; hr2425; hr2424; hr2984;		1	1		1	1	10	152.160	149.155	178.186	231.231	190.190	210.214	155.155		127.145	229.239	F	
hr130	13	hr130; hr131; hr132; hr134; br641; br642; br645; br650; hr1684; hr1688; hr1690; hr2108; br2699;		1					10	152.154	153.159	176.186	221.221	180.186	208.210	141.161		129.133	223.239	F	
hr130	13	hr130; hr131; hr132; hr134; br641; br642; br645; br650; hr1684; hr1688; hr1690; hr2108; br2699;			1	1			10	152.154	153.159	176.186	221.221	180.186	208.210	141.161		129.133	223.239	F	
hr1356	8	hr1356; hr1357; hr1358; hr1360; hr1364; hr1365; hr1367; hr1368;	1						9	156.160	149.161	186.186	231.237	186.186	208.210	161.161			223.223	M	
hr137	12	hr137; hr139; hr140; hr753; hr754; hr756; hr757; hr758; br2894; br2897; br2874; br2984;			1	1			9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	M	
hr137	12	hr137; hr139; hr140; hr753; hr754; hr756; hr757; hr758; br2894; br2897; br2874; br2984;							9	152.158	151.155	172.186	231.237	186.190	208.210	161.161			223.247	M	
hr138	17	hr138; hr743; hr745; hr747; hr748; hr750; hr751; hr752; hr741; hr742; 2012-1668; 2012-1669; 2012-1670; 2012-1671; 2012-1672; 2012-1673; 2012-1674;							9	152.156	161.161	172.176	221.221	186.186	208.210	161.161				M	
hr1405	8	hr1405; hr1408; hr1410; hr1412; hr1413; hr1414; hr1416; hr1417;	1						9	158.160	151.151	172.184	223.231	186.190	208.210	161.161			229.249	M	
hr1449	5	hr1449; hr1454; hr1640; hr1649; hr2141;	1	1		1			9	152.160	149.161	174.180	221.233	180.186	210.210	155.161			229.229	F	
hr151	12	hr151; hr155; hr158; hr717; hr718; hr724; hr2407; hr2760; hr2764; hr2772; hr2777; hr2775;					1	1	10	160.160	149.149	178.184	221.221	186.190	210.210	155.165		129.129	229.249	F	
hr152	2	hr152; hr153;							10	160.160	149.149	184.186	221.237	186.190	210.210	155.161		129.133	223.249	F	
hr154	5	hr154; hr719; hr721; hr2403; hr2563;					1	1	9	156.160	149.161	178.186	221.237	186.186	208.210	161.165			223.249	M	
hr1586	5	hr1586; hr1588; hr1590; hr1592; br3831;						1	9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	F	
hr1586	5	hr1586; hr1588; hr1590; hr1592; br3831;		1					9	152.152	159.161	176.186	221.231	186.190	208.208	139.141			223.239	F	
hr16	8	hr16; hr18; hr20; hr21; hr52; hr53; hr56; hr57;							8	140.160	149.149	174.184	221.233	190.190	210.214	155.155				M	
hr161	3	hr161; hr170; hr272;							8	152.152	155.159	176.178	221.233	186.196	210.210	141.155				M	
hr164	8	hr164; hr269; hr270; hr271; 2012-653; 2012-655; 2012-656; 2012-762;							9	140.160	151.159	172.178	221.233	190.190	210.210	141.155				F	
hr1654	4	hr1654; hr2997; hr3001; hr2972;		1				1	9	140.160	149.151	172.180	221.233	180.180	208.210	155.161			229.229	M	
hr167	9	hr167; 2012-747; 2012-750; 2012-755; 2012-758; 2012-760; 2012-793; 2012-1143; 2012-1144;							9	140.152	151.155	178.184	221.231	186.190	210.210	139.155				F	
hr173	4	hr173; hr177; hr382; hr385;							8	140.160	153.155	172.186	221.233	186.186	208.208	141.153				F	
hr1779	3	hr1779; hr3010; hr3019;			1			1	9	152.160	155.159	178.184	231.237	186.190	210.210	161.161			239.239	M	
hr180	2	hr180; hr181;							8	156.160	151.155	172.172	221.221	190.190	208.210	161.161				M	
hr183	34	hr183; hr185; hr187; hr189; hr191; hr192; hr193; hr475; hr477; hr479; hr480; hr506; hr507; hr512; hr513; hr514; hr683; hr684; hr685; hr687; hr688; hr689; hr690; hr691; hr1571; hr1579; hr1582; hr1583; hr1584; hr1769; hr2358; hr2361; hr2370; hr2371;		1	1	1			9	140.160	151.157	178.183	221.221	186.190	210.210	153.165			229.239	F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
hr1833	3	hr1833; hr1838; hr1857;			1				9	158.160	153.155	174.174	231.231	186.190	208.210	153.161			225.247	M	
hr188	11	hr188; hr1565; hr1546; hr1559; hr1560; hr1561; hr1563; hr1564; hr2483; hr2485; hr2847;		1			1	1	9	140.140	149.151	178.180	221.221	180.190	210.210	153.155			239.249	M	
hr1911	5	hr1911; hr1894; hr1901; hr1907; hr2741;			1			1	9	152.156	153.159	174.174	223.233	186.190	208.208	153.161			223.229	M	
hr208	12	hr208; hr209; hr212; hr213; hr214; hr215; hr217; hr218; hr198; hr201; hr204; hr205;							8	160.160	149.155	172.177	221.231	190.190	208.210	161.161				F	
hr2185	2	hr2185; hr2200;				1			9	152.152	155.159	178.178	221.221	190.196	210.210	153.161			225.229	F	
hr219	27	hr219; hr226; hr229; hr1801; hr1800; hr1807; hr1809; hr1849; hr2292; hr2300; hr2304; hr2315; hr2472; hr2473; hr2474; hr2475; hr2477; hr2502; hr2504; hr2507; hr2909; hr2902; br3625; br3630; br3634; br3600; br3624;					1		9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	F	
hr219	27	hr219; hr226; hr229; hr1801; hr1800; hr1807; hr1809; hr1849; hr2292; hr2300; hr2304; hr2315; hr2472; hr2473; hr2474; hr2475; hr2477; hr2502; hr2504; hr2507; hr2909; hr2902; br3625; br3630; br3634; br3600; br3624;			1	1	1	1	9	140.152	149.155	178.186	221.231	190.190	210.214	155.155			239.239	F	
hr22	7	hr22; hr412; hr418; hr536; hr543; hr740; hr2376;					1		9	140.160	149.149	174.184	221.233	186.190	208.210	155.161			223.249	F	
hr220	3	hr220; br2752; br2755;			1				9	140.160	149.155	176.178	221.231	180.190	210.214	155.155			239.249	M	
hr220	3	hr220; br2752; br2755;							9	140.160	149.155	176.178	221.231	180.190	210.214	155.155			239.249	M	
hr223	6	hr223; hr228; hr240; hr1655; hr1657; hr1661;		1					10	152.160	155.155	176.186	231.231	190.190	210.214	155.155		127.127	229.239	F	
hr230	40	hr230; hr231; hr232; hr234; hr235; hr236; hr237; hr241; hr243; hr244; hr245; br1063; br1064; br1065; br1066; br1067; br1068; br1069; br1149; br1159; br1323; br1324; br1327; br1329; br1331; br1334; br1335; br1337; br1339; br1340; br1341; hr1532; hr2091; hr2081; hr2088; hr2787; br3637; br3612; br3404; br3713;					1	1	10	140.152	149.149	178.180	221.221	180.190	210.210	155.155		129.129	239.249	M	
hr230	40	hr230; hr231; hr232; hr234; hr235; hr236; hr237; hr241; hr243; hr244; hr245; br1063; br1064; br1065; br1066; br1067; br1068; br1069; br1149; br1159; br1323; br1324; br1327; br1329; br1331; br1334; br1335; br1337; br1339; br1340; br1341; hr1532; hr2091; hr2081; hr2088; hr2787; br3637; br3612; br3404; br3713;		1		1		1	10	140.152	149.149	178.180	221.221	180.190	210.210	155.155		129.129	239.249	M	
hr2377	1	hr2377;					1		9	160.160	149.155	174.178	221.233	186.196	208.210	151.155			223.249	F	
hr24	24	hr24; hr26; hr27; hr29; hr30; hr33; hr79; hr83; hr85; hr1321; hr1306; hr1316; hr1317; hr1319; hr1327; hr1917; hr1929; hr1933; hr1936; hr2284; hr2075; hr2071; hr2061; hr2068;	1		1	1			9	160.160	149.149	184.186	221.233	186.190	210.210	155.165			229.229	F	
hr2428	8	hr2428; hr2430; hr2556; br3496; br3497; br3505; br3511; br3514;					1		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	M	
hr2428	8	hr2428; hr2430; hr2556; br3496; br3497; br3505; br3511; br3514;					1		9	152.160	151.155	174.176	221.231	186.186	210.210	141.161			223.229	M	
hr2467	10	hr2467; hr2460; hr2462; hr2463; hr2465; hr2466; br3639; br3423; br3429; br3438;					1		10	152.160	151.163	172.178	221.231	186.196	210.210	161.161		127.129	225.229	M	
hr2467	10	hr2467; hr2460; hr2462; hr2463; hr2465; hr2466; br3639; br3423; br3429; br3438;					1		10	152.160	151.163	172.178	221.231	186.196	210.210	161.161		127.129	225.229	M	
hr2512	2	hr2512; hr2513;					1		9	140.160	151.161	172.186	221.231	180.190	208.210	161.165			223.239	M	
hr2537	1	hr2537;					1		9	158.160	151.155	172.176	221.231	180.186	208.210	153.161			223.229	F	
hr256	7	hr256; hr265; hr267; hr288; hr350; hr356; hr358;							8	158.160	149.155	172.186	221.237	180.186	210.210	153.161				F	
hr257	7	hr257; hr259; hr264; hr287; hr346; hr351; hr359;							8	160.160	149.151	172.176	221.221	180.180	210.210	153.161				F	
hr262	6	hr262; hr266; hr282; hr284; hr348; hr355;							9	152.160	151.155	172.172	221.237	180.186	210.210	161.161			247.249	F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
hr274	57	hr274; hr275; hr276; hr277; hr278; hr279; hr280; hr560; hr562; hr566; hr569; hr570; hr571; hr574; hr575; hr576; hr577; hr578; hr581; hr582; br450; br454; br456; br459; br461; br463; br467; br468; br470; br473; br475; br476; hr1989; hr1972; hr1973; hr1984; hr1960; hr1964; hr1967; hr2597; br2379; br2362; br2363; br2366; br2369; br2372; br2377; br2378; br2359; br2328; br2330; br2331; br2333; br2334; br2337; br2339; br2360;	1						10	140.160	155.159	178.183	231.233	186.196	208.210	161.161		127.139	229.239	M	
hr274	57	hr274; hr275; hr276; hr277; hr278; hr279; hr280; hr560; hr562; hr566; hr569; hr570; hr571; hr574; hr575; hr576; hr577; hr578; hr581; hr582; br450; br454; br456; br459; br461; br463; br467; br468; br470; br473; br475; br476; hr1989; hr1972; hr1973; hr1984; hr1960; hr1964; hr1967; hr2597; br2379; br2362; br2363; br2366; br2369; br2372; br2377; br2378; br2359; br2328; br2330; br2331; br2333; br2334; br2337; br2339; br2360;				1		1	10	140.160	155.159	178.183	231.233	186.196	208.210	161.161		127.139	229.239	M	
hr289	36	hr289; hr290; hr293; hr294; hr298; hr300; hr301; hr302; hr303; hr304; hr305; hr306; hr401; hr405; hr411; hr414; hr417; hr419; hr420; hr528; hr533; hr535; hr538; hr540; hr544; hr735; hr736; hr737; hr738; hr2002; hr2009; hr2560; hr2581; hr2584; hr2585; hr2586;				1	1		9	140.160	149.149	174.174	221.233	180.186	208.210	151.161			223.239	F	
hr342	6	hr342; hr1473; hr1474; hr1476; hr1647; hr2145;	1	1		1			9	140.152	149.151	172.176	221.221	180.186	210.210	155.161			223.229	M	
hr35	16	hr35; hr254; hr621; hr1517; hr1523; hr1786; hr2431; hr2432; hr2433; hr2434; hr2435; hr2408; hr2409; hr2410; hr2413; hr2957;		1	1		1	1	9	152.160	149.151	176.178	231.231	190.196	210.214	151.155			229.239	F	
hr38	52	hr38; hr41; hr42; br1115; br1118; br1120; br1121; br1122; br1123; br1124; br1125; br1146; br1147; hr1938; hr1937; hr1941; hr1944; hr1948; hr1951; hr1955; hr2230; hr2216; hr2022; hr2027; hr2029; br2725; br2703; br2707; br2712; br2714; br2717; br2723; br2724; br3293; br3282; br3284; br3286; br3292; br3296; br3298; br3343; br3345; br3348; br3350; br3440; br3835; br3840; br3827; br3839; br3813; br3820; br3822;		1			1	1	10	152.160	159.159	172.176	231.233	190.196	210.210	141.153		129.129	223.223	M	
hr38	52	hr38; hr41; hr42; br1115; br1118; br1120; br1121; br1122; br1123; br1124; br1125; br1146; br1147; hr1938; hr1937; hr1941; hr1944; hr1948; hr1951; hr1955; hr2230; hr2216; hr2022; hr2027; hr2029; br2725; br2703; br2707; br2712; br2714; br2717; br2723; br2724; br3293; br3282; br3284; br3286; br3292; br3296; br3298; br3343; br3345; br3348; br3350; br3440; br3835; br3840; br3827; br3839; br3813; br3820; br3822;			1	1			10	152.160	159.159	172.176	231.233	190.196	210.210	141.153		129.129	223.223	M	
hr388	22	hr388; hr391; hr392; hr393; hr395; hr397; hr760; hr762; hr1614; hr1597; hr1599; hr1600; hr1601; hr1612; hr1602; hr1604; hr1606; hr1609; hr1611; hr1613; hr2540; hr2541;		1			1		9	140.160	149.151	174.176	221.221	180.180	208.210	153.161			229.229	F	
hr421	15	hr421; hr423; hr425; hr629; hr631; hr632; hr633; hr634; hr730; hr839; hr840; hr841; hr843; hr846; hr847;							10	160.160	149.149	178.186	221.221	186.190	210.214	155.165		129.145	225.229	F	
hr426	12	hr426; hr428; hr430; hr432; hr1728; hr1730; hr1734; hr2321; hr2317; hr2448; hr2456; br3666;						1	9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	F	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

			Captures						Genetic Data												
Individual	# of Samples	List of Samples	Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
hr426	12	hr426; hr428; hr430; hr432; hr1728; hr1730; hr1734; hr2321; hr2317; hr2448; hr2456; br3666;			1	1			9	152.160	155.159	178.184	233.237	186.190	210.214	155.155			223.239	F	
hr47	10	hr47; hr48; hr49; hr50; hr51; 2012-493; 2012-497; 2012-535; 2012-1284; 2012-1289;							9	152.156	149.149	172.174	221.233	186.196	210.214	157.161				M	
hr488	20	hr488; hr489; hr490; hr492; hr493; hr494; hr498; hr500; hr502; hr780; br137; br139; br1284; br1287; br1288; br1298; br1300; hr3032; hr3018; br3227;					1		11	152.152	149.155	178.186	231.231	190.196	210.210	155.161	184.194	127.127	229.239	F	
hr488	20	hr488; hr489; hr490; hr492; hr493; hr494; hr498; hr500; hr502; hr780; br137; br139; br1284; br1287; br1288; br1298; br1300; hr3032; hr3018; br3227;						1	11	152.152	149.155	178.186	231.231	190.196	210.210	155.161		127.127	229.239	F	
hr583	16	hr583; hr584; hr588; hr592; hr594; hr596; hr597; hr600; hr602; hr788; hr789; hr790; br393; hr2162; hr2160; hr2161;							10	140.152	151.153	174.176	221.221	180.186	208.210	139.153		127.129	229.229	F	
hr583	16	hr583; hr584; hr588; hr592; hr594; hr596; hr597; hr600; hr602; hr788; hr789; hr790; br393; hr2162; hr2160; hr2161;				1			10	140.152	151.153	174.176	221.221	180.186	208.210	139.153		127.129	229.229	F	
hr60	68	hr60; hr443; hr444; hr445; hr446; hr87; hr58; hr148; hr179; hr122; hr308; hr312; hr313; hr517; hr519; hr524; hr526; hr546; hr547; hr548; hr550; hr552; hr555; hr556; hr558; hr559; hr663; hr664; hr665; hr666; hr667; hr668; hr669; hr670; hr671; hr672; hr799; hr801; hr803; hr805; hr806; hr807; hr1500; hr1501; hr1504; hr1540; hr2037; hr2042; hr2415; hr2416; hr2417; hr2418; hr2421; hr2420; hr2381; hr2382; hr2388; hr2515; hr2516; hr2518; hr2519; hr2796; hr3048; hr3051; hr3065; hr3056; hr3062; hr3067;		1		1	1	1	9	140.160	149.155	174.186	233.252	180.190	210.210	153.161			223.239	F	
hr605	22	hr605; hr606; hr607; hr608; hr611; hr612; hr613; hr614; hr615; br1456; br1458; hr2353; hr2329; hr2339; hr2350; hr2354; hr2270; hr2093; hr2265; hr2273; hr2396; hr2397;							10	156.158	151.151	186.186	221.237	186.190	210.210	161.161		127.129	223.249	M	
hr605	22	hr605; hr606; hr607; hr608; hr611; hr612; hr613; hr614; hr615; br1456; br1458; hr2353; hr2329; hr2339; hr2350; hr2354; hr2270; hr2093; hr2265; hr2273; hr2396; hr2397;				1	1		10	156.158	151.151	186.186	221.237	186.190	210.210	161.161		127.129	223.249	M	
hr61	29	hr61; hr448; hr450; hr451; hr456; hr457; hr458; hr459; hr146; hr763; hr765; hr766; hr767; hr768; hr769; hr770; hr771; hr772; hr1470; hr1463; hr1464; hr1468; hr1469; hr2543; hr2544; hr2545; hr2547; hr2548; hr2555;	1				1		9	140.160	151.151	176.176	221.233	180.190	208.210	153.161			225.229	M	
hr635	19	hr635; hr638; hr639; hr642; hr643; hr644; hr645; hr1421; hr1537; hr1543; hr1671; hr1674; hr1810; hr1819; hr1816; hr2854; hr2869; hr2875; hr2876;	1	1	1			1	9	152.160	151.153	174.178	221.231	186.186	210.210	161.165			229.239	F	
hr646	12	hr646; hr647; hr648; hr650; hr652; hr656; hr657; hr661; hr1864; hr1881; hr2398; hr2400;			1		1		9	140.160	149.149	184.186	221.231	190.190	210.210	161.161			229.249	F	
hr66	50	hr66; hr69; hr76; hr434; hr435; hr439; hr440; hr462; hr463; hr465; hr466; hr468; hr471; hr472; hr473; hr474; hr708; hr811; hr814; hr816; hr817; hr818; hr819; hr820; hr821; hr822; hr823; hr1567; hr1569; hr1573; hr1574; hr1578; hr2691; br2397; br2400; br2403; br2406; br2411; br2414; br2417; br2419; br2421; br2425; br2479; br3140; br3150; br3151; br3154; br3157; br3261;		1			1		9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	M	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 2. Summary of Individual Grizzly Bear Genotypes and Capture/Recapture Rates, 2013

Individual	# of Samples	List of Samples	Captures						Genetic Data												
			Session 1	Session 2	Session 3	Session 4	Session 5	Session 6	Loci	G10B	CXX110	G1D	G10H	G10J	G10M	G10P	G1A	CXX20	MU59	Sex	Similar Genotypes
hr66	50	hr66; hr69; hr76; hr434; hr435; hr439; hr440; hr462; hr463; hr465; hr466; hr468; hr471; hr472; hr473; hr474; hr708; hr811; hr814; hr816; hr817; hr818; hr819; hr820; hr821; hr822; hr823; hr1567; hr1569; hr1573; hr1574; hr1578; hr2691; br2397; br2400; br2403; br2406; br2411; br2414; br2417; br2419; br2421; br2425; br2479; br3140; br3150; br3151; br3154; br3157; br3261;		1				1	9	140.156	155.161	174.178	221.231	190.196	210.214	159.161			223.239	M	
hr673	1	hr673;							8	160.160	149.155	177.186	231.233	180.190	210.210	161.161				F	
hr674	2	hr674; hr1829;			1				9	140.160	149.155	174.177	231.233	190.190	210.210	161.161			225.249	F	
hr676	3	hr676; hr850; hr858;							8	160.160	151.159	177.186	221.221	186.196	208.214	153.161				F	
hr677	10	hr677; hr678; hr680; hr681; hr682; hr853; hr859; hr1254; hr1248; hr1259;	1						10	140.160	153.159	177.177	221.221	186.190	208.210	161.161		127.127	223.249	M	
hr679	2	hr679; hr851;							10	140.160	149.151	177.177	221.233	186.190	208.210	161.161		127.129	229.249	M	
hr686	12	hr686; hr1425; hr1423; hr1549; hr1554; hr1555; hr2481; hr2489; hr2665; hr2625; hr2852; hr2913;	1	1			1	1	9	140.160	149.151	180.183	221.221	186.190	210.210	153.155			229.249	F	
hr693	22	hr693; hr694; hr695; hr696; hr697; hr699; hr701; hr702; hr703; hr704; hr706; hr707; hr710; br888; br891; br893; br894; br898; br903; br904; br905; br913;							10	140.160	153.161	172.174	221.221	186.186	208.210	139.153		123.145	225.229	M	
hr693	22	hr693; hr694; hr695; hr696; hr697; hr699; hr701; hr702; hr703; hr704; hr706; hr707; hr710; br888; br891; br893; br894; br898; br903; br904; br905; br913;							10	140.160	153.161	172.174	221.221	186.186	208.210	139.153		123.145	225.229	M	
hr698	13	hr698; br186; br187; br188; br190; br191; br192; br193; br337; br1196; br2137; br2744; br2746;	1		1				11	160.160	155.161	172.176	233.237	186.196	210.214	139.155	184.184	129.133	223.249	M	
hr698	13	hr698; br186; br187; br188; br190; br191; br192; br193; br337; br1196; br2137; br2744; br2746;							11	160.160	155.161	172.176	233.237	186.196	210.214	139.155		129.133	223.249	M	
hr70	4	hr70; hr75; br3589; br3590;						1	9	158.160	151.161	178.184	231.231	186.186	210.214	161.161			239.249	M	
hr70	4	hr70; hr75; br3589; br3590;							9	158.160	151.161	178.184	231.231	186.186	210.214	161.161			239.249	M	
hr711	6	hr711; hr712; hr716; br63; br348; br349;							11	140.160	149.153	177.184	221.233	190.190	210.214	155.161	184.184	127.129	229.249	M	
hr711	6	hr711; hr712; hr716; br63; br348; br349;							11	140.160	149.153	177.184	221.233	190.190	210.214	155.161		127.129	229.249	M	
hr732	7	hr732; hr733; hr734; hr782; hr783; hr784; hr785;							8	156.160	151.161	176.186	221.231	186.190	210.210	161.161				M	2MM:br219
hr775	38	hr775; hr777; br1; br3; br5; br7; br9; br12; br13; br14; br15; br18; br52; br53; br55; br59; br65; br1030; br1035; br1296; br2757; br2759; br2762; br2775; br3201; br3163; br3167; br3177; br3202; br3234; br3231; br3235; br3243; br3250; br3239; br3251; br3254; br3255;			1		1		11	156.160	159.159	178.184	233.237	186.190	208.210	161.161	184.184	129.129	239.239	M	
hr775	38	hr775; hr777; br1; br3; br5; br7; br9; br12; br13; br14; br15; br18; br52; br53; br55; br59; br65; br1030; br1035; br1296; br2757; br2759; br2762; br2775; br3201; br3163; br3167; br3177; br3202; br3234; br3231; br3235; br3243; br3250; br3239; br3251; br3254; br3255;							11	156.160	159.159	178.184	233.237	186.190	208.210	161.161		129.129	239.239	M	
hr794	2	hr794; hr795;							8	140.152	149.153	184.186	221.221	180.186	210.214	155.165				M	
hr845	1	hr845;							8	152.160	149.149	178.180	221.221	180.186	210.214	155.155				F	
hr860	15	hr860; hr1332; hr1333; hr1346; hr1491; hr1493; hr1494; hr1497; hr1883; hr1878; hr2401; hr2402; hr2399; hr2712; hr2733;	1	1	1		1	1	9	160.160	149.155	174.186	221.231	186.190	210.214	161.165			229.229	F	
hr89	8	hr89; hr90; hr91; hr93; hr95; hr97; hr99; hr104;							8	160.160	157.159	178.183	221.221	186.190	208.210	153.165				M	

** Bears are duplicated on the list because they were observed in Hackett River DNA Study Area and Adjacent Study Area.*

Appendix 3

Distance Travelled by Individual Grizzly Bears during the 2013 Survey Period

Rescan™
an ERM company

Appendix 3. Distance Travelled by Individual Grizzly Bears during the 2013 Survey Period

Bear ID	Gender	Potential Family Group	Length (km)
hr13 and hr35	Female, Female	Yes	26.7
hr105, hr1449, and hr342	Female, Female, Male	Yes	26.4
hr188 and hr686	Male, Female	Yes	12.3
hr646 and hr860	Female, Female	Yes	16.7
br1086	Female		48.5
br1088	Female		45.6
br128	Female		39.2
br146	Female		11.0
br195	Female		11.9
br199	Female		112.6
br220	Female		34.7
br237	Female		6.6
br2733	Female		12.6
br33	Female		11.0
br350	Female		19.2
br423	Female		76.7
br584	Female		34.7
br598	Female		26.1
br758	Female		14.0
br962	Female		23.4
br97	Female		22.0
br979	Female		34.1
hr1	Female		8.1
hr1242	Female		47.9
hr125	Female		21.2
hr130	Female		9.3
hr151	Female		16.8
hr1586	Female		9.3
hr183	Female		12.3
hr219	Female		24.7
hr24	Female		17.2
hr388	Female		12.1
hr426	Female		26.0
hr488	Female		16.0
hr60	Female		26.8
hr635	Female		37.8
1065	Male		95.6
br101	Male		64.0
br172	Male		44.6
br2232	Male		60.1
br2240	Male		24.6
br2302	Male		49.7
br244	Male		64.9
br2508	Male		10.9
br26	Male		29.0
br2785	Male		19.0
br486	Male		38.0
br696	Male		52.5
br774	Male		58.6
hr12	Male		36.0
hr1219	Male		59.1
hr1289	Male		37.6
hr137	Male		29.04905678
hr1654	Male		12.3998396
hr230	Male		66.15523576
hr2428	Male		109.1600869
hr2467	Male		48.93086532
hr274	Male		72.27645084
hr38	Male		100.83141
hr605	Male		26.81760325
hr61	Male		27.53180939
hr66	Male		64.49106559
hr698	Male		29.20049063
hr775	Male		44.64939329

Appendix 4

Area Used by Individual Grizzly Bears during the 2013 Survey Period

Rescan™
an ERM company

Appendix 4. Area Used by Individual Grizzly Bears during the 2013 Survey Period

Bear ID	Gender	Potential Family Group	Area (km^2)
hr13, hr35	Female, female	Yes	142.3
hr860, hr646	Female, female	Yes	69.7
hr105, hr342, hr1449	Female, female, male	Yes	70.8
br1086	Female		389.9
br1088	Female		176.6
br199	Female		1,169.5
br218	Female		50.0
br220	Female		131.8
br423	Female		218.3
br584	Female		158.6
br962	Female		141.1
br979	Female		151.5
hr125	Female		141.9
hr219	Female		128.7
hr24	Female		72.4
hr60	Female		354.2
hr635	Female		145.2
1065	Male		2,285.5
br172	Male		195.1
br2232	Male		1,091.6
br2240	Male		30.0
br2302	Male		110.5
br244	Male		730.3
br696	Male		315.7
br774	Male		1,110.0
hr12	Male		3.3
hr1289	Male		427.9
hr230	Male		1,507.9
hr274	Male		182.6
hr38	Male		2,572.0
hr605	Male		74.7
hr66	Male		719.1
hr775	Male		264.2

Appendix 5

Remote Camera Grizzly Bear Observations, 2013

Rescan™
an ERM company

Appendix 5. Remote Camera Grizzly Bear Observations, 2013

Cell #	Camera #	Date	Session #	# Animals	Photos #	Comment	Previously Counted?
B25	2	7-Jul-13	4	1	2978-3097	-	No
B25	2	26-Jul-13	6	3	655-905	-	No
B25	2	29-Jul-13	6	1	1599-1698	-	No
B25	2	30-Jul-13	6	1	1751-1811	-	Unknown
B26	55	4-Jun-13	1	1	4111-4170	Knocked down grizzly tripod.	No
B26	55	6-Jul-13	4	1	912-931	Knocked down grizzly tripod.	Unknown
B26	55	15-Jul-13	5	1	446-455	Knocked down grizzly tripod.	Unknown
B35	13	31-May-13	1	1	1092-1641	-	No
B35	13	4-Jun-13	1	1	1812-1981	-	No
B35	13	4-Jun-13	1	1	1989-2058	-	Unknown
B35	13	23-Jun-13	3	1	859	-	No
B35	13	23-Jun-13	3	1	666-826	Tripod baited with blood on 06/22/2013	Unknown
B35	13	23-Jun-13	3	1	839-899	-	Unknown
B35	13	24-Jun-13	3	1	921-1171	-	Unknown
B35	13	29-Jul-13	6	1	881-950	-	No
B35	13	30-Jul-13	6	2	1046-1156	-	No
B35	13	30-Jul-13	6	1	1188-1197	-	Unknown
B35	13	2-Aug-13	6	1	1607-1717	-	No
B58	35	8-Jun-13	1	1	4511-4540	-	No

Appendix 6

Detailed Field Hair Collection and Genetic Marker Data for Wolverines

Rescan™
an ERM company

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
South Study Grid																						
BRWV224S	Xspecies			WV01S	1	4/5/2013	AM1			white hairs, not wolverine	0											
BRWV225S	Xspecies			WV01S	1	4/5/2013	BM1			white hairs, not wolverine	0											
BRWV226S	Xbomb			WV02S	1	4/5/2013	AM1		20		0										50.50	
BRWV227S	Xbomb			WV02S	1	4/5/2013	CM1	1			0						33.133					
BRWV234S	sample	BRWV432S	WV432S	WV04S	1	4/5/2013	AM1	10			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV230S	Xbomb			WV05S	1	4/5/2013	AH1		30		0										50.50	
BRWV233S	Xbomb			WV05S	1	4/5/2013	BH1		30		0		55.55									
BRWV228S	Xbomb			WV07S	1	4/5/2013	BH1		15	may not be wolverine	0										250.50	
BRWV229S	Xbomb			WV07S	1	4/5/2013	AM1		20	wolvereine?	0										250.50	
BRWV232S	sample	BR_WV_2012_00148	WV148	WV08S	1	4/5/2013	AH1	10			8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV235S	Xspecies			WV09S	1	4/5/2013	AH1			fluffy white hair, not wolverine	0											
BRWV236S	Xspecies			WV09S	1	4/5/2013	BM1			fluffy white hair, not wolverine	0											
BRWV248S	Xbomb			WV13S	1	4/8/2013	AM1	1			0		47.147	129.29			31.33					
BRWV249S	Xbomb			WV14S	1	4/8/2013	AM1	2			0			39.141								
BRWV250S	Xinadequate			WV14S	1	4/8/2013	DM1			no root	0											
BRWV251S	Xinadequate			WV14S	1	4/8/2013	CM1			no root	0											
BRWV252S	Xinadequate			WV14S	1	4/8/2013	DM2			no root	0											
BRWV264S	Xinadequate			WV17S	1	4/8/2013	AL1			no hair	0											
BRWV265S	Xinadequate			WV17S	1	4/8/2013	DM1			no root	0											
BRWV262S	Xbomb			WV19S	1	4/8/2013	AM1		10		0											
BRWV263S	Xbomb			WV19S	1	4/8/2013	DH1		30		0											
BRWV260S	Xbomb			WV20S	1	4/8/2013	AL1		30		0						125.33				50.250	
BRWV261S	Xbomb			WV20S	1	4/8/2013	BL1		20		0										250.50	
BRWV255S	sample	BRWV255S	WV255S	WV21S	1	4/8/2013	AM1	10			8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			250.250	
BRWV256S	sample	BRWV256S	WV256S	WV21S	1	4/8/2013	AH1	10			8	204.206	147.161	141.141	171.175	136.136	137.137	168.170			250.250	
BRWV257S	Xsubselect			WV21S	1	4/8/2013	AH2				0											
BRWV258S	sample	BRWV255S	WV255S	WV21S	1	4/8/2013	BM1	10			8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			250.250	
BRWV259S	Xbomb			WV21S	1	4/8/2013	CM1	4			0											
BRWV253S	sample	BRWV255S	WV255S	WV22S	1	4/8/2013	AM1	10			8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			250.250	
BRWV254S	sample	BRWV255S	WV255S	WV22S	1	4/8/2013	DL1	6			8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			250.250	
BRWV244S	Xinadequate			WV25S	1	4/7/2013	AH1			no roots	0											
BRWV245S	Xbomb			WV25S	1	4/7/2013	AM1		5		0											
BRWV246S	Xbomb			WV25S	1	4/7/2013	DH1		30		0						25.25				50.250	
BRWV247S	Xsubselect			WV25S	1	4/7/2013	DH2			uf	0											
BRWV240S	sample	BRWV432S	WV432S	WV26S	1	4/7/2013	AM1		20		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV241S	Xinadequate			WV26S	1	4/7/2013	CL1			no roots	0											
BRWV242S	sample	BRWV432S	WV432S	WV26S	1	4/7/2013	DM1	10			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV243S	Xinadequate			WV26S	1	4/7/2013	DM2				0											
BRWV238S	sample	BRWV255S	WV255S	WV27S	1	4/7/2013	AM1	1			8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			250.250	
BRWV239S	sample	BR_WV_2012_00148	WV148	WV27S	1	4/7/2013	BM1	2			8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV237S	Xbomb			WV29S	1	4/7/2013	AH1	1			0				71.71		33.33				50.250	
BRWV231S	Xinadequate			WV30S	1	4/4/2013	AM1			no roots	0											
BRWV217S	Xbomb			WV33S	1	4/4/2013	AH1		30	yellow hairs	0						31.31					
BRWV218S	Xbomb			WV33S	1	4/4/2013	AM1		20	yellow hairs	0						31.31					
BRWV219S	Xspecies			WV33S	1	4/4/2013	DL1			fluffy white hairs	0											
BRWV220S	Xspecies			WV34S	1	4/4/2013	AM1			fluffy white hair	0											
BRWV221S	Xspecies			WV34S	1	4/4/2013	BH1			fluffy white hair	0											
BRWV222S	Xbomb			WV36S	1	4/4/2013	AH1		5		3	200.206	59.159	129.139	171.73	34.134	33.133	170.172			50.250	
BRWV223S	sample	BR_WV_2012_00045	WV045	WV36S	1	4/4/2013	DM1		10		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV214S	Xsubselect			WV38S	1	4/4/2013	AM1				0											
BRWV215S	sample	BR_WV_2012_00155	WV155	WV38S	1	4/4/2013	AM2	10			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV216S	sample	BR_WV_2012_00155	WV155	WV38S	1	4/4/2013	BM1		15		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV212S	Xbomb			WV39S	1	4/4/2013	AH1		30	yellow hair	0											
BRWV213S	sample	BR_WV_2012_00155	WV155	WV39S	1	4/4/2013	DM1		15		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV210S	sample	BR_WV_2012_00155	WV155	WV40S	1	4/4/2013	AH1	3			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV211S	sample	BR_WV_2012_00155	WV155	WV40S	1	4/4/2013	BM1	2			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV208S	sample	BR_WV_2012_00045	WV045	WV43S	1	4/4/2013	AM1	10			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
BRWV209S	Xbomb			WV43S	1	4/4/2013	DL1		15		1	00.206	59.159	29.139	71.173	34.34	33.133	170.172				
BRWV205S	Xsubselect			WV44S	1	4/4/2013	AH1				0											
BRWV206S	sample	BR_WV_2012_00155	WV155	WV44S	1	4/4/2013	AH2		30		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV207S	sample	BR_WV_2012_00155	WV155	WV44S	1	4/4/2013	BM1	8			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV201S	sample	BR_WV_2012_00155	WV155	WV46S	1	4/4/2013	AH1	10			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV202S	Xinadequate			WV46S	1	4/4/2013	AM1			no rhairs	0											
BRWV203S	sample	BR_WV_2012_00155	WV155	WV46S	1	4/4/2013	BH1		5		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV275S	sample	BRWV432S	WV432S	WV04S	2	4/15/2013	AL1	8			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV277S	sample	BRWV432S	WV432S	WV04S	2	4/15/2013	BM1	1			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV278S	sample	BRWV432S	WV432S	WV04S	2	4/15/2013	CM1	1			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV273S	Xbomb			WV08S	2	4/15/2013	AH1		15		5	204.206	47.147	129.129	71.171	134.136	131.133	168.170			50.250	
BRWV274S	Xsubselect			WV08S	2	4/15/2013	AH2				0											
BRWV279S	Xinadequate			WV09S	2	4/15/2013	AM1			no roots	0											
BRWV280S	Xinadequate			WV09S	2	4/15/2013	AM2			no roots	0											
BRWV281S	Xinadequate			WV09S	2	4/15/2013	BM1			no root	0											
BRWV362S	sample	BR_WV_2012_00006	WV006	WV16S	2	4/14/2013	AM1		15		8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.250	
BRWV282S	Xbomb			WV19S	2	4/15/2013	AM1	1			6	204.206	147.147	129.129	71.171	134.136	131.133	168.170			50.250	
BRWV283S	sample	BR_WV_2012_00148	WV148	WV19S	2	4/15/2013	BM1		15		8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV284S	Xbomb			WV19S	2	4/15/2013	CH1	1			0											
BRWV360S	sample	BR_WV_2012_00172	WV172	WV25S	2	4/14/2013	AM1		20		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV361S	sample	BR_WV_2012_00172	WV172	WV25S	2	4/14/2013	DM1		25	almost looks like grz uf, but can't tell.	8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV359S	sample	BR_WV_2012_00057	WV057	WV26S	2	4/14/2013	AM1	2			8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
BRWV356S	Xspecies			WV28S	2	4/14/2013	AH1			white fluffy uf ~ 5 uf	0											
BRWV357S	sample	BR_WV_2012_00001	WV001	WV28S	2	4/14/2013	AM1		20	not sure if wolverine	8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV358S	sample	BR_WV_2012_00001	WV001	WV28S	2	4/14/2013	CM1		5		8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV353S	sample	BR_WV_2012_00045	WV045	WV29S	2	4/14/2013	AM1	10		uf left	8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV354S	sample	BR_WV_2012_00045	WV045	WV29S	2	4/14/2013	AL1	10			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV355S	sample	BR_WV_2012_00045	WV045	WV29S	2	4/14/2013	BH1	2			8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV350S	sample	BRWV350S	WV350S	WV30S	2	4/14/2013	AM1	10			8	206.206	159.165	139.141	171.171	134.134	137.137	170.174			250.250	
BRWV351S	sample	BRWV350S	WV350S	WV30S	2	4/14/2013	AH1		10		8	206.206	159.165	139.141	171.171	134.134	137.137	170.174			250.250	
BRWV352S	Xinadequate			WV30S	2	4/14/2013	CM1			no roots	0											
BRWV347S	Xbomb			WV32S	2	4/14/2013	AM1		5		0				75.175	34.136						
BRWV348S	sample	BR_WV_2012_00172	WV172	WV32S	2	4/14/2013	CM1		20		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV349S	Xbomb			WV32S	2	4/14/2013	BH1	1			3	02.206	59.159	129.129	171.75	134.136	33.133	170.172			50.250	
BRWV345S	sample	BR_WV_2012_00172	WV172	WV33S	2	4/14/2013	AM1		30	not sure if wolverine	8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV346S	sample	BR_WV_2012_00172	WV172	WV33S	2	4/14/2013	AL1	3			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV341S	sample	BR_WV_2012_00057	WV057	WV34S	2	4/14/2013	AH1		20		10	198.206	159.165	139.143	169.175	134.136	133.137	168.170	191.195	256.268	204.250	
BRWV342S	Xinadequate			WV34S	2	4/14/2013	CM1			no roots	0											
BRWV343S	sample	BR_WV_2012_00057	WV057	WV34S	2	4/14/2013	BM1	2			8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
BRWV344S	Xinadequate			WV34S	2	4/14/2013	BL1			no root	0											
BRWV337S	sample	BR_WV_2012_00045	WV045	WV35S	2	4/14/2013	AM1		30		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV338S	Xsubselect			WV35S	2	4/14/2013	AM2				0											
BRWV339S	Xbomb			WV35S	2	4/14/2013	BM1		30		6	98.00.206	159.161	129.139	171.173	134.136	133.133	170.172			04.250	
BRWV340S	Xinadequate			WV35S	2	4/14/2013	CM1				0											
BRWV336S	sample	BR_WV_2012_00001	WV001	WV37S	2	4/14/2013	AH1	1			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV319S	sample	BR_WV_2012_00172	WV172	WV38S	2	4/14/2013	AH1	6			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV320S	sample	BR_WV_2012_00172	WV172	WV38S	2	4/14/2013	BM1	5			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV321S	sample	BR_WV_2012_00172	WV172	WV38S	2	4/14/2013	DM1		30		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV322S	Xinadequate			WV39S	2	4/14/2013	AH1				0											
BRWV323S	sample	BR_WV_2012_00172	WV172	WV39S	2	4/14/2013	BM1	6			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV324S	Xsubselect			WV39S	2	4/14/2013	DM1			5 uf	0											
BRWV325S	sample	BR_WV_2012_00172	WV172	WV39S	2	4/14/2013	DM2		20		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV326S	sample	BR_WV_2012_00057	WV057	WV40S	2	4/14/2013	AH1		5		8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
BRWV327S	Xinadequate			WV40S	2	4/14/2013	BH1			no roots	0											
BRWV328S	sample	BR_WV_2012_00172	WV172	WV40S	2	4/14/2013	CM1	1			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV329S	sample	BR_WV_2012_00172	WV172	WV40S	2	4/14/2013	DL1	1			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV330S	sample	BR_WV_2012_00045	WV045	WV41S	2	4/14/2013	AM1	1	15		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV331S	Xinadequate			WV41S	2	4/14/2013	BM1			4 uf	0											
BRWV332S	Xinadequate			WV41S	2	4/14/2013	BM2			no roots	0											

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
BRWV333S	sample	BR_WV_2012_00045	WV045	WV42S	2	4/14/2013	AM1	10		uf left	8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV334S	Xsubselect			WV42S	2	4/14/2013	AM2			uf	0											
BRWV335S	Xinadequate			WV43S	2	4/14/2013	AM1			no roots	0											
BRWV318S	sample	BR_WV_2012_00172	WV172	WV44S	2	4/14/2013	AM1		30		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV272S	sample	BR_WV_2012_00155	WV155	WV45S	2	4/14/2013	AH1		10		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV314S	Xinadequate			WV45S	2	4/14/2013	BM1			no roots	0											
BRWV315S	sample	BR_WV_2012_00155	WV155	WV45S	2	4/14/2013	CH1		10		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV316S	sample	BR_WV_2012_00155	WV155	WV45S	2	4/14/2013	CM1		10		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV317S	sample	BR_WV_2012_00172	WV172	WV45S	2	4/14/2013	DM1	3			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV270S	Xbomb			WV46S	2	4/14/2013	AM1	1		small root	0						33.133	72.172				
BRWV271S	Xinadequate			WV46S	2	4/14/2013	BM1			no roots	0											
BRWV268S	sample	BR_WV_2012_00001	WV001	WV47S	2	4/14/2013	AH1	10			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV269S	Xinadequate			WV47S	2	4/14/2013	BH1				0											
BRWV406S	sample	BR_WV_2012_00007	WV007	WV02S	3	4/29/2013	AH1	6			8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.250	
BRWV407S	Xsubselect			WV02S	3	4/29/2013	AH2				0											
BRWV408S	Xsubselect			WV02S	3	4/29/2013	AH3				0											
BRWV409S	sample	BR_WV_2012_00007	WV007	WV02S	3	4/29/2013	AM1	2			10	206.206	147.157	141.147	171.171	136.136	127.133	168.168	183.199	252.252	204.250	
BRWV410S	Xsubselect			WV02S	3	4/29/2013	AM2				0											
BRWV411S	Xsubselect			WV02S	3	4/29/2013	AM3				0											
BRWV412S	Xinadequate			WV02S	3	4/29/2013	BH1			no roots	0											
BRWV413S	Xinadequate			WV02S	3	4/29/2013	BM1			no root	0											
BRWV414S	Xinadequate			WV02S	3	4/29/2013	BM2			1 uf	0											
BRWV415S	sample	BR_WV_2012_00007	WV007	WV02S	3	4/29/2013	BM3	1			8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.250	
BRWV416S	Xsubselect			WV02S	3	4/29/2013	BM4				0											
BRWV417S	sample	BR_WV_2012_00007	WV007	WV02S	3	4/29/2013	CH1	3			10	206.206	147.157	141.147	171.171	136.136	127.133	168.168	183.199	252.252	204.250	
BRWV447S	sample	BR_WV_2012_00057	WV057	WV04S	3	4/29/2013	AH1	6		small roots	8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
BRWV448S	sample	BR_WV_2012_00007	WV007	WV04S	3	4/29/2013	AM1	10		small roots	8	206.206	147.157	141.147	171.171	136.136	127.133	168.168			204.250	
BRWV442S	Xinadequate			WV05S	3	4/29/2013	AM1			no roots	0											
BRWV443S	sample	BRWV432S	WV432S	WV05S	3	4/29/2013	AM2		10		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV444S	Xsubselect			WV05S	3	4/29/2013	AM3				0											
BRWV445S	sample	BRWV432S	WV432S	WV05S	3	4/29/2013	BH1	1			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV446S	sample	BRWV432S	WV432S	WV05S	3	4/29/2013	CM1		5		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV436S	Xbear			WV06S	3	4/29/2013	AH1	10		possible griz, can't tell	2						125.129				204.250	
BRWV437S	Xbear			WV06S	3	4/29/2013	AL1		30	possible griz, can't tell	2					34.34	125.129				204.250	
BRWV438S	Xbear			WV06S	3	4/29/2013	BL1	10			2						125.129				204.250	
BRWV439S	Xsubselect			WV06S	3	4/29/2013	BL2				0											
BRWV440S	Xbear			WV06S	3	4/29/2013	CH1	10		uf left	2						125.129				204.250	
BRWV441S	Xbear			WV06S	3	4/29/2013	CL1	2			2						125.129				204.250	
BRWV428S	Xinadequate			WV07S	3	4/29/2013	AM1			1 small hair, no root	0											
BRWV363S	Xsubselect			WV08S	3	4/29/2013	BM1			10 uf	0											
BRWV364S	Xbear			WV08S	3	4/29/2013	BM2	10		uf left	2						125.129				204.250	
BRWV365S	Xsubselect			WV08S	3	4/29/2013	BM3				0											
BRWV366S	Xsubselect			WV08S	3	4/29/2013	CH1				0											
BRWV367S	Xbear			WV08S	3	4/29/2013	CH2	10			2						125.129				204.250	
BRWV368S	Xbear			WV08S	3	4/29/2013	CL1	10		uf left	2						125.129				204.250	
BRWV369S	Xsubselect			WV08S	3	4/29/2013	CL2				0											
BRWV370S	Xbear			WV08S	3	4/29/2013	DM1	10		uf left	2			41.41			125.129				204.250	
BRWV418S	Xsubselect			WV08S	3	4/29/2013	AH1				0											
BRWV419S	Xsubselect			WV08S	3	4/29/2013	AH2				0											
BRWV420S	Xbear			WV08S	3	4/29/2013	AH3	10			2						125.129				204.250	
BRWV421S	Xbear			WV08S	3	4/29/2013	AM1	10		possible griz?	2						125.129				204.250	
BRWV422S	Xsubselect			WV08S	3	4/29/2013	AM2				0											
BRWV423S	Xbear			WV08S	3	4/29/2013	AL1	10			2						125.129				204.250	
BRWV424S	Xsubselect			WV08S	3	4/29/2013	DM2				0											
BRWV425S	Xsubselect			WV08S	3	4/29/2013	DM3				0											
BRWV426S	Xbear			WV08S	3	4/29/2013	DL1	9			2						125.129				204.250	
BRWV427S	Xinadequate			WV08S	3	4/29/2013	TOP1			no roots	0											
BRWV429S	sample	BRWV432S	WV432S	WV09S	3	4/29/2013	AH1	6			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV430S	sample	BRWV432S	WV432S	WV09S	3	4/29/2013	AM1	7			8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
BRWV431S	Xinadequate			WV09S	3	4/29/2013	BH1			no roots	0											
BRWV432S	sample	BRWV432S	WV432S	WV09S	3	4/29/2013	CM1	10			10	204.206	147.157	129.139	165.175	134.136	135.137	168.174	183.183	252.260	204.250	
BRWV433S	Xbear			WV12S	3	4/29/2013	AM1	10			2						125.129				204.250	
BRWV434S	Xbear			WV12S	3	4/29/2013	AL1	10		uf left	2						125.129				204.250	
BRWV449S	Xsubselect			WV12S	3	4/29/2013	AM2				0											
BRWV450S	Xsubselect			WV12S	3	4/29/2013	AL2				0											
BRWV451S	Xinadequate			WV12S	3	4/29/2013	BH1				0											
BRWV452S	Xsubselect			WV12S	3	4/29/2013	BH2			1 gh	0											
BRWV453S	Xbear			WV12S	3	4/29/2013	BH3	7			2						125.129				204.250	
BRWV454S	Xbear			WV12S	3	4/29/2013	CH1	10			2						125.129				204.250	
BRWV455S	Xsubselect			WV12S	3	4/29/2013	CH2				0											
BRWV456S	Xbear			WV12S	3	4/29/2013	CM1	10			2						125.129				204.250	
BRWV457S	Xsubselect			WV12S	3	4/29/2013	CL1				0											
BRWV458S	Xbear			WV12S	3	4/29/2013	CL2	10			2						125.129				204.250	
BRWV469S	Xsubselect			WV15S	3	4/29/2013	AH1				0											
BRWV470S	Xsubselect			WV15S	3	4/29/2013	AH2				0											
BRWV471S	sample	BRWV432S	WV432S	WV15S	3	4/29/2013	AH3		15		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV472S	Xsubselect			WV15S	3	4/29/2013	AH4				0											
BRWV473S	sample	BRWV432S	WV432S	WV15S	3	4/29/2013	BH1		15		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV474S	Xsubselect			WV15S	3	4/29/2013	BH2				0											
BRWV465S	sample	BR_WV_2012_00006	WV006	WV16S	3	4/29/2013	AH1	7			8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.250	
BRWV403S	Xbomb			WV19S	3	4/28/2013	AH1	2			2	98.204	47.147	129.129	71.171	134.136	33.133	68.170			50.250	
BRWV404S	Xsubselect			WV19S	3	4/28/2013	AH2			1 gh	0											
BRWV276S	Xinadequate			WV19S	3	4/28/2013	AM1				0											
BRWV389S	Xinadequate			WV19S	3	4/28/2013	AM2			1 uf	0											
BRWV390S	sample	BR_WV_2012_00148	WV148	WV19S	3	4/28/2013	BH1	1			8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV399S	sample	BR_WV_2012_00148	WV148	WV20S	3	4/28/2013	AH1	7			8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV400S	sample	BR_WV_2012_00148	WV148	WV20S	3	4/28/2013	AM1	4			10	204.206	147.147	129.129	171.171	134.136	131.133	168.170	179.183	252.264	250.250	
BRWV401S	Xbomb			WV20S	3	4/28/2013	BH1	2			1	204.06	147.147	29.129	71.171	34.134	33.133	68.168				
BRWV402S	sample	BR_WV_2012_00148	WV148	WV20S	3	4/28/2013	BL1		5		8	204.206	147.147	129.129	171.171	134.136	131.133	168.170			250.250	
BRWV391S	Xinadequate			WV22S	3	4/28/2013	AM1			no root	0											
BRWV466S	Xinadequate			WV23S	3	4/29/2013	AH1			no roots	0											
BRWV467S	Xinadequate			WV23S	3	4/29/2013	AH2			no root	0											
BRWV468S	sample	BRWV432S	WV432S	WV23S	3	4/29/2013	AL1	1	5		8	204.206	147.157	129.139	165.175	134.136	135.137	168.174			204.250	
BRWV462S	Xbomb			WV25S	3	4/29/2013	AH1	5		small roots	2	204.206	159.65.161	29.145	71.171	134.136	127.35.133	170.72			204.50	
BRWV463S	sample	BR_WV_2012_00172	WV172	WV25S	3	4/29/2013	AM1	2			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV464S	Xinadequate			WV25S	3	4/29/2013	BM1			1 uf	0											
BRWV459S	sample	BR_WV_2012_00155	WV155	WV26S	3	4/29/2013	AH1	4			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV460S	Xsubselect			WV26S	3	4/29/2013	AH2				0											
BRWV461S	Xinadequate			WV26S	3	4/29/2013	BH1			no root	0											
BRWV405S	Xbomb			WV27S	3	4/28/2013	AH1	1			0											
BRWV394S	sample	BR_WV_2012_00001	WV001	WV28S	3	4/28/2013	AH1	3			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV395S	Xsubselect			WV28S	3	4/28/2013	AH2				0											
BRWV396S	Xinadequate			WV28S	3	4/28/2013	BH1			no hairs	0											
BRWV397S	Xinadequate			WV28S	3	4/28/2013	BH2			4 uf	0											
BRWV398S	sample	BR_WV_2012_00001	WV001	WV28S	3	4/28/2013	BM1	3			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV392S	Xsubselect			WV29S	3	4/28/2013	AM1				0											
BRWV393S	sample	BR_WV_2012_00001	WV001	WV29S	3	4/28/2013	AM2	2			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV435S	sample	BR_WV_2012_00001	WV001	WV29S	3	4/28/2013	AH1	2			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV384S	Xsubselect			WV31S	3	4/28/2013	AH1			2 gh	0											
BRWV385S	sample	BR_WV_2012_00006	WV006	WV31S	3	4/28/2013	AH2	4			8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.250	
BRWV386S	sample	BR_WV_2012_00006	WV006	WV31S	3	4/28/2013	BM1		20		8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.250	
BRWV387S	Xsubselect			WV31S	3	4/28/2013	BM2				0											
BRWV388S	sample	BR_WV_2012_00006	WV006	WV31S	3	4/28/2013	CM1	1			8	202.202	157.161	139.141	171.171	134.136	133.137	172.172			250.250	
BRWV379S	sample	BR_WV_2012_00172	WV172	WV32S	3	4/28/2013	AM1	2			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV380S	Xsubselect			WV32S	3	4/28/2013	AM2			2 questionable roots	0											
BRWV381S	Xbomb			WV32S	3	4/28/2013	BH1		5		3	206.206	59.159	129.129		36.36	35.135	170.172				
BRWV382S	Xbomb			WV32S	3	4/28/2013	CH1	1			0			29.29	71.71	34.34		72.172			204.50	
BRWV383S	Xbomb			WV32S	3	4/28/2013	CM1		10		6	202.206	159.159	129.129	75.175	134.136	33.135	170.172			250.250	

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data										
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
BRWV377S	sample	BR_WV_2012_00155	WV155	WV33S	3	4/28/2013	AM1		20		8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV378S	Xinadequate			WV33S	3	4/28/2013	BH1			no root	0											
BRWV376S	Xinadequate			WV34S	3	4/28/2013	AM1			< 5 uf	0											
BRWV303S	Xbomb			WV35S	3	4/28/2013	AH2	2	5		1	00.206	59.159			34.34		170.172			50.50	
BRWV304S	sample	BR_WV_2012_00045	WV045	WV35S	3	4/28/2013	AM1		30		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV305S	Xinadequate			WV35S	3	4/28/2013	BM1			no roots	0											
BRWV306S	Xbomb			WV35S	3	4/28/2013	BM2	1			3	200.206	59.159	129.139	171.73	34.134	33.133	170.172			50.250	
BRWV307S	Xinadequate			WV35S	3	4/28/2013	AH1				0											
BRWV374S	sample	BR_WV_2012_00045	WV045	WV36S	3	4/28/2013	AM1		30		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV375S	sample	BR_WV_2012_00045	WV045	WV36S	3	4/28/2013	BH1		15		8	200.206	159.159	129.139	171.173	134.134	133.133	170.172			250.250	
BRWV371S	sample	BR_WV_2012_00001	WV001	WV37S	3	4/28/2013	AH1	2			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV372S	sample	BR_WV_2012_00001	WV001	WV37S	3	4/28/2013	BH1	4			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV373S	sample	BR_WV_2012_00001	WV001	WV37S	3	4/28/2013	CM1	10			8	198.206	161.161	139.141	171.171	136.136	131.133	168.168			204.250	
BRWV295S	Xinadequate			WV38S	3	4/28/2013	BM1				0											
BRWV294S	sample	BR_WV_2012_00155	WV155	WV38S	3	4/28/2013	AH1	10			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV296S	Xinadequate			WV39S	3	4/28/2013	AH1			< 5 uf	0											
BRWV297S	Xinadequate			WV39S	3	4/28/2013	AH2			< 5 uf	0											
BRWV298S	Xinadequate			WV39S	3	4/28/2013	BH1			no root	0											
BRWV299S	Xbomb			WV39S	3	4/28/2013	BM1	4			0		59.159	29.129		134.36		70.170			50.250	
BRWV300S	sample	BR_WV_2012_00155	WV155	WV39S	3	4/28/2013	CM1		10		10	204.206	161.165	145.145	171.171	134.136	127.133	170.172	183.183	252.268	204.250	
BRWV301S	Xinadequate			WV41S	3	4/28/2013	AH1			no roots	0											
BRWV302S	Xinadequate			WV41S	3	4/28/2013	AH2				0											
BRWV308S	Xbomb			WV42S	3	4/28/2013	AH1	1			0											
BRWV309S	Xinadequate			WV42S	3	4/28/2013	AH2			no roots	0											
BRWV310S	sample	BR_WV_2012_00001	WV001	WV42S	3	4/28/2013	BH1	8			10	198.206	161.161	139.141	171.171	136.136	131.133	168.168	179.187	252.252	204.250	
BRWV311S	Xbomb			WV42S	3	4/28/2013	CM1	1			0	200.06	59.159	29.139		34.34	33.133	72.172			50.50	
BRWV312S	Xinadequate			WV43S	3	4/28/2013	AM1			no root	0											
BRWV313S	Xbomb			WV43S	3	4/28/2013	AM2	1			0											
BRWV293S	sample	BR_WV_2012_00155	WV155	WV44S	3	4/28/2013	CM1	2			8	204.206	161.165	145.145	171.171	134.136	127.133	170.172			204.250	
BRWV292S	Xinadequate			WV44S	3	4/28/2013	BL3			no root	0											
BRWV291S	sample	BR_WV_2012_00172	WV172	WV44S	3	4/28/2013	BL2		15		8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV290S	Xsubselect			WV44S	3	4/28/2013	BL1				0											
BRWV289S	sample	BR_WV_2012_00172	WV172	WV44S	3	4/28/2013	AM1	4			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV288S	Xinadequate			WV44S	3	4/28/2013	AH1			no hairs	0											
BRWV287S	Xbomb			WV44S	3	4/28/2013	AL1		10		2	04.06	161.65	45.145	71.171	134.36	127.133	170.172			204.50	
BRWV286S	sample	BR_WV_2012_00172	WV172	WV45S	3	4/28/2013	AL1	6			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
BRWV285S	sample	BR_WV_2012_00172	WV172	WV45S	3	4/28/2013	AH1	1			8	202.206	159.159	129.129	171.175	134.136	133.135	170.172			250.250	
North Study Grid																						
WV31N	Xbomb			19N	1	4/12/2013	AH-1		15		2		155.155	49.51							204.250	red fox/ wolverine
WV32N	Xbomb			19N	1	4/12/2013	CH-1		30		1			51.51							204.250	
WV34N	Xbomb			19N	1	4/12/2013	Top of Post	3			1			51.51							204.250	
WV35N	Xbomb			19N	1	4/12/2013	BH-1		30	fluffy uf	1			51.51							204.250	
WV36N	Xsubselect			19N	1	4/12/2013	BH-2				0											
WV37N	Xinadequate			19N	1	4/12/2013	BL-1			no root	0											
WV33N	sample	WV33N	WV33N	25N	1	4/12/2013	AM-1		10		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV14N	Xbomb			26N	1	4/11/2013	AH-1		20		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV15N	sample	WV33N	WV33N	26N	1	4/11/2013	AM-1	4			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV20N	Xbomb			26N	1	4/11/2013	AL-1		30	white uf	1		55.55	51.51							204.250	red fox
WV266N	Xnotsent			27N	1	4/13/2013	Not included - turned out to be bison, from bait				0											
WV267N	Xnotsent			27N	1	4/13/2013	Not included - turned out to be bison, from bait				0											
WV29N	Xbomb			30N	1	4/11/2013	Top of Post		30		1										250.250	
WV25N	Xinadequate			31N_2	1	4/11/2013	AL-1			no roots	0											
WV24N	sample	WV183N	WV183N	31N_3	1	4/11/2013	AM-1	10			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV06N	sample	WV33N	WV33N	39N_2	1	4/11/2013	AH-1		10		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
WV21N	sample	WV33N	WV33N	32N	1	4/11/2013	AH-1	7			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV22N	sample	WV33N	WV33N	32N	1	4/11/2013	AM-1		20		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV23N	Xsubselect			32N	1	4/11/2013	AM-2				0											
WV05N	Xbomb			33N	1	4/11/2013	AH-1		30	fluffy uf	1			49.51							204.250	red fox
WV12N	Xspecies			33N	1	4/11/2013	AM-1			not wolverine	0											
WV13N	Xinadequate			33N	1	4/11/2013	AL-1			no root	0											
WV16N	Xbomb			33N	1	4/11/2013	CH-1		30		1										204.250	
WV17N	Xbomb			33N	1	4/11/2013	DH-1		5		1										204.250	
WV18N	Xbomb			33N	1	4/11/2013	DM-1	4			2	200.206	157.59	45.145	169.71	36.136	33.133	168.168			250.50	
WV19N	Xbomb			33N	1	4/11/2013	DL-1		30	yellow hair	1										204.250	red fox
WV26N	Xinadequate			34N	1	4/11/2013	AM-1			no roots	0											
WV27N	Xinadequate			34N	1	4/11/2013	BH-1			2 v. small hairs	0											
WV28N	sample	WV28N	WV28N	34N	1	4/11/2013	BM-1	1			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV09N	sample	WV183N	WV183N	37N	1	4/11/2013	AM-1		30		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV10N	sample	WV183N	WV183N	37N	1	4/11/2013	BM-1	2			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV07N	sample	WV183N	WV183N	38N	1	4/11/2013	CM-1		10		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV08N	sample	WV183N	WV183N	38N	1	4/11/2013	AM-1		30		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV04N	sample	WV183N	WV183N	47N	1	4/11/2013	AH-1	4			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV01N	Xinadequate			50N	1	4/11/2013	AH-1			3 uf	0											
WV02N	Xbomb			50N	1	4/11/2013	AM-1	1			0											
WV03N	sample	WV30N	WV30N	50N	1	4/11/2013	DM-1		15		8	198.204	147.159	129.145	171.175	136.136	133.135	168.170			204.250	
WV11N	Xinadequate			50N	1	4/11/2013	CH-1			no root	0											
WV30N	sample	WV30N	WV30N	50N	1	4/11/2013	CM-1	7			10	198.204	147.159	129.145	171.175	136.136	133.135	168.170	175.183	272.272	204.250	
WV38N	sample	WV28N	WV28N	30N	2	4/21/2013	AH-1	10			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV39N	sample	WV28N	WV28N	28N	2	4/21/2013	AM-1		30		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV40N	sample	BR_WV_2012_00057	WV057	34N	2	4/21/2013	AH-1		20		10	198.206	159.165	139.143	169.175	134.136	133.137	168.170	191.195	256.268	204.250	
WV41N	Xinadequate			50N	2	4/22/2013	AM-1			no roots	0											
WV42N	Xbear			45N	2	4/22/2013	AH-1		30		2						125.125				204.250	
WV43N	Xbear			45N	2	4/22/2013	AL-1	2			2						125.125				204.250	
WV44N	sample	WV183N	WV183N	40N	2	4/22/2013	AM-1	10			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV45N	Xspecies			33N	2	4/22/2013	AL-1			white, fluffy hair	0											
WV46N	sample	WV183N	WV183N	39N_1	2	4/22/2013	AM-1	1	10		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV47N	Xinadequate			39N_1	2	4/22/2013	AM-2				0											
WV48N	sample	WV183N	WV183N	38N	2	4/22/2013	AM-1		30		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV49N	sample	BR_WV_2012_00057	WV057	36N	2	4/22/2013	AH-1	4	10		8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
WV50N	sample	WV50N	WV50N	26N	2	4/26/2013	AM-1	2			8	200.206	157.159	141.145	169.171	136.136	133.133	168.168			250.250	
WV51N	sample	WV50N	WV50N	19N	2	4/26/2013	AM-1		5		8	200.206	157.159	141.145	169.171	136.136	133.133	168.168			250.250	
WV52N	sample	WV52N	WV52N	13N	2	4/26/2013	AH-1	4			8	204.206	147.147	139.145	171.175	134.136	131.135	168.172			250.250	
WV53N	sample	WV33N	WV33N	24N	2	4/26/2013	AH-1	2			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV54N	Xinadequate			24N	2	4/26/2013	AM-1			< 5 uf	0											
WV55N	Xinadequate			24N	2	4/26/2013	AL-1			< 5 uf	0											
WV56N	Xinadequate			25N	2	4/26/2013	AH-1			no roots	0											
WV57N	sample	WV33N	WV33N	25N	2	4/26/2013	AH-2	1		small root	8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV58N	Xbomb			25N	2	4/26/2013	AL-1	1			0			29.39			31.31					
WV59N	sample	WV33N	WV33N	25N	2	4/26/2013	BH-1	3			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV60N	Xinadequate			25N	2	4/26/2013	BM-1			1 uf	0											
WV61N	Xinadequate			25N	2	4/26/2013	CH-1			no root	0											
WV62N	Xinadequate			25N	2	4/26/2013	CH-2			no roots	0											
WV63N	Xinadequate			18N	2	4/26/2013	AM-1			no roots	0											
WV64N	Xinadequate			18N	2	4/26/2013	BH-1			no root	0											
WV65N	Xbomb			6N	2	4/26/2013	AM-1	1			7	198.198	147.159	129.145	75.77.179	134.136	135.137	168.170			250.250	
WV66N	sample	WV28N	WV28N	5N	2	4/27/2013	AH-1		10		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV67N	Xsubselect			10N	2	4/27/2013	AM-1				0											
WV68N	sample	WV68N	WV68N	10N	2	4/27/2013	AM-2		15		8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			250.250	
WV69N	sample	WV68N	WV68N	10N	2	4/27/2013	AL-1	1			8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			250.250	
WV70N	Xbomb			10N	2	4/27/2013	BL-1	6			1	06.206	157.159		71.171	34.136	35.135	168.74				
WV71N	Xsubselect			10N	2	4/27/2013	AL-2				0											
WV72N	Xsubselect			9N	2	4/27/2013	AH-1				0											
WV73N	sample	WV68N	WV68N	9N	2	4/27/2013	AH-2	10			8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			250.250	

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data										
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
WV74N	sample	WV68N	WV68N	9N	2	4/27/2013	AM-1	4	10		8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			250.250	
WV75N	sample	WV68N	WV68N	9N	2	4/27/2013	AL-1		30		8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			250.250	
WV76N	Xbomb			14N	2	4/27/2013	AM-1		5		1	02.202		129.139	71.171	136.38		68.168			04.50	
WV77N	Xbomb			14N	2	4/27/2013	AL-1	1			0											
WV78N	Xbomb			14N	2	4/27/2013	BL-1		10		0											
WV79N	sample	WV28N	WV28N	15N	2	4/27/2013	AH-1	4			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV80N	sample	WV28N	WV28N	16N	2	4/27/2013	AM-1		15		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV81N	Xbomb			23N	2	4/27/2013	AH-1		15		0			43.143	77.77	36.36					50.250	
WV82N	Xsubselect			23N	2	4/27/2013	AH-2			5 uf	0											
WV83N	Xsubselect			23N	2	4/27/2013	AH-3			1 gh	0											
WV84N	sample	WV28N	WV28N	23N	2	4/27/2013	AM-1		30		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV85N	sample	BR_WV_2012_00057	WV057	23N	2	4/27/2013	BM-1	4			8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
WV86N	Xsubselect			23N	2	4/27/2013	AM-2			a few hairs	0											
WV87N	Xbomb			23N	2	4/27/2013	AL-1	1			0											
WV88N	sample	WV28N	WV28N	23N	2	4/27/2013	CH-1	2			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV89N	Xsubselect			23N	2	4/27/2013	CH-2				0											
WV90N	Xinadequate			23N	2	4/27/2013	DH-1			no roots	0											
WV91N	Xbomb			23N	2	4/27/2013	Top of Post		30		0						33.133	68.168			50.250	
WV92N	Xsubselect			22N	2	4/27/2013	AM-1				0											
WV93N	sample	WV28N	WV28N	22N	2	4/27/2013	AM-2		10		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV94N	sample	WV28N	WV28N	22N	2	4/27/2013	BM-1		30		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV95N	Xinadequate			22N	2	4/27/2013	DM-1			no roots	0											
WV96N	sample	WV28N	WV28N	22N	2	4/27/2013	CH-1	1			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV97N	Xinadequate			21N	2	4/27/2013	AH-1			1 uf	0											
WV98N	Xbomb			21N	2	4/27/2013	AH-2		5		3	98.206	57.65.159	139.143	169.75	34.136	133.137	168.170			204.50	
WV99N	sample	BR_WV_2012_00057	WV057	21N	2	4/27/2013	BM-1		5		8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
WV100N	sample	WV30N	WV30N	50N	3	5/1/2013	AM-1	2			8	198.204	147.159	129.145	171.175	136.136	133.135	168.170			204.250	
WV101N	Xbomb			48N	3	5/1/2013	AH-1	1			0		47.147		71.71							
WV102N	Xinadequate			43N	3	5/1/2013	AH-1			1 hair, no root	0											
WV103N	sample	WV183N	WV183N	43N	3	5/1/2013	BM-1		20		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV104N	sample	WV183N	WV183N	43N	3	5/1/2013	CM-1	2			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV105N	Xsubselect			44N	3	5/1/2013	AH-1			2 hairs	0											
WV106N	sample	WV183N	WV183N	44N	3	5/1/2013	AH-2		15		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV107N	sample	WV183N	WV183N	44N	3	5/1/2013	BH-1	10			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV108N	Xinadequate			45N	3	5/1/2013	AH-1			3 hairs, no roots	0											
WV109N	Xinadequate			45N	3	5/1/2013	AH-2			no roots	0											
WV110N	Xbear			45N	3	5/1/2013	AH-3	1			1						25.125				204.250	
WV111N	Xbear			45N	3	5/1/2013	BL-1	4			2						125.125				204.250	
WV112N	Xbear			45N	3	5/1/2013	Top of Post	7			2						125.125				204.250	
WV113N	sample	WV183N	WV183N	38N	3	5/1/2013	AM-1		30		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV114N	Xbomb			38N	3	5/1/2013	BM-1	2			0	98.98	47.147	129.45				68.168			204.50	
WV115N	sample	WV183N	WV183N	38N	3	5/1/2013	CH-1	10		some uf left	8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV116N	sample	WV183N	WV183N	38N	3	5/1/2013	DH-1	7			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV117N	Xbomb			37N	3	5/1/2013	AH-1		10		1		47.47					168.170				
WV118N	Xinadequate			37N	3	5/1/2013	BM-1			no roots	0											
WV119N	sample	WV183N	WV183N	37N	3	5/1/2013	CM-1		30		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV120N	Xinadequate			11N	3	5/9/2013	BM-1			1 hair, no root	0											
WV121N	Xbomb			27N	3	4/30/2013	AH-1		30		0										50.250	
WV122N	Xinadequate			34N	3	4/30/2013	AH-1			<5 uf	0											
WV123N	Xinadequate			34N	3	4/30/2013	AM-1			<5 uf	0											
WV124N	Xinadequate			34N	3	4/30/2013	AM-2			no roots	0											
WV125N	sample	WV28N	WV28N	35N	3	4/30/2013	AH-1	6	10		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV126N	Xbomb			35N	3	4/30/2013	BH-2	4			3	198.206	55.59.65	129.29	71.171	34.134	33.133	168.172			204.250	
WV127N	Xsubselect			35N	3	4/30/2013	BH-1				0											
WV128N	sample	WV183N	WV183N	47N	3	4/30/2013	AH-1	3			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV129N	Xinadequate			42N	3	4/30/2013	Top of Post			no roots	0											
WV130N	sample	WV28N	WV28N	42N	3	4/30/2013	AM-1		5		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV131N	Xsubselect			36N	3	4/30/2013	AH-1			1 gh	0											
WV132N	Xsubselect			36N	3	4/30/2013	AH-2			2 questionable roots	0											

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data										
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
WV133N	Xbomb			36N	3	4/30/2013	AH-3	4			2	198.02.06	159.65	129.129	71.171	34.134	33.133	168.172			04.50	
WV134N	sample	WV28N	WV28N	36N	3	4/30/2013	BH-1		10		8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV135N	Xinadequate			30N	3	4/30/2013	AH-1			no roots	0											
WV136N	Xinadequate			30N	3	4/30/2013	BH-1			1 uf	0											
WV137N	Xinadequate			31N_1	3	4/30/2013	AM-1			no roots	0											
WV138N	Xinadequate			31N_1	3	4/30/2013	BH-1			no root	0											
WV139N	sample	BR_WV_2012_00057	WV057	31N_1	3	4/30/2013	BM-1	2		small roots	8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
WV140N	Xinadequate			31N_1	3	4/30/2013	CM-1			no roots	0											
WV141N	Xinadequate			31N_2	3	4/30/2013	AH-1			<5 uf	0											
WV142N	Xinadequate			31N_2	3	4/30/2013	AH-2			no roots	0											
WV143N	sample	WV183N	WV183N	31N_2	3	4/30/2013	AH-3	3			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV144N	sample	WV183N	WV183N	31N_2	3	4/30/2013	AM-1		15		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV145N	Xbomb			31N_2	3	4/30/2013	BH-1	3			3	198.204	47.147	29.129	71.71	36.36	133.135	168.170			50.250	
WV146N	sample	WV183N	WV183N	31N_2	3	4/30/2013	BM-1	6			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV147N	sample	WV183N	WV183N	31N_2	3	4/30/2013	CH-1		5		8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV148N	Xbomb			31N_2	3	4/30/2013	CM-1	2			2	98.204	47.147	129.145	71.171	134.36	133.35.37	170.170				
WV149N	Xsubselect			31N_2	3	4/30/2013	CM-2			1 hair	0											
WV150N	Xsubselect			31N_3	3	4/30/2013	AM-1			1 gh	0											
WV151N	Xbomb			31N_3	3	4/30/2013	AM-2	2			3	198.204	47.147	129.145	71.171	134.36	133.135	168.70			50.250	
WV152N	Xinadequate			31N_3	3	4/30/2013	BH-1			1 uf	0											
WV153N	Xinadequate			31N_3	3	4/30/2013	BH-2			2 hairs, no roots	0											
WV154N	Xbomb			31N_3	3	4/30/2013	CL-1	2			3	198.204	147.159	129.145	71.75	36.136	133.35	68.170			04.50	
WV155N	sample	WV33N	WV33N	32N	3	4/30/2013	AM-1		20		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV156N	Xsubselect			32N	3	4/30/2013	AM-2				0											
WV157N	Xbomb			32N	3	4/30/2013	BH-1	1			2	204.206	147.61	129.39		36.136		172.172			04.250	
WV158N	Xinadequate			32N	3	4/30/2013	BH-2			3 uf	0											
WV159N	sample	WV33N	WV33N	32N	3	4/30/2013	BM-1	4			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV160N	Xsubselect			32N	3	4/30/2013	BM-2			5 uf	0											
WV161N	Xinadequate			32N	3	4/30/2013	CM-1			1 uf	0											
WV162N	Xinadequate			32N	3	4/30/2013	CM-2			2 hairs, no roots	0											
WV163N	Xinadequate			32N	3	4/30/2013	DM-1			2 uf	0											
WV164N	Xinadequate			32N	3	4/30/2013	DM-2			2 hairs, no roots	0											
WV165N	Xbomb			33N	3	4/30/2013	AL-1		10	white hairs	0											
WV166N	Xinadequate			33N	3	4/30/2013	AL-2			no hairs	0											
WV167N	Xbomb			33N	3	4/30/2013	BL-1		10	white hairs	0											
WV168N	Xsubselect			33N	3	4/30/2013	BL-2			white hairs, 5 uf	0											
WV169N	Xinadequate			33N	3	4/30/2013	CL-1			no root	0											
WV170N	Xinadequate			33N	3	4/30/2013	CL-2			no roots	0											
WV171N	Xsubselect			40N	3	4/30/2013	AM-1				0											
WV172N	Xbear			40N	3	4/30/2013	AM-2	10			2						125.125				204.250	
WV173N	Xsubselect			40N	3	4/30/2013	AL-1				0											
WV174N	Xbear			40N	3	4/30/2013	AL-2	3	25	unsure if it is wolverine	1						25.125				204.250	
WV175N	Xbear			40N	3	4/30/2013	BH-1	10			2						125.125				204.250	
WV176N	Xsubselect			40N	3	4/30/2013	BH-2				0											
WV177N	Xbear			40N	3	4/30/2013	BL-1	10			2						125.125				204.250	
WV178N	Xbear			40N	3	4/30/2013	CH-1		30		1						25.125				204.250	
WV179N	Xsubselect			40N	3	4/30/2013	CH-2				0											
WV180N	Xsubselect			39N_2	3	4/30/2013	AM-1			5 uf	0											
WV181N	sample	WV33N	WV33N	39N_2	3	4/30/2013	AM-2	9			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV182N	sample	BR_WV_2012_00057	WV057	39N_2	3	4/30/2013	BH-1		10		8	198.206	159.165	139.143	169.175	134.136	133.137	168.170			204.250	
WV183N	sample	WV183N	WV183N	39N_1	3	4/30/2013	AH-1	6			10	198.204	147.147	129.145	171.171	134.136	133.135	168.170	183.183	264.272	250.250	
WV184N	sample	WV183N	WV183N	39N_1	3	4/30/2013	AM-1	10			8	198.204	147.147	129.145	171.171	134.136	133.135	168.170			250.250	
WV185N	Xsubselect			11N	3	5/9/2013	AH-2			1 questionable root	0											
WV186N	Xbomb			11N	3	5/9/2013	AH-1		10		0										50.250	
WV187N	Xbomb			26N	3	5/9/2013	AH-1	2			1	04.04		39.39		36.36	131.37	168.172			204.50	
WV188N	sample	WV50N	WV50N	19N	3	5/9/2013	AH-1	2			8	200.206	157.159	141.145	169.171	136.136	133.133	168.168			250.250	
WV189N	Xbomb			13N	3	5/9/2013	AM-1	1			2	204.206	47.147	45.45			131.135	168.72			50.250	
WV190N	Xinadequate			13N	3	5/9/2013	AM-2			no hair	0											
WV191N	Xbomb			13N	3	5/9/2013	AL-1	2			0	04.04	47.47				31.31					

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 6. Detailed Field Hair Collection and Genetic Marker Data for Wolverines

				Field Data				Extraction Data			Genetic Data											
Sample ID	Class	Individual (Lab)*	Individual (Report)	Cell No.	Check No.	Check Date	Sample Location	No. G	No. U	Comments	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex	Species
WV192N	Xbomb			18N	3	5/9/2013	AH-1	1			0	06.06										
WV193N	Xinadequate			18N	3	5/9/2013	AH-2			no root	0											
WV194N	Xbomb			18N	3	5/9/2013	BM-1	1			0										50.250	
WV195N	Xinadequate			25N	3	5/9/2013	AH-1			no root	0											
WV196N	Xinadequate			25N	3	5/9/2013	BH-1			no root	0											
WV197N	Xinadequate			25N	3	5/9/2013	BM-1			no roots	0											
WV198N	Xinadequate			25N	3	5/9/2013	CH-1			no roots	0											
WV199N	Xinadequate			25N	3	5/9/2013	CH-2			no roots	0											
WV200N	Xinadequate			25N	3	5/9/2013	DM-1			no root	0											
WV201N	sample	WV33N	WV33N	24N	3	5/9/2013	AH-1		10		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV202N	sample	WV33N	WV33N	24N	3	5/9/2013	AM-1		10		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV203N	sample	WV33N	WV33N	24N	3	5/9/2013	BM-1		15		8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV204N	sample	WV33N	WV33N	24N	3	5/9/2013	DM-1	6			8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			204.250	
WV205N	Xinadequate			9N	3	5/10/2013	AH-1			no roots	0											
WV206N	Xinadequate			9N	3	5/10/2013	BH-1			no hairs	0											
WV207N	Xinadequate			9N	3	5/10/2013	BH-2			no hairs	0											
WV208N	Xinadequate			4N	3	5/10/2013	Top of Post			no roots	0											
WV209N	Xinadequate			4N	3	5/10/2013	AM-1			no hairs	0											
WV210N	Xbomb			10N	3	5/9/2013	AH-1		10		1										250.250	
WV211N	Xinadequate			15N	3	5/10/2013	Top of Post			no roots	0											
WV212N	sample	WV28N	WV28N	15N	3	5/10/2013	AH-1	1			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV213N	sample	WV28N	WV28N	15N	3	5/10/2013	AM-1	1			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV214N	Xbomb			22N	3	5/10/2013	AH-1	1			0	06.06		29.29							04.04	
WV215N	Xinadequate			22N	3	5/10/2013	AM-1			no hairs	0											
WV216N	Xinadequate			22N	3	5/10/2013	AM-2			1 hair, no root	0											
WV217N	Xinadequate			22N	3	5/10/2013	AL-1			no hairs	0											
WV218N	sample	WV28N	WV28N	22N	3	5/10/2013	BH-1	1			8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			204.250	
WV219N	Xbomb			22N	3	5/10/2013	BM-1	1			0										50.50	
WV220N	Xbomb			21N	3	5/10/2013	AH-1	1			0		55.55								50.50	
WV242N	Xinadequate			22N	3	5/10/2013	CM-1			< 5 uf	0											
WV243N	Xinadequate			22N	3	5/10/2013	DM-1			1 uf	0											
WV244N	Xbomb			22N	3	5/10/2013	DM-2	1			0	98.06					33.33					

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report.*

Appendix 7

Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Rescan™
an ERM company

Appendix 7. Summary of Individual Wolverine Genotypes and Capture/Recapture Rates

Individual (Lab)*	Individual (Report)	Corresponding Samples		Genetic Data										
		No. Samples	List of Samples	No. Loci	Gg-4	Gg-7	Ggu101	Ggu216	Ma-2	Mvis075	Tt-4	MP0182	MP0197	Sex
South Study Grid														
BRWV432S	BRWV432S	16	HRWV85S; BRWV234S; BRWV240S; BRWV242S; BRWV275S; BRWV277S; BRWV278S; BRWV443S; BRWV445S; BRWV446S; BRWV429S; BRWV430S; BRWV432S; BRWV471S; BRWV473S; BRWV468S;	10	204.206	147.157	129.139	165.175	134.136	135.137	168.174	183.183	252.260	M
BRWV350S	BRWV350S	2	BRWV350S; BRWV351S;	8	206.206	159.165	139.141	171.171	134.134	137.137	170.174			F
BRWV256S	BRWV256S	1	BRWV256S;	8	204.206	147.161	141.141	171.175	136.136	137.137	168.170			F
BRWV255S	BRWV255S	5	BRWV255S; BRWV258S; BRWV253S; BRWV254S; BRWV238S;	8	206.206	147.147	129.141	171.171	134.136	135.137	168.174			F
BR_WV_2012_00172	WV172	33	BR_WV_2012_00067; BR_WV_2012_00118; BR_WV_2012_00149; BR_WV_2012_00157; BR_WV_2012_00158; BR_WV_2012_00161; BR_WV_2012_00172; BR_WV_2012_00173; BR_WV_2012_00181; BR_WV_2012_00182; BR_WV_2012_00186; BR_WV_2012_00193; BR_WV_2012_00194; BRWV360S; BRWV361S; BRWV348S; BRWV345S; BRWV346S; BRWV319S; BRWV320S; BRWV321S; BRWV323S; BRWV325S; BRWV328S; BRWV329S; BRWV318S; BRWV317S; BRWV463S; BRWV379S; BRWV291S; BRWV289S; BRWV286S; BRWV285S;	10	202.206	159.159	129.129	171.175	134.136	133.135	170.172	179.183	268.268	F
BR_WV_2012_00155	WV155	19	BR_WV_2012_00155; BR_WV_2012_00156; BRWV215S; BRWV216S; BRWV213S; BRWV210S; BRWV211S; BRWV206S; BRWV207S; BRWV201S; BRWV203S; BRWV272S; BRWV315S; BRWV316S; BRWV459S; BRWV377S; BRWV294S; BRWV300S; BRWV293S;	10	204.206	161.165	145.145	171.171	134.136	127.133	170.172	183.183	252.268	M
BR_WV_2012_00148	WV148	11	BR_WV_2012_00095; BR_WV_2012_00098; BR_WV_2012_00099; BR_WV_2012_00148; BRWV232S; BRWV239S; BRWV283S; BRWV390S; BRWV399S; BRWV400S; BRWV402S;	10	204.206	147.147	129.129	171.171	134.136	131.133	168.170	179.183	252.264	F
BR_WV_2012_00057	WV057	32	BR_WV_2012_00057; BR_WV_2012_00061; BR_WV_2012_00063; BR_WV_2012_00069; BR_WV_2012_00070; BR_WV_2012_00100; BR_WV_2012_00102; BR_WV_2012_00110; BR_WV_2012_00112; BR_WV_2012_00116; BR_WV_2012_00117; BR_WV_2012_00131; BR_WV_2012_00139; BR_WV_2012_00140; BR_WV_2012_00143; BR_WV_2012_00167; BR_WV_2012_00185; HRWV151S; HRWV152S; HRWV154S; HRWV161S; WV40N; WV49N; WV85N; WV99N; WV139N; WV182N; BRWV359S; BRWV341S; BRWV343S; BRWV326S; BRWV447S;	10	198.206	159.165	139.143	169.175	134.136	133.137	168.170	191.195	256.268	M
BR_WV_2012_00045	WV045	21	BR_WV_2012_00018; BR_WV_2012_00021; BR_WV_2012_00022; BR_WV_2012_00045; BR_WV_2012_00073; BR_WV_2012_00074; BR_WV_2012_00077; BR_WV_2012_00103; BR_WV_2012_00175; BR_WV_2012_00196; BRWV223S; BRWV208S; BRWV353S; BRWV354S; BRWV355S; BRWV337S; BRWV330S; BRWV333S; BRWV304S; BRWV374S; BRWV375S;	10	200.206	159.159	129.139	171.173	134.134	133.133	170.172	183.187	268.272	F
BR_WV_2012_00007	WV007	10	BR_WV_2012_00007; BR_WV_2012_00011; BR_WV_2012_00027; BR_WV_2012_00048; HRWV134S; BRWV406S; BRWV409S; BRWV415S; BRWV417S; BRWV448S;	10	206.206	147.157	141.147	171.171	136.136	127.133	168.168	183.199	252.252	M
BR_WV_2012_00006	WV006	8	BR_WV_2012_00004; BR_WV_2012_00006; BR_WV_2012_00163; BRWV362S; BRWV465S; BRWV385S; BRWV386S; BRWV388S;	10	202.202	157.161	139.141	171.171	134.136	133.137	172.172	175.183	252.252	F
BR_WV_2012_00001	WV001	26	BR_WV_2012_00001; BR_WV_2012_00015; BR_WV_2012_00017; BR_WV_2012_00051; BR_WV_2012_00055; BR_WV_2012_00075; BR_WV_2012_00105; BR_WV_2012_00121; BR_WV_2012_00177; BR_WV_2012_00187; BR_WV_2012_00190; BR_WV_2012_00191; BR_WV_2012_00192; BR_WV_2012_00195; BRWV357S; BRWV358S; BRWV336S; BRWV268S; BRWV394S; BRWV398S; BRWV393S; BRWV435S; BRWV371S; BRWV372S; BRWV373S; BRWV310S;	10	198.206	161.161	139.141	171.171	136.136	131.133	168.168	179.187	252.252	M
North Study Grid														
WV68N	WV68N	5	WV68N; WV69N; WV73N; WV74N; WV75N;	8	206.206	157.159	139.147	171.171	134.136	135.135	168.174			F
WV52N	WV52N	1	WV52N;	8	204.206	147.147	139.145	171.175	134.136	131.135	168.172			F
WV50N	WV50N	3	WV50N; WV51N; WV188N;	8	200.206	157.159	141.145	169.171	136.136	133.133	168.168			F
WV33N	WV33N	15	WV33N; WV15N; WV06N; WV21N; WV22N; WV53N; WV57N; WV59N; WV155N; WV159N; WV181N; WV201N; WV202N; WV203N; WV204N;	8	204.206	147.161	129.139	171.175	136.136	131.137	172.172			M
WV30N	WV30N	3	WV03N; WV30N; WV100N;	10	198.204	147.159	129.145	171.175	136.136	133.135	168.170	175.183	272.272	M
WV28N	WV28N	17	WV28N; WV38N; WV39N; WV66N; WV79N; WV80N; WV84N; WV88N; WV93N; WV94N; WV96N; WV125N; WV130N; WV134N; WV212N; WV213N; WV218N;	8	198.206	159.165	129.129	171.171	134.134	133.133	168.172			M
WV183N	WV183N	24	WV24N; WV09N; WV10N; WV07N; WV08N; WV04N; WV44N; WV46N; WV48N; WV103N; WV104N; WV106N; WV107N; WV113N; WV115N; WV116N; WV119N; WV128N; WV143N; WV144N; WV146N; WV147N; WV183N; WV184N;	10	198.204	147.147	129.145	171.171	134.136	133.135	168.170	183.183	264.272	F
BR_WV_2012_00057	WV057	32	WV40N, WV49N, WV85N, WV99N, WV139N, WV182N	10	198.206	159.165	139.143	169.175	134.136	133.137	168.170	191.195	256.268	M

** Individuals recaptured from 2012 are identified as BR_WV_2012_######. These have been shortened to WV### for use in the current report*

Appendix 8

Distance Travelled by Individual Wolverine during Checks, 2013

Rescan™
an ERM company

Appendix 8. Distance Travelled by Individual Wolverine during Checks, 2013

Wolverine	Sex	Check No.	Distance (km)
South Study Grid			
WV001	M	2	26.8
WV001	M	3	23
WV006	F	3	12
WV007	M	3	13.4
WV045	F	1	8.5
WV045	F	2	20.5
WV045	F	3	6
WV148	F	1	18
WV148	F	3	6
WV155	M	1	32.5
WV155	M	3	26.5
WV172	F	2	47
WV172	F	3	25.4
WV255S	F	1	19.4
WV432S	M	1	25.5
WV432S	M	3	20.5
North Study Grid			
WV183N	F	1	20.3
WV183N	F	2	10.2
WV183N	F	3	30
WV28N	M	2	45.1
WV28N	M	3	29
WV33N	M	1	16.1
WV33N	M	2	5.1
WV33N	M	3	12
WV50N	F	2	5
WV68N	F	2	4.6
Both Grids			
WV057	M	2	140.2
WV057	M	3	79.6

Appendix 9

Wolverine Minimum Use Area and Areas of Overlap between Minimum Use Areas, 2013

Rescan™
an ERM company

Appendix 9. Wolverine Minimum Use Area and Areas of Overlap between Minimum Use Areas, 2013

Minimum Use Areas

Wolverine	Sex	Minimum Use Area (km^2)
South Study Grid		
WV001	Male	108.0
WV045	Female	90.0
WV148	Female	54.0
WV155	Male	162.0
WV172	Female	126.0
WV255S	Female	18.0
WV432S	Male	54.0
North Study Grid		
WV183N	Female	111.7
WV28N	Male	259.7
WV33N	Male	54.9
Across Both Grids		
WV057	Male	1852.6

Overlap in Minimum Use Areas

Wolverine 1	Wolverine 2	Overlap in Minimum Use Areas (km^2)
South Study Grid		
WV057	WV432S	15.9
WV057	WV155	25.6
WV001	WV045	66.0
WV172	WV155	102.0
North Study Grid		
WV057	WV28N	0.1
WV057	WV183N	100.0
WV33N	WV183N	2.2

Appendix 10

Remote Camera Wolverine Observations, 2013

Rescan™
an ERM company

Appendix 10. Remote Camera Wolverine Observations, 2013

Cell No.	Camera No.	Date	Session No.	No. Animals	Photos Numbers	Comment(s)	Previously Counted?
WV10S	6	26-Apr-2013	3	1	2633 - 2652	did not climb post	No
WV10S	6	27-Apr-2013	3	1	2693 - 2702	did not climb post	Unknown
WV04S	7	25-Mar-2013	1	1	551 - 600	climbed post	No
WV04S	7	25-Mar-2013	1	1	607 - 636	climbed post	Yes
WV04S	7	12-Apr-2013	2	1	1753 - 1772	climbed post	Unknown
WV04S	7	17-Apr-2013	3	1	2314 - 2323	did not climb post	Unknown
WV04S	7	21-Apr-2013	3	1	2521	did not climb post	Unknown
WV04S	7	23-Apr-2013	3	1	2632 - 2651	climbed post	Unknown
WV04S	7	28-Apr-2013	3	1	2903 - 2912	very liklely climbed post based on photo sequence	Unknown
WV41S	19	25-Mar-2013	1	1	1484 - 1503	did not climb post	No
WV41S	19	25-Mar-2013	1	1	1507 - 1536	did not climb post	Unknown
WV41S	19	25-Mar-2013	1	1	1548 - 1838	climbed post	Unknown
WV41S	19	27-Mar-2013	1	1	1915 - 1924	did not climb post	Unknown
WV41S	19	30-Mar-2013	1	1	2095 - 2134	climbed post	Unknown
WV41S	19	31-Mar-2013	1	1	2183 - 2222	very liklely climbed post based on photo sequence	Unknown
WV41S	19	8-Apr-2013	2	1	2918 - 2958	climbed post	Unknown
WV41S	19	17-Apr-2013	3	1	3749 - 3839	climbed post	No
WV41S	19	18-Apr-2013	3	1	3911 - 3940	did not climb post	Unknown
WV16N	27	2-Apr-2013	1	1	317 - 446	very liklely climbed post based on photo sequence	No
WV16N	27	12-Apr-2013	1	1	965 - 1024	did not climb post	Unknown
WV16N	27	15-Apr-2013	2	1	163 - 352	climbed post	Unknown