Appendix 21

- **Final Report on Resource Management Planning in West Kitikmeot, Nunavut**
  Planning Commission Transition Team, July 1996.

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Letter of Transmittal

July 1996

TO: Members of the Nunavut Planning Commission

FROM: Nunavut Planning Commission Transition Team

We are pleased to present our report on land use planning issues, entitled **Final Report on Resource Management Planning in West Kitikmeot.**

This report has been prepared after two years of careful consideration of the views of the local communities, regional organizations, industry and government departments and agencies. In our view, it integrates the best concepts from all of these groups into policies and a process which can guide the use of land in the region for the next few years.

We hope this report meets your needs and wish you good luck in your work.

Yours sincerely,

Bob Lyall,
Chairperson

Bob Aknavigak,
Vice-Chairperson

David Mablick,
Member

Peter Suwaksiork,
Member

Louis Pilakapsi,
Member

Akalayok Qavavau,
Member

Loseeosee Aipellee,
Member

Acknowledgments

The Nunavut Planning Commission Transition Team would like to acknowledge all those who contributed to the development of this report: our staff, Nunavut Tunngavik Inc., the Kitikmeot Hunters and Trappers Association, the Kitikmeot Inuit Association, the mining industry, and various federal and territorial departments and agencies. We would also like to point out the contributions made by the Nunavut Wildlife Management Board, the Nunavut Impact Review Board Transition Team and the Nunavut Water Board Transition Team. Other participants in the development of this plan included the Inuit Heritage Centre and the Prince of Wales Northern Heritage Centre.

The greatest thanks go to the people of the West Kitikmeot who, for more than two years, have participated in community discussions, workshops and surveys. Without their participation and enthusiasm this plan could not have been produced. Their ideas, interests and concerns are the foundation of this plan and we hope it does them justice.

KOANA.

Summary of Actions

The Environment, Renewable Resources and Conservation

WASTE SITE CLEAN-UP

1. All users of the land should follow the "Code of Conduct" in Appendix 4 to ensure that no new waste sites are created.

2. The principle of "the polluter pays" should apply to a strategy for cleaning up the environment. Where identification is possible of the person, company or agency responsible for creating an abandoned or inactive waste site, they should be made responsible for site clean up and restoration.

3. When identification is not possible, the government agency (or its successor) that had regulatory responsibility for the site at the time it was active should be responsible for site clean up and restoration.

4. The Department of Indian Affairs and Northern Development, as the lead agency for Canada, should review the Priority List of Cleanup Sites included as Appendix 1 and, in consultation with the Kitikmeot Inuit Association and the Nunavut Planning Commission, prepare a remedial action plan by June 1997.

5. The Department of Municipal and Community Affairs, as the lead agency for the Government of the Northwest Territories, should review the Priority List of Cleanup Sites included as Appendix 1 and, in consultation with the Kitikmeot Inuit Association and the Nunavut Planning Commission, prepare a remedial action plan by June 1997 for the lands it administers.

6. The Department of National Defense and DIAND should clean-up abandoned DEW Line sites and other military facilities as quickly as possible, ensuring that local people are consulted about clean-up priorities, and prepare a remedial action plan by June 1997.

CUMULATIVE EFFECTS AND MONITORING

1. The Nunavut Planning Commission should identify the key components of the ecosystem in a land use plan for the West Kitikmeot.

2. NPC, in co-operation with DIAND and other appropriate agencies, should complete the design and implementation of the monitoring program outlined in section 12.7.6 of the Nunavut Land Claims Agreement.

PARKS AND PROTECTED AREAS

1. The Canadian Wildlife Service should begin consultations with people in the communities of Cambridge Bay, Omingmaktok, as well as Gjoa Haven in the East Kitikmeot, concerning plans to alter the boundary of Queen Maud Gulf Bird Sanctuary and change its designation to a National Wildlife Area. Any change in the boundary or the designation of the sanctuary should take place only after thorough regional and local consultations. It is important that this consultation include representatives of the mining industry.

2. The name of the Sanctuary/ National Wildlife Area should be changed to Iluilik, or some other Inuit name, chosen through community consultation.

3. The Department of National Defence should transfer land near Mount Pelly to the Government of the Northwest Territories in order to ensure the timely development of a territorial park at the site near Cambridge Bay.

4. The Coppermine River should be designated as a Heritage River upon approval by the people of Kugluktuk.

5. The people of Kugluktuk should decide if the Bluenose Lake area will be included in Tuktut Nogait/Tahipak National Park. Following completion of the community survey regarding the park proposal, Parks Canada, NPCTT, and KIA should meet with the people of Kugluktuk to confirm the community response.

6. Visitors to the region, and local residents, should adhere to the Code of Conduct contained in Appendix 4.

CARIBOU

1. Caribou protection measures, based on those suggested in Appendix 5 – and further developed by DIAND and Inuit land managers in consultation with NWMB, KHTA, the local HTOs and DRR -- should be implemented for all caribou herds in the West Kitikmeot by DIAND and by Inuit land managers.

2. The Nunavut Planning Commission, the Nunavut Wildlife Management Board, the Nunavut Impact Review Board, DIAND, Inuit land managers and DRR should work together to monitor the effectiveness of the caribou protection measures over time and to determine whether special protected areas for caribou are required.

3. Shipping in Coronation Gulf should be closed by the Canadian Coast Guard as soon as ice forms in the fall until the caribou migration ends.

4. Renewable Resources and KHTA should continue with studies on seasonal migrations of caribou between Victoria Island and the mainland in order to get better baseline information necessary to assess potential impacts from shipping.

5. Research by Renewable Resources, the Kitikmeot Hunters and Trappers Association, and the Nunavut Wildlife Management Board, as well as studies under West Kitikmeot/Slave Study should continue to develop further an understanding of why and where caribou calve and migrate. All parties, but especially the NPC, should communicate this information widely through the use of maps.

6. The Nunavut Planning Commission, the Nunavut Wildlife Management Board and other responsible agencies should meet at the first opportunity to work out a plan for managing the Bathurst Caribou Herd.

ESKERS

1. More general research should be carried out on the importance of eskers in the environment. This research should be carried out by DIAND and other appropriate agencies, partly under the auspices of the West Kitikmeot/Slave Study.

2. After sufficient information is available NPC, in consultation with DIAND and KIA, should determine whether a special management regime should be established for eskers in the West Kitikmeot.

3. Developers in the West Kitikmeot should carry out their own research on the effects their activities may have on particular eskers.

2 Reclamation of eskers after materials use!

Mineral Development

1. Mining exploration companies and mine operators should continue to minimize the negative effects of their activities on the environment.

2. Mining companies should hire locally and purchase local goods and services when possible. Companies should also use local labour in order to reduce their operating costs and to encourage a higher labour force retention rate.

3. New mines should be developed as fly-in fly-out operations. New communities should not be established at mine sites. The mining industry, in consultation with the Kitikmeot Inuit Association, should study options for improving transportation linkages between communities and exploration/mining employment opportunities in the region.

4. All proposed mining developments must include plans, complete with financial guarantees, for the eventual abandonment and restoration of the sites. All hazardous wastes must be removed.

5. The mining industry is encouraged to assist in identifying local carving stone deposits.

6. Special hunting restrictions at mine sites and along transportation routes should be strictly enforced by mine operators and land managers to prevent adverse impacts on wildlife.

Transportation

SURFACE TRANSPORTATION

1. The Nunavut Planning Commission should implement the concept of a transportation and/or communications "corridor" as a land use policy having general application throughout West Kitikmeot based on the process outlined in Appendix 5.

2. All parties wishing to develop a transportation and/or communications corridor must submit to the Nunavut Planning Commission a detailed application for the project. This application must include an assessment of alternate routes, plus the cumulative effects of the preferred route. It should provide reasonable options for other identifiable transportation and utility facilities.

3. The Nunavut Planning Commission and the Nunavut Impact Review Board should publicly review the proposed corridor to determine whether the proposal adequately meets the guidelines set out in Appendix 5A. Once it is determined that a proposal does meet the guidelines, the Commission may request the Minister of DIAND to amend the plan to include the new transportation corridor.

MARINE TRANSPORTATION

1. The Nunavut Marine Council should be established pursuant to Article 15.4.1 of the NLCA as soon a possible. The council should address the need for regional Inuit shipping advisory committees and an improved communications system to reduce Inuit safety hazards. It should encourage the use of Inuit monitors on board any ship traveling through the region.

2. Any shipping company planning travel near a community where hunter movements might be affected should be required by the Canadian Coast Guard to consult the community CLARC regarding ship timing and routes in order to minimize the effects of ship tracks on hunters, wildlife and the environment.

3. Companies operating cruise ships in the region should be required by the Coast Guard to consult with communities on their proposed routes and timing, to ask permission to visit communities, and to arrange for appropriate logistics.

4. The Coast Guard should complete placement of oil spill response equipment in the region, and train appropriate people in the communities in its use.

Power and Energy

1. DIAND, the Northwest Territories Power Corporation and other responsible agencies should not allow hydro development on the Coppermine or Hood Rivers.

2. The power corporation and the territorial government should do more research on alternative energy sources, wind power, and the potential use of petroleum products from the Beaufort Sea.

Scientific Research

1. The approval process for all scientific research, including research conducted by government departments and agencies, should require the involvement of local residents.

2. Research programs conducted in the West Kitikmeot should rely on local services and local employment where possible.

3. The results of any research carried out in the West Kitikmeot should be translated into Inuinnaqtun and made available to the people of the region. Reports should be translated in a format that will be understood by a non-technical person, but not simplified to the point where meaning is lost.

4. Academic and scientific researchers should consider the research priorities of residents in the conceptual design of their research programs.

5. All agencies should support the efforts of the Nunavut Research Institute (NRI) to better regulate research in Nunavut.

Heritage Resources

1. DIAND, the Kitikmeot Inuit Association and other authorizing agencies should issue land use authorizations in areas containing archeological or other heritage resources only if these sites have been investigated by a qualified archeologist and/or an Inuit

elder authorized by the Inuit Heritage Trust (IHT), and an appropriate course of action has been taken to preserve the integrity of the site and the artifacts it contains.

2. The Inuit Heritage Trust and Prince of Wales Northern Heritage Centre (PWNHC) should work together to identify and monitor activities at or near heritage sites in the West Kitikmeot. The IHT should assume the lead role in this work.

3. Land users should report the discovery of all suspected archaeological sites to the IHT and the NPC. The NPC, IHT and PWNHC should clarify their respective roles in this process.

4. The Inuit Heritage Trust and other agencies such as the Prince of Wales Northern Heritage Centre should adopt the following classification terminology for period dating: Pre-Contact, Post-Contact, Non-Inuit, Undetermined.

List of Abbreviations

Canadian Environmental Assessment Act	CEAA
Canadian Wildlife Service	CWS
Community Land and Resources Committee	CLARC
Department of Economic Development and Tourism, GNWT	DEDT
Department of Natural Resources Canada	NRCan
Department of Energy, Mines and Petroleum Resources	EM&PR
Department of Fisheries and Oceans	DFO
Department of Indian Affairs and Northern Development	DIAND
Department of Municipal and Community Affairs, GNWT	MACA
Department of Renewable Resources, GNWT	DRR
Department of the Environment	DOE
Department of Transport, Government of Canada	DOT
Department of Transportation, GNWT	GNWT DOT
Designated Inuit Organization	DIO
Environmental Assessment and Review Process	EARP
Federal Environmental Assessment and Review Office	FEARO
Inuit Heritage Trust	IHT
Government of the Northwest Territories	GNWT
Nunavut Impact Review Board	NIRB
Nunavut Planning Commission	NPC
Nunavut Tunngavik Incorporated	NTI
Nunavut Water Board	NWB
Nunavut Wildlife Management Board	NWMB
Prince of Wales Northern Heritage Centre	PWNHC
Surface Rights Tribunal	SRT
Tungavik Federation of Nunavut	TFN

List of Definitions

CONSERVATION	A way of managing renewable, non-renewable and heritage resources, so that long-term benefits can be enjoyed by present and future generations.
DEVELOPMENT	Defined by the World Conservation Strategy as "the modification of the biosphere (thin covering of the planet that contains and sustains human life) and the application of human, financial, living, and non-living resources to satisfy human needs and improve the quality of human life."
ECOSYSTEM	A community of organisms, and the environment in which they live.
ENVIRONMENT	The total biosphere including ecological, physical, and human systems. Social, economic, legal, political, institutional, and cultural endeavors are therefore, part of the total environment.
LAND	For the purpose of this Plan, land includes land, inland waters, and the offshore.
LAND USE	The human use of any natural resources in the planning Region. This use may vary from intensive use in settled areas, to very little use in undisturbed areas.
LAND USE ACITIVITY	Any human activity that uses the land or is associated with use of the land, which may vary from camping to mining, seismic activities, drilling for oil.
LAND USE PLANNING	Land use planning is a systematic process of decision-making relating to the conservation, development, management, and use of land and resources including inland waters and the offshore. The land use planning process includes implementation of land use plans, and the monitoring of land use conflicts. Social, cultural and economic interests of people are central to policies that guide land use planning.
NON-RENEWABLE RESOURCE	Finite (limited) resources which cannot be replaced or renewed following extraction, including all minerals, aggregates, and fossil fuels.
PLANNING REGION	The area for which a planning process is carried out and for which a land use plan is made.
POLICY	A series of statements and a process providing a definitive direction for decision-making, which specifies courses of action for achieving goals and objectives. Policy is a way of defining a problem so that it can be solved. Policy principles, goals, objectives, and actions are therefore, part of an ongoing process.

PRESERVATION	A form of conservation involving minimal levels of environmental manipulation so as to safeguard existing features and processed for the future.

PROTECTED AREAS	An area of land and water requiring special management measures, either seasonal or year-round, to protect natural, cultural, historic, archaeological, scientific, recreation, or aesthetic value (GNWT Draft Sustainable Development Policy).

RENEWABLE RESOURCES	A natural resource that comes from an essentially inexhaustible source (such as solar energy) or that can be replenished by natural or human devised cyclical processes if it is not used faster than it is renewed.

SUSTAINABLE DEVELOPMENT	Defined by the National Task Force on Environment and Economy as "development which ensures that the utilization of resources and the environment today does not damage prospects for their use by future generations."

Introduction

The West Kitikmeot Resource Management Planning Process has been guided for the last two years by the Nunavut Planning Commission Transition Team (NPCTT). However, this report is part of a much longer process, one which predates the establishment of the transition team. It is based on a report by the West Kitikmeot Resource Management Working Group, published in May 1994.[1] The NPCTT would like to recognize the work carried out prior to its inception.

This report is the product of several years of work in the communities of Kugluktuk, Cambridge Bay, Omingmaktok and Bathurst Inlet. It comes after more than a dozen community meetings and workshops attended by representatives of regional and local bodies, government, industry and other interested parties. This report will be forwarded to the Nunavut Planning Commission for its consideration as the basis of the West Kitikmeot Regional Land Use Plan.

The research that has gone into this report has been driven primarily by the needs and ideas of the people who live in the West Kitikmeot. But it also incorporates the interests of the government agencies which are responsible for regulating much of the activity which takes place on the land, as well as those of industry which might want to work in the region.

The people of the West Kitikmeot have said repeatedly that they want to see controlled industrial development in their region but they also want to ensure that their valuable renewable resources – the land, water and wildlife – are protected for future generations. The land has always been the foundation of Inuit culture and well-being. Although there have been many changes in Inuit society over the last few decades, this link to the land remains vital. The main focus of all the work in this report has been that this important link must remain unaltered.

That said, the land use plan suggested from this exercise will not be like a traditional land use plan. Rather it will reflect plans which have already been developed for the Keewatin and Lancaster Sound regions. The purpose of this plan will not be to allocate restrictive land uses to particular regions. Rather, it will look at land use activities in the region as a whole, and make recommendations which will guide sound development where it might occur while at the same time ensuring the protection of the land and resources. These recommendations will take the form of a series of actions which will be directed at communities, government or industry.

It is a balancing act, but one which reflects the needs and interests of everyone who has participated in this report's development. This report is also written with an eye to the

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[1] ***Revised Report on Resource Management Planning in West Kitikmeot***

future. The land use plan adopted for the West Kitikmeot will be reviewed every five years. During this period, subject to community consultation and assent, it may also be amended.

Most of the recommended actions are designed to be implemented shortly after the plan is adopted. Where this is not the case, comments have been included which indicate a possible time frame.

Chapter 1: Principles Guiding Preparation of the Plan

Land use planning in the West Kitikmeot is guided by the principles set out in the *Nunavut Land Claims Agreement (NLCA)*. First, people are considered to be an important, living part of the biophysical environment. Further, it is recognized that "land use cannot be planned and managed without reference to the human community." For this reason, the "social, cultural and economic endeavours of the human community must be central to land use planning and implementation."[2]

According to the NLCA, the primary purpose of land use planning in the Nunavut Settlement Area is to protect and promote the existing and future well being of everyone living in the region. Special attention is paid to protecting and promoting the well-being of Inuit and Inuit Owned Lands. Finally, planning must also take into account the interests of all Canadians.

Another key feature of the planning process is that it incorporates, from the outset, the priorities and values of the residents of the region, and gives them a chance to participate in an active way in its development. In order to ensure continued local input in the process, the NPCTT hired mapping coordinators in Kugluktuk and Cambridge Bay. These employees know their communities and region and, besides gathering information and doing research, acted as a liason between the NPCTT board and the residents of the West Kitikmeot. As well, the planning process has included representatives of Inuit organizations, HTAs, government and other agencies.

The objective of the planning work has been to develop policies, priorities and objectives regarding the conservation, development, management and use of land in the region with the goal of creating a land use plan to guide resource use and development in the region. This final report is part of that process. It will be turned over to the NPC when it is created and is expected to form the basis of a land use plan for the West Kitikmeot.

[2] Chapter 11.2.1

Chapter 2: An Overview of the West Kitikmeot Region

2.1 Introduction

The West Kitikmeot planning region covers almost a quarter of a million square kilometers of tundra, lakes and ocean, most of it north of the Arctic Circle. The northernmost point of the region lies in Viscount Melville Sound at 110° west and approximately 74° north. From there the boundary runs east, north of Stefansson Island, then south and southeast through the centre of M'Clintock Channel. At a point north of Gateshead Island, the boundary turns due south, following the 100° west meridian of longitude until reaching the 66th northern parallel. From this point, the boundary turns approximately southwest, eventually intersecting the Nunavut boundary with which it is contiguous back to its origin. (Map 1: West Kitikmeot Planning Region)

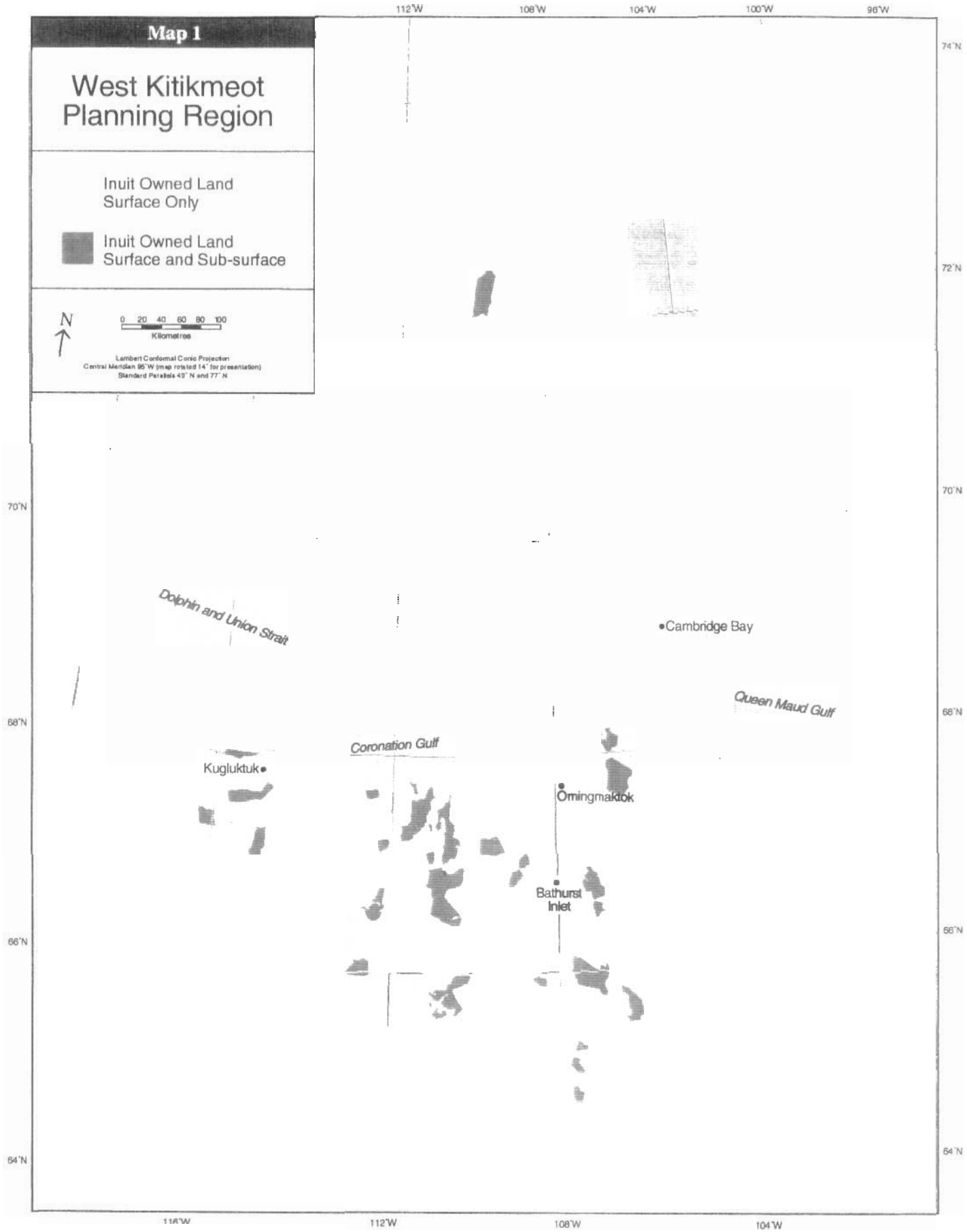
The West Kitikmeot is bounded in the west by the Inuvialuit Settlement Lands and in the southwest by the territories of several Dene First Nations. Under the terms of the *Nunavut Settlement Act (1993)* Inuit title is held on 66,390 square kilometers of land in this region. Inuit have both surface and mineral rights to just over 9,600 square kilometers of this area.

The West Kitikmeot covers parts of the central arctic islands and the coastal area as far inland as Contwoyto Lake. Until 1981, the Kitikmeot was once part of the Fort Smith region. Kitikmeot is the traditional Inuit name for the area, meaning "from the centre" in Inuinaqtun, the language of the region. With Cambridge Bay as a government centre, the Kitikmeot will be one of three administrative districts in Nunavut after the territory of Nunavut is created in 1999.

2.1.1 Mapping the Resources

The West Kitikmeot Mapping Project began under the direction of the Nunavut Planning Commission Transition Team (NPCTT) in 1994. It was designed to gather information on wildlife and harvesting in the region. This information was then converted into a series of wildlife and harvesting databases using information from people in the communities.

This project is the culmination of over two decades of work. In the 1970's DIAND prepared the Land Use Information Series of maps for the North. In the 1980's the Tungavik Federation of Nunavut (TFN) took this information, reviewed the information in all of the communities of Nunavut and produced a new series of maps that has been published as the Nunavut Atlas. In the early 1990's TFN staff recast the information in the Nunavut Atlas into a format that would allow entry into a GIS system. Revised maps


Map 1
West Kitikmeot Planning Region
Inuit Owned Land Surface Only
Inuit Owned Land Surface and Sub-surface
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Ōmingmaktok
Bathurst Inlet
116°W
112°W
108°W
104°W

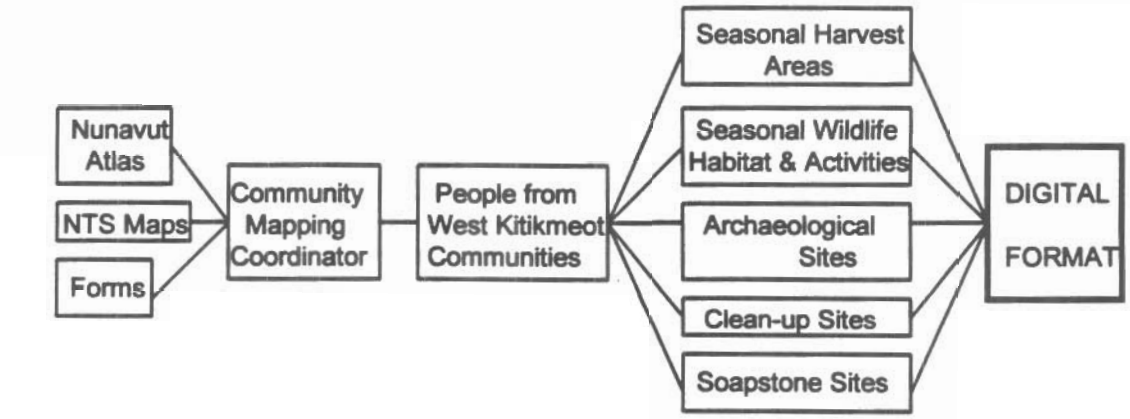
were produced, containing information on wildlife species habitat and harvesting by season. These maps have been reviewed and corrected by people in the communities. New information has also been gathered.

The data has been organized in five categories:

1. Harvest: areas where wildlife is harvested.
2. Wildlife: main areas of wildlife activities (e.g. calving, denning, etc.).
3. Archaeological sites: location and identification of potential and confirmed archaeological sites.
4. Clean-up sites: location and identification of sites requiring clean-up.
5. Soapstone sites: location and identification of sites with soapstone deposits.

This information has been provided by local residents and institutions which have carried out research in these areas. Figure 1 illustrates the information gathering process.

Figure 1: West Kitikmeot Mapping Project Flow Chart



All of this information has been published on CD-ROM. The data can be used to "build" maps using computer software that break out information by species, time of year, and region. There is data on caribou, musk ox, polar and grizzly bear, moose, fox, seal, ground squirrels and other small mammals, as well as golden eagles, Gyrfalcon, peregrine falcon, seabirds, and waterfowl. Figure 2 lists the species by harvest and habitat. Maps can be constructed using each of these categories as a "layer". Individual layers are represented by an "X".

Figure 2: Harvest Areas and Wildlife Habitat

Species / Season	HARVEST AREAS					WILDLIFE HABITAT				
	WINTER	SPRING	SUMMER	FALL		WINTER	SPRING	SUMMER	FALL	REPRODUCTION
Arctic Fox (Harvest Nov.1- Apr.30)	X					X	X	X	X	Denning (late march - late June)
Colored Fox (Harvest Nov.1- Apr.30)	X					X	X	X	X	Denning (late march - late June)
Arctic Ground Squirrel		X	X	X			X	X	X	
Arctic Hare	X	X	X	X		X	X	X	X	
Caribou[3] (Bathurst, Bluenose & island herds)	X	X	X	X		X	X	X	X	Calving (Early June - mid June)
Grizzly Bear (Domestic & sport harvest)		X	X	X			X	X	X	
Moose	X	X	X	X		X	X	X	X	
Muskox[4] (Domestic & sport harvest)	X	X	X	X		X	X	X	X	Calving (Late April- early May)
Polar Bear	X					X	X	X	X	Denning & Cubbing (April - May)
Snowy Owl	X	X	X	X		X	X	X	X	
Golden Eagle						X	X	X	X	Nesting (May - September)
Gyrfalcon						X	X	X	X	Nesting (May - September)
Peregrine Falcon						X	X	X	X	Nesting (May - September)
Rough Legged Hawk						X	X	X	X	Nesting (May - September)
Seabirds & Waterfowl[5]		X	X	X			X	X	X	Nesting[6] (spring)
Bearded Seal[7]	X	X	X	X		X	X	X	X	
Ringed Seal	X	X	X	X		X	X	X	X	
Wolverine	X	X		X		X	X	X	X	
Wolves	X	X		X		X	X	X	X	Denning (Late March early June)

[3] Includes spring and fall migration maps.
[4] Includes areas where seasonal wildlife habitat is concentrated.
[5] Includes Canadian, blue, brant, snow, white fronted geese, red, yellow bill, common loons, old saw, king & common eiders, black duck, mallards, ptarmigans, swans, sand hill cranes.
[6] Includes nesting areas for arctic tern and gloucus gull.
[7] Includes areas where seasonal wildlife habitat is concentrated.

2.2 Environment

2.2.1 Ecozones and Ecoregions

The West Kitikmeot covers three distinct ecozones: the Northern Arctic, Southern Arctic and Taiga Shield. The Northern Arctic zone includes the Ecoregions of Victoria Island Lowlands and Shaler Mountains, as well as parts of the Amudsen Gulf Lowlands around Kugluktuk and the Kent Peninsula.

The Southern Arctic Ecozone stretches from the western to eastern boundaries of the West Kitikmeot. It includes parts of the Coronation Hills, Bluenose Lake, Bathurst Hills, Queen Maud Gulf Lowland, Takijua Lake Lowland, and Garry Lake Lowland ecoregions.

Finally, the Taiga Shield, which touches the southern portion of the region, includes part of the Coppermine River Upland, a large ecoregion which incorporates much of the river's drainage system.

2.2.2 Geology and Geomorphology

From the air, the first thing that strikes an observer about West Kitikmeot is its apparent limitlessness. Without major land forms to add definition, the eye travels to the horizon all around. Below, the land is dotted by thousands of lakes of various size, connected by streams or one of the great rivers which runs through the region – the Rae, Coppermine, Hood, Tree, Burnside and Ellice. Beneath its surface, the West Kitikmeot is underlain by three geologic "provinces". The Bear province, north and east of Great Bear Lake, is comprised mostly of volcanic rocks and sediment. Traces of copper and uranium have been found in the region. (This "native copper" has been known to the Inuit and other Aboriginal people for centuries and finding its source was the goal of the first Europeans in the region.)

The Slave province lies to the east of the Bear and is mainly underlain by granite and related gneissis formations. Some gold prospects have been found. It is also the site of major diamond exploration activity.

North of the mainland, the Arctic coastal plain is made up of mostly sedimentary rock. This area has some oil and gas potential but no active exploration.

The West Kitikmeot region has a high potential for mineral development, more particularly, in the mainland area from Kent Peninsula in the east to Bluenose Lake in the west and south to the region's boundary. There exist several known medium to large

deposits of base metals such as copper, zinc, and lead and several sizable gold deposits in addition to the Lupin deposit currently under production. Some of these deposits are actively being considered for development as mines. Uranium occurrences are also present in this area. In recent years much of this area has been staked by diamond prospectors.

It is possible that a number of deposits could be developed as mines in the near future. Technically, the major limiting factor in the development of new mines is the cost of transportation and energy.

The West Kitikmeot forms part of the Precambrian Canadian Shield. Several geomorphic zones converge in the region, including the Interior Plains through which the Coppermine River flows, the Arctic Lowlands and the Kazan Region. The latter includes the Bathurst Hills, composed of folded, down-faulted sediments that lie within Bathurst Inlet and extend south. Elevations in this region reach more than 300 metres in places. In the northeast, the Bear-Slave Uplands is typical of the treeless regions found elsewhere in the Shield. The land is dotted by hundreds of thousands of small lakes, winding rivers and muskeg. The landscape of rolling hills rarely rises more than 60 or 70 metres. The main part of the Coronation Hills region is low and extends eastward into Coronation Gulf. Hills in this region rise a couple of hundred metres above sea level, with the highest elevations found in the Coppermine Hills (about 2000 feet).[8]

Continental glaciation left its indelible marks on the West Kitikmeot. Much of what is now open tundra was under water 9,000 to 11,000 years ago. Glacial lake Coppermine formed as the glacier melted and its drainage routes to the Arctic ocean are responsible for most of the river valleys of the region. In its wake, the ice left abundant eskers, kames, and drumlins across the terrain.

The West Kitikmeot is a wide open, rugged landscape which has been the home of the Kitikmiut or "Copper Inuit" for thousands of years. It is the homeland of the Inuit who now live most of the year in the communities of Kugluktuk, Cambridge Bay, Omingmaktok (Bay Chimo) and Bathurst Inlet. The land is largely tundra and touches the treeline only in the far southwest and along parts of the Coppermine River basin.

2.2.3 Climate

Precipitation in the region is low, ranging from 12.5 to 25 centimeters a year. Elsewhere, this lack of rain and snow might create a desert, but in the West Kitikmeot permafrost helps hold considerable moisture in the ground. Combined with poor drainage and a low rate of evaporation, this moisture is enough to ensure summer plant growth.

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[8] Bostock, H.S. 1970. "Physiographic Subdivisions of Canada" in R.J.W. Douglas, ed. **Geology and Economic Minerals of Canada.** (Ottawa: Geological Survey of Canada. Department of Energy, Mines and Resources) .

The summer is short. The first frost comes in August and winter freeze up begins with the first snows of September. Snowmelt begins in May followed by the breakup of river ice in June. Sea ice, which can freeze to a depth of 2.5 metres, does not usually break up until July. Many lakes are ice-covered for much longer. And on the north side of Victoria Island, ice stays on the water in many places all year. The last week of June sees the last frost, making the frost-freeze season about 50 to 55 days. Temperatures in January are as low as -45C. Summertime highs range from 15 to 20 C.

The following figure compares climate information in the West Kitikmeot.

Figure 3: West Kitikmeot Climate Data[9]

[redacted]	Cambridge Bay	Kugluktuk	Bathurst Inlet
mean first day of frost	Aug. 20	Aug. 20	Aug. 20
mean last day of frost	Jun-25	Jun-25	Jun-30
mean frost free season	55 days	55 days	50 days
Jan. mean minimum temp.	-37C	-33C	-35C
July mean maximum temp.	12	13	13
annual estimated precipitation	136 mm	202 mm	108 mm

2.2.4 Vegetation

Vegetation in the West Kitikmeot is limited by the severe climate, a lack of groundwater and low precipitation. Most of the vegetation grows sporadically, close to the ground to limit exposure and moisture loss. Small shrubs, lichens, and vibrant arctic flowers can be found on hillsides.

The northern fringe of the boreal forest reaches into the West Kitikmeot as the "treeline" winds through its southern region and consists mainly of spruce, tamarack and birch, as well as grasses and sedges. At lower elevations, willow is also found. In fact, trees are found in many places along the Coppermine river valley well north of the treeline. These trees, remarked upon by numerous Arctic explorers and used as a timber source for many expeditions, provided an important component of the Copper Inuit technology. At Bloody Falls, just a few kilometres from the Arctic coast, ancient dwarf willows cling to clefts in the rock, growing at a minuscule rate each year.

[9] From Lutra Associates Ltd. et al. **Kitikmeot Region Economic Base Study**. Feb. 1985.

2.2.5 Renewable Resources and the Inuit Economy

A main goal of land use planning is the protecting and maintaining the health and well-being of the environment and wildlife. For millennia, Inuit fortunes where linked to the animals they hunted. Today, a healthy wildlife population remains vital to Inuit social, cultural, and economic well-being. The Government of the Northwest Territories recently stated that renewable resources have a value to the territorial economy in the order of $55 million to $60 million annually. Over 70% of NWT Aboriginal households hunt and fish, and more than 90% consume food from this harvest.[10]

The Inuit economy is "mixed". That is, it has two components, each dependent on the other – harvesting from the land and wage employment. Wage earnings are used to supplement hunting activities; hunting provides food which, among other benefits, replaces expensive imported items.[11]

Although harvesting is a part-time activity for most people, production per hunter is high. The *average* hunter in the Arctic takes 1000 to 1500 kilograms of meat and fish each year. This food has

> *an imputed value of $10,000 to $15,000. These harvest levels are not restricted to a few smaller communities like Broughton Island, Pelly Baychimo [sic], and Paulatuk. They occur also in such larger centres as Baker Lake, Pond Inlet, and Coppermine.*[12]

In 1988, the average Kitikmeot Hunter's harvest was about 1400 kilograms. This works out to an average of about 300 kilograms per capita.[13]

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[10] Government of the Northwest Territories, Department of Renewable Resources, **Tradition and Change: A Strategy for Renewable Resource Development in the Northwest Territories**, 1994, p. 1.

[11] A useful explanation is provided by Gary Kofinas, "Subsistence Hunting in a Global Economy Contributions of Northern Wildlife Co-Management to Community Economic Development" in **Making Waves: A Newsletter for Community Economic Development [CED] Practitioners in Canada**, vol 4, no 3 (August 1993):

> ... [T]here are actually two sectors of the economy, one formal and another informal. The formal sector is easily comprehensible to those of us immersed in western industrialized life.... The informal sector is, by definition, difficult to measure. Generally based on non-monetary exchange, private ownership of modes of production, and family, informal economic activities have been defined as those transactions which provide for subsistence and do not increase profits or accumulate capital for its own sake.... In many native communities of the North American Arctic and Sub-Arctic, the informal sector is based largely on subsistence hunting and traditional uses of wild foods. ...

[12] P.J. Usher & Frederick H. Weihs, **Towards a Strategy for Supporting the Domestic Economy of the Northwest Territories.** Ottawa, 1989, p. 11.

[13] Usher & Weihs, p. 12.

Country food replaces expensive store bought food, which can only be purchased with cash. "Numerous studies since the mid-1970s have reported that harvesting consistently provides a higher yield of food per dollar spent than can be bought with money earned from wage labour."[14] Wild food is also a better source of nutrients, such as iron, magnesium and calcium, than imported food. Seal meat, for example, has six to ten times the iron content of beef.[15]

Of prime importance is the abundance of caribou, the main food staple of residents. The calving-grounds of three caribou herds are in the region. The calving-grounds of the Bathurst herd are in the area around Bathurst Inlet, those of the Bluenose herd are in the extreme west of the region, and there are several calving areas on Victoria Island.

A commercial fishery in Cambridge Bay exports Arctic Char to the south, another source of cash income for many people. Caribou and musk ox meat is also exported. Before the collapse of the sealing industry in 1982-3, sealskin production was the major, non-government source of community income.

Many people continue to spend part of their time in the community and part on the land. In the summer people move from town to cabins strung along the coast near Cambridge Bay and Kugluktuk, or along the banks of the Coppermine River. In winter, hunting parties move across the frozen landscape on snow machines. Similar routes are traversed by four-wheeler when summer comes.

Throughout the work on this report, the people of the West Kitikmeot pointed to the land and its rich wildlife population as being a defining characteristic of their region, one which they want to see preserved.

Caribou

Caribou habitat and harvest maps for the West Kitikmeot show the animals either use, or have used, almost the entire region at one time or another. Caribou are one of the most important sources of protein for the people of the region, and the backbone of the hunting economy. The Bathurst and Bluenose herds, which migrate through great expanses of the Arctic lowlands, are made up of Barren-ground caribou (*Rangifer tarandus groenlandicus*). Both of these herds are considered to have "stable" populations. The Department of Renewable Resources has estimated that the Bluenose number 115,000 animals. The Bathurst herd is estimated at 270,000 to 430,000.[16]

The Bluenose herd is an important food source for the people of Kugluktuk who take an average of 3500 to 5000 animals annually. This includes a commercial harvest of 950,

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[14] Environment Canada, "The Inuit Economy – sustaining a way of life: A State of the Environment Fact Sheet," p. 6.
[15] "The Inuit Economy," p. 7.
[16] Numbers from a table on the Department of Renewable Resources Internet "web site" (http://www.edt.gov.nt.ca/renewable/wildlife/caribou/caribou.html).

"the meat being sold by hunters to various commercial outlets in their respective communities. In most years the full quota is not realized and the take is usually 500-600 caribou."[17] According to the Renewable Resources, these numbers are "at or approaching the maximum harvest allowable for herd stability."

Besides being a primary food source for the Kitikmiut, the Bathurst Caribou Herd is important to the lives of the Dene who live south of the Nunavut boundary. An estimated 8000 to 10,000 animals are harvested each year from this herd. "In 1988 a draft management plan for the herd was released. It recommended keeping the population level high enough (between 300,000 and 600,000) to allow an annual harvest of at least 16,000 animals."[18]

There are two types of caribou on Victoria Island. Caribou on the extreme north-west corner of the Island (Minto Inlet herd) are similar to Banks Island Peary caribou, whereas those on the rest of the Island are similar to barren-ground caribou of the mainland. Hunters and biologists have several concerns about Victoria Island caribou. First, there is no good population estimate upon which to evaluate the present harvest. Second, Holman hunters will be shifting their efforts from the Minto Inlet herd (which seems to have dramatically declined since 1987) to other Island caribou. And third, Island caribou are resuming a migration pattern of moving to the mainland for the winter which was last seen in the late 1920's. A substantial but unknown number of Island caribou migrate across the sea ice and are taken on the mainland by hunters from Omingmaktok and Kugluktuk.

During community consultations, Omingmaktok hunters noted changing patterns of caribou migrations between the mainland and Victoria Island during their lifetimes. In the 1950s there were few if any caribou on Victoria Island, whereas now there is a large annual migration.

Renewable Resources initiated a 5-year research program in 1993 to determine calving areas, the number of animals in each population, the location and number of animals harvested, and caribou movements. One objective is to better understand movements to and from the mainland to ensure that commercial shipping does not interfere with the migration. Conventional VHF collars and low level flights along Coronation Gulf will be used to better understand these movements.

In addition, the Kitikmeot HTA is undertaking a study to determine the extent of the harvest of Victoria Island caribou and the extent of the range of Victoria Island caribou. The project would be in support of community management plans for caribou, and would include an effort to document traditional knowledge of Island caribou, their habits and characteristics as noted by harvesters. Work on the project will be completed in March

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[17] GNWT Department of Renewable Resources. **People and Caribou in the Northwest Territories.** Yellowknife, NWT, 1989, p. 106.
[18] **People and Caribou,** p. 115.

1995. Additional research on caribou migrations and the Bathurst Calving grounds is being initiated through the West Kitikmeot/Slave Study.

Musk oxen

Musk oxen populations in Canada were reduced to almost nothing by the turn of the century, so great was the demand for meat and hides. The federal government enacted protective legislation in 1917 and for the next 40 years the musk oxen population grew. In the Queen Maud Gulf area, there is little data on the historical size of the population because the area was visited by outsiders infrequently until the 1940s. Prior to that there had been relatively few musk ox sightings in the area. However, in the 1970s and 1980s, the number of animals apparently increased, due to migration from other areas and a low resident wolf population.[19]

Musk oxen are another important food source for the people of the region. These large animals live in small herds throughout the West Kitikmeot. They are especially numerous on Victoria Island where, in 1990, the population was estimated at 20,000.[20] Since then the numbers appear to have increased. In spring 1996, residents of Cambridge Bay reported seeing far more musk ox than caribou in their area.

Other Animals

Other important mammals include polar bear, grizzly bear, seal, wolf, wolverine and fox. People throughout the region fish for char, whitefish, trout and other species.

Research on grizzly bear ecology in the central Arctic began in May 1995. The study area includes part of the West Kitikmeot from east of Bathurst Inlet to west of Kugluktuk. In 1995, 39 grizzlies were captured around Lac de Gras and the upper Coppermine River. Of these, 23 were equipped with satellite collars. The collars reveal the bears' location every two days and the information gathered will help biologists understand the animals' distribution, movement, population, food and habitat. A traditional knowledge component of the study is also planned.

Each year millions of swans, geese, ducks and other fowl migrate to nesting sites in the West Kitikmeot. The Queen Maud Gulf Bird Sanctuary, east of Bathurst Inlet, was created in 1961 to protect the nesting grounds of Ross' Geese, Lesser Snow Geese, Tundra Swans, Canada Geese and other birds. The sanctuary has been identified as a Wetland of International Importance (RAMSAR Site). The Canadian Wildlife Service would like to reduce the sanctuary's southern boundary slightly and upgrade its status to a National Wildlife Area in order to provide stronger protection for these lands.

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[19] Anne Gunn, et. al. "Possible causes and consequences of an expanding muskox population, Queen Maud Gulf Area, Northwest Territories." **Proceedings of the First International Muskox Symposium.** University of Alaska, 1984, pp 43-45.

[20] Department of Indian Affairs and Northern Development, **Information North**. December 1990.

A GNWT Renewable Resources study identified four other important bird habitats in the West Kitikmeot. These are the western half of the Kent Peninsula, Albert Edward Bay, the area around Cape Krusenstern, near Kugluktuk, and Wellington Bay, west of Cambridge Bay and south of Ferguson Lake.[21]

Renewable Resources has also identified "areas of special interest." These include the calving grounds of the Bluenose and Bathurst caribou herds, and important habitat for Gyrfalcon and Peregrine falcon around the mouths of the Rae, Richardson and Coppermine rivers, near Kugluktuk, as well as Melville Sound and Anderson Bay. A 4800 square kilometre area called the Horton Plain, around the Rae and Richardson rivers, has been identified as important musk ox habitat. The area is 90 kilometres west of Kugluktuk. Finally, an area important to polar bears has been identified at Hadley Bay on the north end of Victoria Island.[22]

2.2.6 Tourism: A Renewable Resource

Tourism is an important and growing source of income for people in the planning area. Its vitality is a function of both a healthy environment and the unique geography of the region.

A Government of the Northwest Territories survey confirms that the number of visitors to the "Eastern Arctic", which includes the West Kitikmeot, increased from 4711 in 1989 to 5052 in 1994.[23] This is a small increase considering two-thirds of the visitors went to Baffin Island. Nevertheless, tourism is a small but growing industry in the West Kitikmeot.

Tourists come to the region to canoe or boat, fish, hike, look at wildlife tour communities.[24] The come to the West Kitikmeot, and the rest of the NWT, to see the things they cannot see elsewhere. And all of these things depend on an unspoiled environment.

A 1988 study of the Coppermine River basin stated that canoeists spent an average of $1,500 and that tourism activities on the river were worth $250,000. The study made two recommendations concerning tourism and the river. The first is that environmental

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[21] R.G. Browley, **Cooperative Central Arctic Waterfowl Surveys 1989-1991**. GNWT Department of Renewable Resources, p. 39.

[22] Details can be found in GNWT Department of Renewable Resources, **Wildlife Areas of Special Interest to the Department of Renewable Resources in the Nunavut Settlement Area**. March 1995.

[23] GNWT Economic Development & Tourism. **1994 NWT Exit Survey: General Report on Visitors to the Northwest Territories.**, p. 19. Although it is difficult to compare numbers, the 1986 **Kitikmeot Visitors Survey** showed that 1200 people visited the region between June and September the previous year. Thirty-one percent of these vacationers went to Kugluktuk and 18 per cent to Cambridge Bay.

[24] *1994 Exit Survey*, p. 24.

conservation be the "governing principle" in the design and operation of any "water-related developments" in the basin. The second recognized the importance of the char fishery on the river, as well as more recent benefits from tourism, and stated that existing uses be preserved and protected from future developments which might conflict with them.[25]

The data in Figure 4 is from 1994 and illustrates tourist activities in Cambridge Bay.

Figure 4: Visitors to the Cambridge Bay Arctic Coast Visitor Center[26]

	Number	Percentage
Total Visitors	**607**	**100**
Visiting Mt. Pelly	323	53
Touring Cambridge Bay	457	75
Hunting or Fishing in Area	206	34
Purchasing Tourism Services	429	71
- Day Tour to Historic Site	234	39
- Day Tour to View Wildlife	284	47
- Staying at Hunting/Fishing Lodge	123	20
Shopping for Arts & Crafts	329	54

While tourists are welcome and few problems have occurred that warrant attention in a land use planning exercise, a few concerns have been expressed at community meetings. People in Kugluktuk are concerned that with the increased use of the Coppermine River by canoe campers, the potential increases for garbage being left on the land and environmental degradation at heavily used campsites. Similar concerns were expressed at a community meeting in Cambridge Bay about the mess that some canoeists left on the Surrey River. It was suggested that it may be time to institute better controls over the activities of such visitors. In Cambridge Bay it was suggested that tourists should contact the CLARC before venturing onto the land.

Concerns were also expressed in Cambridge Bay about the increased use of the Northwest Passage by cruise ships, the removal of artifacts by tourists from these ships, and the anticipated use of nuclear-powered ships.

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[25] Environment Canada, p. 70. An example of a conflicting use is the development of a hydro facility at Bloody Falls, a proposal which has been rejected by the people of Kugluktuk.

[26] GNWT Bureau of Statistics, **1994 NWT Visitors Exit Survey.**

2.3 The People

2.3.1 Introduction

The Kitikmiut or "Copper Inuit" are originally an inland people who moved to the coast about 1000 years ago.[27] Over the centuries, the Kitikmiut traveled over vast stretches of tundra, following inland caribou herds, moving to the coast to hunt seals and other sea mammals, or fishing from the region's countless lakes and rivers. Permanent settlements are a recent phenomenon, the product of major changes introduced from the south during this century, namely the growing influence of European and then Canadian traders, missionaries and government officials.

Like other parts of Nunavut, the contemporary West Kitikmeot economy is "mixed". It has two components: income from wage employment helps subsidize hunting activities; sharing the fruits of the land – caribou, seal, fish and birds – reinforces kinship ties.

The traditional round of hunting activities was determined by the availability of game and geography. From December to May, the main activity used to be hunting seals through breathing holes on the sea ice. The Kitikmiut built snow houses on the ice to be close to their quarry. Polar bears were also an important source of food at this time of year as they too came onto the ice in search of seals. During the latter half of May, the Kitikmiut moved onto the land to hunt caribou which were beginning their annual northward migration. As well, people fished through the ice of inland lakes during the spring.

From May to November, the chief sources of food were caribou, fish, wildfowl and small game. The best caribou hunting is in early August since by then the animals have put on considerable body weight following a summer of grazing. The important arctic char run takes place in the early fall as well.

Where people lived, and who they lived with, depended on economic activities and the season. From May to November, groups varied in size and composition with the largest aggregations (about 50) gathering for the char run.[28]

While Europeans had been periodically exploring parts of the West Kitikmeot since the 1700s, it was only during the latter half of the 20th Century that outside ideas and institutions had a major impact on the lives of the Inuit of the region. Before that, in the words of Robert McGhee, the Kitikmiut lived "in virtual isolation."[29] Historical land use

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[27] Peter Usher, **Economic Basis and Resource Use of the Coppermine - Holman Region, N.W.T.** (Ottawa: Northern Co-ordination and Research Centre, Department of Northern Affairs and National Resources).1965, p. 35.

[28] David Damas, "Copper Eskimos" in **Handbook of North American Indians, Volume 5: Arctic.** (William C. Sturtevant, general editor). Washington : Smithsonian Institution, 1978, p. 398.

[29] Robert McGhee, **Copper Eskimo Prehistory**. National Museums of Canada, Ottawa, 1972, p. 1.

patterns in the region saw people living in small groups on separate lands. There was certainly contact and trade between these groups, but on the whole the populations were not as mobile as they became during the fur trade when trappers ranged over great distances.[30]

It is important to understand the continuing importance of the land. While the people of the West Kitikmeot, like Inuit everywhere, have adapted to the changes introduced by outside forces during this century, they have not abandoned their connection to the land which gave birth to their culture. Figure 5 bears this out. Based on data compiled for the 1991 Aboriginal Peoples Survey, it shows that the people of the region continue to spend a large amount of their time on the land.

Figure 5: Aboriginal Identity and Time Spent on the Land

	Cambridge Bay		Kugluktuk		Omimgmaktok	
	15 yrs+	5-14 yrs	15 yrs+	5-14 yrs	15 yrs+	5-14 yrs
Aboriginal identity	495	310	570	360	35	20
Lived on land last 12 months	310	190	395	280	30	15
1 - 2 weeks	105	65*	85	65*	5*	5*
3 - 4 weeks	50*	50*	80*	75*	≠	≠
5 - 20 weeks	150	70*	180	115	20	10
20+ weeks	≠	≠	≠	≠	5	≠
number not specified	≠	≠	30*	≠	≠	≠

Notes
* High variation. Figure to be used with caution.
≠ Zero, or figure suppressed due to high variation.
... Figure not appropriate, not applicable, or no information provided.

Although the absolute numbers in this table are quite small, they are still revealing. In all communities, the largest proportion of people are on the land from 5 to 20 weeks, followed by those who say they are out for one or two weeks. These numbers demonstrate the continued importance of the land as a source of food and as an anchor for Inuit society. A future land use plan must take this into account.

Finally, in the first couple of decades of this century, the people of the region were visited by several scientific expeditions and were the subjects of a number of ethnographic examinations. Almost all of the writing about the people of this region – like the rest of Nunavut – has been done by outsiders, people who were not part of Inuit culture. Some of that work is used in this section. Other information in this section, and

[30] Don R. Ferguson, "Inuit Land Use in the West-Central Arctic" in **Inuit Land Use and Occupancy . Project, Vol I.** Milton R. Freeman, ed. (Ottawa: Minister of Supply and Services Canada), 1976, p. 42.

the rest of this plan, comes from the Kitikmiut themselves. The next section looks at the three main communities in the region.

2.3.2 Cambridge Bay/Ikaluktutiak ("Fair Fishing Place")

Fish and game are plentiful around Ikaluktutiak (Cambridge Bay), on the southeast coast of Victoria Island. The site has always been a gathering place for the Inuit of Bathurst Inlet, Perry River, Chantry Inlet and Back River who all originally came to the coast from the inland areas of Contwoyto Lake and Thelon River Basins. (Map 2: Cambridge Bay Area of Influence) This migration took place during 1780s during what people call "the first starvation period". Another migration occurred in the late 1800s. Prior to this, the inland people traveled to the coast to hunt and fish.

The area abounded with caribou, seal, fish and wild fowl, and therefore was a favorite spot to barter between Inuit groups. Archeological artifacts and implements in the area, and northeast Victoria Island, indicate Inuit occupation dating back thousands of years.

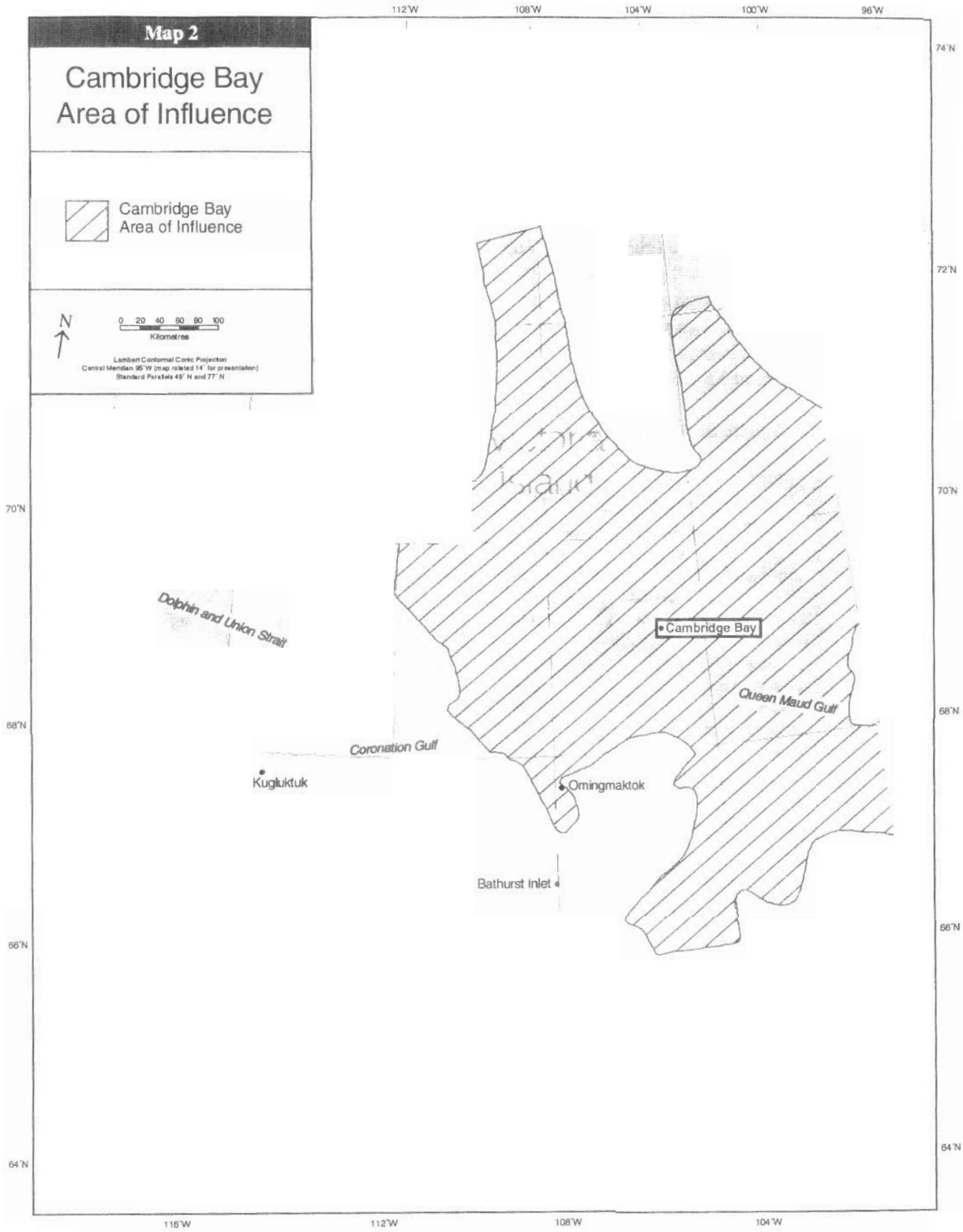
The English explorers Dease and Simpson gave the place its English name in 1839 and Cambridge Bay was visited by several later European expeditions.[31] Roald Amundsen who wintered in the harbour where you can still see the remains of his ship "Queen Maud" which sank at the site.

In the first decades of this century the area came to the attention of European and Canadian fur traders. In 1923, the Hudson Bay Company opened a trading post in the vicinity. An RCMP detachment was set up in 1926. And at about the same period, missionaries began to enter the region. Once trapping became an economic mainstay, people abandoned winter sealing camps on the ice in favour of inland trapping locations. By the 1930s there were important trading posts at Cambridge Bay, Bathurst Inlet and Perry River.[32]

These three agencies – the trading companies, RCMP and missions – had an enormous effect on Inuit life throughout the Arctic. However, it wasn't until the construction of the LORAN Navigational Beacon at Cambridge Bay in 1947, and the Distant Early Radar site in 1955, that a larger, permanent community began to develop. These developments, with their lure of wage labour, led to permanent changes in the Kitikmiut yearly round.

Transition from a traditional way of life to a wage economy was rapid as young Inuit men trained themselves in construction and heavy equipment operations in order to work in the Department of Transport and the numerous DEW Line sites in the along the Kitikmeot coast. By the mid-1960s the pattern of traditional camp life was coming to an

[31] Ferguson, p. 42.
[32] Ferguson., p. 44.


Map 2
Cambridge Bay
Area of Influence
Cambridge Bay
Area of Influence
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet

end as families moved permanently into the communities.[33] An important change at this time was the use of the snow machine which allowed hunters to live in one place yet have access to several different hunting grounds.

More people are employed in wage labour in Ikaluktutiak than in other West Kitikmeot communities, mainly with the Government of the NWT, the local cooperative, and a couple of private companies.

Despite the enormous changes in the decades since the end of World War II, the Inuit have retained their language and culture. In fact, as the following figure shows, the majority of Aboriginal people in the region continue to use Innuinaqtun at home, school and on the job. Language is passed from grandparents and parents to children and with it are the place names and terms for the environment and the wildlife around which so much of Inuit life continues to revolve.

Figure 6: Aboriginal Language Use, Cambridge Bay and Kugluktuk[34]

	Cambridge Bay		Kugluktuk	
	15 yrs +	5-14 yrs	15 yrs +	5-14 yrs
Aboriginal Identity	**495**	**195**	**570**	**220**
Speak aboriginal languages	420	135	445	90
Taught by...				
parents	385	120	420	85
grandparents	210	85*	245	65
elders	175	40*	190	50*
school teacher	105	120	120	75*
someone else	70*	≠	≠	≠
Speak aboriginal languages at...				
home	390	125	445	90
school	40*	130	30*	90
work	195	...	130	¼
other places	390	100	430	60*
Do not speak but understand aboriginal language(s)	45*	35*	90*	100

* Figure to be used with caution.
≠ Zero, or figure suppressed due to high variation.
... Figure not appropriate, not applicable, or no information provided.

[33] By the end of the 1960s, people had moved from places like Perry River and Prince Albert Bay to Cambridge. They were joined by most of the residents of Bathurst Inlet in 1970-71. [Ferguson, p. 49.]
[34] Statistics Canada, **1991 Aboriginal Postcensal Survey.**

2.3.3 Kugluktuk ("Where the water falls")

Kugluktuk (Coppermine) has had a long history of occupation because of its proximity to the point of origin of two great Inuit culture waves (Denbigh, 3000BC - 500BC and Thule/Inuit, AD 800 to present). Many of the present day Inuit of Kugluktuk came from the inland areas of Contwoyto Lake and Bluenose Lake area with another group from Bernard Harbour area to the west who are original descendants of the Alaskan Inuit.

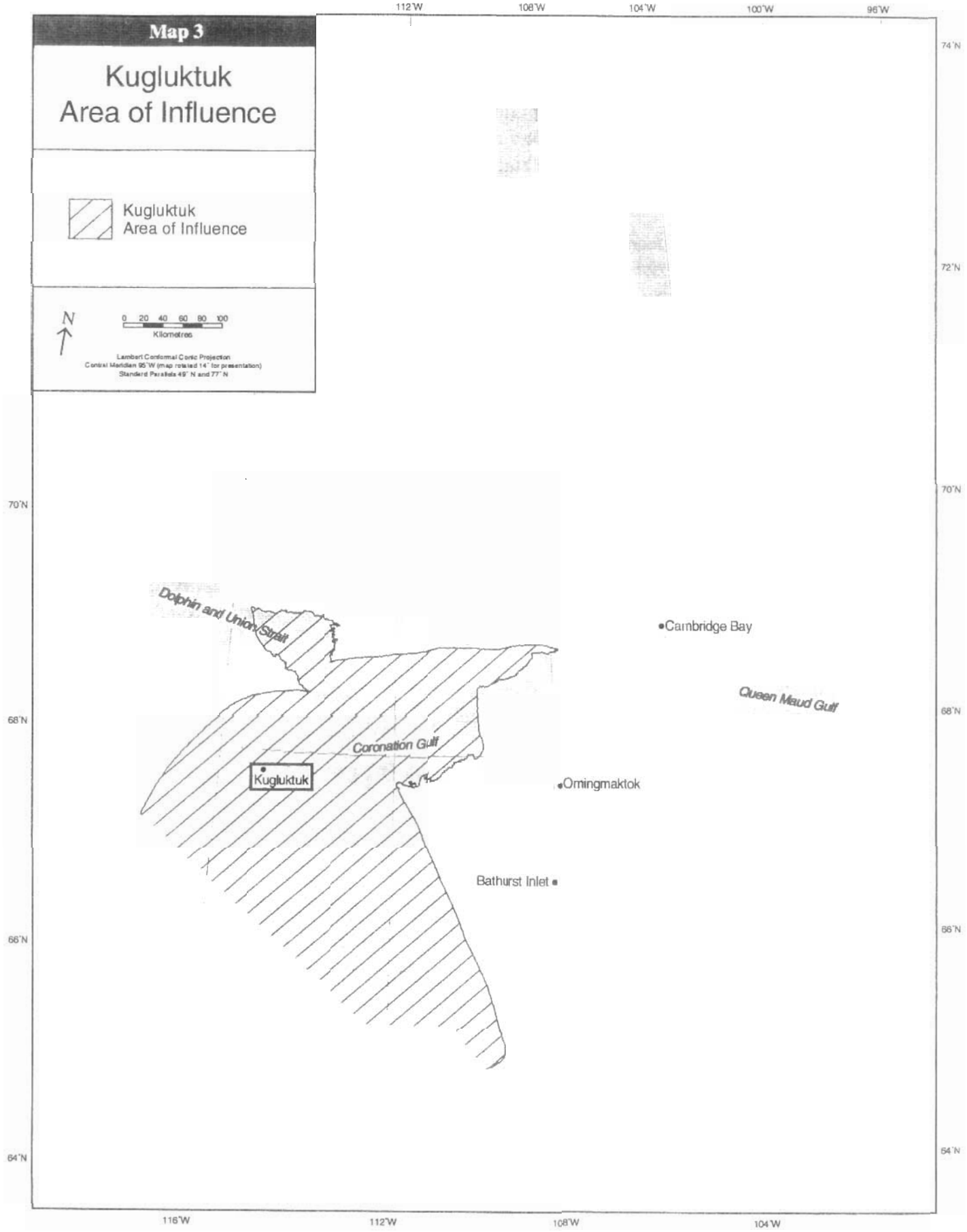
The area has always been populated to some extent because of its proximity to points where the caribou crossed to the mainland from Victoria Island. The area is good for hunting seal, barren ground grizzly, and the moose which make their way north up the Coppermine River valley. Whitefish, char, trout and grayling are abundant in the area's waters. The availability of wood along parts of the Coppermine River valley influenced Inuit technology and provided a source of heat lacking in other parts of the West Kitikmeot. (Map 3: Kugluktuk Area of Influence)

Inuit of the region maintained a nomadic way of life inland harvesting caribou from the Bathurst and Bluenose herds. Today these herds have a combined population of 600,000-700,000 animals. To supplement their diet, the Inuit traveled to the coast to the mouth of Coppermine River to harvest Char, whitefish, seal and wild fowl.

In the 1770s, Samuel Hearne became the first European to survey the Coppermine River. At one point on this journey his Dene guides ambushed and massacred a group of Inuit camped at what Hearne named "Bloody Falls".

Hearne was looking for the fabled source of native copper from which the river derives its name. He was destined to be disappointed.

> *This mine, if it deserves that appellation, is no more than an entire jumble of rocks and gravel, which has been rent many ways by an earthquake. Through these ruins there runs a small river; but no part of it, at the time I was there, was more than knee-deep.*
>
> *The Indians who were the occasion of my undertaking this journey, represented this mine to be so rich and valuable, that if a factory were built at the river, a ship might be ballasted with the oar, instead of stone; ... By their account the hills were entirely composed of that metal, all in handy lumps, like a heap of pebbles. But their account differed so much from the truth, that I and almost all my companions expended near four hours in search of some of this metal, which such poor success, that among us all, only one piece of any good size could be found.*


Map 3
Kugluktuk
Area of Influence
Kugluktuk
Area of Influence
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet

This, however, was remarkably good, and weighed above four pounds....[35]

In 1916 Charles Klengenberg built a small trading post at Kugluktuk, but the community remained very small. Then, in 1928, an epidemic wiped out half the population at Bernard Harbour, then the largest settlement in the area. The survivors moved to Kugluktuk. After that, the pattern of settlement development resembles that of Cambridge Bay – missionaries were followed by medical services, a meteorological station, RCMP post, schools and, by the end of the 1950s, federal administrators.[36] Major movement to the settlement took place in the 1960s although many people continued to live in the Contwoyto Lake area year round.

Today, the Inuit of Kugluktuk combine hunting and land-based activities with wage employment. In the 1970s and 1980s many people from the community worked in oil and gas exploration in the Beaufort Sea. More recently, the main source of non-renewable resource employment has been the Lupin Gold Mine. Nevertheless, fewer people have wage employment than in Cambridge Bay.[37]

2.3.4 Omingmaktok and Bathurst Inlet

Bathurst Inlet or Kingaok Inuit are original descendants of the Takhikyoakmiut or Contwoyto Lake people who migrated to the coast. Approximately 30 people live in this community which is on the site of an old Hudson Bay Company post at the mouth of the Burnside River. In the 1920s it was used as a jump-off point for exploration camps looking for precious metals inland on the Precambrian Shield.

Opened in 1930, the post was moved to Omingmaktok (Bay Chimo) in 1964. Land use in the region is similar to other parts of the West Kitikmeot, with some variations due to inland location. The people of this region maintained a number of relatively small, dispersed and mobile settlements, compared to other areas where the population tended to be more centralized.[38] Inuit of the area still maintain a traditional, independent way of life. At Bathurst Inlet the people are able to use this tradition as a source of wage employment through co-owing Bathurst Inlet Lodge, which is a world class naturalist tourist attraction visited by Europeans, Americans and others. (Map 4: Bathurst Inlet Area of Influence)

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[35] Samuel Hearne. **A Journey to the Northern Ocean: A Journey from Prince of Wale's Fort in Hudson's Bay to the Northern Ocean in the Years 1769, 1770,1771,1772**. Richard Glover, editor. (Toronto: The Macmillan Company of Canada Limited, 1958), p. 112.

[36] G. Abrahamson, **The Copper Eskimos: An Area Economic Survey 1963.** (Ottawa: Industrial Division, Department of Northern Affairs and Natural Resources). 1964, p. 41.

[37] GNWT, **Labour Force Survey**, 1994.

[38] Ferguson, p. 49.

Map 4

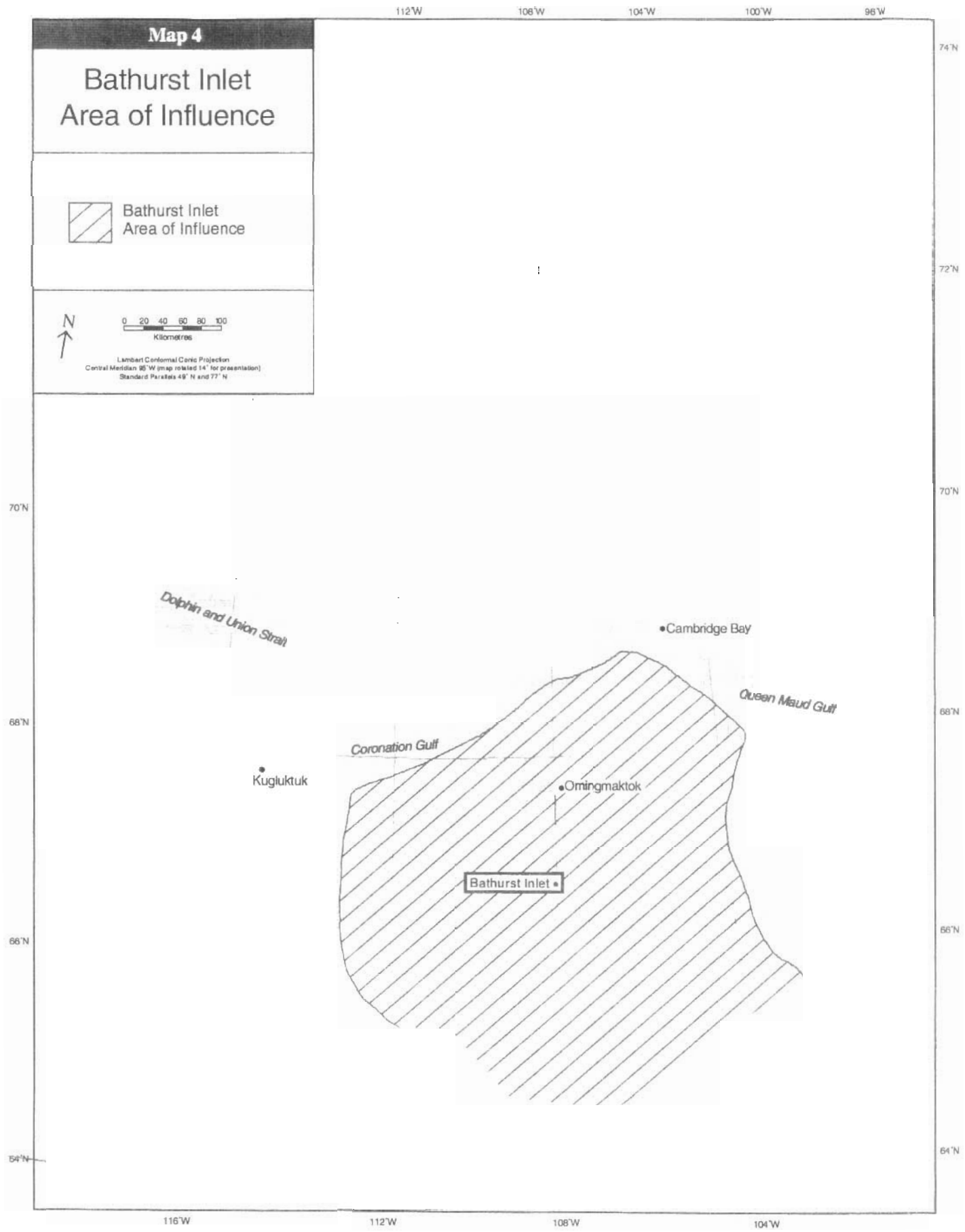
Bathurst Inlet Area of Influence

Bathurst Inlet
Area of Influence

N

0 20 40 60 80 100
Kilometres

Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N



Omingmaktok is located further north on the east side of Bathurst Inlet. (Map 5: Omingmaktok Area of Influence) The approximately 65 people who live in the community are closely related to the Kingaokmiot. The community began as an outpost camp set up by Oyakyoak, Kudlak, Koaha, Avadluk, Okhina. The people who live there maintain a traditional way of life supplemented by work at some exploration camps in the spring and summer (a recent source of this work has been BHP's nearby Boston gold property). Nevertheless, people still strongly identify themselves as independent hunters. Omingmaktok is mid-way between Bathurst Inlet and Cambridge Bay and provides a good safe harbour as well as being close to good trapping around Kent Peninsula and Elu Inlet.

The Danish explorer Knud Rasmussen visited the region early in this century.

> *The Umingmaktormiut live in close contact with the Kiluhiktormiut, or the People of Bathurst Inlet, having common sealing grounds at certain times of the year. They hunt the caribou in the period from May to October. They make their way in via Hope Bay, a fairly high mountain country that once abounded with musk oxen – hence the name of Umingmaktoq: that where musk oxen are many. The herds of caribou that used to reach that country came right in from the regions around the great lakes Pelly and Garry, made their way from there down to the shores of Queen Maud Gulf, whence they scattered out over the big peninsula that lies between Bathurst Inlet and Melbourne Island. In former times the herds were so enormous that it would take them three days to cross the delta of a river, even with the animals constantly on the move. These swarms of animals, undoubtedly numbering into the hundreds of thousands, had last summer entirely failed to put in an appearance in the land of the Musk-Ox People; for since the establishment of the trading post at Kent, and the consequent easy access to guns and ammunition, they have been hunted with such energy that the animals no longer dare to follow their old paths; many families had been unable to procure clothing – new clothing; others had had to content themselves with skins of marmots; so it was no wonder that these skillful men and women were very anxious about the future.*[39]

The widespread use of snow machines has increased the range of hunters throughout the West Kitikmeot. Today, the people of Omingmaktok continue to harvest the Bathurst Caribou Herd. And while they want to see controlled development in their region, they

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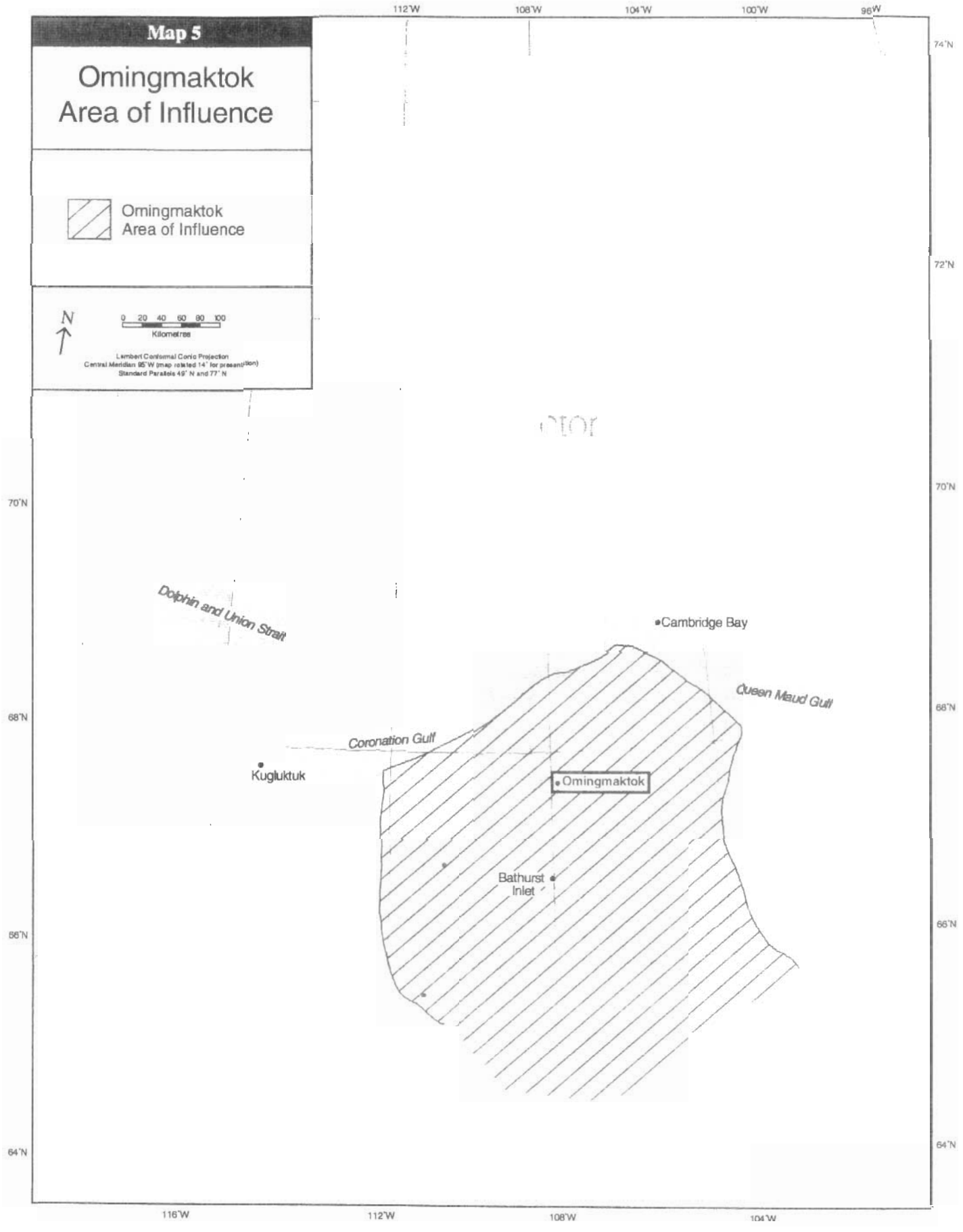
[39] Knud Rasmussen, **The Intellectual Culture of the Copper Eskimos. Report of the Fifth Thule Expedition 1921-24. Vol. IX.** (Copenhagen: Gyldendalske Boghandel, Nordisk Forlag, 1932), pp. 12-13.


Map 5
Omingmaktok
Area of Influence
Omingmaktok
Area of Influence
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst
Inlet

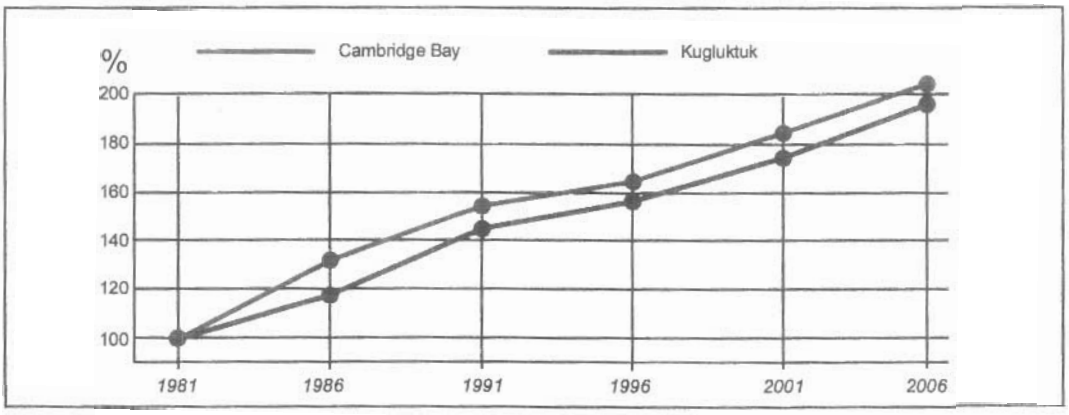
are also concerned that this development take place without harming this important natural resource.

3.5 West Kitikmeot: Contemporary Economic and Social Indicators

Recent census data shows that Aboriginal communities across the country are experiencing a population boom. In the North this growth has been pronounced. In 1981, Aboriginal people accounted for 32% of the Northern population.[40] By 1986, that had increased to 40%.

Figure 7 illustrates a rapid rate of growth for the region's two main communities, projected to the year 2006

Figure 7: Predicted Population Increase[41]



The rapidly increasing population in Nunavut is reflected in statistics for Cambridge Bay and Kugluktuk. The population for these two communities rose substantially in just ten years. In 1981, there were 815 people in Cambridge Bay. By 1991, that number had increased to 1116, an increase of 301 or 37%. Over the same period, the population of Kugluktuk increased by 250 (from 809 to 1059) or 31%. By 1999, the year the Nunavut Government is created, the population of Cambridge Bay is expected to be 1405 and Kugluktuk 1325. By 2006, Cambridge Bay is expected to increase to 1675 while Kugluktuk will be about 1600. Thus, in just more than a single generation, the population of these communities will have doubled (205% and 196% respectively).

Such dramatic increases in population, mostly due to the Inuit birth rate of 33 per 1,000,[42] is putting enormous pressure on community infrastructure, housing and services, and increasing the need for employment.

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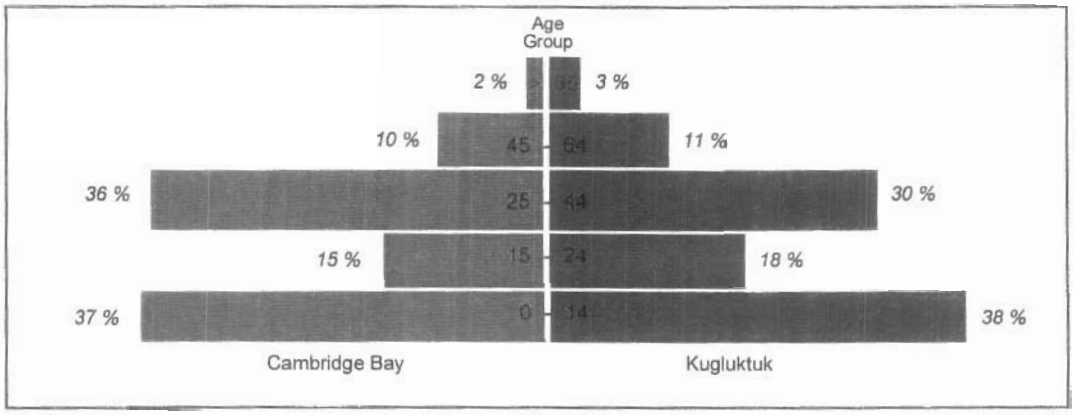
[40] Includes Northwest Territories, the Yukon, Nunavik and northern Labrador.

[41] The data used for the charts in this section comes from the GNWT Bureau of Statistics, **1994 Labour Force Survey** and Statistics Canada, **1991 Census**.

[42] The Nunavut birth rate is higher than both Canada (15/1000) and Mexico (28/1000).

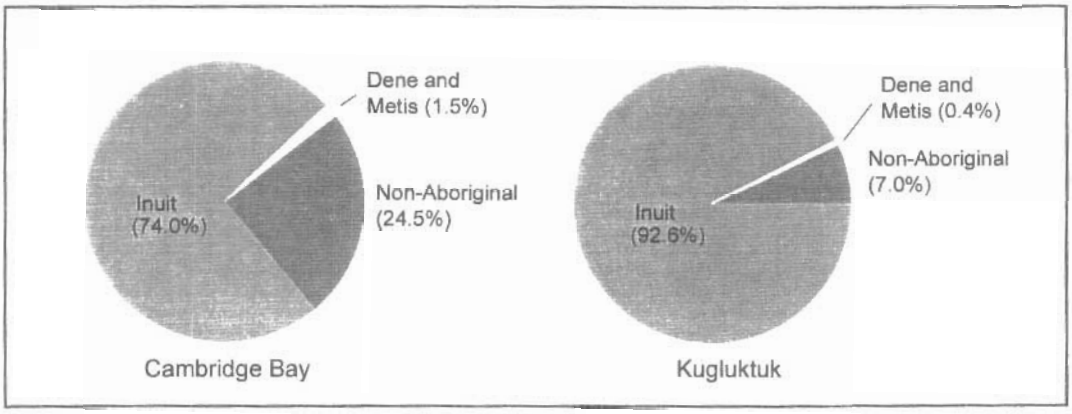
In Cambridge Bay and Kugluktuk over half of the population of both communities is less than 25 years old, with the majority of that group made up of children 14 years or younger. The lower number for the 15-24 age group can be accounted for by the number of students at school away from their home communities.

Figure 8: Population Distribution by Age (1991)



The 1991 Census identified 4,385 people living in the entire Kitikmeot region.[43] Inuit make up the vast majority of regional residents (3920). The next largest group is non-Aboriginal (436), followed by very small numbers of Dene and Metis (30). Figure 9 shows the population distribution by ethnic group in Cambridge Bay and Kugluktuk. Non-aboriginals account for a larger percentage of the population of the former, a factor that is likely explained by the presence of a larger number of government workers in that community.

Figure 9: Ethnic Composition, Cambridge Bay and Kugluktuk

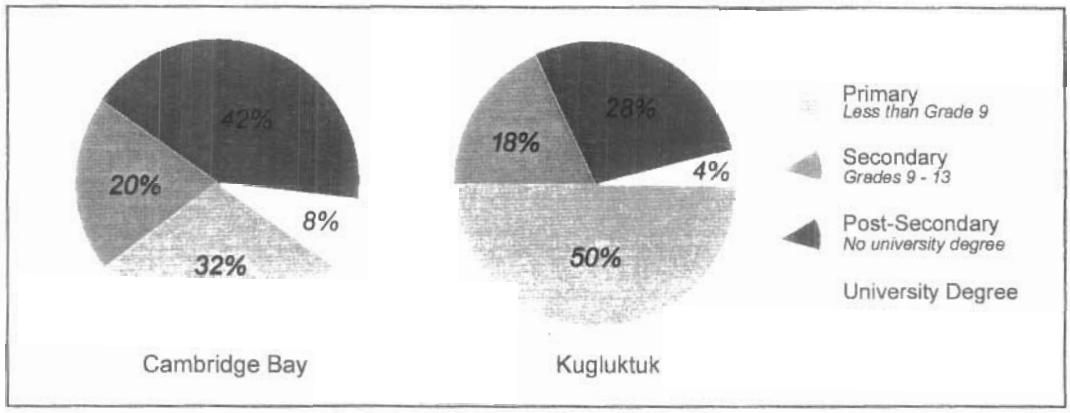


[43] Of that, approximately 2,380 live in the West Kitikmeot.

Education

Figure 10 compares the education levels of the two main West Kitikmeot communities. It shows that, overall, formal education levels are higher in Cambridge Bay than in Kugluktuk. This is likely due to the higher number of government workers in that community.

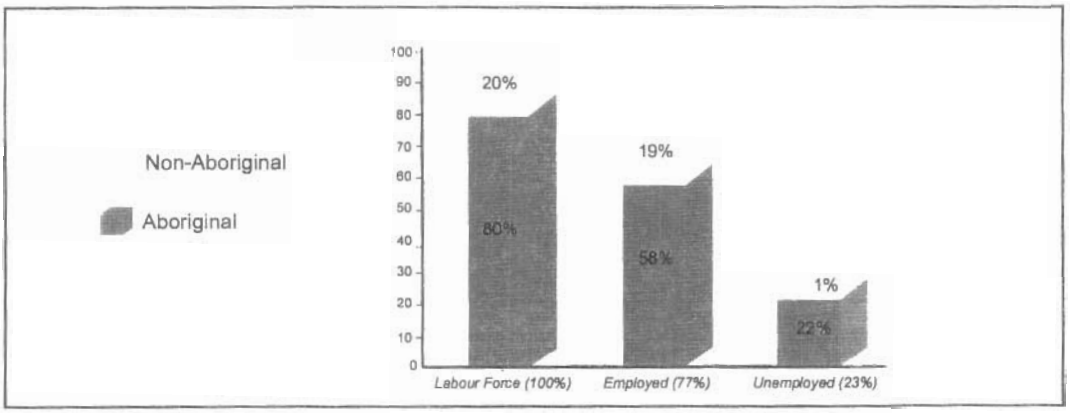
Figure 10: Education Levels (1991)



Labour Force Activity

Census data also shows more people in Cambridge Bay as being in the labour force than in Kugluktuk. This could be due as well to the higher proportion of non-Aboriginal people in Cambridge Bay, many of whom work for government in one form or another. These numbers are skewed by the fact that people who spend most of their time on the land hunting or trapping would not be listed as "employed". This may account for the higher relative and absolute numbers of "unemployed" or people listed as not in the labour force in Kugluktuk.

Figure 11: Labour Force Activity (1994)



The figure above shows the total number of people over 15 years of age who were in the labour force, broken down between Aboriginal and non-Aboriginal, as well as the number of employed and unemployed. The data shows higher overall unemployment among Aboriginal people.

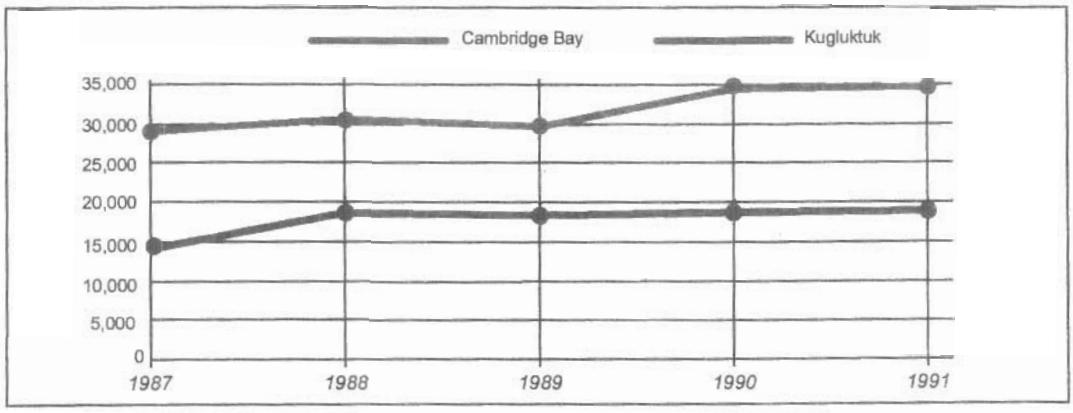
The graph below looks at the unemployment rate and participation rate for Aboriginal and non-Aboriginal people. From this data it is possible to see that non-Aboriginal people participate in the wage economy at a much higher rate than Aboriginal people while the latter have a much higher unemployment rate. In fact, the Aboriginal unemployment rate is higher than the average for the West Kitikmeot.

High unemployment is one reason the people have said they support controlled development in their region. However, while jobs are important, especially to the young, they do not want to see development at the expense of the environment or wildlife.

Income and Transfer Payments

Figure 11 shows there was an increase in personal income in both communities between 1987 and 1991. However, the average in Cambridge Bay is nearly twice what it is in Kugluktuk. Again, this difference may be partly accounted for by the presence of government and other services in Cambridge Bay.

Firgure 11: Personal Income ($)



Another indicator of overall community health is social assistance payments, which correlate with labour force activity and income. If incomes are increasing, one might expect to see social assistance decline, and this is has indeed been the situation, both in terms of the overall number of cases and the amount paid out.

Figure 12: Social Assistance Payments ($)

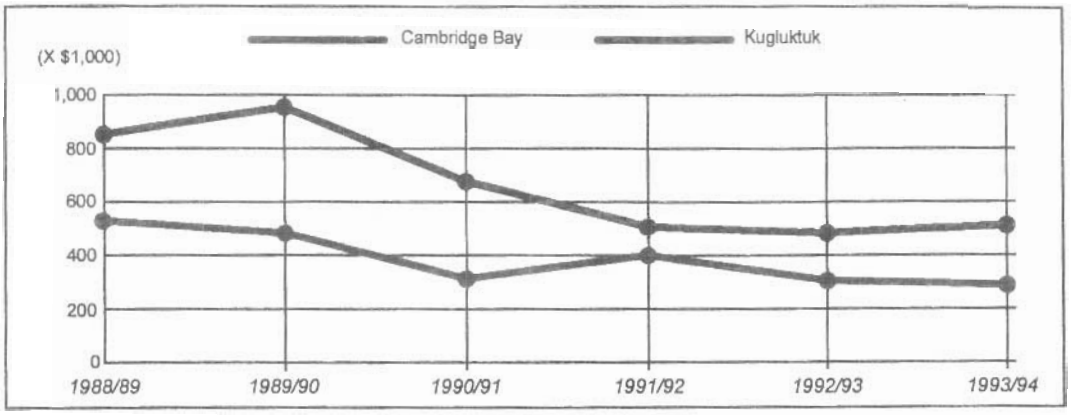
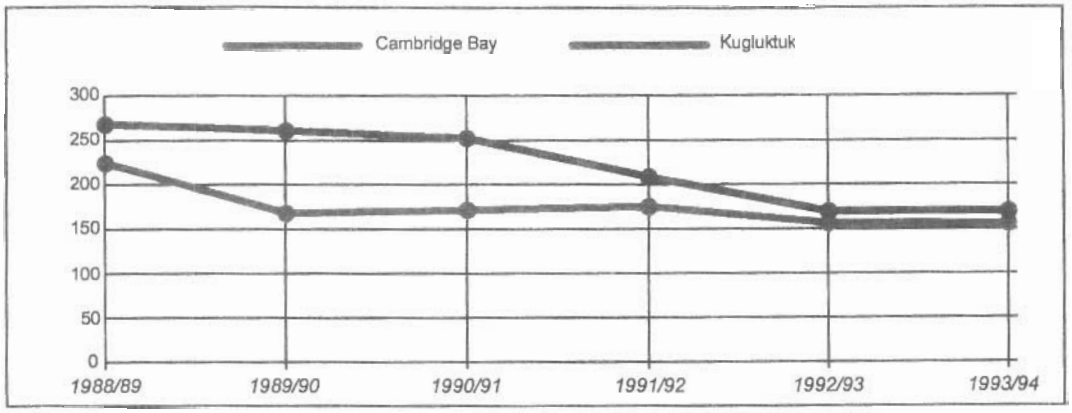


Figure 13: Social Assistance Cases (#)



As mentioned in Chapter 2, the Nunavut Land Claims Agreement lists a number of factors which are to be used to guide land use planning. The social and economic health of the West Kitikmeot is one of them. People in the region have said they want to preserve their environment and the wildlife on which they still depend for a lot of their food. And they also want to see controlled, balanced development which will provide jobs for their growing communities. Any future land use plan will have to consider these inter-related needs, and the consequences for a young and growing population.

Chapter 3: Responsibilities

1. The Environment, Renewable Resources, and Conservation

The Kitikmeot Inuit Association is the DIO responsible for the management of Inuit owned lands within the region. DIAND, on behalf of the federal government, is the manager of crown land which comprises more than 80% of the total West Kitikmeot area. Commissioner's Land -- which is mostly within municipal boundaries and does not include the subsurface -- is the responsibility of the GNWT.

On July 9, 1996 the comanagement institutions created by the Nunavut Land Claim Agreement (the Nunavut Planning Commission, the Nunavut Impact Review Board and the Nunavut Water Board) will assume many of the duties now carried out by DIAND with respect to environmental management. The exact duties of each body are to be confirmed in legislation but will be no less than those duties described for each body in Articles 10 through 13 of the Agreement.

The Implementation Contract[44] provides for Transition Teams for each of NPC, NIRB and NWB with funding to lay the groundwork for the establishment of the NPC, NIRB and NWB in July1996.

The Nunavut Wildlife Management Board (NWMB) was established in 1994 and is now fully operational. It is a comanagement institution consisting of four members appointed by Designated Inuit Organizations (DIOs), four members appointed by government, and a Chairperson appointed from nominations provided by the NWMB. It is the main instrument of wildlife management in the Nunavut Settlement Area and the main regulator of access to wildlife. The NWMB has discretionary powers related to the management and protection of wildlife and wildlife habitat and the direction of wildlife research. The NWMB may establish wildlife reserves and protection programs.

The Nunavut Planning Commission (NPC) will be a comanagement institution with responsibilities and powers relating to the planning and regulation of land use in the Nunavut Settlement Area. The size and makeup of the membership of the NPC may vary, but the federal government and the territorial government will each recommend at least one member and the DIO will nominate a number of members equal to the total number recommended by government. A further member will be appointed as Chairperson from nominations provided by the NPC.

The Nunavut Impact Review Board (NIRB) will be a comanagement institution with

[44] Department of Indian and Northern Affairs. **A Contract Relating to the Implementation of the Nunavut Final Agreement.** (Ottawa: Minister of Supply and Services Canada) 1993.

responsibilities generally for the environmental assessments of projects in the Nunavut Settlement Area. NIRB will be composed of nine members, four appointed upon nomination by the DIO, four from government, and a Chairperson appointed from nominations provided by NIRB.

The Nunavut Water Board (NWB) will be a comanagement institution with responsibilities and powers over the regulation, use and management of waters in the Nunavut Settlement Area. It will be composed of nine members, four appointed from nominations submitted bt the DIO, four from government, and a Chairperson appointed from nominations provided by NWB.

DIAND uses a number of tools to manage Crown land including land use permits, quarrying permits and surface leases. The GNWT uses similar tools on Commissioner's land. In conjunction with the Northwest Territories Water Board, DIAND administers water use licenses. DIAND seeks advice from other departments, from the GNWT and from aboriginal groups. The Lands Advisory Committee provides advice on the terms and conditions to be attached to a surface lease and on other land related matters. The Arctic Waters Advisory Committee, which has members from the federal and territorial governments and Aboriginal groups, provides advice to DIAND on the environmental consequences of marine industrial activities in arctic waters.[45]

The *Arctic Environmental Strategy (AES)*[46] was set up in 1989 under DIAND. The AES has four main sections, one of which is Action on Waste. This component is designed to deal with hazardous waste, abandoned DEW line sites and non-hazardous waste near communities. The AES provides a framework for DIAND's clean-up activities in the North.

The Department of the Environment (DOE) has a general mandate for managing and enhancing the environment. Three agencies within DOE have specific responsibilities: Environmental Protection Branch (EP) is responsible for protecting the environment through the Canada Environmental Protection Act and section 36 of the Fisheries Act; the Environmental Conservation Branch (EC) is responsible for conserving migratory birds and endangered wildlife in Canada, and managing Migratory Bird Sanctuaries and National Wildlife Areas; the Environmental Systems Branch (ES) is responsible for providing climatological and hydrometric data for planning purposes, and observations and forecasts of weather, ice, sea state and air quality.

The federal Minister of the Environment is also responsible for the Canadian Environmental Assessment Agency (CEAA) which, in turn controls an interdepartmental and intergovernmental screening and evaluation process. This is a self-assessment process in which proponents of any proposals involving federal lands, money or

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[45] Some of this will change after the co-management institutions are established.

[46] Canada. Department of Indian Affairs and Northern Development. **The Arctic Environmental Strategy: An Action Plan**. Ottawa, 1991.

jurisdictions submit their proposals for environmental screening and evaluation. DIAND and other licensing agencies meet their assessment responsibilities through committees such as the Lands Advisory Committee and the Regional Environmental Review Committee. The Department of Fisheries and Oceans (DFO) assesses proposals to determine their acceptability under the Fisheries Act. A proposal with potentially significant environmental effects may be subjected to a full public review co-ordinated through CEAA.[47]

Fisheries and Oceans (which now includes the Canadian Coast Guard) manages Canada's oceans and major waterways. It also ensures the sustainable use of fisheries resources, and facilitates marine trade and commerce. The management and protection of fish and marine mammals and their habitats is achieved primarily through the *Fisheries Act* which contains provisions to protect fish habitat and to prevent pollution of habitat (the latter responsibility is administered by DOE on behalf of DFO), and through the environmental assessment process described above. Under the land claims agreement, DFO co-manages fish, marine mammal and marine resources through the NWMB.

Although DOE is responsible for managing migratory birds; the GNWT Department of Renewable Resources (DRR) manages, regulates and encourages the sustainable use of all other wildlife species.

Several federal agencies are responsible for regulating pollution of arctic waters through the Arctic Waters Pollution Prevention Act. These include DFO for shipping activities and DIAND for non-shipping activities.

The National Energy Board (NEB) controls pollution from off-shore oil and gas exploration and development. The NEB also ensures that on-shore operations are safe and environmentally sound. It is responsible for making sure that the requirements of the CEAA are fulfilled prior to making regulatory decisions.

DOT is responsible for regulating the transport of dangerous goods. A number of federal and territorial agencies have responsibilities for preventing, containing and clean-up of spills of hazardous substances on land and water. These include Canadian Coast Guard, DIAND, DFO, DOE-EP and NEB on federal lands and the GNWT on Commissioner's land.

The GNWT Department of Economic Development and Tourism (DEDT) is responsible for promoting economic activity in the renewable resources sector including lodge and outfitter activity and is responsible for the territorial park system. DEDT administers a number of acts and regulations guiding these activities including the Territorial Parks Act, the Travel and Tourism Act, the Tourism Establishment Regulations and the Outfitter Regulations.

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[47] After NIRB is established, the application of CEAA in Nunavut is unclear.

The Surface Rights Tribunal (SRT) is a co-management institution responsible for

a) issuing entry orders subject to the payment of an entry fee;
b) holding hearings to determine compensation payable to surface rights holders;
c) periodically reviewing the level of compensation payable under an entry order;
d) terminating an entry order, after a hearing, where lands are no longer being used for the purpose authorized; and
e) settling disputes for claims for wildlife compensation.

2. Mineral Development

DIAND currently has the major responsibility for managing mineral exploration and development on Crown lands, subject to the environmental protection responsibilities outlined above. NTI manages mineral exploration and development on Inuit Owned Lands.

The possible transfer of many DIAND responsibilities via a "Northern Accord" to the GNWT Department of Energy, Mines and Petroleum Resources (EM&PR), and then to the Nunavut government, may reduce DIAND's role in the next few years.

DIAND is responsible for issuing prospecting permits, registering mineral claims and mineral leases on Crown land and for granting exploration rights for oil and gas. Both DIAND and NEB are responsible for pipeline construction.

NTI is responsible for issuing exploration licenses, and concession agreements and leases on Inuit Owned subsurface lands. The Kitikmeot Inuit Association is responsible for issuing Inuit land use permits, leases, and other surface instruments as they pertain to the surface estate of Inuit Owned Lands.

Any oil and gas development activity within the West Kitikmeot, including pipeline construction, would be regulated by the NEB on behalf of the Minister of DIAND.

3. Transportation and Regional Infrastructure

The responsibility for Arctic shipping, co-ordinating response to marine spills, and preserving the quality of the marine environment is shared by the Coast Guard, Transport Canada and DOE. The "lead-role" varies depending upon the issue being addressed.

Transport Canada is responsible for the development and regulation of a safe and efficient national transportation system and has a particular mandate to regulate air and sea transportation in the North.

The territorial DOT has the mandate to plan, design, build, operate and maintain public transportation infrastructure in the NWT. This includes community airports, docks, and highway systems. DIAND retains responsibility for the construction of new roads.

An agency of DFO, the Canadian Coast Guard, is responsible for providing marine services in arctic waters including ice breaking, navigational aids, search and rescue, vessel traffic management and pollution control from vessels.

The Department of National Defence (DND) is responsible for all military activities and facilities in the Kitikmeot. DND is responsible for maintaining and cleaning up 21 former DEW Line sites in the Arctic. All but five of these sites have been converted to North Warning System installations. In addition, several new NWS sites have been constructed. (DIAND is responsible for another 21 DEW Line sites which were abandoned in the 1960s.) Altogether there are 18 military installations in the West Kitikmeot.

DIAND and the National Energy Board are responsible for regulating pipeline construction.

The Northwest Territories Power Corporation is responsible for providing power to communities.

4. Heritage Resources

Archaeological sites are protected by a federal act and regulation. The Prince of Wales Northern Heritage Centre (PWNHC) issues archaeologists permits to qualified individuals to conduct investigations of archaeological sites which may include the systematic recovery of artefacts. It is also responsible for ensuring that sites are investigated, recorded, and salvaged prior to a development. PWNHC also reviews all federal land use permit applications and advises DIAND on conditions necessary to preserve archaeological sites within the permit area.

The Inuit Heritage Trust (IHT) has been established by NTI as required by the Nunavut Land Claim Agreement. The Trust will assume increasing responsibilities for supporting, encouraging, and facilitating the conservation, maintenance, restoration and display of archaeological sites and specimens in the Nunavut Settlement Area, in addition to other responsibilities set out in the Final Agreement. All applications for archaeological research in the Nunavut Settlement Area are reviewed by the IHT which, in turn, consults with the communities.

Parks Canada is responsible for establishing and managing national parks, national historic sites and monuments. DEDT has the mandate to establish territorial parks. Parks Canada administers the national secretariat for the Canadian Heritage Rivers Board,

while responsibility for the Heritage Rivers program in the NWT falls jointly to DIAND and DEDT.

5. Scientific Research

Generally, all researchers require permits before conducting research in the NWT. PWNHC and/or IHT issues permits to archaeologists, DRR to scientists researching wildlife except for research into migratory birds which is regulated by EC, and fish and marine mammals which is regulated by DFO. The Nunavut Research Institute (NRI) licenses all other researchers. Permits are also required for non-beneficiaries who want access to national wildlife areas or migratory bird sanctuaries.

Chapter 4: A Vision for the Future

The Nunavut Planning Commission Transition Team has a very positive view of the future for the West Kitikmeot planning region.

Overall, the environmental health of West Kitikmeot will remain stable. Mistakes have been made in the past, but these mistakes are now being recognized and work is underway, which may take many years, to find remedy. With the new co-management institutions under the *Nunavut Land Claims Agreement* in place, and with direct Inuit management of Inuit owned lands, residents will have an increasing role to play in the process of land and resource management. New strategies will be developed to prevent old mistakes from recurring. The actual cleanup of old waste sites should provide economic opportunities for residents.

Under the land claims agreement, the Department of Indian Affairs and Northern Development and the Nunavut Planning Commission are responsible for developing a general monitoring program and reporting on the ecosystemic and socio-economic health of Nunavut. As part of this program it is likely that Key Environmental Components will be identified in the land use plan for a region and measurable thresholds or triggers established.[48] The operation of such a monitoring program will help ensure the continued health of the ecosystem in the West Kitikmeot.

With one exception,[49] wildlife populations are healthy and some, like musk oxen, are even growing in numbers. The numbers of caribou and musk oxen are sufficient to sustain substantial harvesting levels into the future, with careful management from the NWMB. Research by NWMB and DRR will enable increasingly effective management into the future.

The transition team expects mineral exploration to continue at a high level for the next five to ten years. The region contains a wide variety of minerals, leading to considerable exploration activity, from gold and precious metals, to diamonds and base metals. It is quite possible that one or two mines may be developed within this time frame, but this is not predictable. When this planning exercise began, it was driven in part by a very well developed proposal to develop a base metal mine at Izok Lake. This proposal has been

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[48] The selection of Key Environmental Components and indicators will involve further community input. An example of a key component might be the Bathurst Caribou Herd, an indicator, (the method by which we measure the component) the population size, and the threshold, 300,000 (or some agreed upon number) or a trigger, concerns from an HTO. If the population dropped below 300,000 or if an HTO raised concerns, action would be taken to find out the cause of the population decline and suggest remedial action.

[49] The "Island" caribou on Victoria Island appear to be in serious decline. Further research, now being carried out by DRR, is needed to understand what is really occurring.

shelved by the potential developer because the project is now not economically feasible. However, several other "hot" prospects have emerged -- the Boston, Doris and Ulu deposits to name three. If the Ulu deposit is developed, Lupin Mine should continue to operate for several years.

The importance of mineral exploration and development to the West Kitikmeot economy will grow in significance. More residents will work in more mines and more residents will participate in exploration activities. Mineral development is an important component of a diversified economy.

With the establishment of Nunavut and the growth in the new Nunavut government and Inuit organizations, many new "office" jobs will become available. The actual number will be a function of the success in designing a decentralized government system. Other economic sectors, such a tourism, will show some growth.

To meet the requirements for employment in the wage economy, the education levels of residents, youth and adults, will continue to increase. Residents will be able to fill technical and managerial positions in the emerging Nunavut government and industrial sectors and further develop entrepreneurial skills.

Chapter 5: Planning Issues, Analysis, Recommended Actions

5.1 The Environment, Renewable Resources and Conservation

Goals and Objectives

- ***Maintain the natural balance of ecological systems within the Nunavut Settlement area including the protection of wildlife habitat;***
- ***Maintain vital, healthy, wildlife populations capable of sustaining harvesting needs;***
- ***Restore and revitalize depleted populations of wildlife and wildlife habitat;***
- ***Ensure the long term maintenance of a healthy renewable resource economy;***
- ***Protect critical habitat areas and certain representative areas through conservation and protected area designations;***
- ***Restore degraded land use sites in an efficient and priorized manner.***

5.1.1 WASTE SITE CLEAN-UP

5.1.1.1 Issues

For thousands of years Inuit have lived in the Arctic and used the land and resources to sustain themselves. Until the modern era, this pattern of land use had no detrimental effects on the environment. Hunters took only what was needed to sustain life and the footprints of human activity were very light. All of this began to change when the North began to be explored, settled and exploited by non-Inuit.

The coming of World War II greatly accelerated this process. Construction of military facilities, mines and settlements changed the way land is used in the Arctic, introduced harmful chemicals and compounds into the environment, and created vast amounts of garbage. Exploration camps were built quickly then abandoned, airstrips carved into the tundra were left unused after a few years, thousands of barrels of fuel was brought in only to be left once work moved on. Tonnes of material was flown or barged in with little or no thought of what would become of it once it was no longer needed. For many

years this material simply lay where it was dropped or was bulldozed into land fill sites. There were few if any environmental controls before 1970.

Many Inuit point out that government, industry and the military aren't the only ones to blame for the mess on the land, that they too bear some responsibility to clean up abandoned outpost or hunting camps where garbage has been left lying around.

As a result, the North is now the resting place of a great deal of waste, some of it hazardous.[50] Besides affecting life in the communities, this waste also shocks and offends visitors who come to the North seeking an untouched and unspoiled environment.

The issue of waste in the North has been addressed by the House of Commons Standing Committee on Environment and Sustainable Development in its review of the *Canadian Environmental Protection Act*:

> *...[T]he Department of Indian Affairs and Northern Development (DIAND) has identified 1,246 waste sites scattered throughout the Arctic in the form of abandoned fuel drums, buildings, equipment and garbage. Of these, 217 waste sites have been classified as hazardous because they contain toxic chemicals. The Committee visited dumpsites in Iqaluit and Cambridge Bay and was struck by their size and the uncertainty of local authorities as to what exactly some of the old dumps contain.*[51]

Area residents are also concerned about he level of contamination at abandoned DEW Line and converted North Warning System sites in the region. There are 17 such sites in the West Kitikmeot.

5.1.1.2 Analysis

A major environmental problem now confronts governments, Inuit land owners and all residents of Nunavut" How can we clean up hundreds of abandoned exploration camps, military installations, outpost camps and other facilities. People also want something

---

[50] The term "hazardous" usually means wastes which have at least one dangerous property. They can be flammable, corrosive (acids), reactive or explosive when combined with other substances, or toxic or poisonous even in small doses. Other substances, such as asbestos, PCBs and some heavy metals that do not fall into these categories, but which pose special hazards to the environment or human health. See W.J. Bryant, **A Hazardous Waste Management Strategy for NWT Communities**. Prepared for the Department of Municipal and Community Affairs, Government of the Northwest Territories. December 1991, p. 2.

[51] Canada. House of Commons. Standing Committee on Environment and Sustainable Development. **It's About Our Health! Towards Pollution Prevention**. Report of the House of Commons Standing Committee on Environment and Sustainable Development, p. 194.

done about the dumps in their communities – dumps which have been used for years and are thought to contain hazardous waste.

The problem of abandoned waste is not unique to Nunavut. Cleaning up the Arctic is related to wider issues of environmental protection faced by indigenous peoples throughout the circumpolar region. The importance of the Arctic environment was recognized by eight circumpolar nations, including Canada, which signed the *Arctic Environmental Protection Strategy* in Rovaniemi, Finland, in 1991.[52] The strategy is a wide-ranging declaration on the protection of the Arctic which identifies the monitoring and assessment of contaminants as a major priority.

During land claim negotiations Inuit of West Kitikmeot demanded that the waste left on the land be cleaned up. This was especially important for sites that were on land that would fall under Inuit ownership. They also demanded a right to participate in the decision-making process that will eventually lead to the clean-up of their region. The issue of waste site clean-up was addressed in the *Nunavut Land Claims Agreement (NLCA)* and special emphasis was given to the situation in the West Kitikmeot.

> *The NPC (Nunavut Planning Commission) shall identify and priorize the requirement to clean-up waste sites in the Nunavut Settlement Area, including hazardous waste sites, inactive mining sites, abandoned DEW line sites, and non-hazardous sites near communities.* ***The NPC shall consider waste sites in the Kitikmeot region on a priority basis.*** *To the extent possible, this initiative shall be coordinated with the development of land use plans.*[53]

At the outset of the planning process in West Kitikmeot, in community meetings and workshops residents once again raised the issue of waste sites and environmental degradation and argued that it should be a priority in any regional resource management plan.

In order to develop the kind of priority list referred to in the NLCA, the first step was to gather information on the location of waste sites. Based largely on information from local residents, the transition team mapped more than 190 sites in West Kitikmeot. Each site has been entered in a database and its contents have been described. Many of these sites were created by mining exploration companies; others are the result of federal

---

[52] The eight nations were: Canada, Denmark, Finland, Iceland, Norway, Sweden, the Union of Soviet Socialist Republics, and the United States of America. The Inuit Circumpolar Conference, Nordic Sami Council and the USSR Association of Small Peoples of the North assisted in preparing the strategy and had observer status at this initiative. For an overview of the Strategy and other circumpolar environmental issues. See Terry Fenge, "Environmental Clean-up and Sustainable Development in the Circumpolar Arctic," **Northern Perspectives**, Volume 21, Number 4, Winter 1993-1994. (Ottawa: Canadian Arctic Resources Committee).

[53] **Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada**. Section 11.9.1, p. 99. [Emphasis added.]

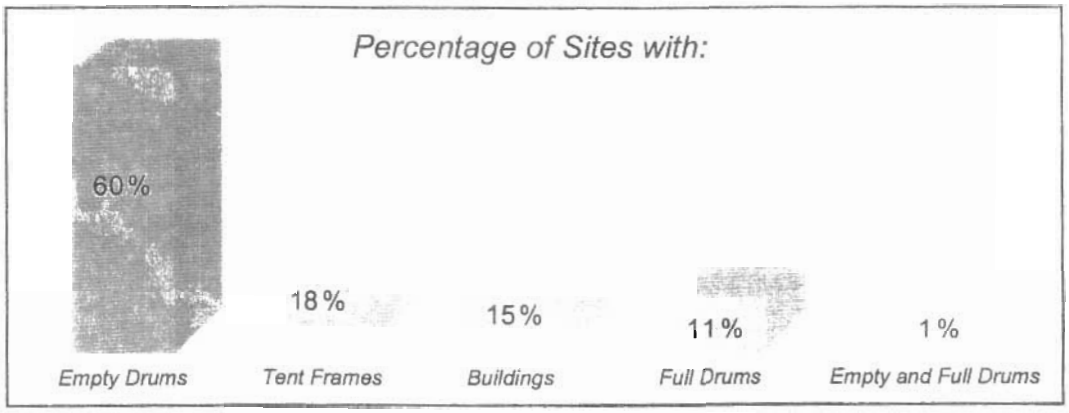
government activities; still others have been created by local residents. A number of the sites in the region appear to be "orphaned" -- it is not known who is responsible for the mess.

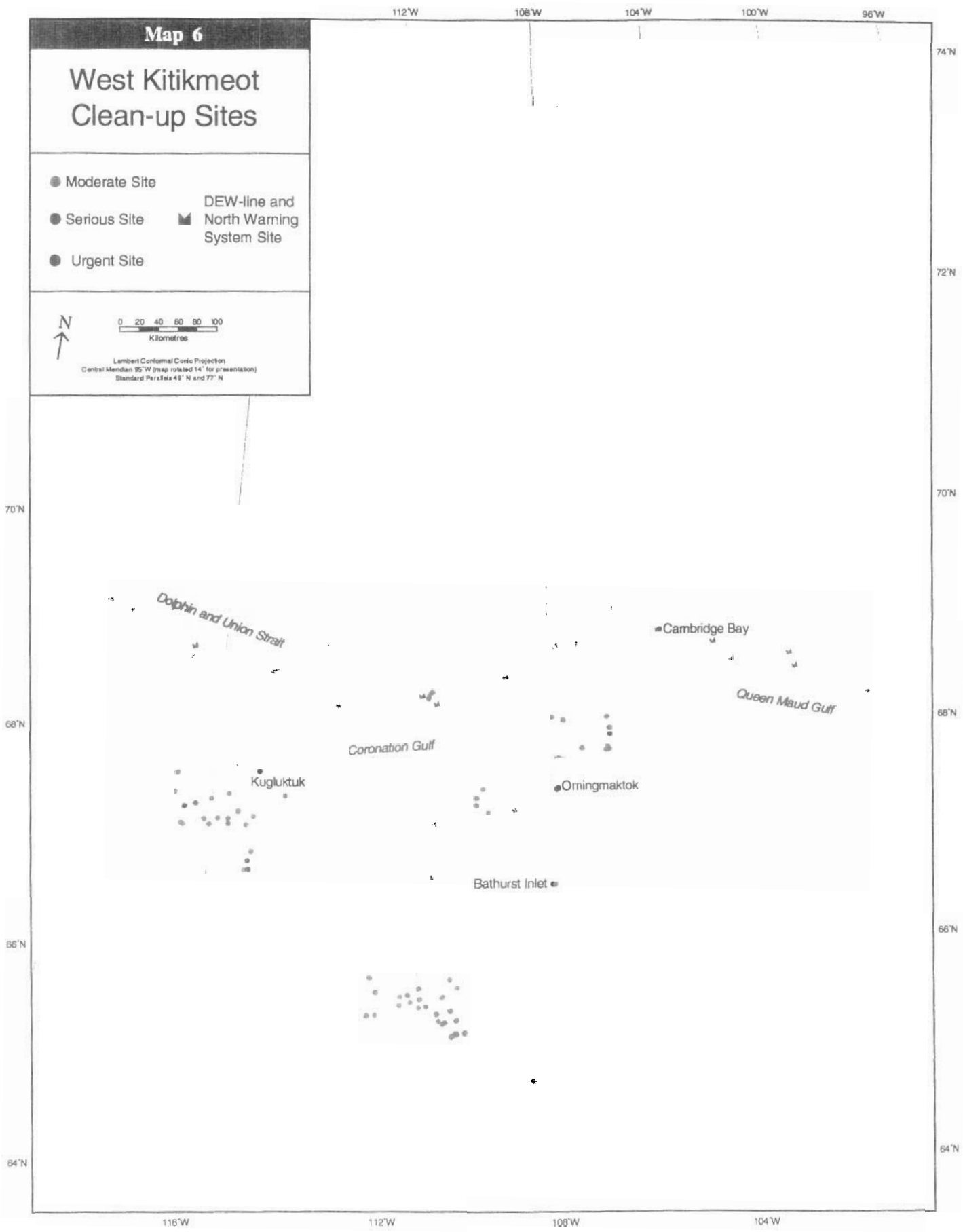
The information supplied by local people has been plotted on digital maps which have been reviewed at public meetings in Kugluktuk and Cambridge Bay. Revisions and additions have been made and information continues to be collected. (Map 6: West Kitikmeot Clean-up Sites) Larger scale maps have also been created for the hamlets of Kugluktuk (Map 7: West Kitikmeot Clean-up Sites/Kugluktuk) and Cambridge Bay. (Map 8: West Kitikmeot Clean-up Sites/Cambridge Bay)

In May 1995, the Nunavut Planning Commission Transition Team coordinated a workshop on clean-up sites in Cambridge Bay which brought together representatives of communities, Inuit organizations and government. The purpose of the workshop was to review the maps and develop a list of criteria which could be used to set clean-up priorities. The discussions at this meeting led to the development of a methodology for classifying and prioritizing waste sites in the planning region. The approach developed here could also be applied to other parts of Nunavut.

The following diagram illustrates the most common type of waste found at the sites mapped in the planning region.[54]

Figure 15: Most Common Waste in Clean-up Database




Map 6
West Kitikmeot Clean-up Sites
Moderate Site
Serious Site
Urgent Site
DEW-line and North Warning System Site
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Ormingmaktok
Bathurst Inlet

Forty-five gallon drums are the most common form of waste found at the clean-up sites mapped in the West Kitikmeot. Of the 194 sites recorded, 141 (73%) contain drums. The column on the left of the chart breaks down these sites by what is nor is not in the drums. The largest number, 117 sites (60%) contain empty drums. Only three sites have full drums 3 (1%). Another 21 (11%) have both empty and full drums. These numbers give us a good idea of the amount of hazardous waste in the planning region (although it says nothing about other forms of waste which might be buried in dumps or other locations).

The next most common form of waste are tent frames and buildings. Thirty-five of the sites in the database have tent frames (18%) and another 30 (15%) have abandoned cabins, houses or other buildings on the site.

A comprehensive description of the steps taken in developing a Clean-up Priority List is included in Appendix 1. It should be pointed out that this does not provide a systematic analysis of site contents, especially those where hazardous wastes are known or suspected. In cases where hazardous waste is identified, a site analysis, requiring specialized training, will have to be carried out. These classification steps are meant to be used for screening the sites only. In each case, remedial plans will have to formulated by the responsible agency or agencies. It should be pointed out as well that the priority list does not address the issue of who will pay to clean up these sites.

As mentioned earlier, DEW Line sites and community dumps have been included in the waste site Clean-up Priority List. All DEW Line sites have also been classified as Urgent clean-up priorities. The most frequent concerns about environmental contamination were directed towards these sites, and people want them cleaned up first.

Overall, 19 sites have been classified as Urgent and another 15 are Serious. More sites are likely to be added to these categories as more data is gathered. So far, the only non-DEW Line site classified as Urgent is the Cambridge Bay community dump.

A 1993 study for the Department of National Defense concluded that "the DEW Line has had an influence on the Arctic environment, both from the perspective of physical changes and as a consequence of chemical inputs...." The study also states that "attention must be paid to local, as well as global, issues."[55] The people of Cambridge Bay echo this conclusion, and point to the CAM-M facility next to their community as the source of many pollutants, including raw sewage which leaks from the site's sewage lagoon to the West Arm of Cambridge Bay, passing under and around people's cabins on the way.

The impact of the radar site at Cambridge on the environment was used as a case study by the Environmental Sciences Group for the Department of National Defense. Besides sewage, other compounds, such as PCBs were found to be leaking into the bay and accumulating in the bodies of mussels, soft-shelled clams, and sea urchins. However, by

[55] Environmental Sciences Group, **Summary Volume**, p. **v.**

far the highest levels were found to have accumulated through a process called biomagnification in the bodies of a bottom-dwelling fish called a sculpin.

> *Bottom-dwelling marine organisms in coastal Arctic communities are potentially important as food sources for larger organisms such as birds and marine mammals. The observed biomagnification of PCBs as shown by the elevated concentrations in four-horned sculpins (Myoxocephalus quadricornis) from Cambridge Bay, NWT, suggests that low-level local inputs have significant ecosystem impact. The DEW Line Cleanup Protocol [developed by DND] calls for the containment of all contaminants entering the ocean. In view of these results, this seems to be the only acceptable course of action.*[56]

Given these findings, this report urges the Department of National Defense to proceed quickly with DEW Line clean-up, ensuring that local people are involved in the setting of clean-up priorities.[57]

5.1.1.3 Actions

The Nunavut Planning Commission Transition Team recommends that:

1. **All users of the land should follow the "Code of Conduct" in Appendix 3 to ensure that no new waste sites are created.**

2. **The principle of "the polluter pays" should apply to a strategy for cleaning up the environment. Where identification is possible of the person, company or agency responsible for creating an abandoned or inactive waste site, they should be made responsible for site clean up and restoration.**

3. **When identification is not possible, the government agency (or its successor) that had regulatory responsibility for the site at the time it was active should be responsible for site clean up and restoration.**

4. **The Department of Indian Affairs and Northern Development, as the lead agency for Canada, should review the Priority List of Clean-up Sites included as Appendix 1 and, in consultation with the Kitikmeot Inuit Association and the Nunavut Planning Commission, prepare a remedial action plan by June 1997.**

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[56] Environmental Sciences Group, Volume One, p. 81.

[57] In June 1996, Nunavut Tunngavik Inc. announced it was suspending negotiations with the Department of National Defense on a comprehensive agreement to clean up DEW Line sites. NTI stated that DND's procedures meant "a significant majority of existing DEW Line dumps" would simply remain buried where they were. NTI said it wants the material removed because it continues to pose an environmental threat. [NTI Press Release, 6 June 1996]

5. **The Department of Municipal and Community Affairs, as the lead agency for the Government of the Northwest Territories, should review the Priority List of Cleanup Sites, in consultation with the Kitikmeot Inuit Association and the Nunavut Planning Commission, prepare a remedial action plan by June 1997 for the lands it administers.**

6. **The Department of National Defense and DIAND should clean-up abandoned DEW Line sites and other military facilities as quickly as possible, ensuring that local people are consulted about clean-up priorities, an prepare a remedial action plan by June 1997.**

5.1.2 CUMULATIVE EFFECTS AND MONITORING

5.1.2.1 Issues

The identification and monitoring of cumulative environmental effects are important elements of land use planning and environmental management.

Two sections of the *Nunavut Land Claims Agreement* relate to land use planning provisions and cumulative environmental effects of development. These two sections refer to a process designed to include the assessment of cumulative effects of projects in relation to other development activities.

Section 12.3.3 states that the Nunavut Planning Commission may refer a project to the Nunavut Impact Review Board for screening "where the NPC has concerns respecting the cumulative impact of that project proposal in relation to other development activities in a planning region."[58] Section 13.4.4 states that "Where the NPC has concerns respecting the cumulative impact of development activities in a planning region, it may refer water applications to NIRB for screening even though the application falls within Schedule
12-1."[59]

5.1.2.2 Analysis

What are cumulative effects? There is no one agreed upon definition of cumulative effects. The following comes from the Canadian Environmental Assessment Research Council:

> *Cumulative effects can be characterized as impacts on the natural and social environments which:*
>
> *1) occur so frequently in time or so densely in space that they cannot be "assimilated," or*
>
> *2) combine with effects of other activities in a synergistic manner.*[60]

Environment Canada has defined it slightly differently:

---

[58] **Nunavut Land Claims Settlement Agreement,** Section 12.3.3, p. 105.

[59] Ibid., Section 13.4.4, p. 125.(Schedule 12-1 lists project proposals which are exempt from NIRB screening.)

[60] Quoted in N.C. Sonntag, et. al. **Cumulative Effects Assessment: A Context for Further Research and Development.** A Background Paper Prepared for the Canadian Environmental Assessment Research Council. (Ottawa: Minister of Supply and Services Canada), 1987, p. 5.

The effect on the environment that results from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions.[61]

According to the Federal Environmental Assessment Review Office, cumulative effects assessment is not a new process.

Most, if not all environmental effects can be seen as cumulative because they occur in environments already stressed by human activities. Yet cumulative environmental effects are different. The key difference lies not in the effects themselves, but in how they are perceived.[62]

While the document quoted above does not provide a definition, it does provide guidelines on what can be considered in determining cumulative environmental effects:

- *direct changes in the environment caused by the project;*
- *the effects of any such changes on:*
  - ⇒ *health and socio-economic conditions;*
  - ⇒ *current use of lands and resources for traditional purposes by aboriginal persons; or*
  - ⇒ *any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance, or*
- *any change to the project caused by the environment.*[63]

Why look at cumulative effects? Traditionally, environmental impact assessment (EIA) has looked at "the biophysical and socio-economic impacts induced directly or indirectly by either small or large scale developments."[64]

Cumulative effects assessment attempts to take a global view. Proponents argue that traditional impact analysis ignores "additive effects of repeated developments in the same ecological systems." Cumulative effects assessments tend to look beyond the specific project and policy concerns to implications for long-term planning. This kind of assessment also takes into account a larger geographic area and examines a range of inter-related systems. It is interdisciplinary and is combined with impact monitoring and management systems.[65]

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[61] Environment Canada, **The State of Canada's Environment Infobase.** Definition from a glossary on EC's web page at http://199.212.18.12/~soer/.

[62] Federal Environmental Assessment Review Office. **Addressing Cumulative Enviornmental Effects: A Reference Guide for the *Canadian Environmental Assessment Act.*** 1993, p. 2.

[63] Federal Environmental Assessment Review Office, p. 3.

[64] David Marshall, et. al. "Environmental Management and Impact Assessment: Some Lessons and Guidance from Canadian and International Experience." March 1985, p. 1.

[65] Sonntag, et. al., p. 1.

The broad, cyclical nature of monitoring for cumulative effects has been recognized in the Nunavut Land Claims Agreement. Section 12.7.6 of that agreement states:

> *There is a requirement for general monitoring to collect and analyse information on the long term state and health of the ecosystemic and socio-economic environment in the Nunavut Settlement Area. Government, in co-operation with the NPC, shall be responsible for developing a general monitoring plan and for directing and co-ordinating general monitoring and data collection. The NPC shall:*
>
> *(a) in accordance with the plan, collate information and data provided by industry, government departments and agencies, amongst others;*
>
> *(b) in accordance with the plan, report periodically on the ecosystemic and socio-economic environment of the Nunavut Settlement Area; and*
>
> *(c) under Article 11 use the information collected under Sub-sections (a) and (b) to fulfil its existing responsibilities.*

How do you monitor for cumulative effects? A useful definition of monitoring is "'the systematic collection of data comprising key indicators of social, environmental, and economic impacts....'"[66] Under the NLCA, responsibility for monitoring the overall health of the human and natural environment of Nunavut has been assigned to the planning commission and government. This monitoring will require the collection of baseline data which could be used, among other things, to determine the cumulative effects of development in Nunavut in general, and in the West Kitikmeot in particular. Work on the design of the cumulative effects monitoring program is underway.

As part of a monitoring program certain specific resources are deemed critical to the health of an ecosystem. For lack of a better term, we have called these Key Environmental Components. These components are selected and criteria established that enables the collection of relevant data over time. Such components could include wildlife populations, specific habitat areas, or bodies of water. A variety of means could be used from sampling the quality of water to plotting the movement of caribou using satellites and radio collars to monitor the health of these components. For example, if it is decided that caribou are critical to the health of the West Kitikmeot environment, it may be decided to monitor the welfare of caribou, perhaps using a regular census. Through discussion with hunters, elders, scientists and researchers, an optimum population level could be established against which regular counts would be measured.

For example, evaluation criteria might include:

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[66] Quoted in Carley, p. 19.

- Relative abundance of wildlife
- Critical habitats
- Community concerns (harvesting areas, sacred places, etc.)
- Scientific concerns
- Economic importance
- Legal status

The challenge is to find measurable indicators which can be used in impact predictions and in monitoring. In order to determine the accuracy of impact predictions, and to monitor impacts and cumulative effects, it is necessary to measure change between baseline (or pre-project) conditions and future conditions. A recent study of transboundary rivers systems within the Mackenzie River Basin provides useful examples of attempts to identify measurable "ecosystem maintenance indicators." Examples which may be useful as measurable indicators for West Kitikmeot might include:

- The number of caribou using a specific caribou crossing
- The number of caribou in a herd (300,000 as critical number for Bathurst herd ?)
- HTO indication of decline in caribou
- The level of contaminants in seal/fish/caribou livers
- Arctic Char adult migrants in a stream
- Arctic Char catch per unit of effort
- The level of contaminants in lichens

Similar work is being conducted in other parts of the Arctic where attempts are being made to assess the potential impact of industrial development on the ecosystem.[67]

5.1.2.3 Actions

1. **The Nunavut Planning Commission should identify the key components of the region's ecosystem in a land use plan for the West Kitikmeot.**

2. **NPC, in co-operation with DIAND and other appropriate agencies, should complete the design and implementation of the monitoring program outlined in section 12.7.6 of the Nunavut Land Claims Agreement.**

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[67] One such region is the "1002 Lands" in the Alaska National Wildlife Refuge (ANWR) which the U.S. Congress is considering opening to oil development. For example, see Thomas R. McCabe, "Assessing values of Arctic wildlife and habitat subject to potential petroleum development" in **Landscape and Urban Planning**, 28 (1994) pp. 33-45. Information taken from the U.S. Fish & Wildlife Service "Preliminary Review of the Arctic National Wildlife Refuge, Alaska Coastal Plain Resource Assessment: Report and Recommendation To the Congress of the United States and Final Legislative Environmental Impact Assessment , August 29, 1995" can be found at the Arctic Circle "web site" at http://www.lib.uconn.edu/ArcticCircle/ANWR/anwrresintro5.html.

5.1.3 PARKS AND PROTECTED AREAS

5.1.3.1 Issues

There is only one established conservation area in the West Kitikmeot – the Queen Maud Gulf Bird Sanctuary which straddles the eastern boundary of the region. The Canadian Wildlife Service wants to adjust the boundaries of the sanctuary and change its designation to a National Wildlife Area. Residents in the region want the name changed form Queen Maud Gulf Bird Sanctuary to Iluilik.

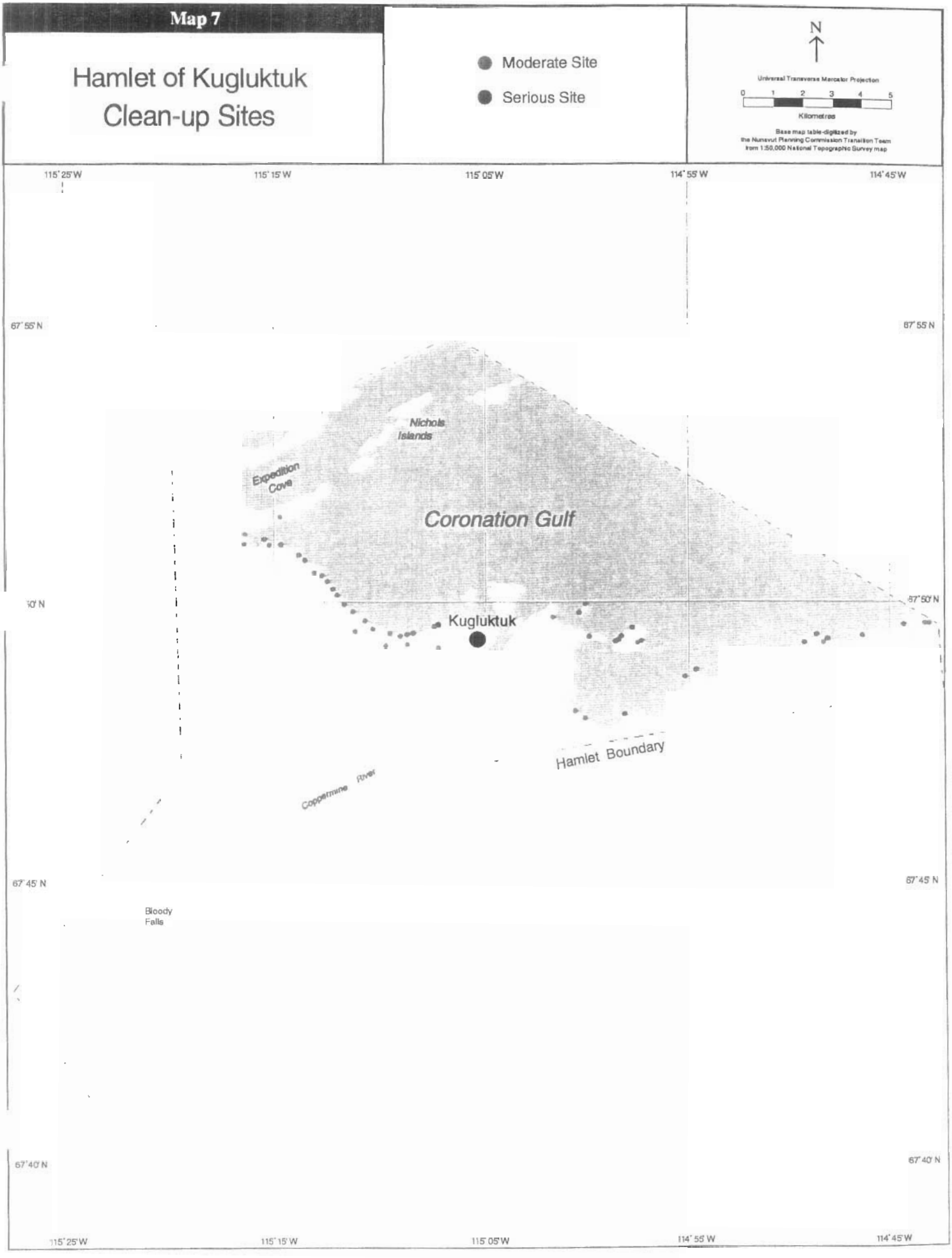
Federal and territorial departments and agencies have made a number of proposals to establish various types of protected areas in several West Kitikmeot locations. The main proposal is by Parks Canada to establish a national park in the Bluenose Lake region, straddling the boundary with the Inuvialuit Settlement Region in the westernmost part of Nunavut.

The Government of the Northwest Territories has also proposed creating territorial parks at Bloody Falls, near Kugluktuk, and at Mount Pelly, outside of Cambridge Bay. Bloody Falls is within the Hamlet of Kugluktuk municipal boundaries and, since the jurisdiction of NPC does not apply to municipal lands, this proposal will not be considered in this report.

The GNWT Department of Economic Development and Tourism is also in the initial stages of considering designating the Coppermine and Back rivers as heritage rivers.

While these are the only sites currently being examined for special designation, (Map 9: Existing and Proposed Protected Areas) the rich wildlife and increasingly intense exploration activity in the region has prompted concern about the need to protect important biological sites. The Department of Renewable Resources considers the calving grounds of the Bluenose and Bathurst herds to be critical wildlife areas. Officials within DRR have raised the possibility of creating a National Wildlife Area to protect the calving grounds of the Bathurst Caribou Herd, however there have been no discussions with communities about the idea.

During the 1970's, the International Biological Program, identified three sites in the region as areas of significance: the Islands of Dolphin and Union Strait, the Bathurst Inlet area, and a site within the Queen Maud Bird Sanctuary. National conservation organizations recently criticized the lack of protected areas in the Slave Geologic Province, which includes the southwest portion of the West Kitikmeot region.


Map 7
Hamlet of Kugluktuk
Clean-up Sites
Moderate Site
Serious Site
N
Universal Transverse Mercator Projection
0 1 2 3 4 5
Kilometres
Base map table-digitized by
the Nunavut Planning Commission Transition Team
from 1:50,000 National Topographic Survey map
115° 25' W
115° 15' W
115° 05' W
114° 55' W
114° 45' W
67° 55' N
67° 50' N
67° 45' N
67° 40' N
Nichols
Islands
Expedition
Cove
Coronation Gulf
Kugluktuk
Hamlet Boundary
Coppermine River
Bloody
Falls

Map 8

Hamlet of Cambridge Bay Clean-up Sites

- Moderate Site
- Serious Site
- Urgent Site
- Road with many 45-gallon barrels
- DEW-line
- Area with many moderate clean-up sites

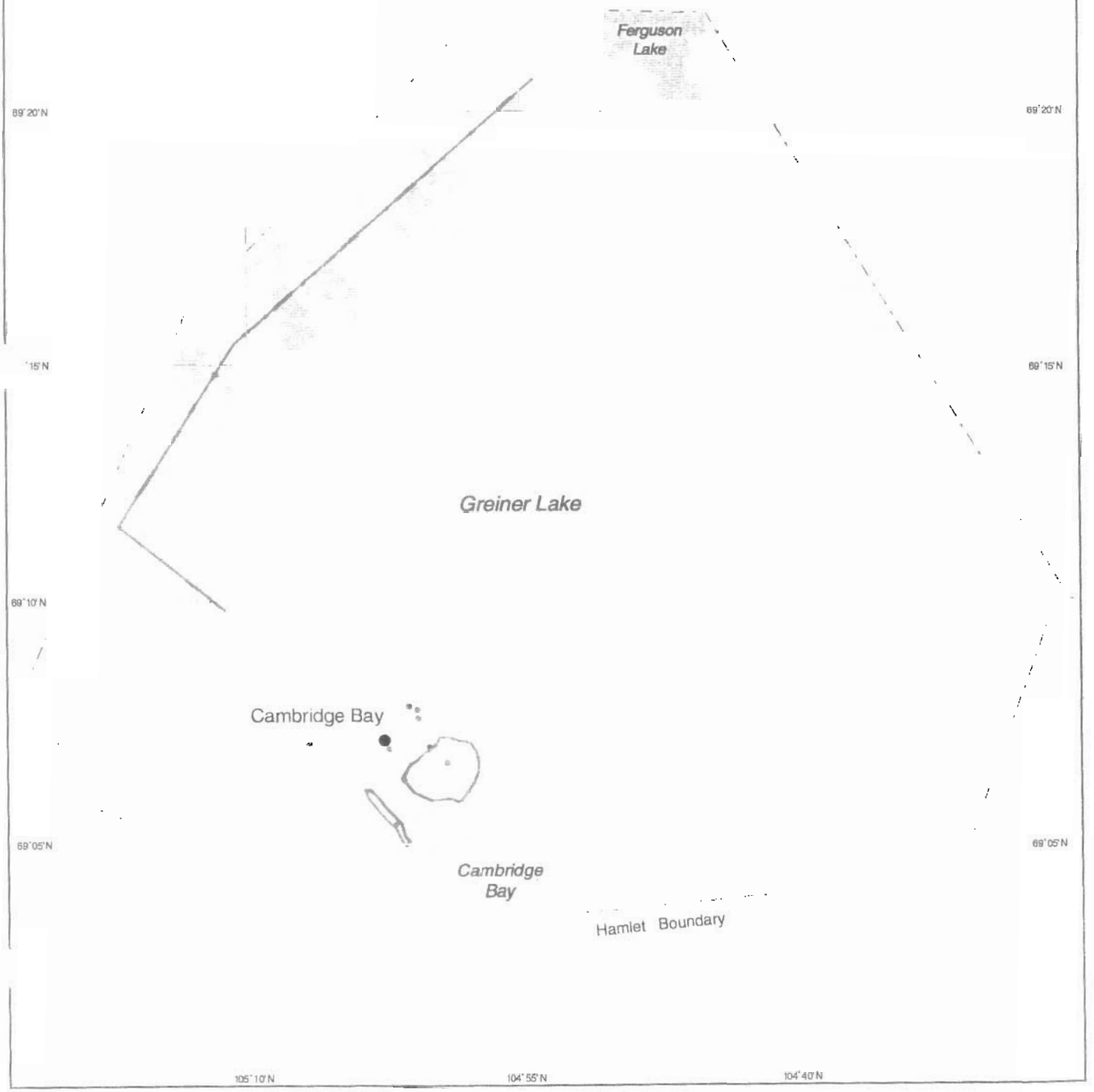
N

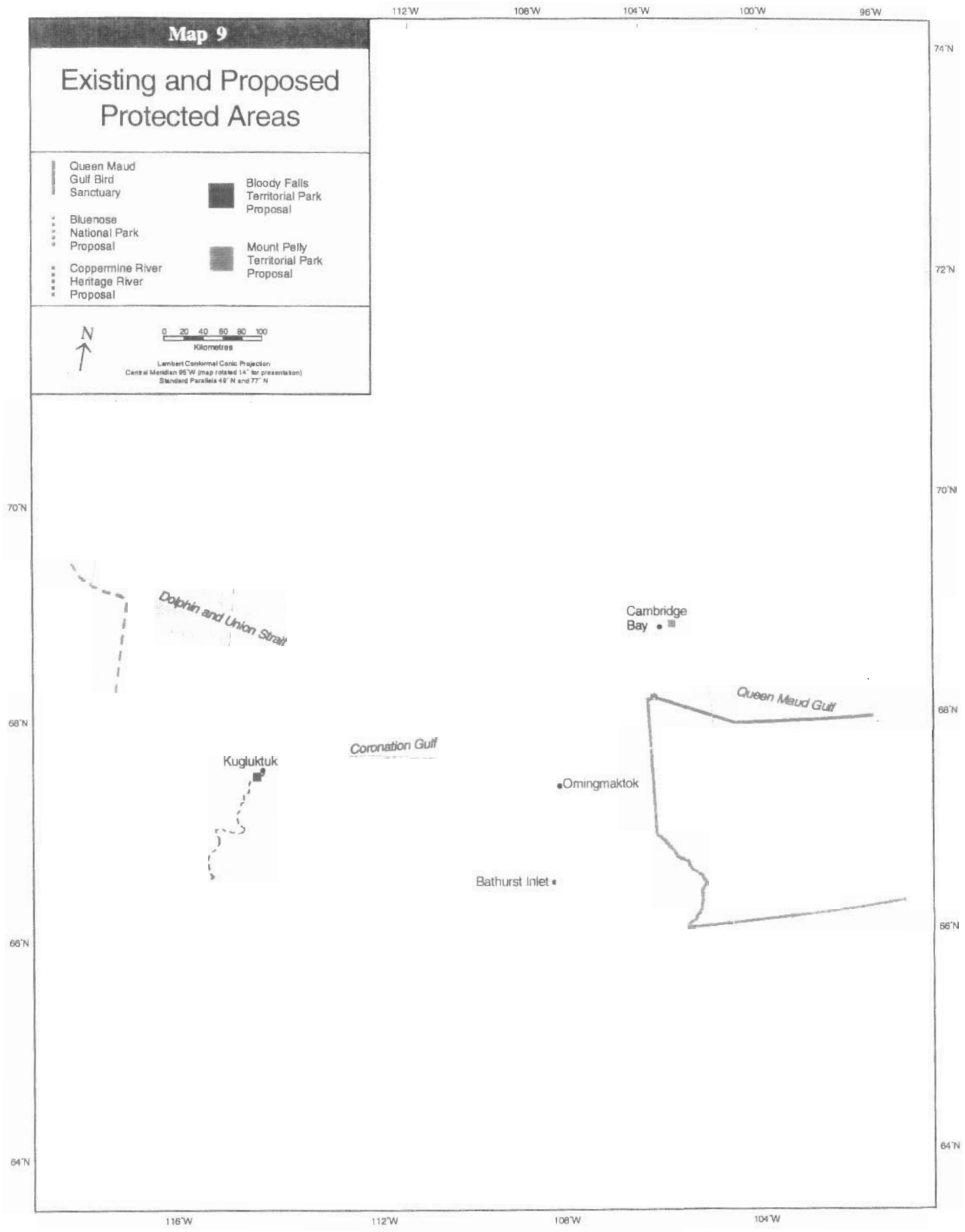
Universal Transverse Mercator Projection

0 1 2 3 4 5

Kilometres

Base map table-digitized by the Nunavut Planning Commission Transition Team from 1:50,000 National Typographic Survey map




Map 9
Existing and Proposed Protected Areas
Queen Maud Gulf Bird Sanctuary
Bluenose National Park Proposal
Coppermine River Heritage River Proposal
Bloody Falls Territorial Park Proposal
Mount Pelly Territorial Park Proposal
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet

5.1.3.2 Analysis

The Proposed Tuktut Nogait/Tahikpak National Park

The Government of Canada, through Parks Canada, establishes national parks to protect the best available examples of the various landscapes and wildlife in the country. To do this, Canada has been divided into 39 terrestrial and 29 marine natural regions. In the West Kitikmeot, the Bluenose Lake and Hornady River drainage basin, west of 119° west longitude, have been identified by Parks Canada planners as the best choice for a national park to represent this part of Canada. (Map10: Tahikpak Park Proposal and Caribou Calving Grounds)

This area includes what some biologists consider to be the core calving grounds of the Bluenose caribou herd. The park proposal covers approximately 28,000 square kilometres and its boundaries overlap the Nunavut, Inuvialuit and Sahtu Dene settlement areas. The land has been withdrawn from development for three years while the park proposal is assessed. The Inuvialuit portion was officially opened as Tuktut Nogait National Park in June 1996. The Nunavut portion.

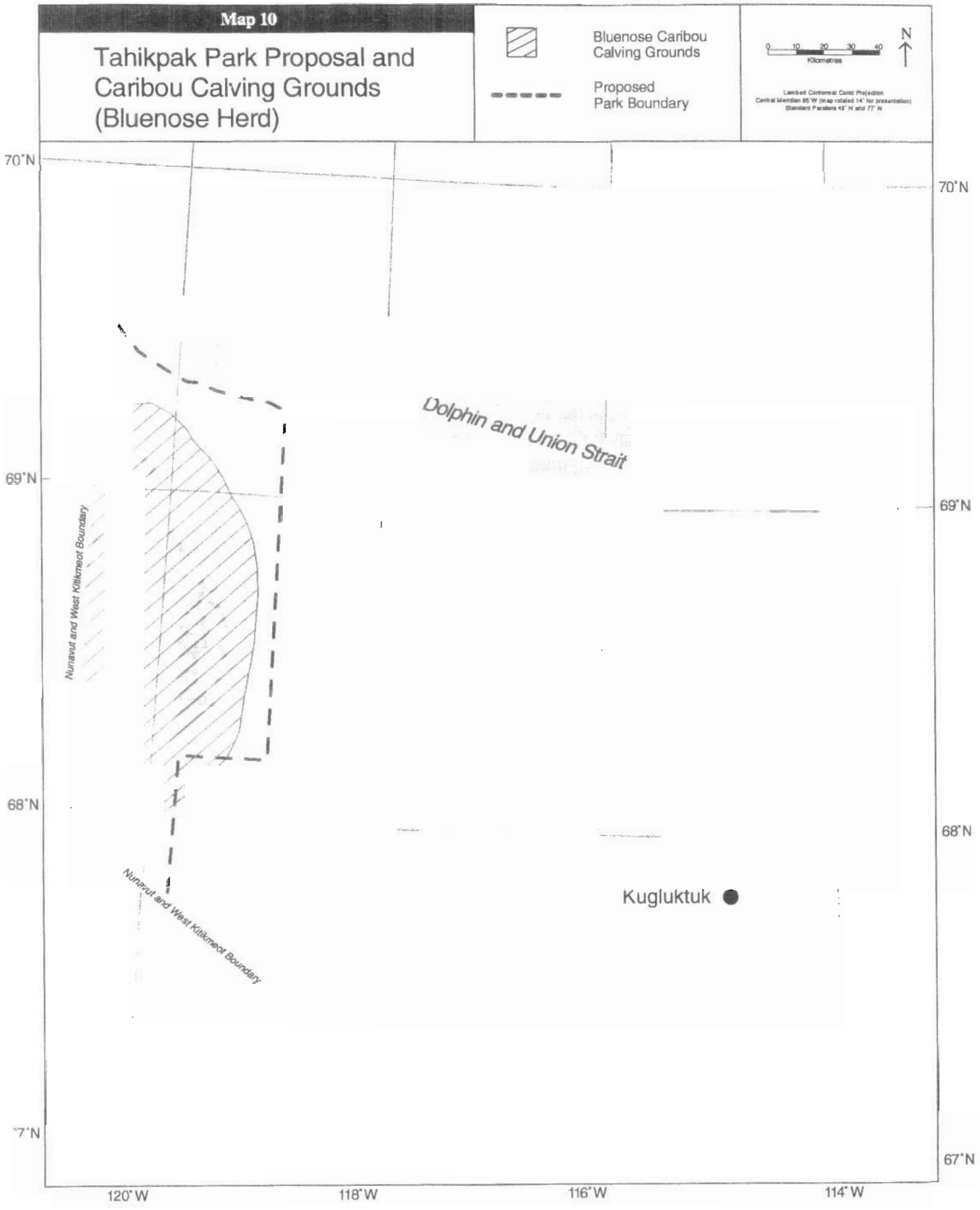
Discussions have been going on for several years about adding a 9,800-square kilometre portion of Nunavut to the park. At the request of the people of Kugluktuk, the NPCTT is conducting a survey in the community to find out whether or not people support the idea of creating a park.

Article 8 of the NLCA sets out the general desirability of creating parks in certain natural regions in Nunavut. It guarantees Inuit a say in the planning of any territorial or national park within the settlement area, as well as in its management. As well, no park will be established in the settlement area without an Inuit Impact Benefits Agreement (IIBA) being negotiated between Inuit and government.

Besides conducting a survey in the community, the transition team contacted Inuit land managers to solicit opinions about whether or not the park should be created. The West Kitikmeot Regional Land Use Plan should reflect this and support whatever decision the people of Kugluktuk make.

One of the main issues for Inuit in Kugluktuk has been the continued ability to use the park for hunting and trapping activities. Under the NLCA, Inuit rights to hunt and trap would be maintained within the boundaries of a national park. Two parcels of Inuit Owned Lands lie within the Nunavut portion of the park proposal. The NLCA ensures Inuit access to these lands would not be restricted.

Questions have been raised about the potential for mineral development in the park. This issue is important to the people of Kugluktuk who look to the mining industry to supply a


Map 10
Tahikpak Park Proposal and Caribou Calving Grounds (Bluenose Herd)
Bluenose Caribou Calving Grounds
Proposed Park Boundary
0 10 20 30 40
Kilometres
N
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
70°N
69°N
68°N
67°N
120°W
118°W
116°W
114°W
Dolphin and Union Strait
Nunavut and West Kitikmeot Boundary
Nunavut and West Kitikmeot Boundary
Kugluktuk

large portion of the community's wage employment. A 1994 Geological Survey of Canada study gave the mineral potential in the Nunavut portion of the proposed park a "low-to-moderate rating ... with moderate certainty."[68]

Parks Canada has stated that one advantage of the proposed park is that it will protect the calving grounds of the Bluenose Caribou Herd. Parks officials have said that a national park represents permanent protection for wildlife and habitat, since no development activities are permitted inside a park. However, people in Kugluktuk do not generally see caribou protection as the main issue connected with the park. Rather, at public meetings people have expressed concern that a national park would limit Inuit rights to land and resources in the region. While the *Nunavut Land Claims Agreement* takes precedence over the *National Parks Act*, the NPCTT feels it is important to listen to the concerns of local residents and to help them evaluate the merits of the proposal.

The Department of Renewable Resources recently documented the seasonal ranges of the Bluenose Caribou Herd. Based on an analysis of 10 years of survey data, the department produced a series of maps of the caribou's range during different times of the year. According to this data, the main concentration of animals during the pre-calving, calving and post-calving (which the department considers to be between 26 May and 25 June) is to the west of the Nunavut boundary, in the Inuvialuit Settlement Region. A smaller concentration of animals appear to be in the Nunavut portion of the proposed national park.[69] (In fact, the maps raise the possibility that the Bluenose herd may in fact be two distinct herds of caribou, each with its own calving grounds.) The maps appear to indicate few caribou in the Nunavut portion of the park at other times of the year. Finally, since the maps delineate total area used for pre-calving, calving and post-calving, it is obvious that the "core calving" areas move over time. This same conclusion has been reached in research on other caribou herds. (See the discussion below concerning caribou protection measures.)

Proposed Changes to the Boundary and Status of the Queen Maud Gulf Bird Sanctuary

The Queen Maud Gulf Bird Sanctuary was established in 1961 to protect the nesting grounds of Ross's Goose and Lesser Snow Goose colonies. It is the only bird sanctuary in the West Kitikmeot.

In 1986, the Conservation Advisory Committee on the Northern Mineral Policy began to review the boundaries of all bird sanctuaries in the NWT. The review was intended "to ensure that the position of the boundaries was appropriate for the purpose for which they

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[68] Geological Survey of Canada, Open File 2789. "Mineral Resource Assessment of the Neoproterozoic Franklin Igneous Events of Arctic Canada: Comparison with the Permo-Triassic Noril'sk-Talnakh Ni-Cu-PGE Deposits of Russia." Ottawa, April 1994, p. 1.

[69] This data is taken from John A. Nagy, Department of Renewable Resources, "Darnley Bay Resources Prospecting Areas and Seasonal Ranges of the Bluenose Caribou Herd" [draft], 13 September 1995.

were established (i.e. the conservation of birds and their habitat.)"[70] This process led to the recommendation that the Queen Maud Gulf sanctuary be reduced by 12 per cent, but that a study of wildlife habitat should be carried out before the boundary was altered.

The Canadian Wildlife Service (CWS) biologists who have worked in the area examined the habitat classification of the sanctuary in 1995 concluded that the southern boundary should be adjusted north. (Map 11: Queen Maud Gulf Bird Sanctuary and Caribou Calving Grounds - Bathurst Herd) This would lead to a 10 per cent reduction in the sanctuary size. The habitat review showed that the area to be excluded "has a much lower value as wildlife habitat than the rest of the Sanctuary."[71] The biologists also recommended that the designation of the sanctuary be changed to a National Wildlife Area. The reasons for this are:

- The Queen Maud Gulf area is rich in other forms of wildlife besides birds. It contains the "heart" of the area's musk ox population, "one entire caribou calving ground and part of another." And the area is recognized as a Wetland of Internal Importance (RAMSAR site). "The Bird Sanctuary designation does not protect other wildlife or their habitat." (Map 12: Queen Maud Gulf Bird Sanctuary and Important Musk Ox Areas)

- The sanctuary was created under the *Migratory Birds Convention Act*. As well, the *Canada Wildlife Act*, under which a National Wildlife Area would be established, "encourages cooperative management of wildlife and National Wildlife Areas. It anticipates the Nunavut style of wildlife conservation" which emphasizes the role of management committees.

Under Section 9.3.2 of the land claims agreement, the Nunavut Wildlife Management Board must approve any changes to conservation area boundaries in Nunavut. Section 5.2.34(b) authorizes the Nunavut Wildlife Management Board to make recommendations to the Nunavut Planning Commission concerning planning in areas with high value for wildlife. The Canadian Wildlife Service has submitted its recommendations to the NWMB and the Nunavut Planning Commission Transition Team. It asked that the latter include the proposed boundary and designation changes in its work on West Kitikmeot land use planning issues. The transition team has included the issue in its West Kitikmeot work and has written a letter to CWS asking that it to begin public consultations.

The NWMB gave the proposal its "general support" but told CWS that it "wished to see further public consultation carried out before making a decision on the issue."[72] The Board stated that it supports re-designating the sanctuary as a National Wildlife Area in

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[70] Canadian Wildlife Service. "Submission to the NWMB for Decision." January 1996, p. 1.
[71] CWS, p. 1.
[72] Ben Kovic, Chairman, NWMB letter to Kevin McCormick, CWS, 19 March 1996, p. 1.

Map 11

Queen Maud Gulf Bird Sanctuary and Caribou Calving Grounds (Bathurst Herd)

Caribou Calving Grounds

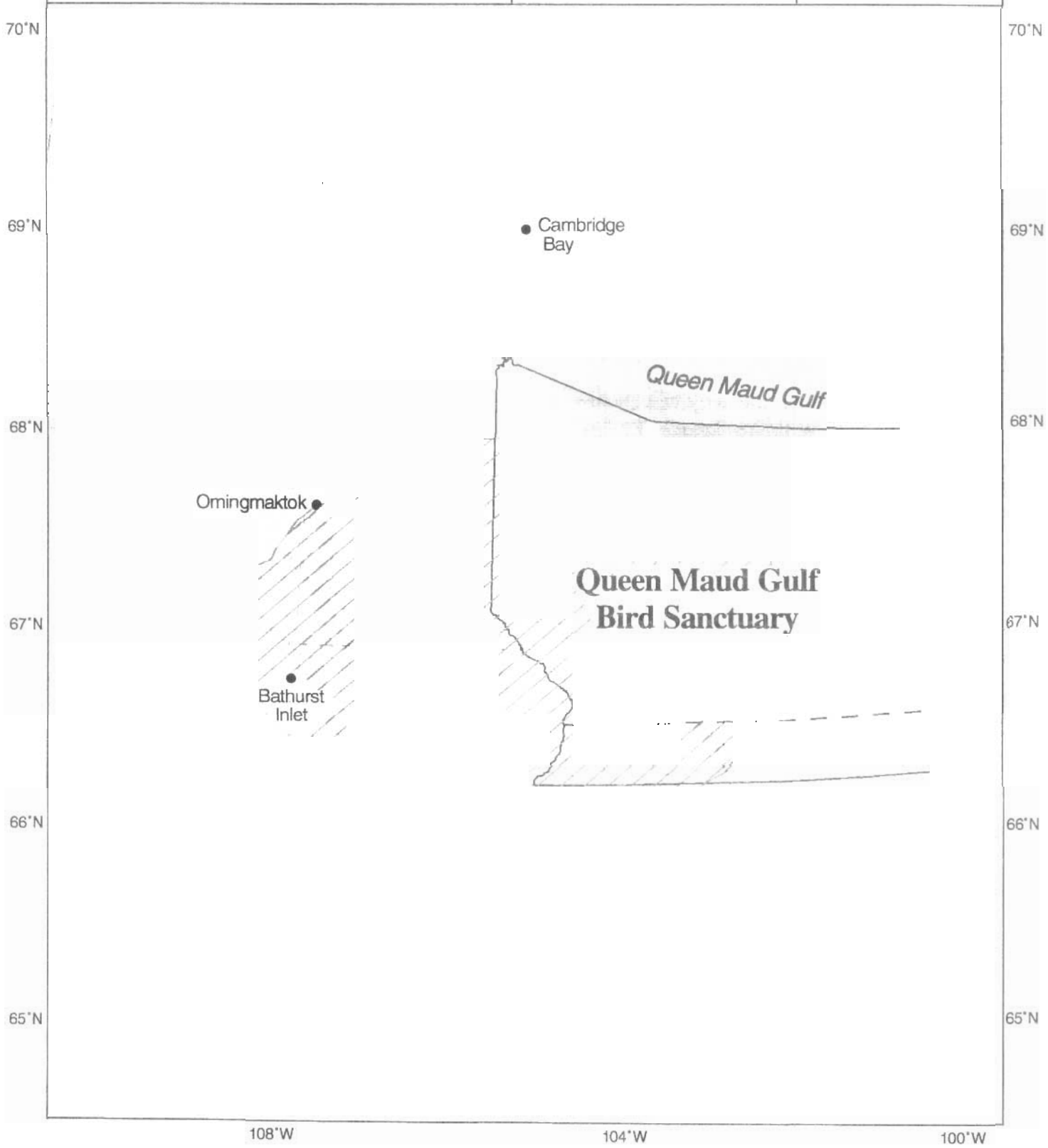
Bird Sanctuary Boundary

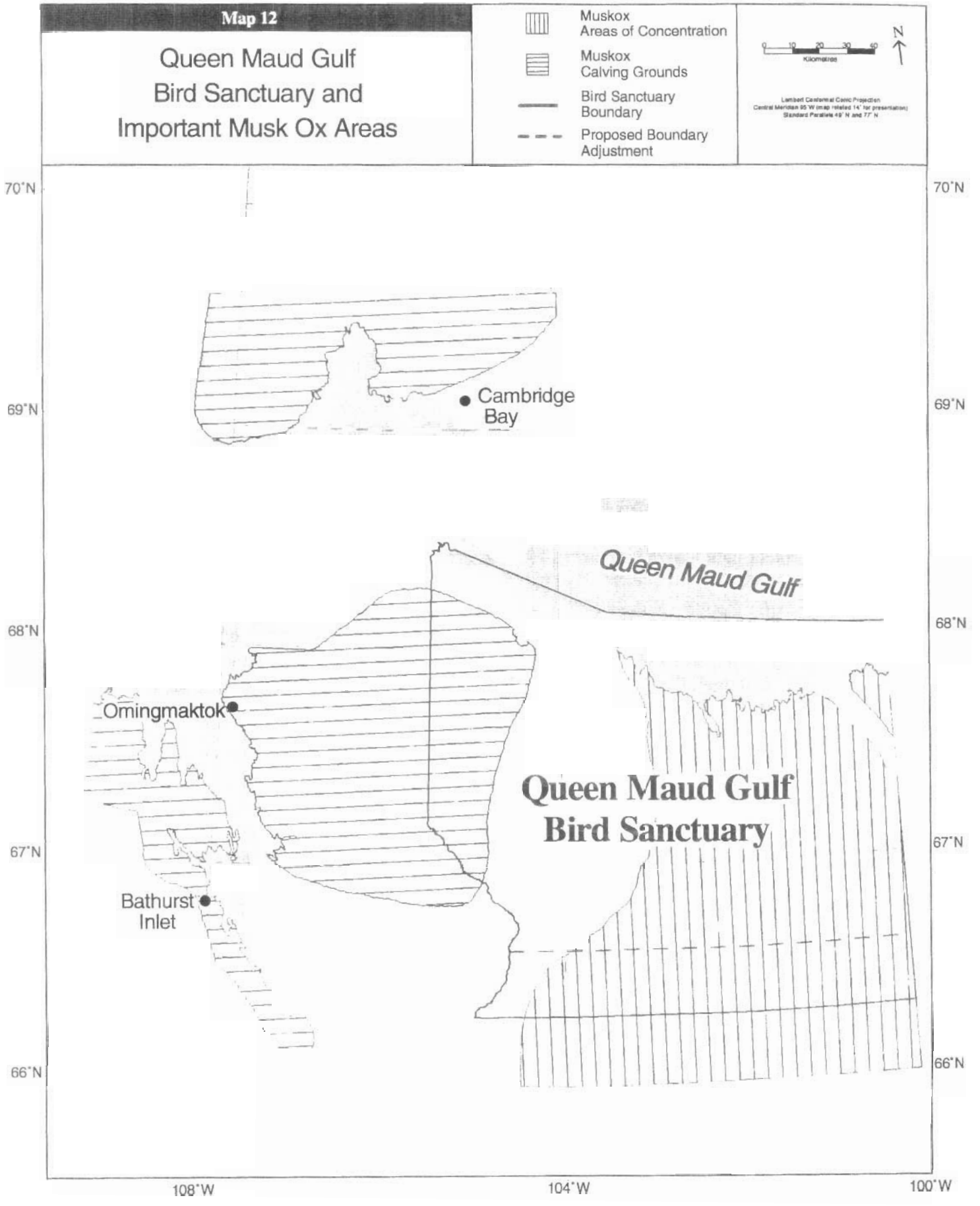
Proposed Boundary Adjustment

0 10 20 30 40 Kilometres

N

Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N




Map 12
Queen Maud Gulf
Bird Sanctuary and
Important Musk Ox Areas
Muskox
Areas of Concentration
Muskox
Calving Grounds
Bird Sanctuary
Boundary
Proposed Boundary
Adjustment
0 10 20 30 40
Kilometres
N
Lambert Conformal Conic Projection
Central Meridian 95 W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
70°N
69°N
68°N
67°N
66°N
108°W
104°W
100°W
Cambridge
Bay
Queen Maud Gulf
Omingmaktok
Bathurst
Inlet
Queen Maud Gulf
Bird Sanctuary

order to protect other wildlife in the region. Once local and regional consultations take place, the Board will examine the issue again.

Industry also has an interest in the change in the sanctuary's designation. Exploration permits have been issued in the sanctuary and at least one company has not received the land use authorizations necessary to gain access to the area. Any change in the boundary or the designation of the sanctuary should only take place after thorough regional and local consultations. It is important that this consultation include representatives of the mining industry.

People in Cambridge Bay have strongly suggested that the name of the Sanctuary or National Wildlife Area be changed to Iluilik. The planning commission supports this proposal.

Mount Pelly Territorial Park Proposal

The Department of Economic Development and Tourism is also interested in developing a territorial park at Mount Pelly, 15 kilometres east of Cambridge Bay. (Map 9) Mount Pelly has been identified as an important site for tourism because of its proximity to the community and the fact that it is an ideal place to view the surrounding landscape. It is also close to local wildlife, such as muskoxen, tundra swans and jaegers. A conceptual management plan was developed in 1993 and the community is interested in seeing the park proceed.

About one-third of the 1570-hectare park proposal lies within the municipality of Cambridge Bay. Another 1000 hectares lies within a Department of National Defense Reserve. Although the park constitutes less than 1% of the total military reserve, to date efforts to acquire the land have been unsuccessful.[73]

Heritage Rivers

In 1991, the Department of Economic Development and Tourism began studying the merits of designating the Coppermine River as a Canadian Heritage River. (Map 9) The study was deferred pending the results of a study of hydro-electric potential by the Northwest Territories Power Corporation. The corporation's study concluded that river was not a good site for power generation. The Department of Economic Development and Tourism has discussed the issue of heritage designation with the people of Kugluktuk but no decisions have been made.

All of the major rivers flowing into Coronation Gulf – the Coppermine, Hood, Burnside, Tree, Perry and Back – are becoming increasingly popular with tourists. Canoeists can be

[73] Parks Canada, p. 9.

seen on all these rivers in the summer. Adventure travel makes up a significant portion of the money spent on tourism in the region. People in Kugluktuk are concerned that with the increased use of the Coppermine River by canoe campers, the potential increases for garbage being left on the land and environmental degradation at heavily used campsites. Whether any of these waters receives heritage river status will not in itself mitigate the impact of increasing numbers of annual visitors.

5.1.3.3 Actions

1. **The Canadian Wildlife Service should begin consultations with people in the communities of Cambridge Bay, Omingmaktok, as well as Gjoa Haven in the East Kitikmeot, concerning plans to alter the boundary of Queen Maud Gulf Bird Sanctuary and change its designation to a National Wildlife Area. Any change in the boundary or the designation of the sanctuary should take place only after thorough regional and local consultations. It is important that this consultation include representatives of the mining industry.**

2. **The name of the Sanctuary/ National Wildlife Area should be changed to Iluilik, or some other Inuit name, chosen through community consultation.**

3. **The Department of National Defence should transfer land near Mount Pelly to the Government of the Northwest Territories in order to ensure the timely development of a territorial park at the site near Cambridge Bay.**

4. **The Coppermine River should be designated** nominated?- **as a Heritage River upon approval by the people of Kugluktuk.**

5. **The people of Kugluktuk should decide if the Bluenose Lake area will be included in Tuktut Nogait/Tahipak National Park. Following completion of the community survey regarding the park proposal, Parks Canada, NPCTT, and KIA should meet with the people of Kugluktuk to confirm the community response.**

6. **Visitors to the region, and local residents, should adhere to the Code of Conduct contained in Appendix 3**

5.1.4 CARIBOU

5.1.4.1 Issues

Harvesting caribou is an important part of the lives of Inuit of the West Kitikmeot region of Nunavut. Caribou provide the people with an important source of protein and a continuing link to their land and culture. Thus, residents want to ensure that the Bathurst Caribou Herd -- and other herds which migrate through the region – as well as their calving and post-calving grounds, and water crossings, are protected for future generations.

Over the last few years, the expansion of mineral exploration has raised concerns about the effects that industrial activity might have on the wildlife in general, and on the Bathurst herd in particular.

People have expressed concerns about the impacts of mineral exploration on wildlife. Specific concerns have been raised about the disturbance of caribou by the noise from low flying helicopters. It was suggested at a meeting in Omingmaktok that exploration activities should be stopped during the caribou calving season.[74] Areas of key habitat, such as calving and post-calving grounds, as well as water crossings, need to be protected.

The people of Kugluktuk have told the transition team that they want to see caribou protection measures introduced for the calving grounds of the Bluenose Caribou Herd to the west of their community. They are concerned about the effects of potential mining activity in the region. The people of Omingmaktok have also told the transition team that there should be caribou protection measures for the Bathurst Caribou Herd, which migrates across a huge portion of the central arctic and calves to the east of Bathurst Inlet. These calving grounds are also the site of considerable mineral activity.

Residents have also expressed concern about the effects shipping might have on caribou migrating across the ice between Victoria Island and the mainland. Inuit depend upon caribou for their livelihood, and marine transportation through Coronation Gulf may present a hazard to caribou migrating across the ice between Victoria Island and the mainland. There are significant concerns about ship passages in the fall, just after freeze-up, and a possible conflict with caribou returning to the mainland from the Island. The timing of migrations varies slightly from season-to-season and year-to-year, depending upon climatic conditions which affect the rate of freezing. There is currently little commercial shipping in Coronation Gulf through consolidated ice. Residents are concerned that an extension of the shipping season into the fall using commercial ice-breaking ships will create a hazard for caribou. Ships passing through Coronation Gulf

[74] West Kitikmeot Resource Planning Working Group, p.11

in the fall through ice would leave ship tracks with open water and create potential problems for over-ice travel of caribou. (See the section on Marine Transportation for additional information on this issue.)

5.1.4.2 Analysis

The Bathurst Caribou Herd is an important source of food for hunters from Omingmaktok, Bathurst Inlet, Cambridge Bay and Kugluktuk – in effect, the entire West Kitikmeot. It is also used by people from a number of Dene communities, including Lutsel k'e, Detah, Rae-Edzo, Rae Lakes, Snare Lakes, Wha Ti, and Deline. An estimated 8,000 to 10,000 animals from this herd are harvested each year.[75]

The Bathurst Caribou herd migrates through territory in which there is considerable mineral and diamond exploration activity. There is also exploration activity near and within its current calving area. For example, BHP Minerals Canada Ltd. conducted a bulk sampling operation in 1996 at its Boston Gold Project property on Spyder Lake.[76] (Map 13: West Kitikmeot Mineral Deposits) While this does not mean that a mine will be developed at the site, if the results are favourable the information gained will be useful in the next stage of development – determining the feasibility of a potential gold mine. BHP is also considering a bulk sample operation at Doris Lake, north of the Boston property, in 1997.

Although cows return to the same general area to calve, the actual calving area varies considerably from year to year. The area the animals use is dictated by a combination of many factors, including weather, snow melt, food sources, and predator avoidance. Traditional knowledge and scientific studies recognize that caribou are more sensitive to disturbance during the calving and post-calving periods than at other times.[77]

A 1978 study found that four types of habitat are critical to caribou: major migration corridors to calving grounds, calving grounds, areas where post-calving aggregations and movements occur, and important water crossings. (Map 14: Caribou Water Crossings) Major concerns with industrial development on calving grounds include the construction of roads and other facilities which could impede animal movements, low-flying aircraft, intensive human use or construction, heavy traffic, habitat destruction due to emission of sulfur dioxides.[78]

The transition team sponsored a community meeting in Omingmaktok in August 1995 to discuss what caribou protection measures people thought would be most appropriate and

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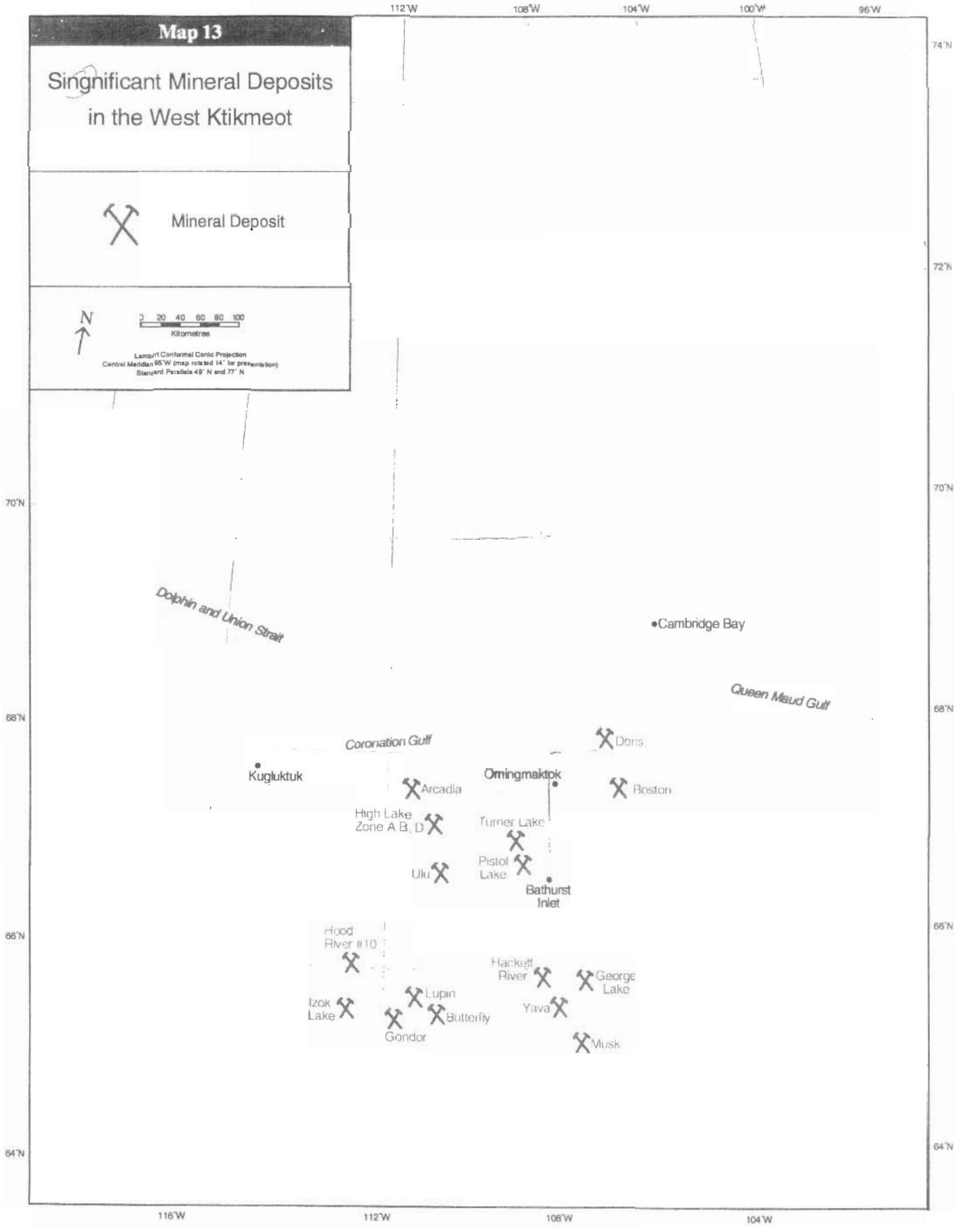
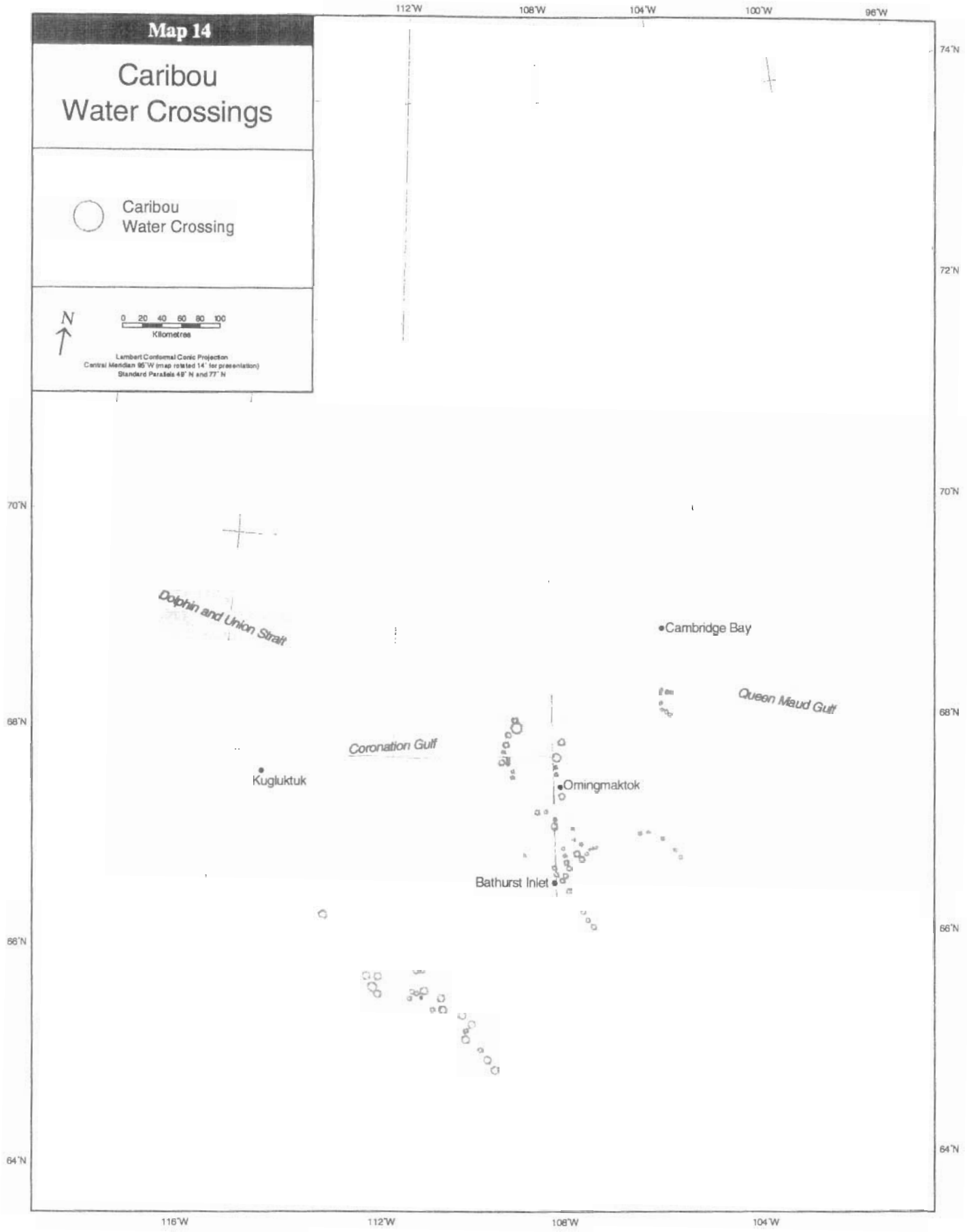
[75] People and Caribou in the NWT, p. 114.
[76] BHP Minerals Canada Ltd. Boston Gold Project, NWT, p. 1-1.
[77] Department of Renewable Resources, 1995b. "Discussion Paper on Protection of Caribou Calving Grounds." Prepared by the Department of Renewable Resources for a Workshop on Protection of Caribou Calving Grounds in Nunavut, 8-9 November 1995. Yellowknife. pp 1-2.
[78] Interdisciplinary Systems Ltd., p. v.


Map 13
Significant Mineral Deposits in the West Ktikmeot
Mineral Deposit
N
0 20 40 60 80 100
Kilometres
Lambirt Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Doris
Arcadia
Boston
High Lake Zone A B, D
Turner Lake
Pistol Lake
Ulu
Bathurst Inlet
Hood River #10
Hackett River
George Lake
Lupin
Izok Lake
Butterfly
Yava
Gondor
Musk


Map 14
Caribou
Water Crossings
Caribou
Water Crossing
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
112°W
108°W
104°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Ormingmaktok
Bathurst Inlet

effective for the region. This meeting took place with the knowledge that the staking rush of the last few years in the region was over and a number of companies were now concentrating on serious exploration. The meeting was informed that as many as 150 land use permits have been issued for Inuit Owned Lands between Kugluktuk and Bathurst Inlet, and another 200 on federal crown lands.

A number of options for protecting caribou have been explored by various agencies over the past two decades. The discussion that follows examines these options.

In the 1970's mineral exploration activity in Keewatin dramatically increased with a strong world market for uranium. By the late 1970s, the residents of Baker Lake were becoming increasingly concerned about the effects of mining exploration on the caribou in their region. In 1978, the Department of Indian Affairs and Northern Development (DIAND) introduced Caribou Protection Measures for the region as part of the territorial land use regulations. These measures impose controls on land use operations within areas defined as "Caribou Protection Areas" (calving and post-calving areas) for the Beverly and Qamanirjuaq herds.

From 1978-1982, the measures were enforced between 15 May and 31 July. In 1983, the period was reduced to between 15 May and 15 July. The measures restrict mineral exploration activities in calving grounds during calving and post-calving periods. As part of the Beverly and Qamanirjuaq Caribou Management Plan, these protection measures are reviewed every year. Boundaries for the protection areas are delineated from the caribou's use of calving and post-calving areas over the previous 5-year period, and are adjusted based on an annual review of boundaries and patterns of range use.

Caribou use the same water crossings year after year. During spring migration the animals often travel over the surfaces of frozen lakes and rivers where windswept, hard-packed snow makes traveling easier.

> *Herds often follow major drainages whose axes lie along the general direction of migration...During summer migrations, snow conditions no longer limit caribou to certain routes and open water bodies are obstacles. Caribou will readily cross open bodies of water, but they tend to follow the shores and concentrate at certain crossing areas.*[79]

The Beverly and Qamanirjuaq herds are the only ones to which protection measures currently apply. However, residents of Omingmaktok and other communities in the West Kitikmeot have said they want to see similar caribou protection measures attached to the Bathurst herd. They have suggested the fastest way to implement such measures would be to attach them to land use permits. The Kitikmeot Inuit Association attached caribou

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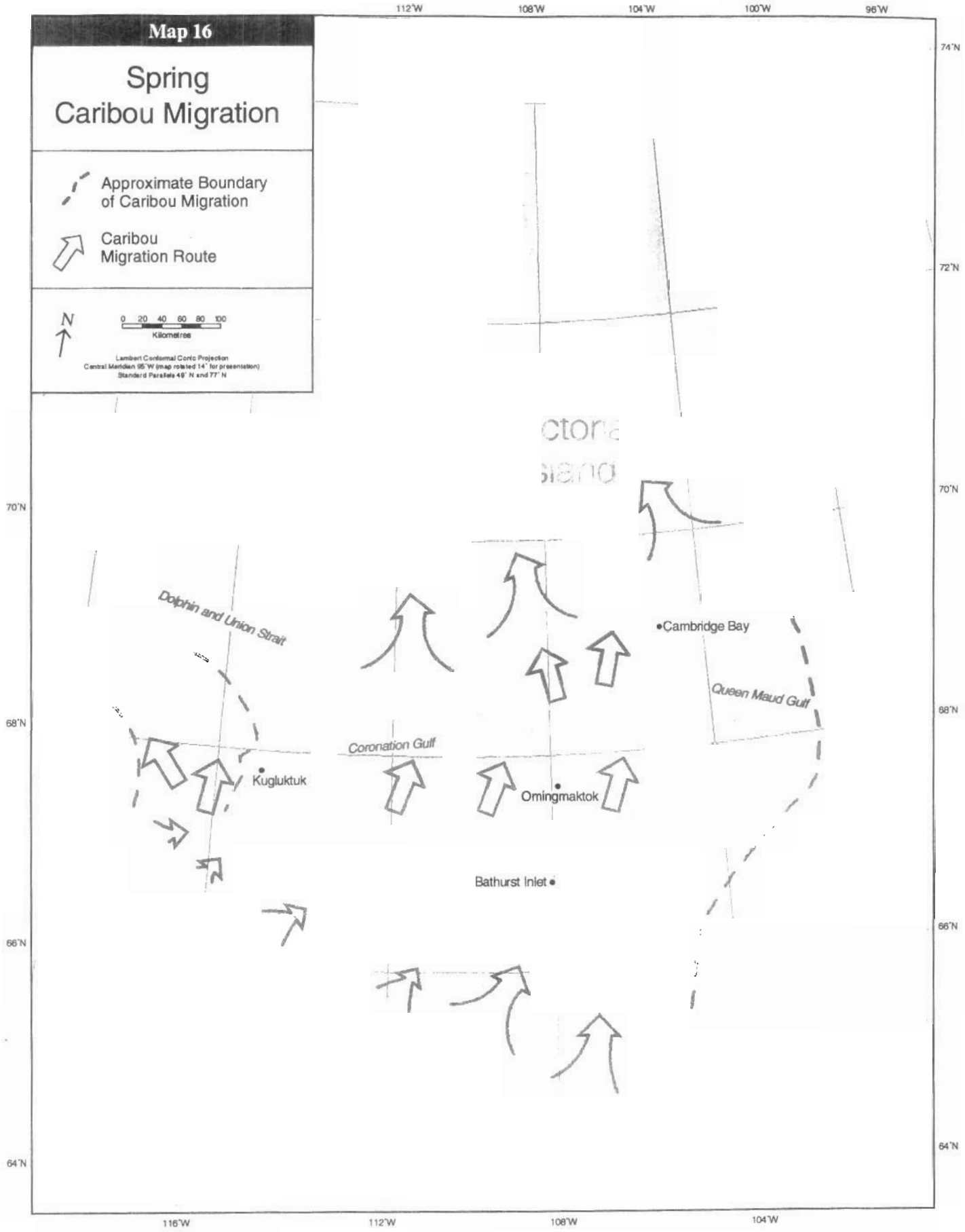
[79] T. Mark Williams and Anne Gunn, **Descriptions of Water Crossings and Their Use by Migratory Barren-Ground Caribou in the Districts of Keewatin and Mackenzie, N.W.T.** NWT Wildlife Service, 1982, p. 36.


Map 15
Caribou Calving Grounds
Caribou Calving Grounds
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet


Map 16
Spring
Caribou Migration
Approximate Boundary of Caribou Migration
Caribou Migration Route
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Coronation Gulf
Queen Maud Gulf
Cambridge Bay
Kugluktuk
Omingmaktok
Bathurst Inlet

protection options to a permit granted to BHP for work at its Boston property in the summer of 1995.

Protection measures could be implemented at least three different ways: as part of a regional land use plan (zoning); through the Nunavut Wildlife Management Board (wildlife regulations); and through terms and conditions attached to land use authorizations (land use regulations).

In its 1991 **Keewatin Regional Land Use Plan**, the former Nunavut Planning Commission recognized that the Beverly and Qamanirjuaq caribou herd had prospered since the protection measures were introduced. The Commission commented on the flexibility of such measures:

> *Given the existing level of knowledge, the Commission thinks that the existing caribou protection measures are adequate. The measures should be reviewed in the future in light of new knowledge. On the one hand, more protection might be considered if research indicates that this would be required to maintain a healthy caribou population; on the other hand, future changes in mining technology may reduce the impact of mining activities on caribou.*[80]

One problem that has been identified with the system in place in Kivvaliq is the requirement for monitoring to determine the actual calving areas in order to determine the boundaries of the management zone. Government has little money to pay for monitoring programs these days and such monitoring has been reduced in recent years. One suggestion has been that the protection measures should be made "portable" – they would go with the caribou and apply throughout the region, wherever caribou cross water, or calve. The best vehicle to ensure compliance with these measures is still land use authorizations. It is the land use operation itself that is the source of potential adverse impact on caribou, and these land use operations are already regulated by DIAND and or the Kivvaliq Inuit Association.

Biologists with Renewable Resources have suggested that three forms of protection should be provided for calving and post-calving Bathurst caribou: year-round protection for the core calving grounds from habitat destruction, modification or fragmentation; protection of calving caribou from disturbance; protection of post-calving caribou from disturbance.[81]

Core calving grounds would be designated as protected areas in which activities that could damage or modify habitat would not be allowed at any time. Activities that do not affect habitat but which could disturb caribou would not be permitted during calving or post-calving. An additional area around the core protected area as conditional buffer

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[80] Nunavut Planning Commission, 1991, p. 71

[81] Renewable Resources, "Discussion Paper", p. 2.

zones in which activities would be regulated during calving and post-calving periods. Conditions on land use activities would operate through a permit system.

While this approach offers to protect both calving caribou and habitat, traditional knowledge and scientific research indicates that that core calving grounds are very difficult to define or determine. On the one hand, there is likely not one single area that is heavily used for calving every year, the variation is such that it is likely that a calving area in one year maybe completely different a decade later, perhaps influenced by changes in vegetation required by caribou for food. On the other hand, if one defines the core area as the maximum extent of the area used by caribou for calving over time, the area becomes very large. (Map 15: Caribou Calving Grounds)[82]

There are also numerous problems sorting out which piece(s) of Territorial or Federal legislation to use to accomplish what it suggested. For example, if Territorial legislation (Critical Wildlife Area Regulations) were used for the post-calving area, there are currently no provisions for management or regulatory control on CWA lands. Resolving these problems would take a substantial effort by a number of agencies and would likely require changes to legislation. This would be a time consuming process.

NTI has recently requested that the Planning Commission consider setting aside areas for the exclusive use of caribou.[83]

Removing such a large area of land from mineral staking, exploration or development would be expensive. Government would be expected to buy out existing claims. There would also be a cost to local people who want to benefit from potential wage employment at these sites. There are no specific proposals to set up protected areas in the region. However, a few years ago a Parks Canada proposal to create a national park around Bathurst Inlet was rejected by area residents.

The Bathurst Caribou Herd is the largest herd in the Northwest Territories. The GNWT Department of Renewable Resources estimated its population at 350,000 in 1990[84]. The herd occupies a range of 250,000 square kilometres which includes wintering grounds in the treeline from the Coppermine River to Great Slave Lake. In spring and fall the animals pass through the Lac de Gras area, now undergoing extensive diamond exploration. (Map 16: Spring Caribou Migration; Map 17: Fall Caribou Migration) For that reason, an environmental panel which examined the potential effects of a BHP diamond mining operation recommended that

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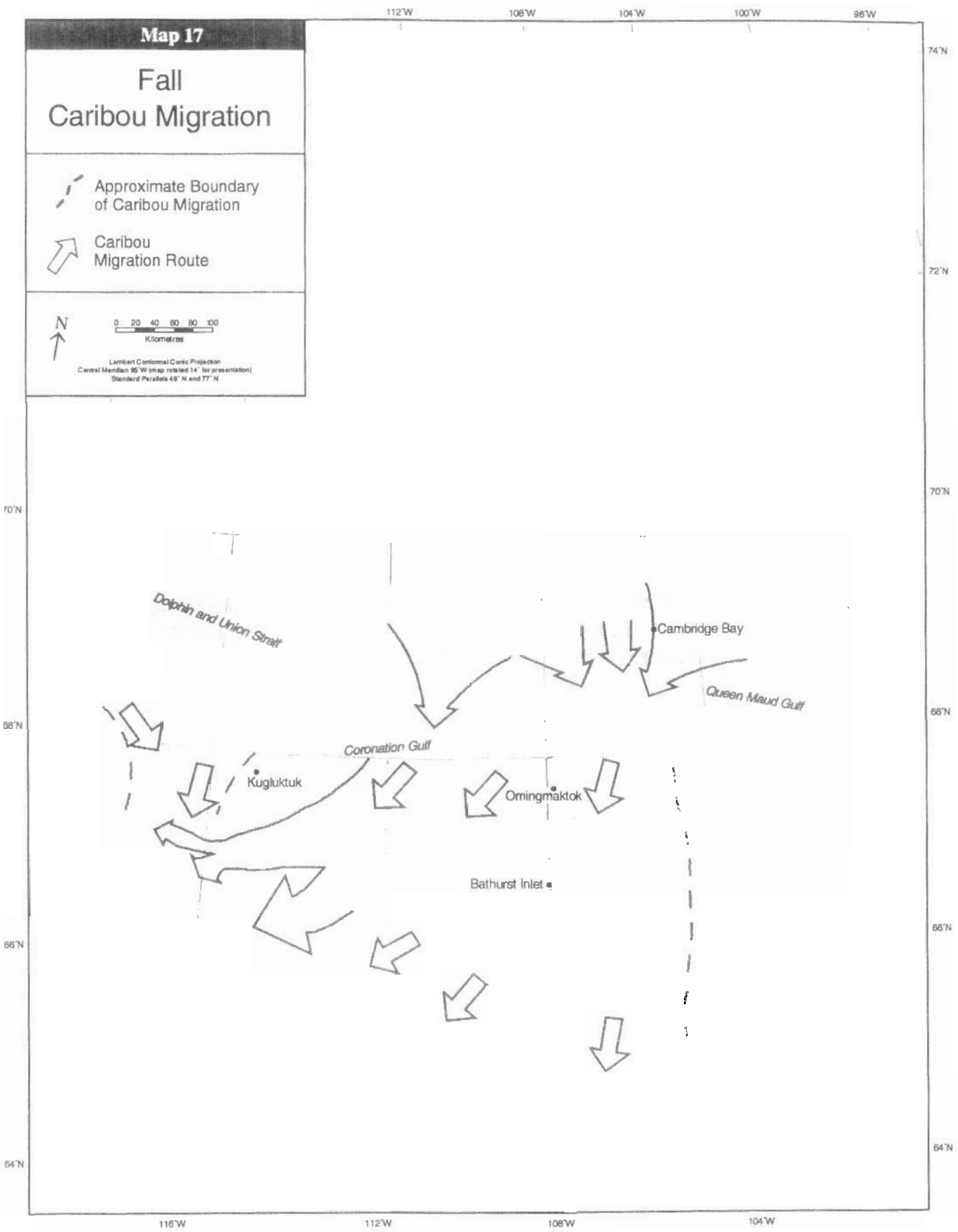
[82] For a historical sketch of the changes in the Bathurst Caribou Herd calving grounds, see Fleck and Gunn, **Characteristics of Three Barren-Ground Caribou Calving Grounds in the Northwest Territories**, 1982, pp 8-13.

[83] Charlie Evalik, letter to Bobby Lyall, Chair, NPCTT re: Caribou Protection Measures in West Kitikmeot, 8 May 1996.

[84] Environmental Assessment Panel, **NWT Diamonds Project**, p.39.


Map 17
Fall
Caribou Migration
Approximate Boundary of Caribou Migration
Caribou Migration Route
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 95°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
112°W
108°W
104°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet

...governments consider establishment of a Bathurst caribou management board. Such a board would provide a focal point for multi-party input to the monitoring and management of this herd.[85]

The panel stated that the management board is needed because of the "interjurisdictional nature of the herd's range."[86] The NPCTT has noted this recommendation and suggests the Nunavut Planning Commission conduct further analysis.

Another issue is cross-ice caribou migration. In 1992-93 Renewable Resources began a study into the number of caribou migrating between Victoria Island and the mainland in the Coronation Gulf area. This study will continue with the co-operation of Renewable Resources and the hunters of Cambridge Bay and Kugluktuk.

In the spring, caribou migrate northward across thick sea ice over a period of weeks. In the fall, caribou stage along the shoreline of Victoria Island with the entire herd crossing to the mainland in a very short period of time once the ice is safe. This passage is hazardous because the ice forms and breaks up a number of times, making it difficult for caribou to determine when ice is safe to cross.

Over the past three or four years there have been reports from people in Cambridge Bay and Kugluktuk of caribou falling through ice near the shoreline resulting in injury or death. In 1990, Renewable Resources looked at some of the injured caribou and found severe bruising from thrashing against the ice, enough to cause death in certain cases. It seems that when caribou are staged along the shoreline, any disturbances which cause panic and frightens them into the water can cause such effects.

Caribou must also contend with cracks in the ice, which they usually walk along until finding a narrow passage to cross. A ship track differs from natural cracks in the ice by having rough, fragmented edges. When temperatures are cold, ship tracks will re-freeze but, because of rubble resulting from ice going through propellers, freezing will be uneven and leave soft spots in the track. Further studies must be done to learn exactly how caribou react to these tracks. However, Renewable Resources biologists concluded by stating that migrations of caribou across sea ice are an essential part of caribou ecology in the Arctic. The timing of passage varies, as does the number of caribou who migrate. Regardless of the number however, those migrating caribou are critical to the species.

Concern was also voiced about ships passing through Dease and Dolphin straits and Union Strait. Caribou also cross in these regions and would face the same potential hazards with ice-breaking in the fall before migration as caribou crossing Coronation Gulf.

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[85] Environmental Assessment Panel, **NWT Diamonds Project,** p. 42.

[86] Environmental Assessment Panel, **NWT Diamonds Project,** p. 42

5.1.4.3 Actions

1. **Caribou protection measures, based on those suggested in Appendix 4 – and further developed by DIAND and Inuit land managers in consultation with NWMB, KHTA, the local HTOs and DRR – should be implemented for all caribou herds in the West Kitikmeot by DIAND and by Inuit land managers.**

2. **The Nunavut Planning Commission, the Nunavut Wildlife Management Board, the Nunavut Impact Review Board, DIAND, Inuit land managers and DRR should work together to monitor the effectiveness of the caribou protection measures and compliance, and to determine whether special protected areas for caribou are required.**

3. **Shipping in Coronation Gulf should be closed by the Canadian Coast Guard as soon as ice forms in the fall until the caribou migration ends.**

4. **Renewable Resources and KHTA should continue with studies on seasonal migrations of caribou between Victoria Island and the mainland in order to get better baseline information necessary to assess potential negative impacts from shipping.**

5. **Research by Renewable Resources, the Kitikmeot Hunters and Trappers Association, and the Nunavut Wildlife Management Board, as well as studies under West Kitikmeot/Slave Study should continue to develop further an understanding of why and where caribou calve and migrate, as well as caribou crossings used during migration. All parties, but especially the NPC, should communicate this information widely through the use of maps.**

6. **The Nunavut Planning Commission, the Nunavut Wildlife Management Board and other responsible agencies should meet at the first opportunity to work out a plan for managing the Bathurst Caribou Herd.**

5.1.5 ESKERS

5.1.5.1 Issues

Eskers are ridges of granular material, the remnants of glacial river beds. Found throughout the West Kitikmeot, they can be straight or meandering, continuous or interrupted, split or braided, broad or narrow. Eskers are key part of the habitat of some animals, and may contain many important archeological sites. They are also used as travel routes for both humans and wildlife. Finally, eskers are also seen as ready sources of granular material by developers for road and airstrip construction.

More information is needed on the role of eskers in the ecosystem in order to avoid land use conflicts in the West Kitikmeot. Research conducted on eskers should operate from the principle that they are a focal point of integrated land use activities.

5.1.5.2 Analysis

Eskers are an important part of the habitat of caribou, grizzly bears, wolves, coloured and white foxes, muskox, wolverine, hikhiks (siksiks) arctic hare, ptarmigan and other birds. Caribou use eskers as travel routes and to get away from insects. During the winter they use them as places of rest and shelter, often gathering on the leeward side of the slope, out of the wind. Wolves, foxes, and hikhiks den in their sandy slopes. Grizzlies feed on the animals and berries found on them. Birds such as sandhill cranes use eskers both for nesting and feeding.

Traditionally, Inuit have used eskers extensively. A large number of archaeological sites, such as tent rings and burial places, are found there. Eskers were also used for traveling, camping, hunting, trapping and a place to seek relief from insects in the summer.

> *The one common thread that ties all wildlife [and human beings] and eskers together is the use of eskers for travel. Movement within the typically wet barren-lands is easiest on these thoroughfares and they serve as vantage points for viewing potential predators and prey....*[87]

Eskers are diverse eco-systems.

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[87] BHP. *NWT Diamonds Project, Environmental Impact Statement (additional information response).* Pg 7.17, December 1995.

Not only are all eskers not the same, even one esker may contain a variety of habitats. The same esker can have a variety of granular materials and a variety of plant communities along its length. It may vary in structural attributes such as height, width, aspect and slope. The longer the esker, the greater the variation. These differences translate into different kinds of habitats for wildlife. Thus, some sections may be more important to wildlife, especially for denning or nesting, than other sections of the same esker.[88]

Eskers are also seen by industry as a source of construction material to build roads, airstrips, pads for buildings, and other construction uses.

At this time, there exists little baseline data on eskers in the West Kitikmeot. Almost everything we know about them, including their location, has come from the knowledge of the people. To try to fill this gap, a proposal to study esker management has been approved by the West Kitikmeot/Slave Study. The project's goal is to "provide timely baseline information on eskers in the Slave Geological Province in a format which will benefit all."[89] The objectives of the study are to provide maps identifying eskers in the Slave Geological Province; identify any eskers which might be used for gravel; and identify those eskers that are important to Aboriginal communities. This information will be used to make a preliminary assessment of the relationship between land use activities and conflicts on eskers. The project will use "scientific" and "traditional" information gathering techniques.

Until this work is done, the use and role of eskers will remain an outstanding land use planning issue. All we can say at this point is that they have multiple uses and that more information needs to be gathered.

5.1.5.3 Actions

1. **More general research should be carried out on the importance of eskers in the environment. This research should be carried out by DIAND and other appropriate agencies, partly under the auspices of the West Kitikmeot/Slave Study.**

2. **After sufficient information is available NPC, in consultation with DIAND and KIA, should determine whether a special management regime should be established for eskers in the West Kitikmeot.**

3. **Developers in the West Kitikmeot should carry out their own research on the effects their activities may have on particular eskers.**

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[88] BHP. **NWT Diamonds Project**, p. 7.17

[89] "Esker Management Project. A Proposal to the West Kitikmeot Slave Study Office", January 1996, p.1.

5.2 Mineral Development

Goals and Objectives

- ***To encourage sustainable mining activity in the West Kitikmeot.***
- ***To ensure that residents of the West Kitikmeot benefit from any mining activity in their region, particularly in terms of employment.***

5.2.1 Issues

The West Kitikmeot region has a high potential for mineral development. Much of the region that lies on the Arctic mainland south of Coronation Gulf is in the Slave Geological Province, an area now undergoing extensive mineral exploration. This activity is having a significant effect on the local economy.[90]

While the most extensive search for minerals in the West Kitikmeot has taken place only in the last few decades, the history of mineral exploration in the region goes back more than two centuries. In the early 1770s, Samuel Hearne journeyed down the Coppermine River seeking the source of native copper used by Inuit. This early attempt at mineral exploration in the West Kitikmeot ended tragically when Hearne's Chipewayan guides massacred a sleeping encampment of Inuit at a site the Englishman dubbed Bloody Falls, about 15 kilometres south of the modern community of Kugluktuk.

For a century and a half after that, mineral exploration in the region was practically non-existent. However, over the last 40 years the West Kitikmeot has seen considerable exploration activity and is the home to Lupin Mine, the only producing mine in the region today.[91] Lupin began gold production in 1982. It was designed to be built, supplied and resupplied from the air, however the bulk of the freight it receives now comes over a winter road from Yellowknife, which is open from January to April every year. The Lupin Mine is an important source of income for the people of Kugluktuk, from which some of its workforce is drawn.

Since the late 1980s the pace of exploration activity has increased in the West Kitikmeot, especially in the area around Bathurst Inlet. BHP is carrying out bulk sampling operations at its Boston property east of Omingmaktok. As well, the company is expecting to begin a bulk sample at Doris Lake, north of the Boston property, in 1997.

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[90] See NWT Chamber of Commerce, **Overview: The Slave Province, Northwest Territories: Canada's Newest Mining Province?** 1994.

[91] From 1973-75, Hope Bay Mines Ltd. Worked a gold deposit at Hope Bay, at Elu Inlet on the western edge of Queen Maud Gulf, 150 km southwest of Cambridge Bay. The Hope Bay Mine operated only during the summer but in its short life 3.4 million grams of silver was shipped by air from the property. The mine is now abandoned and is included as Site 61in the West Kitikmeot Clean-up Database.

After that the company will be in a position to decide whether or not these deposits are feasible to mine. In the fall of 1995, BHP sold another of its gold properties, Ulu, to Echo Bay Mines. That company moved quickly to request land use permits to build a winter road north from the Lupin Mine to the site of the deposit. The company used the road to bring in heavy equipment needed to conduct a bulk sample. (Map 13)

In the past few years, Inmet (formerly Metall Corp.) has undertaken a feasibility study of developing its Izok Lake deposit of zinc, copper, lead and silver, 265 kilometres south of Kugluktuk. The study concluded that a mine would not be economically feasible unless very expensive infrastructure was subsidized from some other source. Given there is little chance that this will happen, it seems unlikely that a mine will be developed at Izok Lake in the near future.

However, the search for base metals continued around Izok during the summer of 1995 as well as at Run Lake near the Arctic coast, on Victoria Island and in the area between Kugluktuk and the former DEW Line station at Cape Young. Gold exploration continued in the area east of Bathurst Inlet, around the Lupin Mine and at Goose Lake. Diamond exploration throughout the West Kitikmeot has identified at least one potential site at the north end of Contwoyto Lake.[92]

All of this potential development introduces a number of planning issues related to the effects of mining on renewable resources such as caribou and other wildlife, as well as general impacts on the environment. There has been considerable discussion of the effect of transportation corridors, such as those proposed for Izok Lake and the BHP sites west of Bathurst Inlet. Transportation corridors on land also raise the issue of increased access by outside hunters to wildlife.[93]

Proponents of various projects have also raised the possibility of building port facilities on the north coast, which has further implications for marine life and the environment.

As well, any new mine in the region will have a major effect on the social and economic health of communities. Other issues are specific to the siting of a potential mines, including the location of buildings, tailings ponds, dumps, airstrips and other facilities.

A final issue is what happens to abandoned mining properties. People in the planning region have said they want to see complete and environmentally acceptable abandonment plans for all exploration sites, and any operating mines which might be developed.

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[92] The main exploration sites are identified in Figure 12. Appendix 3 provides more detail about each site.
[93] Both of these issues are discussed below.

5.2.2 Analysis

Throughout discussions with people in the West Kitikmeot, it became clear that there are two main concerns about mineral development: its effect on the environment and its effect on the local economy. Residents want both to be positive. On the environmental side, they want to see responsible, sustainable development which will not adversely effect wildlife or the long-term health of the environment. As discussed earlier, they are particularly concerned about the long-term health of the caribou herds which migrate and calve in the region. The other focus of popular concern over mineral development is that it benefit the local economy. People want jobs and training, and they want companies operating in their part of Nunavut to purchase local goods and services as much as possible.

Dozens of local residents are already employed by the mining industry, primarily at the Lupin Mine and BHP properties near Omingmaktok. Other businesses in the service sector benefit from mining activity as well. For these reasons, this report supports continued mineral exploration and the growth of a healthy, environmentally responsible mining industry in the West Kitikmeot.

Perhaps the greatest long-term impact of the industry on the regional economy can be seen in Kugluktuk where about 30 people are employed by Lupin Mine. Before the mine opened in 1981, its owners, Echo Bay Mines Ltd. (EBM) signed a socio-economic agreement-in-principle with the Government of the Northwest Territories. This agreement was to provide employment and training for Aboriginal people. Since then, the number of Inuit working at the mine has continued to grow from about 7% to 13% of the present workforce. In 1992, between 30 and 36 workers came from Kugluktuk and another eight from Cambridge Bay.[94]

Echo Bay's success in recruiting, training and retaining Aboriginal workers has set something of a benchmark for the region. Any company planning to work in the West Kitikmeot will need to consider hiring and training local workers. Given the size of the local labour force, it will not take long to develop a mobile pool of skilled potential employees. Such a labour force would be a great advantage to other companies in the region. By eliminating the need to import all its skilled workers, a company could lower its operating costs significantly.

Other lessons can be taken from Echo Bay's experience at Lupin. For example, according to one recent analysis, the company hired managers with considerable northern experience who had some understanding of Aboriginal lifestyles. As well, many people

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[94] Jon Pierce and Robert Hornal. 1994. **Aboriginal People and Mining in Nunavut, Nunavik and Northern Labrador.** Unpublished study prepared for the Royal Commission on Aboriginal Peoples, p. 30.

at Kugluktuk, the community closest to Lupin, worked in the oil and gas industry in the 1970s and early 1980s, and thus had skills which could be used at the mine.

> *EBM followed the example of the oil companies and hired Inuit employment coordinators in both communities. The company also initiated direct discussions with hamlet councils, hunters and trappers associations and Inuit regional organizations which led to increased mutual understanding and fostered a spirit of cooperation.*[95]

Another factor in the retention of workers at Lupin is a shorter (14-day versus 28-day) rotation schedule which contributed to the well-being of Inuit employees and allows them to hunt regularly. As well, the economic benefits for workers, their families, and the community are substantial – about $1 million per year is injected into the local economy through employment at the mine.[96]

The large increase in population in Inuit communities, combined with the downsizing now taking place at all levels of government, emphasizes the need for a continuing, stable source of wage employment. While the vagaries of international metals markets tend to make the mining industry volatile, there are few other sources of income on the horizon. For example, the regional tourism industry can only support a small number of operators.

Even at the exploration stage, mining provides considerable benefits to the local economy. In winter 1996 BHP had about 70 people at its Windy Lake camp, 17% of whom came from Omingmaktok, Cambridge Bay and Kugluktuk[97] While the benefits of this employment are diffused throughout the region, they are still considerable. And these numbers don't include other Inuit employed with companies servicing the BHP sites.

The need for jobs and general support for mineral exploration does not obviate the fact that there are likely to be conflicts between companies and the people who live in the region. However, there has been a great deal of willingness shown by companies operating in the West Kitikmeot to try to avoid problems before they develop. This attitude is seen in the participation of industry representatives in workshops which have helped direct the work in this report, as well as the consultation industry has done on its own in the communities. As employment increases at exploration camps and operating mines in the region, the transportation infrastructure for linking communities with employment opportunities in the region will need to be reviewed and integrated.

Industry has also demonstrated good will when it comes to protecting the environment. For example, BHP has listened to the concerns people have for the long-term health of

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[95] Pierce and Hornal, p. 30.
[96] Pierce and Hornal, p. 31.
[97] Eugene Flood, Senior Project Biologist, BHP. Statement at a community meeting in Omingmaktok, 25 April 1996.

the Bathurst Caribou Herd and says it is complying with caribou protection measures appended to the 1995 land use permit it received from the Kitikmeot Inuit Association. However, since KIA neither has the funds nor expertise to monitor, compliance is strictly voluntary. Nevertheless, given the current state of government finances, it is likely that any similar protection measures will have to be carried out voluntarily in the future.

This report recommends that industry, and all other land users, voluntarily comply with certain recommendations in this plan and that these be adopted by industry in the form of a "Code of Conduct." A suggested code, based on recommendations in this report, is attached as Appendix 3.

Abandonment of exploration camps and, potentially, mines remains a key issue for land use planning. This report concludes that there is a consensus with all parties that proposals for mining development should include plans for the eventual closure and restoration of the site.

Finally, although the mapping work done by the transition team indicates there are few carving stone sites in the West Kitikmeot, these sites are important to the artisans who use them. Carvers in the communities would benefit from the discovery of new deposits and exploration and mining companies are encouraged to work with local people to identify these sites.

5.3.3 Actions

1. **Mining exploration companies and mine operators should continue to minimize the negative effects of their activities on the environment.**

2. **Mining companies should hire locally and purchase local goods and services when possible. Companies should also use local labour in order to reduce their operating costs and to encourage a higher labour force retention rate.**

3. **New mines should be developed as fly-in fly-out operations. New communities should not be established at mine sites. The mining industry, in consultation with the Kitikmeot Inuit Association, should study options for improving transportation linkages between communities and exploration/mining employment opportunities in the region.**

4. **All proposed mining developments must include plans, complete with financial guarantees, for the eventual abandonment and restoration of the sites. All hazardous wastes must be removed.**

5. **The mining industry is encouraged to assist in identifying local carving stone deposits.**

6. **Special hunting restrictions at mine sites and along transportation routes should be strictly enforced by mine operators and land managers to prevent over harvesting of wildlife.**

5.3 Transportation

Goals and Objectives

- ***To minimize the impacts of transportation corridors on the environment, particularly wildlife and people.***
- ***To provide economical transportation and services for the industry and people of West Kitikmeot.***

5.3.1 Surface Transportation

5.3.1.1 Issues

The issue of transportation corridors is taken up in the land claims agreement. Section 11.2.3 states that the development of "planning policies, priorities and objectives" take into account, among other things, "transportation and communications services...." As well, Section 11.3.1 requires that a land use plan take into account factors such as "transportation and communications services and corridors...." For that reason, the West Kitikmeot Resource Management Planning Working Group concluded that "the proposed location or locations of one or more transportation corridors should be an important consideration in the preparation of a land use plan for West Kitikmeot."[98]

While the development climate for the region has changed since the **Revised Report on Resource Management Planning in West Kitikmeot** was written in 1994, the problem of where to put transportation corridors, and how they should be developed, remains current. At the time the report was being drafted attention was focused on a potential corridor to link the Lupin Mine with the proposed Izok Lake development, and from there north to a port on the coast near Kugluktuk. While a mine at Izok Lake is not likely to be developed in the near future, the issue of where to build roads and transportation corridors has been discussed with respect to the BHP sites west of Bathurst Inlet, as well as the Ulu property (the latter received land use permits form the Kitikmeot Inuit Association and DIAND to construct a winter road to bring in supplies for Lupin during the winter of 1996).

Road construction has been seen as crucial to the development of mineral resources in the West Kitikmeot. Some of these road proposals come with plans to construct ports to ship in needed mining equipment and, in some cases, to ship out ore. There have been a number of proposals for transportation routes over the last few years.

[98] **Revised Report on Resource Management Planning in West Kitikmeot**, p. 22.

While the siting of these potential routes has changed with the fortunes of the mining industry, the need to develop guidelines for a transportation corridor has not. Issues related to such development include effects on the environment and wildlife, either through construction or, more significantly, because roads would open up previously isolated areas for hunting and other uses. As well, the construction of roads and, potentially, port facilities will have an impact on the economic and social well-being of people in the region.

5.3.1.2 Analysis

A definition has been developed for a transportation/communication corridor. A corridor is the general routing for an area containing a road (winter or permanent), a pipeline, transmission line or any combination of the two within Nunavut but outside community boundaries. The term corridor is used since the routing is general, not specific.

The objective of the identification of transportation corridors is to confine environmental and social disturbances resulting from land transportation initiatives to a narrow zone. This will limit, as far as possible, the geographic area involved in these disturbances and leave as much as possible of the West Kitikmeot undisturbed.

However, this objective must be qualified. It is recognized that restricting roads, pipelines, transmission lines, etc. to a narrow "corridor" could lead to more intense land use and the possibility of unacceptable environmental and social disruption. Routing roads close to other transportation/communication systems (and the probability of the subsequent development of such systems adjacent to roads) may add to problems of environmental management. Even minor disturbances arising from adjacent development activities may reinforce one another to produce unacceptable cumulative effects. Local shortages of gravel or other granular materials and/or impacts on eskers may result from close spacing of construction projects. In addition, the differing terrain requirements of various transportation alternatives may prevent adjacent routings under some circumstances. Thus, caution will be required in defining specific routes or "corridor" boundaries.

A number of transportation options have been suggested over the last few years. These include:

- In 1990, the Government of the Northwest Territories proposed building an all-weather road from Yellowknife to the Arctic coast near Bathurst Inlet or, alternately, to Kugluktuk.[99]

[99] **Revised Report on Resource Management Planning in West Kitikmeot**, p. 18. For more detail see GNWT, **NWT Transportation Strategy**, 1990.

- The following year, the NWT Chamber of Mines suggested a network of winter roads, capable of being upgraded to all-weather roads, that would connect a number of mineral deposits.[100]

- In 1993, the GNWT proposed a transportation corridor (and eventually an all-weather road) that would link Yellowknife with the Lupin Mine, Lupin with Izok Lake, and from there to a port site on the Arctic coast near Kugluktuk. The Chamber of Mines then suggested an all-weather road along the route suggested by the GNWT.[101]

- Inmet also developed plans for a winter road linking its proposed Izok Lake mine to Lupin and the Arctic coast at Maligut, 22 km east of Kugluktuk. This proposal is now on hold.

- Echo Bay Mines built a winter road to connect its Ulu property with Lupin Mine in order to bring in heavy equipment and other supplies in 1996.

- BHP has preliminary plans for a winter road to connect its Boston and Doris properties, should they be developed, with the Arctic coast for construction and resupply purposes.

One important implication of a transportation corridor is the effect it could have on wildlife. There is conflicting evidence on the effect such corridors have on caribou. In the late 1950s, a transportation corridor was built through the range of a herd of wild reindeer in Norway. The corridor comprised a railway, road and power lines. The reindeer crossed the corridor in search of better grazing and there was no indication that the corridor adversely affected the herd.[102]

On the other hand, it has also been suggested that the Alaska Pipeline Corridor impedes the northward progress of migrating Porcupine caribou. However, another study indicates that males use the pipeline to seek relief from the sun and insects. Overall, it appears that bulls are better able to tolerate the road and pipeline, and with it the noise of human activities, than females.[103] As well, there is evidence that wolves find roads good places to hunt and use the road berm as a cover for stalking. Studies indicate that the road might disrupt free movement of cow-calf groups, cause herd fragmentation, reduce the carrying capacity of the range and potentially effect productivity.[104]

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[100] NWT Chamber of Mines, "Proposal: Transportation and Mining Development for the West Kitikmeot Region, 1991.
[101] GNWT, **Transportation Agenda**, 1993. NWT Chamber of Mines 1993.
[102] R.D. Jakimchuk. "Disturbance to Barren-Ground Caribou: A Review of the Effects and Implications of Human Developments and Activities." Prepared for Polar Gas Project, 1980, p. 31.
[103] Jakimchuk, p. 36.
[104] Jakimchuk, p. 39.

Any corridor proposal for the West Kitikmeot will have to include a careful study of the potential effects it could have on caribou and other wildlife. In approaching the concept of a transportation and communication "corridor", the Nunavut Planning Commission recognized the need for flexibility in the choice of routing in consideration of resource and market locations, economics, engineering and construction requirements, the severity of the Arctic climate and the sensitivity of Arctic terrain. At the same time, control of transportation and communication routes may be required to minimize environmental and social disturbance, to ensure maximum benefits to Northern residents and communities, and to maximize economic benefits for resource developments.

The selection of a transportation corridor precedes detailed planning for a transportation route. It is anticipated that a corridor would first be identified in a Land Use Plan following which transportation engineers and land use specialists would design a route within the broader corridor. This route would then be subject to the Nunavut Impact Review Board (NIRB) environmental screening and assessment process.

The process for defining a corridor is outlined in Appendices 5 and 5A. While this process has been developed for the West Kitikmeot, it is designed to be applied throughout Nunavut.

5.3.1.3 Actions

1. **The Nunavut Planning Commission should implement the concept of a transportation and/or communications "corridor" as a land use policy having general application throughout West Kitikmeot based on the process outlined in Appendix 5.**

2. **All parties wishing to develop a transportation and/or communications corridor must submit to the Nunavut Planning Commission a detailed application for the project. This application must include an assessment of alternate routes, plus the cumulative effects of the preferred route. It should provide reasonable options for other identifiable transportation and utility facilities.**

3. **The Nunavut Planning Commission and the Nunavut Impact Review Board should publicly review the proposed corridor to determine whether the proposal adequately meets the guidelines set out in Appendix 5A. Once it is determined that a proposal does meet the guidelines, the Commission may request the Minister of DIAND to amend the plan to include the new transportation corridor.**

5.3.2 Marine Transportation

5.3.2.1 Issues

Marine transportation represents an important planning issue because of its potential effects on a sensitive part of the regional habitat, and the physical and economic implications it has for local people. Ship passage through consolidated ice presents a safety hazard to Inuit. Located throughout Coronation Gulf and Queen Maud Gulf are numerous over-ice snowmobile travel routes which link communities, outpost camps, and hunting areas. There are many places where over-ice travel routes and ship tracks would intersect. In order to travel safely across a ship track the water must first re-freeze. The duration would vary since the rate of re-freezing is influenced by air temperature, but each time a ship passes there could be a disruption in the routine of Inuit hunters. There are also serious concerns about potential losses of people and equipment through open ship tracks.

One issue which constantly came up during community consultations dealt with the migration of caribou in relation to the timing of ship transits. The importance of the caribou migration cannot be overstated, both in terms of sustenance for Inuit and for the survival of the caribou population. There is serious concern over the timing of voyages through Coronation Gulf relative to the migration of caribou.

Ship transits may affect the timing and pattern of ice break-up in the spring and have a direct impact on wildlife. Ice breakup in Coronation Gulf can occur anywhere from late June to late July. Prior to breakup, the ice serves as a migratory route for wildlife, as birthing lairs for the ringed seal, and as an over-ice connection between communities and hunting areas for local residents. At present there are no plans for spring shipping, so the issue is hypothetical. However, potential effects could include the disruption of caribou migrations, alterations in local climatic conditions, and the physical destruction of birthing lairs by ships. The potential cumulative effects of a number of ship transits raises additional concerns. Ships that travel through northern waters include commercial, tourist and foreign vessels.

Ship operations include travel in open water as well as ice-breaking, and along with the passage of ships comes the possibility of occasional oil spills. Oil spills could be large catastrophic events or of a small but chronic nature. Any spill, regardless of magnitude, poses a hazard for the wildlife, waterfowl and people of the region. The arctic marine environment makes oil spill clean-up very difficult. Biologically productive shoreline environments are of particular concern, since contaminants tend to accumulate in the shore zone from wave action, currents and winds. The shoreline is also the area where supplies and equipment are unloaded, thus making it a higher risk area for accidental spills.

Associated with each marine transportation issue is the issue of *communications*. This includes communications between shipping companies, ships in transit, the Coast Guard, Inuit hunters, and communities. At present there are inadequate and inconsistent communication links regarding ships traveling into the West Kitikmeot. Shipping companies involved may be flying domestic or foreign flags, and may or may not provide advance information about the timing and routes of voyages. Developing a link with hunters is important in that a ship's passage may directly affect their activities. Maintaining a good communications link is important in reducing environmental or safety hazards, and avoiding disruptions of harvesting activities.

5.3.2.2 Analysis

A study on the feasibility of shipping in Coronation Gulf by Canarctic raised a few concerns associated with the ability of caribou to cross a ship track. The study acknowledged that it is impossible to avoid caribou migration routes "...as they occur on every shipping route from Coronation Gulf, including Dolphin and Union Strait, Coronation Gulf, Prince of Wales Strait and Peel Sound."[105] The study noted that if no shipping occurred between the period of October to early June, then there would be relatively few problems regarding ship-caribou interactions. It suggested that ship tracks would re-freeze immediately between the times of late November to early June, but rough ice rubble still could present a barrier to caribou.[106]

People from the West Kitikmeot addressed the effects of shipping traffic on marine mammals at a workshop on transportation and marine issues, organized by the transition team in February 1995. Possible effects include minor disturbances such as whales avoiding ships, to collisions with vessels resulting in death. It was also noted that most of the data on this issue comes from studies in the Beaufort Sea and Lancaster Sound and that research needs to be done in the Coronation Gulf. The Department of Fisheries presented a study done in Strathcona Sound regarding seals and shipping. Seals in the water do not seem to have much of a problem with the passage of the Canadian icebreaker MV Arctic as they continued to dive while the ship passed overhead. Seal hunting can be affected after a ship passes when pieces of ice are thrown on the tops of breathing holes making it difficult for polar bears and hunters to find them.

The Environment Canada Ice Centre monitors, analyzes and predicts sea ice and iceberg conditions in Canada in order for people to make informed decisions about such things as environmental assessment, shipping routes, offshore oil development and fishing. The Coast Guard regularly uses this information to ensure the safety and environmental protection of Arctic waters. Currently underway is a Coast Guard project entitled "Arctic

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[105]Canarctic Shipping Company Ltd. 1993. **The Development of a Marine Transportation System to Service Coronation Gulf, N.W.T.** Ottawa, p. 94.
[106] Canarctic, p. 94.

Environmental Sailing Directions." This will ultimately allow captains to pick the most favorable route (i.e. one with least environmental impact) by consulting information on the relative sensitivities of different areas.

Also available is a modeling program from the Atmospheric Environment Service called 'Oil on Ice.' This program incorporates a number of factors related to a spill such as ice characteristics, air and sea surface temperatures, wind chill and direction, and available daylight to indicate where the oil is moving. In the case of an actual spill, current meteorological conditions, such as wind conditions and ocean currents, are calculated.

Of course, avoiding spills in the first place is the best course of action. All ships entering Canadian waters must comply with regulations under the *Arctic Waters Pollution Prevention Act* by first registering with the Coast Guard. Unfortunately, after vessels have registered, there are no laws which require them to report their movements to the Coast Guard. This is a concern for people especially in the case of tourist ships which carry helicopters or zodiac boats on board and bring curious visitors to sensitive wildlife areas.

A number of suggestions have been made which would see the development of a port (or ports) on the Arctic Coast. The location of any port depends on finding a suitable development site to accommodate ships of a certain size during a shipping season. As mentioned in the previous section, there may also be a land link by all-weather or winter roads to interior mines.

Docking facilities increase the potential for accidental spills on shore. Shorelines are one of most valuable and well-used resources in the Arctic and care must be taken in the loading and unloading of goods. The Coast Guard has responded to the potential for spills by ordering oil spill clean-up equipment to be located in 10 Arctic communities. In the summer of 1996, the Coast Guard announced that it would begin training people to do this work.

Communications and consultations with communities regarding marine transportation is sporadic and inconsistent. Inmet (formerly Metall Corp.) specified a method of communication to be used with communities from ship to shore to inform people when the ship would be in a certain area and what it would be doing. For example, Canarctic informs the community of Arctic Bay about timing and routes in order to minimize the effects of ship tracks on hunters. Coast Guard information is made available to the public or Inuit organizations for purposes of community consultation, and meetings are organized with interested communities, the transition team and NTI prior to the start of the shipping season. However, communities still do not receive advance information about some shipping.

Most communities want to know when ships are coming into their area, including tourist ships and supply ships. Communities need more control over the effects of tourists and cruise ships. Prior to entering an area, tour ships should notify communities of their

presence. Also, there must be a sharing and a balance of traditional Inuit knowledge with scientific knowledge to better understand the possible impacts increased shipping might have in the region.

Finally, a marine advisory group should be created for the West Kitikmeot to deal with some of the issues raised by increased ship traffic.

5.3.2.3 Actions

1. **The Nunavut Marine Council should be established pursuant to Article 15.4.1 of the NLCA as soon as possible. The council should address the need for regional Inuit shipping advisory committees and an improved communications system to reduce Inuit safety hazards. It should encourage the use of Inuit monitors on board any ship traveling through the region.**

2. **Any shipping company planning travel near a community where hunter movements might be affected should be required by the Canadian Coast Guard to consult the community CLARC regarding ship timing and routes in order to minimize the effects of ship tracks on hunters, wildlife and the environment.**

3. **Companies operating cruise ships in the region should be required by the Coast Guard to consult with communities on their proposed routes and timing, to ask permission to visit communities, and to arrange for appropriate logistics.**

4. **The Coast Guard should complete the placement of oil spill response equipment in the region, and train appropriate people in the communities in its use.**

5.4 Power and Energy

Goals and Objectives

- ***To develop and conserve energy resources to meet the needs of residents and industry in West Kitikmeot, with careful regard to environmental impact, sustainability and cost.***

5.4.1 Issues

In its 1994 report, the West Kitikmeot Resource Management Planning Working Group recommended that an "analysis of the present hydro potential of the West Kitikmeot region be included in the preparation of a regional land use plan."[107] The use of local sources of energy is important to land use planning, especially if they require the construction of facilities or the alteration of river flows.

5.4.2 Analysis

A survey of the hydro power potential of Coppermine, Taltson, and Lockhart rivers identified 11 potential hydroelectric generating sites in the Coppermine River Basin. No subsequent development took place in the region, although increasing oil prices in the 1970s focused more attention on the idea. At the time of the survey, the only potential users of hydroelectricity in the region around the river basin were the Lupin Mine and the community of Kugluktuk, but even with both users a case could not be made for economical hydro development.[108]

The economics of hydro power have not changed much in the last 25 years. In 1993, the Northwest Territories Power Corporation evaluated potential hydro developments which might provide energy to the mining industry. Some of the potential hydro developments are south of the planning region on the Snare and Lockhart rivers, while two are within West Kitikmeot on the Coppermine and Hood rivers. One site, called Rocky Defile, is on the Coppermine about 145 kilometres from the mouth and 10 kilometres upstream from the confluence with the Kendall River. Another is at Wilberforce Falls on the Hood River, about five kilometres from the mouth of the river on Bathurst Inlet.[109]

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[107] **Revised Report on Resource Management Planning in West Kitikmeot**, p. 30.
[108] Environment Canada. **An Overview Study of the Coppermine River Basin** (1988), p. 11.
[109] Northwest Territories Power Commission. **Potential Hydro Developments on Snare, Lockhart, Hood and Coppermine Rivers**. Acres International Limited, Calgary. 1993.

Hydro development at these sites could have environmental impacts of several different types, including impacts from the construction of the facility and the filling of the reservoir; impacts on the downstream ecology (habitat and wildlife) from the changes to the flow regime; and impacts related to transmission corridors.

The Northwest Territories Power Corporation also evaluated the potential for hydro development at Bloody Falls on the Coppermine River, about 15 kilometres south of Kugluktuk. The study concluded that development at the site was not economically viable.

Other studies of hydro potential have been linked to possible industrial development. The Environmental Impact Statement for Inmet's proposed Izok Lake project suggests that the mine could be supplied by 6 diesel generators. The EIS makes no mention of hydro power. Since the mine is unlikely to proceed, this is not an issue.

BHP Diamonds looked at various methods of alternative power generation for its diamond project just outside the boundary of Nunavut. The company was looking for ways to replace diesel generation at its site. It ruled out dams on the Snare River because of fluctuating water levels and concluded that it would require an extensive transmission line "with the added disturbance to the environment that would result from construction and maintenance."[110] As well, BHP concluded that hydro wouldn't eliminate the need to burn fuel oil at the mine site for heat. With a diesel generator for electricity, heat would be available as a byproduct. As well, the capital cost of a hydro grid is much higher than that of a diesel system.

Preliminary development plans for BHP's gold properties east of Bathurst Inlet indicate that diesel would continue to be used at the site.

Finally, the idea of using hydro electricity for Kugluktuk faces similar economic and practical obstacles. It would be expensive, it would not replace diesel, and there would still be the need to generate heat.

Since hydrocarbons – in the form of diesel and other fuels – are the primary source of energy in the West Kitikmeot, it is not surprising that there has been research into the viability of developing local sources of supply. A 1993 study looked at using regional reserves to fuel communities in the Mackenzie Delta, West Kitikmeot and High Arctic, as well as the mining industry. Fuel for heating and electricity represents about 75 per cent of the annual demand of the 11 communities considered in the study. As well there is a significant demand from existing and potential mining operations.[111]

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[110] BHP, **NWT Diamonds Project, Environmental Impact Statement**. Volume I, p. 3.21.

[111] North of 60 Engineering Ltd. **Viability of Using Northern Oil and Gas Reserves to Supply Energy for Mining and Community Needs**. NOGAP H53-1. Prepared for Government of the Northwest Territories, Energy, Mines and Petroleum Resources, May 1993.

The study looked at a number of options, including continuing conventional supply from refineries in Eastern Canada, Edmonton and Norman Wells; back hauling diesel from Eastern Canada or Europe in modified ore carriers; and the development of regional reserves to provide "feedstock" for a northern refinery, or "topping plant". Three northern development alternatives were examined: the Atkinson oil field, one of the smaller offshore resources in the Mackenzie Delta; seasonal production from the Amauligak field in the Beaufort Sea; and existing production from the Bent Horn field in the High Arctic.[112]

It was assumed that the "topping plant" would produce naphtha, diesel and residual crude oil. The first two products would be used in the NWT while the third would be shipped south on a seasonal basis. Product storage would also be required for the latter. Transportation alternatives included river barges and tugs, ice-reinforced, ocean-going barges, and 40,000 DWT ore-oil carriers.

The study concluded that regional hydrocarbon resources could be developed to meet the needs of the communities and the mining industry. Northern resources could compete in the market place with alternatives such as back hauling from Europe or supply from existing sources. A northern topping plant could provide heavy fuel oil for use by mines as "an inexpensive source of energy." Development of local energy supplies would provide benefits in the form of local employment and training, "regional benefits" and the opportunity to attract new business to the region.[113]

The picture is not nearly as bright for alternative energy sources. While a number of studies on alternative energy sources have been produced by the search to replace diesel as the main source of energy in the West Kitikmeot, the research so far indicates that alternative sources, principally wind power, are not viable substitutes for hydrocarbons. One reason for this is that it is difficult to convert wind energy to electricity to be fed through electrical grids in the communities or at mine sites.

A 1985 study found wind to be unreliable and better used as a supplement rather than replacement for diesel. There are long periods when there isn't enough wind to supply energy consistently. And there is a need to store surplus energy for these periods. The study concludes that wind power will work when it is proven to be more cost effective than diesel. More research is needed.[114]

Unless further research demonstrates otherwise, diesel will remain the primary source of power generation in the West Kitikmeot. While the development of hydro power in the near future does not now appear to be economically feasible, it might be useful to consider some of the impacts such a development might have. The following list is not

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[112] North of 60, p. 2.

[113] North of 60, p. 3.

[114] Science Institute of the Northwest Territories, **Investigation of the Viability of a Remote Wind/Hydroelectric Power Supply in the Northwest Territories**. Background Study No. 1. Prepared by Unies Consulting Engineers Ltd., 1985, p. 73.

conclusive: the construction of dams and power corridors; roads to dam sites, including increased access to wildlife by hunters; access to construction materials; effects on the environment, including the damming of rivers and the flooding of land, changes to aquatic regimes and impacts on other wildlife; cumulative effects when combined with other development in the region (i.e., large mining projects); impacts on traditional land use activities. At community meetings in Kugluktuk and Omingmaktok, residents have raised concerns about the negative impacts of hydro development and have expressed their objections. In short, even if hydro development was economically feasible it would still not be desirable.

5.4.3 Actions

1. **DIAND, the Northwest Territories Power Corporation and other responsible agencies should not allow hydro development on the Coppermine or Hood Rivers.**

2. **The power corporation and the territorial government should do more research on alternative energy sources, wind power, and the potential use of petroleum products from the Beaufort Sea.**

5.5 Scientific Research

Goals and Objectives

- ***To combine traditional western science with traditional Inuit knowledge in order to develop a better understanding of all land use planning related matters in the region.***

5.5.1 Issues

In the past research agendas were set by non-residents to serve non-resident needs. While residents continue to welcome researchers, and acknowledge the benefit of having better information upon which to make decisions, it has been suggested that research should be targeted to a greater extent at those areas that would be of more benefit and interest to local people.

West Kitikmeot residents think that archaeological sites and important ecological and biological sites should continue to be made subject to scientific research. However, they also want to make sure that any research done on these sites is communicated to the community in an appropriate format.

5.5.2 Analysis

Much of the scientific research being carried out in the West Kitikmeot is related to mineral exploration, especially in the area known as the Slave Geological Province. A major research effort has been launched by a number of regional Aboriginal organizations, co-management bodies (including the NPC), mining industry and the federal and territorial governments. Spurred by mineral development in general, and diamond mining in particular, the West Kitikmeot/Slave Study is cooperative project designed to build on existing knowledge about the regional ecosystem. The goal is to develop a long-term research program which will fill in many existing data gaps through a combination of Aboriginal traditional knowledge and conventional scientific investigation.

People in the region think they should be thoroughly informed of each research project within or near their community and that the results should be communicated to them. Where possible, local people also should be involved in the project. The research should only be undertaken under specified guidelines as stated on each permit.

At the beginning of 1995, the Science Institute of the Northwest Territories (SINT) was divided and the eastern portion amalgamated with Nunavut Arctic College, becoming SINT-East and, more recently, the Nunavut Research Institute (NRI). NRI has been reviewing the research licensing process to reflect the concerns of people in Nunavut about the way research is carried out. The review is an attempt to streamline the research permitting process – both for researchers applying for licenses and community and regional organizations which must review the applications. The institute also wants to ensure that the results of research get back into the communities.

A better consultation process for land use should be developed by government, Inuit organizations, the communities and the scientific community. Residents often feel they are not informed of what is happening on the land. There is a perception that the results of scientific research are not being sufficiently communicated to residents.

5.5.3 Actions

1. **The approval process for all scientific research, including research conducted by government departments and agencies, should require the involvement of local residents.**

2. **Research programs conducted in the West Kitikmeot should rely on local services and local employment where possible.**

3. **The results of any research carried out in the West Kitikmeot should be translated into Inuinnaqtun and made available to the people of the region. Reports should be translated in a format that will be understood by a non-technical person, but not simplified to the point where meaning is lost.**

4. **Academic and scientific researchers should consider the research priorities of residents in the conceptual design of their research programs.**

5. **All agencies should support the efforts of the Nunavut Research Institute (NRI) to better regulate research in Nunavut.**

5.6 Heritage Resources

Goals and Objectives

- ***To preserve the West Kitikmeot's rich Inuit and non-Inuit heritage resources.***

5.6.1 Issues

Inuit are very concerned that heritage sites be preserved. For years archaeologists from the Canadian Museum of Civilization and the Prince of Wales Northern Heritage Center have endeavored to identify archaeological sites in the region, but a large numbers remain unrecorded. Proper identification of heritage sites is viewed as the first step in affording them protection. The importance of this effort is underscored by the following section from the NCLA:

> *The archaeological record of the Nunavut Settlement Area is of spiritual, cultural, religious and educational importance to Inuit. Accordingly, the identification, protection and conservation of archaeological sites and specimens and the interpretation of the archaeological record is of primary importance to Inuit and their involvement is both desirable and necessary.*[115]

The agreement also defines an archaeological site as "a site or work within the Nunavut Settlement Area of archaeological, ethnographic or historical importance, interest or significance or a place where an archaeological specimen is found, and includes explorers' cairns...." An archaeological specimen is "an object or specimen found in an archaeological site of archaeological, ethnological or historical importance, interest or significance and includes explores' documents."[116]

5.6.2 Analysis

Identification of archaeological sites is important both for mapping Inuit heritage resources and developing land use plans. Using information from the Canadian Museum of Civilization (CMC) and from Inuit from the West Kitikmeot communities, the NPCTT has created a database and maps of the archaeological sites in the West Kitikmeot. (Map 18: Heritage Resources)

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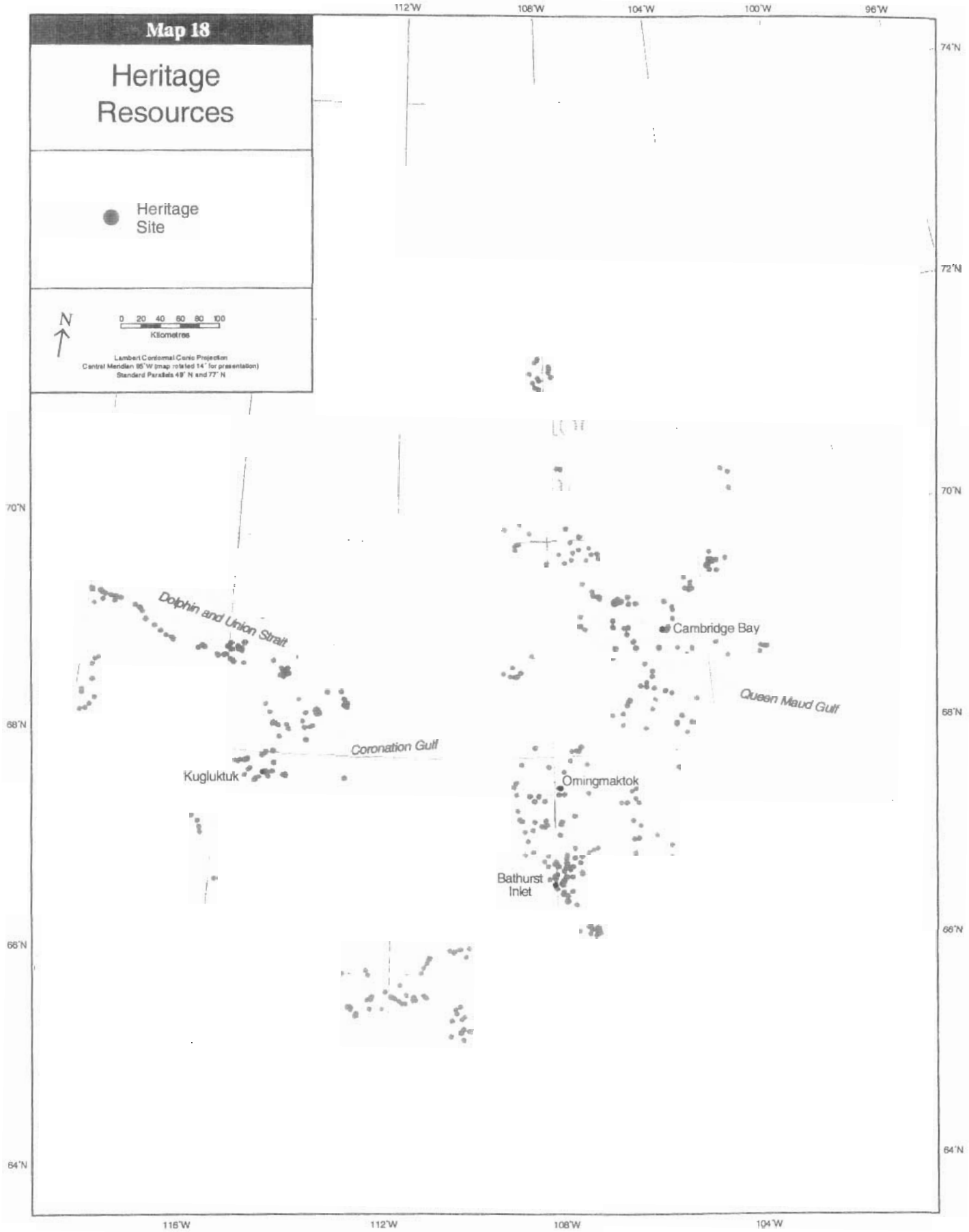
[115] **Nunavut Land Claims Agreement**, Section 33.2.2, p. 226.
[116] NLCA, Section 33.1.1., p. 225.


Map 18
Heritage Resources
Heritage Site
N
0 20 40 60 80 100
Kilometres
Lambert Conformal Conic Projection
Central Meridian 85°W (map rotated 14° for presentation)
Standard Parallels 49° N and 77° N
112°W
108°W
104°W
100°W
96°W
74°N
72°N
70°N
68°N
66°N
64°N
116°W
Dolphin and Union Strait
Cambridge Bay
Queen Maud Gulf
Coronation Gulf
Kugluktuk
Omingmaktok
Bathurst Inlet

For over a year the transition team mapped and identified nearly 700 archaeological sites in the planning region. New information is added to the database and maps as it is collected. The gathering of this information has been guided by criteria provided by the Canadian Museum of Civilization and the Prince of Wales Northern Heritage Centre which considers any relevant cultural or historic feature made before 1950 as an archaeological site. In order to analyze the sites in a consistent manner they were classified according their type and time period. The site types and time periods are listed below:

Site Types:

- Campsites
- Trading Post
- Sacred
- Village
- Unknown
- Findspot (a site where remains of tools, artifacts, etc. have been found.)
- Killsite (a site used for the purpose of kill a group of animals.)
- Lookout (a site used watch for animals.)
- Workshops (a site where there is evidence of work to create or repair tools, weapons, etc.)

Time Periods:

- Pre-Contact
- Post Contact
- Non-Inuit
- Undetermined

It should be noted that the exact chronological date for each category is difficult to establish since European influence was not consistent across groups and regions.

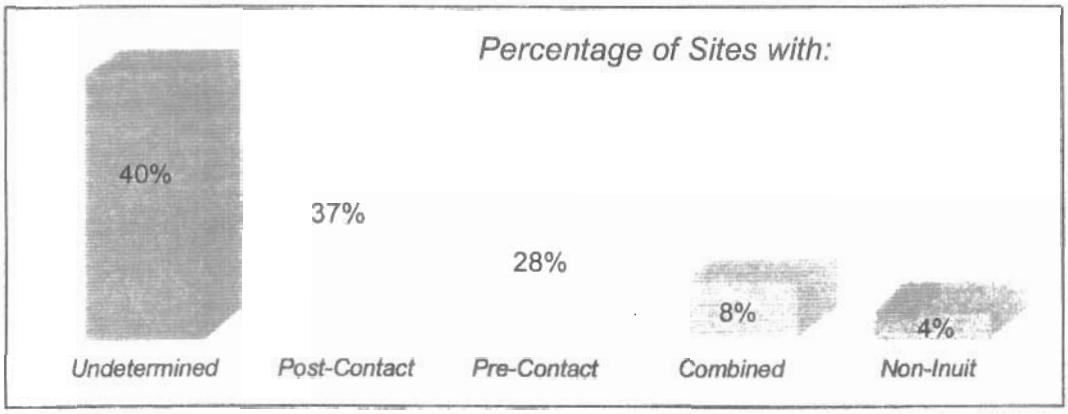
Research shows that the identified sites are located mainly around the communities of Bathurst Inlet, Cambridge Bay and Omingmaktok, as well as around Bluenose, Contwoyto, Ferguson, Rocking Horse, Surrey, Tahoe and Washburn lakes. There are also sites at Kent Peninsula, south of Hadley Bay and along the coast of the mainland in the Dolphin and Union Strait areas. However there might be other sites in other areas.

Archaeological sites with Inuksuks are concentrated around Bathurst Inlet, Washburn, Tahoe and Surrey lakes and South of Hadley Bay. Campsites are also found in most places. There does not seem to be a relationship between the site location and the time period, except for the area of Bathurst Inlet which has a heavier concentration of post-contact sites compared to the other areas.

Most of the information on archaeological sites in the West Kitikmeot (61%) came from the Canadian Museum of Civilization. The rest (39%) is from people in the communities.

According to Figure 14 (below) a high percentage of sites (40%) are from an Unknown period. Another 37% of sites contain features from the Post-Contact and 28% have features from Pre-Contact. Only 4% of the sites are Non-Inuit. Another 8% of the sites are a combination of two site types, time periods, or both. The exact chronological date for each site is difficult to establish and dating is not available for 40% of the sites. There does not seem to be a relationship between the site location and the time period, except for the area of Bathurst Inlet which has a heavier concentration of post-European contact sites compared to the other areas.

Figure 14: Percentage of Sites by Period of Origin



The most common sites were campsites (60%) followed by those of unknown origin (21%). Others included findspots (9%), burial sites (5%) and lookouts (3%).

3.3 Actions

1. **DIAND, the Kitikmeot Inuit Association and other authorizing agencies should issue land use authorizations in areas containing archeological or other heritage resources only if these sites have been investigated by a qualified archeologist and/or an Inuit elder authorized by the Inuit Heritage Trust (IHT), and an appropriate course of action has been taken to preserve the integrity of the site and the artifacts it contains.**

2. **The Inuit Heritage Trust and Prince of Wales Northern Heritage Centre (PWNHC) should work together to identify and monitor activities at or near**

heritage sites in the West Kitikmeot. The IHT should assume the lead role in this work.

3. **Land users should report the discovery of all suspected archaeological sites to the IHT and the NPC. The NPC, IHT and PWNHC should clarify their respective roles in this process.**

4. **The Inuit Heritage Trust and other agencies such as the Prince of Wales Northern Heritage Centre should adopt the following classification terminology for period dating: Pre-Contact, Post-Contact, Non-Inuit, Undetermined.**

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Appendix 1: Developing a Clean-Up Priority List

The following steps have been developed through community consultation to assign clean-up priorities to more than 190 sites mapped in the West Kitikmeot.

Step 1: Site Identification

Sites containing waste are being mapped by the West Kitikmeot Mapping Project based on information gathered from local informants. Once these sites are plotted, the maps are taken back to the communities for validation. This mapping will continue as new sites are identified.

Step 2: Determining Occupation Status

To determine clean-up priorities for the West Kitikmeot, all known sites are first divided into three parallel "streams": Hazardous, Monitoring, and Assessment.

- Hazardous Stream includes any site containing hazardous waste, as defined at the beginning of this paper. Placing a site in the hazardous stream automatically pushes it into the "urgent" range of the priority list. Its final ranking on the list depends on the relative ranking of other sites on the list in general, and within that range in particular. Hazardous waste identified at any stage of the classification process is grouped in this stream.

- Monitoring Stream includes sites which have active and valid land use permits. Activities on these sites are monitored by the permit granting agency, either government or DIO. Sites in this stream re-enter the Classification Stream should the license holder abandon them or not clean them up properly.

- Assessment Stream includes all sites which are do not contain either hazardous waste or which are not under active land use permits. In the West Kitikmeot, the majority of sites fall into this category. The following sections outline the method for classifying sites in this category.

    1. If it is occupied or active and has a valid land use permit from the DIO or DIAND, it goes into the Monitoring Stream. These are not a clean-up sites per se, although they are included in an overall clean up database.

    2. If the site is unoccupied, abandoned or "orphaned", it is included in the cleanup database and proceeds through the steps in the Assessment Stream. An

abandoned site can enter the Hazardous Stream immediately should hazardous waste be found.

3. An annual review of the database will be conducted in order to track any sites which have changed status.

Step 3: Identifying Type of Waste

The purpose of this stage is to list the kinds of waste at a site. This information is being gathered through the mapping project referred to above. Information about the content of these sites has been provided by people in the region who know the land what is on it. Waste that is suspected of being hazardous at this stage moves into the Hazardous Stream. (This process recognizes that it will not be possible to determine the presence of many types of hazardous waste without a scientific analysis. However, since the most common form of hazardous waste so far identified is fuel, it is possible to classify sites where this substance has been found without further investigation. If necessary, a follow up environmental analysis can also be done and the priority list adjusted.

(When hazardous waste is identified, government regulators should be informed. I tis important to note that once hazardous materials are removed, the site may still require clean up and would thus re-enter the classification process.)

Non-hazardous waste remains in the Assessment Stream and proceeds through the next steps.

Step 4: Information Gathering

Information will have to be gathered for all sites in both the Classification and Hazardous streams. However, the level of technical detail required for classification will not be as great for the former. The following perameters have been identified by workshop participants as important in information gathering:

- What kind of waste is at the site? (chemicals, fuel, buildings, old machinery, etc.)
- Who is responsible for the site? Is there a land use permit, etc.?
- What area is affected?
  - → what was the land used for? What will it be used for?
  - → how close is waste to water sources? (surface, drinking water, other)

→ what animal populations use the area? (caribou feeding areas or calving grounds, migration routes, etc.; bird habitat; other)

- How much waste is there at the site?
- Is the site in an area of frequent, regular or irregular Inuit land use?
- Is the area close to a community or within a hamlet boundary?
- Are there aesthetic concerns? (i.e., people are complaining about the mess)
- Are there other community concerns?
- Have there been previous clean up efforts or containment measures?
- Other information

Besides community informant reports and surveys, this information will be gathered from sources such as:

- owner files
- regulatory agency files, including those held by institutions of public government in Nunavut
- land use history
- aerial photography
- archival records
- site plans & drawings
- insurance plans
- review of industrial practices
- anecdotal reports from past employees

Step 5: Site Assessment

At this stage, an assessment is carried out that will assist the development of the clean-up priority list. Wastes in the hazardous stream will require technical analysis. The methodology has been developed by the CCME and used by DND to assess DEW Line sites for clean up. Nunavut Tunngavik Inc. has also used the same methodology to prioritize DEW Line sites. The following section outlines the method NPCTT has developed for classifying potential clean up sites.

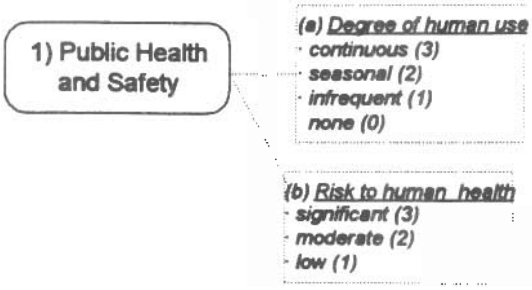
These categories have been developed based on public input and are designed to assist people in the West Kitikmeot in developing a clean up priority list. They will not provide a final assessment of *contents* of particular sites.

Each category below is subdivided and a numerical value is attached. These numbers will be totalled and the number attached to the site. Then all sites will be organized based on this numerical ranking. The numbering system will assist further discussions about assigning priority to the sites. (This assessment will also result in hazardous waste being put at the top of the priority list.)

Potential clean up sites will be assessed using the following categories:

1. Public Health and Safety

The criteria in this section have been developed through consultation with the people of the West Kitikmeot. The classification and the weighting are based upon similar prioritization systems, including those developed by DIAND and DND. However, they have been modified to reflect the needs and interests of the people of the region, and to allow easier classification.



1 (a) *Degree of human use* refers to how often a site is used. At this point the scale of **continuous, seasonal, infrequent** or **none** is estimated based upon information collected from the communities. **We would like your assistance to make sure the classifications are correct.**

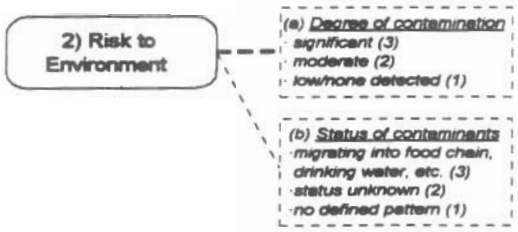
1 (b) *Risk to human health* is another section that has to be estimated at this stage. Risks to health include hazardous materials, but also the amount of debris, etc. at a site. **Are there sites on the list which you think are dangerous to human beings?**

2. Risk to Environment

(a) Degree of site contamination -- This classification is designed for non-hazardous sites but will also pick up hazardous sites. Once again, the categories are estimations.

Significant is given a rating of 3 and refers to a site that is already seriously contaminated, or where there is a significant potential for future contamination based on

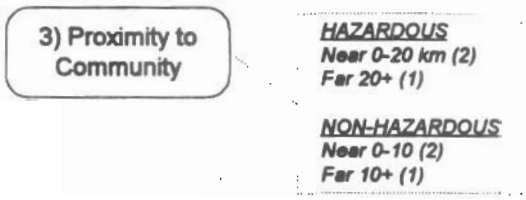
an initial assessment. The other ratings are **moderate**, when some localized contamination is present, and **low/none**.



(b) Status of contaminants refers to the condition of the various substances at the site. If a contaminant is known or strongly suspected to be migrating into the food chain, drinking water, etc. then it is given the most serious rating (3). If no one is sure about what is happening to the contaminants, the site is (2). If the contaminants are stable and not likely to enter water sources, the site is (1).

3. Proximity to Community

During our meeting on clean up sites in Cambridge Bay last May, people told the NCPTT that they were more concerned about sites closer to their communities than by those far away. This category allows a value to be given to distance from a particular community. You will notice that it also distinguishes between **hazardous** and **non-hazardous** materials.

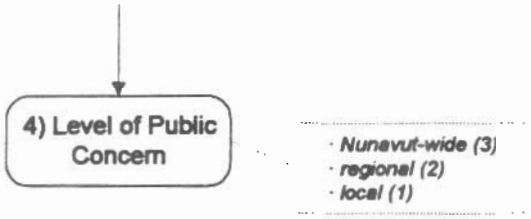


The distances used attempt to reflect people's concerns about living near hazardous materials. The same definitions – **Near** and **Far** – have been used but the distances change depending on whether or not hazardous waste is involved.

If you draw a circle around a community, say Kugluktuk, any hazardous material within 20 kilometres would be considered Near to the community and would be assigned a value of (2). For non-hazardous material, the circle would be 10 miles. While these too would be assigned a value of (2), the area would be much smaller.

4. Level of Public Concern

The final category deals with the degree of concern a site creates. In this category, any site which creates Nunavut-wide concern would be given a value of (3). Those causing concern throughout the Kitikmeot would be (2), while local issues would get a (1).



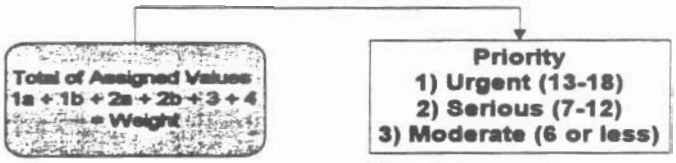
In developing this category, we were conscious of the fact that each community will tend to see sites near or within its boundaries as a major concern, while those farther away may be off less concern. However, following discussions with people in the communities, it was felt that we needed to develop a classification category that would allow us to look at all the sites from the same perspective. It is likely that people will want to talk about some individual sites and where they should be ranked. It also has to be remembered that Level of Public Concern is not the sole criterion for determining clean up priority.

Total of Assigned Values: Once all the sites have been assigned values for the four categories above, those numbers will be added up.

The numbers assigned to a site are totaled and the number arrived at will be used to rank the sites.

Since this is an initial assessment, there may be a number of sites with the equal priority. However, this total will be enough to "weigh" the sites in the Classification Stream and place them in one of three broad categories:

- *Urgent* (sites with values of 13-18)
- *Serious* (sites with values of 7-12)
- *Moderate* (sites with values of 6 or less)



Determining Priorities: Cambridge Bay

As mentioned earlier, DEW Line sites and community dumps have been included in the waste site Clean-up Priority List. The most frequent concerns about environmental contamination were directed towards these sites, and people want them cleaned up first.

Overall, 19 sites have been classified as Urgent and another 15 are Serious. More sites are likely to be added to these categories as more data is gathered. So far, the only non-DEW Line site classified as Urgent is the Cambridge Bay community dump.

People in Cambridge Bay have consistently voiced their concerns about the dump and its contents, which are leeching into the bay adjacent to the community. Based on information gathered from local residents, the dump has been classified as Urgent. Below is a breakdown of the information in the database used to classify the Cambridge Bay dump.

- Site Number: 99
- Responsibility: Environment Canada
- Last seen: 1995 (the year the information was provided)
- Season: Summer (the season the information was provided)
- Informant: Hamlet Office, Cambridge Bay
- Hazardous material present: Yes
- Degree of Human Use: Frequent (US=3)
- Risk to Human Health: High (LI=3)
- Level of Contamination: High (CN=3)
- Status of Contaminants: Migrating (ST=3)
- Proximity to Community: Near [0-20 km] (PR=2)
- Level of Public Concern: Local (CO=3)

Total: 17
Classification: URGENT

The list above shows how a site's specific priority is determined. The site number indicates the order it was entered in the database and is used to link the site to a map showing the location of the waste and other features. The responsible agency in this case is Environment Canada, but for other sites it could be a private company or an individual. In many cases there the responsible agency is unknown and the site is considered "orphaned". The list also indicates what year and season the site was last seen and by whom. These categories are more important for clean-up sites that are used infrequently.

According to the above information, the Cambridge Bay dump contains hazardous material and continues to be used frequently (US=3). It is thought that its contents constitute a high risk to human health (LI=3). The level of overall contamination is estimated to be high (CN=3) and, according to reports from local informants, the dump appears to be leeching into the bay. Thus, according to the chart in Appendix 2, these contaminants are thought to be "migrating" or moving (ST=3). Since the dump is very close to the community, it has been assigned the highest value for "proximity" (PR=2). Finally, the level of public concern is local and high (CO=3).

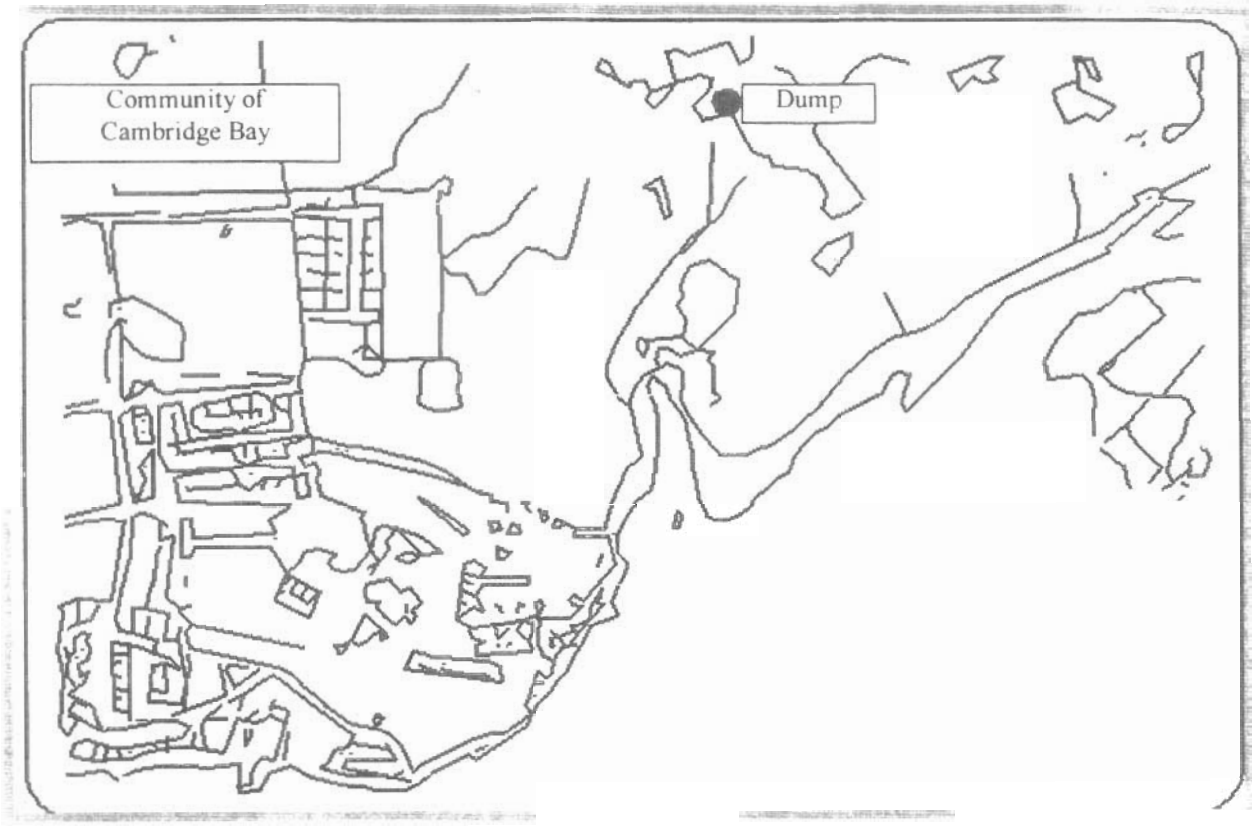
Once all of the values are assigned to the specific criteria in the list, the numbers are added to give a "weight" to the site.

$$US + LI + CN + ST + PR + CO = R$$

This weight is then used to place a site in a range (R), which in turn is used to determine the clean-up priority. The ranges are: Urgent (13-18), Serious (7-12), and Moderate (6 or less). Thus, the Cambridge Bay dump is near the top of the Urgent range.

In some cases there is not yet enough information to properly classify a site, although a temporary classification has been assigned. The sites in the database are also linked to maps, as can be seen from the following map.

Figure 4: Cambridge Bay Map from West Kitikmeot Clean-up Database



Appendix 2: Major Mineral Deposits in the West Kitikmeot

Deposit	Location	Reserves (millions of tonnes)	Grade	Source*
Arcadia	Coronation Gulf Coast-67° 42.4'N 111 23.0'W	0.78	gold 6.2 g/t	DIAND, 1993
Boston	East of Omingmaktok 67° 05'N, 106° 24'E	**		
Butterfly	25km SE of Lupin Mine 65° 36..3'N, 110° 47'E	0.13	gold 14.2 g/t	DIAND, 1993
Doris	Hope Bay 68° 05'N, 106° 37'E	**		
George Lake	Hackett River area- 65° 54' 107° 25'	3.1	gold 12 g/t	NM, 150393
Gondor	60km east of Izok Lake 65° 33'N 111° 48.0'W	7.3	zinc 4.8% lead 0.4% copper 0.2% silver 46 g/t	NM, 091291 CMH 92, p240
Hackett River	SW of Bathurst Inlet 65° 33.7'N 108° 27.5W	21	zinc 5.0% lead 0.8% copper 0.4% gold 4.4% silver 150 g/t	DIAND, 1993
High Lake D Zone	50km S of Coronation Gulf 67° 22.8'N 110° 51.3'W	4.1	zinc 4.2% copper 2.5% silver 29.6 g/t	Aber, 1993
High Lake AB ZONE	50km S of Coronation Gulf 67° 22.8'N 110° 51.3'W	3.2	copper 5.5% zinc 1.1% silver 18.2 g/t gold 2.3 g/t	Aber, 1993 DIAND, 1983 p32
Hood River #10	80km N of Izok Lake 66° 03.6' 112° 45.3'	1.2	zinc 4.4% copper 4.1% silver27 g/t gold 0.7 g/t	CMH92, p240
Izok Lake	265km S of Kugluktuk 65° 37.8'N 112° 47.8'W	16.5	zinc 11.4% copper 2.2%] lead 1.1% silver 60 g/t	CMII95, p203
Lupin	90 km south of the Arctic Circle	2.268	9.91 g/t	Annual Reports

Musk	South of Bathurst Inlet 650 19.3'N 1070 36.0'W	0.34	zinc 10.0% lead 1.4% copper 1.2% silver 343 g/t	DIAND, 1993
Pistol Lake	20km W of Bathurst Inlet 67°3'N 108° 56'	0.5	gold 13.92 g/t	GNWT
Turner Lake	185km NE of Lupin Mines 76° 13'N 108° 56'W	1.2	gold 5.35 g/t	GNWT
Wreck Lake	70 km SW of Kugluktuk 67° 24'N 116° 25'W	3.78	copper 2.96%	GNWT2
Yava	SW of Bathurst Inlet 650 36.2'N 1070 56.0'W	1 - 2	zinc 3% lead 0.5% copper 0.5% silver 102.8 g/t gold 2.0 g/t	DIAND, 1993

*Source can be found in reference
** Reserves unpublished

Aber	-Aber press release, 1993
CMH	-Canadian Mines Handbook, year and page
DIAND	-Department of Indian and Northern Development
GNWT	-Energy Mines and Petroleum Resources, personal communication
GNWT2	-Significant Mineral Deposits of the Northwest Territories, 1995
G & M	-Globe and Mail - refers to date of publication
NM	-the Northern Miner - refers to date of publication

Appendix 3: Code of Conduct for Land Users

1. The landscape of each camp and other land use sites will be restored to its original condition to the greatest degree possible. Water quality will be preserved and no substances that will impair water quality will be dumped in water bodies. When possible, and feasible, old sites will be restored to the natural state.

2. All land users shall assist communities and government(s) in identifying and protecting archaeological sites and carving stone sites.

3. As a general rule, low-level flights by private aircraft at less than 300 metres should not occur where they will disturb wildlife or people. Where possible scheduled low-level flights will only take place after consultation with the appropriate communities. All land users are responsible for reporting to the appropriate authorities any illegal or questionable low level flight.

4. All activities on the land will be conducted in such a fashion that the renewable resources of the area in question are conserved.

5. Whenever practicable, and consistent with sound procurement management, non-resident land users will follow the practice of local purchase of supplies and services.

6. Non-resident land users will establish working relationships with local communities and respect the traditional users of the land.

7. During the caribou calving, post-calving, and migrating season, land use activities should be restricted to avoid disturbing caribou, in general, and more specifically will be governed by caribou protection measures.

8. Artifacts must be left where they are found. All land users are responsible for reporting to the appropriate authorities the location of, or any removal or disturbance of artifacts.

Appendix 4: Draft Caribou Protection Measures for the West Kitikmeot Region[117]

1. (a) The Permittee shall not, without approval, conduct any activity between May 15 and July 15 within the West Kitikmeot region.

   (b) A Permittee may, upon approval by the Land Use Inspector (DIAND) or Land Manager (KIA), operate within the West Kitikmeot region beyond the May 15 deadline set out in 1(a), provided that when caribou cows are approaching the area of operation, the Permittee will implement 1 (c).

   (c) The Permittee will suspend all operations, particularly blasting, overflights by aircraft at any altitude of less than 300 metres above ground level, and the use of snowmobiles and ATV's (all-terrain vehicles) outside the immediate vicinity of the camp, and all personnel will remain quietly in camp or, upon advice from the Land Use Inspector (DIAND) or Land Manager (KIA), the Permittee will remove all personnel from the site who are not required for the maintenance and protection of the camp facilities and equipment.

   (d) The Permittee may resume activities prior to July 15 after the caribou cows have ceased to use the area for calving or post-calving.

2. (a) During migration of caribou, the Permittee shall not locate and operation so as to block or cause substantial diversion to migration.

   (b) The Permittee shall cease activities that may interfere with migration, such as airborne geophysics surveys or movement of equipment, until the migrating caribou have passed.

3. The Permittee shall not construct any camp, cache any fuel or conduct blasting within 10km, or conduct any diamond drilling operation within 5 km, of any "Designated Crossing" as outlined on the map annexed to this Land Use Permit.

4. Concentrations of caribou should be avoided by low level aircraft at all times.

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[117] **Based on the Caribou Protection Measures (Qamanirjuaq and Beverly Herds) 1988**, DIAND

Appendix 5: Transportation/Communications Corridor Alternative Route Assessment

The following information is required by applicants wishing to develop a transportation and/or communications corridor in the West Kitikmeot:

1. A description of the proposed corridor including its use, its general routing, the possible environmental and social impacts and any seasonal considerations that may be appropriate;

2. A comparison of the proposed route with alternate routes in terms of environmental and social factors as well as technical and cost considerations;

3. An assessment of the suitability of the corridor for the inclusion of other possible communication and transportation initiatives (roads, transmission lines, pipelines, etc.). This assessment should include

    - the environmental, social and terrain-engineering consequences and the cumulative impacts of the projects, and
    - an assessment of the environmental and social impact of the other projects on nearby settlements or on nearby existing and proposed transportation systems.

Appendix 5A: Transportation/Communications Corridor Guidelines

The following planning guidelines will be used in the assessment of a new transportation/communications corridor proposal:

1. The corridor width should be a function of:

   - the number and type of identified facilities within the corridor;
   - physical and biophysical conditions;
   - availability of detailed engineering data for one or more modes within the corridor;
   - safe distances between different facilities within the corridor; and
   - esthetics.

2. Corridors should:

   - minimize negative impacts on community life styles;
   - improve access to other resources having high potential for development, while still maintaining the shortest practicable distance between the primary resource areas and the transshipment location;
   - consider existing and prospective land use capability including topography, soil, permafrost and wildlife; and
   - consider the availability of granular supplies.

3. Wherever possible corridors should not negatively impact:

   - community business, residential and projected expansion areas;
   - important fish and wildlife harvesting areas;
   - key habitat for fish and wildlife species, especially areas used by endangered species;
   - areas of high scenic, historic, cultural and archaeological value.

West Kitikmeot Map Request Form

Name: R. COOPER

Institution: Echo Bay Mines - Ulu Project

Address: Post Bag #1 Nisku Alberta T0C 2G0

User Purpose: Compliment Baseline Environmental Studies for transportation corridor from Ulu to Lupin.

Request:

CD ROM including all harvest and wildlife map layers (DXF, DWG or ARC digital format) ☑ $1,500. (Nunavut residents pay only delivery charges.)

Paper Copies Base map $25, plus $5 for each additional layer. (If you are a Nunavut resident a nominal fee will be charged. Please contact NPC.)

Harvesting Layers : All

Animal_____	Season_____	
Animal_____	Season_____	
Animal_____	Season_____	
Animal_____	Season_____	
Animal_____	Season_____	

Wildlife Layers : All

Animal_____	Season_____	Calving/Denning/Nesting___
Animal_____	Season_____	Calving/Denning/Nesting___
Animal_____	Season_____	Calving/Denning/Nesting___
Animal_____	Season_____	Calving/Denning/Nesting___
Animal_____	Season_____	Calving/Denning/Nesting___

Clean-up Sites Layers :

Cambridge Bay ☐ Kugluktuk ☐ West Kitikmeot ☑

Clean-up Sites Posters:

Cambridge Bay (1 poster) ☐ Kugluktuk (1 poster) ☐ West Kitikmeot (5 posters) ☑

Total of copies: One (=5 Posters).

Cost 1631.75

Payment by: Credit Card ☐ Money Order ☐ Cash ☐

1500
25
1525
106.75 65%
1631.75

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