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# Environmental Effects Monitoring (EEM): Cycle 1 Interpretative Report

## Meadowbank Division, Nunavut

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**FINAL**

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## Meadowbank Division, Nunavut

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Key personnel conducting this project were as follows:

- Gary Mann (Azimuth) – Gary was responsible for overall management of this project. He also provided oversight and logistical support for the field crew, collaborated on statistical approach development, conducted the statistical analyses, and authored the report.
- Maggie McConnell (Azimuth) – Maggie teamed with Morgan to collect water and sediment quality samples as well as benthic invertebrates. Maggie also coordinated and collaborated in data collation, analysis, interpretation and reporting.
- Morgan Finley (Azimuth) – Morgan teamed with Maggie to collect a number of the field parameters and was responsible for on-site logistics for the 2011 field monitoring program.
- Sue Hertam, Mike Johnson, Laura Henderson, Claire Hrenchuk (North/South Consultants Inc.) – this group of individuals was responsible for on-site logistics with regards to fish sampling. They also collected all of the fish for this study, processed them in the field laboratory, and entered all of the relevant fish data.
- Randy Baker (Azimuth) – Randy provided oversight and logistical support for the field crew, and reviewed the report (except for the section on benthic invertebrates).
- Ryan Hill (Azimuth) – Ryan reviewed the report (particularly the section on benthic invertebrates).
- Brian Pyper (Azimuth Associate) – Brian provided guidance with statistical part of the data assessment.

## PROFESSIONAL LIABILITY STATEMENT

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## ACRONYMS

**AEMP** – Aquatic Effects Monitoring Program

**AIC** – Akaike's Information Criterion

**ANOVA** – Analysis of Variance

**AWPAR** – All Weather Private Access Road

**BACI** – Before/After Control/Impact

**CES** – Critical effect size

**CREMP** – Core Receiving Environment Monitoring Program

**DFO** – Department of Fisheries and Oceans

**DQO** – Data Quality Objective

**EAS** – Effects Assessment Strategy

**ECDF** – Empirical Cumulative Distribution Function

**EEM** – Environmental Effects Monitoring

**EIA** – Environmental Impact Assessment

**GPS** – Global Positioning System

**HEPH** – Heavy Extractable Petroleum Hydrocarbons

**INUG** – Inuggugayualik Lake

**ISQG** – Interim Sediment Quality Guidelines

**LEPH** – Light Extractable Petroleum Hydrocarbons

**LSM** – Least Squared Means

**MDL** – Method detection limit

**MMER** – Metal Mining Effluent Regulations

**NDEP** – No deposit (referring to effluent)

**NMR** – No measurement required

**PAHs** – Polycyclic Aromatic Hydrocarbons

**PDL** – Pipedream Lake

**PEL** – Probable Effect Level

**QA/QC** – Quality Assurance / Quality Control

**RCA** – Reference Condition Approach

**RPD** – Relative Percent Difference

**SD** – Standard Deviation

**SE** – Standard Error

**SOP** – Standard Operating Procedure

**SQG** – Sediment Quality Guidelines

**SP** – Second Portage Lake

**TAP** – Technical Advisory Panel

**TE** – Tehek Lake

**TEFF** – Tehek Lake Farfield

**TGD** – Technical Guidance Document

**TPE, TPN, TPS** – Third Portage Lake – East, North, and South Basins

**UTM** – Universal Transverse Mercator

**WAL** – Wally Lake

# EXECUTIVE SUMMARY

This report, *Environmental Effects Monitoring (EEM) Cycle 1 Interpretative Report for the Meadowbank Mine*, is submitted to meet AEM's obligations under MMER.

### *Study Design Overview*

The August 2011 EEM biological monitoring study targeted the Third Portage Lake North (TPN) exposure area and two reference areas (Innugugayualik Lake [INUG] and Pipedream Lake [PDL]). This type of study design is classified as a multiple control-impact (MC-I) design.

### *Effluent Water Quality and Receiving Environment Monitoring*

The "effluent" discharged at the Meadowbank Mine consists of natural lake water from isolated impoundments that are dewatered (during which exposed lake sediments become re-suspended and increase TSS) as part of mine development. There were a few minor exceedences of effluent discharge limits and some presence of sublethal toxic effects. However, EEM receiving environment monitoring generally found little trace of effluent (e.g., TSS concentrations were generally non-detectable or very low). These results were corroborated by AEM's core receiving environment monitoring program (CREMP), which targets water and sediment quality (as well as benthic invertebrates).

### *Fish*

Due to insufficient numbers of round whitefish (and Arctic char), the originally-designed fish survey was modified in consultation with Environment Canada to focus only on a sublethal study of lake trout. No significant differences were identified for any endpoint and confidence in the results for each endpoint was high.

Recommendations for consideration in the Cycle 2 Study Design include:

- Focus on non-lethal sampling of lake trout only
- Use power analysis results to reduce lake trout sample size to minimize incidental lake trout mortality

### *Benthic Invertebrate Community*

Differences were observed between reference and exposure areas for both benthic invertebrate community endpoints and for supporting environmental variables (i.e., physical variables that often influence benthic community structure) in the EEM data set. However, supplemental analyses were conducted using the CREMP data set (collected since 2006 and with broader spatial coverage) to verify the initial results and to evaluate causality (i.e., due to natural sediment characteristics or to effluent exposure). A weight-of-evidence framework was used to integrate the results of all analyses (i.e., EEM and CREMP). The conclusion for all benthic invertebrate community endpoints was that there were no effluent-related effects at TPN.

Recommendations for consideration in the Cycle 2 Study Design include:

- Change the number of subsample grabs per station from three to two for benthic invertebrates to be consistent with the long-term CREMP data set.

# 1. INTRODUCTION

## 1.1. Background

The Meadowbank Mine (65°N, 96°W), owned by Agnico-Eagle Mines Ltd. (AEM), is one of Canada's most northerly operating mines, located approximately 75-km north of the Hamlet of Baker Lake, Kivalliq District, Nunavut. Mine construction began in 2008 under Nunavut Water Board *A License* 2AM-Mead0815 (hereafter referred to as the "NWB A License") and Fisheries and Oceans Canada *Authorization for Works or Undertaking Affecting Fish Habitat* NU-03-0191 (hereafter referred to as the "Authorization"). Meadowbank is an open pit mine and produced its first gold bar in February 2010. Mine status formally changed to "operational" March 1, 2010.

Several lakes are located directly within and adjacent to the boundaries of the target mineral zones on the Meadowbank property. Baseline studies describing the physical, chemical, and biological characteristics of the aquatic environment in the vicinity of the project area were initiated in 1995 and continued through 2007 (BAER 2005; Azimuth 2008a,b). In addition, a comprehensive environmental impact assessment of the aquatic ecosystem (Azimuth, 2005a) and an aquatic effects management program (AEMP, 2005) were prepared to meet regulatory requirements pertaining to mine construction, operation, and closure. A range of monitoring activities have continued through the mine's construction phase and into the operational phase.

The AEMP (2005a) specifically recognized future monitoring obligations under the *Metal Mining Effluent Regulations* (MMER), which were detailed further in a companion management plan (Azimuth, 2005b). Consequently, in addition to data collected expressly to meet the requirements of MMER, there is a substantial amount of complementary data relevant to addressing MMER objectives.

Mine construction activities to date have included the isolation of portions of two lakes using dikes. Dewatering of these impoundments and future pits into adjacent lakes started in 2009. Environment Canada (EC) notified AEM that the Meadowbank Mine is subject to MMER as of December 31, 2009.

It is important to note that, at present, effluent discharge from the Meadowbank Mine consists of natural lake water being dewatered from the isolated impoundments into the north basin of Third Portage Lake. As dewatering progressed, wave action, rain events and other disturbances of the now exposed lake sediments have increased total suspended solids content of the water. Mining activities have formally been underway since March 2010; however, "mining-related" water has not been discharged into the receiving environment (e.g., water used in the mining process and contact water, which is sent to the tailings storage facility and used as reclaim water). While discharge of mining-related water will likely occur in the future (i.e., it is a component of mine development plans), this report addresses present discharges only (i.e., effluent from the dewatering process).

The focus of this report is meeting AEM's obligation to submit an Environmental Effects Monitoring (EEM) Cycle 1 Interpretative Report for the Meadowbank Mine by July 1, 2012. This document reports on the results and interpretation of the biological monitoring study conducted in August 2011. The final study design (not including any modifications discussed in **Section 2**) was a combination of three information sources:

1) Environmental Effects Monitoring (EEM): Cycle 1 Study Design, Meadowbank Division, Nunavut. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Environment Canada, Edmonton, AB on behalf of Agnico-Eagle Mines Ltd., Baker Lake, NU. December, 2010.
2) Environmental Effects Monitoring (EEM): Cycle 1 Study Design ADDENDUM, Meadowbank Division, Nunavut. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Environment Canada, Edmonton, AB on behalf of Agnico-Eagle Mines Ltd., Baker Lake, NU. July, 2011.
3) TAP comments on the Meadowbank Gold Mine July 2011 EEM Study Design Addendum and subsequent response email from Azimuth Consulting Group. August, 2011.

The final study design (i.e., combination of all the above documents) is hereafter referred to as the Study Design and cited as Azimuth (2011).

## 1.2. Regulatory Context

The MMER were promulgated under the *Fisheries Act* in 2002 and have undergone several amendments, most notably in 2006 with the *Regulations Amending the Metal Mining Effluent Regulations* (hereafter referred to as the MMER, 2012). The MMER stipulate the conditions under which deleterious substances may be discharged to the aquatic environment by metal mines in Canada.

Environmental Effects Monitoring (EEM) is one of the three main components of MMER and consists of:

- **Part 1** – Effluent and water quality monitoring studies
- **Part 2** – Biological monitoring studies, including a site characterization, a fish survey, and a benthic invertebrate community survey.

The EEM Program is a cyclical receiving-environment monitoring program conducted to evaluate the effects of metal mining effluents on fish, fish habitat and the use of fisheries resources. Studies are carried out in cycles ranging from 2 to 6 years. This report has been prepared to meet the Cycle 1 interpretative report submission requirements of Part 2 of the EEM.

## 1.3. Objectives

The *Metal Mining Guidance Document for Aquatic Environmental Effects Monitoring* (hereafter referred to as TGD, Environment Canada, 2002) stipulates that the Cycle 1 interpretative report outline the following information:

- A description of any deviation from the study design that occurred while the biological monitoring studies were being conducted and any impact that the deviation had on the studies

- The latitude and longitude of sampling areas of sampling areas in degrees, minutes and seconds and a description of the sampling areas sufficient to identify the location of the sampling areas
- The dates and times when samples were collected
- The sample sizes
- The results of the data assessment and any supporting raw data
- The identification of any effect on the fish population, fish tissue, and the benthic invertebrate community based on the above data assessment
- A summary of the results of effluent characterization, sublethal toxicity testing and water quality monitoring reported since the day on which the mine became subject to the MMER
- The conclusions of the biological monitoring studies, taking into account the presence of other factors, the above data assessment results and QA/QC
- A description of how the results will impact the study design for subsequent biological monitoring studies
- The date when the next biological monitoring study will be conducted

The MMER (Amended to 2012) and TGD (Environment Canada, 2002; amended to 2012) cover these requirements in great detail; these information sources were relied on heavily to ensure that this Cycle 1 interpretative report meets the expectations of Environment Canada.

## 1.4. Organization

The remainder of this interpretative report is organized into the following sections:

- Study design update (**Section 2**)
- Effluent water quality and receiving environment monitoring (**Section 3**)
- Fish survey (**Section 4**)
- Benthic invertebrate community survey (**Section 5**)
- Conclusions from biological monitoring (**Section 6**)
- Subsequent biological monitoring (**Section 7**)
- References (**Section 8**)

# 2. STUDY DESIGN UPDATE

This section describes changes to the biological monitoring studies, and their consequences, relative to the Study Design document (Azimuth, 2011).

## 2.1. Clarification Regarding Reference Areas

As discussed in the Study Design (Azimuth, 2011), two lakes were selected as reference area lakes for biological monitoring, Inuggugayualik Lake (INUG) and Pipedream Lake (PDL). The south basin of Third Portage Lake (TPS) has also been used as a reference area for EEM-related receiving environment water quality monitoring since the program started in 2010. In an effort to retain continuity and provide compatible supporting water quality data, EEM-related receiving environment sampling was conducted at all three reference areas (i.e., INUG, PDL and TPS) in August 2011. Given the large distance to INUG and PDL and related safety concerns (i.e., requires helicopter access, which is not available throughout the year, or good snow/ice conditions for safe access by tundra buggy), future EEM-related receiving environment monitoring will continue to use TPS as a reference area.

## 2.2. Study Design and Data Analysis

As planned in the Study Design, both the fish and benthic invertebrate studies were conducted according to a multiple control-impact (MC-I) design. The MC-I design was selected over the more common C-I design; however, some challenges became apparent when analyzing the data from the MC-I design that are described below.

The description of an MC-I design according the technical guidance document [Chapter 8 of TGD (Environment Canada, 2012)] is as follows:

"*The MC-I design is similar to the C-I design, except that it employs additional reference areas that are located in adjacent watersheds or bays where the sampled habitat is comparable to that found within the exposure area. This type of design helps to reduce problems with confounding factors (e.g., when a single reference area differs from an exposure area with respect to several environmental variables in addition to the point source effluent). Analogous to a C-I design, a significant difference between an exposure area and the mean of the reference areas, as determined by ANOVA, would represent an effect* [Chapter 8 of TGD (Environment Canada, 2012)]."

The main challenge is related to how an effect should be fairly defined. The task is straightforward when the reference areas are very similar. As stated above in the TGD, the reference areas are pooled and are assumed to represent the complete population[1]. Similar to the

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[1] The within-pooled-reference area SD is used to derive the actual CES (critical effect size), the key source of replication is the "station", and degrees of freedom for the C-I effect in an ANOVA would be n-2 (where "n" is the number of stations across areas).

C-I design, a significant difference between an exposure area and the mean of the pooled reference areas would represent an effect.

It is not straightforward when the references areas differ from one another. Consider an example where the reference area means differ by a large magnitude, yet the exposure area is quite similar to one of the reference areas. In this case, assuming that exposure area mean should be equal to the pooled reference area mean does not appear appropriate (i.e., as it is ignoring natural variability among areas)[2]. More appropriate statistical models (see footnote) work well with many areas making up the reference "population" (where it is conceptually similar to the reference condition approach [RCA]), but have severe limitations when the number of reference areas is small. Given the very low degrees of freedom, the power to detect differences is therefore substantially reduced.

To address the challenges laid out above, we propose the following hierarchical approach (see diagram in **Figure 2.2-1**) for all data assessment endpoints:

1) CI-BASED: Initial statistical analyses will be conducted using pooled reference areas (i.e., as per EEM TGD). This approach is conservative in that it assumes that there is no among-reference area variation and it sets degrees of freedom based on "stations." The implication of this conservatism is that the Type I (i.e., false positive) error rate may be higher than the actual α of 0.1 selected for this study when the two reference areas actually differ. Where statistically significant differences between C-I are identified, those cases would also be analyzed using the second approach.
2) AREA-BASED: Secondary analyses will test for differences among individual areas. The premise here is that the exposure area must be statistically different from both reference areas in order to be classified as an effect. This approach is less conservative than the first tier in that it assumes that the exposure area mean should not be different than both reference areas individually. Given the present situation (i.e., only two reference areas), this is a reasonable assumption to identify adverse effects. The implication of this lowered conservatism is that the Type II error rate (i.e., false negative) may be higher than the actual β of 0.1 selected for this study.

The contention that Type I and Type II error rates will be "higher" in the above discussion is not due to actual differences in the α or β values used in those statistical procedures, but rather due to the differences in the questions being asked. That said, the practical hierarchical approach described above should serve to support making conclusions regarding C-I differences in this study.

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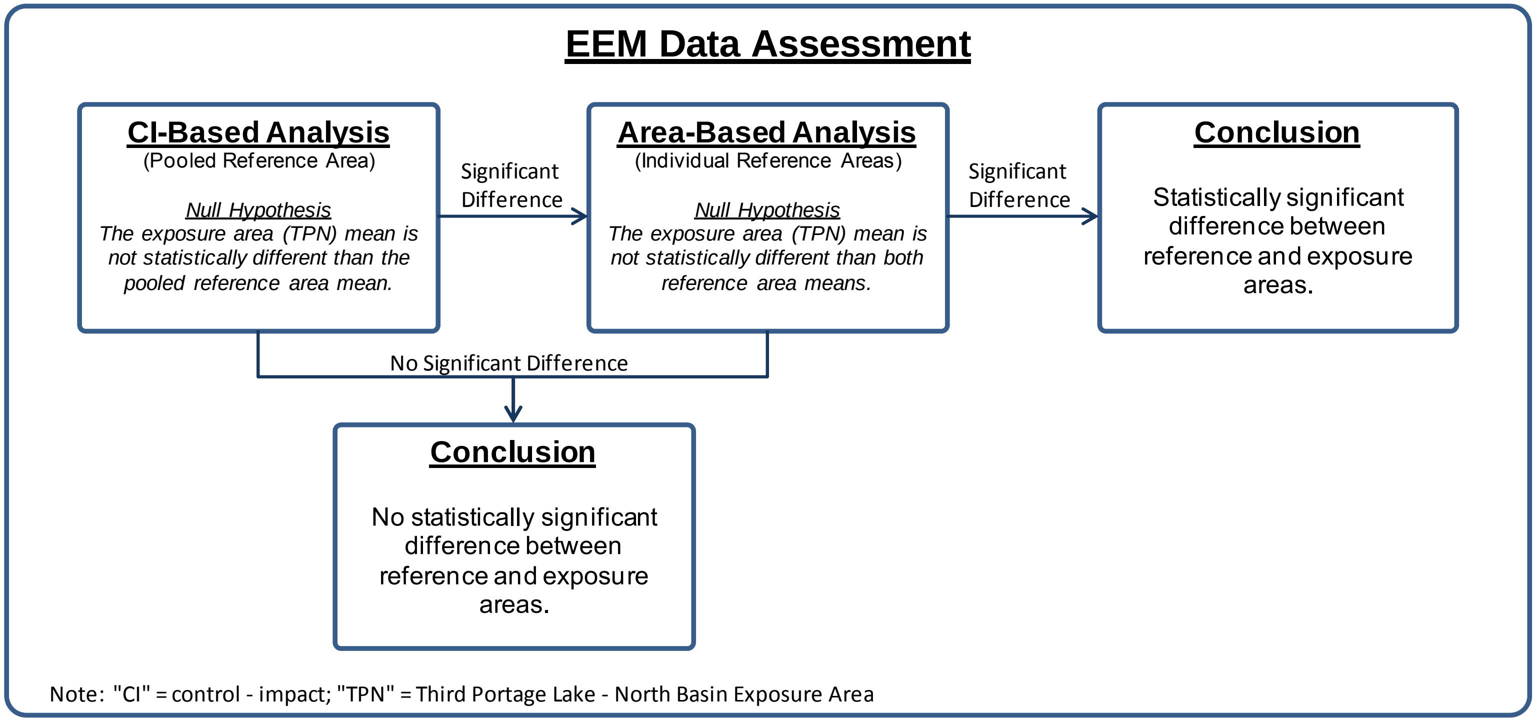
[2] When reference areas differ, natural among-area variation should be explicitly taken into consideration and the appropriate level of replication for testing a C-I effect become "area" rather than "station". Ideally, random-effects models (with "area" as a random effect) would be used to test whether an exposure area is different from the population of reference areas. The among-reference-areas SD (estimated for the random "area" effect) would then serve as the basis to determine the actual CES and the degrees of freedom for the C-I fixed effect would be A-2 (where "A" is the number of areas).

Where appropriate, and as planned, baseline data (CREMP) will be used to further explore potential C-I differences.

**Figure 2.2-1.** Schematic of data analysis for EEM data assessment.



The exposure area (TPN) mean is not statistically different than the pooled reference area mean.

The exposure area (TPN) mean is not statistically different than both reference area means.

Statistically significant difference between reference and exposure areas.

No statistically significant difference between reference and exposure areas.

Note: "CI" = control - impact; "TPN" = Third Portage Lake - North Basin Exposure Area

## 2.3. Fish Survey

As described in the Study Design (Azimuth, 2011), the fish survey was planned as a non-lethal study for lake trout (*Salvelinus namaycush*) and a lethal study for round whitefish (*Prosopium cylindraceum*) (see Study Design for rationale). Baseline data suggested that obtaining the target numbers for round whitefish would be the limiting factor of our program.

Gill netting started at the exposure area TPN on August 11 and we had no trouble catching lake trout. However, far fewer round whitefish were caught than anticipated and after several days it was apparent that we would not reach target sample numbers without fishing for several weeks. In addition, lake trout mortality rates were higher than was anticipated. After consultation with Environment Canada, efforts were then also directed to Arctic char (*Salvelinus alpinus*) and trying to avoid lake trout (e.g., by focusing more on smaller mesh sizes shown to preferentially catch round whitefish and Arctic char). These changes did not alter our catch nor help reduce lake trout mortalities, which were climbing towards the *DFO License to Fish for Scientific Purposes* (**Appendix A**) permit level.

After six days, fishing was halted at TPN on August 16 (with the hope of possibly continuing focused efforts in TPN after fishing the reference areas). Although target numbers of lake trout had been exceeded for the non-lethal study, we did not achieve target numbers for round whitefish and Arctic char. Although we processed incidental mortalities of lake trout, round whitefish and Arctic char according to lethal sampling procedures, an insufficient number of sexually mature fish were captured to make any meaningful conclusions (discussed more in **Section 4**).

Fishing started at INUG and PDL on August 16 and continued for three days with large numbers of lake trout captured with higher than desirable mortality. Again, very few sexually mature round whitefish and Arctic char were caught. Given this situation and after consultation with Environment Canada, the decision was made to halt fishing pending preliminary analyses to determine if the lake trout catch at INUG and PDL was sufficient to reach targeted statistical power (i.e., $1 - \beta = 0.9$) for the non-lethal condition endpoint. Results of that analysis confirmed adequate power to detect the CES and the fish survey was terminated.

Given the paucity of sexually mature fish of any species, conclusions regarding potential effluent-related effects to fish are limited to the non-lethal endpoints of lake trout.

## 2.4. Benthic Invertebrate Community Survey

No changes were made from the planned study design.

# 3. EFFLUENT WATER QUALITY AND RECEIVING ENVIRONMENT MONITORING

As discussed in detail in the Study Design document (Azimuth, 2011), the nature of the "effluent" discharged at the Meadowbank Mine is unlike most mines subject to MMER. Meadowbank Mine effluent consisted of lake water that was pumped from an impoundment and future pit areas (with "non-contact" site drainage water that has not contacted PAG material) into the nearshore environment of TPN. Resuspension of sediments as impoundment water level dropped resulted in elevated total suspended solids (TSS) and turbidity. To minimize water column TSS, a water treatment facility was installed in to ensure that concentrations for TSS and turbidity met permit levels. "Contact" water (i.e., from plant site, pits, or any active mine areas containing potentially acid generating [PAG] material) was segregated and stored on site for use as process make-up water as required; contact water was not discharged to any receiving environment.

In addition to EEM-related receiving environment monitoring, AEM conducts routine water quality sampling as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP data are used herein to complement the EEM data as needed. Apart from EEM and CREMP, AEM also conducts other dewatering-related sampling in accordance with License A; these are not reported herein.

## 3.1. Effluent Characterization Summary

### 3.1.1. Effluent Discharge Location

Effluent is monitored by AEM Meadowbank- Environment Department from a discharge point called DD-FD1, located at latitude N65 01 49.0 and longitude W96 05 25.0.

### 3.1.2. Effluent Monthly Loadings

MMER requires effluent quality monitoring on a weekly basis to ensure that MMER discharge limits are met. Monthly mean concentrations and associated loadings (based on total effluent volume; kg/month) are shown for 2010 and 2011 in **Table 3.1-1**. TSS exceeded the monthly limits on two occasions in 2010: in April due to a single elevated measure, and in June due to consistently elevated (~ 20 mg/L) readings throughout the month. One pH value was also below 6.0 in July 2010. All other parameters were well below monthly discharge limits for 2010 and therefore required only quarterly monitoring in 2011. TSS and pH were monitored monthly in 2011.

### 3.1.3. Effluent Quality Monitoring

Water quality samples have been collected from the effluent discharge four[3] times each year since the mine became subject to the MMER on Jan.1, 2010. During each sampling event, the following parameters were measured in the field (temperature) or the laboratory: alkalinity[4], aluminum, ammonia, cadmium, conductivity[5], hardness, iron, mercury, molybdenum, nitrate and selenium.

Results of the quarterly events at the effluent discharge point are summarized in **Table 3.1-2**. Total mercury concentrations in the dewatering effluent did not exceed the tissue analysis trigger (0.1 µg/L) in 2010, but did during the August sampling event of 2011 (total mercury: 2.93 µg/L)[6].

### 3.1.4. Effluent Toxicity Testing

Water samples for acute toxicity testing are conducted monthly with the following tests:

- 48-hr water flea (*Daphnia magna*) survival
- 96-hr rainbow trout (*Oncorhynchus mykiss*) survival.

Toxicity test results for acute lethality are presented in **Table 3.1-3**. Apart from an uncharacteristically low survival for the water flea, *Daphnia magna*, in the March 2010 sample (where there were no MMER water quality exceedances [see **Table 3.1-1**]), the dewatering effluent has not been acutely toxic.

Sublethal toxicity testing of effluent is conducted twice per year with the following tests:

- 72-hr freshwater alga (*Pseudokirchneriella subcapitata*) growth
- 7-day duckweed (*Lemna minor*) weight and growth
- 7-day water flea (*Ceriodaphnia dubia*) reproduction and survival
- 7-day fathead minnow (*Pimephales promelas*) growth and survival

Toxicity test results for sublethal endpoints are presented in **Table 3.1-4**. There was a general lack of sublethal effluent toxicity in 2010 with minor toxicity in 2011. Minor growth inhibition was observed for duckweed fronds (i.e., IC25 of 81.4% effluent) in the duckweed, *Lemna minor*, test for August 2010 without firsthand review of the test results. In 2011 however, *Lemna minor*

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[3] In 2011, the planned fourth sampling event (due December 2011) was cancelled because effluent discharge was suspended on November 15, 2011.

[4] Alkalinity and hardness were regulated but not monitored in 2010.

[5] Conductivity, temperature and selenium were added to the list of regulated parameters in the 2012 version of the MMER so were not monitored in 2010 and 2011

[6] It should be noted that the “field blank” QA sample which was collected concurrently with the August, 2011 effluent sample also had an elevated mercury concentration (2.5 µg/L), suggesting these results were due to an analytical error by the laboratory.

showed effects both for weight and growth endpoints, particularly in the August sample. Also in the August 2011 sample, *Ceriodaphnia dubia* showed reproductive effects (**Table 3.1-4**). As discussed in **Section 3.2**, however, the dewatering effluent appears to rapidly mix in the receiving environment (which is confirmed by the receiving environment water quality results discussed in **Section 3.3**), so the spatial extent of those potential sublethal effects to duckweed and water fleas in the receiving environment would be very small.

**Table 3.1-1.** Concentrations of MMER deleterious substances in effluent discharge and loadings based on total monthly effluent volume for 2010 and 2011 (2 pages; see notes at bottom of table).

| Month-Year | Total Arsenic | | Total Copper | | Total Cyanide | | Total Lead | | Total Nickel | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Conc.** (mg/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) |
| [Max.Mean]/Month | 0.50 | | 0.30 | | 1.00 | | 0.20 | | 0.50 | |
| **January-10** | 0.0005 | 0.40 | 0.0012 | 0.97 | NMR | NMR | 0.0006 | 0.46 | 0.0015 | 1.17 |
| **February-10** | 0.0020 | 1.86 | 0.0010 | 0.93 | NMR | NMR | 0.0058 | 5.52 | 0.0017 | 1.58 |
| **March-10** | 0.0009 | 0.94 | 0.0012 | 1.30 | 0.0055 | 6.08 | 0.0006 | 0.64 | 0.0014 | 1.57 |
| **April-10** | 0.0109 | 8.87 | 0.0027 | 2.20 | 0.0185 | 15.09 | 0.0010 | 0.80 | 0.0022 | 1.81 |
| **May-10** | 0.0005 | 0.39 | 0.0028 | 2.15 | 0.0130 | 10.12 | 0.0003 | 0.23 | 0.0027 | 2.10 |
| **June-10** | 0.0007 | 0.47 | 0.0031 | 2.21 | 0.0124 | 8.91 | 0.0024 | 1.72 | 0.0043 | 3.06 |
| **July-10** | 0.0014 | 0.56 | 0.0012 | 0.50 | 0.0050 | 2.06 | 0.0044 | 1.79 | 0.0042 | 1.73 |
| **August-10** | 0.0011 | 0.48 | 0.0024 | 1.02 | 0.0053 | 2.24 | 0.0055 | 2.31 | 0.0037 | 1.54 |
| **September-10** | 0.0011 | 0.23 | 0.0010 | 0.21 | 0.0050 | 1.03 | 0.0010 | 0.21 | 0.0051 | 1.06 |
| **October-10** | 0.0036 | 0.58 | 0.0019 | 0.30 | 0.0133 | 2.16 | 0.0030 | 0.48 | 0.0087 | 1.41 |
| **November-10** | 0.0029 | 0.43 | 0.0011 | 0.16 | 0.0150 | 2.21 | 0.0004 | 0.05 | 0.0090 | 1.33 |
| **December-10** | 0.0025 | 0.87 | 0.0013 | 0.46 | 0.0162 | 5.72 | 0.0003 | 0.11 | 0.0096 | 3.38 |
| **January-11** | 0.0026 | 0.63 | 0.0007 | 0.17 | 0.0290 | 7.07 | 0.0013 | 0.30 | 0.0086 | 2.10 |
| **February-11** | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **March-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **April-11** | 0.0021 | 0.87 | 0.0005 | 0.21 | 0.0680 | 28.20 | 0.0003 | 0.12 | 0.0102 | 4.23 |
| **May-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **June-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **July-11** | 0.0005 | 0.14 | 0.0005 | 0.14 | 0.0670 | 19.14 | 0.0003 | 0.09 | 0.0037 | 1.06 |
| **August-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **September-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **October-11** | 0.0207 | 6.40 | 0.0029 | 0.90 | 0.0050 | 1.55 | 0.0048 | 1.48 | 0.0098 | 3.03 |
| **November-11** | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR | NMR |
| **December-11** | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |

| Month-Year | Radium-226 | | Total suspended Solids | | Total Zinc | | pH | | Total Effluent Volume ($m^3$) |
|---|---|---|---|---|---|---|---|---|---|
| | **Conc.** (Bq/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) | **Conc.** (mg/L) | **Loading** (kg) | **Highest** | **Lowest** | |
| [Max.Mean]/Month | 0.37 | | 15.00 | | 0.50 | | 9.5 | 6.0 | |
| **January-10** | 0.004 | 2.83 | 9.0 | 7276 | 0.002 | 1.41 | 7.42 | 7.06 | 808439 |
| **February-10** | 0.005 | 5.02 | 7.0 | 6691 | 0.004 | 4.06 | 7.24 | 6.76 | 955861 |
| **March-10** | 0.004 | 4.42 | 8.5 | 9390 | 0.003 | 3.59 | 7.08 | 6.87 | 1104674 |
| **April-10** | 0.014 | 11.21 | 21 | 17330 | 0.010 | 8.36 | 7.75 | 6.80 | 815525 |
| **May-10** | 0.007 | 5.45 | 13 | 10118 | 0.005 | 3.63 | 6.98 | 6.43 | 778312 |
| **June-10** | NMR | NMR | 22 | 15812 | 0.007 | 4.74 | 6.97 | 6.36 | 718745 |
| **July-10** | 0.013 | 5.35 | 12 | 4858 | 0.002 | 0.82 | 6.94 | 5.85 | 411657 |
| **August-10** | NMR | NMR | 6.7 | 2800 | 0.011 | 4.62 | 6.53 | 6.28 | 420064 |
| **September-10** | NMR | NMR | 8.8 | 1806 | 0.003 | 0.62 | 6.68 | 6.37 | 206366 |
| **October-10** | 0.006 | 0.97 | 6.7 | 1081 | 0.012 | 1.89 | 7.00 | 6.54 | 162119 |
| **November-10** | NMR | NMR | 2.7 | 392 | 0.001 | 0.20 | 6.73 | 6.37 | 147029 |
| **December-10** | NMR | NMR | 5.8 | 2046 | 0.005 | 1.69 | 7.07 | 6.44 | 352792 |
| **January-11** | 0.071 | 17.32 | 4.0 | 976 | 0.004 | 0.98 | 6.80 | 6.45 | 243891 |
| **February-11** | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |
| **March-11** | NMR | NMR | 7.3 | 1731 | NMR | NMR | 6.76 | 6.43 | 236101 |
| **April-11** | 0.067 | 27.79 | 4.5 | 1866 | 0.001 | 0.41 | 6.76 | 6.50 | 414718 |
| **May-11** | NMR | NMR | 6.0 | 2651 | NMR | NMR | 6.92 | 6.55 | 441824 |
| **June-11** | NMR | NMR | ** | ** | NMR | NMR | ** | ** | 144813 |
| **July-11** | 0.025 | 7.14 | 9.0 | 2571 | 0.001 | 0.29 | 6.75 | 6.31 | 285660 |
| **August-11** | NMR | NMR | 4.4 | 642 | NMR | NMR | 7.30 | 6.76 | 145996 |
| **September-11** | NMR | NMR | 5.3 | 420 | NMR | NMR | 7.25 | 7.08 | 78668 |
| **October-11** | 0.100 | 30.90 | 2.6 | 803 | 0.001 | 0.31 | 7.29 | 6.62 | 309007 |
| **November-11** | NMR | NMR | 6.5 | 2112 | NMR | NMR | 7.00 | 6.78 | 324850 |
| **December-11** | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP | NDEP |

**Notes**: Shaded values exceed the maximum monthly mean concentrations; NDEP (No Deposit) = measurement not taken because there was no deposit from the final discharge point; NMR (No Measurement Required) = measurement not taken in accordance with the conditions set out in section 12 or 13 of the MMER; ** June 2011 samples for TSS and pH were erroneously not collected; From January 1 to October 23, 2011 the water originated from Second Portage Lake Impoundment Area; From October 22 to November 14, 2011 the water originated from Bay Goose Impoundment Area.

**Table 3.1-2.** Concentrations of EEM substances in effluent discharge, monitored four times per year for 2010 and 2011.

| | Effluent Discharge Point (DD-FD1) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2010 | | | | 2011 | | |
| **Parameter** | **19-Apr-10** | **24-Aug-10** | **27-Oct-10** | **29-Nov-10** | **10-Jan-11** | **11-Apr-11** | **24-Aug-11** |
| Alkalinity (mg $CaCO_3$/L) | ** | ** | ** | ** | ** | 45 | 82 |
| Aluminium-Total (mg/L) | 0.630 | 0.484 | 1.50 | 0.619 | 0.857 | 1.10 | 0.541 |
| Ammonia-Total (mg N/L) | 0.17 | 0.47 | 2.7 | 4.8 | 4.8 | 6.7 | <0.05 |
| Cadmium-Total (mg/L) | < 0.00008 | ** | 0.00013 | < 0.00008 | <0.00008 | <0.00008 | 0.00025 |
| Hardness (mg $CaCO_3$/L) | ** | ** | ** | ** | ** | 215 | 200 |
| Iron-Total (mg/L) | 0.15 | 0.33 | 0.51 | <0.01 | <0.01 | <0.01 | 0.69 |
| Mercury-Total (mg/L) | < 0.00001 | < 0.00001 | < 0.00001 | 0.00001 | <0.00001 | <0.00001 | 0.00293[1] |
| Molybdenum-Total (mg/L) | 0.0014 | 0.0036 | 0.0069 | 0.0112 | 0.0116 | 0.0148 | 0.0329 |
| Nitrate-Total (mg N/L) | 0.52 | ** | 1.2 | 1.7 | 1.1 | 1.0 | 1.6 |

**Notes**: ** Parameter not measured due to accidental omission on lab analysis request form; Parameters that have been added to the required monitoring list include: field measured conductivity and temperature and laboratory measured total selenium (MMER, 2012); [1] It should be noted that the "field blank" QA sample which was collected concurrently with the August, 2011 effluent sample also had an elevated mercury concentration (2.5 µg/L), suggesting these results were due to an analytical error by the laboratory.

**Table 3.1-3.** MMER acute toxicity results in effluent discharge, monitored monthly for 2010 and 2011.

| | **Effluent Discharge Point (DD-FD1)** | |
|---|---|---|
| **Sampling** | ***Daphnia magna*** | ***Oncorhynchus mykiss*** |
| **Month-Year** | LC50 (48hr) % v/v | LC50 (96hr) % v/v |
| **January-10** | >100 | >100 |
| **February-10** | >100 | >100 |
| **March-10** | 46.2 | >100 |
| **April-10** | >100 | >100 |
| **May-10** | >100 | >100 |
| **June-10** | >100 | >100 |
| **July-10** | >100 | >100 |
| **August-10** | >100 | >100 |
| **September-10** | >100 | >100 |
| **October-10** | >100 | >100 |
| **November-10** | >100 | >100 |
| **December-10** | >100 | >100 |
| **January-11** | >100 | >100 |
| **February-11** | *NDEP* | *NDEP* |
| **March-11** | *NDEP* | *NDEP* |
| **April-11** | >100 | >100 |
| **May-11** | *NMR* | *NMR* |
| **June-11** | *NDEP* | *NDEP* |
| **July-11** | >100 | >100 |
| **August-11** | *NMR* | *NMR* |
| **September-11** | *NMR* | *NMR* |
| **October-11** | >100 | >100 |
| **November-11** | *NMR* | *NMR* |
| **December-11** | *NDEP* | *NDEP* |

**Notes**: "*Daphnia magna*" is an aquatic invertebrate commonly called 'water flea'; "*Oncorhynchus mykiss*" is a fish commonly called 'rainbow trout'; "LC50" = lethal concentration (of effluent) resulting in 50% decrease in survival relative to controls; NDEP (No Deposit) = measurement not taken because there was no deposit from the final discharge point; NMR (No Measurement Required) = measurement not taken in accordance with the conditions set out in section 12 or 13 of the MMER.

**Table 3.1-4.** EEM sublethal toxicity results in effluent discharge, monitored two times per year for 2010 and 2011.

| | **Effluent Discharge Point (DD-FD1)** | | | |
|---|---|---|---|---|
| | **2010** | | **2011** | |
| **Sublethal Toxicity Test -Endpoint** (% v/v) | **19-Apr-10** | **24-Aug-10** | **10-Jan-11** | **25-Aug-11** |
| *Pseudokirchneriella subcapitata* -IC25 growth | >90.9 | >90.9 | >90.9 | >90.9 |
| *Lemna minor* -IC25 weight | >97 | >97 | 76.2 | 1.81 |
| *Lemna minor* -IC25 growth (frond #) | >97 | 81.4 | 46.0 | 1.77 |
| *Ceriodaphnia dubia* -IC25 reproduction | >100 | >100 | 62.5 | 10.8 |
| *Ceriodaphnia dubia* -LC50 survival | >100 | >100 | >100 | 66.0 |
| *Pimephales promelas* - IC25 growth | >100 | >100 | >100 | 91.5 |
| *Pimephales promelas* -LC50 survival | >100 | >100 | >100 | >100 |

**Notes**: "IC25" = inhibitory concentration (of effluent) resulting in 25% decrease in response relative to controls; "LC50" = lethal concentration (of effluent) resulting in 50% decrease in survival relative to controls; "*Pseudokirchneriella subcapitata*" is a freshwater alga; "*Lemna minor*" is a freshwater aquatic plant commonly called 'duckweed'; "*Ceriodaphnia dubia*" is an aquatic invertebrate commonly called 'water flea'; "*Pimephales promelas*" is a fish commonly called 'fathead minnow'

## 3.2. Plume Delineation

As presented in the in the Study Design document (Azimuth, 2011), effluent mixing was modeled by Golder Associates to estimate the location of the 1% dilution boundary defining the TPN exposure area (**Figure 3.2-1**).

Given that the "effluent" consists largely lake water transferred from one basin to another with some TSS, there were no suitable tracers that could provide real-time information for characterizing percent dilution in the receiving environment. While turbidity could be used to qualitatively track the plume, it does not translate well into percent effluent concentration. Notwithstanding, the strategy for plume delineation discussed in the Study Design was to try to roughly map the plume using turbidity with the intent of providing some site-specific characterization to complement the modeled plume results.

A reconnaissance helicopter flight was taken on August 10, 2011 to obtain a "birds-eye view" of the discharge area. As seen by **Photos 3.2-1 through 3.2-3**, apart from some minor signs of surface water flow (i.e., that discharge was occurring), there were no other visual signs of the plume from the air (e.g., turbid water).

The initial plume delineation survey was conducted on August 11, 2011 the first day of fish sampling at TPN. The plan was to conduct turbidity profiling (using the McVan Analite NEP160-3-05R portable turbidity meter/logger with a high sensitivity NEP260 90° probe) over a grid (**Figure 3.2-2**), taking measurements every two meters from the surface to 1m off the bottom. Sampling started at TPN-1 to characterize ambient conditions well away from the effluent discharge location. Background turbidity ranged from 0.11 to 0.37 NTU[7], which roughly corresponds to 0.1 to 0.3 mg/L TSS[8]. The survey then moved in to characterize the closest stations to the discharge point, stepping out as needed until ambient turbidity levels were found. TPN-4 and TPN-6 (ranging from 0 to 0.22 NTU or 0 to 0.2 mg/L TSS) were consistent with background turbidity levels. TPN-5, located approximately 75 m south of the discharge point, but in line with the prevailing winds, had slightly elevated turbidity (0.56 to 0.94 NTU or 0.4 to 0.6 mg/L TSS) in the top two meters. No further sampling was conducted given that the "plume" was bounded.

Delineation of the discharge location in a grid pattern during the August 11 turbidity survey confirmed that discharge was occurring (**Photos 3.2-4 and 3.2-5**), but that the effluent was quite clear (**Photo 3.2-6**). As these conditions did not change while conducting the biological sampling at TPN (August 11 – 16th), no further turbidity surveys were needed.

The plume delineation survey represents a snapshot of conditions that cannot be assumed to be representative. As seen in **Table 3.1-1**, monthly discharge volumes have been much higher

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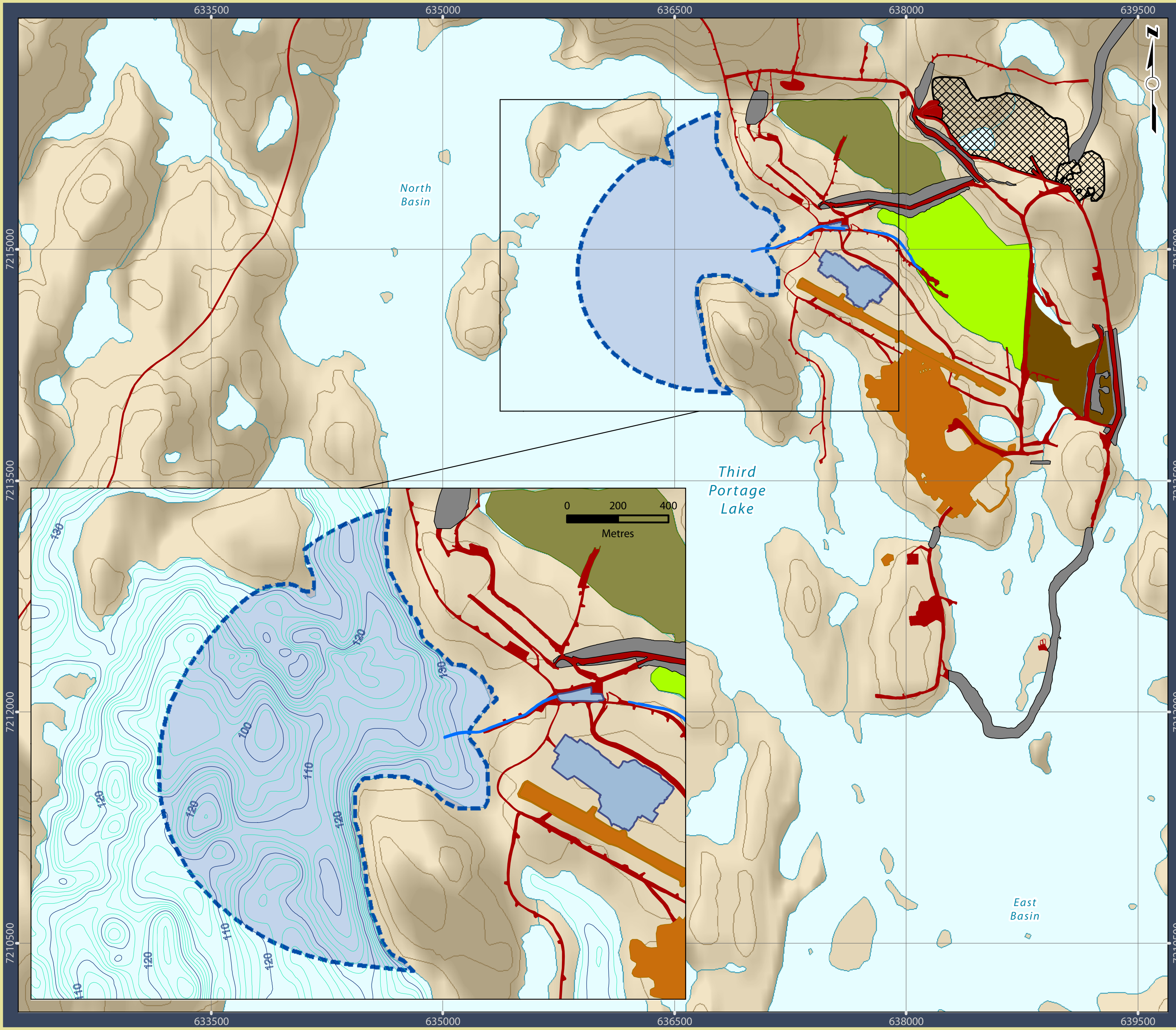
[7] Even after calibration, the turbidity meter was reading slightly negative values in the field. Consequently, the values were corrected by adding the most negative reading (0.4 NTU).

[8] Conversion based on a relationship developed to support dike construction monitoring at Meadowbank. TSS = 10^((Log(NTU) – 0.2729)/1.2002) (Azimuth, 2010).

previously than in August 2011. Consequently, for the purposes of defining the exposure zone for this study, we will use the modeled 1% dilution zone from the Golder study (see **Figure 3.2-1**).



# Figure 3.2-1. Dewatering Discharge Outfall and Exposure Area

**Legend**

- Bathymetry 2m*
- Bathymetry 10m**
- All Weather Private Access Road

**Mine Features**

- Effluent Discharge (Dewatering Pipeline)
- 🟧 Facilities
- 🟥 Road
- ▭ Dike
- ▨ Waste Dump
- 🟫 Dewatered Lake
- 🟩 Portage Attenuation Facility
- 🟩 Tailings Storage Facility
- 🟦 Water Treatment Facility
- 1% Effluent Exposure Area Delineation

* 2m depth = below lake surface
** 10m depth = above sea level

0 250 500 750 1,000
Metres

**Projection:** UTM Zone 14 NAD83

**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

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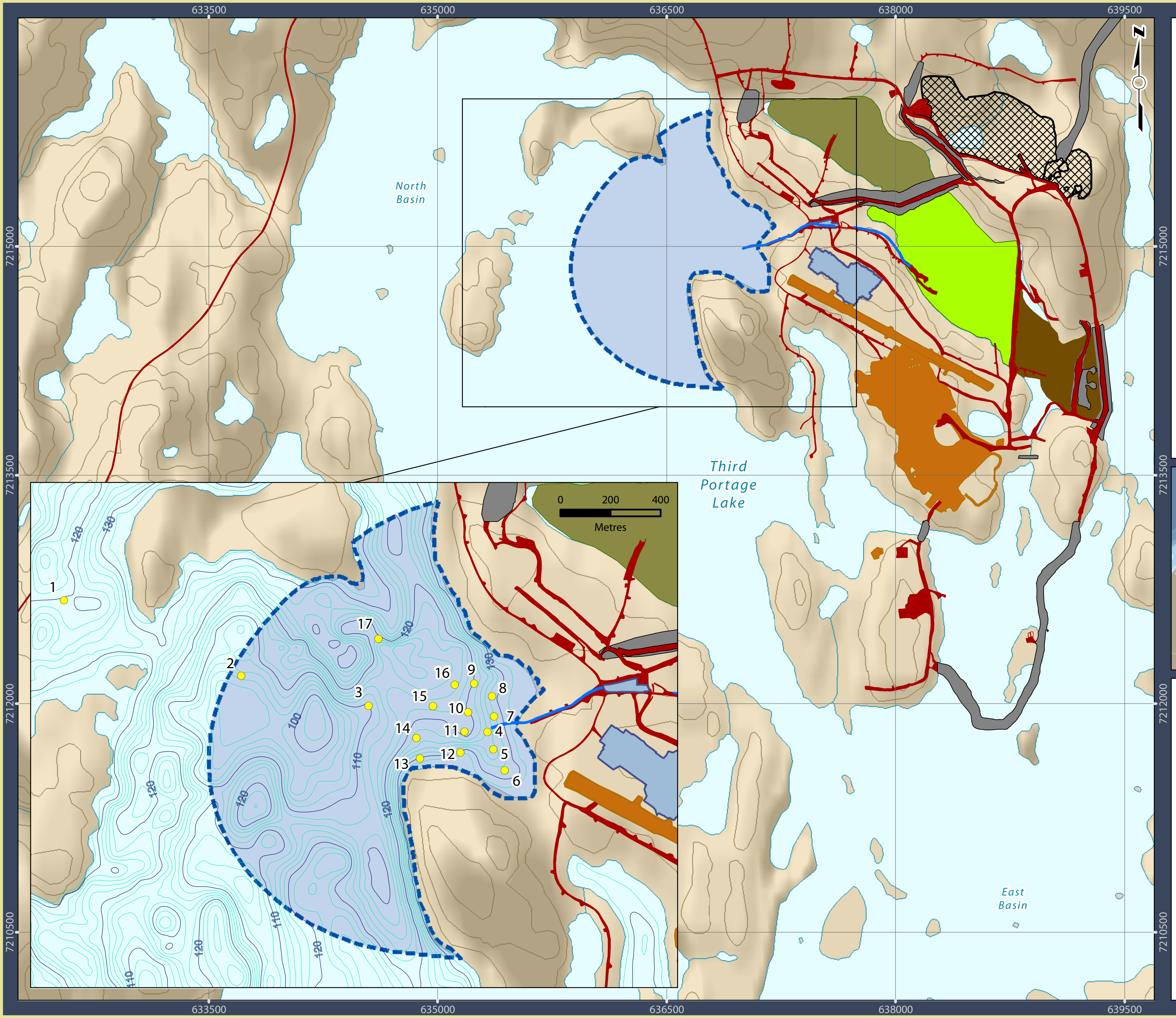
AGNICO-EAGLE

By:
CASLYS CONSULTING

## Figure 3.2-2.
## Plume Delineation Survey: Turbidity Profiling Locations



### Legend

- ● Turbidity Profile Location
- Bathymetry 2m*
- Bathymetry 10m**
- All Weather Private Access Road

**Mine Features**

- Effluent Discharge (Dewatering Pipeline)
- 🟧 Facilities
- 🟥 Road
- ▭ Dike
- ▨ Waste Dump
- 🟫 Dewatered Lake
- 🟩 Portage Attenuation Facility
- 🟩 Tailings Storage Facility
- 🟦 Water Treatment Facility
- 1% Effluent Exposure Area Delineation

* 2m depth = below lake surface
** 10m depth = above sea level

0 250 500 750 1,000
Metres

**Projection:** UTM Zone 14 NAD83

**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

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By: CASLYS CONSULTING

**Photo 3.2-1.** "Birds-eye view" of the discharge area in TPN showing no visual signs of a turbidity plume from the air.

**Photo 3.2-2.** "Birds-eye view" of the discharge area in TPN showing no visual signs of a turbidity plume from the air.

**Photo 3.2-3.** “Birds-eye view” of the discharge area in TPN showing no visual signs of a turbidity plume from the air.

**Photo 3.2-4.** A closer examination of the discharge location from the August 11, 2011 turbidity survey.

**Photo 3.2-5.** A closer examination of the discharge location from the August 11, 2011 turbidity survey.

**Photo 3.2-6.** A view of the clarity of the effluent being discharged during the August 11, 2011 turbidity survey.

## 3.3. Receiving Environment Monitoring

### 3.3.1. Water Chemistry – EEM

Water quality samples have been collected for receiving environment monitoring from the exposure area (TPN) and the reference area (TPS) four times in each of the two years since the mine became subject to the MMER (i.e., since Jan.1, 2010), in addition to 'baseline' data at this location since 2002. Water quality samples were also collected from the two biological monitoring study reference areas (INUG and PDL) in August 2011. To put water chemistry results in perspective (particularly for August when biological parameters were also collected) **Table 3.3-1** provides a daily summary of effluent volume discharge levels and climate conditions for the month of August 2011. Coordinates for water quality sampling locations are shown in **Table 3.3-3**. All samples were collected according to the guidelines of the existing CREMP water sampling SOP (**Appendix B**) and according to the QA/QC procedures presented in the Study Design document (Azimuth, 2011). Field data sheets showing profiles from August 2011 are presented in **Appendix C**.

During each sampling event, the following parameters were measured in the field (pH, temperature, oxygen, conductivity) and the laboratory: alkalinity, aluminum, ammonia, arsenic, cadmium, conductivity[9], copper, cyanide, hardness, iron, lead, mercury, molybdenum, nickel, nitrate, pH, radium 226, selenium[4], TSS, and zinc.

Results of the quarterly events at TPN and TPS are summarized in **Table 3.3-2** (values taken directly from AEM's annual MMER report; EEM data quality objectives assumed to have been met). Results from the August 2011 event (TPN, TPS, INUG, and PDL) are compiled in **Table 3.3-3** (see **Section 3.3.2** for information regarding data quality). Sample locations for TPN and TPS are the same for all sampling periods. All values are screened against CCME water quality guidelines for the protection of aquatic life (CCME, 2007). Noteworthy results include:

- TSS was typically < 1 mg/L (the laboratory MDL) and never exceeded 2 mg/L.
- Total cyanide exceeded the CCME guideline at TPN (Apr 2010; also detected [but <CCME] in Dec 2011), TPS (Apr 2010; also detected [but <CCME] in Jan 2011 and Aug 2011), INUG (Aug 2011), and PDL (Aug 2011). Given the pattern (e.g., higher at the distant reference area) and nature (occurring when TSS < 1mg/L) of results, they are likely anomalous and unrelated to effluent discharge.
- Total lead exceeded the CCME guideline at TPN (May 2010 and Dec 2011) and TPS (May 2010, Aug 2010, Jan 2011). Again, since the reference area TPS generally had higher concentrations and TSS was generally less than 1 mg/L, these results do not appear related to effluent discharge.

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[9] Conductivity and total selenium were added to the list of regulated parameters in the 2012 version of the MMER so were not monitored in 2010 and 2011.

- Total copper was elevated at TPN and TPS in August 2011. Given that TSS was detected in both samples (2 mg/L at TPN and 1 mg/L at TPS), this result is likely due to the detection of particulate-associated copper. Given that turbidity was largely at background levels during plume delineation surveys conducted in August 2011 (see **Section 3.2**), and that the CREMP results (see **Section 3.3.2**) show non-detectable TSS concentrations at both areas, these results are unlikely related to effluent discharge.
- Total aluminum, copper, lead and zinc exceeded CCME guidelines at TPN in December 2011, despite TSS < 1 mg/L. The aluminum result was due to quite low pH (i.e., the lower 0.005 mg/L guideline is triggered at pH < 6.5) in that sample. These results are not consistent with the CREMP results (see **Section 3.3.2**), so suggest either a highly localized (in space and time) influence of effluent discharge at TPN or some other anomaly. Regardless of the reason, this event occurred after the August 2011 EEM biological monitoring study, so would not be a factor.

### 3.3.2. Water Chemistry – CREMP

Details regarding CREMP water quality results are provided in Azimuth (2012a). In short, the CREMP sampling methods are the same as those used for EEM receiving environment monitoring (see SOP in **Appendix B**). The TPN area boundaries, however, are broader in the CREMP, extending across much of the north basin of Third Portage Lake (**Figure 3.3-1**).

Water samples were analyzed for a comprehensive list of parameters, as presented in the Study Design document (Azimuth, 2011). Data quality was assessed and met the stipulated objectives of the CREMP (see Azimuth, 2012a for details). Results for INUG, PDL, TPN, and TPS (focusing on the four areas related to EEM) are shown for the August 2011 CREMP sampling event and screened against CCME guidelines in **Table 3.3-4**. Key results related to EEM are presented below, based on all historical CREMP data:

- *TSS* – concentration at all four areas were typically below the MDL (**Figure 3.3-2**). Detectable concentrations (1 to 2 mg/L) found occasionally at all areas except PDL. These results corroborate the EEM findings that TSS concentrations are typically less than 1 mg/L. See TSS EAS report (Azimuth, 2012b) for further detail.
- *Aluminum* – concentrations were consistently low across all four areas, with no apparent pattern related to effluent discharge at TPN (**Figure 3.3-3**). Note that the Dec 2011 results for TPN did not exceed the CCME and that pH was near 7 (**Figure 3.3-4**).
- *Copper* – concentrations were consistently low across all four areas, suggesting that effluent discharge is not affecting water quality (**Figure 3.3-5**). The August 2011 sampling event showed no indication of elevated copper at either TPN or TPS.
- *Lead* – concentrations were typically low (<MDL), with no patterns related to effluent discharge (**Figure 3.3-6**).

### 3.3.3. Sediment Chemistry

The comprehensive CREMP sediment monitoring data were used to support the EEM study (i.e., no EEM-specific sediment quality monitoring was conducted). Samples were collected according to the existing CREMP sediment (and benthos) sampling SOP (**Appendix D**) and according to the QA/QC procedures presented in the Study Design document (Azimuth, 2011). In short, five replicate samples were collected from each area (synoptically with benthic invertebrate sampling) in August, 2011 using a Petite Ponar grab.

Sampling area locations are shown in **Figure 3.3-7** and results for INUG, PDL, and TPN are presented in **Table 3.3-5** for August 2011, screened against CCME guidelines. Data quality was assessed and met the stipulated objectives of the CREMP (see Azimuth, 2012a for details). Field data sheets for August 2011 sampling are presented in **Appendix E**.

CREMP sediment chemistry monitoring has historically included both grab and core samples. Grab samples, while providing sediment chemistry context for historical deposition patterns, are not ideal compared to core samples for assessing possible subtle changes over time. Grab samples are useful for the collection of sediments to characterize substrate conditions in support benthic invertebrate community surveys.

A comprehensive review of temporal and spatial patterns in the existing sediment chemistry data set for Meadowbank conducted as part of last year’s CREMP did not identify any apparent changes in metals concentrations related to effluent discharge to TPN. Further detail regarding CREMP sediment quality sampling is provided in Azimuth (2012a).

Based on the preceding information, the grab sample data for physical parameters (i.e., total organic carbon and particle size) were used as supporting data to help interpret the benthic invertebrate community assessment (see **Section 5**).

**Table 3.3- 1.** Daily effluent discharge volume and climate conditions for August, 2011.

| Days during August 2011 | Effluent Volume ($m^3$) | Climate Conditions[1] | | | | |
|---|---|---|---|---|---|---|
| | | Temperature Range (°C) | Temperature Mean (°C) | Precipitation Total (mm) | Wind Speed Mean (km/h) | Wind Speed Max gust (km/h) |
| 1 | 13706 | 5.8 - 17.1 | 11.5 | 0 | 17.0 | 39 |
| 2 | 0 | 9.4 - 11.3 | 10.4 | 8.8 | 41.5 | 70 |
| 3 | 0 | 9.9 - 12.5 | 11.2 | 3.5 | 27.7 | 46 |
| 4 | 0 | 8.7 - 14.6 | 11.7 | 0 | 26.0 | 46 |
| 5 | 4090 | 6.2 - 19.1 | 12.7 | 0 | 21.4 | 37 |
| 6 | 18910 | 10.8 - 21.8 | 16.3 | 0 | 18.3 | 33 |
| 7 | 24380 | 8.3 - 19.1 | 13.7 | 0 | 19.8 | 35 |
| 8 | 13810 | 8.5 - 19.8 | 14.2 | 0 | 19.1 | 37 |
| 9 | 1700 | 8.2 - 17.1 | 12.7 | 0 | 16.9 | 39 |
| 10 | 5620 | 9.8 - 14.6 | 12.2 | 0.9 | 13.7 | 32 |
| 11 | 5050 | 8.4 - 15.0 | 11.7 | 1.8 | 16.8 | <31 |
| 12 | 6600 | 9.0 - 15.6 | 12.3 | 0 | 14.9 | 35 |
| 13 | 5015 | 8.9 - 17.1 | 13.0 | 0 | 18.5 | 37 |
| 14 | 0 | 7.5 - 15.6 | 11.6 | 0 | 26.5 | 43 |
| 15 | 5015 | 2.9 - 15.7 | 9.3 | 0 | 9.8 | <31 |
| 16 | 0 | 8.6 - 14.2 | 11.4 | 0 | 23.8 | 48 |
| 17 | 3010 | 7.9 - 10.7 | 9.3 | 2 | 34.8 | 54 |
| 18 | 0 | 8.0 - 10.8 | 9.4 | 0 | 33.5 | 56 |
| 19 | 4050 | 8.4 - 11.9 | 10.2 | 2.9 | 20.7 | 35 |
| 20 | 6620 | 8.2 - 14.9 | 11.6 | 0 | 12.0 | 32 |
| 21 | 0 | 4.8 - 17.8 | 11.3 | 0 | 18.0 | 37 |
| 22 | 1780 | 3.0 - 12.9 | 8.0 | 0 | 20.9 | 44 |
| 23 | 2130 | 8.7 - 13.8 | 11.3 | 0.9 | 25.4 | 43 |
| 24 | 5340 | 8.5 - 12.4 | 10.5 | 0 | 10.0 | <31 |
| 25 | 2280 | 8.7 - 10.9 | 9.8 | 0 | 18.8 | <31 |
| 26 | 1130 | 8.9 - 12.0 | 10.5 | 0 | 19.8 | 37 |
| 27 | 2040 | 7.1 - 14.6 | 10.9 | 0.9 | 22.8 | 41 |
| 28 | 5990 | 3.7 - 12.8 | 8.3 | 1.3 | 16.6 | 39 |
| 29 | 2170 | 3.1 - 10.6 | 6.9 | 0.3 | 16.5 | 39 |
| 30 | 1400 | 4.7 - 13.0 | 8.9 | 0 | 11.7 | <31 |
| 31 | 4160 | 5.5 - 10.0 | 7.8 | 1.2 | 19.8 | 39 |

**Notes**: [1] Climate conditions were taken from Environment Canada's website and are for Baker Lake, Nunavut (75 km from the mine).

**Table 3.3- 2.** EEM water quality results at TPN and TPS, monitored four times per year for 2010 and 2011 (2 pages; see notes at bottom of table).

| Parameter | CCME (2007) Guideline[1] | 2010 | | | | 2011 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 19-Apr-10 | 22-May-10 | 28-Jul-10 | 31-Aug-10 | 17-Jan-11 | 12-Apr-11 | 24-Aug-11 | 20-Dec-11 |
| **TPN (Exposure Area)** | | | | | | | | | |
| Alkalinity (mg CaCO$_3$/L) | NG | 6 | 6 | 40 | 6 | 25 | 15 | 10 | <2 |
| Aluminium-Total (mg/L)[2] | 0.005 - 0.100 | 0.026 | 0.027 | 0.019 | 0.010 | 0.016 | 0.149 | 0.009 | 0.060 |
| Ammonia-Total (mg N/L)[2,3] | 0.832 - 25.9 | 0.16 | 0.31 | 0.07 | 0.06 | <0.05 | 0.25 | <0.05 | <0.05 |
| Arsenic-Total (mg/L) | 0.0050 | 0.0023 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0008 | <0.0005 | <0.0005 |
| Cadmium-Total (mg/L)[4] | 0.0000025 - 0.0000046 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00002 | <0.00002 |
| Copper-Total (mg/L)[4] | 0.002 - 0.002 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.0005 | <0.0005 | 0.0271 | 0.0021 |
| Cyanide-Total (mg/L) | 0.005 | 0.008 | ** | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.005 |
| Dissolved oxygen-Field (mg/L) | NG | 14.0 | 11.3 | ** | 10.6 | 12.4 | 19.5 | 9.2 | 25.3 |
| Hardness (mg CaCO$_3$/L) | NG | 5 | 6 | 5 | 5 | 6 | 10 | 7 | 10 |
| Iron-Total (mg/L) | 0.3 | <0.01 | <0.01 | <0.01 | <0.01 | 0.03 | <0.01 | <0.01 | <0.01 |
| Lead-Total (mg/L)[4] | 0.001 - 0.001 | <0.0003 | 0.0068 | <0.0003 | <0.0003 | <0.0003 | <0.0003 | <0.0003 | 0.0109 |
| Mercury-Total (mg/L) | 0.000026 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 |
| Molybdenum-Total (mg/L) | 0.073 | <0.0005 | <0.0005 | <0.0005 | <0.001 | <0.0005 | <0.0005 | 0.0016 | <0.0005 |
| Nickel-Total (mg/L)[4] | 0.025 - 0.025 | <0.0005 | 0.0006 | 0.0012 | 0.0013 | <0.0005 | <0.0005 | 0.0014 | 0.0006 |
| Nitrate-Total (mg N/L) | 2.9 | 0.01 | 0.08 | 0.03 | 0.03 | 0.01 | 0.03 | 0.05 | 0.03 |
| pH-Field | 6.5 - 9.0 | 6.88 | ** | 6.72 | 6.88 | 7.12 | 7.17 | 7.59 | 6.22 |
| Radium-226 (Bq/L) | NG | <0.002 | <0.002 | <0.003 | <0.003 | <0.002 | <0.002 | <0.002 | 0.003 |
| Temperature-Field (°C) | NG | 0.47 | 0.74 | 7.75 | 9.16 | 0.31 | 0.17 | 10.4 | 0.38 |
| Total suspended solid (mg/L) | NG | <1 | <1 | <1 | <1 | 1 | <1 | 2 | <1 |
| Zinc-Total (mg/L) | 0.030 | <0.001 | 0.006 | <0.001 | <0.001 | <0.001 | 0.009 | <0.001 | 0.035 |

| Parameter | CCME (2007) Guideline[1] | 2010 | | | | 2011 | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 19-Apr-10 | 22-May-10 | 28-Jul-10 | 31-Aug-10 | 17-Jan-11 | 12-Apr-11 | 24-Aug-11 | 20-Dec-11 |
| **TPS (Reference Area)** | | | | | | | | | |
| Alkalinity (mg $CaCO_3$/L) | NG | 7 | 4 | 27 | 5 | 18 | 12 | 9 | <2 |
| Aluminium-Total (mg/L)[2] | 0.100 - 0.100 | 0.019 | 0.024 | <0.002 | 0.018 | 0.046 | 0.033 | <0.006 | 0.030 |
| Ammonia-Total (mg N/L)[2,3] | 0.832 - 8.24 | 0.17 | 0.29 | 0.07 | 0.06 | <0.05 | <0.05 | <0.05 | <0.05 |
| Arsenic-Total (mg/L) | 0.0050 | 0.0033 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cadmium-Total (mg/L)[4] | 0.0000021 - 0.0000050 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00008 | <0.00002 | <0.00002 |
| Copper-Total (mg/L)[4] | 0.002 - 0.002 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0009 | <0.0005 | 0.0131 | 0.0010 |
| Cyanide-Total (mg/L) | 0.005 | 0.020 | ** | <0.005 | <0.005 | 0.005 | <0.005 | 0.005 | <0.005 |
| Dissolved oxygen-Field (mg/L) | NG | 12.5 | 11.2 | ** | 10.4 | 11.9 | 16.8 | 9.2 | 16.8 |
| Hardness (mg $CaCO_3$/L) | NG | 4 | 5 | 5 | 5 | 6 | 5 | 6 | 11 |
| Iron-Total (mg/L) | 0.3 | <0.01 | <0.01 | <0.01 | <0.01 | 0.25 | <0.01 | <0.01 | <0.01 |
| Lead-Total (mg/L)[4] | 0.001 - 0.001 | <0.0003 | 0.0108 | <0.0003 | 0.0069 | 0.0124 | <0.0003 | 0.0005 | <0.0003 |
| Mercury-Total (mg/L) | 0.000026 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 | <0.00001 |
| Molybdenum-Total (mg/L) | 0.073 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0005 | <0.0005 |
| Nickel-Total (mg/L)[4] | 0.025 - 0.025 | <0.0005 | 0.0005 | <0.0005 | 0.0013 | <0.0005 | <0.0005 | 0.0008 | <0.0005 |
| Nitrate-Total (mg N/L) | 2.9 | <0.01 | <0.01 | 0.03 | 0.05 | 0.01 | 0.08 | 0.01 | 0.03 |
| pH-Field | 6.5 - 9.0 | 7.08 | ** | 7.06 | 6.91 | 6.81 | 7.12 | 7.92 | 7.91 |
| Radium-226 (Bq/L) | NG | <0.002 | 0.003 | <0.003 | 0.003 | <0.002 | 0.002 | <0.002 | 0.003 |
| Temperature-Field (°C) | NG | 0.52 | 0.22 | 9.22 | 9.37 | 0.37 | 0.36 | 10.7 | 0.42 |
| Total suspended solid (mg/L) | NG | <1 | <1 | 1 | <1 | <1 | <1 | 1 | <1 |
| Zinc-Total (mg/L) | 0.030 | <0.001 | 0.006 | 0.003 | <0.001 | 0.004 | 0.003 | <0.001 | 0.006 |

**Notes**: NG = no guideline; [1] CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007; [2] Guideline is pH dependent; [3] Guideline is temperature dependent; [4] Guideline is hardness dependent; **Parameter not measured due to malfunctioning field equipment or accidental omission on lab analysis request form; Shaded values exceed the CCME guideline; Parameters that have been added to the required monitoring list include: field measured conductivity and laboratory measured total selenium (MMER, 2012).

**Table 3.3- 3.** EEM water quality results at INUG, PDL, TPN and TPS, monitored at the same time that the biological monitoring studies were conducted (August, 2011).

| **Area** | | **INUG** | **PDL** | **TPN** | **TPS** |
|---|---|---|---|---|---|
| **Date** | | **18-Aug-11** | **18-Aug-11** | **24-Aug-11** | **24-Aug-11** |
| **Latitude (dd mm ss.s)** | **CCME (2007)** | N65 03 08.1 | N65 06 17.8 | N65 01 51.8 | N64 58 10.0 |
| **Longitude (dd mm ss.s)** | **Guideline[1]** | W96 23 22.5 | W96 13 05.2 | W96 05 33.3 | W96 09 55.8 |
| Alkalinity (mg $CaCO_3$/L) | NG | 10 | 24 | 10 | 9 |
| Aluminium-Total (mg/L)[2] | 0.100 - 0.100 | 0.010 | 0.007 | 0.009 | <0.006 |
| Ammonia-Total (mg N/L)[2,3] | 0.274 - 0.832 | <0.05 | <0.05 | <0.05 | <0.05 |
| Arsenic-Total (mg/L) | 0.0050 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| Cadmium-Total (mg/L)[4] | 0.0000011 - 0.0000034 | <0.00002 | <0.00002 | <0.00002 | <0.00002 |
| Copper-Total (mg/L)[4] | 0.002 - 0.002 | <0.0005 | <0.0005 | 0.0271 | 0.0131 |
| Cyanide-Total (mg/L) | 0.005 | 0.016 | 0.007 | <0.005 | 0.005 |
| Dissolved oxygen-Field (mg/L) | NG | 8.5 | 8.8 | 9.2 | 9.2 |
| Hardness (mg $CaCO_3$/L) | NG | 2 | 4 | 7 | 6 |
| Iron-Total (mg/L) | 0.3 | <0.01 | <0.01 | <0.01 | <0.01 |
| Lead-Total (mg/L)[4] | 0.001 - 0.001 | 0.0006 | <0.0003 | <0.0003 | 0.0005 |
| Mercury-Total (mg/L) | 0.000026 | ** | ** | <0.00001 | <0.00001 |
| Molybdenum-Total (mg/L) | 0.073 | <0.0005 | <0.0005 | 0.0016 | 0.0005 |
| Nickel-Total (mg/L)[4] | 0.025 - 0.025 | <0.0005 | <0.0005 | 0.0014 | 0.0008 |
| Nitrate-Total (mg N/L) | 2.9 | <0.01 | <0.01 | 0.05 | 0.01 |
| pH-Field | 6.5 - 9.0 | 7.82 | 8.32 | 7.59 | 7.92 |
| Radium-226 (Bq/L) | NG | <0.002 | <0.002 | <0.002 | <0.002 |
| Temperature-Field (°C) | NG | 12.0 | 11.4 | 10.4 | 10.7 |
| Total suspended solid (mg/L) | NG | <1 | <1 | 2 | 1 |
| Zinc-Total (mg/L) | 0.030 | <0.001 | <0.001 | <0.001 | <0.001 |

**Notes**: NG = no guideline; [1] CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007; [2] Guideline is pH dependent; [3] Guideline is temperature dependent; [4] Guideline is hardness dependent; **Parameter not measured due to malfunctioning field equipment or accidental omission on lab analysis request form; Shaded values exceed the CCME guideline; Parameters that have been added to the required monitoring list include: field measured conductivity and laboratory measured total selenium (MMER, 2012).

**Table 3.3- 4.** CREMP water quality results at INUG, PDL, TPN and TPS, monitored during August, 2011 (2 pages; see notes at bottom of table).

| | CCME (2007) | INUG | | PDL | | TPN | | TPS | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Guideline**[1] | 13-Aug-11 | 13-Aug-11 | 11-Aug-11 | 11-Aug-11 | 23-Aug-11 | 23-Aug-11 | 23-Aug-11 | 23-Aug-11 |
| **Field Parameters** (@ 3m) | | | | | | | | | |
| DO (mg/L) | NG | 8.47 | NA | 8.80 | NA | 9.16 | 8.91 | 9.18 | 9.19 |
| pH | NG | 7.44 | 7.42 | 7.48 | 7.39 | 8.03 | 8.01 | 7.76 | 8.09 |
| Conductivity (µS/cm) | NG | 13.8 | 13.9 | 19.0 | 19.0 | 21.4 | 21.1 | 20.6 | 20.6 |
| Temperature (°C) | NG | 14.1 | 14.3 | 13.0 | 12.6 | 10.5 | 10.5 | 10.7 | 10.6 |
| **Physical Tests (mg/L)** | | | | | | | | | |
| Conductivity (µS/cm) | NG | 12.5 | 12.5 | 20.2 | 20.2 | 20.3 | 16.9 | 17.5 | 17.8 |
| Hardness | NG | 5.08 | 5.11 | 8.10 | 8.15 | 7.47 | 6.57 | 6.37 | 6.55 |
| pH | 6.5 - 9.0 | 6.94 | 7.05 | 7.23 | 7.23 | 7.00 | 7.08 | 7.13 | 7.12 |
| Total Suspended Solids | NG | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Total Dissolved Solids | NG | 16.0 | 18.0 | 12.0 | 16.0 | 10.0 | 6.0 | <5.0 | 6.0 |
| Turbidity (NTU) | NG | 0.28 | 0.30 | 0.24 | 0.24 | 0.88 | 0.28 | 0.28 | 0.26 |
| **Anions & Nutrients (mg/L)** | | | | | | | | | |
| Alkalinity - Bicarbonate | NG | 7.1 | 7.0 | 10.0 | 10.1 | 7.5 | 7.6 | 7.7 | 7.7 |
| Alkalinity - Carbonate | NG | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 | <0.60 |
| Alkalinity - Hydroxide | NG | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 | <0.40 |
| Alkalinity - Total | NG | 5.8 | 5.8 | 8.2 | 8.3 | 6.2 | 6.2 | 6.3 | 6.3 |
| Ammonia (as N)[2,3] | 2.61 - 8.24 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Bromide | NG | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Chloride | NG | 0.61 | 0.60 | 0.54 | 0.54 | 0.52 | 0.53 | 0.51 | 0.51 |
| Fluoride | NG | 0.053 | 0.053 | 0.034 | 0.034 | 0.059 | 0.059 | 0.059 | 0.059 |
| Nitrate (as N) | 2.9 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | 0.0326 | 0.0300 | 0.0255 | 0.0251 |
| Nitrite (as N) | 0.060 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Total Kjeldahl Nitrogen | NG | 0.157 | 0.116 | 0.118 | 0.123 | 0.163 | 0.100 | 0.134 | 0.112 |
| Total Phosphate (as P) | 0.004 | 0.0060 | 0.0087 | 0.0041 | 0.0068 | 0.0036 | 0.0027 | 0.0034 | 0.0051 |
| Silicate (as $SiO_2$) | NG | 0.293 | 0.289 | 0.293 | 0.284 | 0.203 | 0.198 | 0.199 | 0.200 |
| Sulphate ($SO_4$) | NG | 0.77 | 0.75 | 1.43 | 1.43 | 2.87 | 2.83 | 2.72 | 2.72 |
| **Carbon (mg/L)** | | | | | | | | | |
| Dissolved Organic Carbon | NG | 2.6 | 2.7 | 1.7 | 2.3 | 1.9 | 1.9 | 1.7 | 1.9 |
| Total Organic Carbon | NG | 2.6 | 2.7 | 2.1 | 2.3 | 1.9 | 2.0 | 2.0 | 2.0 |
| **Plant Pigments (µg/L)** | | | | | | | | | |
| Chlorophyll-a | NG | - | - | - | - | 0.76 | 0.81 | 0.68 | 0.80 |
| Phaeophytin-a | NG | - | - | - | - | 0.20 | 0.20 | 0.23 | 0.19 |
| **Total Metals (mg/L)** | | | | | | | | | |
| Aluminum[2] | 0.100 - 0.100 | 0.0134 | 0.0097 | 0.0057 | 0.0064 | 0.0089 | 0.0093 | 0.0093 | 0.0089 |
| Antimony | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Arsenic | 0.0050 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Barium | NG | 0.00203 | 0.00197 | 0.00201 | 0.00220 | 0.00383 | 0.00265 | 0.00266 | 0.00253 |
| Beryllium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Bismuth | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Boron | NG | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Cadmium[4] | 0.0000026 - 0.0000038 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Calcium | NG | 1.06 | 1.03 | 2.07 | 2.13 | 1.89 | 1.70 | 1.66 | 1.66 |
| Cesium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Chromium | 0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Cobalt | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Copper[4] | 0.002 - 0.002 | 0.00051 | 0.00046 | 0.00059 | 0.00054 | 0.00050 | 0.00042 | 0.00039 | 0.00048 |
| Iron | 0.3 | 0.015 | 0.019 | <0.010 | <0.010 | 0.047 | <0.010 | 0.015 | <0.010 |
| Lead[4] | 0.001 - 0.001 | <0.000090 | <0.000090 | <0.000090 | <0.000090 | <0.000090 | <0.000090 | <0.000090 | <0.000090 |
| Lithium | NG | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |
| Magnesium | NG | 0.638 | 0.617 | 0.727 | 0.730 | 0.703 | 0.707 | 0.680 | 0.671 |
| Manganese | NG | 0.00266 | 0.00258 | 0.00133 | 0.00138 | 0.00606 | 0.00498 | 0.00447 | 0.00459 |
| Mercury | 0.000026 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Molybdenum | 0.073 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Nickel[4] | 0.025 - 0.025 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |
| Phosphorus | NG | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 | <0.20 |

| | CCME (2007) | INUG | | PDL | | TPN | | TPS | |
|---|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Guideline[1]** | 13-Aug-11 | 13-Aug-11 | 11-Aug-11 | 11-Aug-11 | 23-Aug-11 | 23-Aug-11 | 23-Aug-11 | 23-Aug-11 |
| Potassium | NG | 0.360 | 0.349 | 0.327 | 0.329 | 0.448 | 0.433 | 0.428 | 0.424 |
| Rubidium | NG | 0.00049 | 0.00047 | 0.00039 | 0.00040 | 0.00063 | 0.00059 | 0.00061 | 0.00058 |
| Selenium | 0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Silicon | NG | 0.167 | 0.166 | 0.151 | 0.159 | 0.140 | 0.115 | 0.111 | 0.102 |
| Silver | 0.0001 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Sodium | NG | 0.508 | 0.498 | 0.465 | 0.471 | 0.843 | 0.857 | 0.815 | 0.802 |
| Strontium | NG | 0.00597 | 0.00579 | 0.00835 | 0.00859 | 0.00813 | 0.00783 | 0.00769 | 0.00733 |
| Tellurium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Thallium | 0.0008 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Thorium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Tin | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | 0.00035 | <0.00020 | <0.00020 | <0.00020 |
| Titanium | NG | 0.00027 | 0.00022 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | 0.00023 | 0.00024 |
| Tungsten | NG | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Uranium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Vanadium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Zinc | 0.030 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0050 |
| Zirconium | NG | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 |
| **Dissolved Metals (mg/L) [5]** | | | | | | | | | |
| Aluminum[2] | 0.100 - 0.100 | 0.0033 | 0.0034 | 0.0026 | 0.0023 | 0.0098 | 0.0039 | 0.0033 | 0.0031 |
| Antimony | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Arsenic | 0.0050 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | 0.00032 | <0.00020 | <0.00020 | <0.00020 |
| Barium | NG | 0.00185 | 0.00185 | 0.00196 | 0.00197 | 0.00226 | 0.00284 | 0.00267 | 0.00270 |
| Beryllium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Bismuth | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Boron | NG | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Cadmium[4] | 0.0000026 - 0.0000038 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Calcium | NG | 1.00 | 0.986 | 2.01 | 2.05 | 1.65 | 1.58 | 1.56 | 1.59 |
| Cesium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Chromium | 0.0010 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |
| Cobalt | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Copper[4] | 0.0020 - 0.0020 | 0.00040 | 0.00036 | 0.00048 | 0.00042 | 0.00064 | 0.00036 | 0.00034 | 0.00035 |
| Iron | 0.300 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 | <0.010 |
| Lead[4] | 0.0010 - 0.0010 | <0.000090 | <0.000090 | <0.000090 | 0.000173 | <0.000090 | <0.000090 | <0.000090 | <0.000090 |
| Lithium | NG | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |
| Magnesium | NG | 0.626 | 0.644 | 0.747 | 0.735 | 0.812 | 0.639 | 0.605 | 0.625 |
| Manganese | NG | 0.00042 | 0.00033 | 0.00055 | 0.00060 | 0.00041 | 0.00449 | 0.00356 | 0.00297 |
| Mercury | NG | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 | <0.000010 |
| Molybdenum | 0.073 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | 0.00016 | 0.00018 | 0.00016 | 0.00016 |
| Nickel[4] | 0.025 - 0.025 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Phosphorus | NG | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Potassium | NG | 0.337 | 0.331 | 0.318 | 0.317 | 0.415 | 0.404 | 0.396 | 0.393 |
| Rubidium | NG | 0.00045 | 0.00044 | 0.00039 | 0.00038 | 0.00065 | 0.00054 | 0.00055 | 0.00056 |
| Selenium | 0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 | <0.0010 |
| Silicon | NG | 0.139 | 0.139 | 0.137 | 0.132 | 0.097 | 0.096 | 0.100 | 0.097 |
| Silver | 0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Sodium | NG | 0.495 | 0.497 | 0.473 | 0.456 | 0.510 | 0.783 | 0.727 | 0.733 |
| Strontium | NG | 0.00527 | 0.00534 | 0.00781 | 0.00800 | 0.00795 | 0.00717 | 0.00727 | 0.00726 |
| Tellurium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Thallium | 0.00080 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Thorium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Tin | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Titanium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Tungsten | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Uranium | NG | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 | <0.00010 |
| Vanadium | NG | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 | <0.00020 |
| Zinc | 0.030 | <0.0020 | <0.0020 | <0.0020 | 0.0021 | <0.0020 | <0.0020 | <0.0020 | <0.0020 |
| Zirconium | NG | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 | <0.00040 |

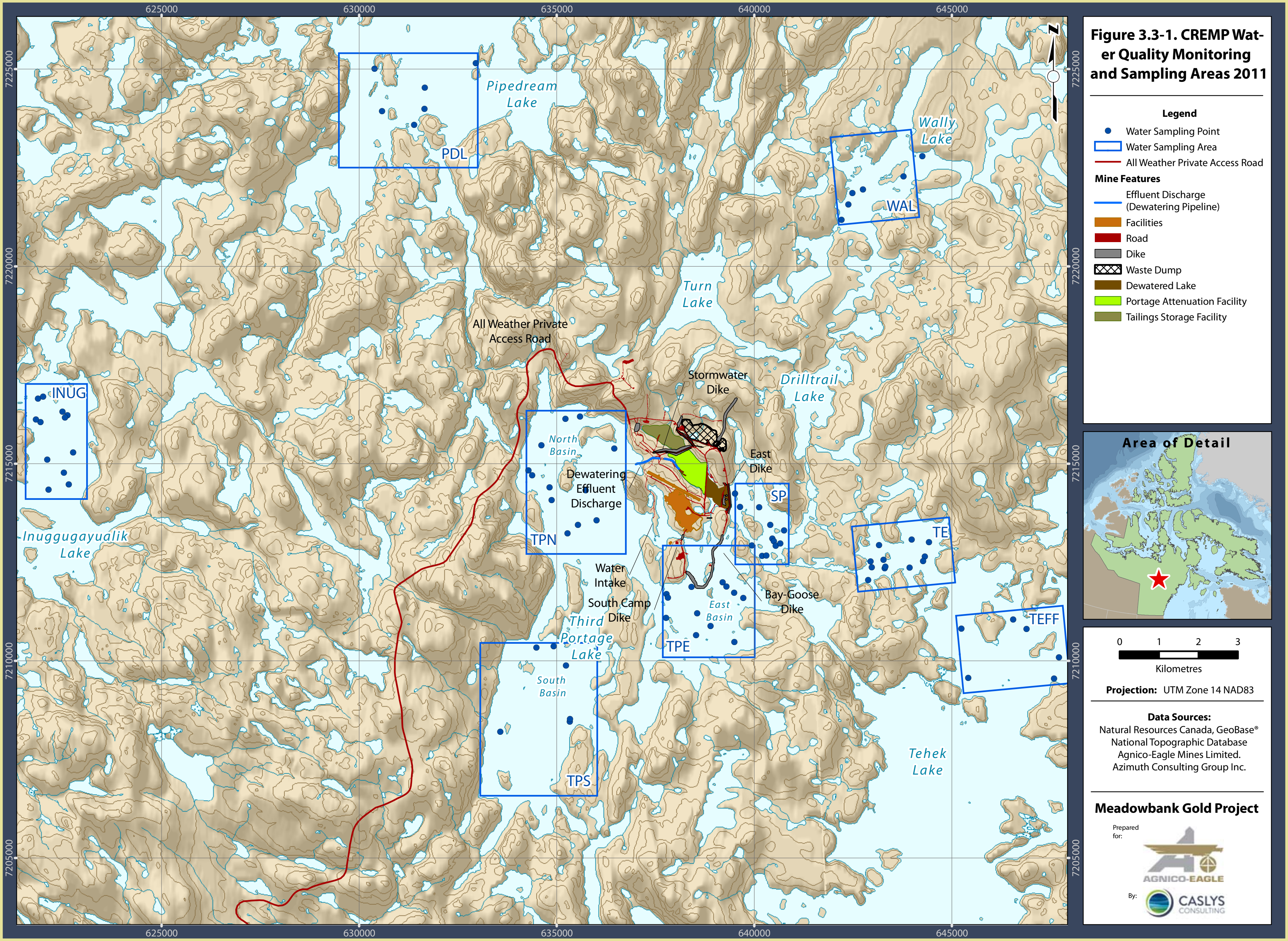
**Notes**: NG = no guideline; [1] CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated December 2007; [2] Guideline is pH dependent; [3] Guideline is temperature dependent; [4] Guideline is hardness dependent; [5] Guidelines have not yet been made for "Dissolved Metals" thus were screened against CCME guidelines for "Total Metals"; Shaded values exceed the CCME guideline.

**Table 3.3- 5.** CREMP sediment quality results at INUG, PDL, and TPN during August, 2011 (2 pages; see notes at bottom of table).

| **Area ID** | **Sediment Quality Guidelines (CCME 2002)**[1] | | **INUG** | | | | | **PDL** | | | | | **TPN** | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Replicate ID** | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| **Date** | **ISQG** | **PEL** | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 |
| **Physical & Organic Parameters** | | | | | | | | | | | | | | | | | |
| Moisture (%) | NG | NG | 79.0 | 79.7 | 84.6 | 83.1 | 82.4 | 78.8 | 79.3 | 72.1 | 79.4 | 80.8 | 76.1 | 85.8 | 71.9 | 57.8 | 39.2 |
| pH | NG | NG | 5.96 | 6.08 | 5.69 | 5.73 | 6.01 | 7.87 | 5.87 | 5.97 | 5.87 | 6.12 | 6.06 | 6.03 | 5.63 | 5.95 | 5.25 |
| Total Organic Carbon (% dw) | NG | NG | 2.93 | 2.99 | 4.84 | 4.01 | 4.22 | 2.44 | 2.64 | 1.77 | 2.76 | 3.09 | 1.80 | 3.71 | 1.25 | 0.66 | 0.51 |
| **Particle Size** | | | | | | | | | | | | | | | | | |
| % Gravel (>2mm) | NG | NG | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.64 | <0.10 | <0.10 | 3.62 | 4.49 |
| % Sand (2.00mm - 0.063mm) | NG | NG | 11.5 | 13.6 | 5.08 | 2.69 | 2.71 | 13.7 | 14.9 | 15.8 | 5.71 | 12.6 | 46.0 | 14.5 | 46.8 | 38.7 | 25.3 |
| % Silt (0.063mm - 4µm) | NG | NG | 75.1 | 78.9 | 90.1 | 87.3 | 88.1 | 74.0 | 75.0 | 76.0 | 77.3 | 81.4 | 42.8 | 70.8 | 46.5 | 46.8 | 42.2 |
| % Clay (<4µm) | NG | NG | 13.4 | 7.49 | 4.86 | 9.98 | 9.20 | 12.3 | 10.1 | 8.18 | 16.9 | 6.05 | 10.6 | 14.7 | 6.74 | 10.9 | 28.1 |
| **Aggregate Organics (mg/kg)** | | | | | | | | | | | | | | | | | |
| Mineral Oil and Grease | NG | NG | <900 | <950 | <1300 | <1125 | <1050 | <950 | <950 | <675 | <900 | <1025 | <800 | <1400 | <750 | <500 | <500 |
| **Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | | | |
| EPH10-19 | NG | NG | <370 | <400 | <510 | <520 | <480 | <350 | <430 | <290 | <400 | <400 | <340 | <640 | <300 | <200 | <200 |
| EPH19-32 | NG | NG | <370 | <400 | <510 | <520 | <480 | <350 | <430 | <290 | <400 | <400 | <340 | <640 | <300 | <200 | <200 |
| LEPH | NG | NG | <370 | <400 | <510 | <520 | <480 | <350 | <430 | <290 | <400 | <400 | <340 | <640 | <300 | <200 | <200 |
| HEPH | NG | NG | <370 | <400 | <510 | <520 | <480 | <350 | <430 | <290 | <400 | <400 | <340 | <640 | <300 | <200 | <200 |
| **Polycyclic Aromatic Hydrocarbons (mg/kg)** | | | | | | | | | | | | | | | | | |
| Acenaphthene | 0.00671 | 0.0889 | <0.0050 | <0.0050 | <0.0065 | <0.0065 | <0.0065 | <0.0050 | <0.0055 | <0.0050 | <0.0050 | <0.010 | <0.0050 | <0.0080 | <0.0050 | <0.0050 | <0.0050 |
| Acenaphthylene | 0.00587 | 0.128 | <0.0050 | <0.0050 | <0.0065 | <0.0065 | <0.0065 | <0.0050 | <0.0055 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0080 | <0.0050 | <0.0050 | <0.0050 |
| Anthracene | 0.0469 | 0.245 | <0.0040 | <0.0040 | <0.0052 | <0.0052 | <0.0052 | <0.0040 | <0.0044 | <0.0040 | <0.0040 | <0.0040 | <0.0040 | <0.0064 | <0.0040 | <0.0040 | <0.0040 |
| Benz(a)anthracene | 0.0317 | 0.385 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Benzo(a)pyrene | 0.0319 | 0.782 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Benzo(b)fluoranthene | NG | NG | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.020 | <0.020 | <0.010 | <0.016 | <0.020 | <0.020 | <0.010 |
| Benzo(b+j+k)fluoranthene | NG | NG | <0.015 | <0.015 | <0.018 | <0.018 | <0.018 | <0.015 | <0.016 | <0.015 | <0.022 | <0.022 | <0.015 | <0.023 | <0.022 | <0.022 | <0.015 |
| Benzo(g,h,i)perylene | NG | NG | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Benzo(k)fluoranthene | NG | NG | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Chrysene | 0.0571 | 0.862 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Dibenz(a,h)anthracene | 0.00622 | 0.135 | <0.0050 | <0.0050 | <0.0065 | <0.0065 | <0.0065 | <0.0050 | <0.0055 | <0.0050 | <0.0050 | <0.0050 | <0.0050 | <0.0080 | <0.0050 | <0.0050 | <0.0050 |
| Fluoranthene | 0.111 | 2.355 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Fluorene | 0.0212 | 0.144 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Indeno(1,2,3-c,d)pyrene | NG | NG | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| 2-Methylnaphthalene | 0.0202 | 0.201 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| Naphthalene | 0.0346 | 0.391 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.010 | <0.020 | <0.020 | <0.020 | <0.030 | <0.020 | <0.010 | <0.010 |
| Phenanthrene | 0.0419 | 0.515 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | 0.011 | <0.010 | <0.010 |
| Pyrene | 0.053 | 0.875 | <0.010 | <0.010 | <0.013 | <0.013 | <0.013 | <0.010 | <0.011 | <0.010 | <0.010 | <0.010 | <0.010 | <0.016 | <0.010 | <0.010 | <0.010 |
| B(a)P Total Potency | NG | NG | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 |
| IACR (CCME) | NG | NG | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.15 | <0.17 | <0.15 | <0.15 | <0.15 |

| Area ID | Sediment Quality Guidelines (CCME 2002)[1] | | INUG | | | | | PDL | | | | | TPN | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Replicate ID | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| Date | ISQG | PEL | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 |
| **Total Metals (mg/kg dw)** | | | | | | | | | | | | | | | | | |
| Aluminum | NG | NG | 21900 | 21000 | 21600 | 19800 | 15500 | 19000 | 15100 | 17300 | 23900 | 17200 | 13300 | 17600 | 11900 | 14700 | 21100 |
| Antimony | NG | NG | 0.16 | 0.14 | 0.21 | 0.18 | 0.16 | 0.24 | 0.18 | 0.23 | 0.30 | 0.20 | 0.15 | 0.20 | 0.10 | 0.10 | 0.11 |
| Arsenic | 5.9 | 17 | 23.4 | 6.63 | 34.1 | 155 | 78.3 | 20.2 | 7.45 | 91.9 | 41.4 | 8.45 | 8.89 | 13.7 | 5.93 | 15.6 | 10.7 |
| Barium | NG | NG | 103 | 107 | 133 | 116 | 90.8 | 81.9 | 77.1 | 72.3 | 104 | 90.2 | 48.6 | 73.4 | 41.1 | 56.2 | 102 |
| Beryllium | NG | NG | 1.21 | 1.19 | 1.35 | 1.20 | 0.89 | 0.94 | 0.70 | 0.77 | 1.12 | 0.76 | 0.70 | 1.07 | 0.64 | 0.83 | 0.90 |
| Bismuth | NG | NG | 1.14 | 1.05 | 1.58 | 1.07 | 0.86 | 0.86 | 0.60 | 0.72 | 1.10 | 0.70 | 0.77 | 1.13 | 0.66 | 0.85 | 1.05 |
| Cadmium | 0.6 | 3.5 | 0.11 | 0.10 | 0.25 | 0.18 | 0.15 | 0.12 | 0.19 | 0.12 | 0.14 | 0.22 | 0.07 | 0.24 | 0.06 | <0.050 | 0.10 |
| Calcium | NG | NG | 1630 | 1800 | 1790 | 1600 | 1330 | 1790 | 1660 | 1690 | 2140 | 1850 | 1220 | 1590 | 867 | 829 | 1610 |
| Chromium | 37.3 | 90 | 110 | 103 | 108 | 96.9 | 76.0 | 124 | 97.2 | 114 | 157 | 111 | 89.5 | 115 | 73.5 | 88.8 | 97.4 |
| Cobalt | NG | NG | 15.3 | 9.26 | 14.0 | 13.0 | 14.1 | 11.6 | 8.25 | 17.5 | 20.4 | 9.61 | 7.56 | 10.5 | 6.88 | 9.72 | 13.6 |
| Copper | 35.7 | 197 | 43.8 | 39.5 | 48.2 | 42.2 | 33.1 | 46.3 | 33.5 | 35.5 | 57.9 | 38.8 | 33.4 | 54.1 | 27.9 | 34.3 | 26.7 |
| Iron | NG | NG | 57700 | 27800 | 64700 | 121000 | 94900 | 33400 | 19700 | 58900 | 46200 | 22600 | 20800 | 27200 | 16700 | 24400 | 31100 |
| Lead | 35 | 91.3 | 12.5 | 12.1 | 14.9 | 12.2 | 10.5 | 13.7 | 10.4 | 11.8 | 16.6 | 12.0 | 11.3 | 15.2 | 8.67 | 10.2 | 13.8 |
| Lithium | NG | NG | 34.2 | 33.6 | 33.4 | 28.8 | 17.6 | 32.0 | 27.0 | 28.6 | 37.9 | 30.2 | 19.9 | 32.1 | 19.2 | 31.7 | 55.9 |
| Magnesium | NG | NG | 9870 | 9620 | 9520 | 8560 | 6900 | 10400 | 8150 | 9830 | 12400 | 9320 | 6830 | 8430 | 6070 | 7480 | 10500 |
| Manganese | NG | NG | 1530 | 406 | 1340 | 1540 | 2680 | 359 | 216 | 873 | 1410 | 255 | 279 | 407 | 190 | 456 | 700 |
| Mercury | 0.170 | 0.486 | 0.016 | 0.016 | 0.028 | 0.023 | 0.022 | 0.010 | 0.008 | 0.011 | 0.012 | 0.010 | 0.011 | 0.016 | 0.007 | 0.006 | <0.0050 |
| Molybdenum | NG | NG | 4.20 | 2.02 | 4.59 | 7.61 | 10.2 | 2.80 | 1.26 | 4.64 | 3.46 | 1.42 | 1.56 | 2.75 | 1.72 | 3.63 | 2.68 |
| Nickel | NG | NG | 72.0 | 65.9 | 85.9 | 67.6 | 61.4 | 74.7 | 64.1 | 71.4 | 99.8 | 71.6 | 44.6 | 64.4 | 39.9 | 45.6 | 63.1 |
| Phosphorus | NG | NG | 560 | 637 | 1230 | 3190 | 841 | 531 | 318 | 964 | 547 | 387 | 374 | 569 | 213 | 228 | 305 |
| Potassium | NG | NG | 3520 | 3330 | 3450 | 3170 | 2290 | 2360 | 1890 | 2140 | 3220 | 2110 | 1650 | 2290 | 1550 | 1960 | 3720 |
| Selenium | NG | NG | 0.46 | 0.39 | 0.68 | 0.66 | 0.57 | 0.41 | 0.29 | 0.39 | 0.34 | 0.31 | 0.29 | 0.70 | 0.23 | <0.20 | <0.20 |
| Silver | NG | NG | <0.10 | 0.12 | 0.19 | 0.17 | 0.12 | 0.15 | 0.17 | 0.13 | <0.10 | 0.19 | <0.10 | 0.18 | <0.10 | <0.10 | <0.10 |
| Sodium | NG | NG | 120 | 120 | 140 | 120 | <100 | 110 | <100 | <100 | 100 | <100 | <100 | 120 | <100 | <100 | 130 |
| Strontium | NG | NG | 23.0 | 23.9 | 24.4 | 22.5 | 17.9 | 20.2 | 17.4 | 19.3 | 24.0 | 18.0 | 10.8 | 13.9 | 8.65 | 8.38 | 15.7 |
| Thallium | NG | NG | 0.203 | 0.185 | 0.217 | 0.188 | 0.160 | 0.169 | 0.133 | 0.159 | 0.212 | 0.154 | 0.144 | 0.217 | 0.130 | 0.174 | 0.285 |
| Tin | NG | NG | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| Titanium | NG | NG | 556 | 541 | 525 | 472 | 384 | 486 | 394 | 485 | 501 | 402 | 384 | 454 | 380 | 438 | 968 |
| Uranium | NG | NG | 16.1 | 13.9 | 16.8 | 14.1 | 10.8 | 8.13 | 5.82 | 6.31 | 10.7 | 6.70 | 9.16 | 15.2 | 8.09 | 10.0 | 12.2 |
| Vanadium | NG | NG | 35.1 | 34.8 | 34.9 | 31.5 | 24.8 | 33.7 | 25.3 | 31.1 | 41.0 | 28.9 | 24.8 | 31.9 | 21.0 | 25.4 | 38.4 |
| Zinc | 123 | 315 | 80.0 | 76.2 | 89.6 | 76.3 | 61.9 | 76.4 | 60.5 | 67.0 | 87.3 | 67.8 | 56.0 | 84.3 | 54.0 | 66.4 | 86.9 |

**Notes**: NG = no guideline; [1] CCME (Canadian Council of Ministers of the Environment) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, 1999, updated in 2002; ISQG = Interim freshwater Sediment Quality Guideline; PEL = Probable Effect Level; Shaded concentrations = or > ISQG; Boxed concentrations also > PEL.



# Figure 3.3-1. CREMP Water Quality Monitoring and Sampling Areas 2011

**Projection:** UTM Zone 14 NAD83

**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

**Meadowbank Gold Project**

Prepared for:
AGNICO-EAGLE

By:
CASLYS CONSULTING

**Figure 3.3- 2.** Total Suspended Solids (TSS; mg/L) in water samples from CREMP monitoring at Meadowbank study lakes since 2006 (relevant sampling areas for EEM are TPN, INUG, PDL, and TPS).

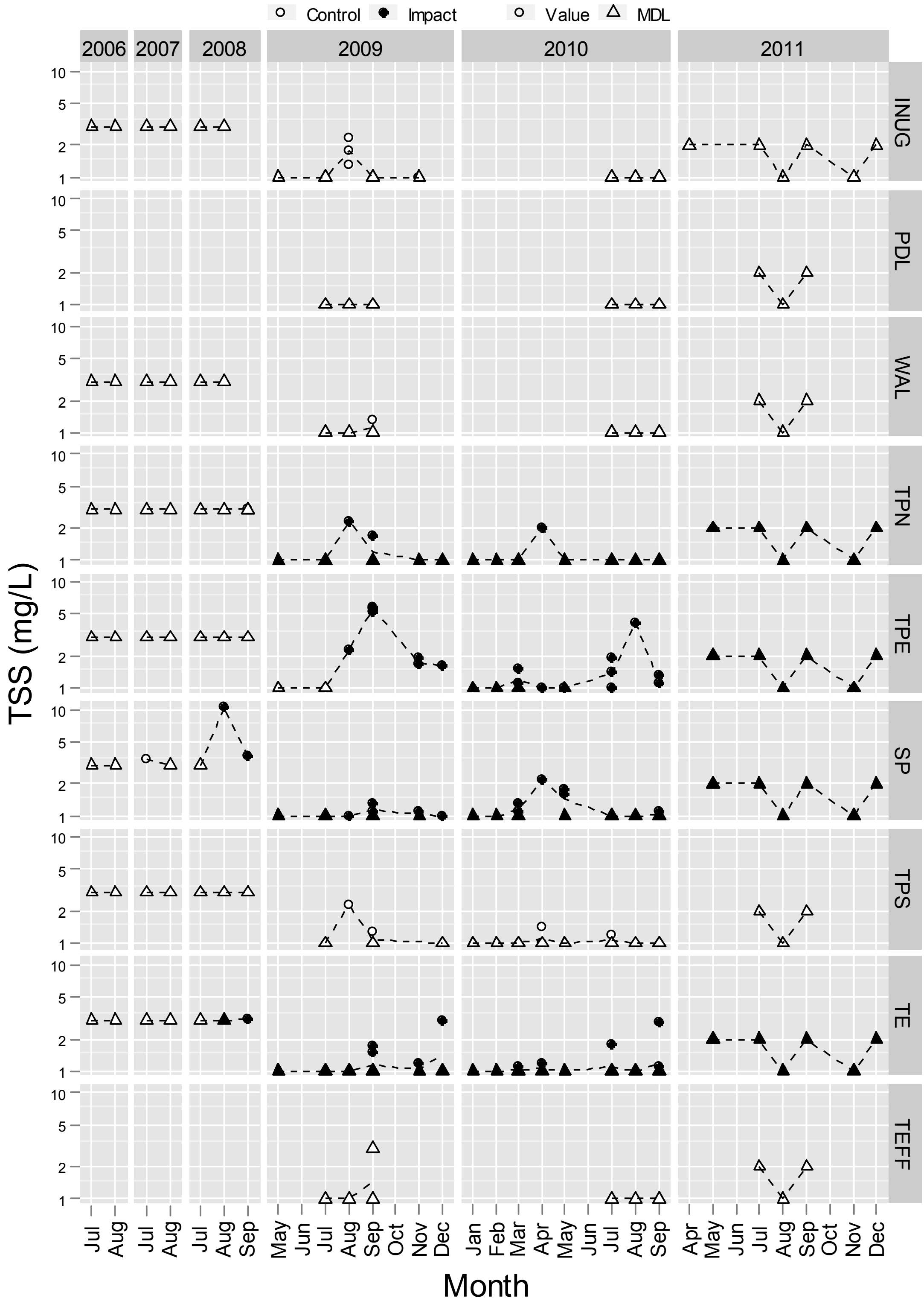


**Figure 3.3- 3.** Total Aluminum (mg/L) in water samples from CREMP monitoring at Meadowbank study lakes since 2006 (relevant sampling areas for EEM are TPN, INUG, PDL, and TPS).

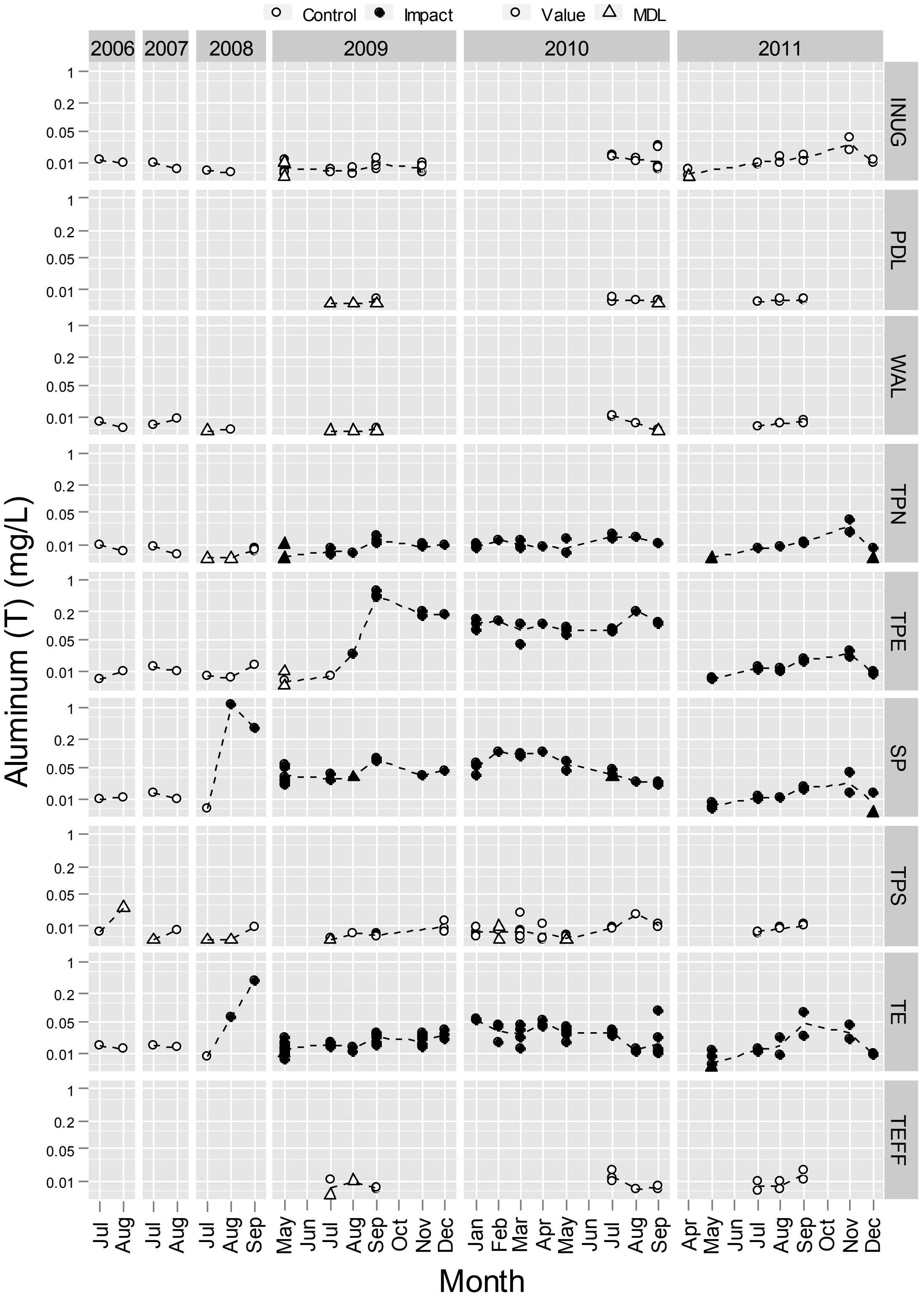


**Figure 3.3- 4.** pH in water samples from CREMP monitoring at Meadowbank study lakes since 2006 (relevant sampling areas for EEM are TPN, INUG, PDL, and TPS).

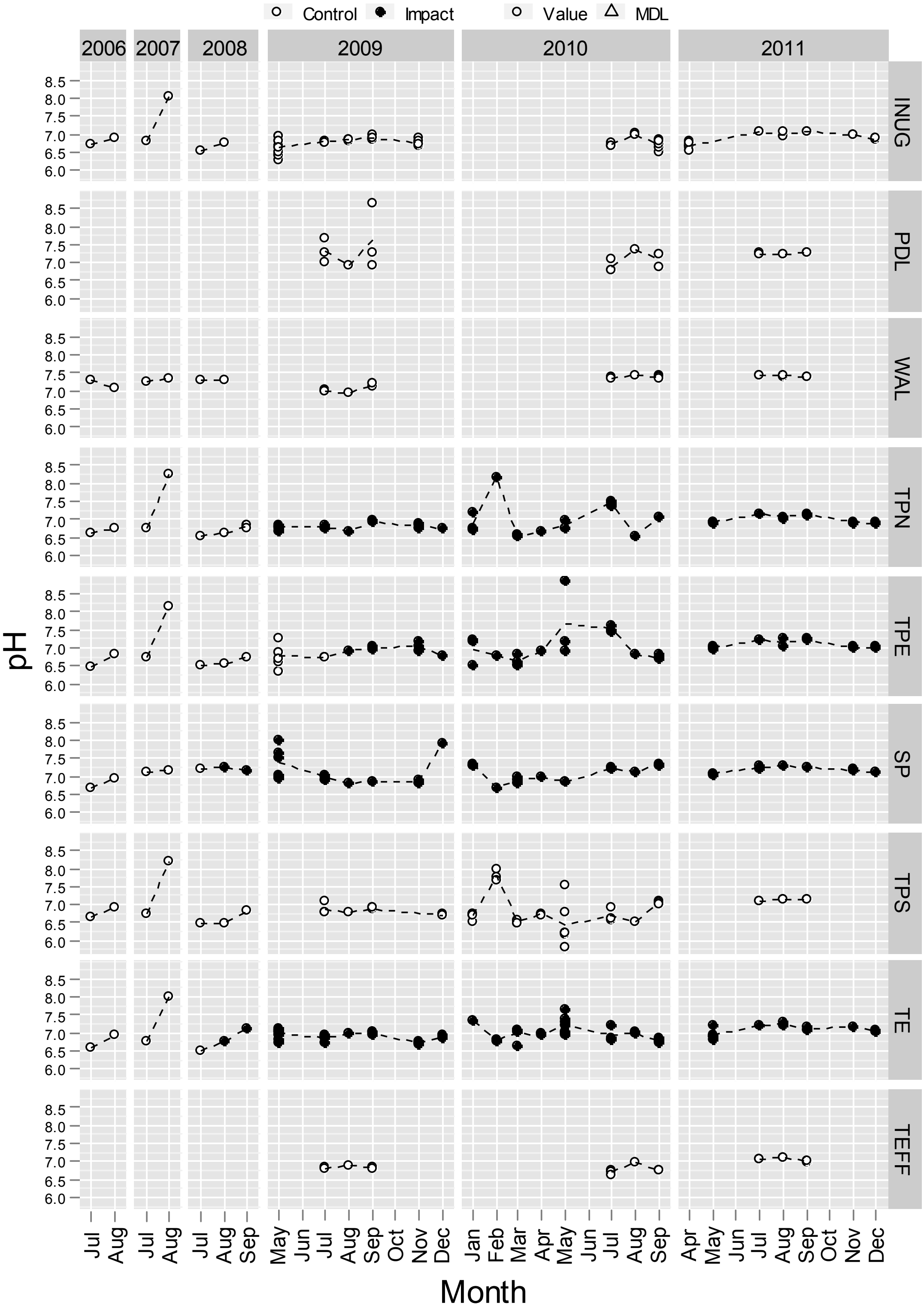


**Figure 3.3- 5.** Total Copper (mg/L) in water samples from CREMP monitoring at Meadowbank study lakes since 2006 (relevant sampling areas for EEM are TPN, INUG, PDL, and TPS).

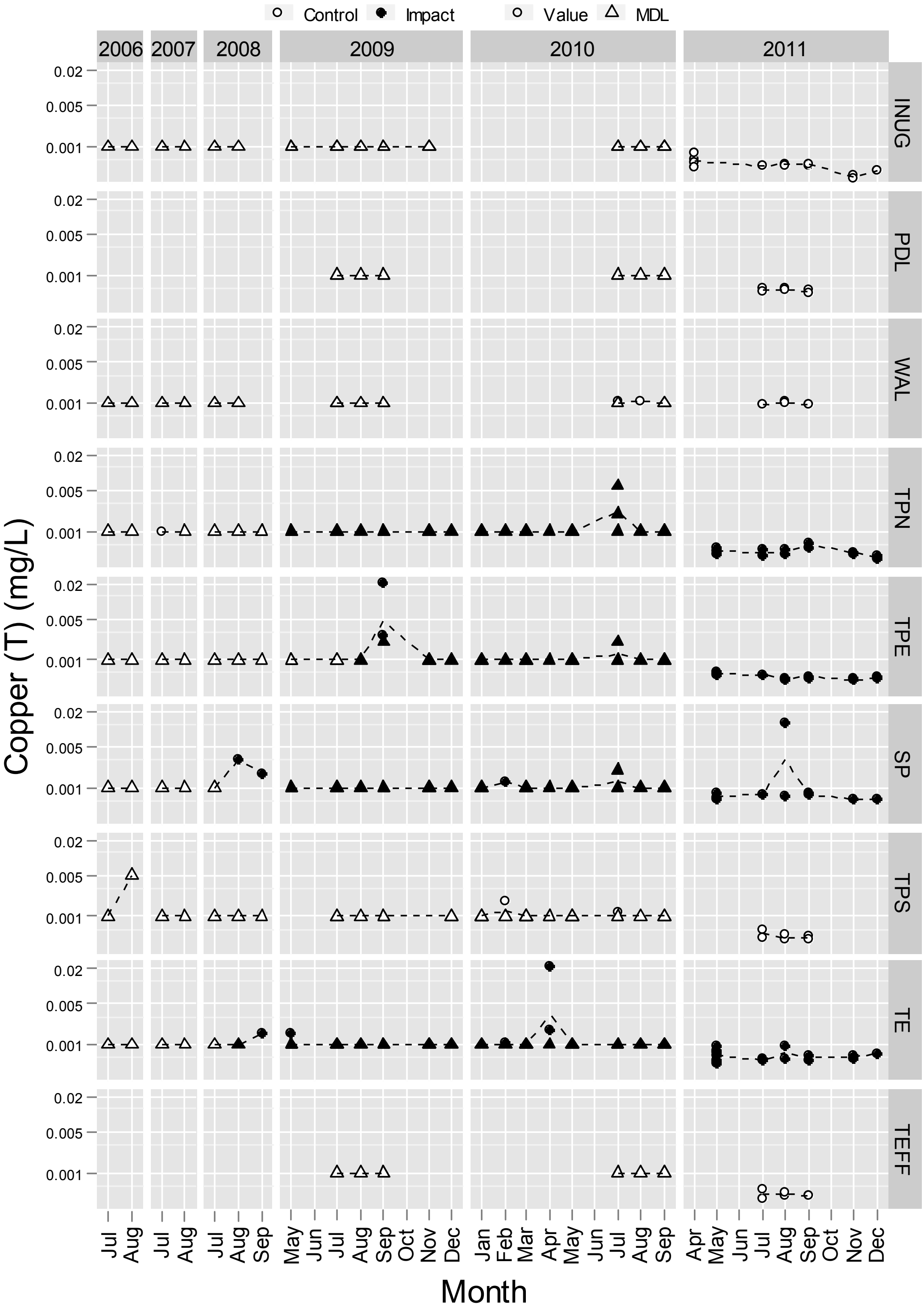
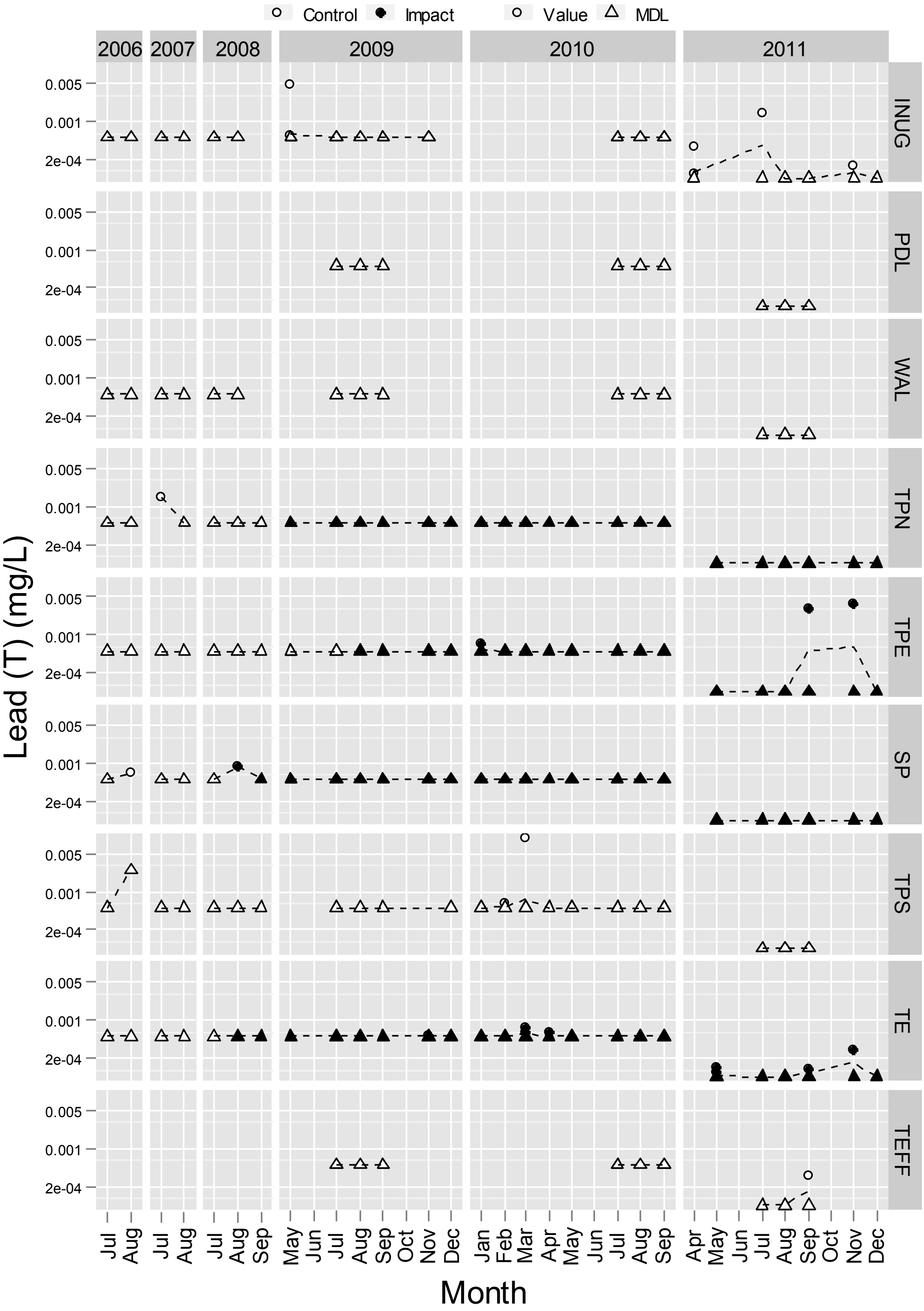
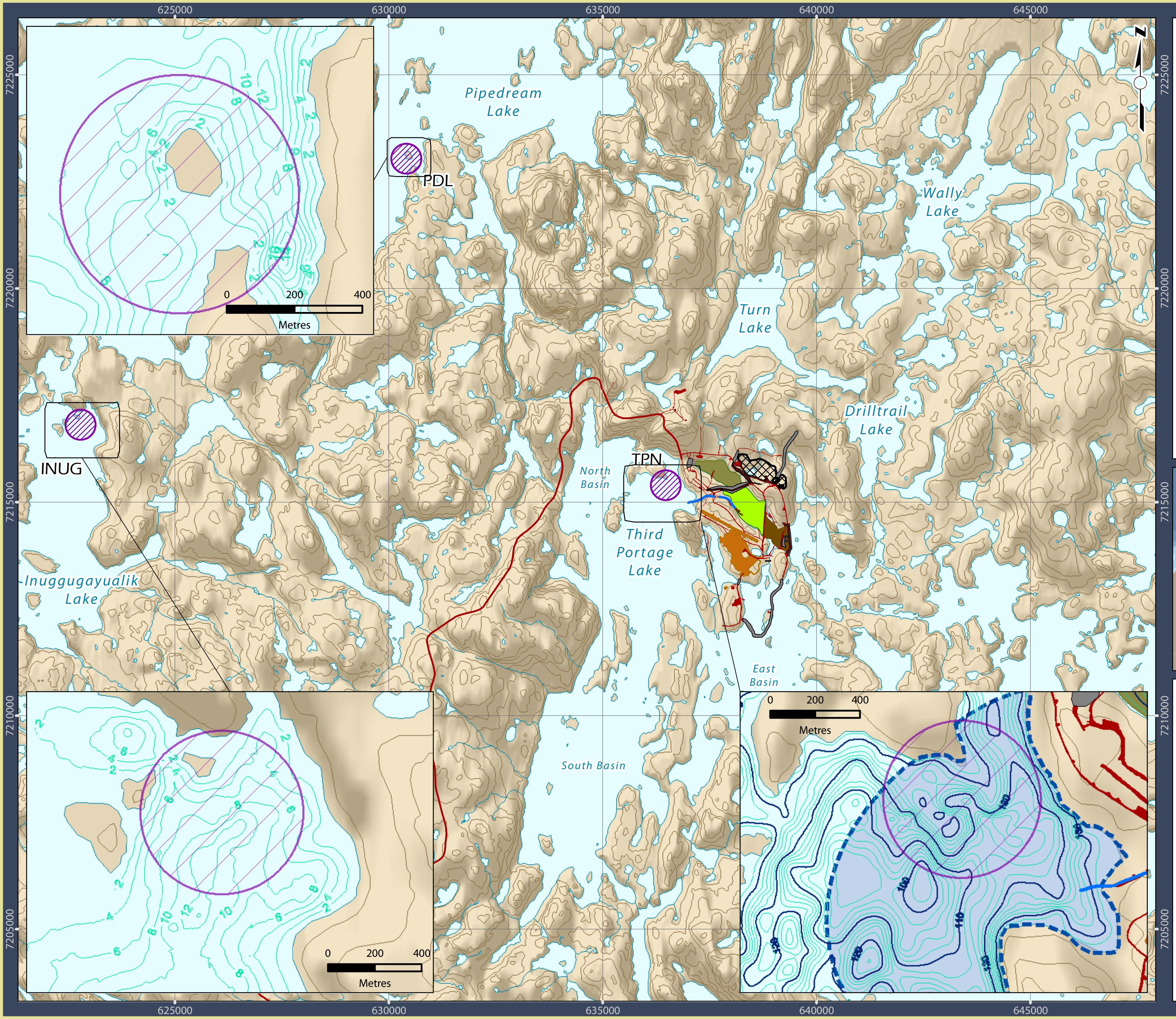


**Figure 3.3- 6.** Total Lead (mg/L) in water samples from CREMP monitoring at Meadowbank study lakes since 2006 (relevant sampling areas for EEM are TPN, INUG, PDL, and TPS).





# Figure 3.3-7. EEM Sediment and Benthos Sampling Areas

**Legend**

- Bathymetry 2m *
- Bathymetry 10m **
- All Weather Private Access Road
- ▨ EEM/CREMP Sampling Area
- Effluent Discharge (Dewatering Pipeline)
- 🟧 Facilities
- 🟥 Road
- ⬜ Dike
- ▩ Waste Dump
- 🟫 Dewatered Lake
- 🟩 Portage Attenuation Facility
- 🟩 Tailings Storage Facility
- 1% Effluent Exposure Area Delineation

* 2m depth = below lake surface
** 10m depth = above sea level

0 1 2 3
Kilometres

**Projection:** UTM Zone 14 NAD83

**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

## Meadowbank Gold Project

Prepared for:
AGNICO-EAGLE

By:
CASLYS CONSULTING

# 4. FISH SURVEY

## 4.1. Sample Collection

Fish were collected from each of the three sampling areas (INUG, PDL, and TPN) from August 11–18th, 2011. Sampling locations (UTM coordinates) and dates are presented in **Table 4.1-1** and gillnet sets locations are illustrated in **Figure 4.1-1**.

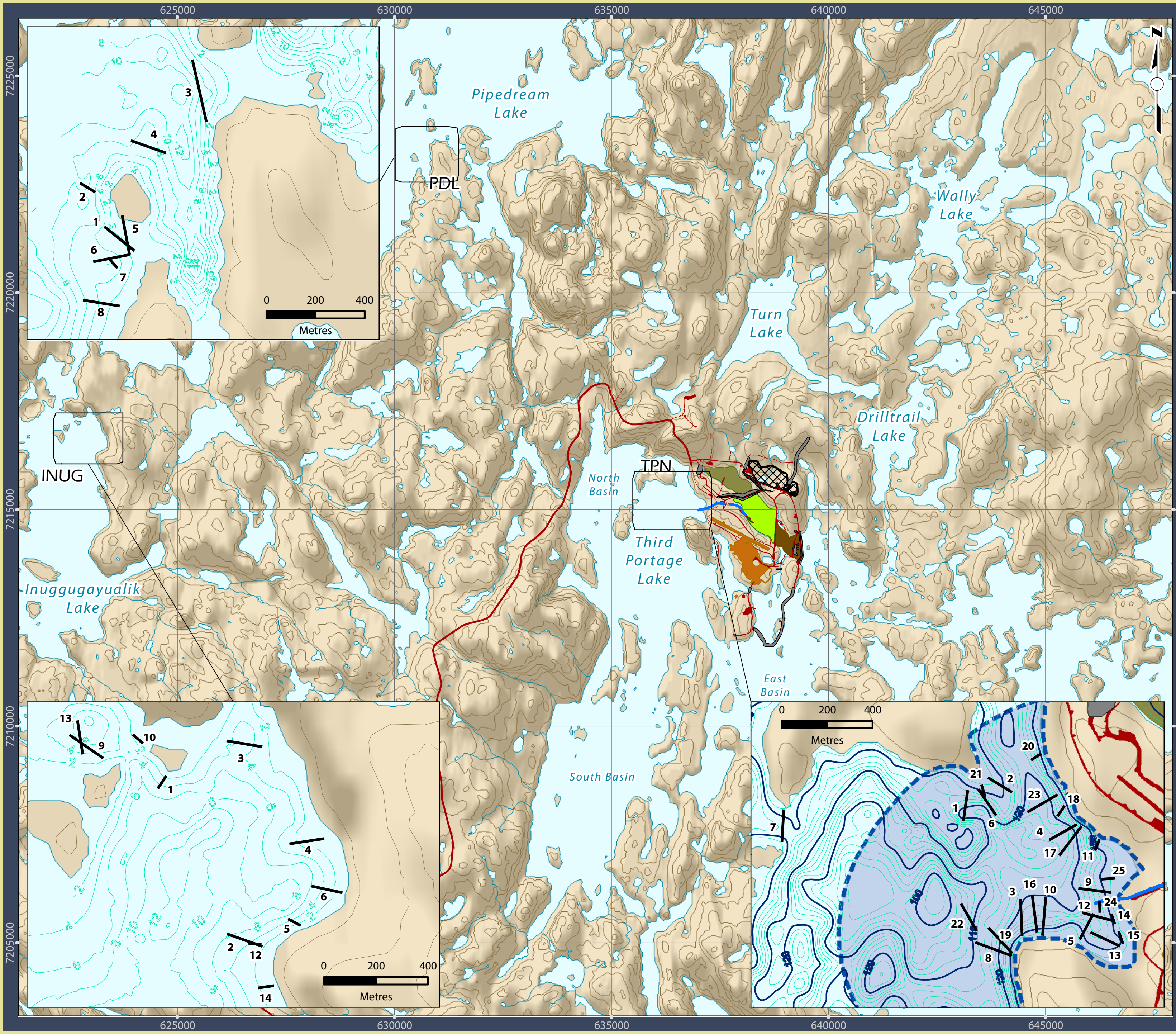
All fish were collected and analyzed according to the guidelines of the fish sampling SOP (**Appendix F**) and according to the QA/QC procedures presented in the Study Design document (Azimuth, 2011). Field and field laboratory data sheets from August 2011 are presented in **Appendix G**. Fish catch summary statistics are discussed and presented in **Section 4.3**.

**Table 4.1- 1.** Fish sampling areas: gillnet locations (UTM coordinates, NAD83) (2 pages; see notes at bottom of table).

| Area[1] | Net ID | Sampling Date | Point A | | Point B | |
|---|---|---|---|---|---|---|
| | | | Latitude (dd.mm.ss.s) | Longitude (dd.mm.ss.s) | Latitude (dd.mm.ss.s) | Longitude (dd.mm.ss.s) |
| INUG | 1 | 16-Aug-11 | 65 03 12.4 | 96 23 32.8 | 65 03 10.9 | 96 23 35.5 |
| | 2 | 16-Aug-11 | 65 02 50.7 | 96 23 06.6 | 65 02 52.5 | 96 23 17.0 |
| | 3 | 17-Aug-11 | 65 03 15.5 | 96 23 04.2 | 65 03 16.5 | 96 23 14.7 |
| | 4 | 17-Aug-11 | 65 03 03.8 | 96 22 47.2 | 65 03 03.3 | 96 22 57.5 |
| | 5 | 17-Aug-11 | 65 02 53.1 | 96 22 55.2 | 65 02 54.0 | 96 22 58.8 |
| | 6 | 17-Aug-11 | 65 02 57.0 | 96 22 42.5 | 65 02 58.0 | 96 22 51.5 |
| | 7 | 17-Aug-11 | 65 02 30.6 | 96 23 02.4 | 65 02 33.2 | 96 23 02.4 |
| | 8 | 17-Aug-11 | 65 02 36.9 | 96 22 57.8 | 65 02 37.1 | 96 23 01.1 |
| | 9 | 18-Aug-11 | 65 03 14.9 | 96 23 51.0 | 65 03 18.0 | 96 24 00.8 |
| | 10 | 18-Aug-11 | 65 03 16.6 | 96 23 39.3 | 65 03 17.7 | 96 23 42.1 |
| | 11 | 18-Aug-11 | 65 02 34.7 | 96 22 54.2 | 65 02 34.7 | 96 23 05.8 |
| | 12 | 18-Aug-11 | 65 02 51.0 | 96 23 06.9 | 65 02 51.2 | 96 23 10.8 |
| | 13 | 18-Aug-11 | 65 03 15.5 | 96 23 57.1 | 65 03 19.7 | 96 23 58.2 |
| | 14 | 18-Aug-11 | 65 02 45.8 | 96 23 03.7 | 65 02 45.6 | 96 23 08.5 |
| PDL | 1 | 16-Aug-11 | 65 06 14.4 | 96 13 18.2 | 65 06 17.7 | 96 13 27.2 |
| | 2 | 16-Aug-11 | 65 06 22.3 | 96 13 29.6 | 65 06 23.6 | 96 13 34.2 |
| | 3 | 17-Aug-11 | 65 06 30.9 | 96 12 53.9 | 65 06 39.2 | 96 12 57.4 |
| | 4 | 17-Aug-11 | 65 06 27.0 | 96 13 07.0 | 65 06 28.9 | 96 13 17.7 |
| | 5 | 18-Aug-11 | 65 06 19.1 | 96 13 21.5 | 65 06 13.9 | 96 13 19.8 |
| | 6 | 18-Aug-11 | 65 06 13.9 | 96 13 19.8 | 65 06 13.1 | 96 13 31.1 |
| | 7 | 18-Aug-11 | 65 06 12.1 | 96 13 23.7 | 65 06 13.6 | 96 13 26.5 |
| | 8 | 18-Aug-11 | 65 06 07.1 | 96 13 23.5 | 65 06 08.1 | 96 13 34.9 |

| Area[1] | Net ID | Sampling Date | Point A | | Point B | |
|---|---|---|---|---|---|---|
| | | | Latitude (dd.mm.ss.s) | Longitude (dd.mm.ss.s) | Latitude (dd.mm.ss.s) | Longitude (dd.mm.ss.s) |
| TPN | 1 | 11-Aug-11 | 65 02 06.0 | 96 06 07.6 | 65 02 01.7 | 96 06 09.5 |
| | 2 | 11-Aug-11 | 65 02 07.7 | 96 06 00.6 | 65 02 05.4 | 96 05 52.7 |
| | 3 | 11-Aug-11 | 65 01 45.0 | 96 05 51.5 | 65 01 50.2 | 96 05 51.5 |
| | 4 | 11-Aug-11 | 65 02 00.4 | 96 05 31.4 | 65 01 58.4 | 96 05 40.9 |
| | 5 | 12-Aug-11 | 65 01 44.1 | 96 05 32.2 | 65 01 47.7 | 96 05 27.2 |
| | 6 | 12-Aug-11 | 65 02 06.1 | 96 06 04.0 | 65 02 02.3 | 96 05 58.3 |
| | 7 | 13-Aug-11 | 65 02 04.5 | 96 07 09.5 | 65 01 59.9 | 96 07 10.7 |
| | 8 | 13-Aug-11 | 65 01 42.2 | 96 05 55.3 | 65 01 44.4 | 96 06 07.3 |
| | 9 | 13-Aug-11 | 65 01 50.5 | 96 05 21.0 | 65 01 51.3 | 96 05 31.9 |
| | 10 | 13-Aug-11 | 65 01 44.9 | 96 05 44.6 | 65 01 50.3 | 96 05 42.9 |
| | 11 | 13-Aug-11 | 65 01 56.6 | 96 05 25.7 | 65 01 58.2 | 96 05 24.0 |
| | 12 | 14-Aug-11 | 65 01 46.5 | 96 05 20.6 | 65 01 47.9 | 96 05 30.9 |
| | 13 | 14-Aug-11 | 65 01 42.9 | 96 05 18.7 | 65 01 45.0 | 96 05 28.5 |
| | 14 | 14-Aug-11 | 65 01 47.5 | 96 05 21.2 | 65 01 46.0 | 96 05 20.2 |
| | 15 | 14-Aug-11 | 65 01 45.0 | 96 05 19.0 | 65 01 43.1 | 96 05 17.6 |
| | 16 | 14-Aug-11 | 65 01 45.3 | 96 05 46.5 | 65 01 50.8 | 96 05 47.5 |
| | 17 | 14-Aug-11 | 65 02 00.2 | 96 05 29.8 | 65 01 56.1 | 96 05 37.7 |
| | 18 | 14-Aug-11 | 65 02 03.2 | 96 05 35.2 | 65 02 01.7 | 96 05 37.8 |
| | 19 | 14-Aug-11 | 65 01 42.5 | 96 05 55.1 | 65 01 46.4 | 96 06 02.7 |
| | 20 | 15-Aug-11 | 65 02 10.8 | 96 05 42.2 | 65 02 09.9 | 96 05 45.8 |
| | 21 | 15-Aug-11 | 65 02 06.7 | 96 06 02.8 | 65 02 04.9 | 96 06 01.8 |
| | 22 | 15-Aug-11 | 65 01 45.9 | 96 06 06.7 | 65 01 49.9 | 96 06 11.5 |
| | 23 | 15-Aug-11 | 65 02 04.8 | 96 05 37.4 | 65 02 02.5 | 96 05 47.8 |
| | 24 | 15-Aug-11 | 65 01 49.4 | 96 05 25.0 | 65 01 47.7 | 96 05 25.0 |
| | 25 | 15-Aug-11 | 65 01 52.5 | 96 05 19.5 | 65 01 52.5 | 96 05 24.1 |

**Notes**: [1] Areas are as follows: TPN=Third Portage Lake - North; INUG=Inuggugayualik Lake; PDL=Pipedream Lake.



# Figure 4.1-1. EEM Fish Sampling Areas

**Legend**

- Bathymetry 2m *
- Bathymetry 10m **
- All Weather Private Access Road
- EEM Gillnet location
- Effluent Discharge (Dewatering Pipeline)
- 🟧 Facilities
- 🟥 Road
- ⬜ Dike
- ▨ Waste Dump
- 🟫 Dewatered Lake
- 🟩 Portage Attenuation Facility
- 🟩 Tailings Storage Facility
- 1% Effluent Exposure Area Delineation

* 2m depth = below lake surface
** 10m depth = above sea level

**Area of Detail**

0 1 2 3
Kilometres

**Projection:** UTM Zone 14 NAD83

**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
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## 4.2. QA/QC

The fish sampling SOP (**Appendix F**) was developed to ensure that the data quality objectives stipulated in the Study Design (Azimuth, 2011) were met. Two senior scientists were on site for the first week of the program to tailor the SOP (with any last minute modifications needed to adapt to the specific situation encountered in the field) and to ensure that its contents were all well understood by the experienced field crew.

In addition to the detailed SOP, the primary QA method in the field involved the completion of data sheets to provide a record and hard copy of relevant observations and to ensure that all relevant information was collected in the field. Reliable sample tracking, logging, and data recording was practiced and documented to establish continuity between the sample collected and the results reported. Raw fish data as entered into excel (e.g., database), is presented in **Appendix H**.

Although much of the survey information is collected while in the field, variables such as gonad and liver weights and fecundity/egg size were determined at an on-site “laboratory” facility. Again, in addition to the detailed SOP, data sheets were used to ensure that all relevant information was properly collected and recorded for each fish, along with any specific comments (**Appendix G**). Weight scales were selected for appropriate precision and tested (and calibrated if needed) for accuracy prior to their use and periodically through the study.

Finally, all fish otoliths and pectoral fin rays were sent to North South Consultants (Winnipeg, MB) for ageing analysis. Regardless of the preparation method used, all structures were viewed a minimum of two times, and, if consistency was not met between the first two reads, a third was undertaken. If consistency could not be accomplished within three reads the structure was deemed un-ageable and no age was assigned. All readings were conducted as “blind” (independent from each other). A minimum of 10 % QA/QC was then performed on the structures. Over 75% of the repeat age determinations were the same as the final age determinations (**Table 4.2-1**), and of the remaining repeats, RPD values were always less than 11% (i.e., final and repeat age determination did not differ by more than 2 years; in most cases they differed by only 1 year). Raw fish ageing data is presented in **Appendix I**.

Overall, the quality assurance measures stipulated in the Study Design were implemented and the data quality of the resulting fish data set is considered appropriate for this EEM study.

**Table 4.2- 1.** QA/QC data from fish ageing analysis (2 pages; see notes at bottom of table).

| Fish Species | Age Structure | Sample ID | Final Age Determination (yrs) | Repeat Age Determination (yrs) | RPD (%) |
|---|---|---|---|---|---|
| ARCH | OT | INUG-07-15 | 5 | 5 | 0 |
| LKTR | OT | INUG-02-05 | 8 | 8 | 0 |
| LKTR | OT | INUG-05-07 | 23 | 24 | -4.3 |
| LKTR | OT | INUG-07-12 | 8 | 8 | 0 |
| LKTR | OT | INUG-13-17 | 20 | 19 | 5.1 |
| RNWH | OT | INUG-01-15 | 9 | 9 | 0 |
| RNWH | OT | INUG-08-04 | 16 | 16 | 0 |
| RNWH | OT | INUG-13-14 | 15 | 14 | 6.9 |
| ARCH | OT | TPN-25-03 | 5 | 5 | 0 |
| ARCH | OT | TPN-10-03 | 3 | 3 | 0 |
| LKTR | OT | TPN-06-21 | 6 | 6 | 0 |
| LKTR | OT | TPN-10-22 | 18 | 19 | -5.4 |
| LKTR | OT | TPN-16-12 | 22 | 22 | 0 |
| LKTR | OT | TPN-24-05 | 29 | 28 | 3.5 |
| ARCH | OT | PDL-03-06 | 6 | 6 | 0 |
| LKTR | OT | PDL-02-01 | 10 | 10 | 0 |
| LKTR | OT | PDL-03-15 | 22 | 22 | 0 |
| LKTR | OT | PDL-04-12 | 6 | 6 | 0 |
| RNWH | OT | PDL-01-08 | 12 | 12 | 0 |
| RNWH | OT | PDL-03-18 | 16 | 15 | 6.5 |
| LKTR | FR | INUG-01-09 | 5 | 5 | 0 |
| LKTR | FR | INUG-05-05 | 15 | 15 | 0 |
| LKTR | FR | INUG-08-17 | 16 | 17 | -6.1 |
| LKTR | FR | INUG-14-01 | 5 | 5 | 0 |
| RNWH | FR | INUG-01-14 | 8 | 8 | 0 |
| RNWH | FR | INUG-01-21 | 14 | 14 | 0 |
| RNWH | FR | INUG-08-11 | 12 | 12 | 0 |
| RNWH | FR | INUG-13-12 | 14 | 14 | 0 |
| RNWH | FR | INUG-14-11 | 12 | 12 | 0 |
| ARCH | FR | TPN-10-07 | 10 | 10 | 0 |
| ARCH | FR | TPN-25-09 | 10 | 9 | 10.5 |
| ARCH | FR | TPN-06-11 | 8 | 8 | 0 |
| ARCH | FR | TPN-10-04 | 2 | 2 | 0 |

| Fish Species | Age Structure | Sample ID | Final Age Determination (yrs) | Repeat Age Determination (yrs) | RPD (%) |
|---|---|---|---|---|---|
| LKTR | FR | TPN-02-02 | 11 | 11 | 0 |
| LKTR | FR | TPN-05-14 | 3 | 3 | 0 |
| LKTR | FR | TPN-05-20 | 21 | 22 | -4.7 |
| LKTR | FR | TPN-06-29 | 14 | 14 | 0 |
| LKTR | FR | TPN-11-04 | 5 | 5 | 0 |
| LKTR | FR | TPN-16-15 | 18 | 18 | 0 |
| LKTR | FR | TPN-24-01 | 6 | 6 | 0 |
| LKTR | FR | TPN-05-01 | 10 | 9 | 10.5 |
| LKTR | FR | TPN-06-02 | 15 | 15 | 0 |
| LKTR | FR | TPN-10-09 | 4 | 4 | 0 |
| LKTR | FR | TPN-11-01 | 5 | 5 | 0 |
| LKTR | FR | TPN-16-14 | 11 | 10 | 9.5 |
| LKTR | FR | TPN-25-01 | 9 | 9 | 0 |
| RNWH | FR | TPN-11-06 | 14 | 14 | 0 |
| LKTR | FR | PDL-04-02 | 20 | 21 | -4.9 |
| LKTR | FR | PDL-08-04 | 6 | 6 | 0 |
| LKTR | FR | PDL-03-03 | 5 | 5 | 0 |
| LKTR | FR | PDL-04-04 | 16 | 16 | 0 |
| LKTR | FR | PDL-08-05 | 4 | 4 | 0 |
| RNWH | FR | PDL-01-07 | 8 | 8 | 0 |
| RNWH | FR | PDL-03-18 | 12 | 11 | 8.7 |
| ARCH | FR | INUG-02-13 | 4 | 4 | 0 |
| LKTR | FR | INUG-02-09 | 14 | 14 | 0 |
| LKTR | FR | INUG-06-01 | 5 | 5 | 0 |
| LKTR | FR | INUG-08-03 | 13 | 13 | 0 |
| LKTR | FR | INUG-13-11 | 14 | 14 | 0 |
| LKTR | FR | INUG-14-12 | 20 | 22 | -9.5 |

**Notes**: RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100; ARCH: Arctic char; LKTR: lake trout; RNWH: round whitefish; OT = otolith; FR = pectoral fin ray.

## 4.3. Data Assessment

### 4.3.1. Catch Summary and Target Endpoints

As described in **Section 2.3**, the fish survey had targeted non-lethal sampling of lake trout (*Salvelinus namaycush*) and lethal sampling of round whitefish (*Prosopium cylindraceum*). However, catch (summarized in **Table 4.3-1** and **Figure 4.3-1**) was insufficient for round whitefish, and an alternative, Arctic char (*Salvelinus alpinus*), particularly at TPN.

**Figures 4.3-2 and 4.3-3** show maturity status and reproductive status (of mature fish) by species and lake (area). These figures show the paucity of appropriate data for the lethal study due to the low numbers of ripe individuals of any species. While plans were adapted to collect the full suite of lethal sampling endpoints on incidental lake trout mortalities, the final sample sizes for gonad weight (**Table 4.3-2**) or liver weight (**Table 4.3-3**) were too low across all species to make any meaningful insights regarding effluent-related effects. As shown in **Figures 4.3-4 and 4.3-5**, the low numbers for lake trout were primarily due to a large fraction of mature fish being in the resting phase. Consequently, this study focuses on non-lethal endpoints (summarized in **Table 4.3-4**) for lake trout only (note that outlier screening and summary statistics are shown for all three species).

In support of future studies, lake trout incidental mortality status is shown by gillnet panel mesh size (**Figures 4.3-6**), gillnet set type (i.e., day or night; **Figures 4.3-7**) and fork length (**Figure 4.3-8**). Overall, incidental mortality rates were higher than expected across all mesh sizes. There was a general pattern of relatively lower mortality rates with smaller and larger mesh sizes, but the pattern was not consistent across lakes. Not unexpectedly, mortality rates were higher for the longer overnight sets (n.b., catch was also substantially higher during the overnight sets). In general, it also appears that incidental mortality rates decrease with increasing fork length. These results will be discussed further in **Section 7**.

### 4.3.2. Data Quality and Outlier Identification

Data quality procedures outlined in the Study Design (Azimuth, 2011) were followed to minimize errors in the fish survey results. Notwithstanding the use of rigorous recording and transcription procedures, the data were carefully screened to identify outliers by examining the condition (k) distribution (**Figure 4.3-9**) and body weight-length relationships (**Figure 4.3-10**) by species and lake.

The following outliers were identified:

1) Five fish were removed from the data set for incomplete measurements (generally very small fish with no reliable weight or age structure result).
2) Eleven fish were removed from the data set for either abnormally low [k<0.75] or high [k>1.4] condition and are presumed due to errors in recording of length or weight. These are clearly shown in **Figure 4.3-10**.

A summary of outliers by species and lake is shown in **Table 4.3-5**. Updated catch results without outliers is shown in **Table 4.3-6**.

### 4.3.3. Summary Statistics

Key variables used to assess the non-lethal endpoints (see **Table 4.3-4**) include:

- Fork length (mm)
- Body weight (g)
- Age – pectoral fin (yrs)
- Age – otolith (yrs)

Summary statistics by species and area are shown in **Table 4.3-7**. Summary statistics for the opportunistically-collected lethal parameters are shown in **Appendix J**.

### 4.3.4. Visual Fish Condition

Results for external and internal visual fish condition observations are shown in **Table 4.3-8**. Key results for lake trout were:

- Similar rates of external (DELT[10]) abnormalities across lakes.
- No external parasites were found at all
- Minor internal abnormalities in two fish from TPN
- Internal parasite loads were similar at TPN and PDL; INUG were higher

Overall, no major differences in lake trout external or internal condition were observed among areas. No conclusions can be drawn from the round whitefish and Arctic char observations due to the limited sample sizes.

### 4.3.5. Modification of Age Variables for Statistical Analyses

As described in the Study Design (Azimuth, 2011), lake trout ages derived from pectoral fin rays, particularly for older fish, are less reliable than ages derived from otoliths. Consequently, age estimates from both structures were made on incidental mortalities in an effort to determine the reliability of estimates based on pectoral fin rays.

The breakdown of age structure collection by species and area is shown in **Table 4.3-9**. For lake trout, both ageing structures (i.e., "PEC/OTO") were collected for 134 fish (126 lake trout had age estimated from pectoral fin rays only). Given the higher than expected incidental lake trout mortalities and the resulting larger data set, sufficient data were available to determine the

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[10] DELT is a detailed visual examination focusing on specific deformities, morbidities or abnormalities present externally (i.e., deformities, erosions, lesions and tumors). We use the term herein to also describe the internal fish health examinations.

statistical relationship between the two ageing methods. This relationship could then be used to correct the pectoral fin ray ages.

The raw (i.e., unstransformed) relationship between PEC-based and OTO-based age estimates is shown in **Figure 4.3-11** relative to a 1:1 relationship (red dashed line). Overall, the PEC-based age estimates are biased about 5 years lower than the OTO-based ages. There was a pattern of increasing variance with increasing age, so variables were sqrt(x+0.5)-transformed to run the final linear regression model. The final model used to correct PEC-based age estimates to be consistent with OTO-based age estimates was:

$$\text{Age}_{\text{OTOpred}} = (0.966 + (0.915*(\text{PEC}+0.5)^{\ 0.5}))^2 - 0.5$$

$$p<0.001 \qquad \text{Adjusted R-squared: } 0.77$$

The corrected PEC age estimates were used in all subsequent analyses.

### 4.3.6. Statistical Analyses

As described in **Section 2.2** and shown in **Figure 2.2-1**, a hierarchical approach was used to test for statistical differences among sampling areas. Initial analyses were conducted to test for differences between the pooled reference areas (i.e., INUG and PDL pooled as “REF” for reference) and TPN (as “EXP” for exposure); this is hereafter referred to as “C-I” (or “CI-based”). If statistical differences were identified, then analyses would test for differences among areas (i.e., testing to see if TPN is different from both INUG and PDL) (referred to hereafter as “area-based”).

The statistical procedures recommended by the EEM technical guidance document (Environment Canada, 2012) are shown in **Table 4.3-10**. The fish survey data from the non-lethal lake trout study has two statistical analyses: analysis of covariance (ANCOVA) and the two-sample Kolmogorov-Smirnov (K-S) test. These analyses are described in more detail in the following sections.

#### *4.3.6.1. ANCOVA*

As discussed in the EEM technical guidance document (Environment Canada, 2012), analysis of covariance (ANCOVA) has four key assumptions:

- The relationship between the response and covariate is linear;
- The slopes of the regression lines among areas are parallel;
- The covariate is fixed and measured without error; and
- The residuals are normally distributed and independently distributed with zero mean and a common variance.

The steps followed for endpoints analyzed using ANCOVA were:

1) Plot the relationships between response variable (e.g., weight for the condition endpoint) and covariate (e.g., length for the condition endpoint), highlighting C – I groups.

2) Examine residuals graphically to determine the need for transformations.
3) Conduct linear regression analysis of relationship for each group (C, I) to ensure that the underlying relationships are linear for both groups.
4) Run ANCOVA model with interaction term to assess whether slopes can be assumed parallel between groups (slopes assumed parallel if p>0.05 for interaction term).
5) If slopes are parallel, then run ANCOVA model without interaction to determine whether the intercepts differ significantly by group (C, I).
6) Examine final ANCOVA model residuals graphically to check for underlying patterns that would violate model assumptions of normality and homogeneity of variance.
7) Covariate data were centered (at fork length = 500 mm or age = 20 years) and the ANCOVA model re-run to compute meaningful least squares mean (LSM) estimates for each group (n.b., centering a covariate does not change the other general model results). These were then back-transformed to estimate effect size in the I group relative to the C group.

CI-Based ANCOVA results are presented in **Table 4.3-11**; an overview by endpoint is provided below.

*Growth (body weight against age)*

- Response variable and covariate were both log-transformed (**Figure 4.3-12**) based on visual examination of the variables in untransformed, log-linear, and log-log space. While age usually does not require transformation, there was a distinct curvature to the residuals when only body weight was log-transformed.
- The linear regressions models fit for each group (C and I) were highly significant (**Table 4.3-11**), explaining over 85% of the variability in each of the groups.
- The interaction term was not statistically significant (p=0.48), so the slopes were assumed parallel.
- There was no significant difference between C and I intercepts (p=0.21).
- Visual observations of ANCOVA model residuals showed no major departures from model assumptions.
- The observed effect size based on the modeled means was 1.3%

*Growth (fork length against age)*

- Response variable and covariate were both log-transformed (**Figure 4.3-13**) based on visual examination of the variables in untransformed, log-linear, and log-log space. As mentioned above, there was a distinct curvature to the residuals when age was not transformed.

- The linear regressions models fit for each group (C and I) were highly significant (**Table 4.3-11**), explaining over 85% of the variability in each of the groups.
- The interaction term was not statistically significant (p=0.44), so the slopes were assumed parallel.
- There was no significant difference between C and I intercepts (p=0.11).
- Visual observations of ANCOVA model residuals showed no major departures from model assumptions.
- The observed effect size based on the modeled means was 0.8%

*Condition (body weight against fork length)*

- Response variable and covariate were both log-transformed (**Figure 4.3-14**) based on visual examination of the variables in untransformed and log-log space.
- The linear regressions models fit for each group (C and I) were highly significant (**Table 4.3-11**), explaining over 99% of the variability in each of the groups.
- The interaction term was not statistically significant (p=0.08), but it was marginal. The assumption of slope equality in this case is fairly robust given that the actual slopes of the individual regressions were 3.05 and 3.00 (only a 1.7% slope difference in I relative to C).
- There was no significant difference between C and I intercepts (p=0.45).
- Visual observations of ANCOVA model residuals showed no major departures from model assumptions.
- The observed effect size based on the modeled means was -0.9%.

Given that no differences were found in the CI-based ANCOVA analyses, no area-based ANCOVA analyses were conducted.

### 4.3.6.2. Kolmogorov-Smirnov (K-S) Test

The Kolmogorov-Smirnov (K-S) test is a non-parametric test for equality of continuous, one-dimensional probability distributions. While the one-sample version of the test can be used to compare a sample to a reference probability distribution, the two-sample test recommended by the EEM TGD (Environment Canada, 2012) compares two sample distributions. As shown in **Table 4.3-10**, this statistical test was used to determine whether the length (or age) frequency distributions differed significantly between C and I groups.

The steps followed for endpoints analyzed using the K-S test were:

1) Estimated the empirical cumulative density function (ECDF) for each group (C-I).

2) Plotted the cumulative frequency distribution and density function for each group.
3) Conducted the two-sample K-S test (two-sided).

The results are presented below for each distribution type.

*Length Frequency Distribution*

- Cumulative frequency (**Figure 4.3-15**) and density (**Figure 4.3-16**) plots for fork length show similar distributions. Both the C and I areas show the “classic” bimodal size distribution seen in Arctic lakes[11].
- The K-S test showed no significant difference between the two length frequency distributions (D=0.138, p=0.173).

*Age Frequency Distribution*

- Cumulative frequency (**Figure 4.3-17**) and density (**Figure 4.3-18**) plots for age show similar distributions. Again, both the C and I areas show the anticipated bimodal size distribution.
- The K-S test showed no significant difference between the two age frequency distributions (D=0.142, p=0.173).

### 4.3.7. Post-hoc Assessment of Power and Confidence

This section examines results of statistical analyses with the intent of providing insights into the degree of confidence of their conclusions. This is typically done in different ways for each statistical procedure, but essentially focuses on understanding the degree of uncertainty (e.g., using 95% confidence intervals) for observed effect size estimates in the context of the EEM-recommended critical effect size (CES). *Post-hoc* power analyses can also provide insights for planning subsequent EEM cycles.

For endpoints analyzed using ANCOVA, the following approaches were taken:

1) Comparisons of observed effect sizes and their 95% confidence intervals to the EEM-recommended critical effect sizes (CES) to determine the confidence that the observed effects do not exceed the CES.
2) Estimation of statistical power of detecting the CES based on the executed study design.
3) Estimation of the minimum detectable effect size for the targeted statistical power of 0.9 (i.e., $\beta = 0.1$) based on the executed study design.

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[11] As discussed in the Study Design (Azimuth, 2011), the magnitude of the bimodal result is likely an artefact of gillnet sampling as the two fish out programs conducted at Meadowbank showed much higher numbers of smaller fish after all fish had been caught from two large impoundment areas. That said, bimodality of some degree is common in size frequency distributions for fish Arctic lakes (Johnson, 2002).

4) Estimation of minimum sample size required to detect the CES based on the targeted statistical power.

Key results for the ANCOVA endpoints were as follows:

- *Observed Effect Sizes* – observed effect sizes and their 95% confidence limits are shown in **Figure 4.3-19** relative to the respective EEM CES. Simulations (i.e., random generation of data based on the properties of the existing data) were used to quantitatively estimate the confidence that the observed effect size (ES) was less than the CES; confidence was high for all three ANCOVA variables (**Table 4.3-12**). As an example, **Figure 4.3-20** shows the cumulative response ratio distribution (i.e., exposure mean/reference mean) compiled from 1000 simulations; 0 cases were below the CES of 25% (0.75 in response ratio).
- *Power to Detect CES* – the statistical power equations from the EEM TGD (Environment Canada, 2012) were used to estimate power (see textbox). Power to detect the CES was high for all three endpoints (**Table 4.3-12**).
- *Minimum Effect Size for Target Power* – the statistical power equations from the EEM TGD (Environment Canada, 2012) were used to estimate minimum detectable effect size for power (1-β) = 0.9 (see textbox). The minimum detectable effect sizes were all lower than the CES (**Table 4.3-12**). The growth endpoint had the highest minimum detectable effect size at 19.1%; both condition and length-at-age had low minimum detectable effect sizes (4.4% and 5.6%, respectively).
- *Minimum Sample Size for CES with Target Power* – the statistical power equations from the EEM TGD (Environment Canada, 2012) were used to estimate minimum sample size required to detect the EEM CES with power (1-β) = 0.9 (see textbox). The minimum sample sizes ranged from 7 fish to 61 fish (**Table 4.3-12**), well below the target sample size of 100 fish for a non-lethal study.

### Post-hoc Power Analyses for ANCOVA

EEM TGD provides the following equation for determining ANCOVA power:

$$t_\beta = \sqrt{\frac{n}{2((SD_z/(CES_z)^2}} - t_\alpha$$

Where:

SDz = sqrt(mean squares error)
CESz = effect size
n = sample size
t = t value for $\beta_{(1\ \text{tail})}$ or $\alpha_{(2\ \text{tail})}$

The equation can also be solved for CES (i.e., to determine minimum effect size) or n (i.e., to determine minimum sample size).

EEM TGD provides no guidance on assessing confidence or power for the Kolmogorov-Smirnov (K-S) test used to compare the age and size frequency distributions. Unlike parametric tests like ANOVA or t-test that essentially compare means (as an indicator of magnitude) and assume that the underlying distribution is normal, the K-S test takes both distribution shape and magnitude into consideration. Unfortunately, while the concept of CES (which is based on magnitude alone) is easily applied to ANOVA, it is not apparent how it can apply to frequency distributions where both shape and magnitude are important. Consequently, we relied only on presentation of statistical confidence bands of the reference area ECDF to help provide some context for the observed results. Given that two ECDFs with minor differences will have statistically significant differences when sample size (n) is sufficiently high, this approach is limited by the lack of a pre-defined ecologically-relevant effect size (i.e., so that effects are defined in terms of ecological significance rather than statistical significance).

The confidence bands were constructed for each reference area ECDF (i.e., age or length) as follows:

1) Calculate the *Dvoretzky-Kiefer-Wolfowitz inequality* value (epsilon) using the following equation: $\varepsilon = \sqrt{\frac{1}{2n}\log\left(\frac{2}{\alpha}\right)}$. Epsilon represents the predicted difference based on sample size (n = 100) and α = 0.025 for the 95% confidence band (i.e., the band ranging from 2.5% to 97.5%).
2) Add (for upper band) or subtract (for lower band) the epsilon value from the reference ECDF to construct upper and lower confidence bands, respectively.

The resulting 95% confidence bands are shown for the age and length ECDFs in **Figure 4.3-21** and **Figure 4.3-22**, respectively. For both age and length, the exposure area ECDFs are quite close to the reference area confidence bands (e.g., ages 13 – 15 years or fork length 375 – 500 mm), highlighting a difference (i.e., the pooled reference area has more younger/smaller fish) that is not statistically significant, but reasonably close.

More insight into this pattern can be provided from looking at the ECDFs and density plots for the individual areas (**Figures 4.3-23 through 4.3-26**), which both show that TPN and INUG are quite similar (K-S test results for no significant difference for both age and length). PDL, however, shows age and length distributions that are quite different from the two other sites (K-S test results were significant [p<0.1] for the age and length distributions for both TPN-PDL and INUG-PDL). This provides more confidence from an ecological perspective that the age and length frequency distributions at TPN are not meaningfully different from both reference areas.

**Table 4.3- 1.** Catch results across area and species.

| | LKTR | RNWH | ARCH |
|---|---|---|---|
| **TPN** | 125 | 2 | 33 |
| **INUG** | 88 | 39 | 5 |
| **PDL** | 58 | 7 | 8 |

**Notes**: these catch data were calculated prior to outlier removal.

**Table 4.3- 2.** Mature fish with gonad weight measurements by sex, area and species.

| | | LKTR | RNWH | ARCH |
|---|---|---|---|---|
| **TPN** | **F** | 0 | 1 | 0 |
| | **M** | 0 | 1 | 0 |
| **INUG** | **F** | 6 | 14 | 1 |
| | **M** | 2 | 20 | 0 |
| **PDL** | **F** | 4 | 4 | 0 |
| | **M** | 3 | 2 | 0 |

**Table 4.3- 3.** Fish with liver weight measurements by sex, area and species.

| | | LKTR | RNWH | ARCH |
|---|---|---|---|---|
| **TPN** | **F** | 0 | 1 | 0 |
| | **M** | 0 | 0 | 0 |
| **INUG** | **F** | 19 | 17 | 1 |
| | **M** | 19 | 20 | 0 |
| **PDL** | **F** | 17 | 4 | 1 |
| | **M** | 13 | 3 | 2 |

**Table 4.3- 4.** Primary and supporting endpoints for non-lethal lake trout study.

| **Endpoint Type** | **Effect Indicator** | **EEM Targeted Endpoints for Non-lethal Survey** | **Non-lethal Endpoints for Meadowbank Fish Survey** | **Rationale for Difference** |
|---|---|---|---|---|
| **Primary** | Growth (*Energy Use* ) | Size (length and weight) of YOY (age 0+) at end of growth period | Size-at-age (body weight against age) | As per Study Design, YOY not targeted; endpoint selected is consistent with lethal study |
| | Reproduction (*Energy Use* ) | Relative abundance of YOY (% composition of YOY) | None | As per Study Design, YOY not targeted |
| | Condition (*Energy Storage* ) | Body weight relative to length | Body weight relative to length | No difference |
| | Survival | Length frequency distribution | Length frequency distribution | No difference |
| **Supporting** | (*Energy Use* ) | Body weight (whole) | Not used | Redundant to body wt against age used for Growth (see above) |
| | | Length | Not used | Redundant to length frequency used for survival (see above) and length against age (see below) |
| | | Size-at-age (length against age) | Size-at-age (length against age) | No difference |

**Table 4.3- 5.** Outliers across area and species.

| | LKTR | RNWH | ARCH |
|---|---|---|---|
| **TPN** | 8 | 0 | 2 |
| **INUG** | 2 | 0 | 1 |
| **PDL** | 3 | 0 | 0 |

**Table 4.3- 6.** Catch results across area and species.

| | LKTR | RNWH | ARCH |
|---|---|---|---|
| **TPN** | 117 | 2 | 31 |
| **INUG** | 86 | 39 | 4 |
| **PDL** | 55 | 7 | 8 |

**Table 4.3- 7.** Summary statistics for key variables by species and area.

| | | Fork Length (mm) | | | | | | | Body Weight (g) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **Area** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** |
| LKTR | TPN | 117 | 494 | 535 | 164 | 15 | 169 | 961 | 117 | 1652 | 1538 | 1504 | 139 | 50 | 10294 |
| LKTR | INUG | 86 | 480 | 515 | 169 | 18 | 152 | 903 | 86 | 1552 | 1435 | 1460 | 157 | 36 | 6750 |
| LKTR | PDL | 55 | 434 | 403 | 209 | 28 | 132 | 869 | 55 | 1493 | 640 | 1831 | 247 | 23 | 7600 |
| RNWH* | TPN | 2 | 372 | 372 | 16 | 12 | 360 | 383 | 2 | 584 | 584 | 48 | 34 | 550 | 618 |
| RNWH* | INUG | 39 | 374 | 382 | 40 | 6 | 241 | 430 | 39 | 545 | 570 | 158 | 25 | 126 | 884 |
| RNWH* | PDL | 7 | 358 | 377 | 56 | 21 | 247 | 412 | 7 | 571 | 564 | 237 | 89 | 158 | 838 |
| ARCH* | TPN | 31 | 351 | 302 | 160 | 29 | 126 | 604 | 31 | 728 | 294 | 819 | 147 | 20 | 2425 |
| ARCH* | INUG | 4 | 385 | 262 | 326 | 163 | 150 | 868 | 4 | 2009 | 172 | 3762 | 1881 | 40 | 7650 |
| ARCH* | PDL | 8 | 218 | 245 | 56 | 20 | 114 | 272 | 8 | 130 | 157 | 68 | 24 | 18 | 213 |

| | | Age - Pectoral Fin (yrs) | | | | | | | Age - Otolith (yrs) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **Area** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** |
| LKTR | TPN | 111 | 13.5 | 14.0 | 5.8 | 0.5 | 3 | 26 | 59 | 16.5 | 17.0 | 8.6 | 1.1 | 3 | 40 |
| LKTR | INUG | 85 | 12.8 | 14.0 | 6.8 | 0.7 | 1 | 30 | 42 | 16.1 | 17.0 | 7.6 | 1.2 | 4 | 40 |
| LKTR | PDL | 52 | 11.6 | 10.0 | 7.3 | 1.0 | 2 | 30 | 31 | 14.1 | 12.0 | 6.1 | 1.1 | 4 | 29 |
| RNWH* | TPN | 2 | 14.0 | 14.0 | 0.0 | 0.0 | 14 | 14 | 2 | 14.0 | 14.0 | 0.0 | 0.0 | 14 | 14 |
| RNWH* | INUG | 39 | 11.5 | 12.0 | 2.9 | 0.5 | 4 | 16 | 38 | 14.6 | 15.0 | 4.1 | 0.7 | 6 | 24 |
| RNWH* | PDL | 7 | 10.1 | 12.0 | 3.8 | 1.4 | 5 | 14 | 7 | 14.4 | 14.0 | 4.2 | 1.6 | 9 | 22 |
| ARCH* | TPN | 22 | 5.7 | 5.5 | 3.0 | 0.6 | 1 | 10 | 17 | 5.1 | 5.0 | 2.3 | 0.6 | 2 | 11 |
| ARCH* | INUG | 4 | 5.8 | 3.5 | 5.6 | 2.8 | 2 | 14 | 1 | 5.0 | 5.0 | -- | -- | 5 | 5 |
| ARCH* | PDL | 0 | -- | -- | -- | -- | -- | -- | 5 | 7.6 | 6.0 | 2.7 | 1.2 | 5 | 11 |

**Notes**: n = sample size; SD = standard deviation; SE = standard error; min = minimum; max = maximum; **--** = not applicable; * = non-sentinel species.

**Table 4.3- 8.** External and internal visual condition observations by area and species.

| Area | Species | External Condition | | | Internal Condition | | |
|---|---|---|---|---|---|---|---|
| | | n | DELT | Parasites | n | DELT | Parasites |
| INUG | LKTR | 88 | 3 fish with a dorsal fin deformity<br>1 fish with a tiny lower caudal fin lobe<br>1 fish with a bi-lobed adipose fin<br>1 fish with a missing adipose fin<br>1 fish with a scar on its stomach | None | 43 | None | High amount in 9% of fish<br>Moderate amount in 35% of fish<br>Low amount in 51% of fish<br>None in 5% of fish<br>Presence of cestodes in 1 fish |
| INUG | RNWH | 39 | None | None | 38 | None | Low amount in 5% of fish<br>None in 95% of fish |
| INUG | ARCH | 5 | 1 fish with a damaged caudal fin | None | 2 | None | High amount in 1 of the 2 fish<br>Low amount in 1 of the 2 fish |
| PDL | LKTR | 58 | 2 fish with a dorsal fin deformity<br>2 fish with a clip or nick in adipose fin<br>1 fish with red spots b/w pectoral fins<br>1 unusually skinny fish with a flaccid belly<br>1 fish with a small scratch on its dorsal fin | None | 31 | None | Moderate amount in 22% of fish<br>Low amount in 71% of fish<br>None in 7% of fish<br>Presence of cestodes in 2 fish |
| PDL | RNWH | 7 | None | None | 7 | None | Low amount in 1 of the 7 fish<br>None in 6 of the 7 fish |
| PDL | ARCH | 8 | 1 fish with a torn left operculum | None | 5 | None | Low amount in 4 of the 5 fish<br>None in 1 of the 5 fish |
| TPN | LKTR | 125 | 2 fish with a clipped or damaged adipose fin<br>1 fish with a deformed upper caudal fin lobe<br>1 fish with a missing lower caudal fin lobe<br>1 fish with a damaged dorsal fin<br>1 fish with a missing adipose fin<br>1 unusually skinny fish | None | 59 | 1 fish with a discoloured liver<br>1 fish with a pinched swim bladder | Moderate amount in 19% of fish<br>Low amount in 64% of fish<br>None in 17% of fish<br>Presence of a parasite cyst in 2 fish<br>Presence of tapeworm in 1 fish |
| TPN | RNWH | 2 | 1 fish with a deformed left pectoral fin<br>1 fish with a stunted adipose fin | None | 2 | None | None |
| TPN | ARCH | 33 | 1 fish missing part of left operculum<br>1 fish with red spots around anus and peduncle | None | 16 | None | High amount in 6% of fish<br>Moderate amount in 25% of fish<br>Low amount in 38% of fish<br>None in 31% of fish<br>Presence of a parasite cyst in 1 fish |

**Table 4.3- 9.** Summary of ageing structures analyzed across areas and species.

| | | LKTR | RNWH | ARCH |
|---|---|---|---|---|
| **TPN** | None | 6 | 0 | 5 |
| | OTO | 0 | 0 | 6 |
| | PEC | 58 | 0 | 11 |
| | PEC, OTO | 60 | 2 | 11 |
| **INUG** | None | 1 | 0 | 0 |
| | OTO | 0 | 0 | 0 |
| | PEC | 44 | 1 | 3 |
| | PEC, OTO | 43 | 38 | 2 |
| **PDL** | None | 3 | 0 | 3 |
| | OTO | 0 | 0 | 0 |
| | PEC | 24 | 0 | 0 |
| | PEC, OTO | 31 | 7 | 5 |

**Notes**: OTO = otolith; PEC = pectoral fin ray.

**Table 4.3- 10.** EEM-recommended statistical analyses for primary and supporting endpoints used in this study.

| Endpoint Type | Effect Indicator | Non-lethal Endpoints for Meadowbank Fish Survey | Recommended Statistical Procedures |
|---|---|---|---|
| Primary | Growth (*Energy Use*) | Size-at-age (body weight against age) | ANCOVA |
| | Condition (*Energy Storage*) | Body weight against length | ANCOVA |
| | Survival | Length (or Age) frequency distribution | Kolmogorov-Smirnov |
| Supporting | (*Energy Use*) | Size-at-age (length against age) | ANCOVA |

**Table 4.3- 11.** Regression and ANCOVA results for lake trout.

| Area | N | Log-Transformed |  | $R^2$ | Slopes Different? |  | Log-Transformed |  | Means Different? |  | Antilog LSM | Magnitude Difference |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  |  | Intercept | Slope |  | p-value | sig. at p<0.05 | LSM* | SE | p-value | sig. @ p<0.1 |  |  |
| Model: log10(Weight.g)~ log10(Age.yr) |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure | 116 | -0.418 | 2.77 | 0.887 | - | - | 3.183 | 0.099 | - | - | 1524 | - |
| Reference | 141 | -0.069 | 2.49 | 0.863 | 0.481 | no | 3.177 | 0.032 | 0.213 | no | 1505 | 1.3% |
| Model: log10(Length.mm)~log10(Age.yr) |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure | 116 | 1.54 | 0.908 | 0.893 | - | - | 2.724 | 0.031 | - | - | 530 | - |
| Reference | 141 | 1.64 | 0.827 | 0.869 | 0.436 | no | 2.720 | 0.010 | 0.112 | no | 525 | 0.8% |
| Model: log10(Weight.g)~ log10(Length.mm) |  |  |  |  |  |  |  |  |  |  |  |  |
| Exposure | 117 | -5.12 | 3.05 | 0.994 | - | - | 3.106 | 0.038 | - | - | 1277 | - |
| Reference | 141 | -4.99 | 3.00 | 0.995 | 0.083 | no | 3.110 | 0.005 | 0.454 | no | 1289 | -0.9% |

**Notes**: "N" = sample size; "LSM" = least squares mean; "SE" = standard error of the mean; * LSM estimated for either a 500-mm (for length as covariate) or 20-yr old (for age as covariate) lake trout; “Age.yr” is the corrected pectoral fin ray age (see **Section 4.3.5**).

**Table 4.3- 12.** Power analysis information and results for lake trout endpoints tested using ANCOVA.

| Endpoint Type | Effect Indicator | Non-lethal Endpoints for Meadowbank Fish Survey | Obs. ES | Mean Square of Residuals | CES | n | α | β | Confidence that ES<CES | Power for Prescribed CES | Minimum ES (%) | n for CES and Target Power |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Primary | Growth (*Energy Use*) | Size-at-age (body weight against age) | 1.3% | 0.033 | 0.25 | 100 | 0.1 | 0.1 | 1.0 | 0.98 | 19.1% | 61 |
|  | Condition (*Energy Storage*) | Body weight against length | -0.9% | 0.002 | 0.1 | 100 | 0.1 | 0.1 | 1.0 | 0.99 | 4.4% | 21 |
| Supporting | (*Energy Use*) | Size-at-age (length against age) | 0.8% | 0.0032 | 0.25 | 100 | 0.1 | 0.1 | 1.0 | 1 | 5.6% | 7 |

**Notes**: "Obs." = observed; "ES" = effect size (% relative to REF); "CES" = critical effect size; "n" = sample size; "α" = Type I (false positive) error rate; "β" = Type II (false negative) error rate; See text for description of last four columns.

**Figure 4.3- 1.** Fish survey catch results by species and sampling area.

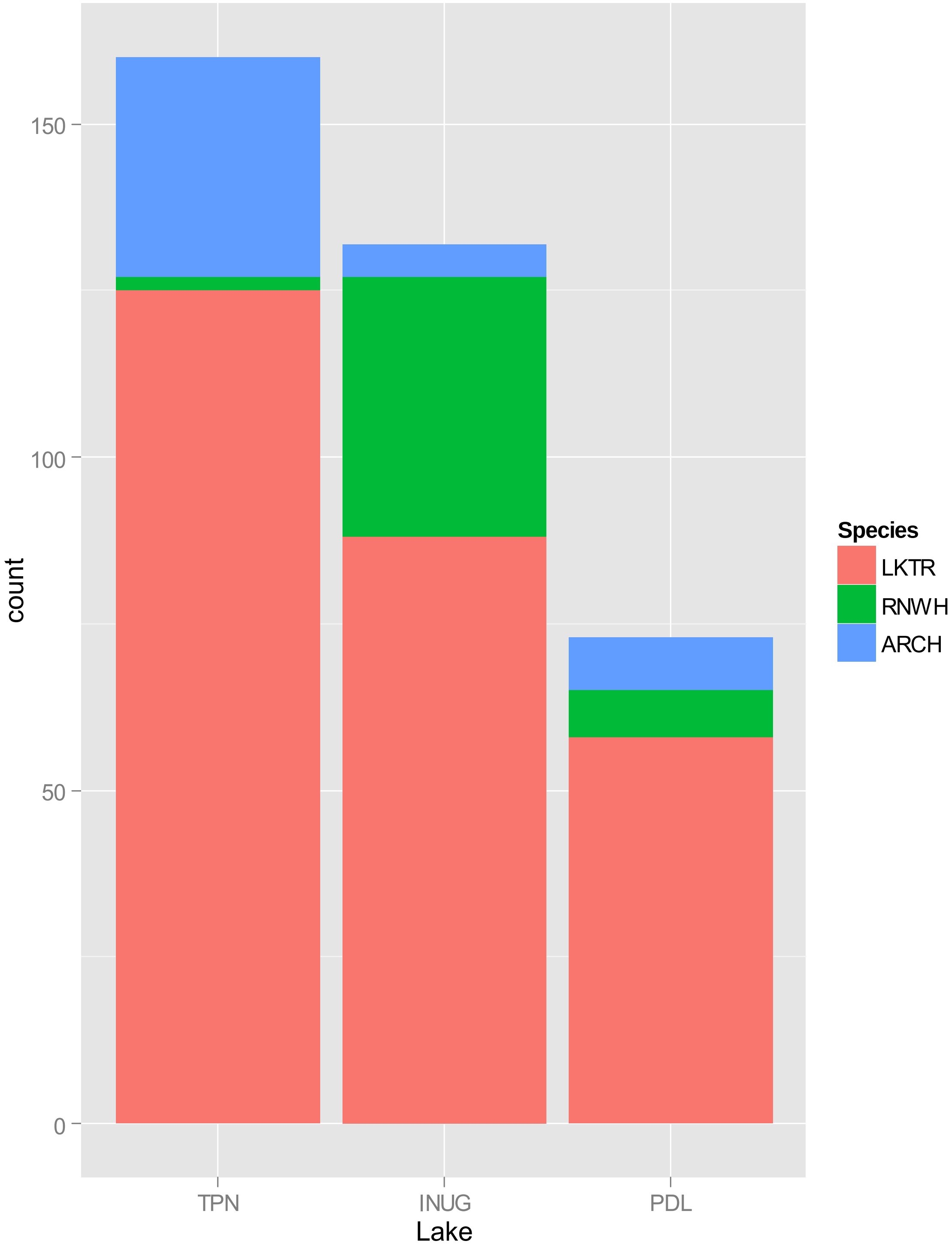


**Figure 4.3- 2.** Fish maturity status (blank/U=unknown, IM=immature, MA=mature) by sex, species and sampling area.

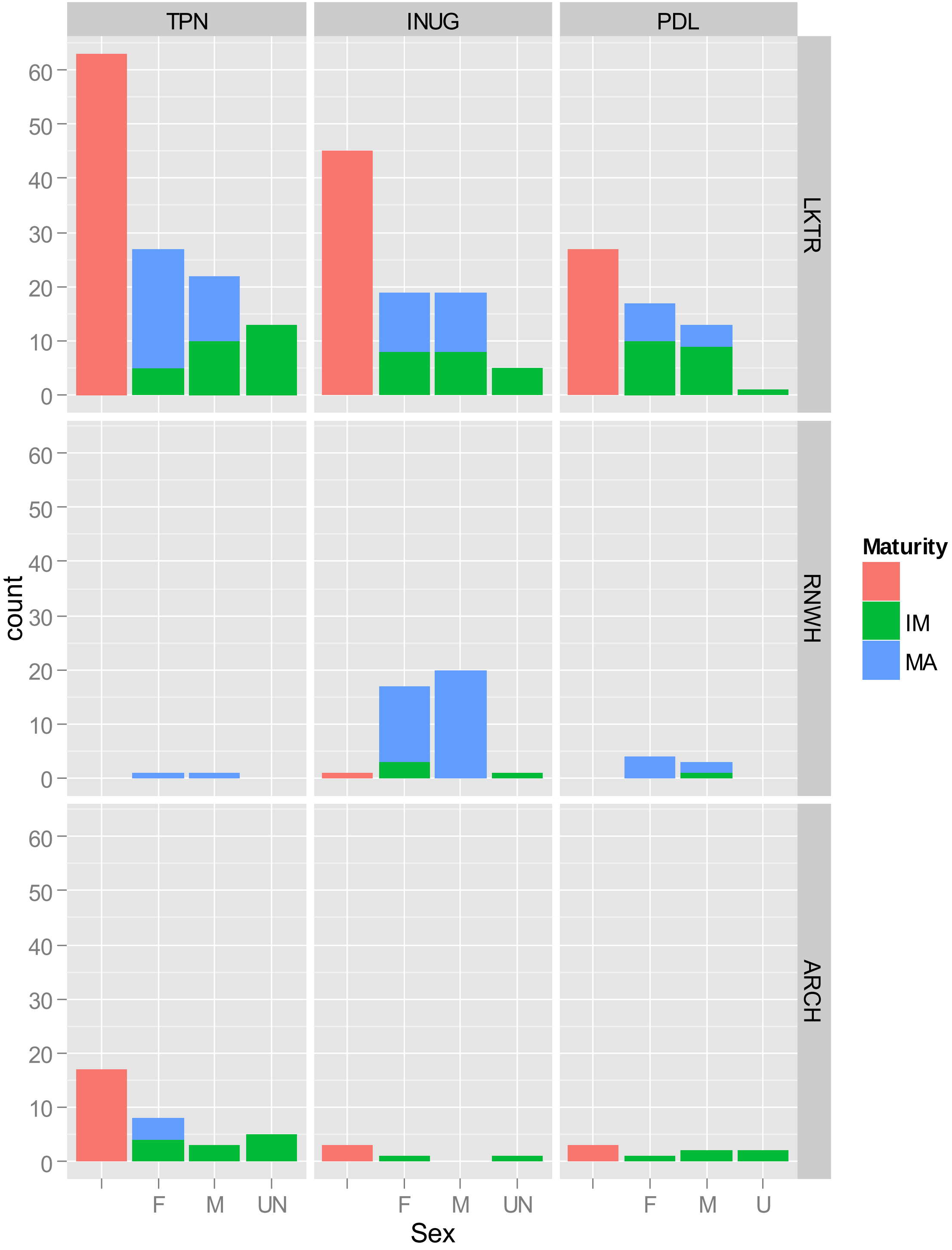


**Figure 4.3- 3.** Reproductive status (RI=ripe, RS=resting) of mature fish by sex, species and sampling area.

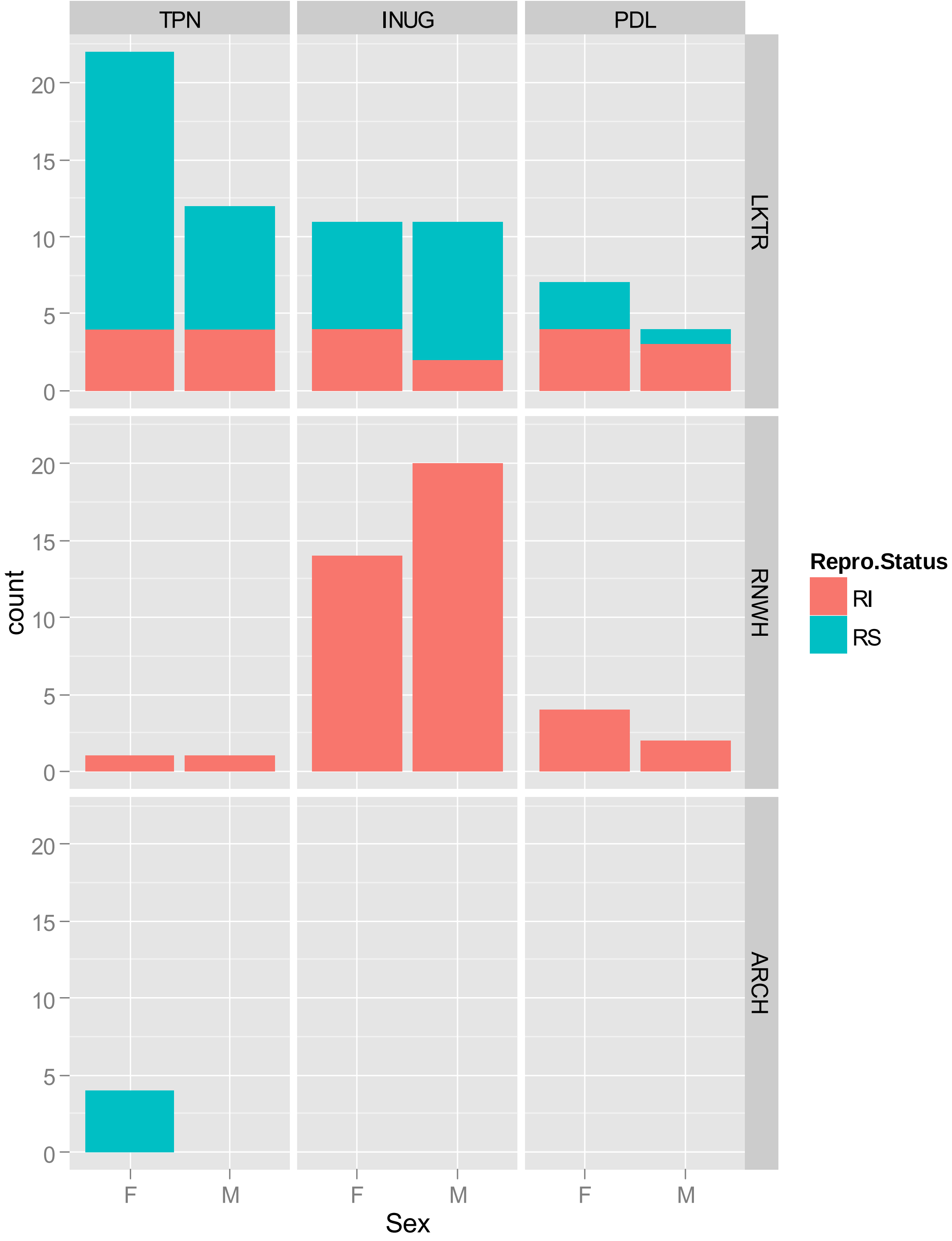


**Figure 4.3- 4.** Lake trout maturity status (blank/U=unknown, IM=immature, MA=mature) by fork length (mm) and sampling area.

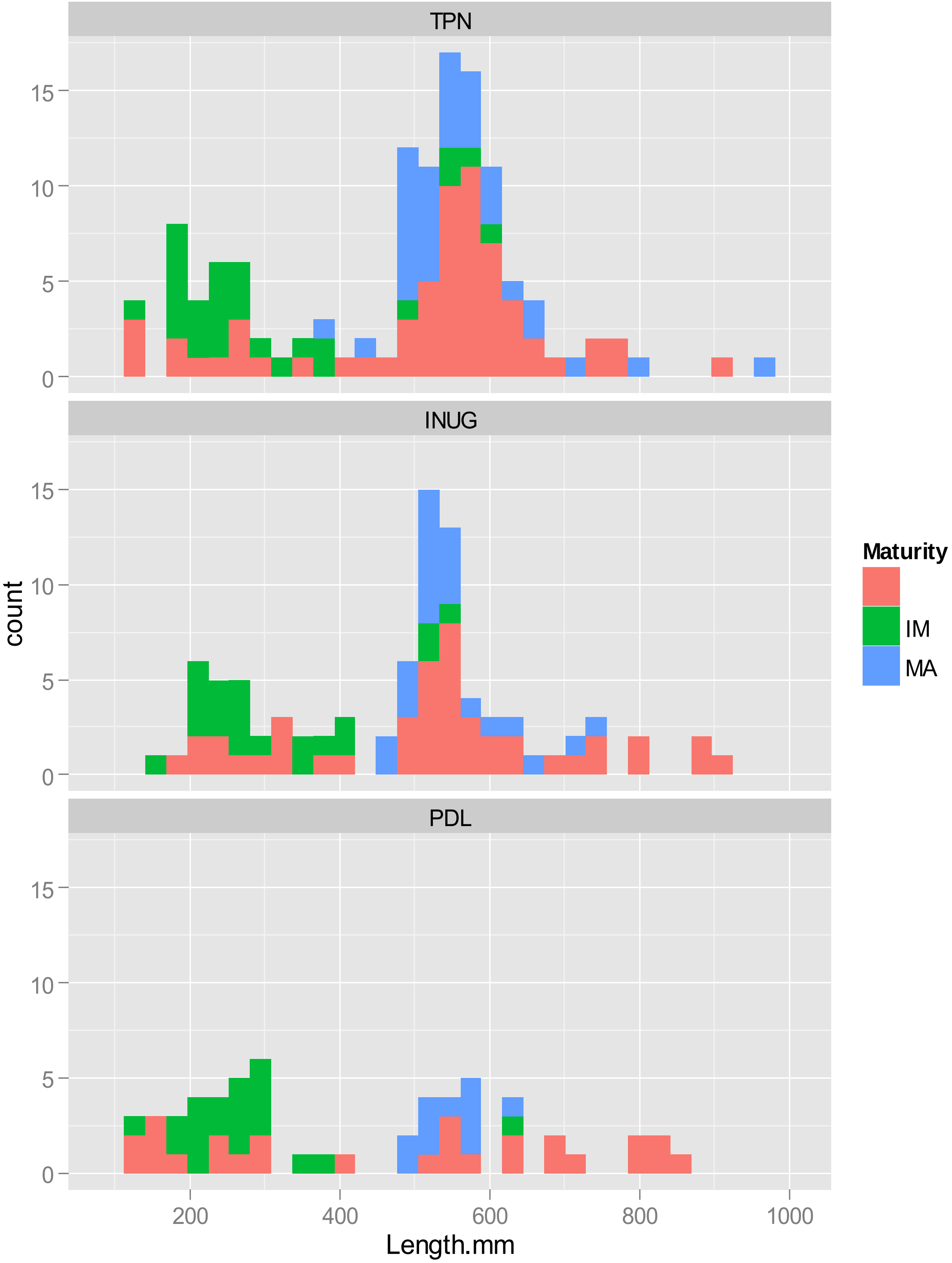


**Figure 4.3- 5.** Reproductive status (RI=ripe, RS=resting) of mature lake trout by fork length (mm) and sampling area.

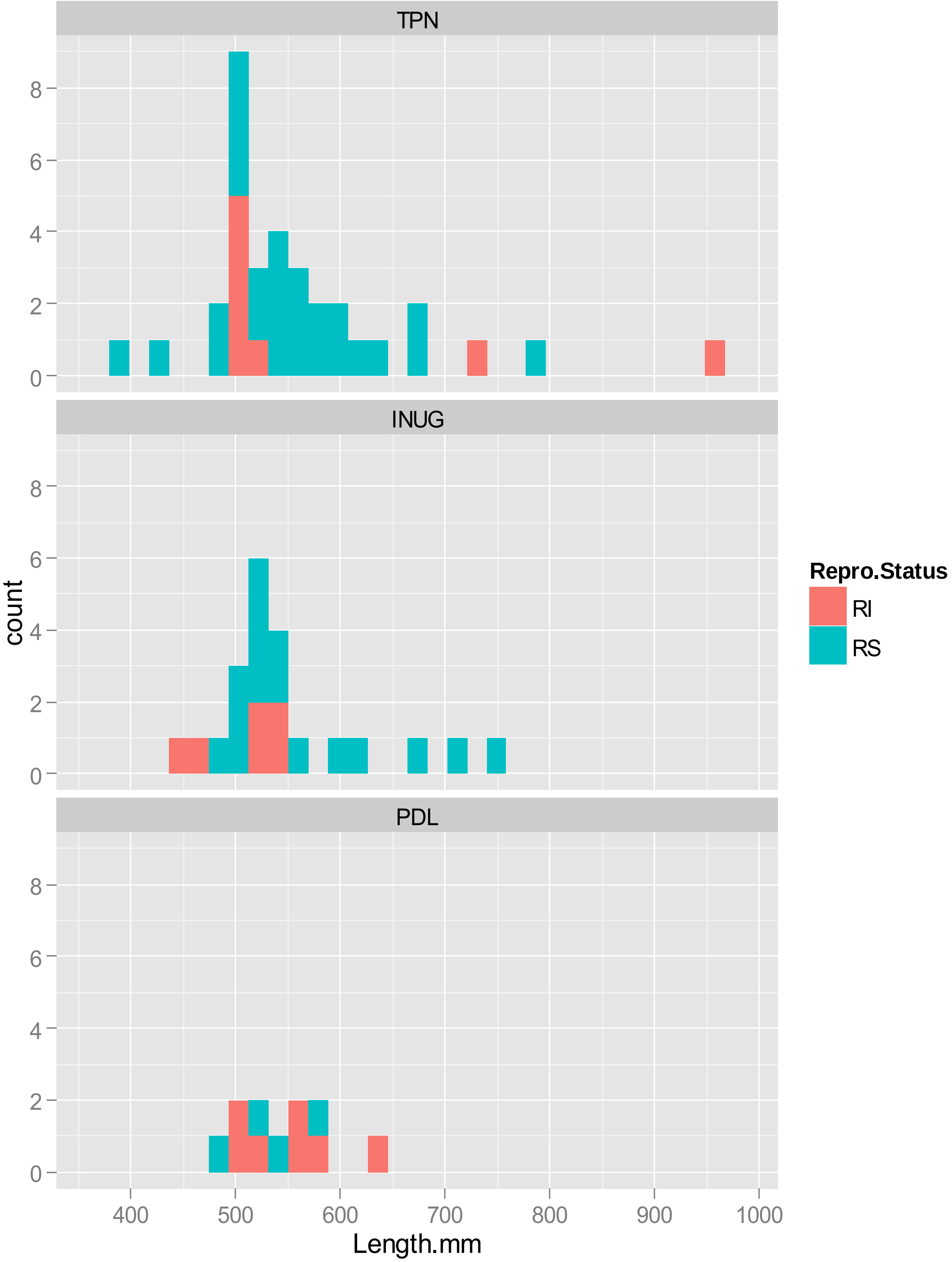


**Figure 4.3- 6.** Lake trout incidental mortality status (N=alive, Y=dead) by mesh size (mm) and sampling area.

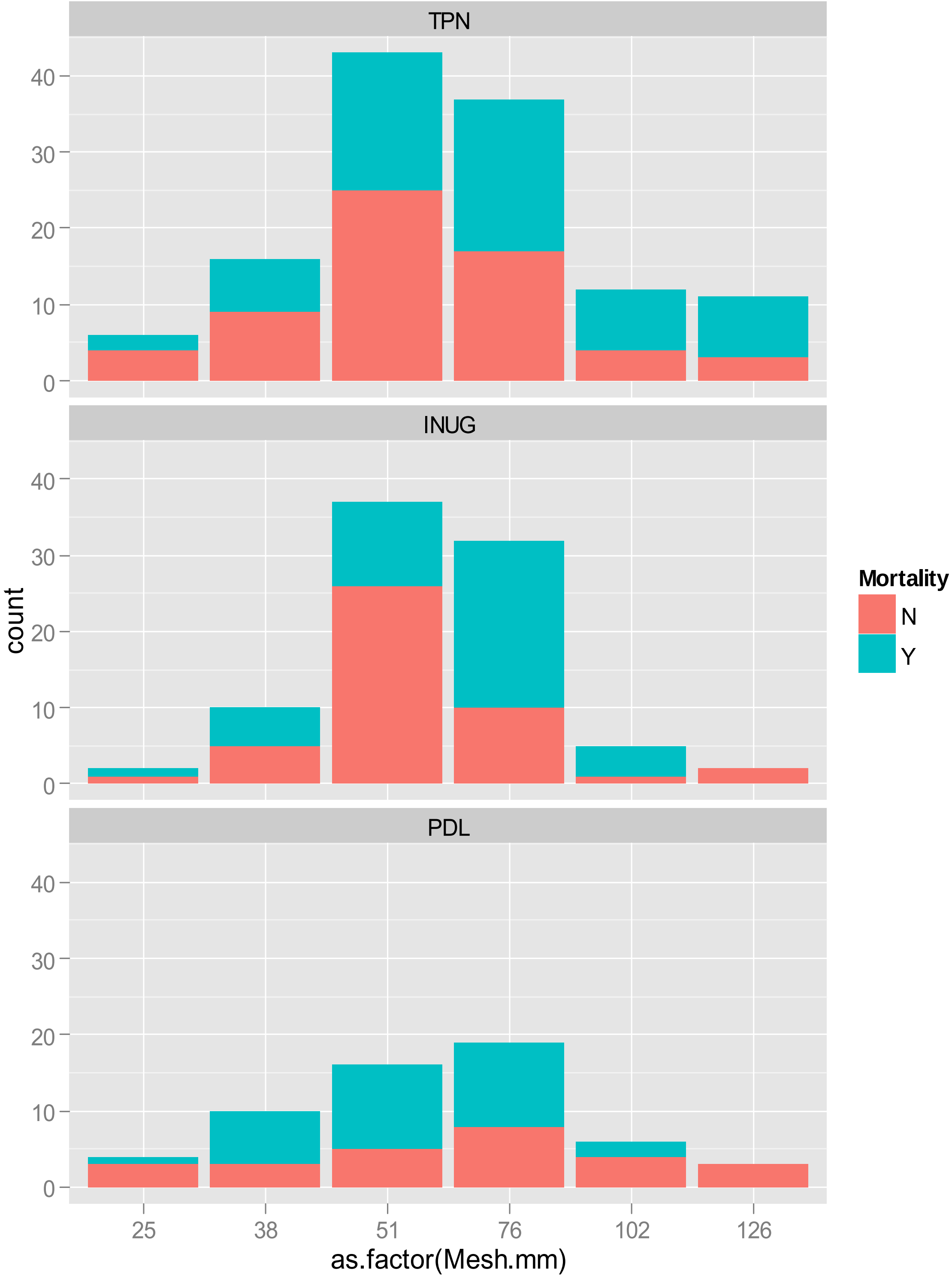


**Figure 4.3- 7.** Lake trout incidental mortality status (N=alive, Y=dead) by gillnet set type (day or night) and sampling area.

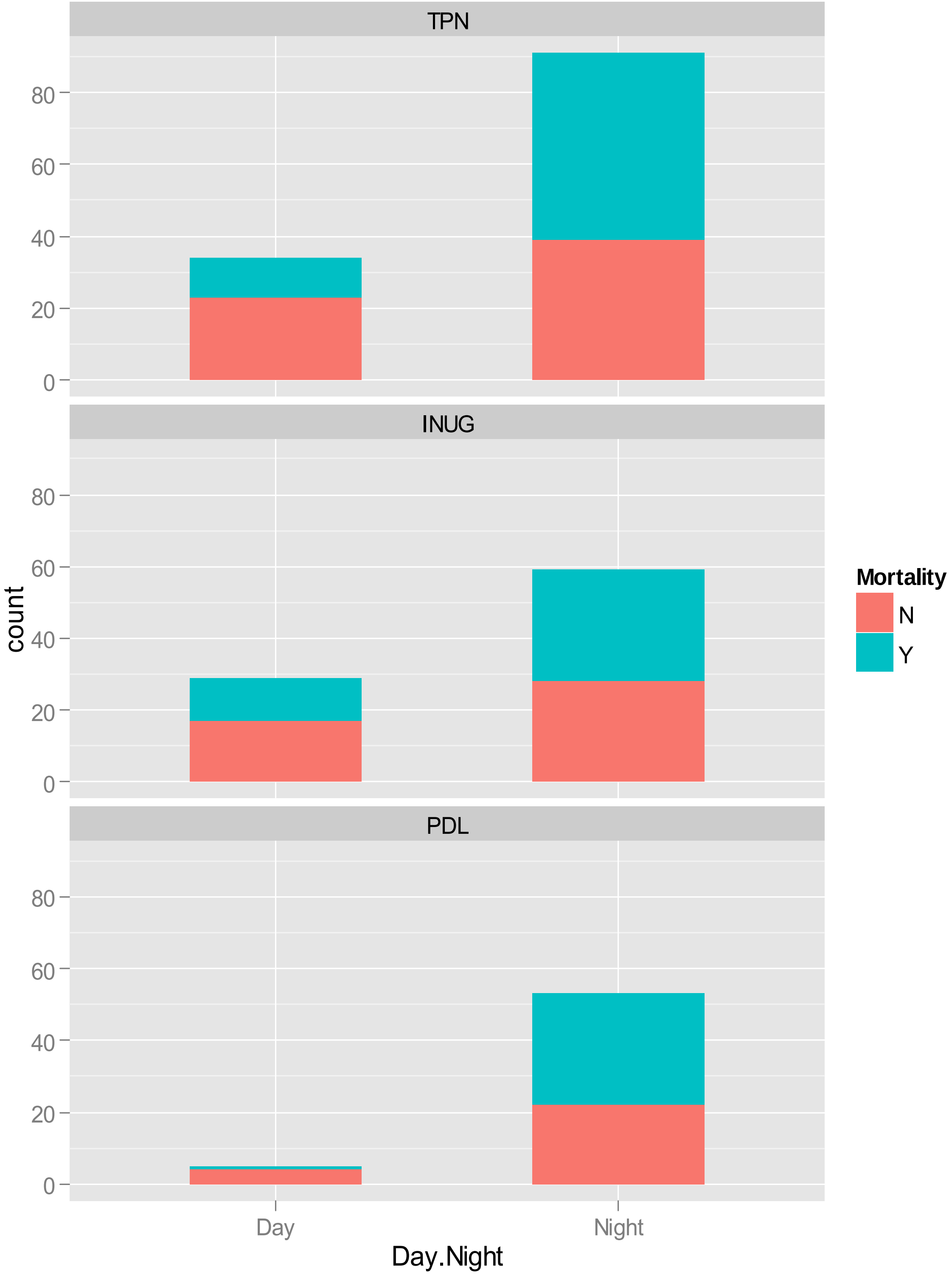


**Figure 4.3- 8.** Lake trout incidental mortality status (N=alive, Y=dead) by fork length (mm) and sampling area.

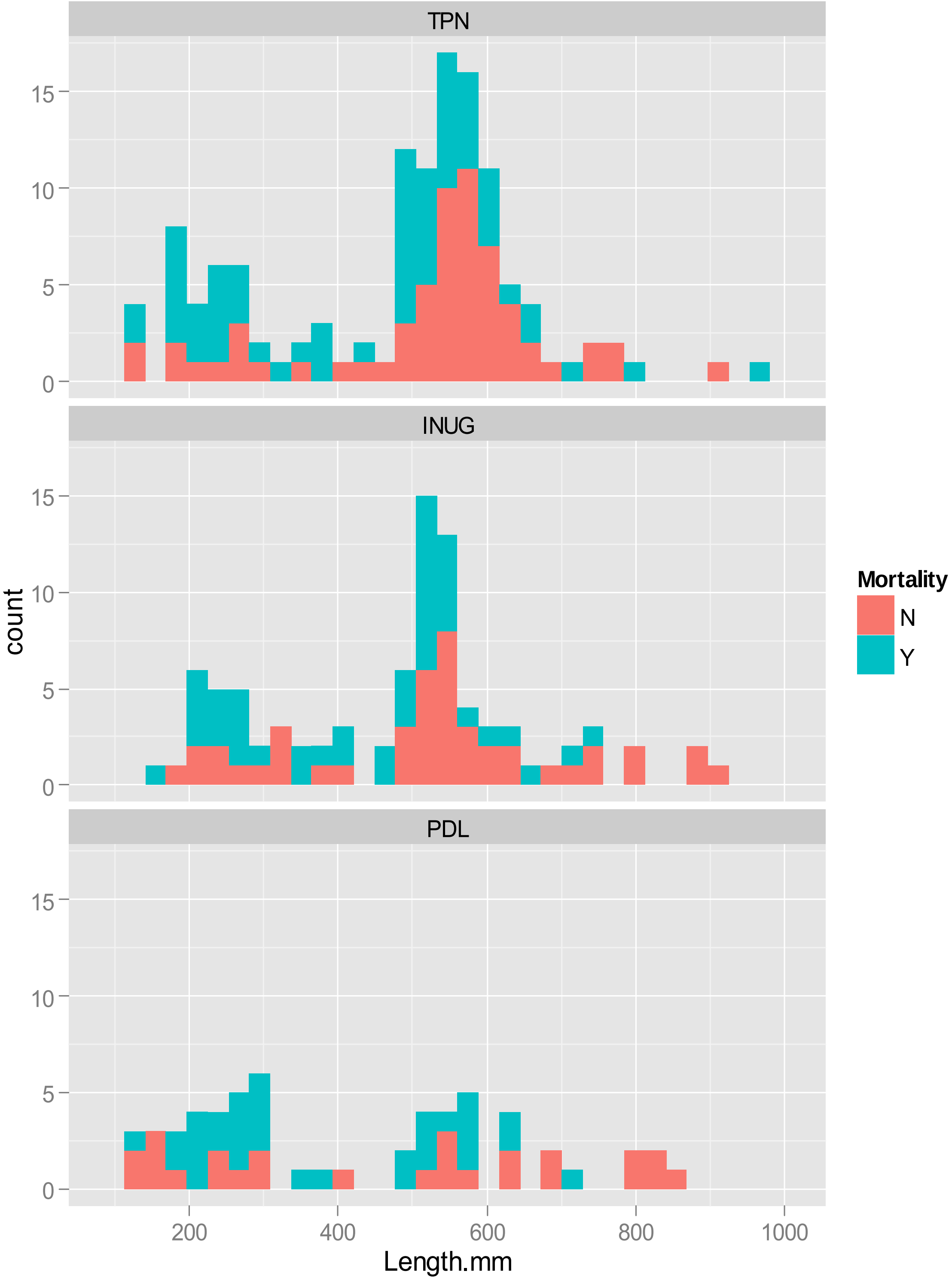


**Figure 4.3- 9.** Condition (k) distribution by species highlighting sampling areas.

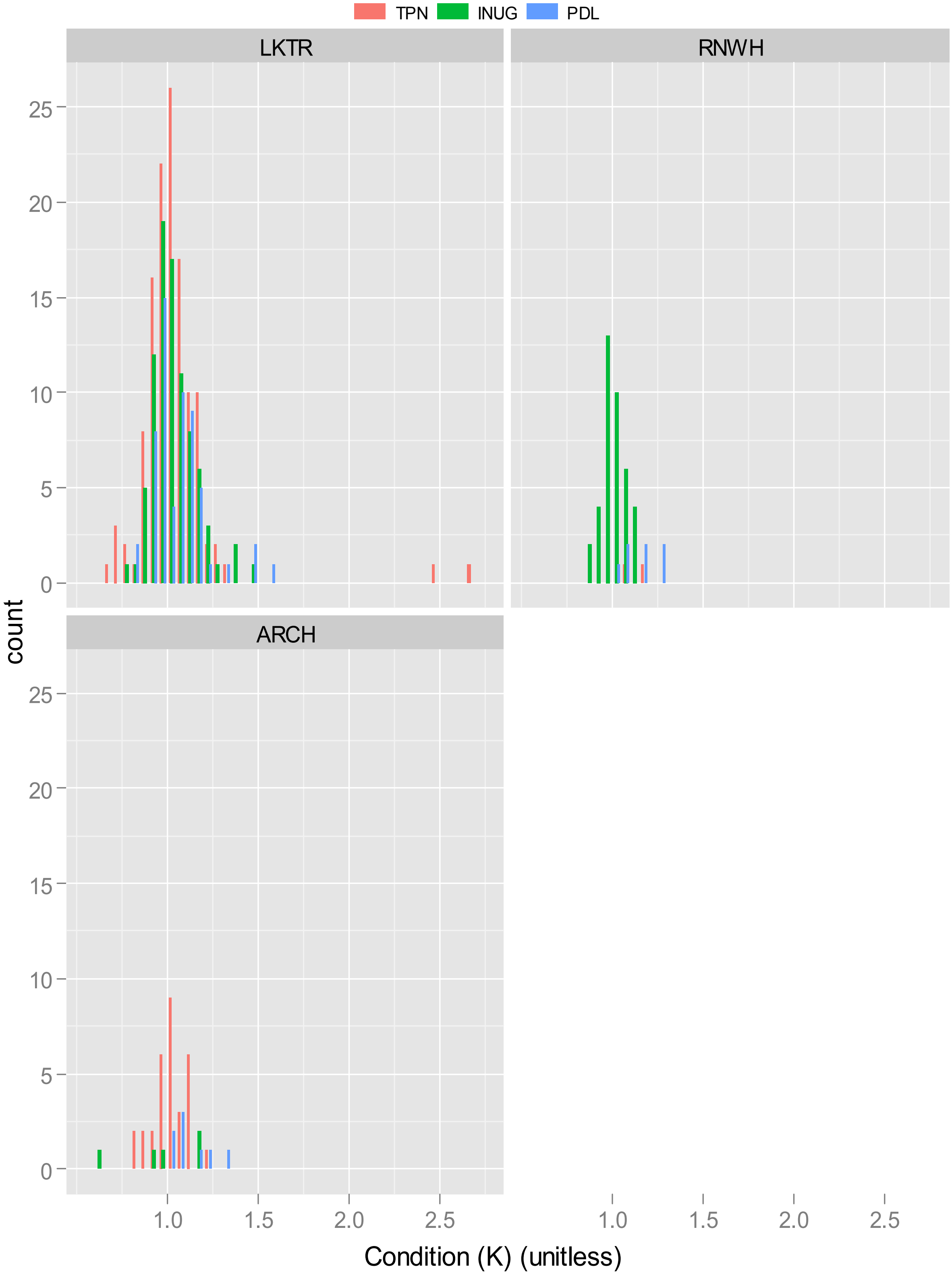


**Figure 4.3- 10.** Body weight (g) – fork length (mm) plots by species highlighting sampling areas (outliers circled).

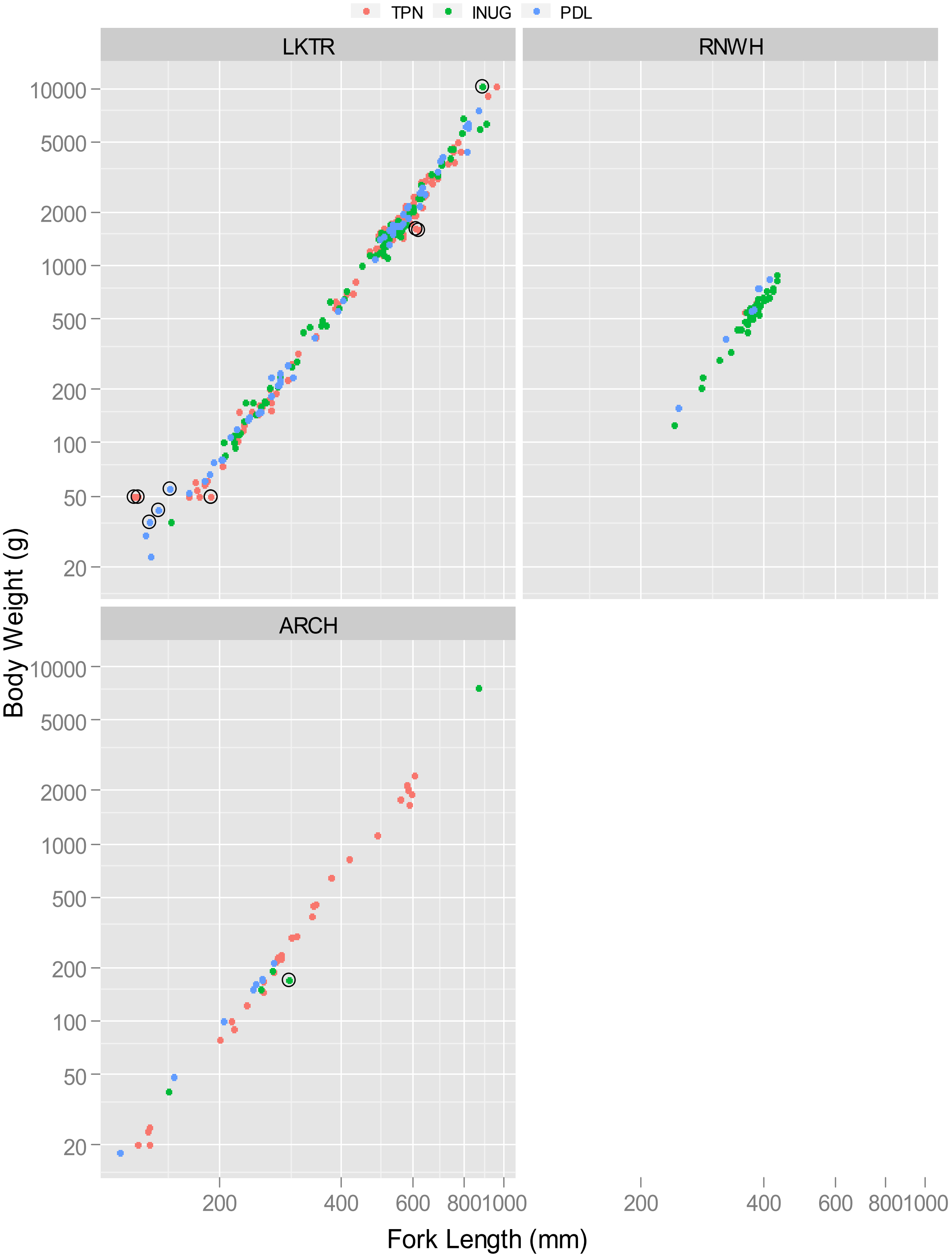


**Figure 4.3- 11.** Relationship between PEC-based and OTO-based age estimates (un-transformed data) relative to a 1:1 relationship (red dashed line).

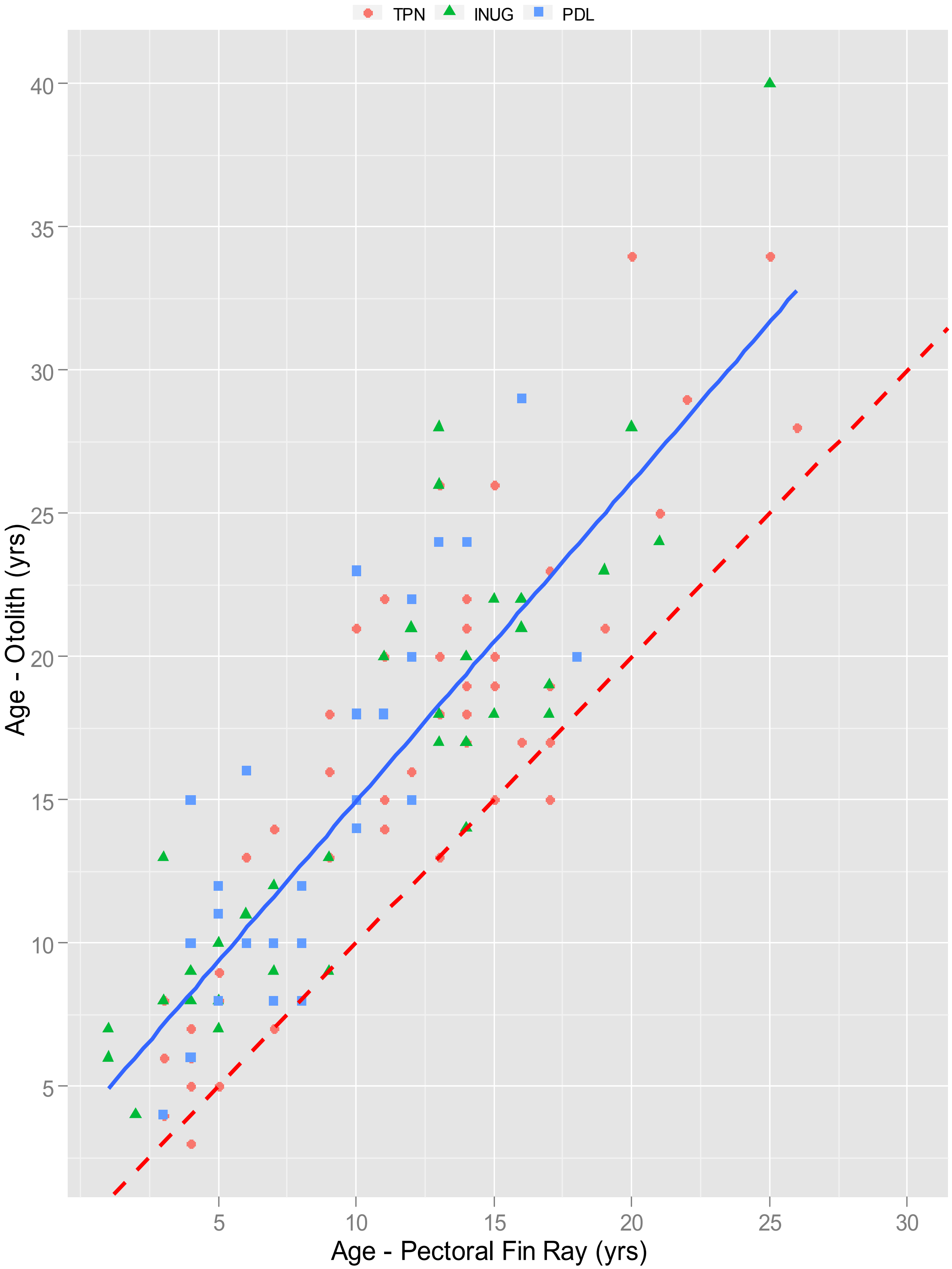


**Figure 4.3- 12.** Relationship between body weight (g) and age (yr) for pooled reference and exposure areas (axes shown in log space).

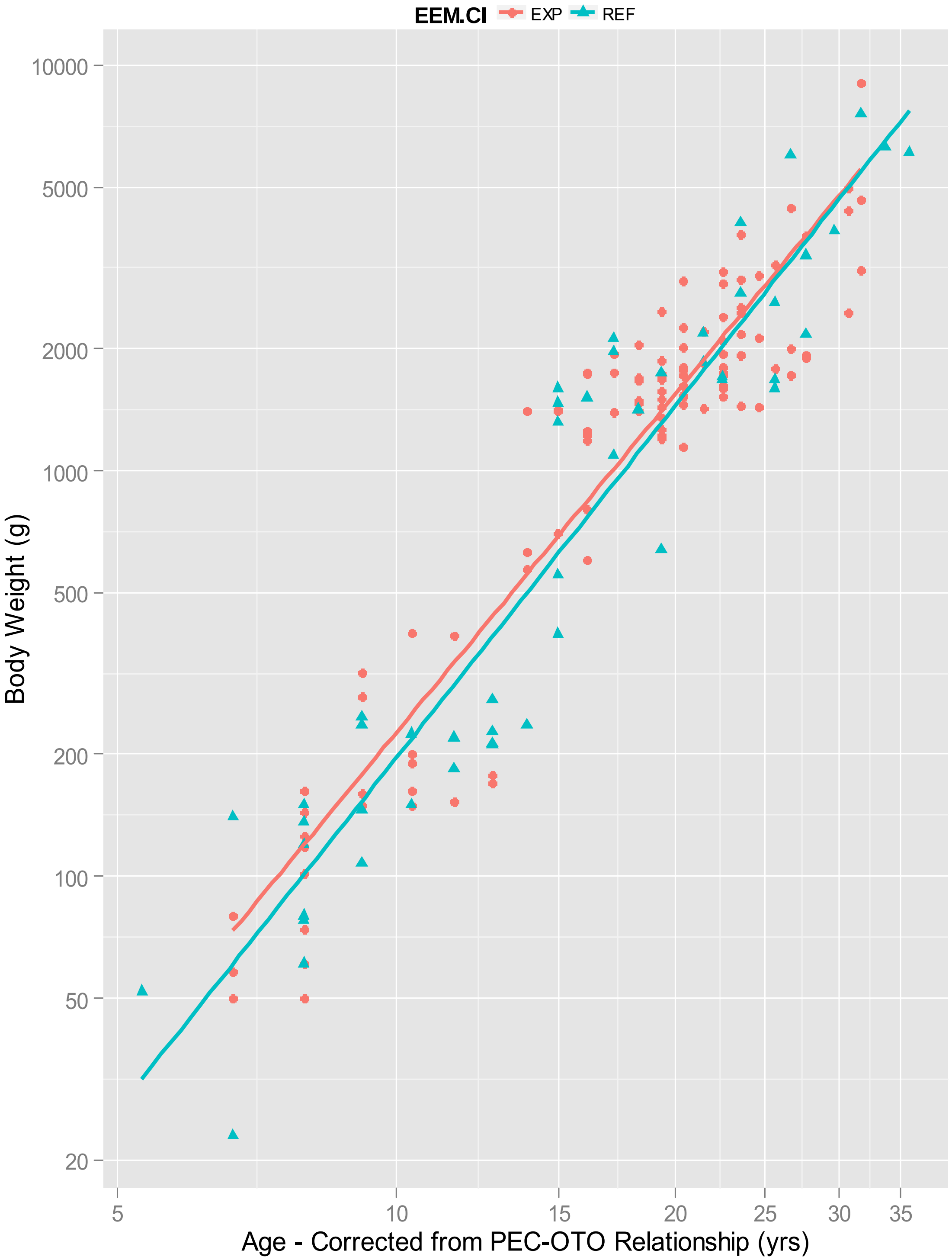


**Figure 4.3- 13.** Relationship between fork length (mm) and age (yr) for pooled reference and exposure areas (axes shown in log space).

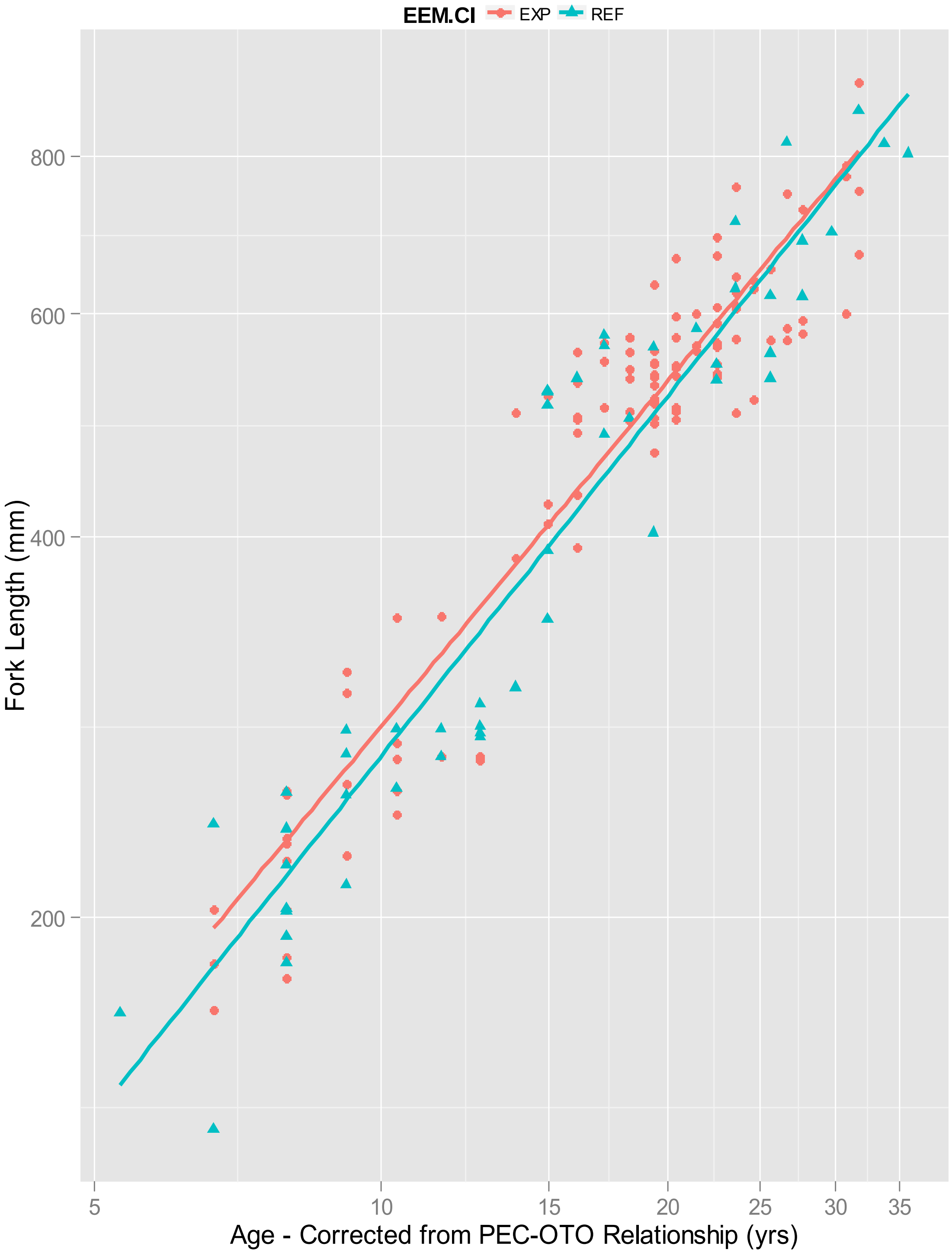


**Figure 4.3- 14.** Relationship between body weight (g) and fork length (mm) for pooled reference and exposure areas (axes shown in log space).

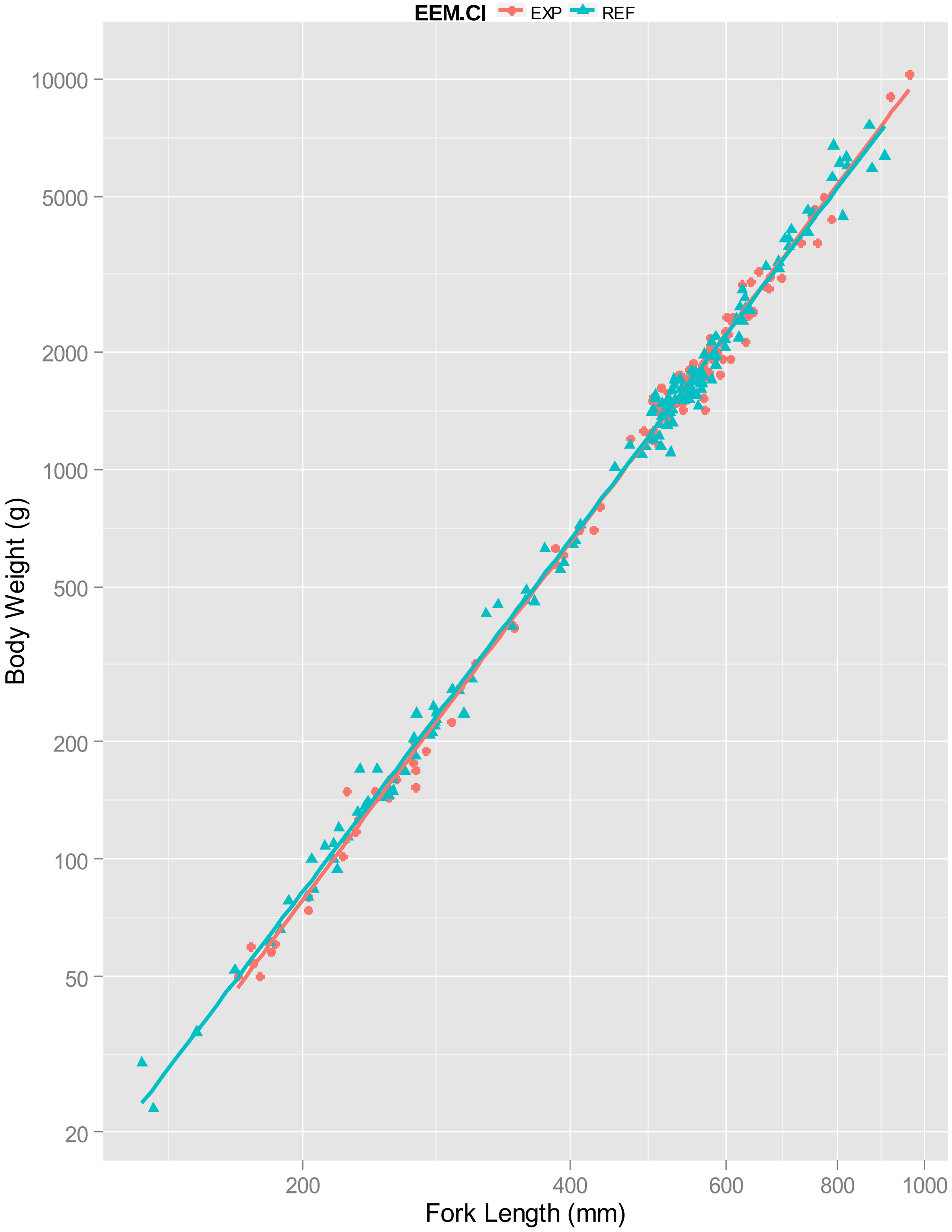


**Figure 4.3- 15.** Fork length (mm) empirical cumulative distribution function for pooled reference and exposure areas.

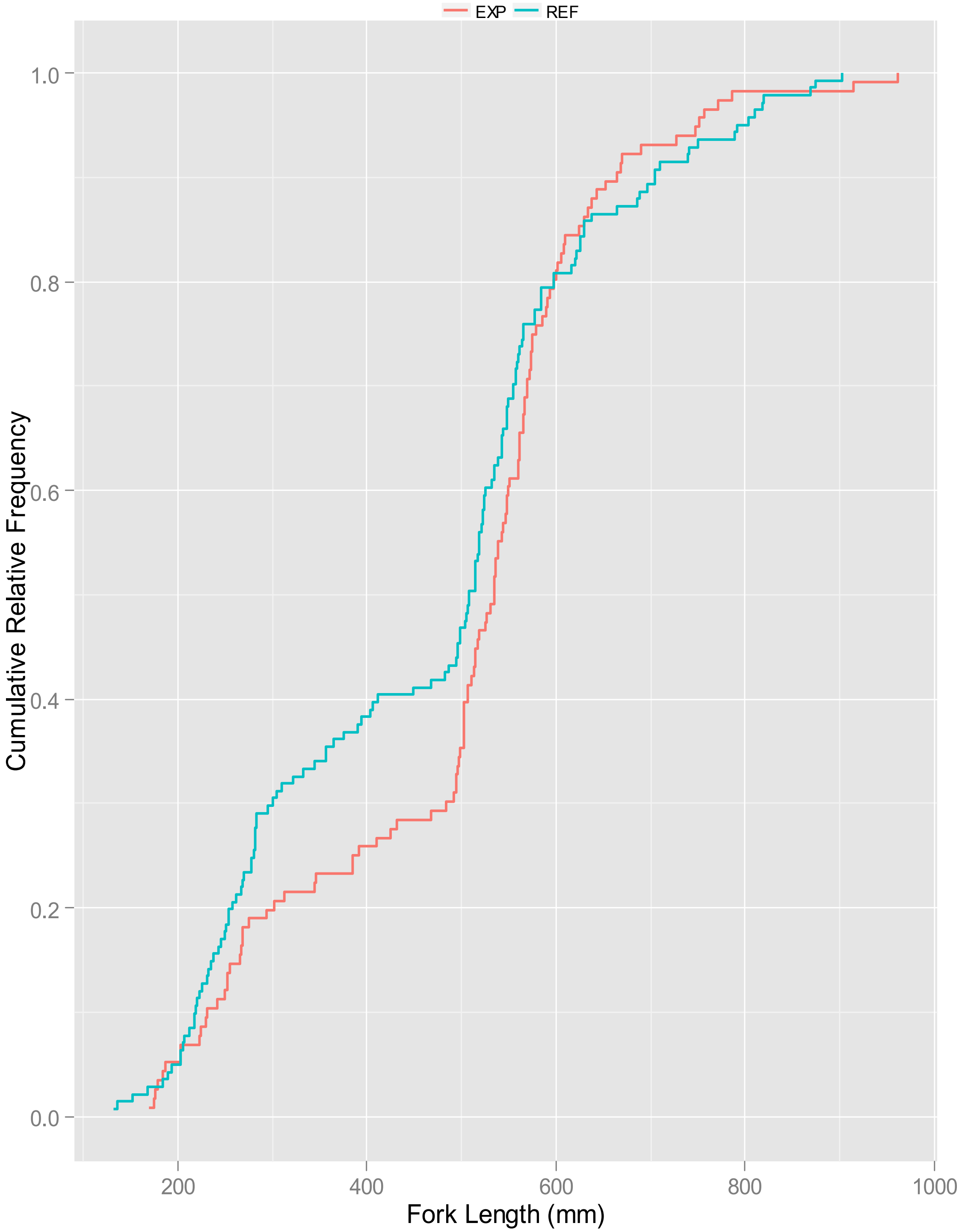


**Figure 4.3- 16.** Fork length (mm) density plots for pooled reference and exposure areas.

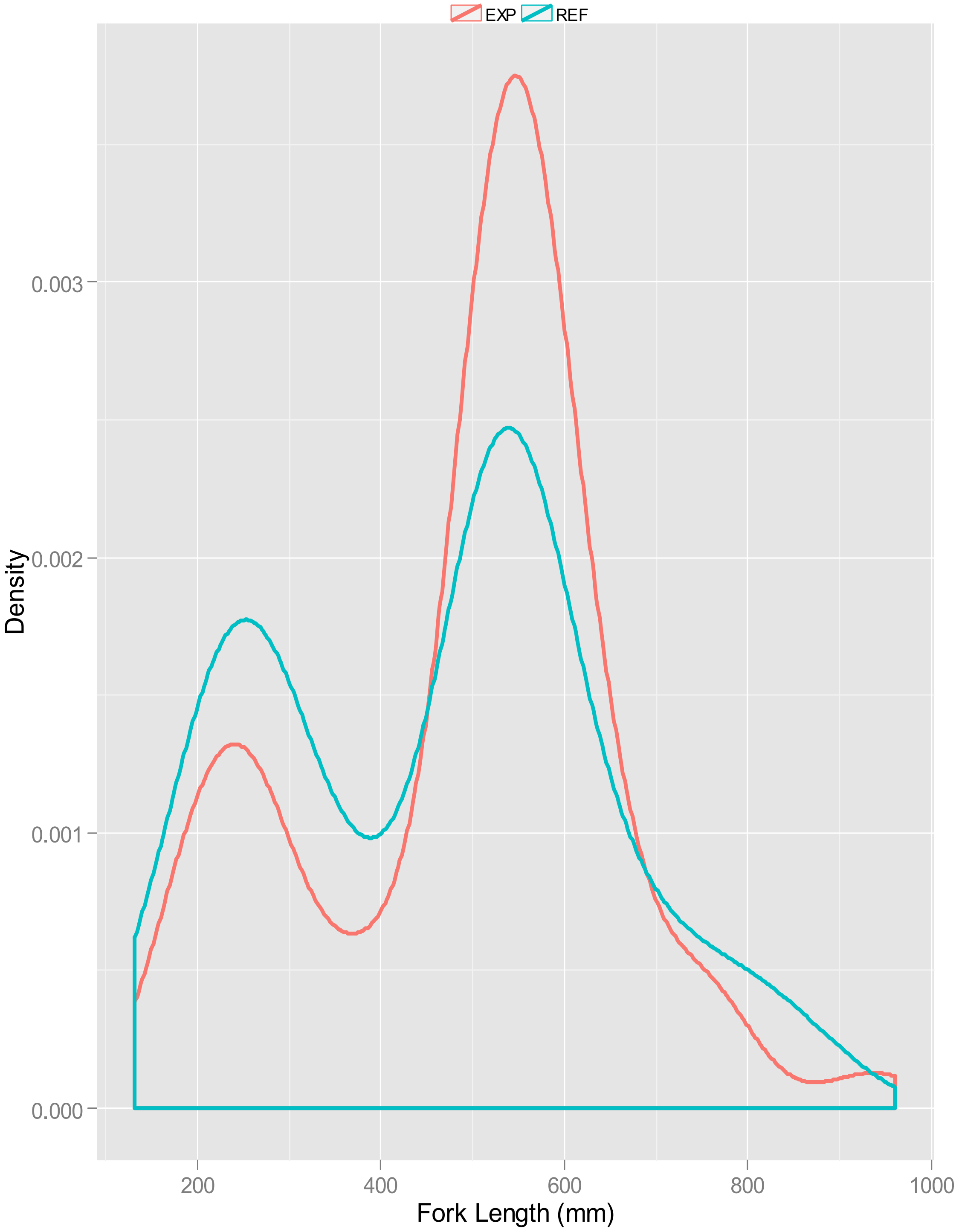


**Figure 4.3- 17.** Age (yr) empirical cumulative distribution function for pooled reference and exposure areas.

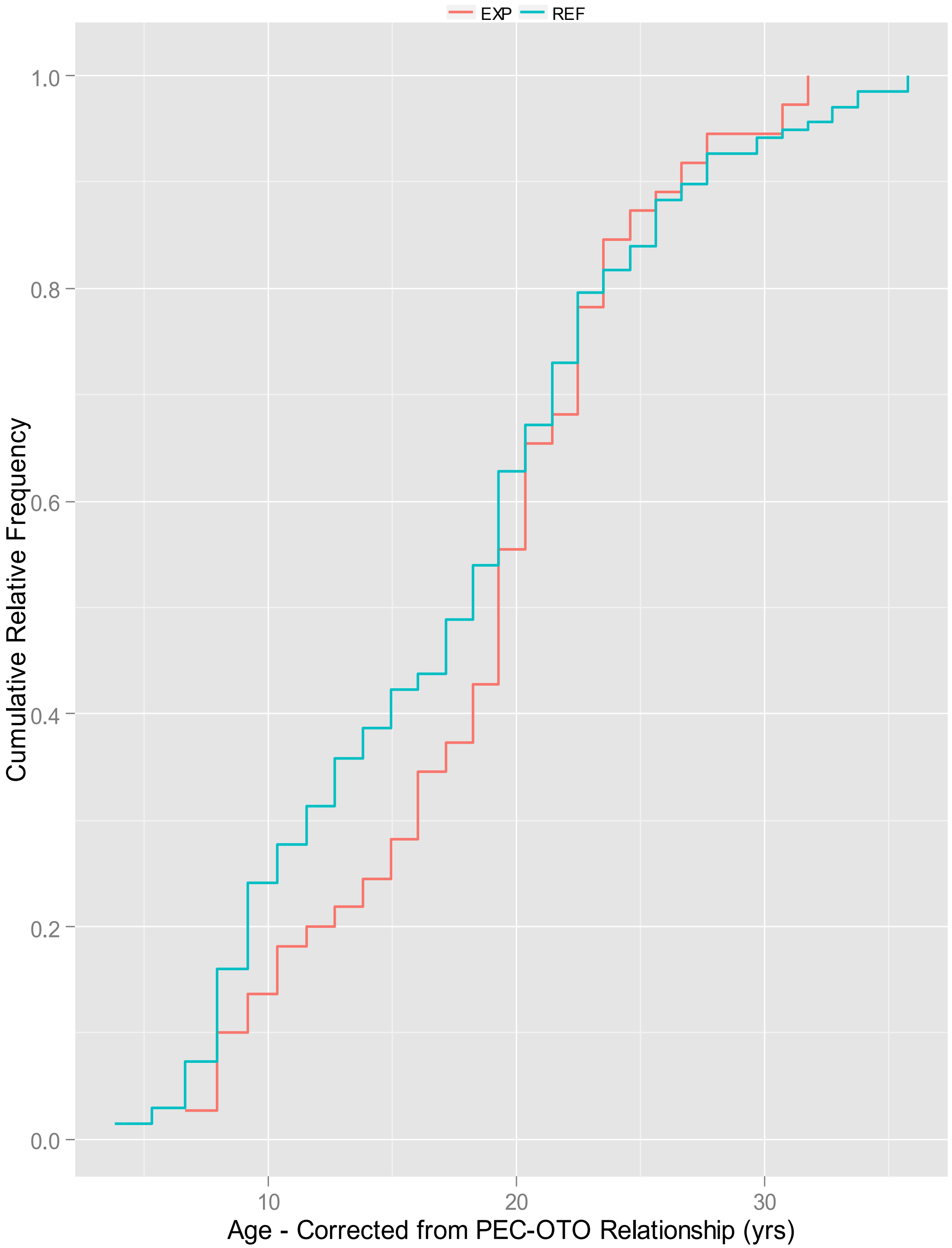


**Figure 4.3- 18.** Age (yr) density plots for pooled reference and exposure areas.

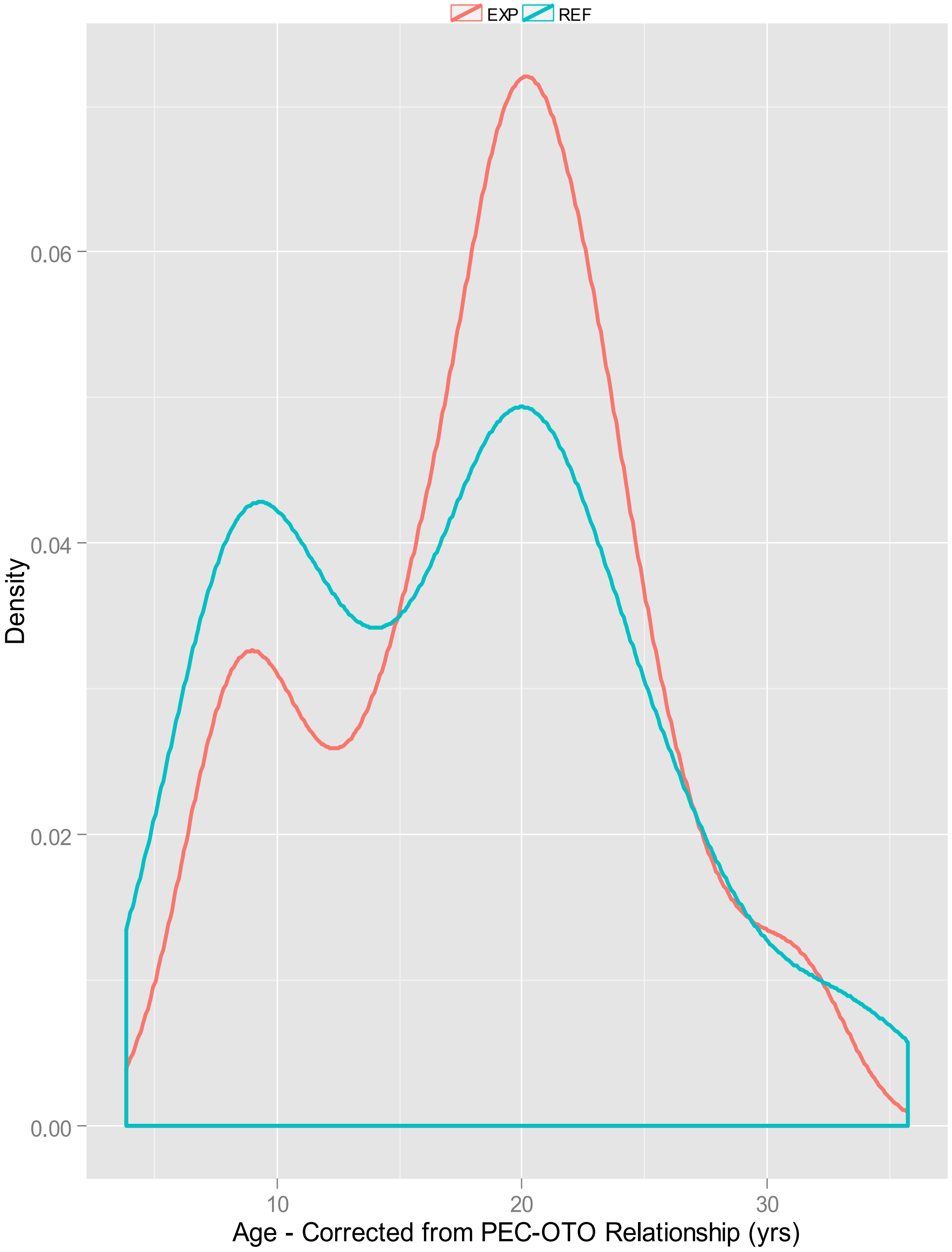


**Figure 4.3- 19.** Observed effect size and 95% confidence intervals for ANCOVA endpoints relative to EEM-recommended critical effect sizes (CES).

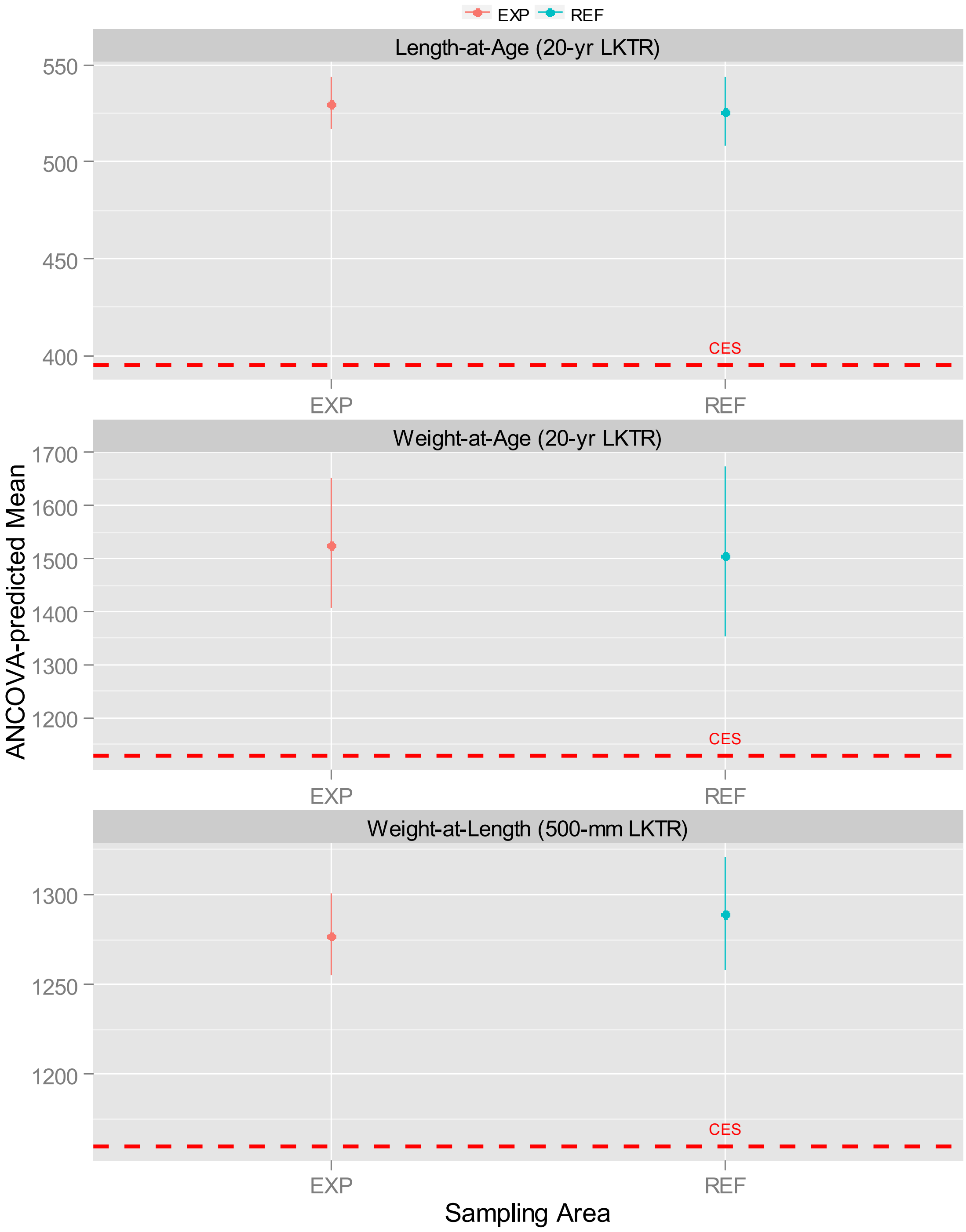


**Figure 4.3- 20.** Response ratio (i.e., exposure response/reference) empirical cumulative distribution function simulated for weight-at-age relative to the EEM-recommended critical effect size (CES) of 25% (i.e., response ratio of 0.75).

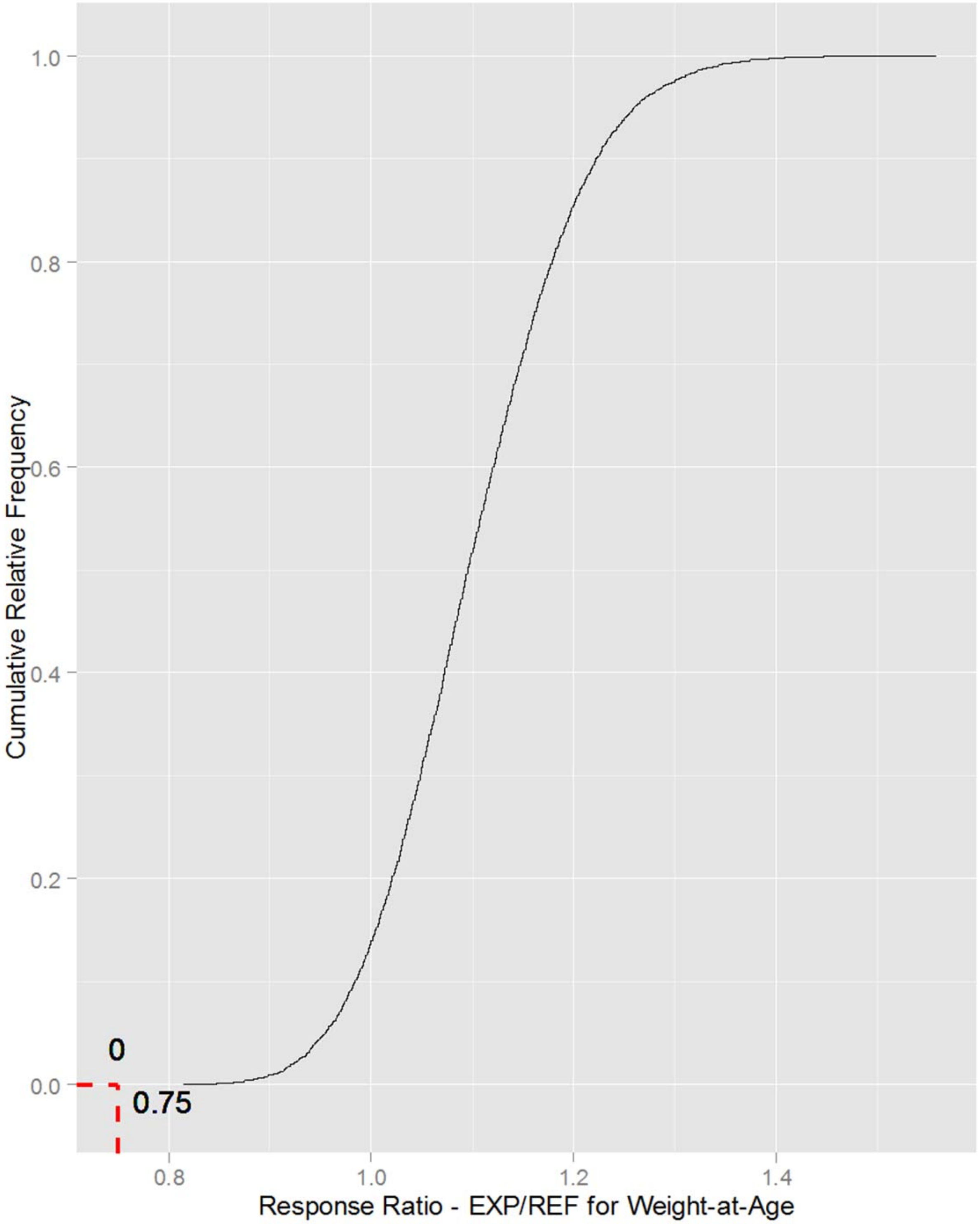


**Figure 4.3- 21.** Lake trout age (yr) empirical cumulative distribution function for pooled reference (with associated 95% confidence bands) and exposure areas.

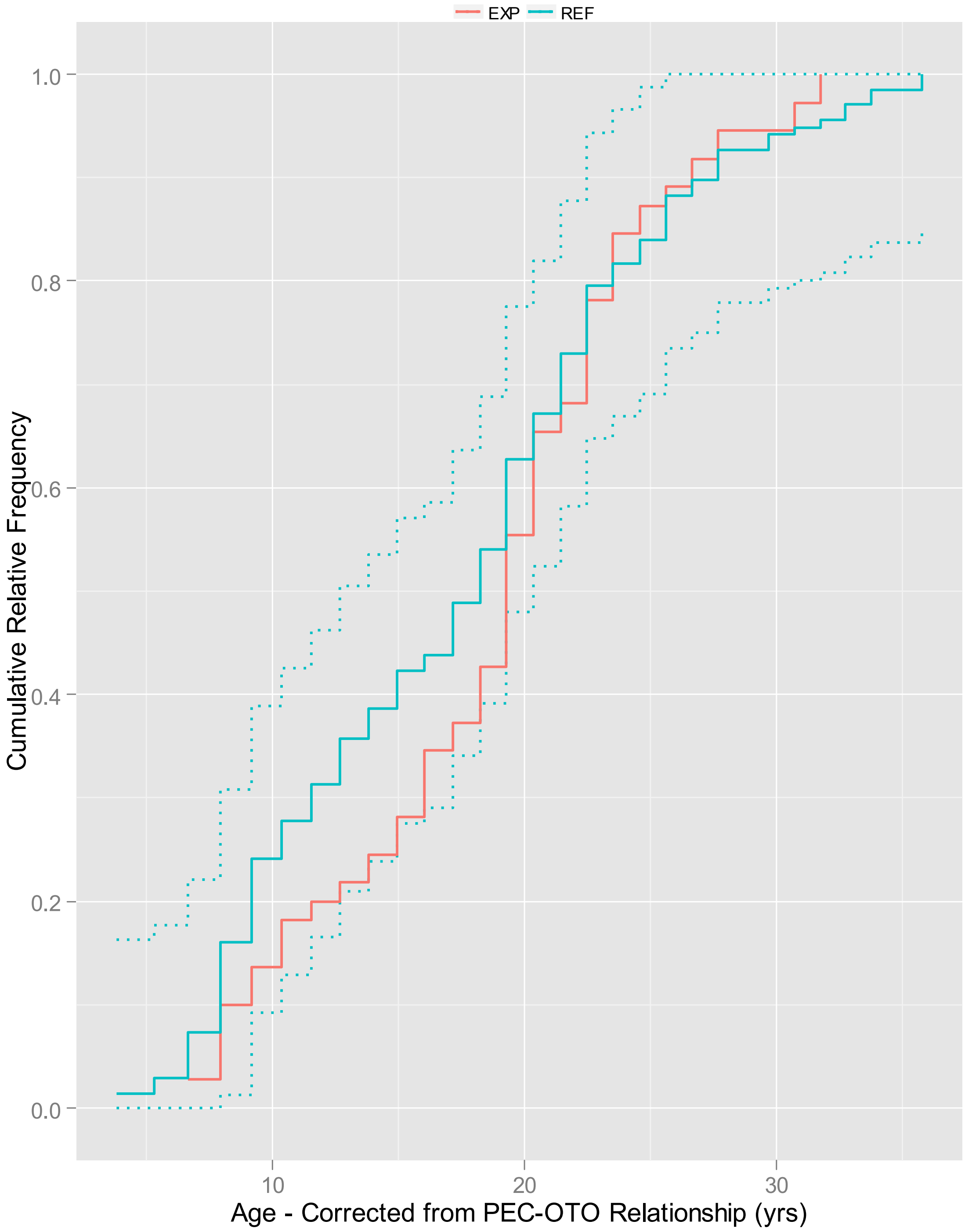


**Figure 4.3- 22.** Lake trout fork length (mm) empirical cumulative distribution function for pooled reference (with associated 95% confidence bands) and exposure areas.

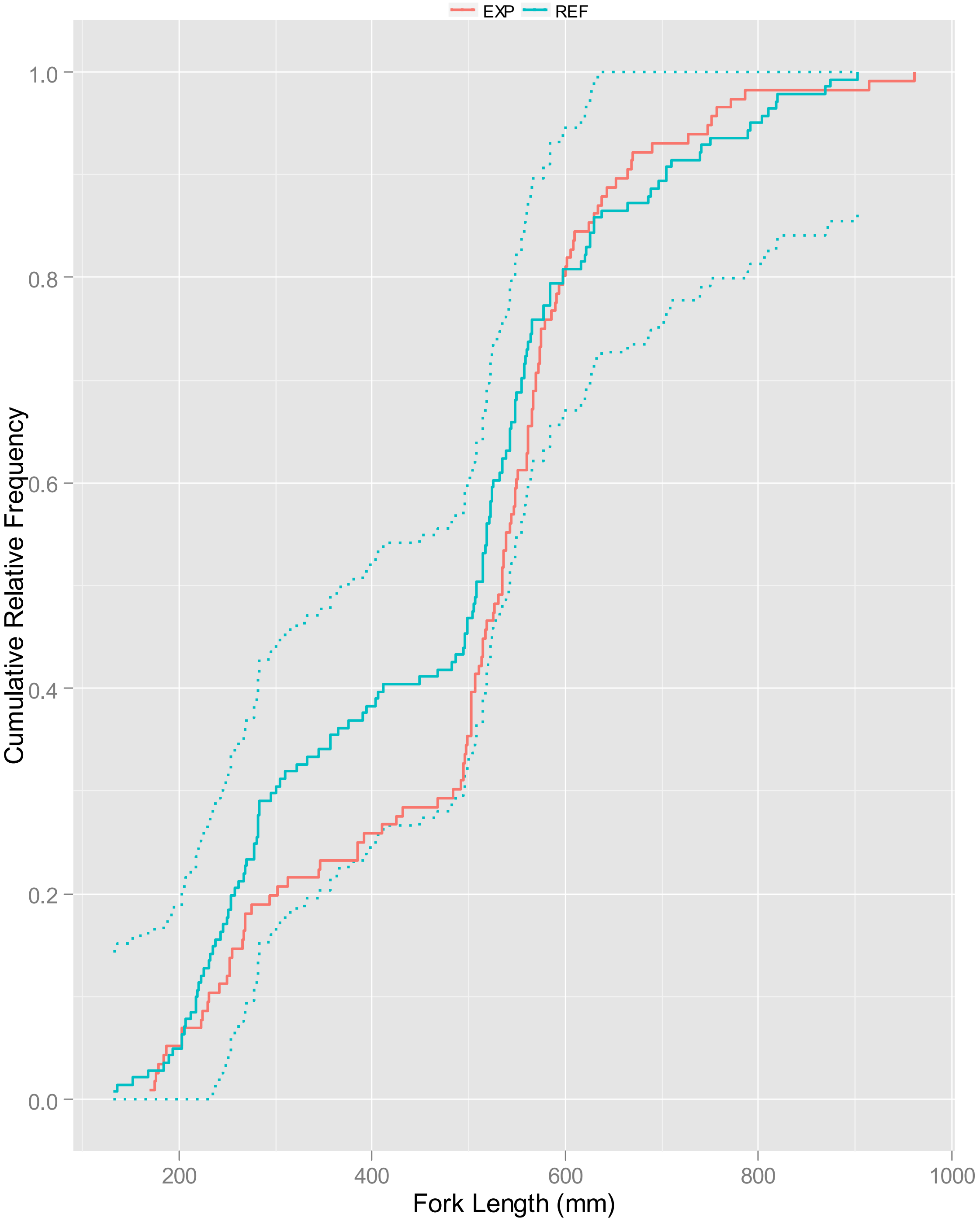


**Figure 4.3- 23.** Lake trout age (yr) empirical cumulative distribution function for each sampling area.

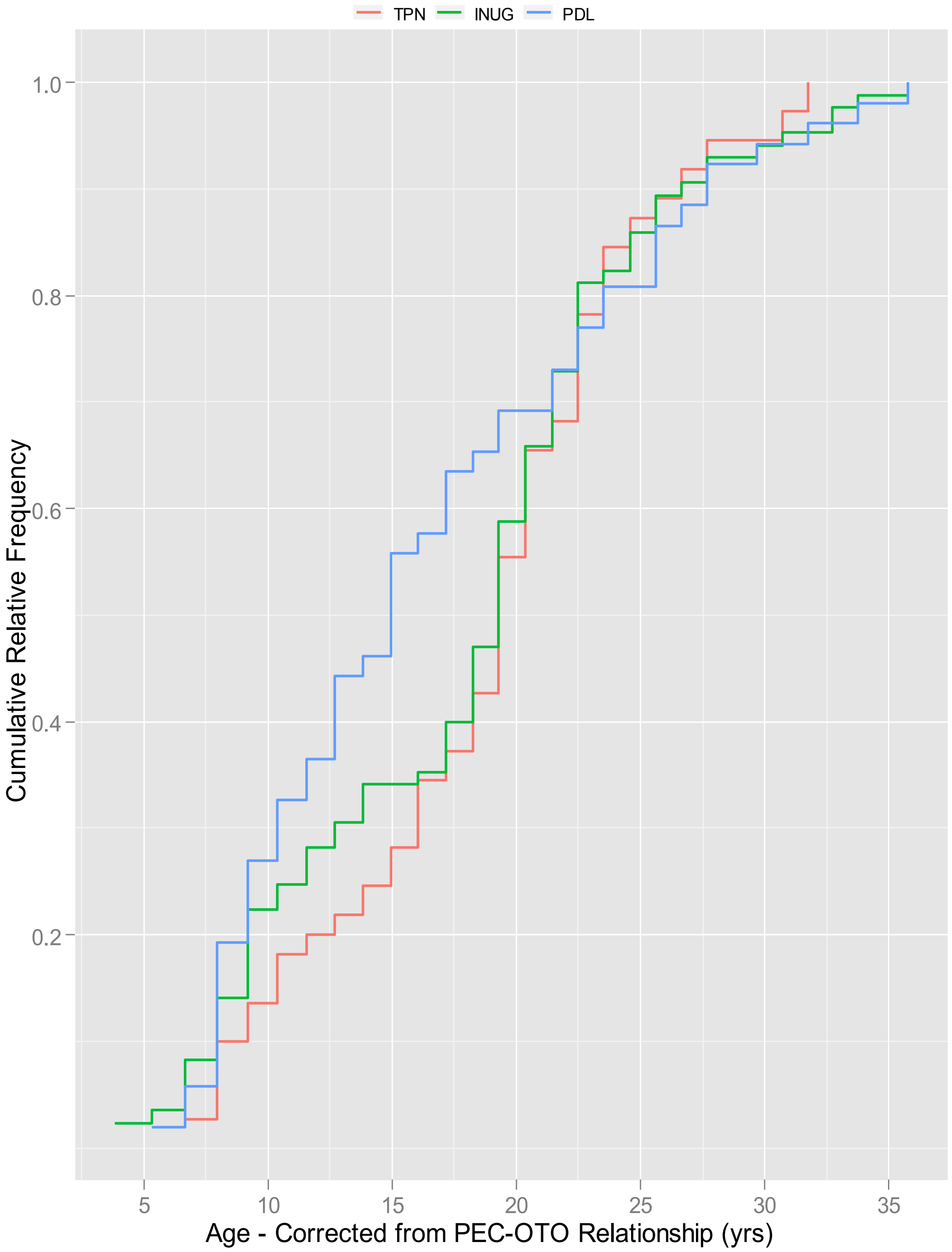


**Figure 4.3- 24.** Lake trout age (yr) density plots for each sampling area.

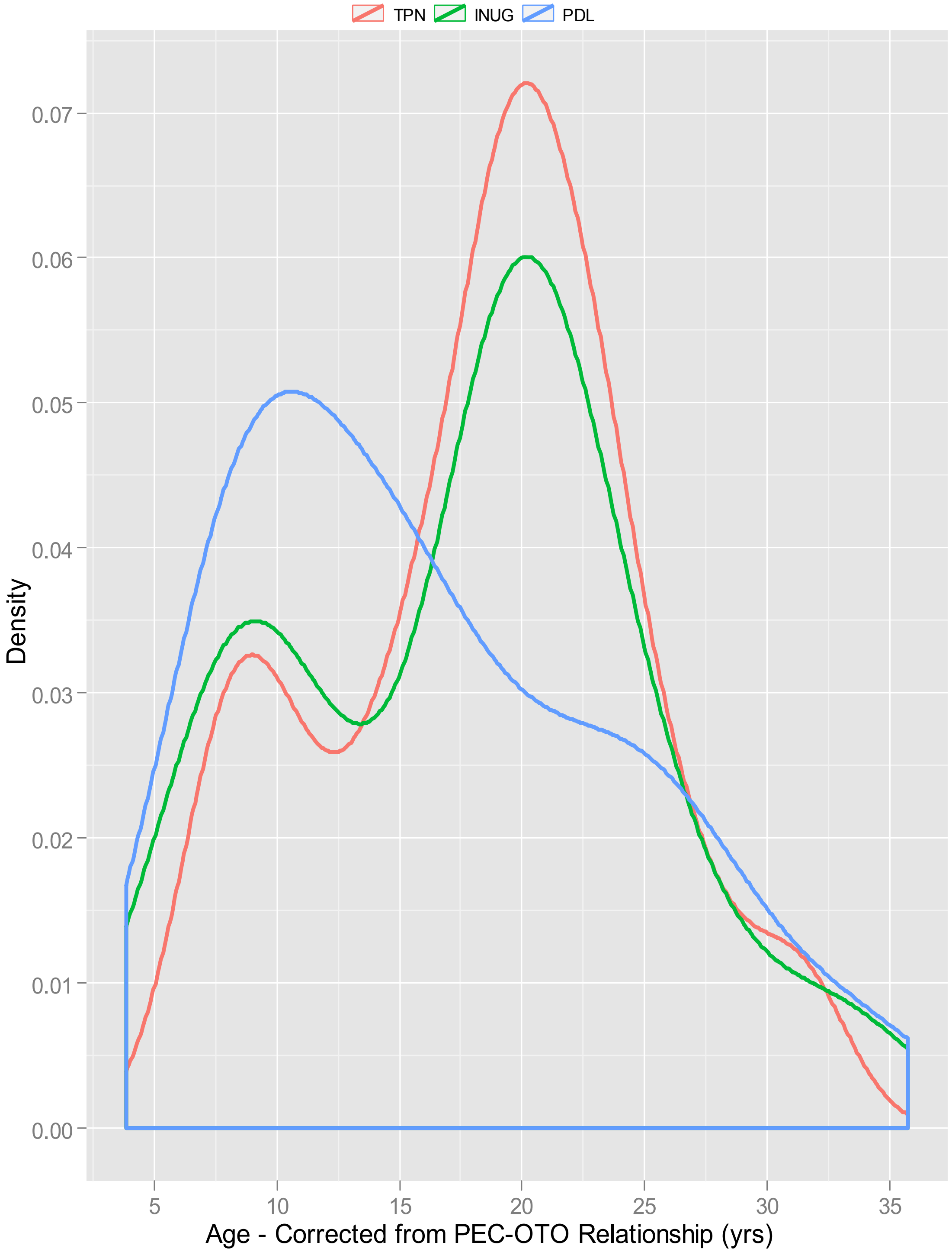


**Figure 4.3- 25.** Lake trout fork length (mm) empirical cumulative distribution function for each sampling area.

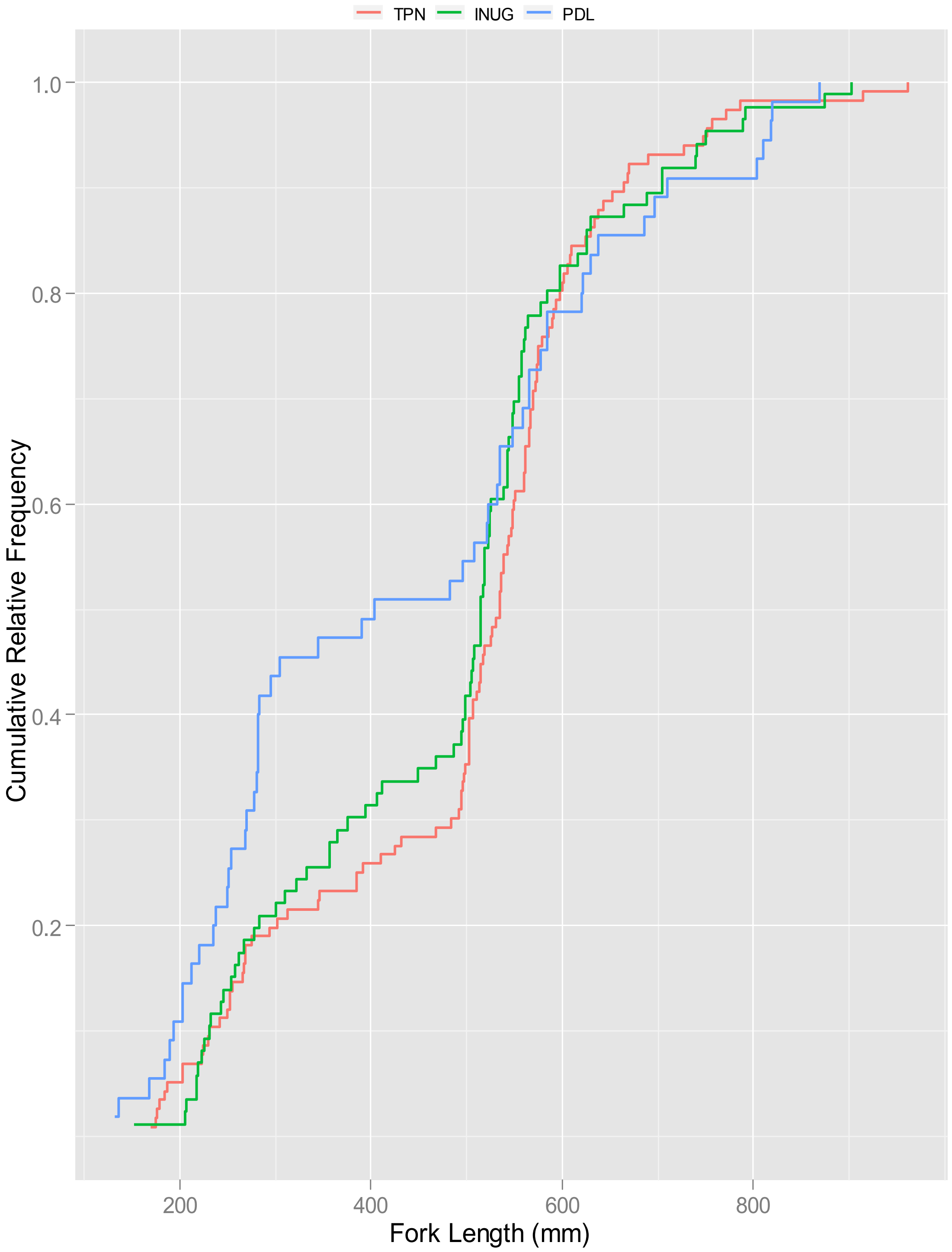
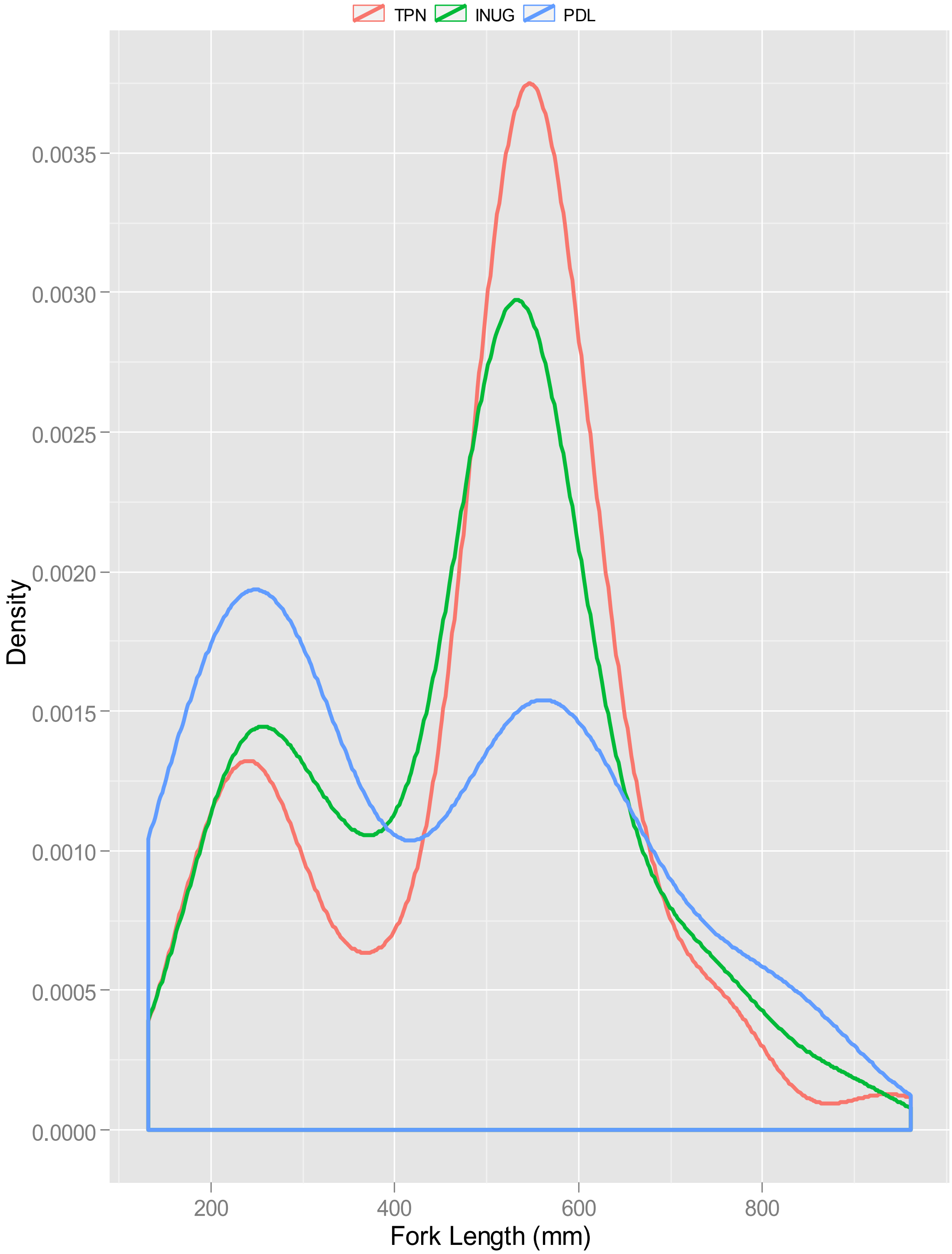


**Figure 4.3- 26.** Lake trout fork length (mm) density plots for each sampling area.



# 5. BENTHIC INVERTEBRATE COMMUNITY SURVEY

## 5.1. Sample Collection

Benthic invertebrates were collected from each of the three sampling areas (INUG, PDL, and TPN) from August 13–19th, 2011. Sampling locations (UTM coordinates), depth and dates are presented in **Table 5.1-1**. Sampling locations are illustrated in **Figure 3.3-7** (corresponding with sediment quality sampling), i.e., benthic invertebrate samples were collected at the same time and locations as sediment chemistry samples (see **Section 3.3.3**).

Benthic invertebrates were collected and analyzed according to the guidelines of the sediment and benthos sampling SOP (**Appendix D**) and according to the QA/QC procedures presented in the Study Design document (Azimuth, 2011). Generally, a Petite Ponar grab sampler (0.023 $m^2$) was used to collect five replicate samples per area. Three independent grabs (subsamples) per replicate were sieved (500-µm) and composited to form a single sample. Only those grab samples that met the acceptability criteria outlined in the SOP were retained for analysis. Depths ranged from 6.5 to 9.2 m. Field data sheets from August 2011 are presented in **Appendix E** (sediment and benthos data are recorded on the same data sheets).

**Table 5.1- 1.** Benthic invertebrate sampling areas (UTM coordinates, NAD83).

| Area Type[1] | Area-Replicate[2] | Sampling Date | Depth (m) | Latitude (dd.mm.ss.s) | Longitude (dd.mm.ss.s) |
|---|---|---|---|---|---|
| REF | INUG-1 | 14-Aug-11 | 6.9 | 65 03 09.2 | 96 23 23.5 |
| | INUG-2 | 14-Aug-11 | 6.8 | 65 03 09.7 | 96 23 25.9 |
| | INUG-3 | 14-Aug-11 | 7.6 | 65 03 08.8 | 96 23 29.4 |
| | INUG-4 | 14-Aug-11 | 8.5 | 65 03 07.3 | 96 23 31.7 |
| | INUG-5 | 14-Aug-11 | 9.2 | 65 03 06.8 | 96 23 33.1 |
| REF | PDL-1 | 13-Aug-11 | 6.5 | 65 06 16.8 | 96 13 11.6 |
| | PDL-2 | 13-Aug-11 | 6.8 | 65 06 18.1 | 96 13 07.4 |
| | PDL-3 | 13-Aug-11 | 6.9 | 65 06 09.4 | 96 13 00.4 |
| | PDL-4 | 13-Aug-11 | 7.6 | 65 06 18.5 | 96 13 01.9 |
| | PDL-5 | 13-Aug-11 | 6.7 | 65 06 17.5 | 96 13 08.3 |
| EXP | TPN-1 | 19-Aug-11 | 7.0 | 65 02 08.1 | 96 06 11.2 |
| | TPN-2 | 19-Aug-11 | 9.0 | 65 02 07.4 | 96 06 11.5 |
| | TPN-3 | 19-Aug-11 | 9.2 | 65 02 06.9 | 96 06 09.1 |
| | TPN-4 | 19-Aug-11 | 8.6 | 65 02 04.4 | 96 06 02.0 |
| | TPN-5 | 19-Aug-11 | 8.4 | 65 02 03.3 | 96 05 55.0 |

**Notes**: [1] Area types are as follows: EXP = exposure; REF = reference; [2] Area IDs are as follows: TPN=Third Portage Lake - North; INUG=Inuggugayualik Lake; PDL=Pipedream Lake.

## 5.2. QA/QC

Standard procedures were used to collect biota samples. All sampling gear was thoroughly rinsed between sampling areas to ensure that there was no inadvertent introduction (i.e., cross-contamination) of biota from one area to another.

Field replicates (5 per area) were collected for benthos to determine natural variability and heterogeneity. Replicates were collected at least 20 m apart from one another, within the defined sampling areas, as described in **Section 5.1**.

Benthos samples were preserved in the field with a 10% buffered formalin solution and sent to Zaranko Environmental Assessment Services (ZEAS) (Nobleton, ON) for taxonomic identification and analysis. Benthic invertebrate raw data are presented in **Appendix K**.

Upon arrival at ZEAS, samples were immediately logged and inspected to ensure adequate preservation to a minimum level of 10% buffered formalin and checked for correct labeling. Benthos samples were sorted at a magnification of between 7 and 10 times with the use of a stereomicroscope. To expedite sorting prior to processing, all samples were stained with a protein dye that is absorbed by aquatic organisms but not by organic material, such as detritus and algae.

Prior to sorting, samples were washed free of formalin in a 500-µm sieve. Benthos were enumerated and sorted into major taxonomic groups, (i.e., order and family), placed in glass bottles and re-preserved in 80% ethanol for more detailed taxonomic analysis by senior staff. Each bottle was labeled internally with the survey name, date, area and replicate number.

ZEAS incorporates the following set of QA/QC procedures in all benthic projects undertaken by the company to ensure the generation of high quality and reliable data:

- Samples were logged upon arrival, inspected, and enumerated;
- Samples were checked for proper preservation;
- Samples were stained to facilitate sorting;
- Taxonomic identifications were based on the most updated and widely used keys;
- 10% of the samples were re-sorted, and re-counted, targeting >90% recovery;
- Precision and accuracy estimates were calculated;
- A voucher collection was compiled;
- Sorted sediments and debris were re-preserved in 10% formalin and are retained for up to three months. For samples subject to subsampling, sorted and unsorted fractions were re-preserved separately.

Laboratory replicate counts were performed on 10% of all benthic samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce bias. Of the re-sorted samples, 0/21 and 1/14 of organisms were missed (**Table 5.2.1**). These results suggest that the vast majority of animals observed in benthic samples by the taxonomist were recovered.

**Table 5.2- 1.** Percent recovery of benthic invertebrate samples.

| Area-Replicate | Number of Organisms Recovered | Number of Organisms in Re-sort | Percent Recovery |
|---|---|---|---|
| INUG-5-A | 21 | 21 | 100.0% |
| PDL-4-A | 13 | 14 | 92.9% |
| | | ***Average % Recovery*** | 96.4% |

**Note**: All fifteen samples were sorted in their entirety.

## 5.3. Data Assessment

### 5.3.1. Benthic Invertebrate Community Endpoints

The targeted benthic community endpoints (along with their abbreviated variable names in some tables and figures) were:

- *Total density (N.Tot.m2)* – number of invertebrates per m$^2$.
- *Evenness (Simp.E.prop)* – calculated using the method (based on Smith and Wilson, 1996) described in the TGD (Environment Canada, 2012).
- *Taxa richness (R.Tot)* – based on taxa counts identified to the lowest practical taxonomic level (i.e., lower than or equal to family level).
- *Similarity index (Bray.Cur)* – calculated using the method (based on Legendre and Legendre, 1983) described in the TGD (Environment Canada, 2012).

These endpoints are summarized in **Table 5.3-1** and **Figure 5.3-1**.

Summary tables for other supporting endpoints are presented in **Appendix L**; this includes:

- *Family density* – the number of individuals of each family expressed per unit area (#/m$^2$). Values are reported for each family at each replicate station and as the mean and standard error of each family for the area.
- *Family proportion* – the percentage (%) density for each family at each replicate station and the mean and standard error of each family for the area.
- *Family presence/absence* – a matrix indicating the presence and absence of each family at each replicate station.
- *Raw family data* – a tabular listing of the number of individuals identified per family for each replicate station.
- *Raw lowest practical level data* – a tabular listing of the number of individuals identified at the lowest practical level for each replicate station.

### 5.3.2. Supporting Environmental Endpoints

The targeted supporting environmental endpoints (along with their abbreviated variable names in tables and figures) were:

- *Total organic carbon (TOC)* – in units of percent (%).
- *Sediment particle size (Fines)* – in units of percent (%); combination of silt and clay (fraction size <4 µm – 0.063 mm).
- *Depth (Depth.m)* – in units of meters (m).

These endpoints are summarized in **Table 5.3-2** and **Figure 5.3-2**.

### 5.3.3. Statistical Analysis

As described in **Section 2.2** and shown in **Figure 2.2-1**, a hierarchical approach was used to test for statistical differences among sampling areas. Initial analyses were conducted to test for differences between the pooled reference areas (i.e., INUG and PDL pooled as “REF” for reference) and TPN (as “EXP” for exposure); this is hereafter referred to as “C-I” (or “CI-based”). If statistical differences were identified, then analyses would test for differences among areas (i.e., testing to see if TPN is different from both INUG and PDL) (referred to hereafter as “area-based”).

The analyses described herein follow the statistical procedures recommended by the EEM technical guidance document (Environment Canada, 2012) to assess potential differences in the benthic invertebrate community between reference and exposure areas. Analysis of variance (ANOVA) is the standard method for testing for statistical differences among sampling areas (although ANCOVA can be used if there is a known covariate). All statistical analyses were conducted using R software (v 2.15).

Key assumptions of ANOVA are as follows (Environment Canada, 2012):

- Data for reference and exposure areas are normally distributed; and
- Variances are equal between reference and exposure area; and
- Errors are independently distributed.

The steps for CI-based ANOVA were as follows:

1) Response variables were plotted, highlighting C-I groups, to see basic relationships (e.g., see **Figures 5.3-1 and 5.3-2**).
2) Formal tests (Shapiro-Wilk normality test and Bartlett test of homogeneity of variance) and graphical methods (e.g., examination of residuals from ANOVA model conducted with various transformations) to determine the need for transformations.
3) Run ANOVA model testing for pooled C-I differences in the response endpoints. The model form in R was: Response ~ CI, where Response is a numeric response variable and CI is a factor with 2 levels (Control [pooled reference] and Impact [exposure]).
4) Examine final ANOVA model residuals graphically to check for underlying patterns that would violate model assumptions of normality and homogeneity of variance.
5) Effect size information calculated relative to reference area means.

This process was repeated for area-based ANOVA testing (i.e., the second tier of the hierarchical strategy discussed in **Section 2.2** to make inference for the MC-I design) to determine whether the TPN exposure area was different from both reference areas (i.e., independently, not pooled).

The CI-based ANOVA results are provided below by response endpoint.

*Total Density (N.Tot.m2)*

- N.Tot.m2 was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-3**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was not statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area had 39% lower total density than the pooled reference area.

*Total Richness (R.Tot)*

- R.Tot was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-3**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area had 24% lower total richness than the pooled reference area.

*Evenness (Simp.E.prop)*

- Simp.E.prop was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-3**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was not statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area had 12% higher Simpson's Evenness than the pooled reference area.

*Similarity (Bray.Cur)*

- Bray.Cur was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-3**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area had a 41% higher Bray Curtis Similarity Index than the pooled reference area.

*Total organic carbon (TOC)*

- TOC was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-4**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was statistically significant.

- Observed effect size information is provided in **Table 5.3-4**. The exposure area had 50% lower TOC than the pooled reference area.

*Fines (Fines)*

- Fines was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-4**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area had 29% lower fine sediments than the pooled reference area.

*Depth (Depth.m)*

- Depth.m was not transformed for the ANOVA.
- Reference and exposure area means +/- standard error are shown in **Figure 5.3-4**.
- ANOVA results are shown in **Table 5.3-3**. The difference between pooled reference area and the TPN exposure area was statistically significant.
- Observed effect size information is provided in **Table 5.3-4**. The exposure area was 15% deeper than the pooled reference area.

The area-based ANOVA results are provided below by response endpoint (note that only those endpoints showing significant differences in CI-based analyses were included in area-based analyses). ANOVAs were first conducted to test for among-area differences (all area-based ANOVA results shown in **Table 5.3-5**) then to test whether there was a difference between the TPN exposure area and the particular reference area (i.e., INUG or PDL) with the nearest mean (only the ultimate results [effect or not] are reported for the area-based ANOVAs in **Table 5.3-6**, along with effect size information).

*Total Density (N.Tot.m2)*

- No differences in CI-based analyses, so not included in area-based assessment.

*Total Richness (R.Tot)*

- R.Tot was not transformed for the ANOVA.
- Area means and raw data are shown in **Figure 5.3-1**.
- Significant differences were not detected among areas (**Table 5.3-5**), nor was there a significant difference between TPN and PDL.
- Observed effect size information is provided in **Table 5.3-6**. The TPN exposure area had 20% lower total richness than the PDL reference area.

*Evenness (Simp.E.prop)*

- No differences in CI-based analyses, so not included in area-based assessment.

*Similarity (Bray.Cur)*

- Bray.Cur was not transformed for the ANOVA.
- Area means and raw data are shown in **Figure 5.3-1**.
- Significant differences were detected among areas (**Table 5.3-5**), and there was a significant difference between TPN and PDL.
- Observed effect size information is provided in **Table 5.3-6**. The exposure area had a 38% higher Bray Curtis Similarity Index than the pooled reference area.

*Total organic carbon (TOC)*

- TOC was not transformed for the ANOVA.
- Area means and raw data are shown in **Figure 5.3-2**.
- Significant differences were detected among areas (**Table 5.3-5**), but there was no significant difference between TPN and PDL.
- Observed effect size information is provided in **Table 5.3-6**. The exposure area had 37% lower TOC than the PDL area.

*Fines (Fines)*

- Fines were not transformed for the ANOVA.
- Area means and raw data are shown in **Figure 5.3-2**.
- Significant differences were detected among areas (**Table 5.3-5**), and there was a significant difference between TPN and PDL.
- Observed effect size information is provided in **Table 5.3-6**. The exposure area had 27% lower fine sediments than the PDL reference area.

*Depth (Depth.m)*

- Depth.m was not transformed for the ANOVA.
- Area means and raw data are shown in **Figure 5.3-2**.
- Significant differences were detected among areas (**Table 5.3-5**), but there was no significant difference between TPN and INUG.
- Observed effect size information is provided in **Table 5.3-6**. The TPN exposure area was 8% deeper than the INUG reference area.

Based on the preceding results (i.e., differences detected between reference and exposure areas for both benthic invertebrate community endpoints and supporting environmental variables), a series of supplemental analyses were conducted (**Section 5.4**) to assess causality (i.e., if the differences are attributable to effluent exposure or to natural causes).

### 5.3.4. Post-hoc Assessment of Power and Confidence

This section examines results of CI-based (i.e., pooled reference area) statistical analyses with the intent of providing insights into the degree of confidence of their conclusions. This essentially focuses on understanding the degree of uncertainty (e.g., using 95% confidence intervals) for observed effect size estimates in the context of the EEM-recommended critical effect size (CES). *Post-hoc*[12] power analyses can also provide insights for planning subsequent EEM cycles.

This section focuses on the benthic invertebrate community endpoints only; further exploration of the role of the supplemental environment endpoints is conducted in **Section 5.4** (i.e., where a much larger CREMP data set can be used to better characterize the influence of supporting environmental variables on the differences observed in the EEM data). Consequently, while caution should be used regarding making inferences as to the cause to the observed differences between pooled reference and exposure areas (i.e., as the results described in **Section 5.3.3** show differences in both the benthic invertebrate community endpoints and supplemental environmental endpoints, the nature and cause of the biological differences will be explored in greater detail in **Section 5.4**), the ability of the study design to detect such effects relative to the CES is still relevant for planning future studies.

The following approaches were taken using the results of the CI-based ANOVA analyses:

1) Comparisons of observed effect sizes and their 95% confidence intervals to the EEM-recommended critical effect sizes (CES) to determine the confidence that the observed effects do not exceed the CES. This was conducted by:
    a. Randomly generate 500,000 new effect size estimates using the actual effect size and its standard error.
    b. Compare each of the generated effect sizes to the CES and record the proportion of those not exceeding the CES.
2) Estimation of statistical power of detecting the CES based on the executed study design. This was conducted using the two methods described in the textbox.
3) Estimation of the minimum detectable effect size for the targeted statistical power of 0.9 (i.e., $\beta = 0.1$) based on the executed study design. This was conducted using the two methods described in the textbox.

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[12] Note that *post-hoc* power analysis is often associated with the controversial practice of estimating the power of a study using the sample size and observed effect size. While the EEM TGD uses the term "*post-hoc*", the nature of the power analyses would actually classify them as *a priori* since they are being used to inform subsequent EEM cycles.

4) Estimation of minimum sample size required to detect the CES based on the targeted statistical power. This was conducted using the two methods described in the textbox.

Key results for the benthic invertebrate community endpoints were as follows:

- *Observed Effect Sizes* – **Figure 5.3-5** shows the mean and standard errors of each benthic invertebrate community endpoint relative to the EEM-recommended CES values. The simulated effect size distribution and EEM CES are shown in in **Figure 5.3-6**, along with the confidence estimates regarding exceeding the CES. Confidence was high (i.e., > 0.88) that the observed effects sizes were below the CES for all endpoints except for the Similarity Index (Bray.Cur), for which the mean value exceeded the CES (confidence was 0.44 that the CES was not exceeded).
- *Power to Detect CES* – an R function (see textbox) was used to estimate statistical power. Power to detect the CES was fairly high for all three endpoints (**Table 5.3-7**), ranging from near 0.8 to nearly 1.
- *Minimum Effect Size for Target Power* – an R function (see textbox) was used to estimate minimum effect size. Minimum detectable effect sizes were higher than observed effect sizes for all benthic invertebrate endpoints (**Table 5.3-7**).
- *Minimum Sample Size for CES with Target Power* – an R function (see textbox) was used to estimate minimum sample size. The minimum sample sizes were higher than actual sample sizes for Evenness and Similarity (**Table 5.3-7**).

### Power Analyses for ANOVA

**Method 1 –** The function "pwr.t2n.test" in the R "pwr" package, which estimates power for the t-test for unequal sample sizes, was used (n.b., t-test produces the same result as ANOVA when testing two groups [C-I]). This procedure solves for whichever of the following are missing: effect size (d = [EXP-REF]/SD, where SD = sqrt[ANOVA Mean Square Error]), n for EXP, n for REF, α,β. This allows all the key power questions to be addressed.

**Method 2 –** Simulated data sets based on the actual properties of the data (e.g., ref mean, SD, n) were used to verify that Method 1 was producing accurate results.

As discussed earlier, these results do not take potential confounding relationships with supporting environmental variables into consideration. Consequently, the above results should be viewed with caution.

**Table 5.3- 1.** Summary statistics for benthic invertebrate community endpoints by sampling area, EEM Data.

| | Primary Benthic Endpoints | | | | Supporting Benthic Endpoints | |
|---|---|---|---|---|---|---|
| | Total Density (#/m$^2$) | Taxa Richness (# taxa) | Simpson's Evenness Index | Bray-Curtis Similarity Index | Simpson's Diversity Index | Family Richness (# families) |
| **INUG** | | | | | | |
| 1 | 319 | 9 | 0.53 | 0.59 | 0.79 | 4 |
| 2 | 783 | 9 | 0.46 | 0.34 | 0.76 | 4 |
| 3 | 971 | 12 | 0.39 | 0.34 | 0.79 | 4 |
| 4 | 1783 | 18 | 0.23 | 0.41 | 0.76 | 5 |
| 5 | 783 | 15 | 0.41 | 0.34 | 0.84 | 4 |
| **PDL** | | | | | | |
| 1 | 739 | 12 | 0.42 | 0.43 | 0.80 | 4 |
| 2 | 899 | 12 | 0.40 | 0.41 | 0.79 | 5 |
| 3 | 1203 | 10 | 0.35 | 0.48 | 0.71 | 6 |
| 4 | 638 | 8 | 0.41 | 0.35 | 0.70 | 3 |
| 5 | 928 | 14 | 0.44 | 0.43 | 0.84 | 6 |
| **TPN** | | | | | | |
| 1 | 899 | 10 | 0.32 | 0.42 | 0.69 | 5 |
| 2 | 855 | 10 | 0.31 | 0.45 | 0.68 | 4 |
| 3 | 261 | 6 | 0.64 | 0.75 | 0.74 | 3 |
| 4 | 536 | 11 | 0.40 | 0.51 | 0.77 | 3 |
| 5 | 217 | 8 | 0.60 | 0.77 | 0.79 | 3 |

| | Primary Benthic Endpoints | | | | Supporting Benthic Endpoints | |
|---|---|---|---|---|---|---|
| | Total Density (#/m$^2$) | Taxa Richness (# taxa) | Simpson's Evenness Index | Bray-Curtis Similarity Index | Simpson's Diversity Index | Family Richness (# families) |
| **INUG** | | | | | | |
| n | 5 | 5 | 5 | 5 | 5 | 5 |
| Mean | 928 | 12.6 | 0.40 | 0.40 | 0.79 | 4.2 |
| Median | 783 | 12 | 0.41 | 0.34 | 0.79 | 4.0 |
| StDev | 535 | 3.9 | 0.11 | 0.11 | 0.03 | 0.4 |
| SE | 239 | 1.7 | 0.05 | 0.05 | 0.01 | 0.2 |
| Min | 319 | 9 | 0.23 | 0.34 | 0.76 | 4.0 |
| Max | 1783 | 18 | 0.53 | 0.59 | 0.84 | 5.0 |
| **PDL** | | | | | | |
| n | 5 | 5 | 5 | 5 | 5 | 5 |
| Mean | 881 | 11.2 | 0.40 | 0.42 | 0.77 | 4.8 |
| Median | 899 | 12 | 0.41 | 0.43 | 0.79 | 5.0 |
| StDev | 215 | 2.3 | 0.03 | 0.05 | 0.06 | 1.3 |
| SE | 96 | 1.0 | 0.02 | 0.02 | 0.03 | 0.6 |
| Min | 638 | 8 | 0.35 | 0.35 | 0.70 | 3.0 |
| Max | 1203 | 14 | 0.44 | 0.48 | 0.84 | 6.0 |
| **TPN** | | | | | | |
| n | 5 | 5 | 5 | 5 | 5 | 5 |
| Mean | 554 | 9.0 | 0.45 | 0.58 | 0.73 | 3.6 |
| Median | 536 | 10 | 0.40 | 0.51 | 0.74 | 3.0 |
| StDev | 320 | 2.0 | 0.16 | 0.17 | 0.05 | 0.9 |
| SE | 143 | 0.9 | 0.07 | 0.07 | 0.02 | 0.4 |
| Min | 217 | 6 | 0.31 | 0.42 | 0.68 | 3.0 |
| Max | 899 | 11 | 0.64 | 0.77 | 0.79 | 5.0 |

**Table 5.3- 2.** Summary statistics for benthic invertebrate community supporting environmental variables endpoints by sampling area, EEM Data.

| | Fines (%) | TOC (%) | Depth (m) | | Fines (%) | TOC (%) | Depth (m) |
|---|---|---|---|---|---|---|---|
| **INUG** | | | | **INUG** | | | |
| 1 | 88.5 | 2.93 | 6.9 | n | 5 | 5 | 5 |
| 2 | 86.4 | 2.99 | 6.8 | Mean | 92.9 | 3.80 | 7.8 |
| 3 | 95.0 | 4.84 | 7.6 | Median | 95.0 | 4.01 | 7.6 |
| 4 | 97.3 | 4.01 | 8.5 | StDev | 5.1 | 0.82 | 1.0 |
| 5 | 97.3 | 4.22 | 9.2 | SE | 2.3 | 0.37 | 0.5 |
| | | | | Min | 86.4 | 2.93 | 6.8 |
| | | | | Max | 97.3 | 4.84 | 9.2 |
| **PDL** | | | | **PDL** | | | |
| 1 | 86.3 | 2.44 | 6.5 | n | 5 | 5 | 5 |
| 2 | 85.1 | 2.64 | 6.8 | Mean | 87.4 | 2.54 | 6.9 |
| 3 | 84.2 | 1.77 | 6.9 | Median | 86.3 | 2.64 | 6.8 |
| 4 | 94.2 | 2.76 | 7.6 | StDev | 4.0 | 0.49 | 0.4 |
| 5 | 87.5 | 3.09 | 6.7 | SE | 1.8 | 0.22 | 0.2 |
| | | | | Min | 84.2 | 1.77 | 6.5 |
| | | | | Max | 94.2 | 3.09 | 7.6 |
| **TPN** | | | | **TPN** | | | |
| 1 | 53.4 | 1.80 | 7.0 | n | 5 | 5 | 5 |
| 2 | 85.5 | 3.71 | 9.0 | Mean | 64.0 | 1.59 | 8.4 |
| 3 | 53.2 | 1.25 | 9.2 | Median | 57.7 | 1.25 | 8.6 |
| 4 | 57.7 | 0.66 | 8.6 | StDev | 13.9 | 1.29 | 0.9 |
| 5 | 70.3 | 0.51 | 8.4 | SE | 6.2 | 0.58 | 0.4 |
| | | | | Min | 53.2 | 0.51 | 7.0 |
| | | | | Max | 85.5 | 3.71 | 9.2 |

**Table 5.3- 3.** Summary of CI-based ANOVA tests for benthic invertebrate community and supporting environmental endpoints, EEM Data.

| Endpoint | Source of Variation | Sum of Squares | df | Mean Square | F | p-value | Significant at p<0.1? |
|---|---|---|---|---|---|---|---|
| | | | | *Benthic Community Endpoints* | | | |
| Total Density | Between Groups (C-I) | 410029 | 1 | 410029 | 3.054 | 0.104 | No |
| N.Tot.m2 | Within Groups (Residual | 1745266 | 13 | 134251 | | | |
| | Total | 2155295 | 14 | | | | |
| Total Richness | Between Groups (C-I) | 28.033 | 1 | 28.0333 | 3.542 | 0.082 | Yes |
| (R.Tot) | Within Groups (Residual | 102.9 | 13 | 7.9154 | | | |
| | Total | 130.93 | 14 | | | | |
| Evenness | Between Groups (C-I) | 0.008 | 1 | 0.008 | 0.715 | 0.413 | No |
| (Simp.E.prop) | Within Groups (Residual | 0.152 | 13 | 0.012 | | | |
| | Total | 0.160 | 14 | | | | |
| Similarity | Between Groups (C-I) | 0.094 | 1 | 0.094 | 7.247 | 0.018 | Yes |
| (Bray.Cur) | Within Groups (Residual | 0.169 | 13 | 0.013 | | | |
| | Total | 0.263 | 14 | | | | |
| | | | | *Supporting Sediment Endpoints* | | | |
| TOC | Between Groups (C-I) | 8.353 | 1 | 8.353 | 7.583 | 0.016 | Yes |
| | Within Groups (Residual | 14.321 | 13 | 1.102 | | | |
| | Total | 22.674 | 14 | | | | |
| Fines | Between Groups (C-I) | 2277.3 | 1 | 2277.3 | 29.272 | <0.001 | Yes |
| | Within Groups (Residual | 1011.4 | 13 | 77.8 | | | |
| | Total | 3288.7 | 14 | | | | |
| Depth | Between Groups (C-I) | 3.960 | 1 | 3.960 | 5.140 | 0.041 | Yes |
| | Within Groups (Residual | 10.017 | 13 | 0.771 | | | |
| | Total | 13.977 | 14 | | | | |

**Notes**: "df" = degrees of freedom; "F" = statistical F ratio; "C-I" = control-impact (or REF-EXP).

**Table 5.3- 4.** Summary of CI-based effect size information for benthic invertebrate community and supporting environmental endpoints, EEM Data.

| Endpoint | Area | Mean | Ref SD | Obs. ES | % ES | ES/Ref SD | Effect? |
|---|---|---|---|---|---|---|---|
| *Benthic Community Endpoints* | | | | | | | |
| Total Density | Reference | 905 | 385 | | | | |
| N.Tot.m2 | Exposure | 554 | | -351 | -39% | -0.9 | No |
| Total Richness | Reference | 11.9 | 3.107 | | | | |
| (R.Tot) | Exposure | 9 | | -2.9 | -24% | -0.9 | Yes |
| Evenness | Reference | 0.404 | 0.077 | | | | |
| (Simp.E.prop) | Exposure | 0.454 | | 0.05 | 12% | 0.6 | No |
| Similarity | Reference | 0.412 | 0.079 | | | | |
| (Bray.Cur) | Exposure | 0.580 | | 0.17 | 41% | 2.1 | Yes |
| *Supporting Sediment Endpoints* | | | | | | | |
| TOC | Reference | 3.2 | 0.9 | | | | |
| | Exposure | 1.6 | | -1.6 | -50% | -1.7 | Yes |
| Fines | Reference | 90.2 | 5.2 | | | | |
| | Exposure | 64.0 | | -26.1 | -29% | -5.0 | Yes |
| Depth | Reference | 7.4 | 0.9 | | | | |
| | Exposure | 8.4 | | 1.1 | 15% | 1.2 | Yes |

**Notes**: "Ref SD" = pooled REF standard deviation; "Obs. ES" = observed effect size; "% ES" = 100*(EXP Mean - REF mean)/REF mean.

**Table 5.3- 5.** Summary of Area-based ANOVA tests for benthic invertebrate community and supporting environmental endpoints, EEM Data.

| Endpoint | Source of Variation | Sum of Squares | df | Mean Square | F | p-value | Effect? |
|---|---|---|---|---|---|---|---|
| *Benthic Community Endpoints* | | | | | | | |
| Total Richness | Between Groups (Areas) | 32.9 | 2 | 16.5 | 2.016 | 0.176 | No |
| (R.Tot) | Within Groups (Residuals) | 98.0 | 12 | 8.2 | | | |
| | Total | 130.90 | 14 | | | | |
| Similarity | Between Groups (Areas) | 0.095 | 2 | 0.047 | 3.380 | 0.068 | Yes |
| (Bray.Cur) | Within Groups (Residuals) | 0.168 | 12 | 0.014 | | | |
| | Total | 0.263 | 14 | | | | |
| *Supporting Sediment Endpoints* | | | | | | | |
| TOC | Between Groups (Areas) | 12.309 | 2 | 6.155 | 7.126 | 0.009 | Yes |
| | Within Groups (Residuals) | 10.364 | 12 | 0.864 | | | |
| | Total | 22.673 | 14 | | | | |
| Fines | Between Groups (Areas) | 2351.3 | 2 | 1175.65 | 15.050 | <0.001 | Yes |
| | Within Groups (Residuals) | 937.39 | 12 | 78.12 | | | |
| | Total | 3288.7 | 14 | | | | |
| Depth | Between Groups (Areas) | 5.985 | 2 | 2.993 | 4.494 | 0.035 | Yes |
| | Within Groups (Residuals) | 7.992 | 12 | 0.666 | | | |
| | Total | 13.977 | 14 | | | | |

**Notes**: "df" = degrees of freedom; "F" = statistical F ratio; "C-I" = control-impact (or REF-EXP); "Effect" = difference among areas (p<0.1).

**Table 5.3- 6.** Summary of Area-based effect size information for benthic invertebrate community and supporting environmental endpoints, EEM Data.

| Endpoint | Area | Mean | Ref SD | Obs. ES | % ES | ES/Ref SD | Effect? |
|---|---|---|---|---|---|---|---|
| | | *Benthic Community Endpoints* | | | | | |
| Total Richness | PDL | 11.2 | 2.28 | | | | |
| (R.Tot) | TPN | 9 | | -2.2 | -20% | -1.0 | No |
| Similarity | PDL | 0.420 | 0.047 | | | | |
| (Bray.Cur) | TPN | 0.580 | | 0.16 | 38% | 3.4 | Yes |
| | | *Supporting Sediment Endpoints* | | | | | |
| TOC | PDL | 2.5 | 0.5 | | | | |
| | TPN | 1.6 | | -0.9 | -37% | -1.9 | No |
| Fines | PDL | 87.4 | 4.0 | | | | |
| | TPN | 64.0 | | -23.4 | -27% | -5.9 | Yes |
| Depth | INUG | 7.8 | 1.0 | | | | |
| | TPN | 8.4 | | 0.6 | 8% | 0.6 | No |

**Notes**: "Ref SD" = standard deviation of Ref area tested; "Obs. ES" = observed effect size; "% ES" = 100*(EXP Mean - REF mean)/REF mean; "Effect" = difference between TPN and closest REF area (p<0.1).

**Table 5.3- 7.** Power analysis information and results for benthic invertebrate community endpoints tested using ANOVA.

| Endpoint | Obs. ES | Ref SD | CES | n (EXP/REF) | α | β | Confidence Obs. ES<CES | Power for CES | Minimum ES | Minumum EXP n for CES and Power |
|---|---|---|---|---|---|---|---|---|---|---|
| *Benthic Community Endpoints* | | | | | | | | | | |
| Total Density N.Tot.m2 | -351 | 385 | -770 | 5/10 | 0.1 | 0.1 | 0.88 | 0.98 | 620 | 4 |
| Total Richness (R.Tot) | -2.9 | 3.1073 | -6.2146 | 5/10 | 0.1 | 0.1 | 0.98 | 0.98 | 4.77 | 4 |
| Evenness (Simp.E.prop) | 0.05 | 0.0775 | 0.155 | 5/10 | 0.1 | 0.1 | 0.96 | 0.80 | 0.183 | 7 |
| Similarity (Bray.Cur) | 0.17 | 0.0791 | 0.1582 | 5/10 | 0.1 | 0.1 | 0.44 | 0.78 | 0.193 | 7 |

**Notes**: "Obs. ES" = observed effect size; "CES" = critical effect size (from EEM TGD) = 2 * Ref SD (note that it is shown here with the same change direction as the Obs. ES); "n" = sample size; "Ref SD" = standard deviation of pooled reference area; "Minimum ES" reported in Obs. ES units, not as multiple of Ref SD; Minimum sample size (REF n = 2 * EXP n).

**Figure 5.3- 1.** Benthic invertebrate community endpoint results by sampling area, EEM Data.

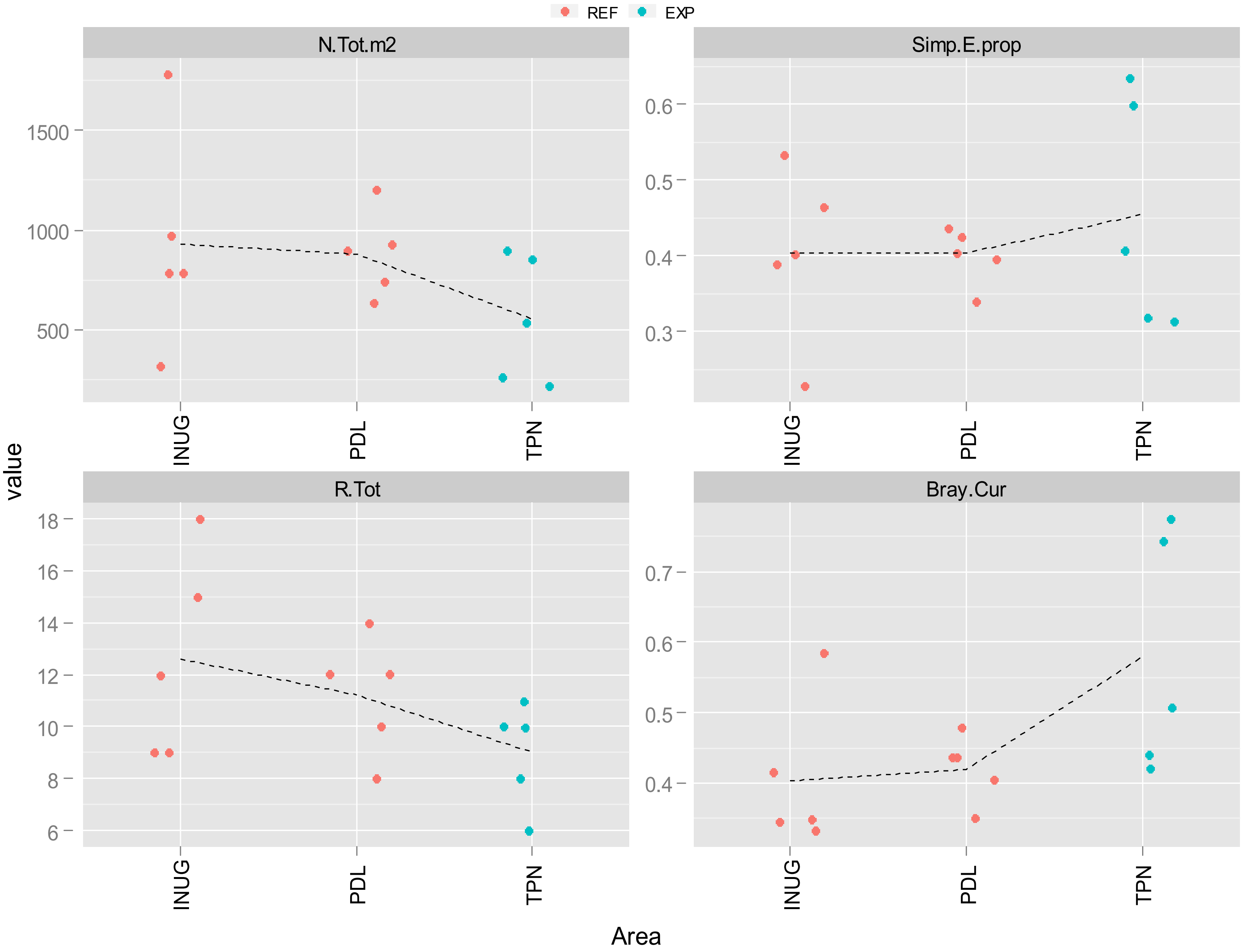


**Figure 5.3- 2.** Benthic invertebrate community supporting environmental endpoint results by sampling area, EEM Data.

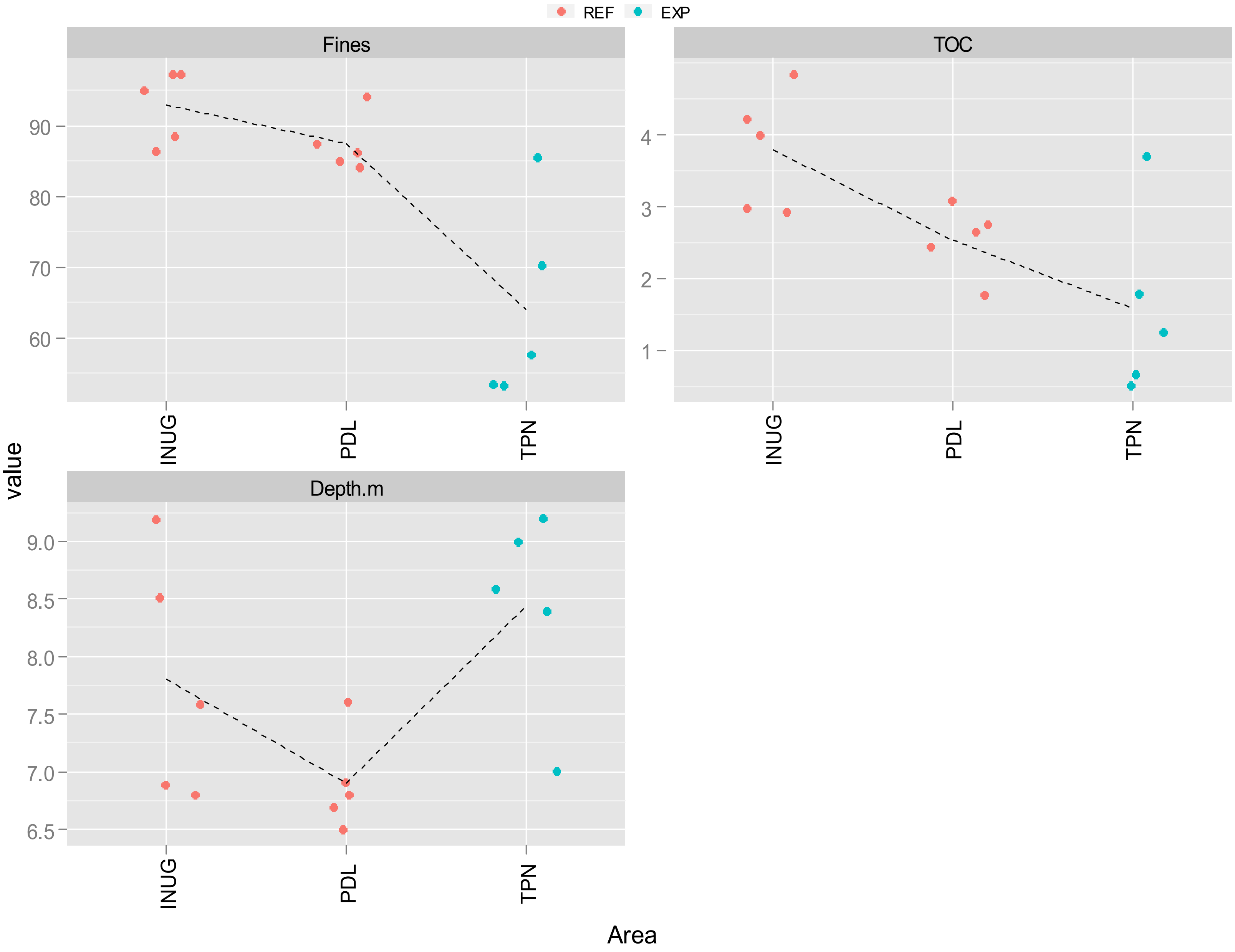


**Figure 5.3- 3.** Benthic invertebrate community endpoint means and standard errors for pooled reference area and exposure area, EEM Data.

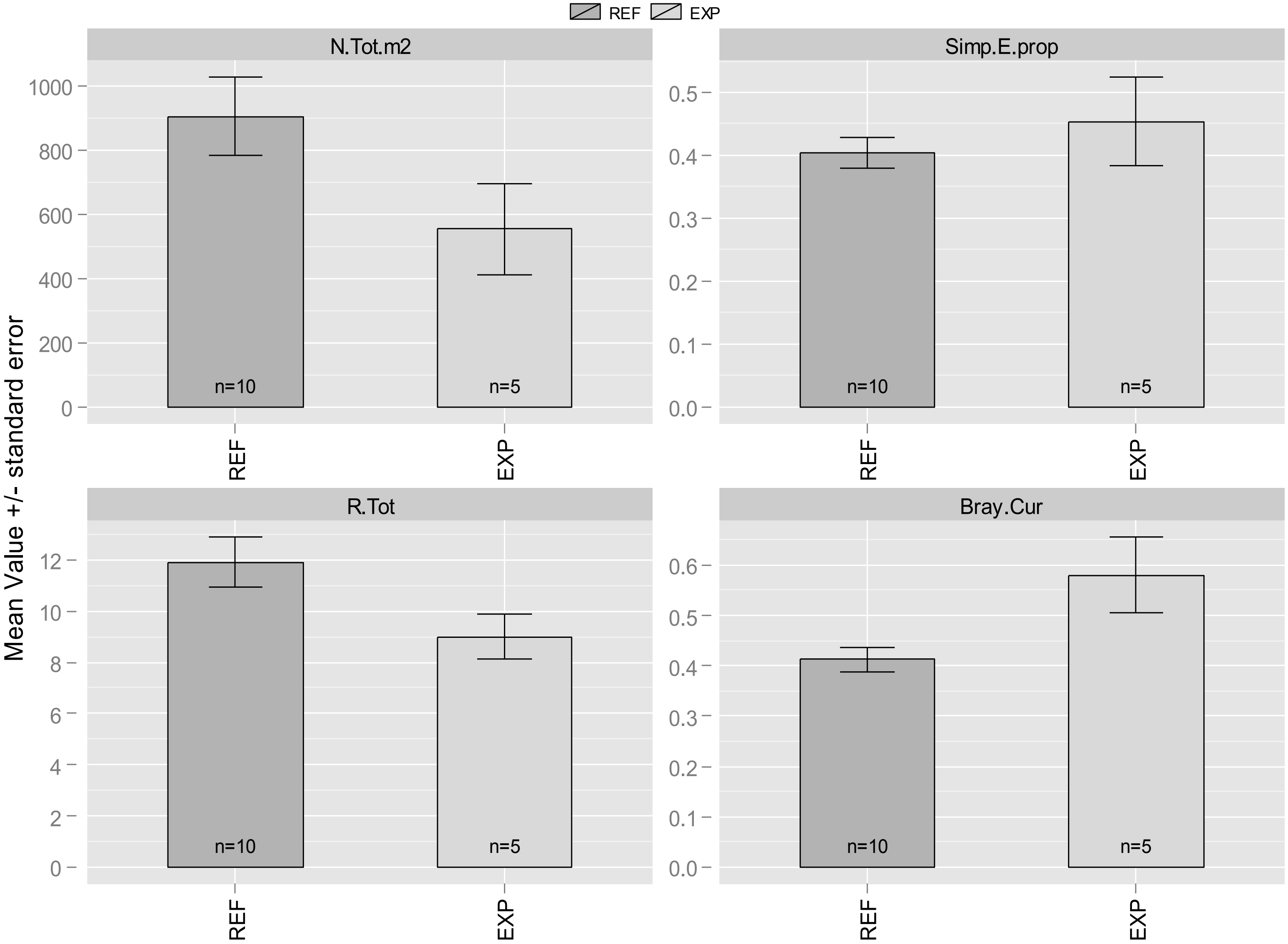


**Figure 5.3- 4.** Benthic invertebrate community supporting environmental endpoint means and standard errors for pooled reference area and exposure area, EEM Data.

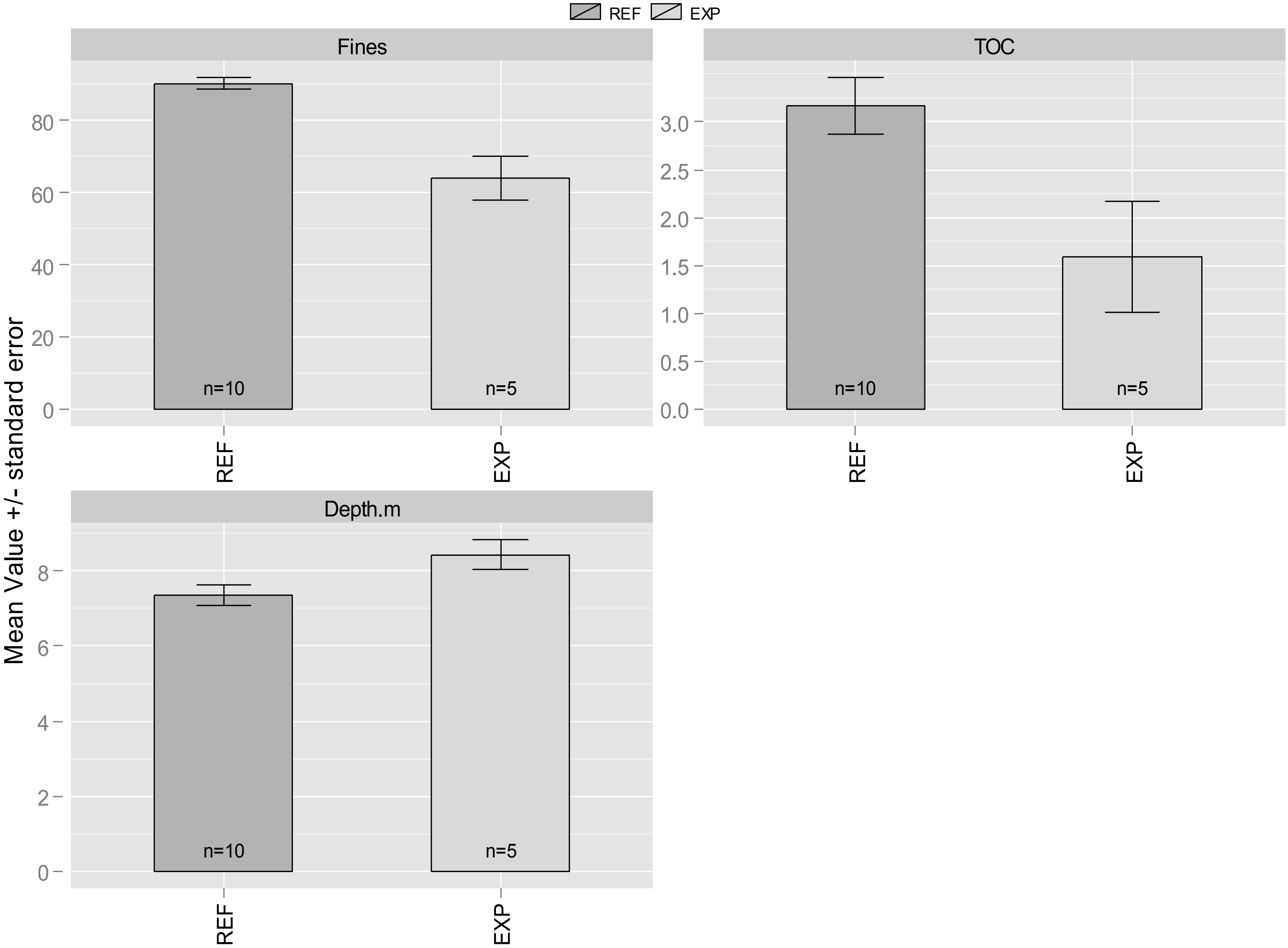


**Figure 5.3- 5.** Benthic invertebrate community endpoint means and standard errors for pooled reference areas plotted along with the EEM-recommended critical effect size (+/-2 SD), EEM Data.

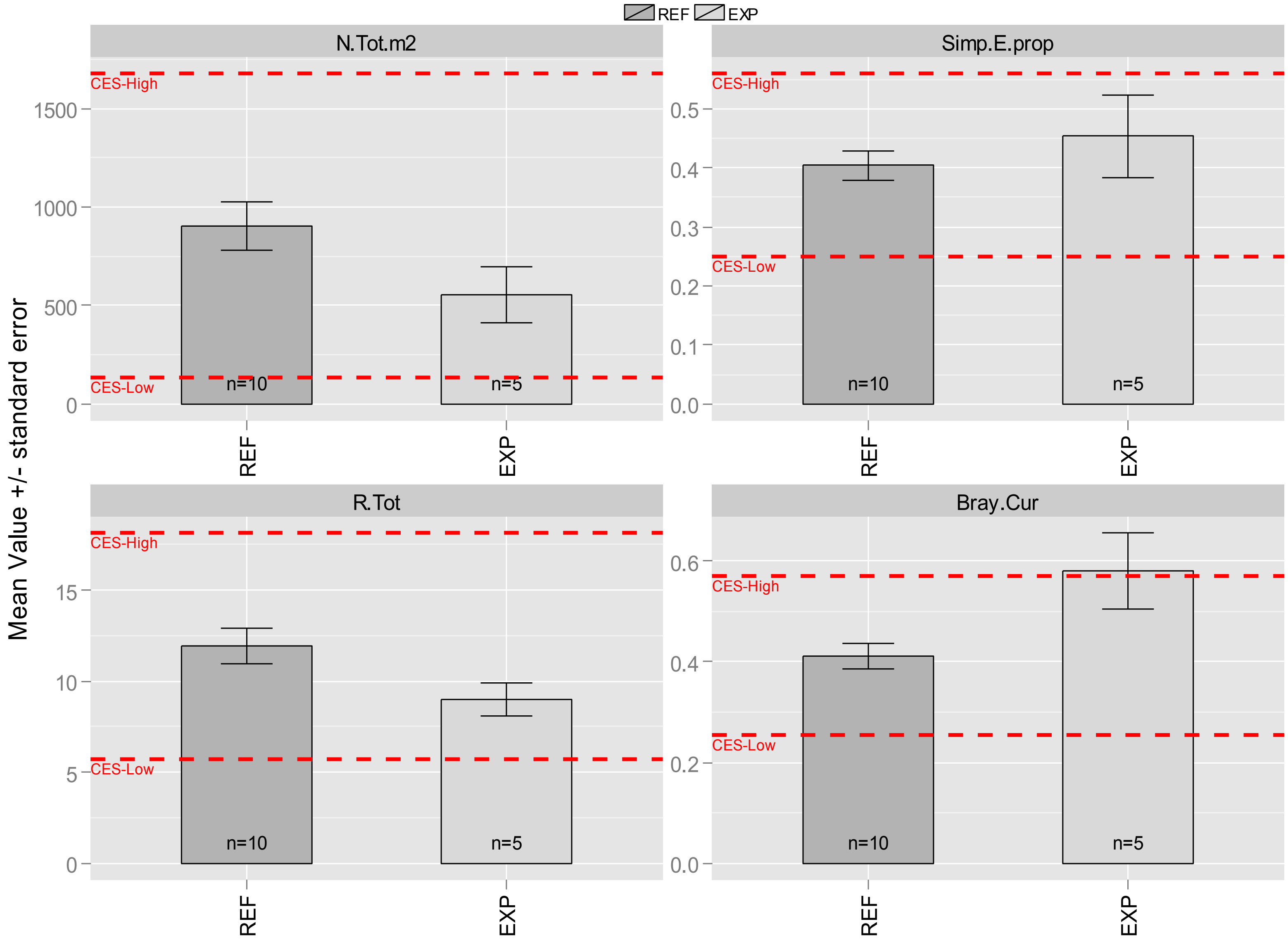
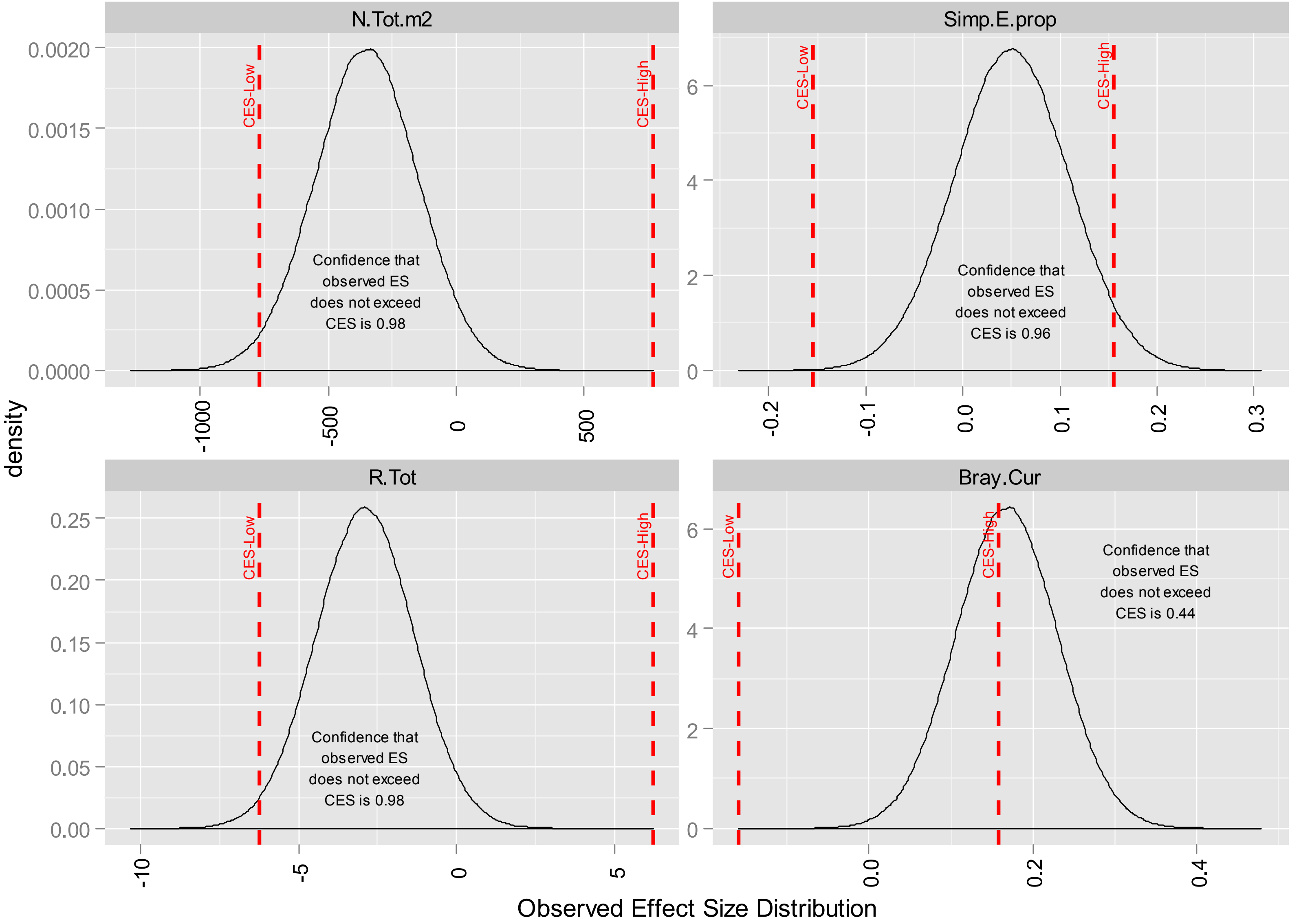


**Figure 5.3- 6.** Simulated effect size distributions (in original units of each endpoint) for benthic invertebrate community endpoints showing the confidence estimates of exceeding the EEM-recommended critical effect size (+/-2 SD), C-I ANOVA on EEM Data.



## 5.4. Supplementary Analyses

This section presents the results of a number of different statistical analyses conducted to put the observed differences in EEM benthic invertebrate community endpoints into context (see **Figure 5.4-1**). This included testing whether the initial conclusions were more broadly applicable (i.e., when a data set with more reference areas was used) and testing to discern the causes of the observed differences.

Most of the supplementary analyses use the CREMP data set, which provides EEM-related insights over a wider spatial and temporal range. While the EEM and CREMP data sets were collected using virtually the same methods (e.g., sampling locations, grab type, sieve mesh, etc.), the one key difference between the data sets is the number of subsample grabs (i.e., CREMP has two and EEM has three) composited for each of the five stations per sampling area.

This section covers the following components

- Comparability of EEM and CREMP data sets.
- Summary of applicable CREMP data.
- Conduct CI-based ANOVA with CREMP data.
- Report on before-after-control-impact (BACI) model conducted with CREMP data.
- Assessment of the importance of supporting environmental variables as covariates with the benthic invertebrate community endpoints using CREMP data.
- Analysis of MC-I design with important supporting environmental variables using CREMP data.
- Reference condition approach (RCA) using CREMP data.

Each of the above analyses will be presented and discussed in the following sections. The overall results will be assessed using a weight-of-evidence approach in **Section 5.5**.

### 5.4.1. Comparability of 2011 EEM and 2011 CREMP Data Sets

As described above, the main difference between the two data sets is the number of subsample grabs (i.e., CREMP has two and EEM has three) composited for each of the five stations per sampling area. In an effort to reduce duplication of monitoring programs at Meadowbank, methods (e.g., Elliot equation and taxa-area curves) outlined in the EEM TGD (Environment Canada, 2012) were used to assess the number of subsamples required to adequately characterize total density and family-level richness. Based on tests of these two variables at four different locations, the highest subsample estimate was 2.4. However, there were anomalies in one of the subsamples at the station where the 2.4 result was obtained for total density. Consequently, both the original study design document and the addendum included recommendations for maintaining consistency with the CREMP by collecting two subsample grabs per station. Notwithstanding, the project's Technical Advisory Panel (TAP) recommended that benthic invertebrate samples be comprised of three subsamples to be consistent with the default for EEM and allow for a more comprehensive assessment of the two data sets.

While the benefits of having more data (more reference areas and more years) are somewhat obvious, this section explores whether the two-grab CREMP data set poses any constraints to detecting statistical differences between reference and exposure areas. The main concern would be whether the two-grab samples inflate estimates of within-area variability (i.e., due to insufficient characterization) relative to the EEM data, thus reducing statistical power.

Side-by-side EEM (all data = TPN, PDL, INUG in 2011) vs. CREMP (subset of data to include only TPN, PDL, INUG in 2011) raw data (by area; **Figure 5.4-2**) and means and standard errors for each benthic invertebrate community endpoint (except for Simpson's Evenness, which is not calculated in the CREMP) are shown by pooled reference area and exposure area in **Figure 5.4-3**. Given the concerns highlighted above regarding statistical power, power analysis (see text box in **Section 5.3.4**) was used to compare the two data sets (**Table 5.4-1**). In two of three cases, the minimum detectable effect size was actually smaller (i.e., better) for the CREMP data set. Power to detect the +/- 2 SD CES was somewhat lower for the CREMP data set for the Similarity Index, but that result was mainly due to a smaller reference area standard deviation (and hence a smaller SD-based CES). The CREMP and EEM results are very similar and there is no reason to believe that using the CREMP data would limit our ability to make defensible inferences regarding potential differences between reference and exposure areas. Over and above the obvious cost savings in terms of laboratory and statistical analyses, the more extensive (spatially and temporally) CREMP data set will ultimately help make better inferences regarding potential effluent-related effects to the benthic invertebrate community.

### 5.4.2. Summary of CREMP Data

The CREMP has been conducted at Meadowbank since 2006. The first two years of monitoring were conducted prior to any major development activity at the site, thus representing baseline conditions. For the CREMP, tracking spatial and temporal differences related to mining activities relied on categorizing sampling areas using two factors:

- *Type* – this concept relates to an area's spatial proximity to the planned mine development, whether built or not; categories include near-field, mid-field, far-field, and reference (see text for more details).
- *Status* – this concept has two levels: control (not exposed to mine-related activity) or impact (exposed to mine-related activity). The term "impact" is taken from the BACI statistical study design approach and does not mean that an actual impact has taken place; rather, it designates a time period when potential mine-related impacts may occur for an area.

The construction phase of the project started in 2008 and the operations phase in 2010. Discharge of dewatering effluent started in spring 2009. **Table 5.4-2** provides a temporal look at the status of the CREMP monitoring areas (excluding those in Baker Lake). Based on their continued "control" status, the following CREMP areas are considered suitable reference areas for the TPN exposure area (see **Figure 3.3-7** for a map of these sampling areas):

- INUG and PDL (these are the EEM reference areas)
- South Basin of Third Portage Lake (TPS)

- Tehek Lake Far-field (TEFF)

Simpson's evenness is not calculated in the CREMP (and there was no statistically significant difference for this endpoint in the EEM data), so the focus of subsequent analyses is on total density, total richness and similarity index. Monitoring results for the benthic invertebrate community endpoints are presented in **Figure 5.4-4** (raw results) and **Figure 5.4-5** (area means and standard error). Monitoring results for the supporting environmental endpoints are presented in **Figure 5.4-6** (raw results) and **Figure 5.4-7** (area means and standard error). The figures show a vertical line at TPN representing the dividing line[13] when the area changed from "control" to "impact" status.

### 5.4.3. CI-based ANOVA – 2011 CREMP Data

The statistical analyses of the MC-I EEM data were conducted following a hierarchical approach (see **Section 2.2** for rationale). In this section, the CI-based (i.e., pooled reference area) approach is conducted using the 2011 CREMP data comprised of the same areas used in the EEM study (TPN, PDL and INUG), but with two additional reference areas (TPS and TEFF).

The general procedures were the same as those reported in **Section 5.3.3**. Plots of the data by sampling area are shown in **Figures 5.4-3 through 5.4-6**; plots of pooled reference area vs. exposure area for the benthic invertebrate community endpoints (except Evenness) are shown in **Figure 5.4-8**.

Results from the CI-based ANOVA of the CREMP data are provided in **Tables 5.4-3 and 5.4-4**. Key findings were:

1) No significant differences were detected between pooled reference area and the TPN exposure area for any benthic invertebrate community endpoint.
2) All observed effect sizes for benthic invertebrate community endpoints were within 1 standard deviation of the pooled reference area mean (i.e., below the EEM-recommended CES).
3) Significant differences were observed for Fines and Depth.

The lack of significant differences in these results suggest that the differences detected in the EEM CI-based ANOVA analyses are sensitive to which references areas are used in the CI comparison. This highlights the challenges of making meaningful inferences regarding potential mine-related effects without a broader understanding of natural variability in unimpaired areas.

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[13] Note that the dividing line is shown between 2008 and 2009, while dewatering discharges to TPN started in spring 2009. The reason for this is that benthic invertebrate community samples are collected in August each year.

### 5.4.4. CREMP Before-After-Control-Impact (BACI) Model

CREMP monitoring has been conducted since 2006 at a number of lakes surrounding the Meadowbank Mine. As such, it includes pre-development baseline data and thus provides context regarding spatial and temporal variability in the benthic community. The CREMP data set was used as part of the TSS Effects Assessment Study (Azimuth, 2012b) that was initiated in response to concerns regarding short-term and long-term adverse effects related to sediment releases during dike construction. In addition, the TSS EAS study also included a BACI analysis of the TPN benthic invertebrate community to provide insights into the potential for adverse effects related to TSS in dewatering effluent. This section reports on the results of that study at a fairly high level; details are available in the report (Azimuth, 2012b).

The BACI model was run as a mixed effects model using the lmer package in R. Model structure was as follows:

lmer (y ~ Area + Year + Effect + (1|Area:Year))

For a mixed-effects BACI model with Year and Effect as fixed effects and Area-Year as the random effect, overall significance of the Effect term would be tested by defining the appropriate *F* ratio as MS[Effect]/MS[Area*Year]. This is consistent with the discussion in **Section 2.2**.

The BACI model focused on single-year and multi-year effects to benthos at four key "impact" (i.e., exposed to mine-related activities) locations compared to spatial-temporal controls (i.e., area-year combinations not exposed to mine-related activities). The results reported for TPN in the 2011 TSS EAS (Azimuth, 2012b) were as follows:

> *"TPN (2009, 2010, 2011 and 2009-2011) – … this area was potentially exposed to elevated TSS during dewatering of the NW arm of Second Portage Lake starting in March 2009. During dewatering, AEM was required to discharge water that was lower than TSS thresholds to minimize the potential for adverse effects in Third Portage Lake north basin. Based on CREMP water quality (Azimuth, 2010a; 2011b; 2012a) and Bay-Goose dike construction monitoring (Azimuth, 2010b), TSS values in the north basin were very low (< 1 mg/L), suggesting that adverse effects to the benthic community would be unlikely. This was confirmed by the CREMP benthos results, which had no significant adverse effects. The only significant or marginal changes observed were increases for richness (2010; Table 3-8) and Simpson's Diversity (2009-2011; Table 3-10)."*

Results for the short-term (2011 only) and long-term (2009-2011) are presented in **Tables 5.4-5 and 5.4-6**, respectively. The large size of the 95% confidence intervals of the effect size estimates reflect the high degree of natural variability in this system.

Box plots showing how the various effect terms compared to the spatial-temporal controls and other impacts tested (not discussed further herein) are presented in **Figures 5.4-9 and 5.4-10.**

Using the more appropriate BACI model, there were no statistically significant adverse effects found for the primary benthic invertebrate community endpoints. Note that there was an increase in total richness in 2010, but it is hard to imagine that being considered as a difference relevant to EEM.

### 5.4.5. Influence of Supporting Environmental Variables – CREMP Data

Sampling of supporting environmental variables in the CREMP has evolved over time. While depth measurements have always been taken at each station, the program started out with a single composite sample for sediment quality (i.e., chemistry, TOC and grain size). In 2009, the program was expanded to three replicate samples for sediment quality, taken synoptically with the first three benthic invertebrate community stations. In 2011, the program was expanded again to collect sediment quality synoptically at all five benthic invertebrate community stations. Consequently, there is a much larger data set for Depth than there is for TOC or Fines.

The following approach was used to assess the influence of supporting environmental variables on benthic invertebrate community endpoints using the CREMP data (i.e., the subset of the data described in **Section 5.4.2**):

1) Benthic endpoints were plotted against each supporting environmental variable (2011 data for TPN was highlighted with large points).
2) Linear regression was used to test the strength of the relationship; significant relationships ($p<0.1$) were plotted on the graphs.
3) Influential outliers were removed and the regression analyses repeated; significant relationships were plotted.

The results are tabulated in **Table 5.4-7** (all benthic endpoints) and shown in **Figure 5.4-11** (Total Density), **Figure 5.4-12** (Total Richness) and **Figure 5.4-13** (Similarity Index). After removal of highly influential outliers (see data on plots), the results show statistically significant relationships with TOC and Fines. For Total Density and Total Richness, the relationships with TOC were quite strong and explained 24% (in both cases) of the variability in the data. These results show that TOC and Fines should be considered when testing for potential mine-related differences between reference and exposure areas.

### 5.4.6. C-I Testing with Environmental Covariates – CREMP Data

The preceding section highlighted the importance of environmental variables in explaining patterns in benthic invertebrate community endpoints. Given the confounding environmental gradients seen in some of the CI ANOVA analyses, it is important to try to account for environmental covariates when testing for CI differences. Consequently, the 2009 to 2011 CREMP data set (i.e., with four reference areas: INUG, PDL, TPS, TEFF; and the TPN exposure area) was used in a linear modeling framework with the following variables:

- Response variables –benthic invertebrate community endpoints (i.e., total density, total richness and similarity index)

- Environmental covariates – based on the preceding section, this effort focuses on TOC and fines.
- Cofactors – Year (as a fixed effect testing for inter-year differences among areas) and CI (as a fixed effect testing for differences potentially related to effluent discharge) were used.

Model alternatives using these variables include linear regression and multiple linear regression with and without interactions (i.e., analogous to ANCOVA). The various models were examined for each response variable using the “stepAIC” function from the MASS package for R. This function uses Akaike’s information criterion (AIC) to decide the best (lowest AIC) model. Results are as follows by response variable:

- *Total density* – the best model explaining patterns in total density contained TOC and Year only (combining to explain 33% of the variability). Neither Fines nor CI (by itself explaining <1% of the variability) contributed sufficiently to be included.
- *Total richness* – the best model explaining patterns in total richness contained TOC and Year only (combining to explain 30% of the variability). Neither Fines nor CI (by itself explaining virtually 0% of the variability) contributed sufficiently to be included.
- *Similarity index* – the best model explaining patterns in similarity index contained Fines only (explaining 11% of the variability).

In summary, after accounting for natural variation in TOC and Fines, the factor CI (which would indicate differences potentially related to effluent discharge) does not explain results for the benthic invertebrate community. The lack of a statistically significant relationship between any of the response variables and CI suggests that the differences seen in the EEM data set are likely to be due to the differences in physical environmental variables.

### 5.4.7. Reference Condition Approach – CREMP Data

The fundamental premise of RCA is that a suitably large set of existing data can be used to characterize unimpaired conditions in terms of a variety of biological attributes. As described in the EEM TGD, some applications rely on using a database of biological and environmental endpoints that allows development of predictive models (i.e., predicting biological attributes based on environmental variables). Given that the CREMP study design attempts to reduce the influence of environmental factors (e.g., by targeting depositional habitat within a narrow depth range), habitat-based predictive models aren’t necessary to apply the RCA at Meadowbank.

The following steps were taken to conduct the RCA analysis:

1) All CREMP area-year combinations representing unimpacted conditions (i.e., all combinations with “impact” status in **Table 5.4-2** were excluded) were compiled to represent the reference condition (n = 27).
2) TPN data from 2009 through 2011 were used to represent the exposure area (n = 3).
3) Means were calculated for each of eight biological attribute variables (density and richness of the major taxa groups at Meadowbank: insects, mollusks, oligochaetes, and

"other" [e.g., flatworms, mites, fairy shrimp] taxa) using the replication stations for each area-year combination.

4) As described in EEM TGD (Chapter 4.4.3), non-metric multidimensional scaling (nMDS) was used to reduce the dimensionality of the multivariate data set to two main axes (i.e., each area-year combination gets a score on each axis, thus providing its relative location in XY space).
5) Reference area-year XY scores were plotted on an ordination biplot along with 90%, 95% and 99% probability ellipses (i.e., each representing the probability that reference area-year combinations lie within the ellipse).
6) Exposure area-year XY scores were then plotted on the biplot to determine where they were situated in relation to the probability ellipses.

RCA results are presented in **Figure 5.4-14** and show that all three TPN exposure area-year combinations fall within the 90% probability ellipse. According to the EEM TGD, Reynoldson et al. (1985, as cited in Environment Canada, 2012) concluded that sites located in ordination space within the 90% probability ellipse would be considered as equivalent to reference and therefore unstressed. Thus, the RCA results suggest that no TPN exposure area-year combinations would be considered different from unimpaired conditions.

**Table 5.4- 1.** Comparability of EEM and CREMP benthic community data sets using power analysis.

| Endpoint | Program | Obs. ES | Ref SD | CES | n (EXP/REF) | α | β | Power for CES | Minimum ES | Minumum EXP n for CES and Power |
|---|---|---|---|---|---|---|---|---|---|---|
| *Benthic Community Endpoints* | | | | | | | | | | |
| Total Density log10(N.Tot.m2) | EEM | -351 | 385 | -770 | 5/10 | 0.1 | 0.1 | 0.98 | 620 | 4 |
| | CREMP | -415 | 471 | -942 | 5/10 | 0.1 | 0.1 | 0.99 | 715 | 4 |
| Total Richness (R.Tot) | EEM | -2.9 | 3.11 | -6.2 | 5/10 | 0.1 | 0.1 | 0.98 | 4.77 | 4 |
| | CREMP | -2 | 2.75 | -5.5 | 5/10 | 0.1 | 0.1 | 0.98 | 4.36 | 4 |
| Similarity (Bray.Cur) | EEM | 0.17 | 0.0791 | 0.158 | 5/10 | 0.1 | 0.1 | 0.78 | 0.193 | 7 |
| | CREMP | 0.16 | 0.0579 | 0.116 | 5/10 | 0.1 | 0.1 | 0.57 | 0.187 | 13 |

**Notes**: "Obs. ES" = observed effect size, reported in log10 units for N.Tot.m2; "CES" = critical effect size (from EEM TGD) = 2 * Ref SD (reported here in the same direction as the Obs.ES); "n" = sample size; "Ref SD" = standard deviation of pooled reference area; "Minimum ES" reported in Obs. ES units, not as multiple of Ref SD; Minimum sample size (REF n = 2 * EXP n).

**Table 5.4- 2.** Status of all CREMP sampling areas since the beginning of monitoring.

| | Meadowbank Sampling Areas | | | | | | | | | Baker Lake Areas | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | REF | REF | NF | NF | NF | NF | MF | MF | FF | REF | REF | NF | NF |
| Year | INUG | PDL | TPN | SP | TPE | WAL | TPS | TE | TEFF | BAP | BES | BBD | BPJ |
| 2006 | C | | C | C | C | C | C | C | | | | | |
| 2007 | C | | C | C | C | C | C | C | | | | | |
| 2008 | C | | C | I (Aug) | C | C | C | I (Aug) | | C | | I | I |
| 2009 | C | C | I (Mar) | I | I (Aug) | C | C | I | C | C | | I | I |
| 2010 | C | C | I | I | I | C | C | I | C | C | | I | I |
| 2011 | C | C | I | I | I | C | C | I | C | C | C | I | I |

**Notes**:
Area designations: C = Control; I = Impact; REF = reference; NF = near-field; MF = mid-field; FF = far-field; Blank denotes that the area was not part of the monitoring program that year.

Meadowbank Sampling Area abbreviations: INUG = Inuggugayualik Lake; PDL = Pipedream Lake; TPN = Third Portage North; SP = Second Portage Lake; TPE = Third Portage East; WAL = Wally Lake; TPS = Third Portage South; TE = Tehek Lake; TEFF = Tehek Lake Far Field.

**Table 5.4- 3.** Summary of CI-based ANOVA tests for benthic invertebrate community and supporting environmental endpoints, CREMP Data.

| Endpoint | Source of Variation | Sum of Squares | df | Mean Square | F | p-value | Effect? |
|---|---|---|---|---|---|---|---|
| *Benthic Community Endpoints* | | | | | | | |
| Total Density | Between Groups (C-I) | 578923 | 1 | 578923 | 2.600 | 0.121 | No |
| N.Tot.m2 | Within Groups (Residual: | 5121448 | 23 | 222672 | | | |
| | Total | 5700371 | 24 | | | | |
| Total Richness | Between Groups (C-I) | 6.8 | 1 | 7 | 1.035 | 0.320 | No |
| (R.Tot) | Within Groups (Residual: | 150.2 | 23 | 7 | | | |
| | Total | 157.0 | 24 | | | | |
| Similarity | Between Groups (C-I) | 0.016 | 1 | 0 | 0.936 | 0.343 | No |
| (Bray.Cur) | Within Groups (Residual: | 0.390 | 23 | 0 | | | |
| | Total | 0.406 | 24 | | | | |
| *Supporting Sediment Endpoints* | | | | | | | |
| TOC | Between Groups (C-I) | 7.37 | 1 | 7.4 | 6.791 | 0.016 | No |
| | Within Groups (Residual: | 24.95 | 23 | 1.1 | | | |
| | Total | 32.31 | 24 | | | | |
| Fines | Between Groups (C-I) | 2127 | 1 | 2127 | 12.803 | 0.002 | Yes |
| | Within Groups (Residual: | 3821 | 23 | 166 | | | |
| | Total | 5948 | 24 | | | | |
| Depth | Between Groups (C-I) | 4.8 | 1 | 4.8 | 8.063 | 0.009 | Yes |
| | Within Groups (Residual: | 13.7 | 23 | 0.6 | | | |
| | Total | 18.5 | 24 | | | | |

**Notes**: "df" = degrees of freedom; "F" = statistical F ratio; "C-I" = control-impact (or REF-EXP); "Effect" = significant (p<0.1) difference between pooled REF and EXP.

**Table 5.4- 4.** Summary of CI-based effect size information for benthic invertebrate community and supporting environmental endpoints, CREMP Data.

| **Endpoint** | **Area** | **Mean** | **Ref SD** | **Obs. ES** | **% ES** | **ES/Ref SD** | **Effect?** |
|---|---|---|---|---|---|---|---|
| | | *Benthic Community Endpoints* | | | | | |
| Total Density | Reference | 945 | 502 | | | | |
| N.Tot.m2 | Exposure | 565 | | -380 | -40% | -0.8 | No |
| Total Richness | Reference | 9.3 | 2.64 | | | | |
| (R.Tot) | Exposure | 8 | | -1.3 | -14% | -0.5 | No |
| Similarity | Reference | 0.497 | 0.117 | | | | |
| (Bray.Cur) | Exposure | 0.560 | | 0.06 | 13% | 0.5 | No |
| | | *Supporting Sediment Endpoints* | | | | | |
| TOC | Reference | 2.9 | 1.0 | | | | |
| | Exposure | 1.6 | | -1.4 | -46% | -1.4 | No |
| Fines | Reference | 87.0 | 12.7 | | | | |
| | Exposure | 64.0 | | -23.0 | -26% | -1.8 | Yes |
| Depth | Reference | 7.3 | 0.8 | | | | |
| | Exposure | 8.4 | | 1.1 | 15% | 1.5 | Yes |

**Notes**: "Ref SD" = pooled REF standard deviation; "Obs. ES" = observed effect size; "% ES" = 100*(EXP Mean - REF mean)/REF mean; "Effect" = significant (p<0.1) difference between pooled REF and EXP.

**Table 5.4- 5.** Results of statistical analyses of benthic invertebrate community descriptors for the 2011 CREMP data set; short-term effect.

| | **Total Abundance** (#/$m^2$) | **Taxa Richness** (# taxa/ sample) | **Simpon's Diversity** (unitless)[5] | **Bray Curtis Distance** (unitless)[5] |
|---|---|---|---|---|
| Data Transformation[1] | Log10 | None | None | None |
| Advanced Transformation[2] | Log10(x-10) | NA | NA | NA |
| Tests relative to controls | | | | |
| C-SP2011 Differences? | No | Marginal | No | No |
| p-value | 0.78 | 0.14 | 0.17 | 0.46 |
| "No Effect" Mean[3] | 647 | 7.1 | 0.72 | 0.63 |
| Effect Size | -85 | 3.1 | 0.08 | 0.18 |
| 95% Upper CI[4] | -458 | -1.2 | -0.04 | -0.23 |
| 95% Lower CI[4] | 1068 | 7.5 | 0.21 | 1.01 |
| C-TE2011 Differences? | No | No | No | No |
| p-value | 0.87 | 0.89 | 0.29 | 0.95 |
| "No Effect" Mean | 791 | 6.5 | 0.66 | 0.60 |
| Effect Size | -68 | -0.3 | 0.07 | -0.01 |
| 95% Upper CI[4] | -559 | -4.9 | -0.07 | -0.33 |
| 95% Lower CI[4] | 1516 | 4.3 | 0.20 | 0.68 |
| C-TPE2011 Differences? | No | No | No | No |
| p-value | 0.42 | 0.87 | 0.62 | 0.41 |
| "No Effect" Mean | 2357 | 9.7 | 0.72 | 0.77 |
| Effect Size | -774 | -0.3 | 0.03 | -0.19 |
| 95% Upper CI[4] | -1803 | -4.4 | -0.09 | -0.49 |
| 95% Lower CI[4] | 2205 | 3.8 | 0.15 | 0.44 |
| C-TPN2011 Differences? | No | No | Marginal | No |
| p-value | 0.38 | 0.52 | 0.09 | 0.48 |
| "No Effect" Mean | 779 | 6.7 | 0.72 | 0.69 |
| Effect Size | -282 | 1.3 | 0.10 | -0.15 |
| 95% Upper CI[4] | -608 | -3.0 | -0.02 | -0.44 |
| 95% Lower CI[4] | 703 | 5.5 | 0.23 | 0.46 |

Notes:

1. Initial transformation options discussed in **Section 2**.
2. Advanced transformations determined using Box-Cox method (Venables & Ripley 2002).
3. "No Effect" Mean estimated by not including the Effect coefficient when estimating Area-Year mean.
4. Confidence intervals estimated using 2 * Std. Error of Effect Size estimate.
5. Model assumptions not met, see text for details.

**Table 5.4- 6.** Results of statistical analyses of benthic invertebrate community descriptors for the 2006 to 2011 CREMP data set; long-term effect.

| | Total Abundance (#/m$^2$) | Taxa Richness (# taxa/ sample) | Simpon's Diversity (unitless)$^5$ | Bray Curtis Distance (unitless)$^5$ |
|---|---|---|---|---|
| Data Transformation$^1$ | Log10 | None | None | Log10 |
| Advanced Transformation$^2$ | Log10(x+50) | NA | NA | NA |
| Tests relative to controls | | | | |
| C-SP'08-'11 Differences? | Marginal | No | Marginal | No |
| p-value | 0.10 | 0.61 | 0.10 | 0.87 |
| "No Effect" Mean$^3$ | 836 | 8.05 | 0.71 | 0.60 |
| Effect Size | -379 | -0.8 | 0.07 | 0.02 |
| 95% Upper CI$^4$ | -625 | -4.3 | -0.01 | -0.17 |
| 95% Lower CI$^4$ | 101 | 2.6 | 0.15 | 0.29 |
| C-TE'08-'11 Differences? | No | No | Marginal | No |
| p-value | 0.29 | 1.00 | 0.07 | 0.89 |
| "No Effect" Mean$^3$ | 1018 | 7.41 | 0.65 | 0.60 |
| Effect Size | -335 | -0.01 | 0.08 | 0.01 |
| 95% Upper CI$^4$ | -710 | -3.70 | -0.01 | -0.18 |
| 95% Lower CI$^4$ | 432 | 3.68 | 0.17 | 0.30 |
| C-TPE'09-'11 Differences? | Yes | No | Yes | No |
| p-value | 0.02 | 0.97 | 0.02 | 0.11 |
| "No Effect" Mean$^3$ | 2866 | 10.02 | 0.70 | 0.70 |
| Effect Size | -1484 | -0.06 | 0.10 | -0.16 |
| 95% Upper CI$^4$ | -2139 | -3.20 | 0.02 | -0.32 |
| 95% Lower CI$^4$ | -277 | 3.09 | 0.17 | 0.05 |
| C-TPN'09-'11 Differences? | No | No | Yes | No |
| p-value | 0.67 | 0.24 | 0.01 | 0.33 |
| "No Effect" Mean$^3$ | 963 | 7.08 | 0.69 | 0.63 |
| Effect Size | -130 | 1.96 | 0.11 | -0.10 |
| 95% Upper CI$^4$ | -556 | -1.43 | 0.03 | -0.26 |
| 95% Lower CI$^4$ | 692 | 5.34 | 0.19 | 0.13 |

Notes:

1. Initial transformation options discussed in **Section 2**.
2. Advanced transformations determined using Box-Cox method (Venables & Ripley 2002).
3. "No Effect" Mean estimated by not including the Effect coefficient when estimating Area-Year mean.
4. Confidence intervals estimated using 2 * Std. Error of Effect Size estimate.
5. Model assumptions not met, see text for details.

**Table 5.4- 7.** Linear regression results testing for relationships between benthic invertebrate community endpoints and supporting environmental variables, CREMP Data.

| Data | Dependent Variable | Independent Variable | n | slope | intercept | p | significant | adj. $R^2$ | Figure # |
|---|---|---|---|---|---|---|---|---|---|
| CREMP - all | Log10(N.Tot.m2) | Depth.m | 111 | 0.033 | 2.74 | 0.122 | no | 0.01 | 5.4-11 |
| CREMP - out | Log10(N.Tot.m2) | Depth.m | 105 | 0.017 | 2.85 | 0.41 | no | 0.00 | 5.4-11 |
| CREMP - all | Log10(N.Tot.m2) | TOC | 56 | 0.096 | 2.72 | 0.001 | yes | 0.17 | 5.4-11 |
| CREMP - out | Log10(N.Tot.m2) | TOC | 53 | 0.111 | 2.65 | <0.001 | yes | 0.24 | 5.4-11 |
| CREMP - all | Log10(N.Tot.m2) | Fines | 54 | 0.005 | 2.55 | 0.05 | yes | 0.05 | 5.4-11 |
| | | | | | | | | | |
| CREMP - all | R.Tot | Depth.m | 111 | 0.39 | 6.9 | 0.079 | yes | 0.02 | 5.4-12 |
| CREMP - out | R.Tot | Depth.m | 108 | 0.34 | 7.24 | 0.19 | no | 0.01 | 5.4-12 |
| CREMP - all | R.Tot | TOC | 56 | 1.17 | 6.43 | <0.001 | yes | 0.24 | 5.4-12 |
| CREMP - all | R.Tot | Fines | 56 | 0.076 | 3.43 | 0.005 | yes | 0.12 | 5.4-12 |
| CREMP - out | R.Tot | Fines | 50 | 0.013 | 8.29 | 0.56 | no | 0.00 | 5.4-12 |
| | | | | | | | | | |
| CREMP - all | Bray.Cur | Depth.m | 111 | 0.12 | 0.44 | 0.3 | no | 0.00 | 5.4-13 |
| CREMP - out | Bray.Cur | Depth.m | 108 | 0.016 | 0.4 | 0.23 | no | 0.00 | 5.4-13 |
| CREMP - all | Bray.Cur | TOC | 56 | -0.022 | 0.58 | 0.011 | no | 0.02 | 5.4-13 |
| CREMP - all | Bray.Cur | Fines | 56 | -0.004 | 0.81 | 0.03 | yes | 0.16 | 5.4-13 |

**Notes**: significance based on $p<0.1$; "out" = with outliers removed; N.Tot.m2 = total density (#/$m^2$); R.Tot = taxa richness; Bray.Cur = Bray Curtis Index; Depth.m = depth (m); TOC = total organic carbon; Fines = clay + silt (%).

**Figure 5.4- 1.** Schematic of data analysis for benthic invertebrate community endpoints showing supplemental analyses.

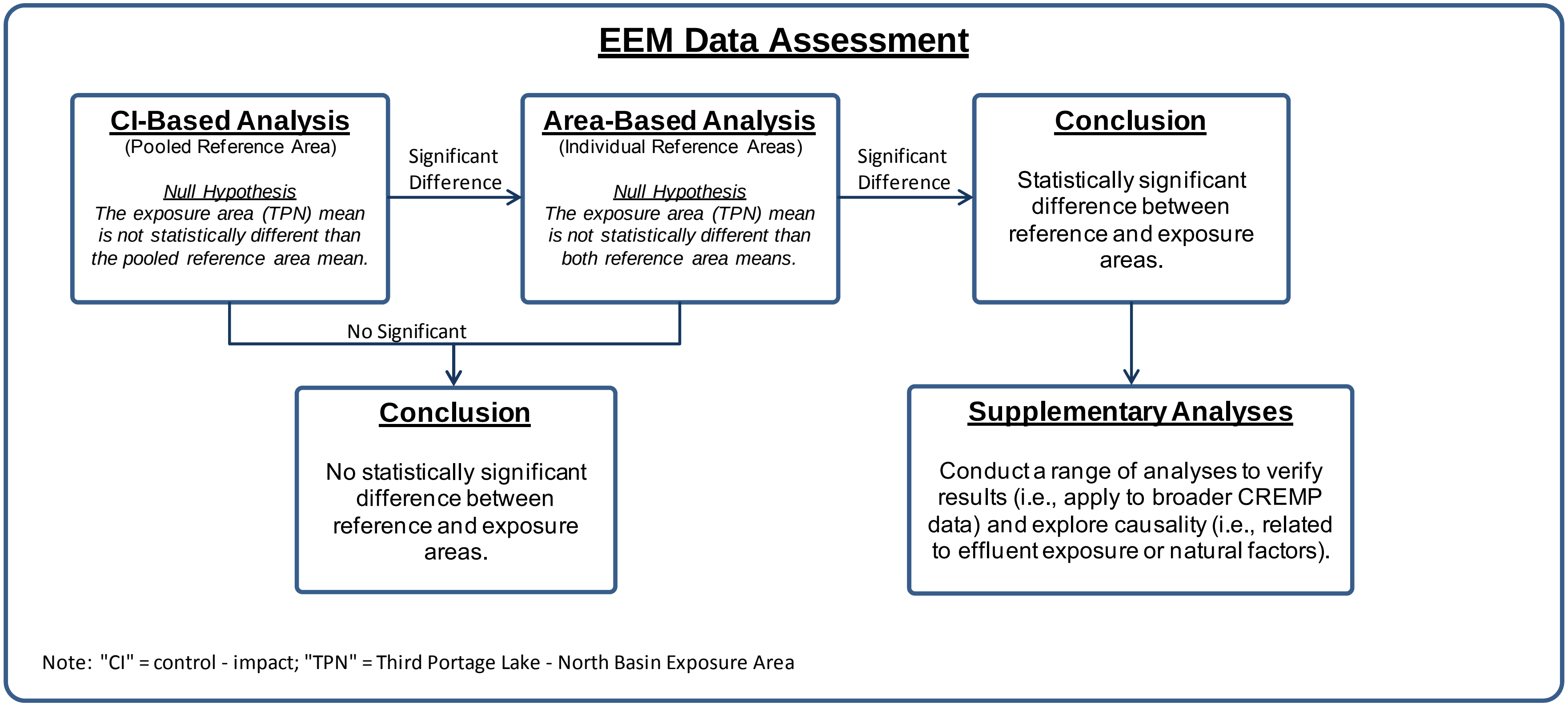


**Figure 5.4- 2.** Benthic invertebrate community endpoint results by area and program (CREMP, EEM).

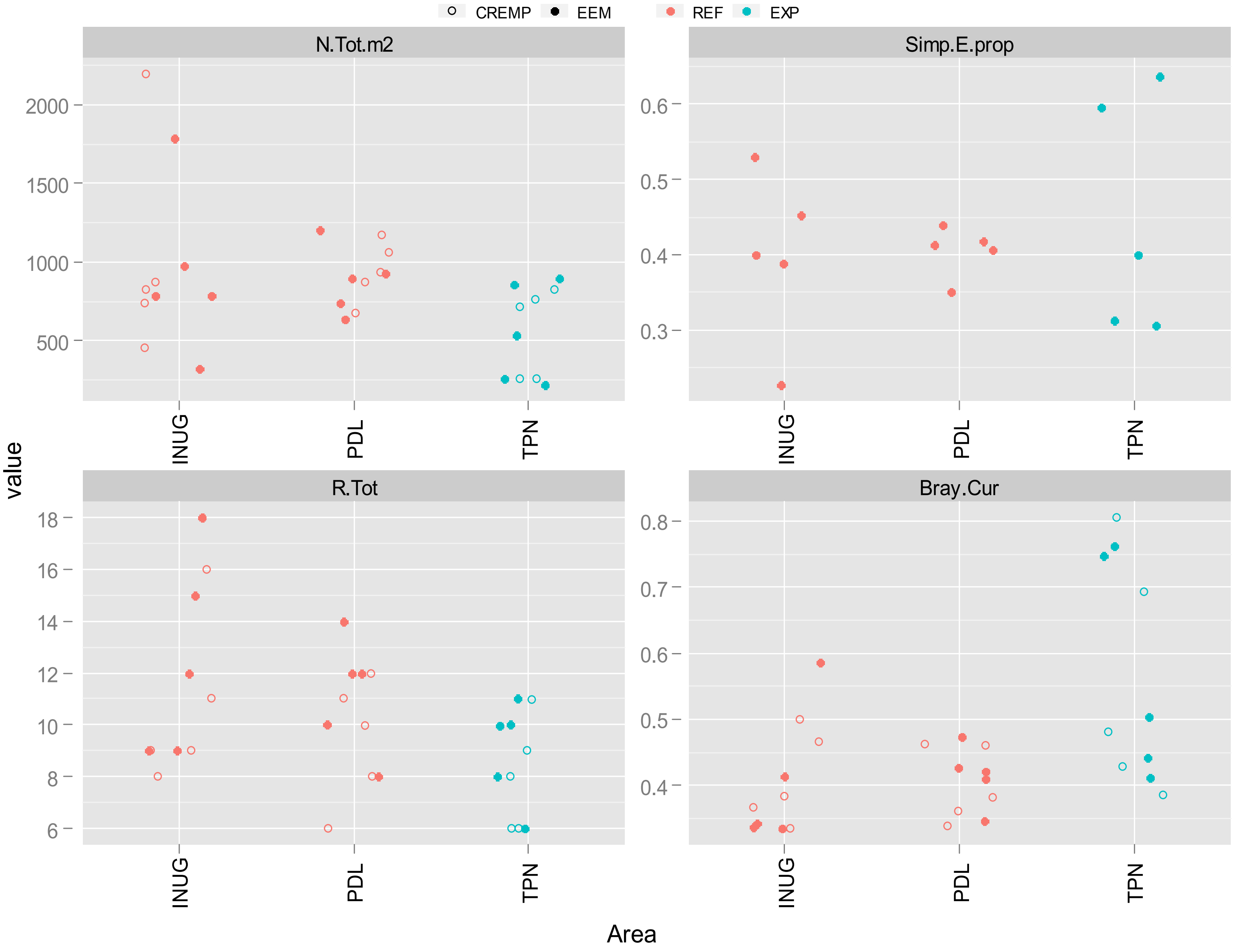


**Figure 5.4- 3.** Benthic invertebrate community endpoint means and standard errors for pooled reference area and exposure area by program (CREMP, EEM).

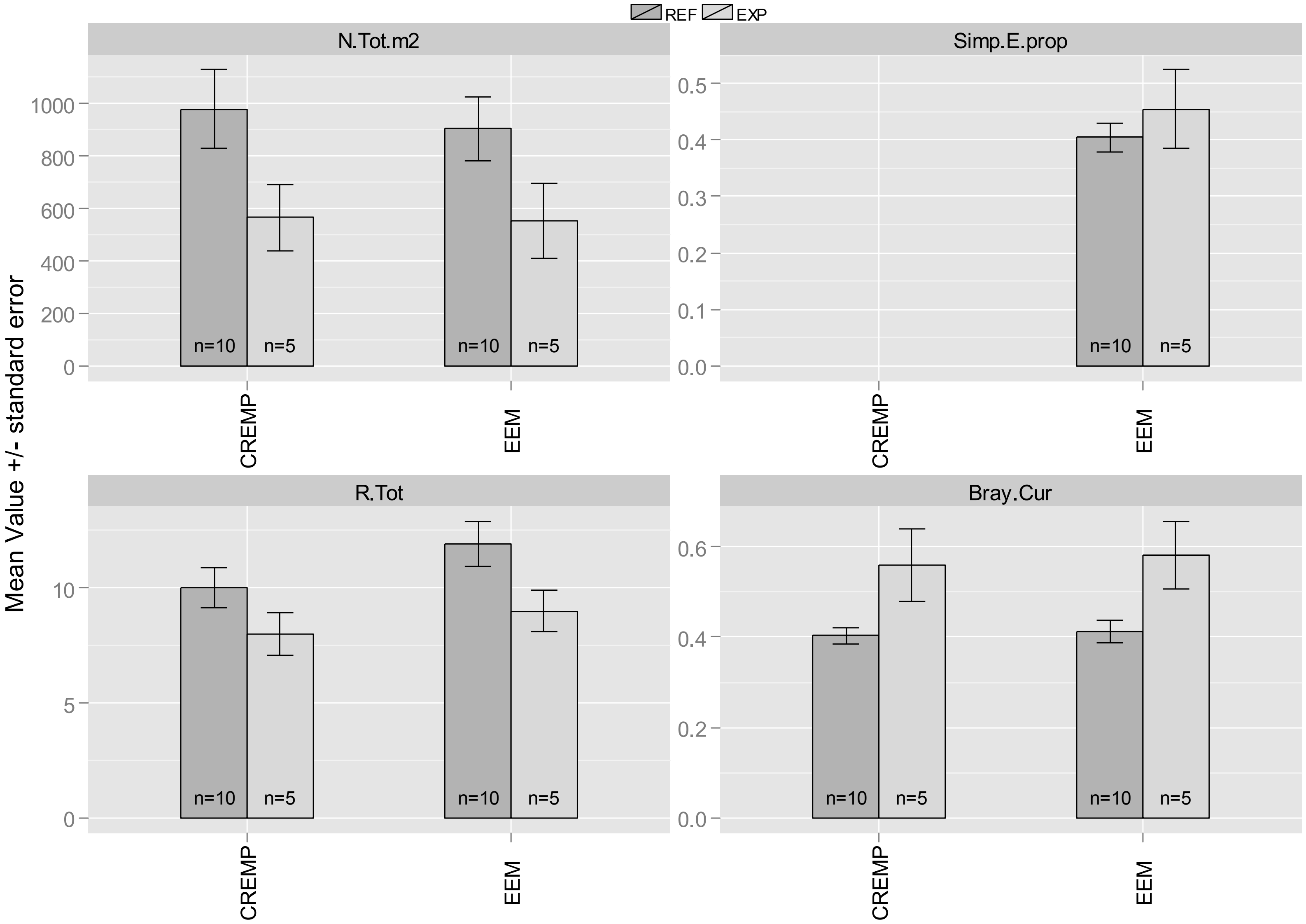


**Figure 5.4- 4.** Benthic invertebrate community endpoint results by year (dashed line connects annual means) and sampling area, CREMP Data.

**Figure 5.4- 5.** Benthic invertebrate community endpoint means and standard errors by year and sampling area, CREMP Data.

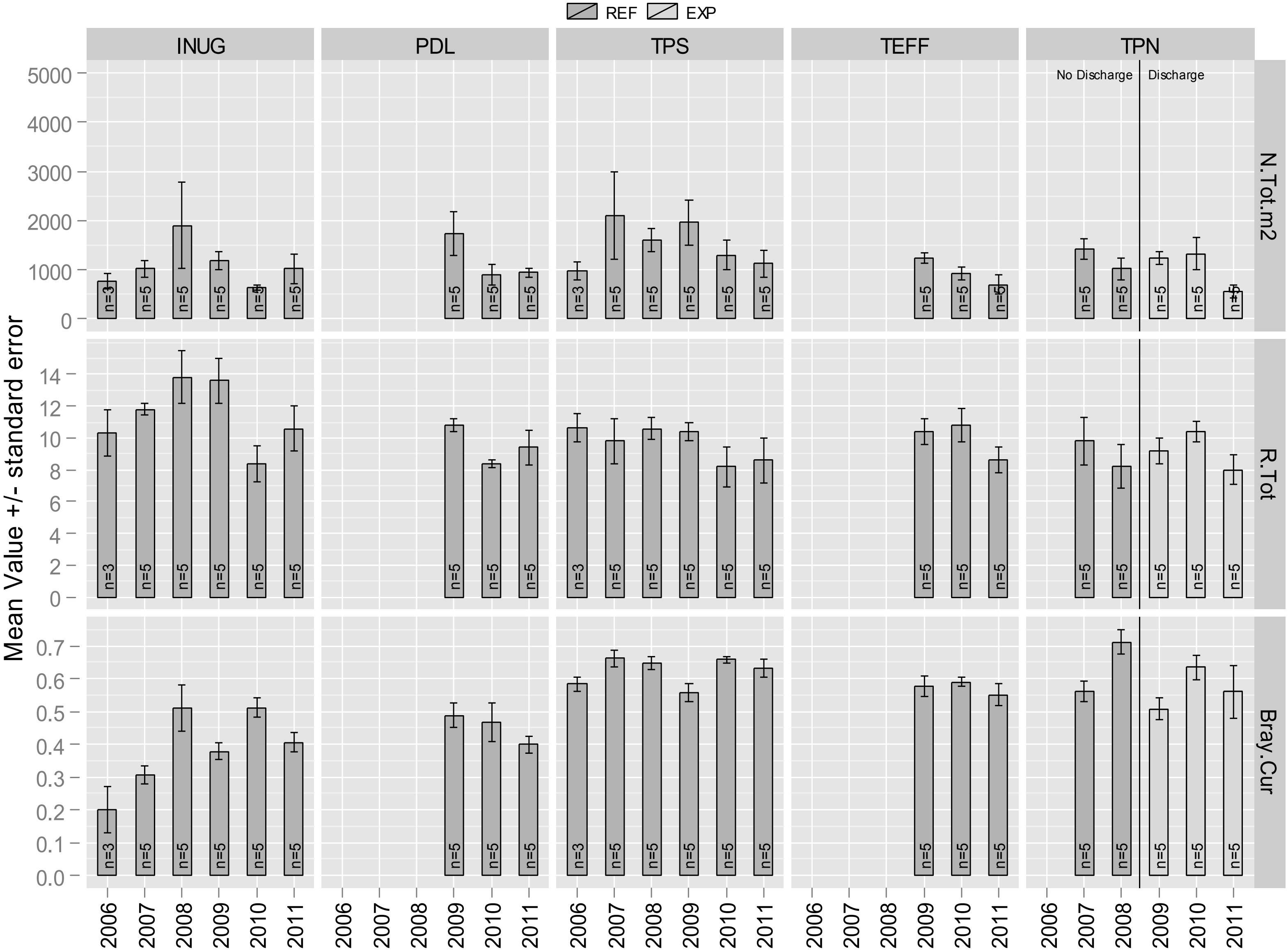


**Figure 5.4- 6.** Benthic invertebrate community supporting environmental endpoint results by year (dashed line connects annual means) and sampling area, CREMP Data.

**Figure 5.4- 7.** Benthic invertebrate community supporting environmental endpoint means and standard errors by sampling area, CREMP Data.

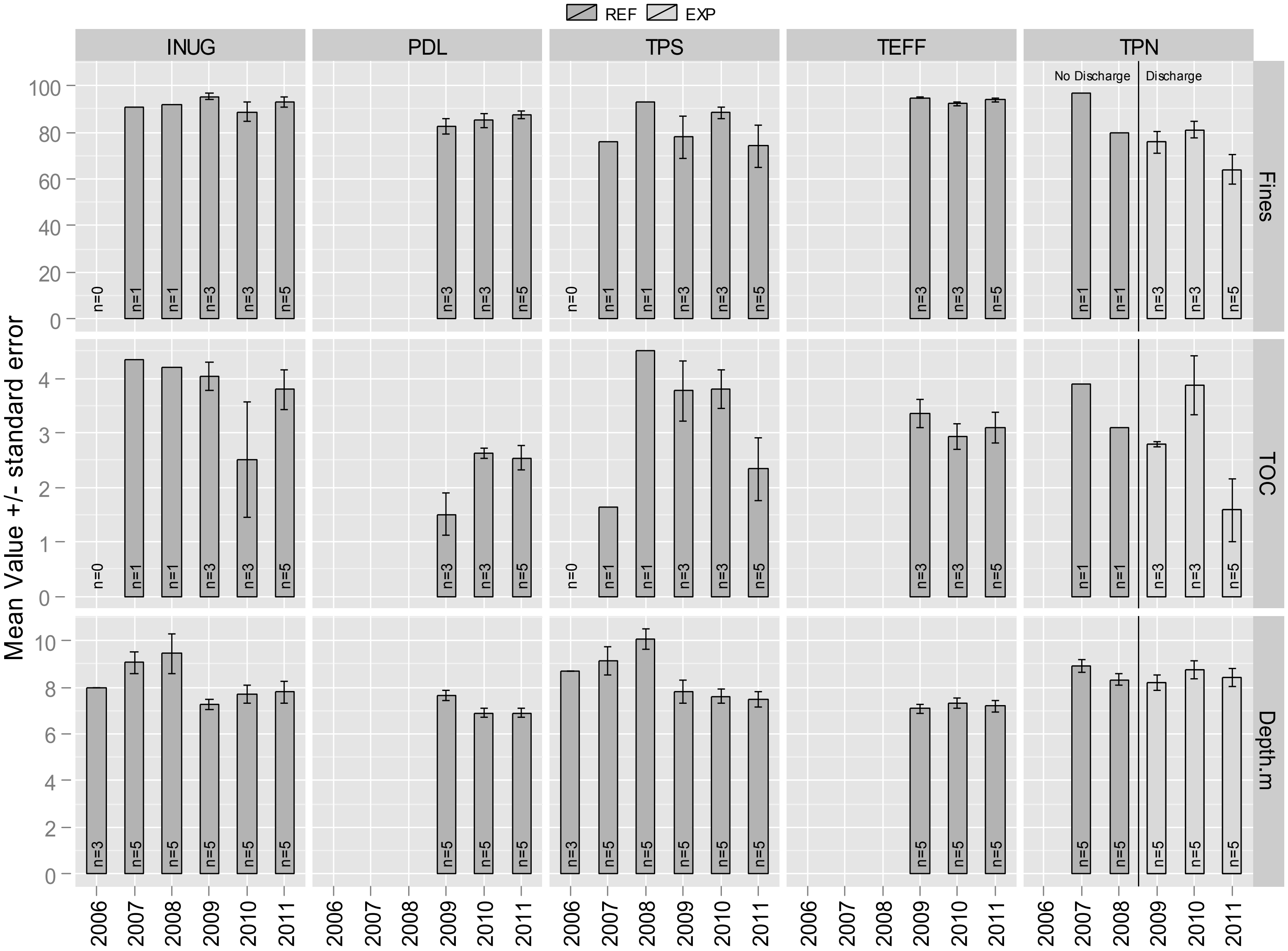


**Figure 5.4- 8.** Benthic invertebrate community endpoint means and standard errors by pooled reference area and exposure area, 2011 CREMP Data.

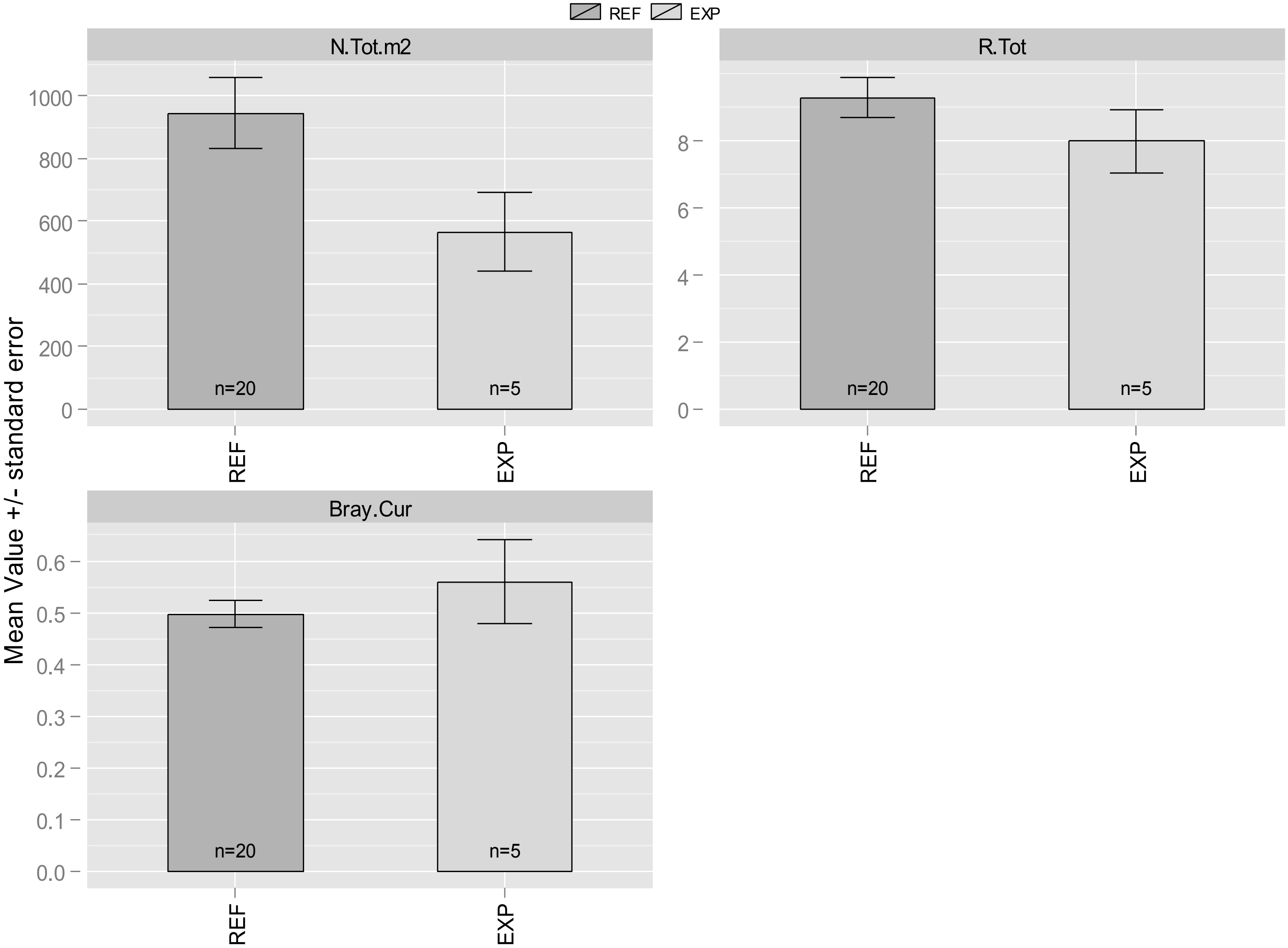


**Figure 5.4- 9.** Boxplots of benthic community metrics by short-term effect grouping for the CREMP BACI Model.

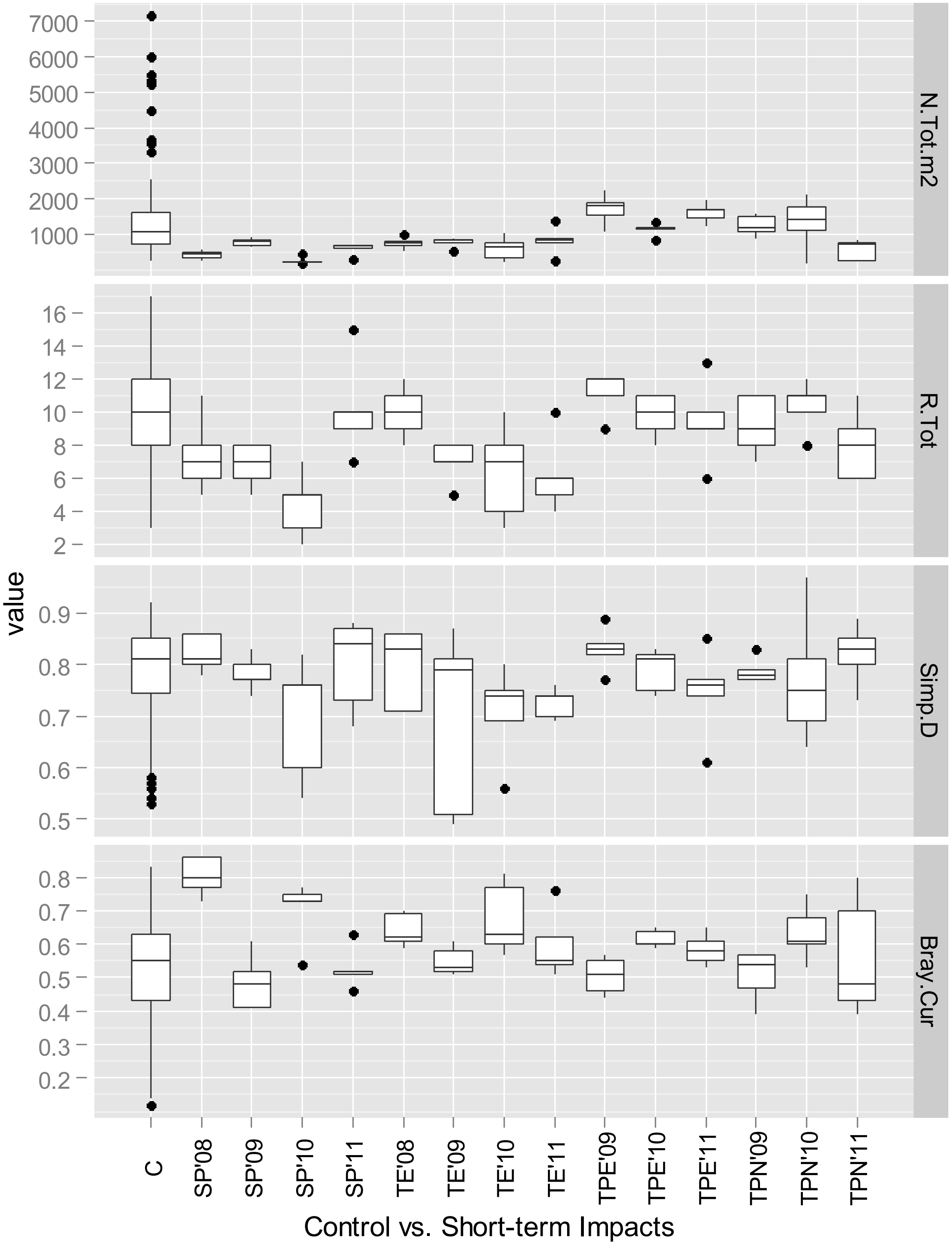


**Figure 5.4- 10.** Boxplots of benthic community metrics by long-term effect grouping for the CREMP BACI Model.

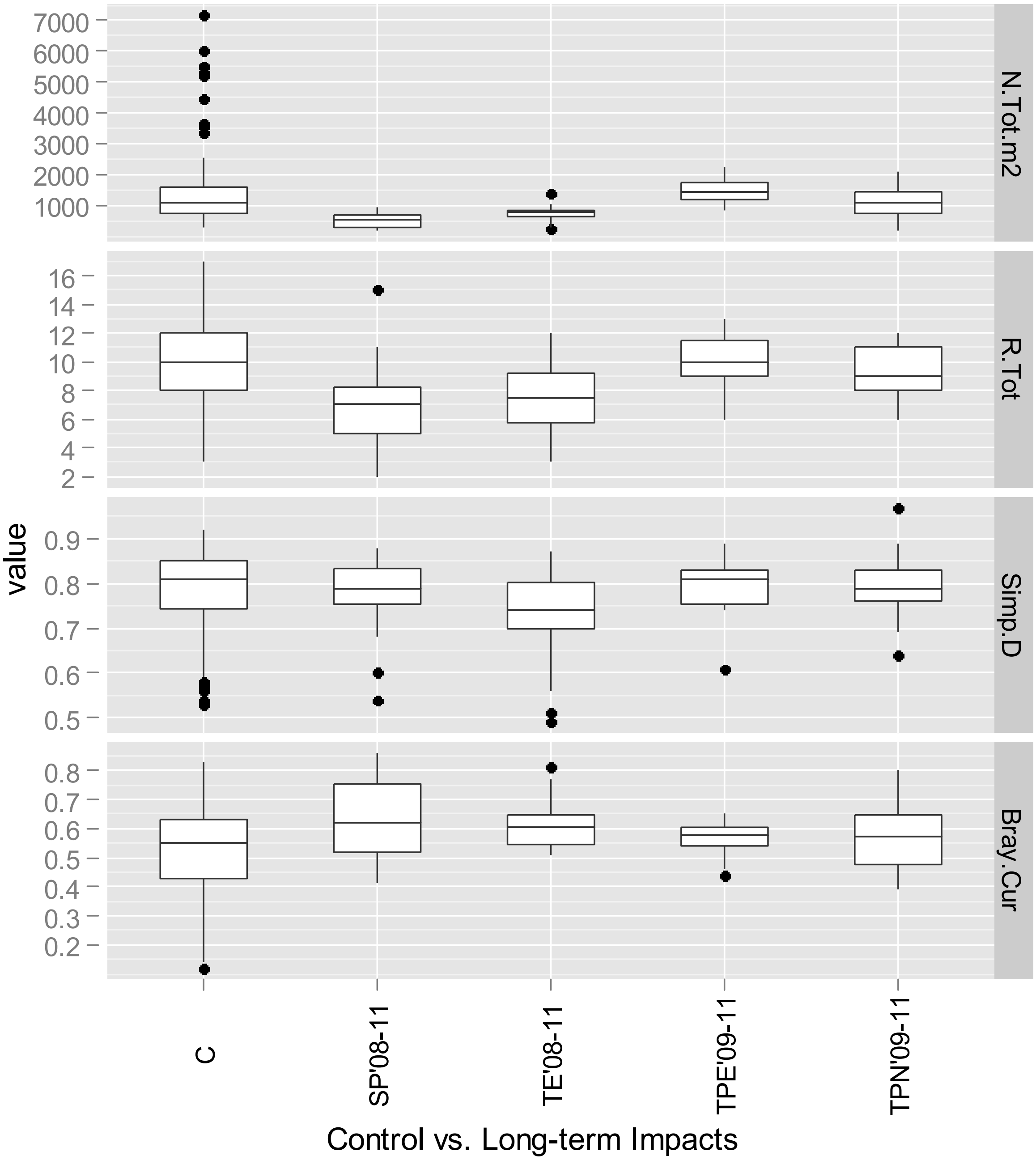


**Figure 5.4- 11.** Relationships (significant regressions shown in blue) between Total Density and Depth, TOC and Fines, CREMP Data.

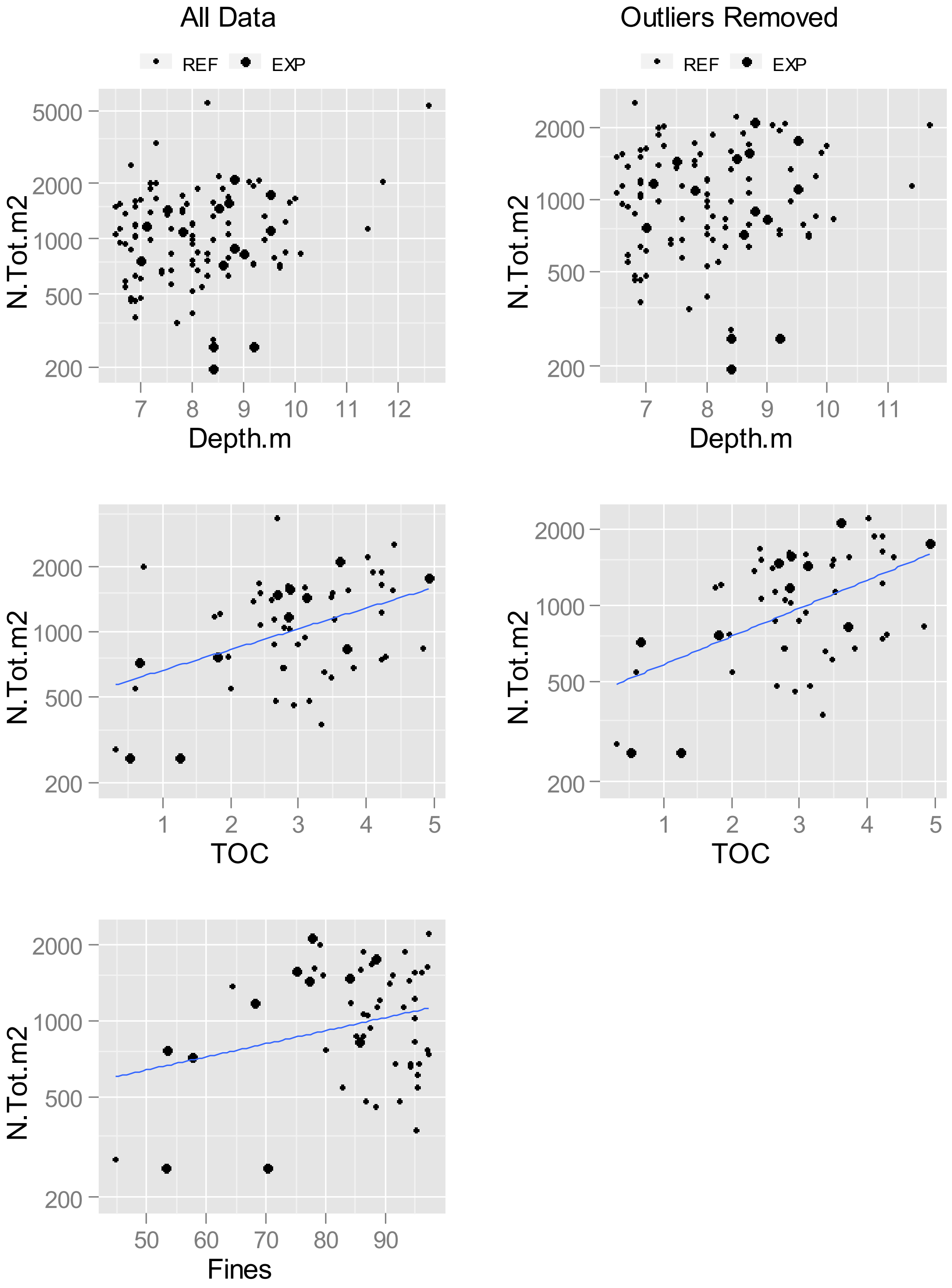


**Figure 5.4- 12.** Relationships (significant regressions shown in blue) between Total Richness and Depth, TOC and Fines, CREMP Data.

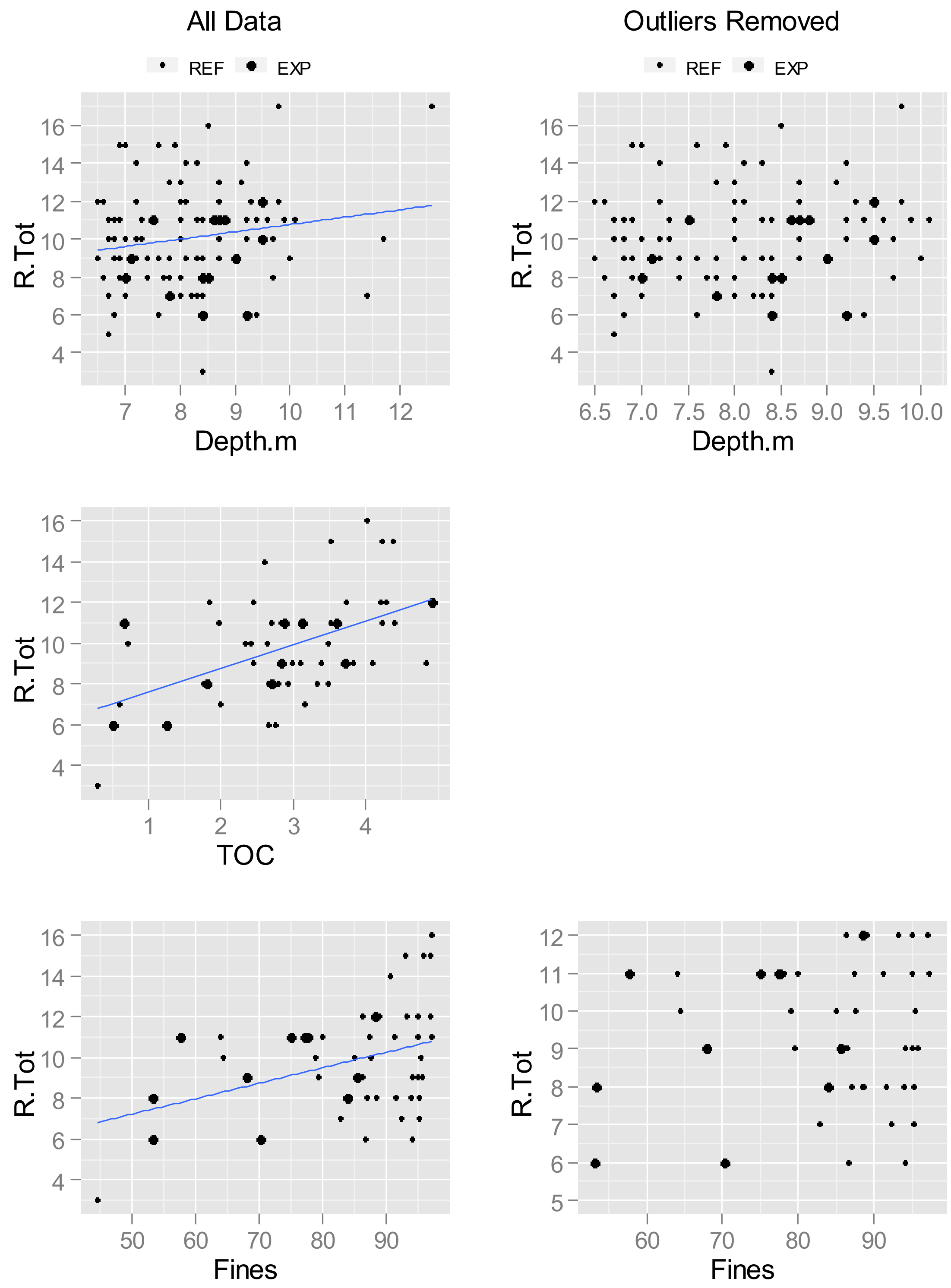


**Figure 5.4- 13.** Relationships (significant regressions shown in blue) between Similarity Index (Bray.Cur) and Depth, TOC and Fines, CREMP Data.

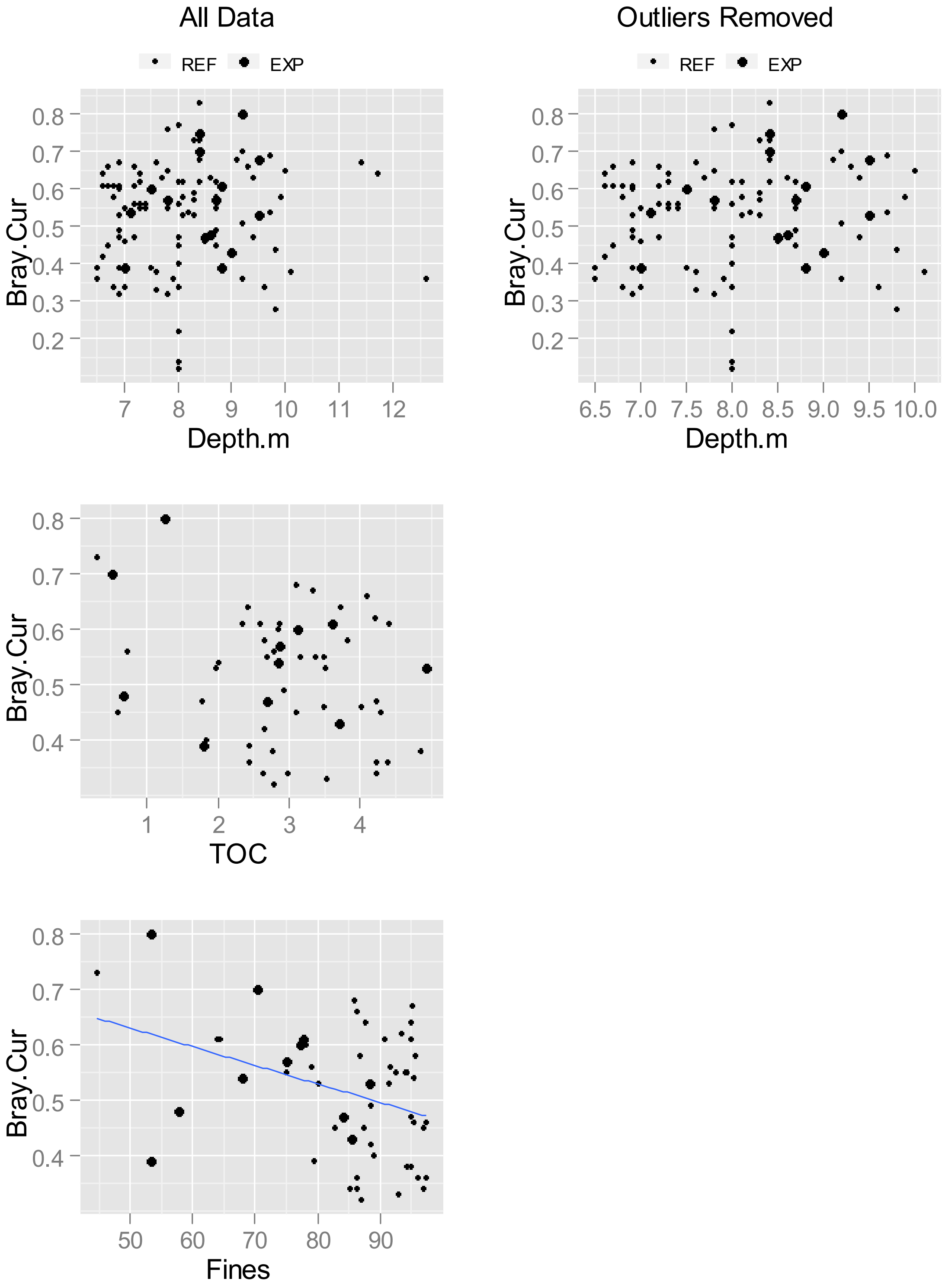
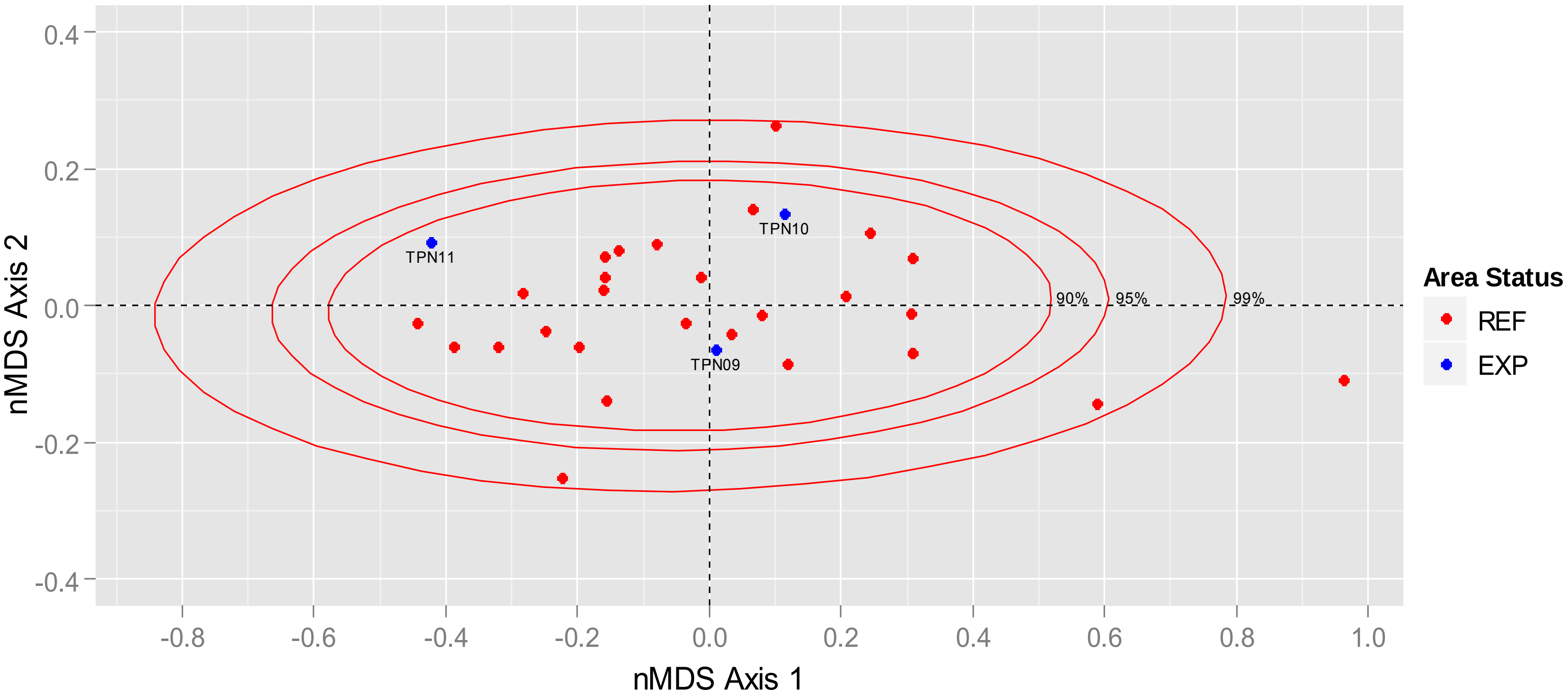


**Figure 5.4- 14.** Reference condition approach (RCA) results comparing TPN exposure area-year combinations to all CREMP control area-year combinations based on multivariate analysis of density and richness by major taxa group, CREMP Data.



## 5.5. Weight-of-Evidence Assessment

A weight-of-evidence framework was used to evaluate the extensive analyses conducted in support of this EEM study. The goal of this approach was to critically evaluate the existing data to determine the most likely cause of the observed differences in benthic invertebrate community metrics described in **Section 5.3.3** (**Figure 5.5-1**). The weight-of-evidence approach included the following:

- *Analysis name* – included to clearly differentiate between subtly different statistical analyses that provide complementary insights.
- *Data set description* – describes the program (EEM vs CREMP), years and areas included in the analysis.
- *Effect definition* – describes the specific comparisons being made in the analysis and the critical p-value defining an effect.
- *Significant differences in benthic invertebrate community endpoints* – this column generally provides a synopsis of the actual results, with one or more of: (1) a “SS” or “NS” indicating whether a difference was statistically significant, (2) the direction of response relative to reference (i.e., < or >) and (3) the rough magnitude of response relative to the respective CES (i.e., < , =, >). Other information may also be included as appropriate for the analysis (e.g., relationships with supporting environmental variables described as low, moderate or strong). Shaded cells highlight cases where statistically significant differences were observed.
- *Notes on Supporting Environmental Endpoints* – similar to above.
- *Comments regarding interpretation* – this column provides a narrative regarding key constraints or uncertainties that should be considered when interpreting the overall results.

The weight-of-evidence is presented in **Table 5.5-1**. While significant differences in benthic invertebrate community endpoints were found between reference and exposure areas using the EEM 2011 data, the available evidence from the CREMP data set indicates that the cause of those differences was a confounding gradient in TOC or Fines.

These finding are also consistent with known temporal patterns in effluent exposure (**Figure 5.5-2**). Despite the highest TSS loading occurring in spring 2010, there was no apparent adverse response by the benthic invertebrate community in August 2010. Effluent TSS loadings had been reduced for nearly a year by the time the observed differences occurred. During that same period (i.e., low effluent TSS loadings), however, measured amounts of Fines and TOC were noticeably lower relative to samples from previous years (with assumed cause to be spatial heterogeneity rather than temporal changes[14]). While the benthic invertebrate sampling programs target fine sediments, it is not uncommon to encounter areas with coarser substrates in all the study lakes. Consequently, the most likely explanation of the lower TOC and Fines is that such an area was sampled at TPN in 2011.

Finally, these findings are also consistent with those of a long-term study (TSS Effects Assessment Study) looking at the potential effects of TSS releases during dike construction (Azimuth, 2012b). In that study, despite seeing high TSS concentrations in the receiving environment (e.g., extensive areas >10 to 15 mg/L and localized areas near the construction zone in the hundreds of mg/L), adverse effects to the benthic community appeared limited to the areas closest to the dike construction zone. Even then, the expected patterns of response and subsequent recovery were often clouded by natural variability. Based on the TSS EAS results, it is unlikely that the receiving environment TSS concentrations measured to date would result in a "signal" (i.e., response) that can be detected above the "noise" of natural variability.

---

[14] There are a number of reasons why we would expect the differences observed in TOC and Fines to be natural rather than associated with the dewatering effluent: (1) the particulates in the dewatering effluent are expected to be within the range included in the Fines (i.e., silt and clay fractions). Heavier material would be expected to settle in the treatment plant or very close to the final discharge point; (2) the TPN sampling stations were all much closer to each other than they were to the final discharge point (i.e., in the 8 to 10 m depth range shown in **Figure 3.3-7**). Thus, we would not expect to see the magnitude of change observed in Fines and TOC based on effluent exposure.

**Table 5.5- 1.** Weight-of-evidence summary for benthic invertebrate community statistical analyses.

| | | | Differences in Benthic Invertebrate Community Endpoints | | | | Notes on Supporting Environmental Endpoints | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analysis** | **Data Set Description** | **Effect Definition** | **Total Density** | **Total Richness** | **Simpson's Evenness** | **Similarity Index** | **TOC** | **FINES** | **DEPTH** | **Comments Regarding Interpretation** |
| EEM CI-Based ANOVA (Section 5.3.3) | 2011 EEM Data; Pooled Reference (PDL/INUG) Areas and TPN Exposure Area. | Exposure mean different than pooled reference mean (p<0.1). | NS<br>REF>EXP<br><CES | SS<br>REF>EXP<br><CES | NS<br>EXP>REF<br><CES | SS<br>EXP>REF<br>>CES | SS<br>REF>EXP | SS<br>REF>EXP | SS<br>EXP>REF | The pooled CI differences observed are confounded by the gradient in all three supporting variables. However, the data set to too small to accurately characterize the importance of the environmental variables in explaining the observed benthic community differences. |
| EEM Area-Based ANOVA (Section 5.3.3) | 2011 EEM Data; Pooled Reference (PDL/INUG) Areas and TPN Exposure Area. | Exposure mean independently different than both reference means (p<0.1). | NS<br>REF>EXP<br><CES | NS<br>REF>EXP<br><CES | NS<br>EXP>REF<br><CES | SS<br>EXP>REF<br>>CES | NS<br>REF>EXP | SS<br>REF>EXP | NS<br>EXP>REF | The Area-based ANOVA requires TPN to be different from both reference areas. While this is a more stringent definition of "effect", limited inferences can be made about the observed difference in the Similarity Index due to the confounding environmental gradient. |
| CREMP CI-Based ANOVA (Section 5.4.3) | 2011 CREMP Data; Pooled Reference (PDL/INUG + TPS/TEFF) Areas and TPN Exposure Area. | Exposure mean different than pooled reference mean (p<0.1). | NS<br>REF>EXP<br><CES | NS<br>REF>EXP<br><CES | -- | NS<br>EXP>REF<br><CES | NS<br>REF>EXP | SS<br>REF>EXP | SS<br>EXP>REF | This data set contains a more extensive set of reference areas. No CI differences were seen in this analysis. Differences were seen in Fines and Depth, after difference in the Similarity Index due to the confounding environmental gradient. |
| CREMP BACI MODEL (Section 5.4.4) | 2006 - 2011 CREMP Data; Looked for adverse effects to benthos related to dewatering discharges to TPN since 2009. | Significant differences in the B-A and C-I interaction term (p<0.1). | NS | NS | -- | NS | -- | -- | -- | The BACI model does a better job of taking natural variability in control area-year combinations into consideration. However, it did not consider relationships with environmental variables. Simpson's diversity was significantly higher at TPN for both the short-term and long-term effects. |
| CREMP Environmental Covariates (Section 5.4.5) | 2009 - 2011 CREMP Data; Looked for relationships between benthic endpoints and environmental variables across the five areas. | Not Applicable. | Moderate relationship with TOC Weak with Fines | Moderate relationship with TOC | -- | Moderate relationship with Fines | Moderate relationships with density and richness | Moderate relationships with density and richness | No relationships with benthic endpoints | These stronger relationships explain up to 24% of the variability in total density and total richness, and up to 16% in the Bray Curtis similarity index. These results warrant closer attention. |
| CREMP Analyses with Environmental Covariates (Section 5.4.6) | 2009 - 2011 CREMP Data; Tested for CI differences using multiple regression models with environmental variables as covariates. | Significant "effect" factor (p<0.1) after relationships with environmental variables is taken into account. | NS<br>Best model with TOC and Year; CI not important | NS<br>Best model with TOC and Year; CI not | -- | NS<br>Best model with Fines; CI not | TOC gradient was most important component in model | Fines was important | -- | CI differences were not significant for any benthic invertebrate community endpoint after including an enviromental covariate (TOC or Fines). "Year" was also important, suggesting that certain response patterns may be due to regional climate trends. |
| CREMP Reference Condition Approach (RCA) (Section 5.4.7) | 2006 - 2011 CREMP Data; All control area-yrs used to establish reference, then test TPN yrs since 2009. | Comparison of impact area-yrs to reference envelope (90% probability ellipse). | NS<br>TPN<90% | NS<br>TPN<90% | NS<br>TPN<90% | NS<br>TPN<90% | -- | -- | -- | Control area-yr combinations since 2006 were used to construct a multivariate characterization of reference conditions at the Meadowbank site. TPN-09, TPN-10 and TPN-11 were all situated inside the 90% probability ellipse, suggesting that their benthic community endpoints were within the range of natural conditions. |

**Notes**: "Yes" or "No" refers to statistically significant differences detected; "REF" or "EXP" refer to reference or exposure areas; "CES" = critical effect size (+/- 2 SD); Shading = statistically significant difference in endpoint between C-I.

**Figure 5.5- 1.** Schematic of data analysis for benthic invertebrate community endpoints showing weight-of-evidence.

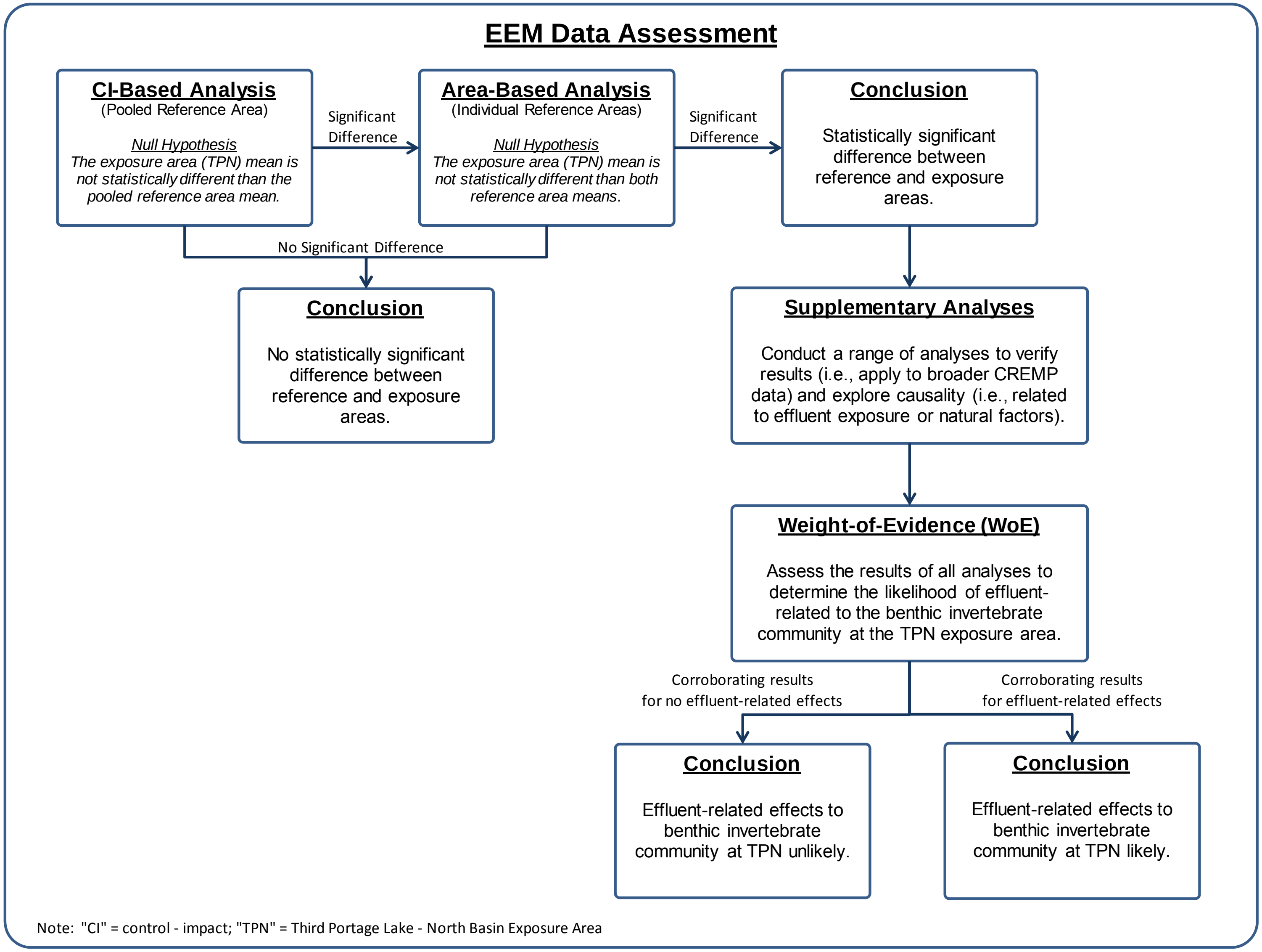
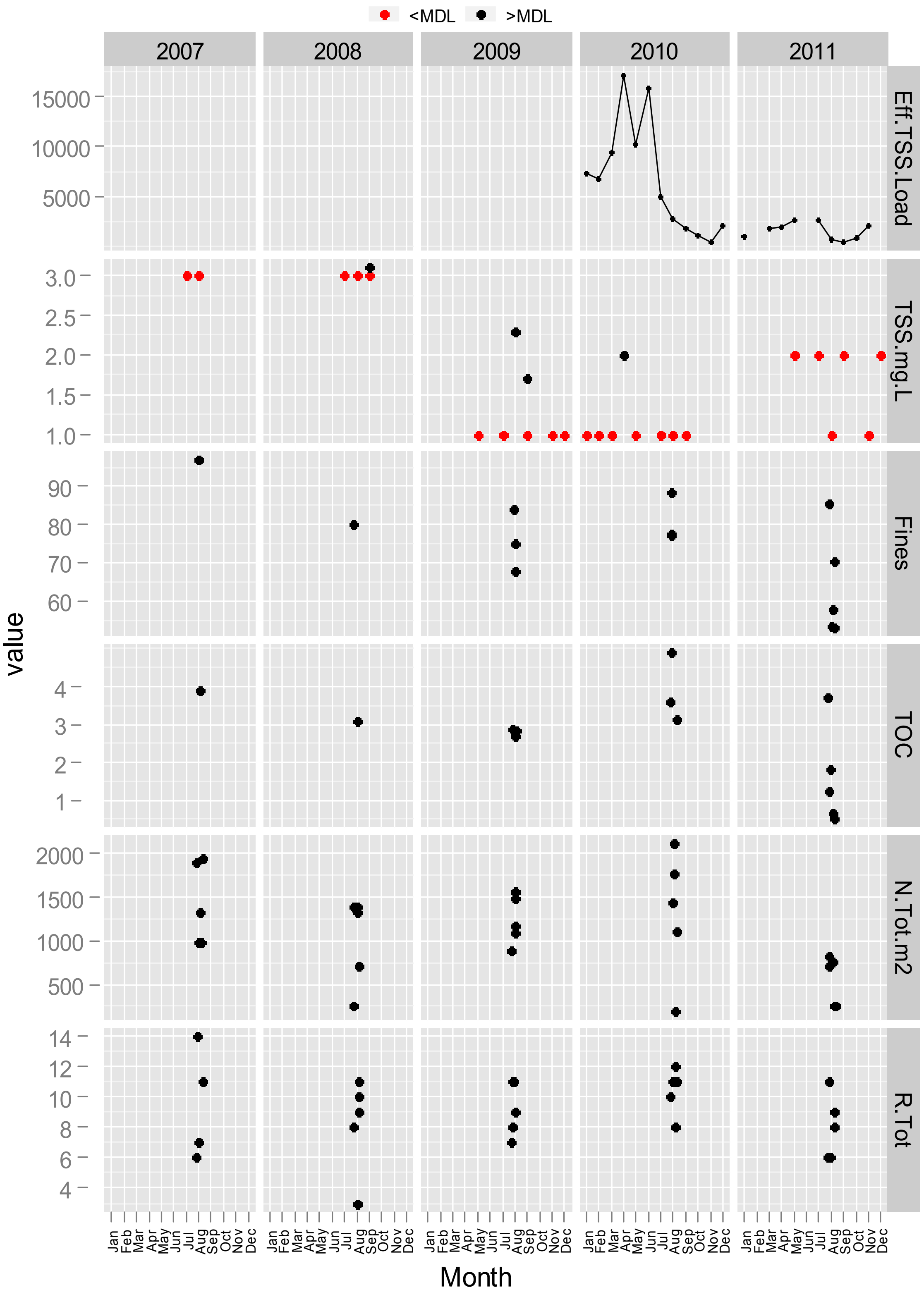


**Figure 5.5- 2.** Temporal patterns in effluent (TSS loading), receiving environment (TSS, Fines, TOC, Depth) variables. and biological response variables (total density, total richness).



# 6. CONCLUSIONS FROM BIOLOGICAL MONITORING

## 6.1. Fish Survey

Details of the data assessment results for the fish survey were presented in **Section 4.3**. A summary of the results by target endpoint is presented in **Table 6.1-1**. No significant differences were identified for any endpoint (see **Section 4.3.6** for details) and confidence in the results for each endpoint was high (see **Section 4.2** [data quality] and **Section 4.3.7** [statistical confidence and power assessment] for details).

These results are consistent with the receiving environment water quality results presented in **Section 3.3**.

**Table 6.1- 1.** Summary of lake trout data assessment results by target endpoint.

| Endpoint Type | Effect Indicator | Non-lethal Endpoints for Meadowbank Fish Survey | Recommended Statistical Procedures | Effect? | Confidence in Result? |
|---|---|---|---|---|---|
| Primary | Growth (*Energy Use*) | Size-at-age (body weight against age) | ANCOVA | No | High |
| | Condition (*Energy Storage*) | Body weight against length | ANCOVA | No | High |
| | Survival | Age frequency distribution | Kolmogorov-Smirnov | No | High |
| | | Length frequency distribution | Kolmogorov-Smirnov | No | High |
| Supporting | (*Energy Use*) | Size-at-age (length against age) | ANCOVA | No | High |

**Notes**: Effect based on statistical significance (see **Section 4.3.6**); Confidence in result based on a combination of data quality (see **Section 4.2**) and statistical confidence/power assessment (see **Section 4.3.7**).

## 6.2. Benthic Invertebrate Community Survey

Details of the data assessment results for the benthic invertebrate community survey were presented in **Sections 5.3 and 5.4**. A weight-of-evidence approach was used to integrate the various studies to evaluate the likelihood of effluent-related effects to the benthic invertebrate community (**Section 5.5**). A simplified summary of the results by target endpoint is presented in **Table 6.2-1**. After accounting for relationships with environmental variables (i.e., TOC or Fines), there were no significant differences were identified for any endpoint (see **Section 5.4.6** for details).

Overall, confidence in these conclusions is high. As examined in **Section 5.3.4**, the study had high power to detect the CES for total density and total richness, and had moderate power ($1-\beta = \sim 0.8$) for evenness and the similarity index. In addition, study data quality objectives were also met (**Section 5.2**).

The conclusion for all benthic invertebrate community endpoints was that there were no effluent-related effects at TPN. These results are consistent with the receiving environment water quality results presented in **Section 3.3**.

**Table 6.2- 1.** Summary of benthic invertebrate community data assessment results by target endpoint.

| Endpoint | Differences between Reference and Exposure Areas?[1] | Relationship with Environmental Variables?[2] | Differences between Reference and Exposure Areas after Accounting for Relationship with Environmental Variables?[3] | Confidence in result?[4] |
|---|---|---|---|---|
| | | *Benthic Community Endpoints* | | |
| Total Density (N.Tot.m2) | No | Yes (TOC and Fines) | No | High |
| Total Richness (R.Tot) | Yes | Yes (TOC) | No | High |
| Evenness (Simp.E.prop) | No | Not Applicable (see text) | No | High |
| Similarity Index (Bray.Cur) | Yes | Yes (Fines) | No | High |

**Notes**: [1] Section 5.3.3; [2] Section 5.4.5; [3] Section 5.4.6; [4] Sections 5.2 and 5.3.4.

# 7. SUBSEQUENT BIOLOGICAL MONITORING

As per Division 2, Part 2 of Schedule 5 of the *Metal Mining Effluent Regulations*, the following timing is stipulated for the second cycle of biological monitoring studies:

- *Cycle Two Study Design* – needs to be submitted at least six months prior before undertaking the biological monitoring study (target December 2013).
- *Cycle Two Biological Monitoring Study* **–** no stipulated timeline, but needs to be completed to allow sufficient time for analysis, interpretation and reporting (target August 2014).
- *Cycle Two Interpretative Report* **–** submission by July 1, 2015 (i.e., no later than 36 months after the submission of this interpretative report).

## 7.1. Fish Survey

Based on the results presented herein, we recommend the following considerations for the fish survey component of the Cycle 2 Study Design:

*Focus on non-lethal sampling of lake trout only.*

As discussed in **Sections 2.3 and 4.3**, efforts to catch round whitefish and Arctic char to support a lethal study were far from successful this past year. In addition to the relatively low abundance of these species compared to lake trout, it is common in Arctic lakes for mature fish to take one or more years off between spawning events to "rest" (as discussed in **Section 4.3.1**. The implication of this is that even more fish need to be caught (and likely sacrificed to determine reproductive status) to support a lethal survey than would be needed at most southern mines.

*Use power analysis results to reduce sample size to minimize incidental lake trout mortality.*

The power analysis results summarized in **Table 4.3-12** clearly show that sample size can be reduced at all areas for all the endpoints analyzed with ANCOVA (i.e., growth [body weight and length against age] and condition [body weight against length]). The body weight-age endpoint required the highest number of fish per area at 61. A conservative target of 70 to 80 fish should meet the targeted power ($1-\beta = 0.9$) for the EEM-recommended CES values.

Sample size requirements for the age and length frequency distribution endpoints could be estimated if meaningful CES values were available. However, the challenge is that the Kolmogorov-Smirnov test is sensitive to changes in both magnitude (e.g., a change in the overall mean of the variable) and distribution shape (e.g., changes that might not affect the mean, but that would affect the overall distribution). Based on the critical D values for the K-S test (for $\alpha=0.1$, two tails and n=100, $D_{0.1(2),100} = 0.120$; for n=75, $D_{0.1(2),75} = 0.139$), the absolute difference in critical cumulative relative frequency values is only about 0.02 (or about 2%). Consequently, a reduction in sample size to 70 or 80 fish for this test would not substantially lower its power.

## 7.2. Benthic Invertebrate Community Survey

Based on the results presented herein, we recommend the following considerations for the benthic invertebrate community survey component of the Cycle 2 Study Design:

*Change the number of subsample grabs per station from three to two to be consistent with the long-term CREMP data set.*

- This issue was initially addressed in the Study Design document following EEM TGD methods (see **Section 5.4.1** for brief recap); the majority of the data supported collecting two grabs per sample (and the other results were somewhat questionable), but the TAP recommended using the default three subsamples to be consistent with EEM and to provide a more substantive data set with which to address this issue.
- The EEM and CREMP data sets were quantitatively compared using power analysis in an effort to document whether the two-grab data set had less statistical power (**Section 5.4.1**). The results confirmed those in the Study Design (i.e., statistical power of the two-grab data set was virtually the same as the three-grab data set) and support moving to two-grab subsamples in future EEM cycles.
- Not only will consistency with the CREMP reduce sampling effort, sample analysis costs, duplication of statistical analyses, and reporting time, but it will expand the available data temporally (i.e., back to 2006) and spatially (e.g., can include more CREMP control data), resulting in more robust analyses.

# 8. REFERENCES

AEMP (Aquatic Effects Management Program), 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005.

Azimuth Consulting Group (Azimuth). 2012a. Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2011, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.

Azimuth. 2012b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2011, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU. March, 2012.

Azimuth. 2011. This reference includes three related documents, as follows:

1) Environmental Effects Monitoring (EEM): Cycle 1 Study Design, Meadowbank Division, Nunavut. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Environment Canada, Edmonton, AB on behalf of Agnico-Eagle Mines Ltd., Baker Lake, NU. December, 2010.
2) Environmental Effects Monitoring (EEM): Cycle 1 Study Design ADDENDUM, Meadowbank Division, Nunavut. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Environment Canada, Edmonton, AB on behalf of Agnico-Eagle Mines Ltd., Baker Lake, NU. July, 2011.
3) TAP comments on the Meadowbank Gold Mine July 2011 EEM Study Design Addendum and subsequent response email from Azimuth Consulting Group. August, 2011.

Azimuth. 2010. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Baker Lake, NU.

Azimuth. 2008a. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2007. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2008.

Azimuth. 2008b. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2006. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. March 2008.

Azimuth. 2005a. Aquatic Ecosystem/Fish Habitat Impact Assessment – Meadowbank Gold Project, 2005. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. October 2005.

Azimuth. 2005b. Metal Mining Effluent Report (MMER). Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico-Eagle Mines Ltd., Vancouver, BC. 2005.

BAER (Baseline Aquatic Ecosystem Report). 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005.

CCME (Canadian Council of Ministers of the Environment) 2007. Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life, 1999, updated December 2007.

CCME (Canadian Council of Ministers of the Environment) 2002. Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life, 1999, updated 2002.

Environment Canada. 2002. Amended to 2012. Metal Mining Environmental Effects Monitoring Technical Guidance Document (TGD). Can be viewed at Environment Canada's website: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=D175537B-24E3-46E8-9BB4-C3B0D0DA806D

Johnson, Lionel. 2002. Imperfect Symmetry. Thermodynamics in Ecology and Evolution. Torgoch Publishing. Sidney, BC.

Krebs, C.J. 1985. Ecology: the experimental analysis of distribution and abundance. 3rd Edition, New York (NY): Harper and Row.

Legendre, L. and P. Legendre. 1983. Numerical ecology. Amsterdam (NL): Elsevier.

MMER (Metal Mining Effluent Regulations). 2002. Amended March, 2012. Can be viewed at the Department of Justice website: http://laws-lois.justice.gc.ca/eng/regulations/SOR-2002-222/index.html

Smith, B. and J.B. Wilson. 1996. A consumer's guide to evenness indices. *Oikos* 76: 70-82.

# APPENDICES

# APPENDIX A

# FISH PERMITS: DFO LICENSE TO FISH FOR SCIENTIFIC PURPOSES

Fisheries and Oceans Canada
Pêches et Océans Canada

Licence #: S-11/12-1042-NU

Gary Mann
218-2902 West Broadway
Vancouver, BC, CA V6K 2G8

Dear Gary Mann,

Enclosed is your Licence to Fish for Scientific Purposes issued pursuant to Section 52 of the Fishery (General) Regulations.

Failure to comply with any of the conditions specified on the attached licence may result in a contravention of the Fishery (General) Regulations.

Please be advised that this licence only permits those activities stated on your licence. Any other activity may require approval under the Fisheries Act or other legislation. It is the Project Authority's responsibility to obtain any other approvals.

Please ensure that you include the licence number and project title in any future correspondence and that you complete the Summary Harvest Report upon completion of activities under this licence.

Yours truly,

Chris Lewis

Aug. 9/11
Date

Chris Lewis
Fisheries Management Biologist
Eastern Arctic Area
Central and Arctic Region
Fisheries and Oceans Canada

Enclosure

Fisheries and Oceans Canada
Pêches et Océans Canada

# LICENCE TO FISH FOR SCIENTIFIC PURPOSES

## S-11/12-1042-NU

Pursuant to Section 52 of the Fishery (General) Regulations, the Minister of Fisheries and Oceans hereby authorizes the individual(s) listed below to fish for scientific purposes, subject to the conditions specified.

**Project Authority:** Gary Mann — Azimuth Consulting Group
218-2902 West Broadway
Vancouver, BC, CA V6K 2G8

**Other Personnel:**
Randy Baker
Sue Hertam
Mike Johnson
Laura Henderson
Claire Hrenchuk
Craig Fazakas

**Objectives:** Agnico-Eagle Mines Ltd. has received a NIRB Project Certificate for its Meadowbank gold project, located 70km north of Baker Lake, Nunavut. Environmental monitoring has been ongoing at this site since 1999. The purpose of the monitoring program is to avoid or mitigate negative impacts from mine activities, and to meet the conditions and commitments of the NIRB Project Certificate and DFO Authorization (NU-03-0109) for the all-weather road and project lake area. Environment Canada notified AEM that the Meadowbank Mine is subject to Metal Mining Effluent Regulations as of December 31, 2009. The focus of this study is to fulfill requirements of Cycle 1 of the EEM Study Design by evaluating the effects of metal mining effluents on fish, fish habitat and the use of fisheries resources.

### CONDITIONS

**Waters:**
Waterbodies Listed - X000:
Third Portage Lake – North basin - 65d00'51"N; 96d05'33"W
Inuggugayualik Lake - 65d01'43"N; 96d23'18"W
Pipedream Lake - 65d01'43"N; 96d23'18"W

**Water Body: Waterbodies Listed - See Conditions**
Point A: 0° 0' N, 0° 0' W

Species: Trout, Lake
Gear: 10 MM Mesh Gillnets and Larger

| Total Weight | Weight Live | Weight Dead | Number Alive | Number Dead | Number Tows | Number Sets | Hours | Minutes |
|---|---|---|---|---|---|---|---|---|
| | | | 480 | 120 | | | | |

**Water Body: Waterbodies Listed - See Conditions**
Point A: 0° 0' N, 0° 0' W

Species: Whitefish, Round
Gear: 10 MM Mesh Gillnets and Larger

| Total Weight | Weight Live | Weight Dead | Number Alive | Number Dead | Number Tows | Number Sets | Hours | Minutes |
|---|---|---|---|---|---|---|---|---|
| | | | | 120 | | | | |

**Water Body: Waterbodies Listed - See Conditions**
Point A: 0° 0' N, 0° 0' W

Species: Benthos
Gear: Ponar dredge

| Total Weight | Weight Live | Weight Dead | Number Alive | Number Dead | Number Tows | Number Sets | Hours | Minutes |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 15 | | |

**Fishing Period:** August 10, 2011 to August 31, 2011

**A copy of this licence must be available at the study site and produced at the request of a fishery officer.**

**Live fish may not be retained unless specified in the conditions of this licence.**

**The licence holder shall immediately cease fishing when the total fish killed or live sampled reaches any of the maximums set for any of the species listed.**

## Transportation:

Other approvals/permits may be necessary to collect or transport certain species, such as Marine Mammal Transportation Permits. For marine mammal parts, products and derivatives a Marine Mammal Transportation Licence is required for domestic transport and, for international transport a Canadian CITES Export Permit is also required.

## Retention & Disposal of Fish Caught:

Fish not required for the purpose of dead sampling and/or retention MUST be returned to the water at the site of capture. Retained fish may be made available to the nearest settlement for domestic consumption or sold commercially within the Territory. Any dead fish for commercial sale beyond the Territory in which it was caught requires authorization under the Fish Inspection Regulations. Disposal of any fish remains must be in accordance with local land use regulations.

## Report on Activities:

The Project Authority will submit to the Area Licensing Coordinator, Department of Fisheries and Oceans, within one month of the expiry date, a report stating:

i) whether or not the field work was conducted; and if conducted

ii) waterbody location, fishing coordinates, gear types used at each coordinate, numbers or amount of fish (by species) collected and/or marked and the date or period of collection.

A Summary Harvest Report template is provided by the Licensing Coordinator at time of issuance of this licence.

The Project Authority also will provide a copy of any published or public access documents which result from the project. Information supplied will be used for population management purposes by the Department of Fisheries and Oceans and becomes part of the public record.

All documents should be sent to:

Area Licensing Administrator
Fisheries and Oceans Canada
P.O. Box 358
Iqaluit, NU X0A 0H0
Email: XCA-NUpermit@dfo-mpo.gc.ca

**Notification of Commencement:**

Prior to the commencement of fishing the Project Authority will contact:

Area Licencing Administrator
Fisheries and Oceans Canada
Box 358
Iqaluit, NU X0A 0H0
email: XCA-NUpermit@dfo-mpo.gc.ca

Eric Kan

2011.08.09
Date

Eric Kan
Area Director, Eastern Arctic Area
Central and Arctic Region
Fisheries and Oceans Canada

For the Minister of Fisheries and Oceans.

Pursuant to Section 52 of the Fishery (General) Regulations.

Canada

Date: August 9, 2011

To: Gary Mann
Azimuth Consulting Group
Vancouver, BC, V5V 3G1

**Subject: Animal Use Protocol - Letter of Approval**

Dear Gary,

Your 2011 Animal Use Protocol (AUP), number FWI-ACC-2011-057 entitled "Meadowbank Mine: Environmental Effects Monitoring Cycle 1", has been reviewed and approved by the Freshwater Institute Animal Care Committee. This AUP will expire on August 31, 2011.

Keep this signed letter of approval as well as the signed AUP approval form for your records. Please be advised that should there be a need to revise the protocol you are requested to contact the Freshwater Institute Animal Care Committee and obtain approval prior to proceeding.

In addition, you are required to submit a brief report within 30 days of completion of the project outlining the unexpected changes to the protocol, the number of animals used and any unanticipated results or mortalities. The report form is enclosed.

Feel free to contact me if you have any questions or concerns.

Sincerely,

Bernard LeBlanc

*Bernard LeBlanc* *FWISL-ACC Chairperson*

*Freshwater Institute Science Laboratories Animal Care Committee*
*Arctic Aquatic Research*
*Central & Arctic / Région du Centre et de l'Arctique*
*Fisheries and Oceans Canada / Pêches et Océans Canada*
*501 University Crescent*
*Winnipeg, Manitoba R3T 2N6*
*Phone:204 983-1327*
*Fax:204 984-2403*

Enclosure

# APPROVAL BY ANIMAL CARE COMMITTEE MEMBERS

AUP#: ACC-2011-057

Date: August 9, 2011

## Signatures of ACC Members

Bernard LeBlanc, Chair

Theresa Carmichael

Theresa Carmichael

Dr. Ericka Anseeuw D.V.M.

Bob Artes

Cortney Watt

Kerry Wautier

Kerry Wautier

M. Desai

Megan Desai

**Interim Approval** ☐ **Final Approval** ☒

**APPROVAL BY THE FWI ANIMAL CARE COMMITTEE IS FOR THE PERIOD STATED ON YOUR ANIMAL USE PROTOCOL.**

# APPENDIX B

# STANDARD OPERATION PROCEDURE (SOP) FOR CREMP WATER & PHYTOPLANKTON SAMPLING

# Standard Operating Procedure
# Meadowbank Project Lakes & Baker Lake
# CREMP Water & Phytoplankton Sampling

## GENERAL:

**Project Coordinator:**
Maggie McConnell
Azimuth Consulting Group
218-2902 West Broadway
Vancouver, BC, V6K 2G8
Telephone: 604-730-1220
Email: mmcconnell@azimuthgroup.ca

In case of **emergency**, contact Gary Mann (Azimuth telephone number 604-730-1220 or cell phone 604-908-0601).

## LOCATION AND TIMING FOR FIELD ACTIVITIES:

**Twelve (12) sampling stations** have been chosen for water quality monitoring in the Meadowbank project lakes and Baker Lake. Water samples are collected monthly during open water and during ice-cover, except for October and June, when ice conditions are unsafe for sampling. The 12 stations (with their corresponding abbreviation) are:

- Third Portage Lake – North Basin (TPN) **[EEM Sampling Area]**
- Third Portage Lake – East Basin (TPE)
- Second Portage Lake (SP)
- Tehek Lake (TE)
- Inuggugayualik Lake (INUG) **[EEM Sampling Area]**

- Tehek Lake – Far-field (TEFF)
- Third Portage Lake – South Basin (TPS)
- Wally Lake (WAL)
- Pipedream Lake (PDL) **[EEM Sampling Area]**

- Baker Lake – Barge Dock (BBD)
- Baker Lake – Proposed Jetty (BPJ)
- Baker Lake – Akilahaarjuk Point (BAP)

There are two levels of sampling intensity over the course of the year, depending on whether under ice or in open water; during open water all stations are sampled, whereas only the first 5 stations listed above are sampled through-ice. Check the monthly water sampling schedule to confirm which sampled are to be collected where, BEFORE going into the field.

All samples are now collected from **3 m below the water surface**, which is indicated by "-S" at the end of the sample ID (S=Surface). Two target sample locations for each station listed above have been randomly pre-determined and recorded in MapSource and in the hand-held GPS units (NAD 83). Confirm before going into the field.

Field activities are scheduled roughly once a month for 6 months, including winter ice sampling. Sampling through the ice will take place in May, November, and December. Open water sampling will take place in July, August, and September. Sampling will not be conducted in June and October because of thin ice conditions.

## MONTHLY CREMP WATER CHEMISTRY & PHYTOPLANKTON SAMPLING:

1. Prior to leaving camp gather the appropriate type and number of sampling vessels and acid vials for preservation. Prepare appropriate labels for containers, affix them to the appropriate bottle (see below), and wrap label with packing tape. Use the following information:
   - Azimuth company name
   - Station abbreviation (e.g. TPE-36-S, INUG-24-S)
   - Date of sample collection
   - Parameters to be measured from individual bottle (TOC, total metals, etc.)

2. Gather **field collection materials**:
   In the boat:
   - Field collection data forms, pencils, waterproof markers & clipboard
   - GPS unit, batteries
   - Diaphragm water pump & 12V battery
   - Flexible food-grade silicone tubing (4 meter length and 1 meter length) & weight (& extra C-clamps and cable ties)
   - In-line filter (0.45 µm) and a spare
   - YSI Professional Plus meter, batteries
   - Secchi disk
   - Hand held pH meter (if not part of YSI measurements), batteries
   - Depth meter, batteries
   - Rope
   - Sampling gloves
   - Field sample bottles & preservatives (per sample) ***(this may be different for ALS Winnipeg)***:
     - 2 – 1 L plastic (TSS-low and Conventionals)
     - 1 – 250 mL amber glass (TKN, Ammonia)
     - 2 – 125 ml amber glass (TOC & DOC)
     - 2 – 250 mL plastic (total and dissolved metals)
     - 1 – 50 mL vial for phytoplankton
     - 1 vial sulfuric acid
     - 2 vial hydrochloric acid
     - 2 vial nitric acid
     - 1 syringe & magnesium carbonate slurry
     - 1 syringe & Lugol’s solution for phytoplankton
   - Extra sample bottles in case of breakage or loss
   - QA/QC field duplicate sampling containers & preservatives (same as above).
   - Take one set of Travel Blank bottles into the field and transport and treat as other samples. Note that the Travel Blank bottles are not to be opened and no preservatives added.

In camp:

- Hand pump, filters, tweezers, tinfoil and magnesium carbonate for chlorophyll-a
- De-ionized water for rinsing equipment and collected field equipment blank
- Coolers (for storing and shipping samples)
- Ice packs (for shipping samples to laboratories)
- Address labels for coolers
- Chain-of-custody forms
- Large Ziploc bags (for sending chain-of-custody form in cooler)
- Packing tape (for affixing labels to sampling containers & sealing cooler)

The following table lists the specific bottles to be filled, parameters to be measured and preservatives required for each. Affix the labels to the sampling containers and then prior to shipping, wrap packing tape around the labels to ensure a waterproof seal.
***(Note: this may be different for ALS Winnipeg)***

| **Sampling Container** | **Parameters to be Measured** | **Preservatives to be Added** |
|---|---|---|
| 2 - 1 L plastic | Conventionals* | None |
| 250 mL amber glass | TKN, Ammonia | 1 vial of sulfuric acid |
| | | |
| 250 mL plastic | Total Metals | 1 vial of nitric acid |
| 250 mL plastic | Dissolved Metals | 1 vial of nitric acid |
| 125 mL amber glass | TOC | 1 vial of hydrochloric acid |
| 125 mL amber glass | DOC | 1 vial of hydrochloric acid |
| 50 mL vial | Phytoplankton | **1/2 mL** of Lugol's solution per 50 mL sample |

* includes: hardness, conductivity, pH, TDS, TSS-low, turbidity, alkalinity (speciated), orthophosphate and total phosphate, chloride, fluoride, bromide, sulfate, nitrate-nitrogen, nitrite-nitrogen, silicate.
** **do not use filtrate water** for any sample. Use the in-line filters for collecting dissolved metals and dissolved organic carbon samples.

3. For **QAQC** purposes three kinds of samples are required; one set per 10 field samples as follows:

A: One field duplicate is collected for every 10 sample per event (i.e., 10%). All parameters measured in the original sample are measured in the field duplicate. The sampling station is selected randomly from one of the stations, and labeled as station CREMP [month] DUP-1, -2, -3, -4, etc. Prepare the QAQC labels and affix to the sampling containers, as described in step 2.

B: One set of travel blanks are to be carried into the field and treated like the other sampling vessels except that the bottles are not to be opened or anything added to them.

C: One equipment blank will be acquired per every 10 field samples. To collect an equipment blank set up the water sampling equipment as if a routine sample was to be collected except that the incurrent and excurrent hoses are placed into a 4L container of de-ionized water (***use DI water sent from ALS laboratories***). Pump for 2 minutes (just like in the field) to flush site water from the equipment (also attach the filter to flush for 30 seconds). Using a second 4L jug, flush another approx. 1L (this time excurrent hose is placed in sink or bucket) and then use the remaining 2L fill all bottles, except for TSS-low and chlorophyll parameters. Preserve and treat as other samples, including filtering where necessary. Label as station CREMP [month] EB-1, -2, -3, -4, etc. Finally, fill a new suite of bottles (if available) directly from a third 4L jug to test for any problems with the DI water itself. Label theses as CREMP [month] DI-1, -2, -3, -4.

4. Before and during sampling fill in the requested information on the field data form; complete one field data form in its entirety for each sampling station and sampling event. Forms are made of waterproof paper; print all information on the form using a lead pencil or a write-in-the-rain pen.

5. With the aid of a GPS unit, navigate the boat to the sampling station using the UTM coordinates (in NAD 83) provided. Approach the station from downstream of the wind direction. In windy conditions, anchor the boat upstream of the station and drift back; it is not necessary to anchor the boat in calm conditions providing the boat remains in the same position. Do not allow the anchor to drag through the sampling station. Record the **UTM coordinates** on the field data form.

6. Measure **water depth** at the sampling station using the 'Hawkeye' hand-held depth meter (or transom-mounted lowrance). Hold the meter in the water, facing the lake bottom, until the meter measures the depth. Record this information on the field data form. If you are in water that is too shallow (i.e., **must have at least 5 meters depth**), move to deeper water near the assigned station.

7. Measure the light attenuation at the sampling station using the **Secchi disk**. Lower the disk into the water, on the shady side of the boat, so that you can no longer see it. Slowly raise the disk to the point that you can see it and measure this depth using the markings on the disk rope.

8. Measure the pH of the water at the sampling station using the **pH meter** (unless the YSI includes this parameter). Hold the probe portion of the meter in the lake until the meter measures the pH. Record this information on the field data form.

9. Calibrate the YSI probe prior to going into the field; confirm elevation (m) of sampling environment. Check the DO calibration (adjust barometric pressure based on airport data) but also check the DO membrane (it may need to be replaced). At Meadowbank DO readings should be about 8 – 12mg/L; if meter is reading much lower/higher than this, membrane likely needs to be replaced. Keep a calibration log which includes date and time, type of calibration, results, and troubleshooting.

10. Lower the **YSI probe** into the lake to just below the water surface level. Measure the temperature ($^{o}$C), specific conductance (i.e., temperature corrected; uS/cm) and dissolved oxygen concentration (mg/L) in the water and record on the field data form. Lower the meter to a depth of 1 m and record the field measurements. Allow the concentrations on the meter to stabilize for 10 to 15 seconds before recording the concentrations. Continue recording the field measurements at **1 m depth intervals** until you reach the whole metre mark above the lake bottom (i.e. if the lake depth is 9.3 meters, record field measurements up to a depth of 9 meters). Use the **turbidity probe** in a similar manner to record a turbidity profile.

11. Set up the **water pump** in the boat; attach the tubing to the pump using the C-clamps and attach the 12-V battery. Attach the 4 meter length of tubing to the intake valve, and the 1 meter length to the output valve. Attach the plastic coated ball weight to the end of the 4 meter length of tubing. Lower the 4 meter length of tubing into the water to ***3 meters depth*** and place the 1 meter length of tubing over the edge of the boat. Run the pump for ***2 minutes*** to flush the sampling device.

12. For each sampling station, **fill** the required **pre-labeled sampling containers** with water from the 1 meter length of tubing.

13. Dissolved metals and dissolved organic carbon samples are to be collected with an in-line high capacity filter with 0.45 um pore size. After all unfiltered samples have been collected, disconnect the battery from the pump and fix the filter onto the end of the discharge hose. Re-connect the pump and allow the water to discharge and flush through the filter for 15 – 20 seconds. Direct filtered water into the DOC and dissolved metals bottles. Flow from the hose can be controlled by pinching the incurrent end of the tube (***not the excurrent***). Once filtered samples have been collected remove the filter and place into a plastic or zip-loc bag for re-use. In the Meadowbank environment where the amount of suspended solids is typically low, filters can be re-used for up to 10 samples. Remember to use the same filter when collecting equipment blank samples, not a new filter.

14. **Add the specified preservatives** to the appropriate sampling containers (according to the information on the labels and table in step 2), seal and mix thoroughly by turning upside down and then upright a number of times.

15. To collect a phytoplankton sample, add site water from appropriate depth (i.e., 3 m) into the 50 mL vial provided. Make sure that site information is appropriately labeled on the jar. In the field or the lab, add a few drops of Lugol's solution to the sample so that it has the color of weak tea.

16. Rinse all sections of the water filter apparatus with site water.

17. Back in the office, to process the chlorophyll-a sample, use the hand-held pump apparatus and filters. Using the tweezers, place an ashless filter paper on the screen in the water filter apparatus, and, prior to filtering, add 1–2 drops of magnesium carbonate slurry directly onto the filter, then screw the two sections together and attach the hand-held vacuum pump. **Filter 1 L of water** through the water filter apparatus. Wrap the filter paper in a piece of tinfoil, then place the filter in the pre-labeled ziploc bag. Mark on the field collection data sheet the volume of water filtered. In some cases it is not possible to filter up to 1L. In such cases it is critical to note the actual volume filtered. After filtering remove the filter with clean tweezers, place on a piece of tin foil and double wrap. With a sharpie pen, write the appropriate sampling information on a label and stick to the tin foil. Place the folded tinfoil in a zip loc bag and put into the **freezer**.

18. Until ready for shipping, the water samples are stored **chilled** in a refrigerator in camp, if space is available. The filter for chlorophyll-a analysis must be **frozen**; store this bag in a deep freezer in the camp. Bottles should be put in plastic bubble bags prior to storage on ice to protect the labels from water damage. The phytoplankton samples are stored at **room temperature**.

19. If this sampling station is selected as the QAQC **field duplicate**, collect a second set of water samples (repeat step 10), fill the pre-labeled sampling containers, including the phytoplankton vial (repeat step 11-14) and collect a second filtered chlorophyll-a sample (step 16). Record which sampling station the QAQC samples are collected from on the appropriate field data form.

20. Fill out a **chain-of-custody** form for the water samples and filters being sent to **ALS Environmental**. The COC form must be completed carefully and in its entirety to ensure proper analysis. This includes listing all of the specific conventional parameters (see table in step 2), Azimuth and ALS

contact names, and checking off all of the specific boxes for requested analyses. The ALS laboratory quote number must be printed on the COC form to ensure proper billing.

A **digital COC** form is most commonly used; this form can be filled out in advance to ensure accuracy and efficiency and amended in the field as required. Note that using a digital copy of the COC requires printing 2 copies of the document in the field (one for the laboratory, one for Azimuth). Any questions regarding the COC form should be directed to the Azimuth project coordinator – Maggie McConnell. Put the completed COC form in a sealed ziploc plastic bag in a cooler with the water samples.

21. Fill out a **chain-of-custody** form for the phytoplankton samples being sent to **Plankton R Us Inc.**, Winnipeg, MB. Complete all of the required fields and then put the form in a sealed ziploc plastic bag in the cooler with the phytoplankton samples.

## PACKAGING & SHIPPING SAMPLES:

1. Ensure all **water samples** are **sealed** securely. Prior to shipping, it is advisable to wrap the label of each sample bottle with clear tape to make sure that the label does not come off during shipping and handling. Dry the water bottle and wrap with tape. **Pack** water sampling containers upright in coolers with ice packs, and packing material, to ensure samples do not spill or break during transport. (Ideal storage and transport temperature is 4°C).

2. Ensure the COC form is enclosed and then seal the cooler(s). **Label the cooler**(s) with the following address:

   ALS Environmental
   101-8081 Lougheed Hwy.
   Burnaby, BC, Canada
   V5A 1W9
   Tel: 604-253-4188
   Attn: Brent Mack

   **OR**

   ALS Environmental
   39 – Unit 12, 1329 Niakwa Road East
   Winnipeg, MB
   R2J 3T4
   Tel: 204-255-9721

3. Ensure **phytoplankton samples** are **sealed** securely and **pack** in a cooler with packing material to ensure samples do not break during transport. It is not necessary to keep samples cool.

4. Ensure the COC form is enclosed and then seal the cooler. **Label the cooler** with the following address:

   Plankton R Us Inc.
   Dave Findlay
   39 Alburg Drive
   Winnipeg, MB
   R2N 1M1
   Tel: 204-254-7952

5. **Ship** the water **samples** to ALS Environmental <u>as quickly as possible</u>. Ship the phytoplankton samples to Dave Findlay at the end of each month or event.

6. Send completed **COC forms** and **field data forms** to **Azimuth** Consulting Group, attention the project coordinator – Maggie McConnell.

# APPENDIX C

# WATER SAMPLING FIELD DATA SHEETS, AUGUST 2011

PROFILES.
NOT USED
REVISITED.

# Water Sampling - Meadowbank 2011

## STATION INFORMATION

**Lake Station:** INUG

**Sample ID:** EEM

**Crew:** Morgan & maggie + Anne

**Date/ Time:** Aug 18. 7:30

**Weather Observations:** Windy SE 25+km

**UTM Coordinates:** **Easting:** 14W 0622830 097

**Northing:** 7216816

**Photos #s:** –  **Field DUP collected?** ×

## FIELD MEASUREMENTS

| Depth | Temperature | Conductivity | Dissolved Oxygen | pH | ~~Turbidity~~ |
|---|---|---|---|---|---|
| units: | | | | | |
| 0 | 13.1 | 14.8 | 4.09 | 7.65 | |
| 1 | 13.1 | 14.6 | 3.99 | 7.69 | |
| 2 | 13.1 | 14.6 | 3.88 | 7.68 | |
| 3 | 13.1 | 14.6 | 3.80 | 7.81 | |
| 4 | 13.1 | 14.6 | 3.65 | 7.80 | |
| 5 | 13.1 | 14.7 | 3.53 | 7.81 | |
| 6 | 13.1 | 14.6 | 3.43 | 7.85 | |
| 7 | 13.1 | 14.7 | 3.43 | 7.43 | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

**Total Water Depth:** 7.8

**Secchi Depth:** –

**Phytoplankton collected?** –

**Field Notes:**

**Chlorophyll Filter Volume Notes?** –

**Equipment Blank Collection Notes?** –

# Water Sampling - Meadowbank 2011

## STATION INFORMATION

**Lake Station:** INUG
**Sample ID:** INUG - EEM
**Crew:** Morgan + Maggie
**Date/ Time:** Aug. 25, 2011 935am
**Weather Observations:**

**UTM Coordinates:** **Easting:** 14W 0622830
**Northing:** 7216816

**Photo #s:** — **Field DUP collected?** —

## FIELD MEASUREMENTS

| Depth | Temperature | Conductivity | Dissolved Oxygen | pH | ~~Turbidity~~ |
|---|---|---|---|---|---|
| units: | °C | $\mu S/cm^2$ | mg/L | — | — |
| 0 | 12.0 | 16.32 | 8.48 | 7.68 | — |
| 1 | 12.0 | 16.4 | 8.53 | 7.70 | — |
| 2 | 12.0 | 16.3 | 8.53 | 7.76 | — |
| 3 | 12.0 | 16.3 | 8.47 | 7.82 | — |
| 4 | 12.0 | 16.3 | 8.56 | 7.88 | — |
| 5 | 12.0 | 16.3 | 8.50 | 8.00 | — |
| 6 | 12.0 | 16.3 | 8.41 | 8.10 | — |
| 7 | 12.0 | 16.4 | 8.33 | 8.05 | — |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

**Total Water Depth:** 8.0 m
**Secchi Depth:** —
**Phytoplankton collected?** —
**Field Notes:** —

**Chlorophyll Filter Volume Notes?** —
**Equipment Blank Collection Notes?** —

TPN - EEM Aug 24

14W0636907 wp 176
7215067

depth 14.2m

morgan + maggie

| depth | temp | SPC | DO | PH |
|---|---|---|---|---|
| 0 | 10.5 | 21.9 | 9.05 | 7.52 |
| 1 | 10.5 | 22.0 | 9.09 | 7.56 |
| 2 | 10.5 | 22.0 | 9.09 | 7.56 |
| 3 | 10.4 | 22.3 | 9.20 | 7.59 |
| 4 | 10.4 | 22.5 | 9.17 | 7.60 |
| 5 | 10.4 | 23.0 | 9.13 | 7.61 |
| 6 | 10.4 | 22.7 | 9.16 | 7.60 |
| 7 | 10.4 | 22.5 | 9.16 | 7.63 |
| 8 | 10.4 | 23.3 | 9.05 | 7.64 |
| 9 | 10.4 | 23.2 | 9.19 | 7.64 |
| 10 | 10.4 | 23.2 | 9.09 | 7.71 |
| 11 | 10.4 | 23.1 | 9.19 | 7.69 |
| 12 | 10.4 | 23.7 | 9.18 | 7.76 |
| 13 | 10.4 | 24.0 | 9.04 | 7.63 |

wp 175
14W0637783
7208049 8.5m

TPS - EEM
DUP yes
Field Blank yes

morgan + maggie Aug 24

|  | Temp | SPC | DO | PH |
|---|---|---|---|---|
| 7m | 10.7 | 20.5 | 9.33 | 8.43 |
| 6 | 10.6 | 20.4 | 9.07 | 7.80 |
| 5 | 10.7 | 20.3 | 9.12 | 7.94 |
| 4 | 10.7 | 20.3 | 9.17 | 7.92 |
| 3 | 10.7 | 20.3 | 9.19 | 7.92 |
| 2 | 10.7 | 20.3 | 9.14 | 7.89 |
| 1 | 10.7 | 20.1 | 9.15 | 7.89 |
| 0 | 10.7 | 20.1 | 9.24 | 7.86 |

NOTE readings start at depth.

# Water Sampling - Meadowbank 2011

PROFILES NOT USED REVISITED

## STATION INFORMATION

**Lake Station:** Pipedream

**Sample ID:** PDL - EEM

**Crew:** Morgan+maggie + Anne.

**Date/ Time:**

**Weather Observations:** Aug 18th 8:20

**UTM Coordinates:** **Easting:** 14W0630636 wp 098

**Northing:** 7223028

**Photo #s:** –

**Field DUP collected?** yes *

## FIELD MEASUREMENTS

| Depth | Temperature | Conductivity | Dissolved Oxygen | pH | ~~Turbidity~~ |
|---|---|---|---|---|---|
| units: | | | | | |
| 0 | 11.8 | 20.4 | 4.59 | 7.65 | |
| 1 | 11.8 | 20.4 | 4.51 | 7.59 | |
| 2 | 11.8 | 20.4 | 4.44 | 7.65 | |
| 3 | 11.9 | 20.4 | 4.34 | 7.68 | |
| 4 | 11.9 | 20.5 | 4.31 | 7.47 | |
| 5 | 11.9 | 20.4 | 4.30 | 7.45 | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

**Total Water Depth:** 6.6

**Secchi Depth:** –

**Phytoplankton collected?** –

**Field Notes:**

**Chlorophyll Filter Volume Notes?** –

**Equipment Blank Collection Notes?** –

# Water Sampling - Meadowbank 2011

## STATION INFORMATION

**Lake Station:** PDL
**Sample ID:** PDL - EEM
**Crew:** Morgan + Maggie
**Date/ Time:** Aug. 25, 2011 9 am
**Weather Observations:**

**UTM Coordinates:** **Easting:** 14 W 0630636 ——> Same as before
**Northing:** 7223028

**Photo #s:** X **Field DUP collected?** X

## FIELD MEASUREMENTS

| Depth | Temperature | Conductivity | Dissolved Oxygen | pH | ~~Turbidity~~ |
|---|---|---|---|---|---|
| units: | °C | uS/cm² | mg/L | — | — |
| 0 | 11.4 | 21.8 | 8.80 | 8.15 | — |
| 1 | 11.4 | 21.8 | 8.80 | 8.22 | — |
| 2 | 11.4 | 21.8 | 8.80 | 8.26 | — |
| 3 | 11.4 | 21.8 | 8.80 | 8.32 | — |
| 4 | 11.4 | 21.9 | 8.75 | 8.40 | — |
| 5 | 11.4 | 21.9 | 8.70 | 8.52 | — |
| 6 | 11.4 | 22.1 | 8.70 | 8.51 | — |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |
| 16 | | | | | |
| 17 | | | | | |
| 18 | | | | | |
| 19 | | | | | |
| 20 | | | | | |

**Total Water Depth:** 6.6
**Secchi Depth:** —
**Phytoplankton collected?** —
**Field Notes:**

**Chlorophyll Filter Volume Notes?** —
**Equipment Blank Collection Notes?** —

# APPENDIX D

# STANDARD OPERATION PROCEDURE (SOP) FOR CREMP SEDIMENT & BENTHOS SAMPLING

# Standard Operating Procedure
# Meadowbank Project Lakes & Baker Lake
# CREMP Sediment & Benthos Sampling

## GENERAL:

**Project Coordinator:**
Maggie McConnell
Azimuth Consulting Group
218-2902 West Broadway
Vancouver, BC, V6K 2G8
Telephone: 604-730-1220
Email: mmcconnell@azimuthgroup.ca

In case of **emergency**, contact Gary Mann (Azimuth telephone number 604-730-1220 or cell phone 604-908-0601).

## LOCATION AND TIMING FOR FIELD ACTIVITIES:

**Twelve (12) sampling stations** have been chosen for benthos and sediment quality monitoring in the Meadowbank project lakes. These stations (with their corresponding abbreviation) are:

- Third Portage Lake – North Basin (TPN) **[EEM Sampling Area]**
- Third Portage Lake – East Basin (TPE)
- Second Portage Lake (SP)
- Tehek Lake (TE)
- Inuggugayualik Lake (INUG) **[EEM Sampling Area]**

- Tehek Lake – Far-field (TEFF)
- Third Portage Lake – South Basin (TPS)
- Wally Lake (WAL)
- Pipedream Lake (PDL) **[EEM Sampling Area]**

- Baker Lake – Barge Dock (BBD)
- Baker Lake – Proposed Jetty (BPJ)
- Baker Lake – Akilahaarjuk Point (BAP)

Field activities are scheduled for once per year, in **mid/late August**. The **target water depth** at each sampling station is approximately **8 meters +/- 1.5 m**; Wally Lake is the exception, with a total water depth of approximately 6 meters (target water depth is 5 to 6 meters).

## BENTHOS & SEDIMENT CHEMISTRY SAMPLING:

1. Gather **field collection materials**:
   In the boat:
   - Field collection data forms, waterproof paper, pencils, waterproof markers & clipboard

- GPS unit, batteries
- Depth meter, batteries
- pH meter, batteries
- Rope
- Petite Ponar grab and rope
- 500 micron sieve bag
- 2 stainless steel bowls
- 2 stainless steel spoons
- Liquinox detergent and dish cleaning brush
- Plastic squirt bottle
- Sampling gloves
- Safety glasses
- Field sample jars & preservatives (per sampling station):
  - 8 – 125 mL glass jars (sediment samples : 2 jars for first 3 reps; 1 jar for last 2 reps, except for EEM where 2 jars for all 5 reps)
  - 5 – 500 mL plastic jars (benthos: 1 jar for each rep)
- QA/QC field duplicate sediment jars
- Ashless filter paper & tweezers; 1-125 mL glass jar

<u>In camp</u>:

- Formalin (10% of pure Formaldehyde)
- Labels for sampling containers
- Coolers, action packers (for storing and shipping samples)
- Ice packs (for shipping sediment samples to lab)
- Address labels for coolers
- Chain-of-custody forms
- Large Ziploc bags (for sending chain-of-custody form in coolers)
- Electrical tape (for sealing benthos jars)
- Packing tape (for affixing labels to sediment sample containers & sealing coolers)

2. Before going into the field, **label the lids** of all sampling containers using a permanent waterproof marker. After sampling, prepare appropriate labels for containers and affix them when bottles are dry enough to stick to. Use the following information:
   - Azimuth company name
   - Station abbreviation (e.g. TPE-1, INUG-3)
   - Date of sample collection
   - Parameters to be measured from individual jar (1 x 125 mL – total metals, pH, moisture, PAHs, LEPHs & HEPHs, Mineral Oil & Grease; 1 x 125 mL – grain size (PSA), TOC)

   Affix the labels to the sediment jars and then wrap packing tape around the labels to ensure a waterproof seal.

   For the **benthos containers**, print the following information directly onto both the jar and jar lid using a permanent waterproof marker:
   - Azimuth company name
   - Station abbreviation (e.g. TPE, INUG) and replicate number (e.g. TPE-1, TPE-2); there are a total of 5 replicates per sampling station
   - Date of sample collection

Prepare **internal labels** for each of the benthos containers. On a small piece of waterproof paper, write, using a lead pencil, the station abbreviation and replicate number (e.g. TPE-1). If no waterproof paper is available, use regular paper. Store the labels in their corresponding sampling container.

3. For **QAQC** purposes, sediment samples are collected in duplicate from one station every sampling event. All parameters measured in the original sample are measured in the field duplicate. The sampling station is selected randomly from one of the ten stations, and labeled as station DUP. Prepare the QAQC labels and affix to the sediment jars, as described in step 2. Label one new 125 mL glass jar with the Azimuth company name, date, QAQC filter and total metals.

4. A 100% formalin solution is equivalent to a solution of 37% formaldehyde. The **target formalin concentration** in each of the sampling containers is 10%. A neutral buffered formalin solution is achieved by adding a sufficient amount of calcium carbonate powder or pellets to render the solution pH neutral (pH = 7.0). Borax powder may be substituted for calcium carbonate powder if necessary.

   Transport Canada allows the free transport of formalin at concentrations less than 25% formaldehyde. Consequently, the formalin transported up to Meadowbank will be diluted in half (18.5% formaldehyde / 50% formalin solution).

   To **prepare** the **neutral buffered formalin**, add a small amount of calcium carbonate powder or pellets to the 50% formalin solution, seal the container and shake until mixed. Check the pH of the solution using the pH pen. Continue adding the powder/pellets until the pH of the solution reaches approximately 7.0. Store at room temperature until ready to use. Only prepare the required volume of neutral buffered formalin for that sampling event. Buffered formalin will not store for long periods of time.

   Follow all **safety precautions** when preparing the formalin solution. Formalin is a carcinogen and irritant. Wear sampling gloves and safety glasses when mixing the solution and prepare the solution in a well ventilated area.

5. Before and during the benthos and sediment sampling fill in the requested information on the **field data form**; complete one field data form in its entirety for each sampling station and sampling event. Forms are made of waterproof paper; **print** all information on the form using a **lead pencil** or write-in-the-rain pen.

6. With the aid of a GPS unit, **navigate the boat** to the sampling station using the UTM coordinates (in NAD 83) provided. Approach the station from downstream of the wind direction. In windy conditions, anchor the boat upstream of the station and drift back; it is not necessary to anchor the boat in calm conditions providing the boat remains within a 50 meter radius of the position. Do not allow the anchor to drag through the sampling station. Record the UTM coordinates on the field data form.

7. Measure the **water depth** at the sampling station using the ‘Hawkeye’ hand-held depth meter (or transom-mounted lowrance). Hold the meter in the water, facing the lake bottom, until the meter measures the depth. Record this information on the field data form Ensure sample depth is within the target (8 meters +/- 1.5 m, or 5-6 meters for Wally).

8. Begin collecting the benthos samples. Collecting the sediment first would disturb the benthic community.

9. Ensure the rope is securely attached to the **Ponar**. Rinse the Ponar grab, stainless steel bowl and spoon with lake water. **Wash** each of these items with liquinox soap by scrubbing with the dish cleaning brush and then thoroughly rinse with lake water. Put aside the stainless steel bowl and spoon until later (step 18).

10. Lower the **Ponar** to within 1 meter of the bottom of the lake. Lower the Ponar very slowly over the last meter and allow the rope to go slack. Raise the Ponar to the edge of the boat and check the grab for **acceptability**. The grab is acceptable if the sample:
    - does not contain large foreign objects;
    - has adequate penetration depth (i.e., 10-15 centimeters);
    - is not overfilled (sediment surface must not be touching the top of the Ponar);
    - did not leak (there is overlying water present in Ponar); and
    - is undisturbed (sediment surface relatively flat).

    Once the grab is deemed acceptable, open the Ponar jaws and drop the sample into a stainless steel bowl. Rinse the ponar with squirt bottles to make sure all of the material is in the bowl. Gently pour the contents of the bowl into the 500 micron sieve bag.

11. **Sieve the sample** in the lake water until only the benthic organisms and coarse materials remain. Care must be taken to ensure the benthic organisms are not damaged or crushed. Do not disturb the sample to the point that it is splashing out of the sieve. Do not forcibly push materials through the sieve; gently break apart any small clay balls. Rinse off any pieces of larger plant material or rocks in the sample and discard.

12. **Flush** the **remaining sample** in the bottom of the sieve into the pre-labeled plastic sampling container (i.e. station-1 jar). A plastic squirt bottle filled with lake water is useful for this purpose.

13. **Repeat (twice for EEM) steps 10-12**, flushing the sample into the same pre-labeled plastic sampling container (i.e., station-1 jar). Ensure the sample is collected in an area not previously disturbed by the Ponar. The two (three for EEM) independent grabs (per replicate) are composited to increase the surface area sampled.

14. **Rinse the sieve** bag to clear out any debris in the screen. To rinse, hold the sieve upside down and raise and lower the sieve into the water.

15. **Repeat steps 10-14** four more times; there must be a separation of ***20 meters*** or more from other replicate stations. Record the depth and GPS coordinates of each replicate station on the field data form. Put the samples from each replicate in pre-labeled station replicate jars 2 through 5. In total, 10 Ponar grabs will be collected for benthos collection, two grabs per replicate.

16. Ensure internal labels are in each sample container. Shake the formalin to ensure all of the calcium carbonate powder is in solution. **Add** a sufficient volume of **formalin** to each sampling container to make a corresponding formalin solution of approximately 10%. Volumes of formalin are added by 'eye' (for a 10% solution, a ratio of 4 parts water and 1 part 50% formalin solution). Overall, there must be enough liquid in the jar to cover the entire sample. Seal the sample container securely and

gently roll the container to mix the sample and formalin solution. Do not shake the sample container; this will crush the benthic organisms inside.

17. Prior to collecting the next REP, clean ponar and both bowls with liquinox and scrub brush, rinse with lake water. Begin collecting the sediment samples. Lower the **Ponar** to within 1 meter of the bottom of the lake, in an area not previously disturbed by the Ponar. Lower the Ponar very slowly over the last meter and allow the rope to go slack. Raise the Ponar to the edge of the boat and check the grab for **acceptability** (see step 10 for criteria).

18. Once the grab is deemed acceptable, open the top of the Ponar and remove any overlying water. Using the pre-cleaned stainless steel spoon, scoop out the **top 3-5 centimeters** of **sediment** and place in the pre-cleaned stainless steel bowl. Empty the remainder of the grab sample into a bucket in the boat, not directly into the lake, to ensure the area is not disturbed.

19. **Repeat steps 17** and **18** one more time, placing the sediment into the bowl with the other sediment sample(s).

20. **Homogenize** the sediment samples in the stainless steel bowl (by stirring with the spoon) until the sediment is thoroughly mixed. Scoop the sediment into pre-labeled sediment sampling containers. **Fill the jars** to the top and seal securely.

21. If this station is selected as the QAQC **field duplicate**, using the tweezers and a set of clean sampling gloves, **swipe** the stainless steel bowl and spoon with one piece of ashless **filter paper** and store in the pre-labeled 125 mL glass jar. Collect the duplicate sediment sample from the same sediment collected in steps 17-20. Fill the sampling containers labeled as station DUP. Record that the QAQC samples were collected from this sampling station on the field data form.

22. **Complete** the **field data form**, including a description of the sediment (grain size, consistency, colour, presence of biota, sheen, unusual appearance) and the sampling effort (equipment failure, control of vertical descent of sampler) required to collect the benthos and sediment samples.

23. **Rinse** out the Ponar, stainless steel bowl and spoon with lake water. Dump the sediment and water from the plastic bin into the lake.

24. Until ready for shipping, store the sediment samples and QAQC filter paper **chilled** (on ice) in a cooler or in a refrigerator in camp, if space is available. The sediment sampling containers may be put in plastic bags prior to storage on ice to further protect the labels from water damage. Benthos samples are stored in a cooler or action packer at **room temperature**.

25. Fill out a **chain-of-custody** form for the sediment samples being sent to **ALS Environmental**. The COC form must be completed carefully and in its entirety to ensure proper analysis. This includes listing all of the specific parameters to be analyzed (see step 2), Azimuth and ALS contact names, and checking off all of the specific boxes for requested analyses. The ALS laboratory quote number must be printed on the COC form to ensure proper billing.

    A **digital COC** form is most commonly used; this form can be filled out in advance to ensure accuracy and efficiency and amended in the field as required. However, using a digital copy of the COC requires printing 2 copies of the document in the field (one for the laboratory, one for Azimuth). Any questions regarding the COC form should be directed to the Azimuth project coordinator – Maggie McConnell. Put the completed COC form in a sealed ziploc plastic bag in the cooler with the samples.

26. Fill out a **chain-of-custody** form for the benthos samples being sent to **Zaranko Environmental Assessment Services** (ZEAS). Complete all of the required fields and then put the form in a sealed ziploc plastic bag in the cooler with the benthos samples.

## PACKAGING & SHIPPING SAMPLES:

1. Ensure all **sediment samples** are **sealed** securely. **Pack** sediment sampling containers upright in a cooler with ice packs, and packing material, to ensure containers do not break during transport. (Ideal storage and transport temperature is 4°C).

2. Ensure the COC form is enclosed and then seal the cooler(s). **Label the cooler**(s) with the following address:

   ALS Environmental
   101-8081 Lougheed Hwy.
   Burnaby, BC, Canada
   V5A 1W9
   Tel: 604-253-4188
   Attention: Brent Mack

3. Ensure **benthos samples** are **sealed** securely. Wrap electrical tape around the edge of the lids to ensure a tight seal. **Pack** benthos sampling containers upright in a cooler or action packer; ensure the cooler/action packer is well packed so the jars are not able to move around.

4. Ensure the COC form is enclosed and then seal the cooler(s). **Label the cooler**(s) with the following address:

   Zaranko Environmental Assessment Services (ZEAS)
   36 McCutcheon Avenue
   P.O. Box 1045
   Nobleton, ON
   L0G 1N0
   Tel: 905-859-7976

5. **Ship** the sediment **samples** to ALS Environmental as quickly as possible. Ship the benthos samples to ZEAS when convenient. Coordinate shipping with the camp manager.

6. Send completed **COC forms** and **field data forms** to **Azimuth** Consulting Group, attention the project coordinator – Maggie McConnell.

# APPENDIX E

# SEDIMENT & BENTHOS SAMPLING FIELD DATA SHEETS, AUGUST 2011

# Benthos and Sediment Sampling - Meadowbank 2011

## STATION INFORMATION

**Station ID:** INUG

**Crew:** Morgan, Maggie + Gary!

**Date/ Time:** Aug 14 9:45

**Weather Observations (wind/waves):** Wind S N 20 overcast

**Locations for BENTHOS** (2 grabs composited per rep; >20 m separation b/w reps)

| Name | Depth (m) | Easting | Northing | Waypoint # |
|---|---|---|---|---|
| Rep1 | 6.9 | 14W0622816 | 7216850 | 030 |
| Rep2 | 6.8 | 14W0622784 | 7216864 | 031 |
| Rep3 [illegible] | 7.6 | 14W0622790 | 7216834 | 032 |
| Rep4 *may have three grabs | 8.5 | 14W0622711 | 7216786 | 033 |
| Rep5 | 9.2 | 14W0622694 | 7216769 | 034 |

**Locations for SED. CHEMISTRY** (2-3 grabs composited per rep; collect top 3-5 cm, post benthos)

| Name | Or same as above? Y / N | |
|---|---|---|
| Rep1 + A | Yes. | Full Suite |
| Rep2 + A | yes | Full Suite |
| Rep3 + A | yes | Full Suite |
| Rep4 + A | yes | ~~TOC & PSA~~ Full |
| Rep5 + A | yes | ~~TOC & PSA~~ Full |

**Photo #s:**

**DUPS?:** Rep 1

**Filter Swipes?:** Rep 1

## FIELD NOTES

**Sediment Characteristics:**
**(Grain size, consistency, colour, odour, biota, sheen or unusual appearance)**

**Sampling Effort (Equipment failure, control of vertical descent of sampler):**

**More than 500 mL container collected for any benthic sample?**

## BENTHOS / SEDIMENT SAMPLE CHECKLIST (per REP)

| Jar Type | Parameters | Preservation / Storage |
|---|---|---|
| 1 x 125 mL glass | Metals (incl. Al, Ph), pH, moisture, PAHs, LEPHs&HEPHs, MO&G | none / keep cool |
| 1 x 125 mL glass | TOC & PSA | none / keep cool |
| 1 x 500 mL plastic | Benthos Taxonomy | 10% buffered formalin solution |

# Benthos and Sediment Sampling - Meadowbank 2011

## STATION INFORMATION

**Station ID:** PDL
**Crew:** mlm, mF
**Date/ Time:** Aug. 13, 2011
**Weather Observations (wind/waves):** Sun + clouds 10 km N wind.

**Locations for BENTHOS** (2 grabs composited per rep; >20 m separation b/w reps)

| | Name | Depth (m) | Easting | Northing | Waypoint # |
|---|---|---|---|---|---|
| **Rep1** | +A | 6.5 | 14W0630554 | 7222992 | 013 |
| **Rep2** | +A | 6.8 | 14W0630607 | 7223035 | 014 |
| **Rep3** | +A | 6.9 | 14W0630711 | 7222711 | 015 |
| **Rep4** | +A | 7.6 | 14W0630879 | 7223053 | 016 |
| **Rep5** | +A | 6.7 | 14W0630596 | 7223017 | 017 |

**Locations for SED. CHEMISTRY** (2-3 grabs composited per rep; collect top 3-5 cm, post benthos)

| | Name | Or same as above? Y / N | |
|---|---|---|---|
| **Rep1** | | YES | Full Suite |
| **Rep2** | | YES | Full Suite |
| **Rep3** | | YES | Full Suite |
| **Rep4** | | YES | ~~TOC & PSA~~ Full |
| **Rep5** | | YES | ~~TOC & PSA~~ Full |

EEM station

**Photo #s:**
**DUPS?:** X
**Filter Swipes?:** X

## FIELD NOTES

**Sediment Characteristics:**
**(Grain size, consistency, colour, odour, biota, sheen or unusual appearance)**
Rep 4 – 1st grab lots of clay

**Sampling Effort (Equipment failure, control of vertical descent of sampler):**

**More than 500 mL container collected for any benthic sample?**

## BENTHOS / SEDIMENT SAMPLE CHECKLIST (per REP)

| Jar Type | Parameters | Preservation / Storage |
|---|---|---|
| 1 x 125 mL glass | Metals (incl. Al, Ph), pH, moisture, PAHs, LEPHs&HEPHs, MO&G | none / keep cool |
| 1 x 125 mL glass | TOC & PSA | none / keep cool |
| 1 x 500 mL plastic | Benthos Taxonomy | 10% buffered formalin solution |

# Benthos and Sediment Sampling - Meadowbank 2011

## STATION INFORMATION

**Station ID:** TPN

**Crew:** Tripod

**Date/ Time:** Aug 19, 2011 10:00

**Weather Observations (wind/waves):** winds 20 SE rainy.

**Locations for BENTHOS** (2 grabs composited per rep; >20 m separation b/w reps)

| Name | Depth (m) | Easting | Northing | Waypoint # |
|---|---|---|---|---|
| Rep1 + A | 7.0m | 14W0636389 | 7215547 | 107 |
| Rep2 + A | 9.0m | 14W0636285 | 7215525 | 108 |
| Rep3 + A | 9.2m | 14W0636417 | 7215511 | 109 |
| Rep4 + A | 8.6m | 14W0636514 | 7215438 | 110 |
| Rep5 + A | 8.4m | 14W0636607 | 7215409 | 111 |

**Locations for SED. CHEMISTRY** (2-3 grabs composited per rep; collect top 3-5 cm, post benthos)

EEM Stn.

| Name | Or same as above? Y / N | |
|---|---|---|
| Rep1 | yes. | Full Suite |
| Rep2 | yes. | Full Suite |
| Rep3 | yes. | Full Suite |
| Rep4 | yes | ~~TOC & PSA~~ Full |
| Rep5 | yes | ~~TOC & PSA~~ Full. |

**Photo #s:**

**DUPS?:**

**Filter Swipes?:**

## FIELD NOTES

**Sediment Characteristics:**
**(Grain size, consistency, colour, odour, biota, sheen or unusual appearance)**

GRABS were good at R1 + R2 but much more difficult after that

**Sampling Effort (Equipment failure, control of vertical descent of sampler):**

**More than 500 mL container collected for any benthic sample?**

## BENTHOS / SEDIMENT SAMPLE CHECKLIST (per REP)

| Jar Type | Parameters | Preservation / Storage |
|---|---|---|
| 1 x 125 mL glass | Metals (incl. Al, Ph), pH, moisture, PAHs, LEPHs&HEPHs, MO&G | none / keep cool |
| 1 x 125 mL glass | TOC & PSA | none / keep cool |
| 1 x 500 mL plastic | Benthos Taxonomy | 10% buffered formalin solution |

# APPENDIX F

# STANDARD OPERATION PROCEDURE (SOP) FOR EEM FISH SAMPLING

# Standard Operating Procedure
# Meadowbank Project Lakes
# EEM Fish Sampling

## GENERAL:

**Project Coordinator:**
Gary Mann/Randy Baker
Azimuth Consulting Group
218-2902 West Broadway
Vancouver, BC, V6K 2G8
Telephone: 604-730-1220; Fax: 604-739-8511
Email: gmann@azimuthgroup.ca; rbaker@azimuthgroup.ca

**Crew Leader:** Sue Hertam, North/South Consultants (on site)

In case of **emergency** contact Azimuth Office in Vancouver (604-730-1220)

## LOCATION AND TIMING FOR FIELD ACTIVITIES:

**Three lakes** have been chosen for fish samplings at the Meadowbank Mine for the EEM cycle one study. These lakes (with their corresponding abbreviation) are:

- Third Portage Lake North Basin (TPN): Exposure Area
- Inuggugayualik Lake (INUG): Reference Area
- Pipedream Lake (PDL): Reference Area

Sampling areas within each lake can be viewed in **Figure 1**.

Field activities are scheduled for once per year, in **August to early September**, with **a minimum time allocation of 1 week sampling per lake** (or until sufficient fish numbers are captured). According to EEM guidance, if longer than a week is required to collect all fish samples at all lakes (this is anticipated at Meadowbank as 3 weeks have been allocated to this study), then samples at the reference areas should be collected before and after the exposure area.

## FISH SAMPLING:

**1.** Gather field collection materials:

**In the boat:**

- Field collection data forms, waterproof paper, pencils, waterproof markers & clipboard
- Gill nets. “Standard” panels are (mm [in]): 126 [5], 102 [4], 76 [3], 51 [2], 38 [1.5], and 25 [1]. Typically deployed as indexed gang (1 of each panel). Panels are 22.7 m long and 1.8 m deep. Other smaller mesh sizes are also available. *Crew leader has flexibility to alter net deployment to meet project targets and minimize incidental catch.*
- Depth meter, batteries; GSP unit and batteries
- Thermometer
- Camera
- Two scales, one for big fish (10 kg +/- 25 g), one for smaller fish (4 kg max +/- 10 g).

- Fin clippers
- Scale collection envelops for fin rays
- Floy tags/gun
- Cooler(s) and ice packs – one per boat
- Boat safety kit

**In camp:**

- Length board
- Scales (high range OHAUS Ranger RD60LS [+/- 2 g] for large fish [>200 g]; low range [+/- 0.01 g] for small fish [<200 g] and organs
- Lab data forms
- Camera
- Collection envelopes for otoliths and fin rays
- Dissection utensils (scalpel, forceps, tweezers, etc.) and sampling gloves

Before going into the field, **double check that all gear is present, and that nets of various sizes are available. Make sure you have all field forms needed (i.e. partially filled out forms awaiting net-lifting and fish-catch data).**

General photographs of each location should be taken to document the areas.

*Once in the Field*

**2.** N**avigate the boat** to the desired sampling area within the allowable sampling area of the lake (see **Figure 1**). Record air and water temperature daily.

**3.** Once at location and the nets are organized and ready for deployment, fill out the **field data sheet**. Record on the field data sheet: the set ID, set date, set time, recorder, gang information (mesh sizes etc.), mesh sizes and any other comments. Record the “start” and “end” UTM location (Northing, Easting, Zone in NAD83) using a GPS unit, and water depth (m), using a depth meter. Take a picture of the sampling location. Forms are made of waterproof paper; **print** all information on the form using a **lead pencil** or write-in-the-rain pen.

*Retrieving Nets*

**4.** Initial day set durations should be approximately 2 – 3 hrs (duration may be lengthened by Crew Leader after discussion with Coordinator). Record all lift information and fish data on the same form that was filled out when the nets were set. Be sure to be clear on the “Lift Date” and “Lift Time”, as over-night sets would have a different “Set Date”.

*Recording Fish Data*

**5.** During net retrieval, record the number and size (FL mm) of each species per panel (mesh size) in the field data sheets. *Do not* inter-mingle fish from different net panels. *All* captured fish are retained for either non-lethal or lethal sampling, including non-target species. See **Table 1** for an overview of target numbers and required parameters for the EEM fish study.

**6.** **Scale:** Use the appropriate scale for the size of fish captured, i.e. a small fish should be weighed on a finer scale. **Scales must be calibrated before initial use and checked each day (record in log)**. Check that the scale is reading zero prior to measuring *each* fish. For more information on required precision of measurements see **Table 2**.

7. **Establish a person as "measurer" and a person as "recorder".** This will maximize consistency throughout the study. The recorder should read back each recorded value to the measurer as a verification of accuracy. **Ensure all information is collected each set.**

8. **All fish:** ensure that **field data sheet** fields for species, sample ID and mesh size are filled in.

9. **Lake trout (non-lethal):** Lake trout are to be non-lethally sampled and should be handled quickly but carefully. Collect a wide range of sizes of fish (see historic range, **Figure 2**). Gender of fish is not a factor. Take photos of representative fish. For all lake trout the following parameters should be collected in the field:
    - Measure the length (fork [mm; accuracy to nearest mm]) and weight (g; accuracy to 1% of body weight) of each fish.
    - Record the external DELTs. This includes abnormalities of body form, body surface, fins, eyes, lesions, tumors, scars etc. Mark any of these on the fish diagram sheet (**Figure 3** for example). Take additional pictures as necessary.
    - Using fin-clippers, take the left pectoral fin clip (first 4 rays) and place in a paper scale envelope. Label the bag immediately with the Set ID, Date, and Fish ID.
    - Tag the fish with a Floy Tag, and record the Tag # in the field data sheet.
    - Carefully release the fish back to the water.

*Lake trout mortalities to be taken to the lab for further processing (**see Comment #14**).*

10. **Round whitefish:** Retain only sexually mature, current year spawners in specific weight categories until **lethal sampling** targets met[1] (see **Table 1**); once targets have been reached, cease sampling, *unless* the full quota of lake trout has not been met.

    Field processing for **lethal sampling**:
    - Sacrifice the fish by quick blow to the head.
    - Bag the fish, and label it clearly with the Set ID and mesh size. Place the bag in a cooler with ice packs.
    - Laboratory processing will be covered in **Comment 14**.

    Field processing for **non-lethal sampling**:
    - Check for fin clip. If present, then release immediately. If absent, then follow next steps.
    - Measure the length (fork [mm; accuracy to nearest mm]) and weight (g; accuracy to 1% of body weight) of each fish.
    - Record the external DELTs. This includes abnormalities of body form, body surface, fins, eyes, lesions, tumors, scars etc. Mark any of these on the fish diagram sheet (**Figure 3** for example). Take additional pictures as necessary.

---

[1] In the event that one or more targeted size categories of round whitefish are **not** filled and whitefish are captured within one or more of the 'filled' size categories, sample the additional fish as per the protocols to ensure that at least 20 fish of each gender are captured and processed. After 20 fish of each sex are sampled at an area (but all size categories still unfilled), discuss situation with project coordinator.

- Using fin-clippers, take a left pectoral fin clip (first 4 rays) and place in a paper scale envelope. Label the bag immediately with the Set ID, Mesh Size, Date, and Fish ID.
- Carefully release the fish back to the water.

11. **Incidental catch (non-target species such as Arctic char):**
    Field processing for **non-lethal sampling**:
    - Check for pectoral fin clip. If present, then release. If absent, then follow next steps.
    - Measure the length (fork [mm; accuracy to nearest mm]) and weight (g; accuracy to 1% of body weight) of each fish.
    - Using fin-clippers, take a left pectoral fin clip (first 4 rays) and place in a paper scale envelope.
    - Carefully release the fish back to the water.

*Non-target species mortalities to be taken to the lab for further processing (**Comment #14**).*

12. Once the gang of nets has been fully brought into the boat, and all fish processed as needed, the gang can be set again. Repeat process of setting nets.

*Laboratory Fish Processing*

13. At the end of each field day, all dead fish are processed in the laboratory. Round whitefish are the only species routinely lethally sampled, but may also include incidental mortalities of lake trout and by-catch species (e.g., char).

14. Detailed biological assessment requirements vary by fish species (**Table 1**). The following is presented for round whitefish, but applies to other species, but only for specific measurements.

    Follow these procedures (recording details in the **detailed biological analysis lab sheet** [and **field data sheet** if certain measurements were not done in the field]; see **Table 2** for measurement precision):
    - **All fish.** Weigh the fish to the nearest gram
    - **All fish.** Place the fish on the length board with the right side down and the nose against the end of the board. Place the unique identifier on a piece of paper adjacent to the fish and photograph each whitefish prior to examining for external DELTS
    - **All fish.** Examine the fish from both sides noting any irregularities in color, appearance, deformities, fin erosions, lesions, tumours, and scars. Photograph any abnormalities and record them on the fish drawing sheet.
    - **All fish.** Cut the fish open from the anus to below the gill isthmus with a sharp knife or scissors taking care not to cut or damage any organs. Inspect the interior of the fish noting any lesions, growths, deformities, tumors and discoloration of major organs including the spleen, liver, kidney, gonad and stomach. Photograph any abnormalities.
    - **All fish.** Record the presence and approximate load of any parasites (low [1-10], moderate [11-24], high [>25]) and location in the gut cavity or on major organs. Photograph representative examples of lake trout or char.
    - **All fish.** Open the stomach and record relative percent fullness (10% increments) and rough taxonomic composition of stomach contents.
    - **All fish, including lake trout, Arctic char, whitefish.** This new protocol was determined by the TAPP on August 16. Excise the liver using a scalpel or scissors – remove the gall bladder,

taking care to take only the liver and minimize taking connective tissue and blood vessels; weigh to the nearest 0.01 g in a tared weighing boat. Verify the weight.

- **All sexually mature, current year spawners only.** Excise the gonads taking care not to damage the testes/ovary and risk losing milt, eggs or fluid; minimize the collection of connective tissue and blood vessels; weigh to the nearest 0.01 g. Verify the weight.
- **All sexually mature, current year spawners.** For females, cut open the ovary and randomly remove and count a subset of 400 eggs. Weigh to the nearest 0.01 g.
- **All fish.** Remove otoliths and pectoral fin and place in a labeled scale envelope.

**15.** Once the detailed biological analysis has been completed, all biological waste should be gathered and disposed of appropriately. **All offal, small non-edible fish and very large lake trout shall be returned to the lake where captured. Only those fish deemed suitable for human consumption should be frozen for distribution to the community**.

**16.** Until ready for shipping, dry and store aging structures (fins and otoliths) in a secure and central location.

## PACKAGING & SHIPPING SAMPLES:

1. Fill out a **chain-of-custody** (COC) form for the aging structure samples.

2. Ensure all **aging samples** are packaged together in a padded envelope or box, with the COC.

3. Ensure the COC form is enclosed and then seal the cooler(s). **Label the cooler** with the following address:

North/South Consultants
83 Scurfield Boulevard
Winnipeg, Manitoba R3Y 1G4
Tel: 204-284-3366
Attention: Sue Hertam

4. Send completed COC forms and data forms (field and lab) to Azimuth.

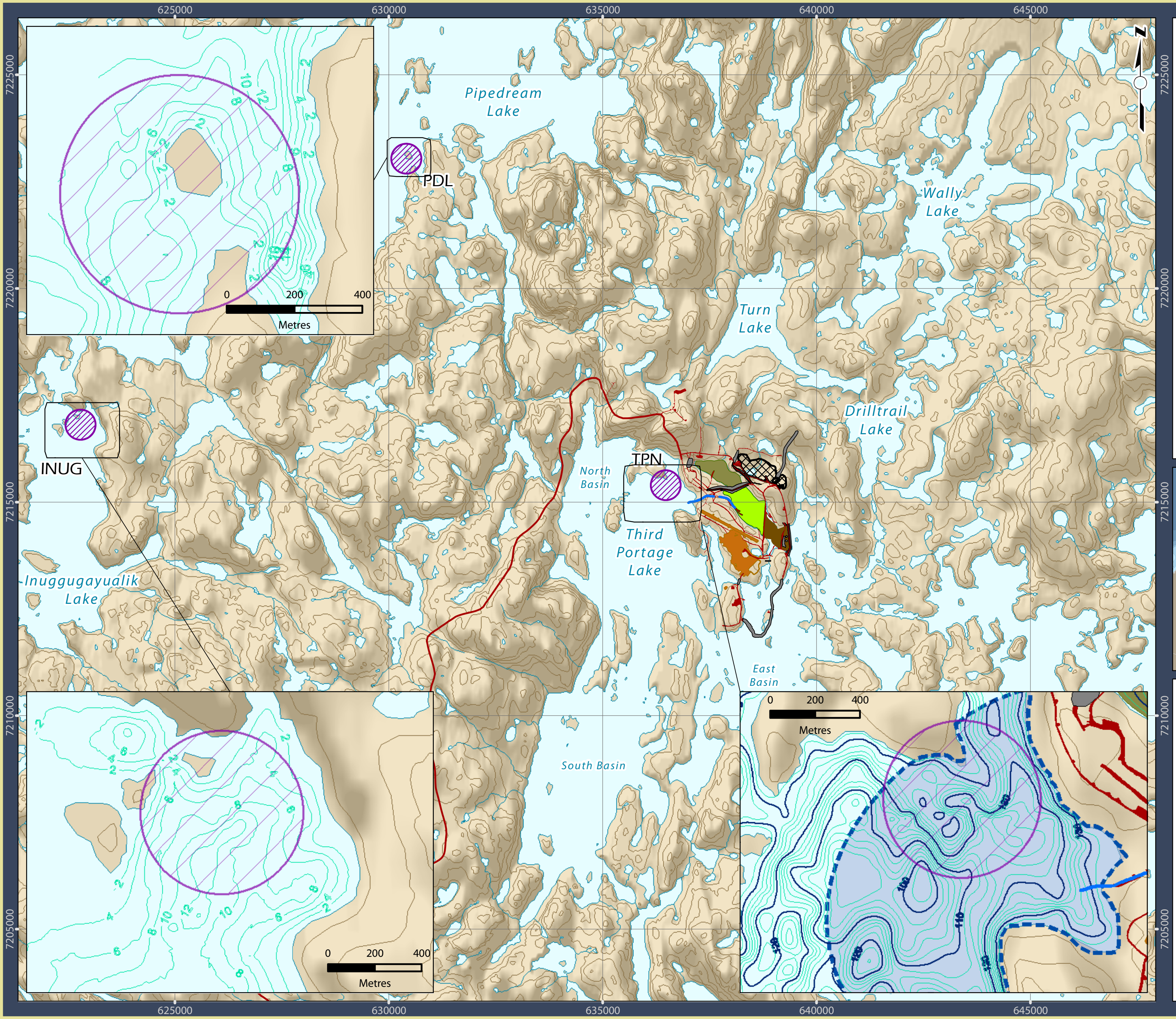
**Table 1.** Program summary for Meadowbank EEM Fish Study.

| | Round Whitefish | | Lake Trout | | Arctic char, Burbot | | Notes |
|---|---|---|---|---|---|---|---|
| | lethal (5 of ripe M & F in each size class) | non-lethal | non-lethal | lethal | non-lethal | lethal | · Weather (general)<br>· Air & water temperature (when lifting)<br>· UTM and depth (m) for each end of the net<br>· Effort: panels & duration of set (i.e. time & date of set and pull/run)<br>· General observations (depth, biota etc)<br>· Photographs |
| **Target per water body**<br>• Exposure:<br>Third Portage N (TPN)<br>• Reference:<br>Inuggugayualik(INUG)<br>Pipedream (PDL) | 270-400 g<br>401-550 g<br>551-700 g<br>>701 g | Over and above the quota | 100+ ( tag and return to water body) | As few as possible | As few as possible | As few as possible | |
| **Parameters** | | | | | | | |
| Species (& net & mesh in which it was captured) | * | * | * | * | * | * | |
| Fork length (mm) | * | * | * | * | * | * | If fish species with no forked tail, then measure total length. |
| Total weight (g) | * | * | * | * | * | * | |
| Sex, maturity, reproductive status | * | | | * | | * | Mature, IMM, resting, unknown |
| Gonad weight, egg wt (400 eggs to 0.01 g) | * | | | | | | Weight of 400 eggs (g), weight of gonads |
| DELTS (internal) | * | | | * | | * | Parasites, deformities, lesions, tumors, general condition etc. |
| DELTS (external) | * | * | * | * | | | Parasites, deformities, lesions, tumors, general condition<br>Use fish diagram if necessary |
| Age | Otoliths + Pectoral Fin | Pectoral Fin | Pectoral Fin | Otoliths + Pectoral Fin | Otoliths + Pectoral Fin | Otoliths + Pectoral Fin | Otoliths and fins (4 rays) in paper envelopes. |
| Liver weight (g) | * | | | | | | |
| Floy Tag (Floy) | | | Floy (fin clip small ones) | | | | |
| Stomach Contents | * | | | * | | * | Note identifiable items and fullness (to nearest 25%) |

**Table 2.** Required fish survey measurements, expected precision and summary statistics.

| **Measurement Requirement** (MMER Schedule 5, s. 16 (a) and (b)) | **Expected Precision** | **Reporting of Summary Statistics**(MMER Schedule 5 s. 16) and other general reporting |
|---|---|---|
| Length (fork or total or standard) | +/- 1 mm | Mean, median, SD, standard error, minimum and maximum values forsampling areas |
| Total body weight (fresh) | +/- 1.0% | Mean, median, SD, standard error, minimum and maximum values forsampling areas |
| Age | +/- 1 year (10% to be independently confirmed) | Mean, median, SD, standard error, minimum and maximum values forsampling areas |
| Gonad weight (mature fish only) | +/- 0.01 g for sexually mature species | Mean, median, SD, standard error, minimum and maximum values forsampling areas |
| Egg size (if fish are sexually mature) | +/- 0.001 g | Weight, (recommended minimum sub-sample sizes of 400 eggs), mean, median, standard error, minimum and maximum values for sampling areas |
| Fecundity (if fish are sexually mature) | +/- 1.0% | Total number of eggs per female, mean, median, standard error, minimum and maximum for sampling areas |
| Weight of liver | +/- 0.01 g for sexually mature fish | Mean, median, SD, standard error, minimum and maximum values for sampling areas |
| Abnormalities | N/A | Presence of any lesions, tumours, parasites, or other abnormalities |
| Sex | N/A | |

# Figure 1.
# EEM Study Design and Sampling Areas



**Legend**

| | |
|---|---|
| — | Bathymetry 2m * |
| — | Bathymetry 10m ** |
| — | All Weather Private Access Road |
| ▨ | EEM/CREMP Sampling Area |
| — | Effluent Discharge (Dewatering Pipeline) |
| 🟧 | Facilities |
| 🟥 | Road |
| ⬜ | Dike |
| ▩ | Waste Dump |
| 🟫 | Dewatered Lake |
| 🟩 | Portage Attenuation Facility |
| 🟩 | Tailings Storage Facility |
| ▭ | 1% Effluent Exposure Area Delineation |

* 2m depth = below lake surface
** 10m depth = above sea level

**Area of Detail**

0 1 2 3
Kilometres

**Projection:** UTM Zone 14 NAD83

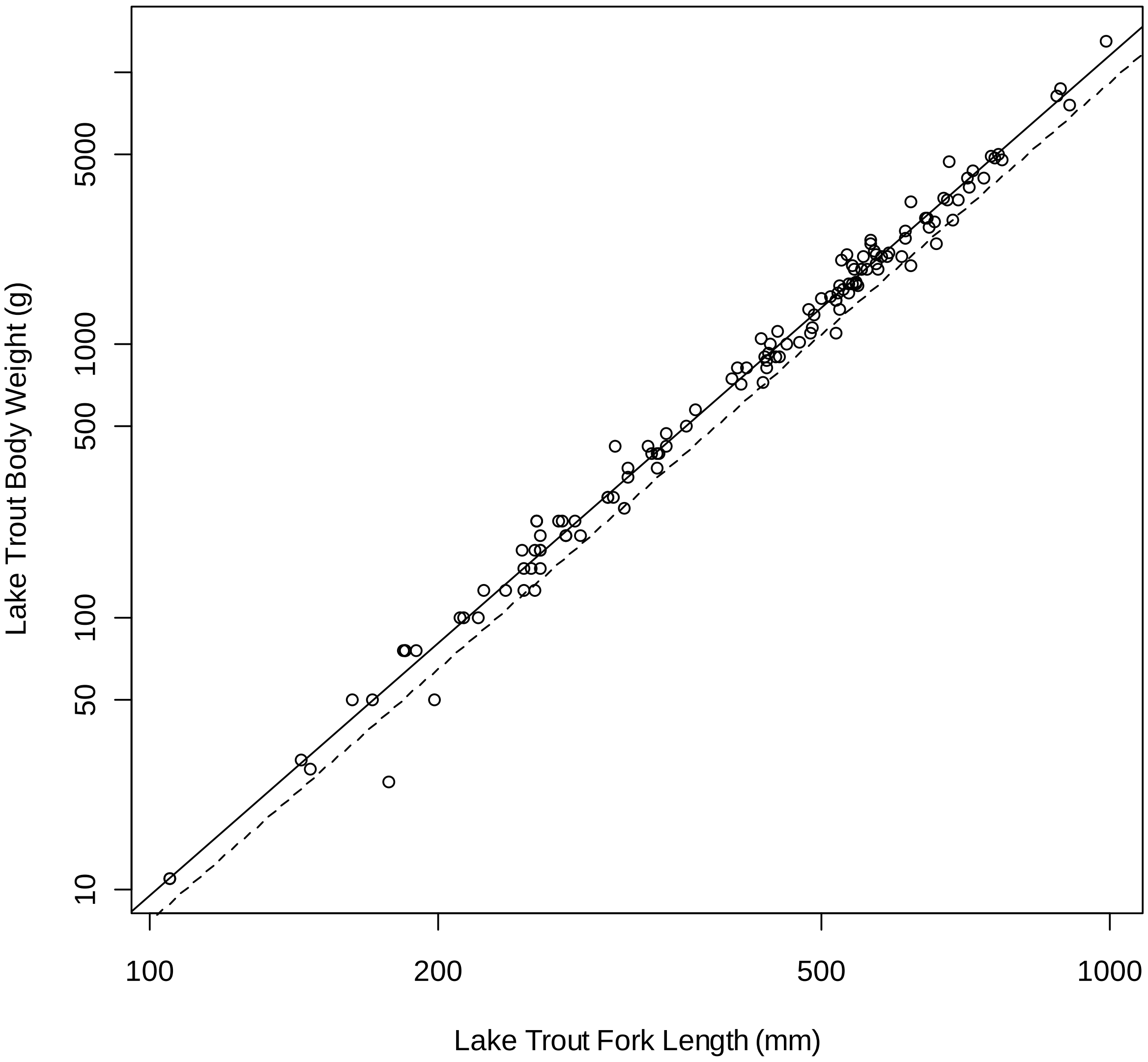
**Data Sources:**
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

## Meadowbank Gold Project

Prepared for:
AGNICO-EAGLE

By:
CASLYS CONSULTING

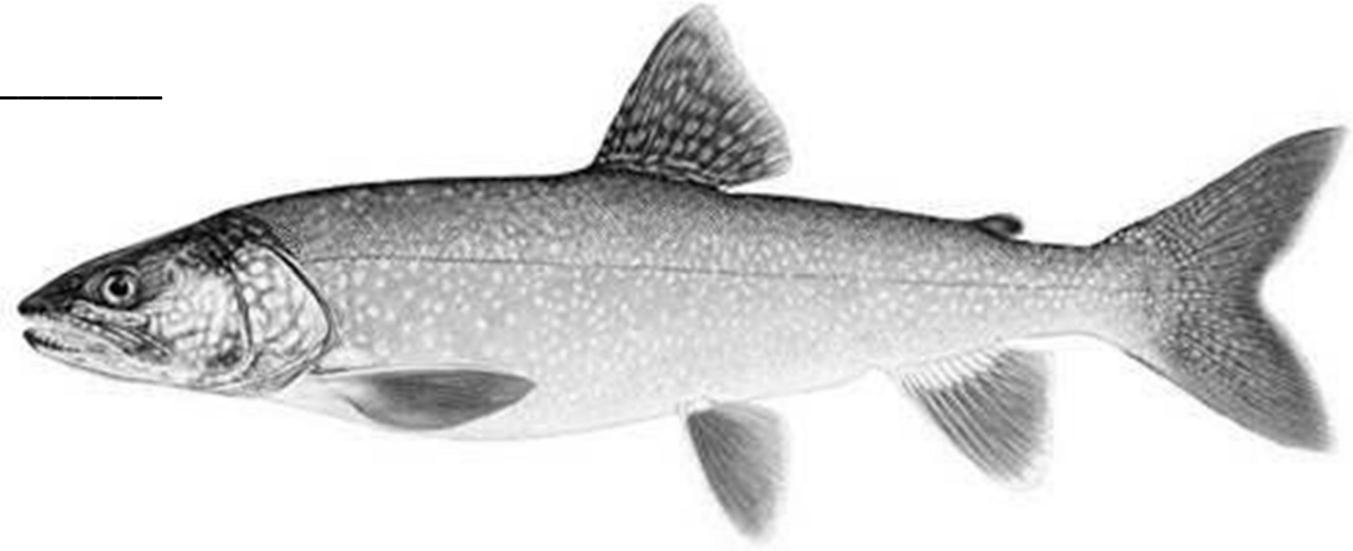
**Figure 2.** Relationship between body weight and fork length (solid line) and target effect size (dashed line) for Lake Trout.



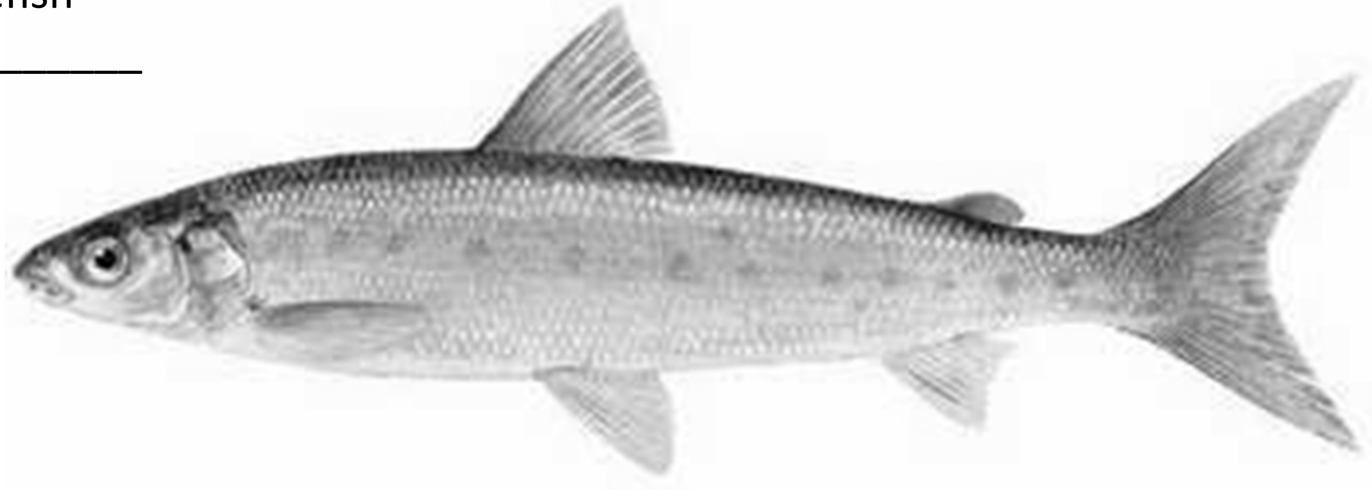
**Note**: axes shown on log scale.

External DELTs

Lake Trout
Fish ID: ___________



Round Whitefish
Fish ID: __________



# APPENDIX G

# FISH SAMPLING FIELD AND FIELD LABORATORY DATA SHEETS, AUGUST 2011

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 1 of 30

**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-01 | Recorder: Laura.
**Set date:** Aug 11/11 | **Set time:** 14:03
*Start UTMs* Wypt 388 | *End UTMs* Wypt 387
Easting: 0636439 | Easting: 0636420
Northing: 7215485 | Northing: 7215350
Number of panels by mesh size (mm):
25: S start 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: End
**Lift date:** Aug 11/11 | **Lift time:** 17:04

Water Body: TPN
Net Length (m): 22.7x6
Net Height (m): 1.8
Net depth at each end (m): 6.0m / 2.7
Weather / Comments: Cloudy. wind N ~10Km/hr.
Water Temp (at lift) (°C): 10.5°C
Air Temp (at lift) (°C): 11°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-01.01 | 102 | 567 | 1800 | Y | F | MA | RS | PEC, OT | – | None Dead. |
| LKTR | TPN-01.02 | 76 | 560 | 1700 | Y | – | – | – | PEC | – | None Alive. |
| LKTR | TPN-01.03 | 51 | 517 | 1400 | Y | – | – | – | PEC | – | None Alive. |
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**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** ~~PEL = Pelvic fin;~~ PEC = Pectoral fin; DR = Dorsal ray

entered SH
QA/QC RB

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 2 **of** 30

**GILLNET SET & LIFT DATA**

A-DAY

| | | | |
|---|---|---|---|
| **Set ID:** TPN-02 | Recorder: Laura | | Water Body: TPN |
| **Set date:** Aug 11/11 | **Set time:** 14:15 | | Net Length (m): 22.7×6 |
| *Start UTMs* 14 W 390 | *End UTMs* 14 W 389 | | Net Height (m): 1.8 |
| Easting: 0636528 | Easting: 0636634 | | Net depth at each end (m): 22m 17.7m |
| Northing: 7215541 | Northing: 7215476 | | Weather / Comments: Cloudy with sunny periods. Wind N ~10 km/hr. |
| Number of panels by mesh size (mm):<br>25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E | | | Water Temp (at lift) (°C): 10.5°C |
| **Lift date:** Aug 11/11 | **Lift time:** 17:27 | | Air Temp (at lift) (°C): 11° |

**CATCH DATA**

Ⓐ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-02.01 | 51 | Escaped | | | | | | | | - ~~None~~ Alive |
| LKTR | TPN-02.02 | 51 | 498 | 1225 | Y | - | - | - | PEC | - | None Alive |
| LKTR | TPN-02.03 | 25 | Escaped | | | | | | | | - Alive |
| LKTR | TPN-02.04 | 25 | 123 | 50 | Y | - | - | - | - | - | None Alive |
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CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

entered SH
QA/QC RB

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

Page 3 of 30

**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-03
**Recorder:** Laura.
**Set date:** Aug 11/11
**Set time:** 14:46
*Start UTMs* (14 D) Wypt 391
*End UTMs* (14) Wypt 392
Easting: 0636679
Easting: 0636672
Northing: 7214843
Northing: 7215005
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E
**Lift date:** Aug 11/11
**Lift time:** 18:01

**Water Body:** TPN
**Net Length (m):** ~~~126m~~ 22.7x6
**Net Height (m):** ~~~2m~~ 1.8
**Net depth at each end (m):** 2m / 12.5
**Weather / Comments:** Cloudy with sunny periods. Wind ~10 Km/hr
**Water Temp (at lift) (°C):** 10.5°C
**Air Temp (at lift) (°C):** 11°C

**CATCH DATA**

Ⓐ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-03.01 | 76 | 527 | 1700 | Y | – | – | – | PEC | – | None Alive |
| LKTR | TPN-03.02 | 51 | 575 | 2050 | Y | – | – | – | PEC | – | None Alive |
| ARCH | TPN-03.03 | 38 | 214 | 100 | Y | – | – | – | – | – | None Alive |
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**CODES**
**SEX** M = Male; F = Female; **IM** = Immature; **UN** = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** PEL = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

entered 8/11.
QA/QC RB

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 4 of 30

**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-04
**Recorder:** Laura
**Set date:** Aug 11/11
**Set time:** 15:00
*Start UTMs* (14) Wypt 394
*End UTMs* (14) Wypt 393
Easting: 0636920
Easting: 0636798
Northing: 7215334
Northing: 7215266
Number of panels by mesh size (mm):
25: S 38: / 51: / 76: / 102: / 126: E
**Lift date:** Aug 11/11
**Lift time:** 18:15

Water Body: TPN
Net Length (m): 22.7x6
Net Height (m): ~2m,8
Net depth at each end (m): 2.5 / 18.6
Weather / Comments: Cloudy with sunny periods. Wind ~10 Km/hr N
Water Temp (at lift) (°C): 10.5°C
Air Temp (at lift) (°C): 11°C

**CATCH DATA**

Ⓐ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No FISH | | | | | | | | | | | |
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CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

entered SM
QA/QC RB

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A- NIGHT B-DAY C-DAY

**Set ID:** TPN-05 A,B,C

**Recorder:** Laura / Claire

**Set date:** Aug 12/11

**Set time:** 18:54

*Start UTMs* Wpt 412

*End UTMs* Wpt 413

Easting: 0636932

Easting: 0636993

Northing: 7214827

Northing: 7214941

Number of panels by mesh size (mm):

25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E

**Lift date:** Aug 13/11

**Lift time:** 08:20 Ⓐ

Ⓑ Lift 2 date = Aug 13/11 8:20

Lift 2 time = 13:15

Ⓒ Lift 3 date = Aug 13/11 13:15

Lift 3 time = 19:00

Water Body: TPN

Net Length (m): 22.7×6

Net Height (m): 1.8

Net depth at each end (m): 22m / 8.9m

Weather / Comments: overcast

Water Temp (at lift) (°C): Ⓐ 10.5 / Ⓑ 10.0 / Ⓒ 10.9 (3rd)

Air Temp (at lift) (°C): 12 / 12.0 /

**CATCH DATA**

| | Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ 1 | LKTR | TPN-05.01 | 126 | 518 | 1418 | N | F | MA | RS | OT/PEC | N/A | NONE Dead | 1 |
| 2 | LKTR | TPN-05.02 | 126 | 503 | 1150 | N | M | MA | RS | OT/PEC | N/A | NONE Dead | 2 |
| 3 | LKTR | TPN-05.03 | 126 | 392 | 605 | N | F | MA | RS | OT/PEC | N/A | NONE Dead | 3 |
| | LKTR | TPN-05.04 | 76 | 567 | 1425 | Y | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | 87451 | NONE | |
| | LKTR | TPN-05.05 | 76 | 690 | 3700 | Y | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | 8752 | NONE | |
| | LKTR | TPN-05.06 | 76 | 345 | 400 | Y | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | 8753 | lower lobe of caudal missing | |
| | ARCH. | TPN-05.07 | ~~102~~ 51 | 272 | 190 | N | F | IM | UD | OT/PEC | N/A | NONE Dead | 4 |
| 4 | LKTR | TPN-05.08 | ~~102~~ 51 | 190 | 50 | N | IM | [illegible] | [illegible] | PEC | N/A | None Dead. | 4 |
| | ARCH. | TPN-05.09 | ~~102~~ 51 | 275 | 216 | N | M | IM | UD | OT/PEC | N/A | NONE Dead | 6 |
| | ARCH | TPN-05.10 | ~~102~~ 51 | 294 | 225 | Y | — | — | — | — | N/A | NONE | |
| | ARCH | TPN-05.11 | ~~102~~ 51 | 338 | 390 | N | F | MA | RS | OT/PEC | N/A | NONE Dead. | 7 |
| | ARCH | TPN-05.12 | ~~102~~ 51 | 250 | 144 | N | F | IM | UD | OT/PEC | N/A | NONE Dead | 8 |
| | ARCH | TPN-05.13 | ~~102~~ 51 | 301 | 278 | N | F | IM | UD | OT/PEC | N/A | NONE Dead | 9 |
| | LKTR | TPN-05.14 | ~~102~~ 51 | 190 | 50 | Y | ~~IM~~ | ~~IM~~ | ~~UD~~ | PEC | N/A | NONE ~~Dead~~ | |
| | ARCH | TPN-05.15 | ~~102~~ 51 | 229 | 148 | N | M | IM | UD | OT/PEC | N/A | NONE Dead | |

**CODES**

**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** ~~**REL** = Relict fin~~; **PEC** = Pectoral fin; **DR** = Dorsal ray

entered SH

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

Page 6 of 30

**CATCH DATA (continued)**

| | Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5 | LKTR | TPN-05.16 | 25 | 120 | — | N | UN | IMM | UD | — | | None Dead | |
| | LKTR | TPN-05.17 | 25 | 126 | 50 | Y | ~~UN~~ | ~~IM~~ | ~~UD~~ | PEC | — | None | Ⓐ |
| 6 | LKTR | TPN-05.18 | 25 | 130 | — | N | — | — | — | — | — | None. Dead | |
| | LKTR | TPN-05.19 | 25 | 771 | 5000 | Y | — | — | — | PEC | 87454 | None | |
| Aug 13 Ⓑ | LKTR | TPN-05.20 | 38 | 748 | 4450 | Y | – | – | — | PEC | 87464 | None. | Ⓑ |
| 7 Ⓑ | LKTR | TPN-05.21 | 102 | 506 | 1620 | N | F | MA | RI | ~~[illegible]~~ | — | None | |
| Aug 13 | LKTR | TPN-05.22 | 51 | | | | | | | | 87464 recap | — | Ⓒ |
| Ⓒ | " | TPN-05.23 | " | 539 | 1625 | Y | — | — | — | PEC | 87467 | — | |

CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

**Page** 7 **of** 30

**GILLNET SET & LIFT DATA**

A-NIGHT B-DAY C-DAY

**Set ID:** TPN -06 A,B,C
**Recorder:** Laura / Claire
**Set date:** Aug 12/11
**Set time:** 19:03
*Start UTMs* Wpt 414
*End UTMs* Wpt 415
**Easting:** 0636486
**Easting:** 0636565
**Northing:** 7215489
**Northing:** 7215374

**Number of panels by mesh size (mm):**
25: 8 38: / 51: / 76: / 102: / 126: E

**Lift date:** Aug 13/11
**Lift time:** 09:06
Lift 2 Ⓑ Aug 13/11 09:06 Lift time 2: 13:25
Lift 3 Ⓒ Aug 13/11 13:25 Lift time 2: 19:15

**Water Body:** TPN
**Net Length (m):** 22.7x6
**Net Height (m):** 1.8
**Net depth at each end (m):** 2.3 / 15.4
**Weather / Comments:** overcast
**Water Temp (at lift) (°C):** 10.5 / 10.5 / 10.9
**Air Temp (at lift) (°C):** 12 / 12 /

**CATCH DATA**

| | **Species** | **Sample ID** | **Mesh Size (mm)** | **Fork Length (mm)** | **Weight (g)** | **Weighed in field? (Y/N)** | **Sex** | **Mat.** | **Repro Status** | **Age Struct.** | **Tag ID** | **Ext. DELT / Parasites?** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ ✓ | LKTR | TPN-06.01 | 126 | 565 | 1525 | Y | ~~UN~~ | — | ~~UN~~ | PEC. | 87455 | None |
| 1 | LKTR | TPN-06.02 | 126 | 664 | 2944 | N | M | MA | RS | OT/~~PEC~~ | — | None Dead |
| 2 ✓ | LKTR | TPN-06.03 | 102 | 510 | 1438 | N | F | MA | RS | OT/PEC | — | None Dead |
| — | ARCH | TPN-06.04 | 102 | 581 | 2025 | Y | — | — | — | PEC | — | None |
| 3 | LKTR | TPN-06.05 | 102 | 538 | 1686 | N | F | MA | RS | OT/PEC | — | None Dead |
| | ARCH | TPN-06.06 | 102 | 576 | 2150 | Y | ~~UN~~ | — | ~~UN~~ | PEC | | None |
| ✓ | LKTR | TPN-06.07 | 102 | 535 | 1600 | Y | — | — | ~~UN~~ | PEC | 87456 | None |
| — | ARCH | TPN-06.08 | 76 | 345 | 454 | N | F | MA | RS | OT/PEC | — | None DEAD |
| ✓ | LKTR | TPN-06.09 | 51 | 551 | 1750 | Y | ~~UN~~ | — | ~~UN~~ | PEC | 87457 | NONE |
| ✓ | LKTR | TPN-06.10 | 51 | 425 | 700 | Y | — | — | — | PEC | 87458 | NONE |
| | ARCH | TRN-06.11 | 51 | 488 | 1125 | Y | F | MA | RS | PEC/OT | — | None Dead |
| ✓ | LKTR | TPN-06.12 | 51 | 606 | 1925 | Y | — | — | — | PEC | 87459 | NONE |
| ✓ | LKTR | TPN-06.13 | 51 | 547 | 1775 | Y | — | — | — | PEC | 87460 | NONE |
| 4 | LKTR | TPN-06.14 | 51 | 266 | 178 | N | M | IM | UN | PEC/OT | — | None Dead |
| 5 | LKTR | TPN-06.15 | 38 | 231 | 126 | N | M | IM | UN | OT/PEC | — | None Dead |

**CODES**
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

entered SH
QA/QC SH

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

Page 8 of 30

**CATCH DATA (continued)**

| | Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ✓ | LKTR | TPN-06.16 | 38 | 609 | 2430 | Y | – | – | – | PEC | 87461 | NONE | entered SH |
| | ARCH | TPN-06.17 | 38 | 201 | 78 | N | M | IM | UN | OT/PEC | – | None Dead | |
| 6 | LKTR | TPN-06.18 | 38 | 176 | 54 | N | M | IM | UN | OT/PEC | – | None DEAD | |
| | ARCH | TPN-06.19 | 38 | 218 | 90 | N | F | IM | UN | OT/PEC | – | None DEAD | |
| | ARCH | TPN-06.20 | 38 | 257 | 146 | N | M | IM | UN | OT/PEC | – | None DEAD | |
| 7 | LKTR | TPN-06.21 | 38 | 169 | 50 | N | F | IM | UN | OT/PEC | – | None DEAD | Ⓐ |
| ✓ | LKTR | TPN-06.22 | 38 | 536 | 1525 | Y | UN | UN | UN | PEC | 87462 | NONE | |
| 8 | LKTR | TPN-06.23 | 38 | 203 | 74 | N | M | IM | UN | OT/PEC | – | None DEAD | |
| | ARCH | TPN-06.24 | 25 | 115 | – | N | IM | IM | UD | N/A | N/A | NONE | |
| | ARCH | TPN-06.25 | 25 | 136 | – | N | IM | IM | UD | N/A | N/A | NONE | |
| | | | | | | | | | | | | | |
| SET Ⓑ | ARCH | TPN-06.26 | 102 | 577 | 2125 | Y | – | – | – | – | 87465 | NONE | Ⓑ entered MJ |
| | LKTR | TPN-06.27 | 51 | 565 | 1875 | Y | – | – | – | – | 87466 | NONE | |
| SET 3 Ⓒ | LKTR | TPN-06.28 | 76 | 525 | 1475 | – | – | – | – | – | Adipose | None adipose clip (weak) | Ⓒ |
| | " | TPN-06.29 | 51 | 562 | 1725 | Y | – | – | – | PEC | 87468 | NONE | |
| | ~~"~~ | ~~TPN-06.30~~ | ~~"~~ | ~~ESCAPED~~ | | | | | | | | | |
| | " | TPN-06.30 | 38 | 668 | 2900 | Y | – | – | – | PEC | 87469 | NONE | |
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CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY B-DAY

**Set ID:** TPN-07 A,B
**Recorder:** Claire
**Set date:** Aug 13/11
**Set time:** 09:50
*Start UTMs* WP 416 (14W)
*End UTMs* WP 417 (14W)
Easting: 0635631
Easting: 0635622
Northing: 7215400
Northing: 7215257

Number of panels by mesh size (mm):
25: E 38: ✓ 51: / 76: / 102: / 126: S

**Lift date:** Aug 13/11
**Lift time:** 13:40
Ⓑ Aug 13/11, 1340
Ⓑ 19:30

**Water Body:** Third Portage North
**Net Length (m):** 22.7×6
**Net Height (m):** 1.8
**Net depth at each end (m):** 1.7 14.7
**Weather / Comments:**

**Water Temp (at lift) (°C):** 10.7°C
**Air Temp (at lift) (°C):** 11.0°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ LKTR | TPN-07,01 | 76 | 534 | 1474 | N | UN | IM | UD | OT/PEC | N/A | Normal Dead Ⓐ |
| | | | | | | | | | | | |
| Ⓑ NO FISH in second lift | | | | | | | | | | | Ⓑ |
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**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

**Page** 10 **of** 30

**GILLNET SET & LIFT DATA**

A-DAY B-DAY

**Set ID:** TPN-08
**Recorder:** Claire
**Set date:** Aug 13 /11
**Set time:** 10:08
*Start UTMs* WP 418
*End UTMs* WP 419
Easting: 14W 0636633
Easting: 14W 0636473
Northing: 7214755
Northing: 7214815
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E
**Lift date:** Aug 13/11
**Lift time:** 13:55
Ⓑ Aug 13/11 1355 B: 19:45

Water Body: TPN
Net Length (m): 22.7×6
Net Height (m): 1.8
Net depth at each end (m): start 1.8 / end 22.9
Weather / Comments:
Water Temp (at lift) (°C): 10.7°C
Air Temp (at lift) (°C): 11.06

**CATCH DATA**

| | Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ | LKTR | TPN-08.001 | 102 | Escaped | | | | | | | | |
| | LKTR | TPN-08.002 | 76 | 503 | 1464 | N | M | MA | RI | OT/PEC | — | NONE Dead |
| | LKTR | TPN-08.003 | 51 | 548 | 1720 | N | M | IM | UD | OT/PEC | — | NONE Dead |
| | | | | | | | | | | | | |
| Ⓑ | LKTR | TPN-08.004 | 102 | 569 | 1950 | Y | – | – | – | PEC | 87473 | Good NONE |
| | " | TPN-08.005 | 76 | 575 | 2025 | Y | – | – | – | PEC | 87472 | NONE |
| | " | TPN-08.006 | 76 | 495 | 1194 | N | M | IM | UD | OT/PEC | — | NONE DEAD |
| | " | TPN-08.007 | 51 | 633 | 2470 | N | F | MA | RS | OT/PEC | — | NONE DEAD |
| | " | TPN-08.008 | 38 | 915 | 9050 | Y | – | – | – | PEC | 87470 | NONE Alive |
| | " | TPN-08.009 | 38 | 549 | 1875 | Y | – | – | – | PEC | 87471 | NONE Alive |
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**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY B-DAY

**Set ID:** TPN-09 A,B
Recorder: Claire
**Set date:** Aug 13/11
**Set time:** 10:10
*Start UTMs* WP 420
*End UTMs* WP 421
Easting: 14W 0637070
Easting: 14W 0636926
Northing: 7215034
Northing: 7215052
Number of panels by mesh size (mm):
25: S (1) 38: (1) 51: (1) 76: (1) 102: (1) 126: E (1)
**Lift date:** Aug 13/11
**Lift time:** 14:10
#Ⓑ Aug 13/11
#Ⓑ 20:20

Water Body: TPN
Net Length (m): 22.7×6
Net Height (m): 1.8
Net depth at each end (m): start 1.5 / end 13.9
Weather / Comments:
Water Temp (at lift) (°C): 10.5°C
Air Temp (at lift) (°C): 11.0°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ No | FISH # | 1 check | | | | | | | | | Ⓐ |
| Ⓑ No | FISH # | 2 check | | | | | | | | | Ⓑ |
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CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 12 **of** 30

A- ~~NIGHT~~

**GILLNET SET & LIFT DATA**

**Set ID:** TPN-10
**Recorder:** Claire
**Set date:** Aug 13/11
**Set time:** 20:15
*Start UTMs* WP 436
*End UTMs* WP 422
Easting: 0636769
Easting: 14W 0636783
Northing: 7214844
Northing: 7215014
Number of panels by mesh size (mm):
25: 5 38: ✓ 51: ✓ 76: 2 102: ✓ 126: E (7 panels)
**Lift date:** Aug 14/11
**Lift time:** 10¹⁰

Water Body: TPN
Net Length (m): 22.7×7
Net Height (m): 1.8
Net depth at each end (m): start 1.8 / 15.4 end
Weather / Comments:
Water Temp (at lift) (°C): 10.1°C
Air Temp (at lift) (°C): 11.0°C

**CATCH DATA**

Ⓐ

Aug 14

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID NSC | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-10.01 | 25 | 579 | 1900 | Y +/-25 | ~~UN~~ | UN | UN | PEC | 91700 | None A |
| ARCH | TPN-10.02 | 25 | 135 | 25 | Y +/-1 | UN | UN | UN | — | — | None. A |
| ARCH | TPN-10.03 | 25 | 126 | 20 | N | UN | IMM | UD | PEC/OT | — | None D |
| ARCH | TPN-10.04 | ~~38~~ 25 | 134 | 24 | N | UN | IMM | UD | PEC/OT | — | None D |
| ARCH | TPN-10.05 | ~~38~~ 25 | 135 | 20 | N | — | — | — | PEC/OT | — | Partially digested / Damaged in net. |
| [illegible] | TPN-10.06 | ~~38~~ 38 | 535 | 1500 | ~~Y~~ Y +/-25 | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | 87450 | None A |
| ARCH | TPN-10.07 | ~~38~~ 38 | 580 | 2050 | Y +/-25 | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | — | None A |
| RNWH ~~ARCH~~ | TPN-10.08 | 38 | 360 | 550 | N | M | MAT | RI | pect/OT | — | Deformed L pectoral otherwise N. D |
| LKTR | TPN-10.09 | 38 | 222 | 102 | N | UN | Imm | UD | pect/OT | — | None D |
| LKTR | TPN-10.10 | 38 | 186 | 61 | N | UN | Imm | UD | pect/OT | — | None D |
| LKTR | TPN-10.11 | 51 | 530 | 1750 | Y +/-25 | ~~UN~~ | ~~UN~~ | ~~UN~~ | PEC | 87449 | None A |
| ARCH | TPN-10.12 | 51 | 360 | 300 | N | UN. | Imm | UD | OTO | — | None D |
| LKTR | TPN-10.13 | 51 | 385 | 574 | N | UN. | Imm | UD | pect/OT | — | None D |
| LKTR | TPN-10.14 | 51 | 252 | 162 | N | UN. | Imm | UD | pect/OTO | — | None D |
| ARCH. | TPN-10.15 | 51 | 302 | 294 | N | UN. | Imm | UD | OTO | — | missing part of operculum D |

Ⓐ

**CODES**
**SEX** M = Male; F = Female; **IM** = Immature; **UN** = Unknown
**MAT.** MA = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** UD = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** PEL = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

Page 13 of 30

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARCH | TPN.10.16 | 51 | 256 | 168 | N | UN | Imm | UD | OTO | — | None D |
| ARCH | TPN.10.17 | 51 | 340 | 450 | Y +/- 25 | — | — | — | PEC | — | None rub from net A |
| ARCH | TPN.10.18 | 51 | 268 | 170 | Y +/- 100 | — | — | — | PEC | — | None A |
| LKTR | TPN.10.19 | 51 | 252 | 162 | N | UN | Imm | UD | pect OTO | — | None D |
| LKTR | TPN.10.20 | 51 | 175 | 50 | N | UN | Imm | UD | pect OTO | — | None D |
| LKTR | TPN.10.21 | 76 | 203 | 80 | N | UN | IMM | UD | pect/OT | — | NONE D |
| LKTR | TPN.10.22 | 76 | 502 | 1406 | N | F | MA | RS | pect/OT | — | NONE D |
| LKTR | TPN.10.23 | 76 | 569 | 1944 | N | M | MA | RS | pect/OT | — | NONE D |
| LKTR | TPN.10.24 | 76 | 467 | 1200 | Y | — | — | — | PEC/OT | 87448 | None A |
| LKTR | TPN.10.25 | 102 | 601 | 2214 | N | M | MA | RS | pect/OTO | — | None P |
| LKTR | TPN.10.26 | 102 | 535 | 1424 | N | F | MA | RS | pect OTO | — | None D |

**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

**Page** 14 **of** 30

**GILLNET SET & LIFT DATA**

A-NIGHT B-DAY C-NIGHT

**Set ID:** TPN-11 A,B,C
**Recorder:** Claire
**Set date:** Aug 13/11
**Set time:** 20:50
*Start UTMs* WP 424
*End UTMs* WP 423
Easting: 0637000
Easting: 0637019
Northing: 7215219
Northing: 7215269
Number of panels by mesh size (mm):
25:___ 38:___ 51: 1 76: 1 102:___ 126:___ (2 panels only)
**Lift date:** August 14/11
**Lift time:** 1110 REST 1125 Aug 14/11

Water Body: TPN
Net Length (m): 22.7 x 2
Net Height (m): 1.8
Net depth at each end (m): start 3.0 / 9.0 m end
Weather / Comments: Sunny.
Water Temp (at lift) (°C): 10.1°C
Air Temp (at lift) (°C): 11°C

Set Ⓑ: Aug 14 @ 11:26 Pulled @ 17:55

SET Ⓑ = MT $T_{H_2O}$: 10.8 $T_{AIR}$: 12

Set Ⓒ: Aug 14/11 @ 18:02 pulled @ Aug 15/11 @ 9:25 $T_{H_2O}$: 10°C $T_{AIR}$: 9.5°C

**CATCH DATA**

Ⓐ Aug 14

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-11-.01 | 51 | 255 | 160 | N | UN | IMM | UD | PEC/OT | — | normal D |
| LKTR | TPN-11.02 | 51 | 513 | 1350 | N | M | MA | RI | PEC/OT | — | upper lobe of caudal deformed D |
| LKTR | TPN-11.03 | 51 | 561 | 1734 | N | M | MA | RS | PEC/OT | — | normal D |
| LKTR | TPN-11.04 | 51 | 224 | 150 | Y +/- 10.0 | UN | UN | UN | PEC | — | None. A |
| LKTR | TPN-11.05 | 76 | 543 | 1670 | N | M | MA | RS | PEC/OT | — | normal D |
| RNWH | TPN-11.06 | 76 | 383 | 618 | N | F | MA | RI | PEC/OT | — | normal D |
| ARCH | TPN-11.07 | 76 | 378 | 650 | Y +/- 25 | UN | UN | UN | PEC | — | None A |
| LKTR | TPN-11.08 | 76 | 503 | 1408 | N | F | MA | RI | PEC/OC | — | normal D |
| LKTR | TPN-11.09 | 76 | 432 | 806 | N | F | MA | RS | PEC/OT | — | normal D |
| LKTR | TPN-11.10 | 51 | 268 | 153.1 | N | UN | IMM | UD | OT/PEC | — | none D |
| ↓ | TPN-11.11 | 51 | 652 | 3225 | Y |  |  |  | PEC | 87437 | none |
| ↓ | TPN-11.12 | 51 | 608 | 2400 | Y |  |  |  | PEC | 87438 | adipose missing |
|  |  |  |  |  |  |  |  |  |  |  |  |
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Ⓒ set 3 Aug 15

87436 destroyed

entered SA

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**CODES**
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

SET-B - EMPTY - NO CATCH

2011 EEM for Meadowbank Gold Mine: ***FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN - 12
Recorder: Claire
**Set date:** Aug 14/11
**Set time:** 09:20
*Start UTMs* WP 430
*End UTMs* WP 431
Easting: 0637080
Easting: 0636944
Northing: 7214910
Northing: 7214945
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E (6 panels)
**Lift date:** Aug 14/11
**Lift time:** 14:05

Water Body: TPN
Net Length (m): 22.7x6
Net Height (m): 1.8
Net depth at each end (m): start 5.2/13.1
Weather / Comments:
Sun/cloud, wind N 20
Water Temp (at lift) (°C): 10.8
Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | EMPTY | | | | | | | | | | |
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CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

entered SM.

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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A- ~~DAY~~ DAY

**GILLNET SET & LIFT DATA**

**Set ID:** TPN - 13

**Recorder:** Claire

**Set date:** Aug 14/11

**Set time:** 09:40

*Start UTMs* WP 429

*End UTMs* WP 428

Easting: 0637110

Easting: 0636980

Northing: 7214798

Northing: 7214859

Number of panels by mesh size (mm):

25: E 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: S (6 panels)

**Lift date:** Aug 14/11

**Lift time:** 14:20

Water Body: TPN

Net Length (m): 22.7×6

Net Height (m): 1.8

Net depth at each end (m): 3.0 / 9.5m

Weather / Comments:

Sun + Cloud, Wind N 20

Water Temp (at lift) (°C): 10.9

Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | EMPTY | | | | | | | | | | |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

entered SH

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-14
Recorder: Claire
**Set date:** Aug 14/11
**Set time:** 09:53
*Start UTMs* WP432
*End UTMs* WP433
Easting: 0637072
Easting: 0637087
Northing: 7214940
Northing: 7214895
Number of panels by mesh size (mm):
~~25:~~ ~~38:~~ 51: S 76: E ~~102:~~ ~~126:~~ 2 panels
**Lift date:** Aug 14/11
**Lift time:** 14:00

Water Body: TPN
Net Length (m): 22.7x2
Net Height (m): 1.8
Net depth at each end (m): 2 / 5.3
Weather / Comments: Sun / cloud, wind N
Water Temp (at lift) (°C): 10.8°C
Air Temp (at lift) (°C): 12°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-14.01 | 76 | 497 | 1260 | Y | — | — | — | PEC | 87426 | None A |
| | | | | | | | | | | | |
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**CODES**
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

entered SH

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 18 **of** 30

**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-15
**Recorder:** Claire
**Set date:** Aug 14/11
**Set time:** 10:00
*Start UTMs* WP434
*End UTMs* WP435
Easting: 0637104
Easting: 0637124
Northing: 7214863
Northing: 7214807
Number of panels by mesh size (mm):
~~25:~~ ___ ~~38:~~ ___ [✓ 51: E] [✓ 76: S] ~~102:~~ ___ ~~126:~~ ___ 2 panels
**Lift date:** Aug 14/11
**Lift time:** 14:15

Water Body: TPN
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 2 / 2.2
Weather / Comments:
sun/cloud, wind N 20
Water Temp (at lift) (°C): 10.8
Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | EMPTY |  |  |  |  |  |  |  |  |  |  |
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**CODES**
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

entered 8/11

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

| | | | |
|---|---|---|---|
| **Set ID:** | TPN-16 - A | **Recorder:** | Claire / Laura |
| **Set date:** | Aug 14 / 11 | **Set time:** | 11:05 |
| *Start UTMs* | WP437 | *End UTMs* | WP438 |
| **Easting:** | 0636744 | **Easting:** | 0636723 |
| **Northing:** | 7214858 | **Northing:** | 7215025 |

Number of panels by mesh size (mm):
25: E 38: ✓ 51: ✓ 76: 2 102: ✓ 126: S    6 panels

**Lift date:** Aug 14/11 **Lift time:** 17:30

Water Body: TPN

Net Length (m): 22.7 x 7

Net Height (m): 1.8

Net depth at each end (m): 2.3 / 15.1

Weather / Comments: Sunny.

Water Temp (at lift) (°C): 10.8 °C

Air Temp (at lift) (°C): 12°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARCH | TPN-16.01 | 126 | 604 | 2425 | Y | — | — | — | PEC | — | None. |
| LKTR | TPN-16.02 | 102 | 629 | 2125 | Y | — | — | — | PEC | 87427 | None |
| ~~ARCH~~ | ~~TPN-16.03a~~ | ~~102~~ | ~~577~~ | ~~2150~~ | ~~Y~~ | ~~—~~ | ~~—~~ | ~~—~~ | ~~PEC~~ | ~~—~~ | Recap (pec clip) |
| LKTR | TPN-16.03 | 76 | 590 | 1750 | Y | — | — | — | PEC | 87428 | White discoloration base of dorsal fin. |
| LKTR | TPN-16.04 | 76 | 585 | 2000 | N | M | IMM | UD | PEC/OT | — | ~~none~~ |
| ARCH | TPN-16.04a | 76 | 340 | — | — | — | — | — | — | — | recap (PEC clip) |

**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

entered SM

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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B- NIGHT

**GILLNET SET & LIFT DATA**

| | | | |
|---|---|---|---|
| **Set ID:** TPN-16 (b) | Recorder: Laura | Water Body: TPN | |
| **Set date:** Aug 14/11 | **Set time:** 17:49 | Net Length (m): 22.7~~x7~~ | |
| *Start UTMs* | *End UTMs* | Net Height (m): 1.8 | |
| Easting: Same | Easting: Same | Net depth at each end (m): 2.8 / 15.1 | |
| Northing: | Northing: | Weather / Comments: Sunny.<br>Aug 14 = 2 pipes flowing. | |
| Number of panels by mesh size (mm):<br>25: S1 38: 1 51: 1 76: 2 102: 1 126: E1 | 7 panels. | Water Temp (at lift) (°C): 10.0°C | |
| **Lift date:** Aug 15/11 | **Lift time:** 8:25 | Air Temp (at lift) (°C): 9.5°C | |

**CATCH DATA**

Ⓑ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-16.05 | 38 | 175 | 60 | Y (100g +/-1) | — | — | — | — | — | None |
| LKTR | TPN-16.06 | " | 184 | 58 | N | IM | IM | UD | PEC/OT | — | None D |
| LKTR | TPN-16.07 | 51 | 275 | 190 | Y (1000g +/- 1/10) | — | — | — | PEC | | none |
| LKTR | TPN-16.08 | 76 | 502 | 1450 | Y | — | — | — | PEC | 87474 | none |
| LKTR | TPN-16.09 | 76 | 610 | 1625 | Y | F | MA | RS | PEC/OT | ~~87475~~ | none D. |
| LKTR | TPN-16.10 | 76 | 562 | 1850 | Y | — | - | — | PEC | 87430 | none |
| LKTR | TPN-16.11 | 76 | 536 | 1725 | Y | — | — | — | PEC | 87431 | none |
| LKTR | TPN-16.12 | 76 | 492 | 1226 | N | F | MA | RS | OT/PEC | — | none D |
| LKTR | TPN-16.13 | 76 | 560 | 1732 | N | F | MA | RS. | OT/PEC | — | none D. |
| LKTR | TPN-16.14 | 76 | 484 | 1258 | N | F | MA | RS | OT/PEC | — | none D. |
| LKTR | TPN-16.15 | 76 | 757 | 3825 | Y | ~~M~~ | ~~MA~~ | ~~RS~~ | | 87361 | recap none |
| LKTR | TPN-16.16 | 76 | — | — | — | — | — | — | — | 87428 | recap none |
| LKTR | TPN-16.17 | 76 | 514 | 1438 | N | M | MA | RS | OT/PEC | — | none. D |
| LKTR | TPN-16.18 | 76 | 732 | 4675 | Y | — | — | — | PEC | 87432 | none |
| ARCH | TPN-16.19 | 102 | 558 | 1800 | Y | — | — | — | PEL | — | redness (spots) around anus + peduncle |

#87429 destroyed

CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

2011 EEM for Meadowbank Gold Mine: ***FIELD DATA SHEET***

**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-16.20 | 102 | 515 · | 1575 | Y | – | – | — | PEC | 87433 | none |
| ↓ | TPN-16.21 | ↓ | 591 | 2100 | N | IM | IM | UD | OT/PEC | —— | none D |
| ↓ | TPN-16.22 | ↓ | 496 | 1538 | N | M | MA | RI | OT/PEC | —— | D |
| LKTR | TPN-16.23 | 126 | 624 · | 2975 | Y | – | – | – | PEC | 87435 | none |
| ↓ | TPN-16.24 | 126 | 544 · | 1800 | Y | – | – | – | PEC | 87436 | none |
| ↓ | TPN-16.25 | ↓ | 670 | 3122 | N | F | MA | RS | PEC/OT. | —— | none D |
| ↓ | TPN-16.26 | ↓ | 548 | 1722 | N | F | MA | RS | PEC/OT | —— | x3270 photo of mature eggs. (none) D |
| ↓ | TPN-16.27 | ↓ | 786 | 4384 | N | F | MA | RS | PEC/OT | —— | none. D |
| ↓ | TPN-16.28 | ↓ | 961 | 10 294 | N | F | MA | RI | PEC/OT | —— | D |
| LKTR | TPN-16. 29 | 76 | 573 | 1782 | N | M | MA | RS | PEC/OT | —— | none D |

87434 destaged

* * (TPN-16.28) **

CODES

SEX M = Male; F = Female; IM = Immature; UN = Unknown

MAT. MA = Mature; IM = Immature; UN = Unknown

REPRO STATUS UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

AGE STRUCT. PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-17
**Recorder:** Claire
**Set date:** Aug 14/11
**Set time:** 11:31
*Start UTMs* WP439
*End UTMs* WP440
Easting: 0636941
Easting: 0636843
Northing: 7215326
Northing: 7215197
Number of panels by mesh size (mm):
25: E 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: S
6 panels.
**Lift date:** Aug 14/11
**Lift time:** 14:42

Water Body: TPN
Net Length (m): 22.7 x 6
Net Height (m): 1.8
Net depth at each end (m): 5.0 / 17
Weather / Comments:
sun / cloud, wind N 20
Water Temp (at lift) (°C): 10.8
Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-17.01 | 76 | 506 | 1394 | N | F | MA | RS | pect oto | — | Normal DEAD |
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CODES
SEX M = Male; F = Female; IM = Immature; UN = Unknown
MAT. MA = Mature; IM = Immature; UN = Unknown
REPRO STATUS UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
AGE STRUCT. PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-18
Recorder: Claire
**Set date:** Aug 14/11
**Set time:** 11:42
*Start UTMs* WP442
*End UTMs* WP443
Easting: 0636866
Easting: 0636834
Northing: 7215416
Northing: 7215370
Number of panels by mesh size (mm):
25: 38: [✓ 51: S] [✓ 76: E] 102: 126:
**Lift date:** Aug 14/11
**Lift time:** 15:00

Water Body: TPN
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 10.0/ 16
Weather / Comments:
Sun /Cloud, wind N 20
Water Temp (at lift) (°C): 10.8
Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | EMPTY |  |  |  |  |  |  |  |  |  |  |

CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-19 **Recorder:** Claire

**Set date:** Aug 14/11 **Set time:** 12:00

*Start UTMs* WP 445 *End UTMs* WP 444

Easting: 0636635 Easting: 0636530

Northing: 7214766 Northing: 7214880

Number of panels by mesh size (mm):

25: E 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: S

**Lift date:** Aug 14/11 **Lift time:** 15:16

Water Body: TPN

Net Length (m): 22.7 x 6

Net Height (m): 1.8

Net depth at each end (m): 1.5 / 17.1

Weather / Comments:

sun/cloud, wind N 20

Water Temp (at lift) (°C): 10.8

Air Temp (at lift) (°C): 12

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | EMPTY | | | | | | | | | | |
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CODES

**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 25 **of** 30

**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN - 20
Recorder: Claire
**Set date:** Aug 15/11
**Set time:** 07:55
*Start UTMs* WP 446
*End UTMs* WP 447
Easting: 0636764
Easting: 0636718
Northing: 7215647
Northing: 7215617
Number of panels by mesh size (mm):
25: ~~S~~ 38: ~~__~~ 51: E 76: S 102: ~~__~~ 126: ~~S~~
**Lift date:** Aug 15/11
**Lift time:** 15:50

Water Body: TPN
Net Length (m): 22.7 x 2
Net Height (m): 1.8
Net depth at each end (m): 2.2 / 11.9
Weather / Comments:
Water Temp (at lift) (°C): 10.5
Air Temp (at lift) (°C): 18

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-20.01 | 51 | 241 | 150 | Y (± 10g) | – | – | – | PEC | – | none |

CODES
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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A-DAY

**GILLNET SET & LIFT DATA**

**Set ID:** TPN-21
**Recorder:** Claire
**Set date:** Aug 15/11
**Set time:** 08:05
*Start UTMs* WP 448
*End UTMs* WP 449
Easting: 0636500
Easting: 0636516
Northing: 7215509
Northing: 7215454
Number of panels by mesh size (mm):
25: 38: 51: E 76: S 102: 126:
**Lift date:** Aug 15/11
**Lift time:** 16:00

Water Body: TPN
Net Length (m): 22.7x2
Net Height (m): 1.8
Net depth at each end (m): 2.0 / 7.4
Weather / Comments:
Water Temp (at lift) (°C): 10.5
Air Temp (at lift) (°C): 18.0

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NO FISH | | | | | | | | | | | |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET*

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**GILLNET SET & LIFT DATA**

A-DAY

**Set ID:** TPN-22
**Recorder:** Claire / Mike
**Set date:** Aug 15/11
**Set time:** 08:13
*Start UTMs* WP 451
*End UTMs* WP 450
Easting: 0636479
Easting: 0636410
Northing: 7214864
Northing: 7214985
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E
**Lift date:** Aug 15/11
**Lift time:** 16:10

Water Body: TPN
Net Length (m): 22.7 × 6
Net Height (m): 1.8
Net depth at each end (m): 29.7 / 20.9
Weather / Comments:
Water Temp (at lift) (°C): 10.5°
Air Temp (at lift) (°C): 8.0°

**CATCH DATA**

Ⓐ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-22.01 | 76 | 643 | 2525 | Y | – | – | – | PEC | 87434 | none adipose clipped? |
| ↓ | TPN-22.02 | 76 | 598 | 2260 | N | F | MA | RS | PEC/OT | – | Normal D |
| | TPN-22.03 | 76 | 494 | 1498 | N | F | MA | RI | PEC/OT | – | NORMAL D |
| | TPN-22.04 | 51 | 616 | 1600 | Y | – | – | – | PEC | 87901 | very skinny fish |
| | TPN-22.05 | 38 | 600 | 2450 | Y | – | – | – | PEC | 87902 | adipose damaged |

**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

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A-DAY

**GILLNET SET & LIFT DATA**

**Set ID:** TPN - 23
**Recorder:** Claire / mike
**Set date:** Aug 15 / 11
**Set time:** 09:20
*Start UTMs* WP452
*End UTMs* WP453
Easting: 0636835
Easting: 0636702
Northing: 7215466
Northing: 7215388
Number of panels by mesh size (mm):
25: E 38: 1 51: 1 76: 2 102: 1 126: S
7 panels
**Lift date:** Aug 15/11
**Lift time:** 16:40

Water Body: TPN
Net Length (m): 22.7 × 7
Net Height (m): 1.8
Net depth at each end (m): 6.6 / 16.1
Weather / Comments:
Aug 15 =
Water Temp (at lift) (°C): 10.5
Air Temp (at lift) (°C): 18.0°

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARCH | TPN-23.01 | 76 | 596 | 1926 | N | F | MA | RS | OT | — | NORMAL D |
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CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY B-NIGHT

| | | | | | |
|---|---|---|---|---|---|
| **Set ID:** | TPN-24 | **Recorder:** | Claire / Laura | **Water Body:** | TPN |
| **Set date:** | Aug 15/11 | **Set time:** | 09:45 | **Net Length (m):** | 22.7×2 |
| *Start UTMs* | WP 455 | *End UTMs* | WP 454 | **Net Height (m):** | 1.8 |
| **Easting:** | 0637019 | **Easting:** | 0637021 | **Net depth at each end (m):** | 7.4 / 6.9 |
| **Northing:** | 7214997 | **Northing:** | 7214945 | **Weather / Comments:** | Aug 15 = both pipes, Aug 16 = 1 pipe |

Number of panels by mesh size (mm):

25: ~~__~~ 38: ~~__~~ 51: E 76: S 102: ~~__~~ 126: ~~__~~

Water Temp (at lift) (°C): Ⓐ 10.5° / Ⓑ 10°C

Air Temp (at lift) (°C): 18.0° / 8°C

A **Lift date:** Aug 15/11 **Lift time:** Ⓐ 16:52

Ⓑ Lift date #2 Aug 16/11 Ⓑ lift 1734

**CATCH DATA**

B

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-24.01 | 51 | 267 | 200 | Y | — | — | — | PEC | — | none |
| LKTR | TPN-24.02 | 51 | 410 | 700 | Y | — | — | — | PEC | ~~87903~~ | none |
| ARCH | TPN-24.03 | 51 | 284 | 225 | Y | — | — | | PEC | — | none |
| LKTR | TPN-24.04 | 51 | 313 | 318 | N | M | IM | UD | PEC, OT | — | none D |
| LKTR | TPN-24.05 | 76 | 727 | 3806 | N | M | MA | RI | PEC, OT | — | none D |
| | | | | | | | | | | | |
| A → NO FISH | | | | | | | | | | | |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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## GILLNET SET & LIFT DATA

A- NIGHT

**Set ID:** TPN- 25

**Recorder:**

**Set date:** Aug 15 / 11

**Set time:** 17:00

*Start UTMs* WP 457

*End UTMs* WP 458

Easting: 0637087

Easting: 0637026

Northing: 7215097

Northing: 7215093

Number of panels by mesh size (mm):

25: \ 38: \ 51: E 76: S 102: \ 126: \

**Lift date:** Aug 16/11

**Lift time:** 7:53

Water Body: TPN

Net Length (m): 22.7 × 2

Net Height (m): 1.8

Net depth at each end (m): 1.9 / 4.9

Weather / Comments: Aug 16/11 = 1 pipe spill
Aug 15/11 = both pipes

Water Temp (at lift) (°C): 10°C

Air Temp (at lift) (°C): 8°C

## CATCH DATA

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | TPN-25.01 | 51 | 385 | 630 | ~~Y~~N | F | IM | UD | PEC, OT | — | none. D |
| LKTR | TPN-25.02 | 51 | 346 | 392 | N | F | IM | UD | PEC, OT | — | none. D |
| ARCH | TPN-25.03 | 51 | 284 | 236 | N | F | IM | UD | OT | — | none D |
| LKTR | TPN-25.04 | 51 | 593 | 1925 | Y | — | — | — | PEC | 87904 | none |
| Ⓐ LKTR | TPN-25.05 | 51 | 574 | 2175 | Y | — | — | — | PEC | 87905 | damaged dorsal fin<br>pic |
| ARCH | TPN-25.06 | 51 | 278 | 230 | Y ±/10 | — | — | — | PEC | — | none |
| ARCH | TPN-25.07 | 51 | 233 | 122 | N | F | IM | UN | OT | — | none. D |
| LKTR | TPN-25.08 | 51 | 638 | 3025 | Y | — | — | — | PEC | 87906 | none |
| ARCH | TPN-25.09 | 76 | 585 | 1675 | Y | — | — | — | PEC | — | none |
| LKTR | TPN-25.10 | 76 | 572 | 1725 | Y | — | — | — | PEC | 87907 | none |
| ARCH | TPN-25.11 | 76 | 416 | 825 | Y | — | — | — | PEC | — | none |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 1 of 19

**GILLNET SET & LIFT DATA**

A- NIGHT

**Set ID:** INUG-01
**Recorder:** Mike J.
**Set date:** Aug 16/11
**Set time:** 18:13
*Start UTMs*
Easting: 622690
Northing: 7216943
*End UTMs*
Easting: 622657
Northing: 7216894
Number of panels by mesh size (mm):
25: ~~__~~ ~~38:~~___ 51: 1(5) ~~76:~~ 1(5) ~~102:~~___ ~~126:~~___
**Lift date:** Aug 17/11
**Lift time:** 10:40

Water Body: INUG
Net Length (m): 22.7×2
Net Height (m): 1.8m
Net depth at each end (m): 2.3 16.3
Weather / Comments: overcast, windy rain
Water Temp (at lift) (°C): 10.
Air Temp (at lift) (°C): 9°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-01.01 | 51 | 558 | 1450 | Y | — | — | — | — | ~~87908~~ | No tag - no fin ray - weak | released |
| LKTR | INUG-01 .02 | ″ | 750 | 4550 | Y | — | — | — | PEC | 87908 | none | |
| LKTR | INUG-01.03 | ″ | 789 | 5600 | Y | — | — | — | PEC | 879809 | none | |
| LKTR | INUG-01 .04 | ″ | 792 | 6750 | Y | — | — | — | PEC | 87910 | none. | |
| LKTR | INUG-01 .05 | ↓ | 505 | 1300 | Y | — | — | — | PEC | 87911 | none | |
| LKTR | INUG-01.06 | 76 | 630 | 2575 | Y | — | — | — | PEC | 87912 | ~~none~~ | |
| LKTR | INUG-01.07 | \| | 548 | 1600 | Y | — | — | — | PEC | 87913 | none | |
| LKTR | INUG-01.08 | ↓ | 549 | 1556 | N | F | MA | RS | OTO/PEC | — | none D | 1 |
| LKTR | INUG-01.09 | 51 | 278 | 208 | N | F | IM | UD | OTO/PEC | — | none D | 2 |
| LKTR | INUG-01.10 | 51 | 267 | 204 | N | F | IM | UD | OTO/PEC | — | none D | 3 |
| RNWH | INUG-01.11 | 51 | 413 | 656 | N | M | MA | RI | OTO/PEC | — | none D | |
| RNWH | INUG-01.12 | 51 | 408 | 664 | N | F | MA | RI | OTO/PEC | — | none D | |
| RNWH | INUG-01.13 | 51 | 400 | 642 | N | F | MA | RI | OTO/PEC | — | none D | |
| RNWH | INUG-01.14 | 51 | 360 | 488 | N | F | MA | RI. | OTO/PEC | — | none D | |
| RNWH | INUG-01.15 | 51 | 310 | 292 | N | M | MA | RI | OTO/PEC | — | none D | |

**CODES**

**SEX** M = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** MA = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** UD = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** PEL = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-01.16 | 76 | 506 | 1142 | N | IM | IM | UD | PEC/OTO | — | tiny lower lobe of caudal fin D 4 |
| LKTR | INUG-01.17 | 76 | 467 | 1150 | N | M | MA | RI | PEC/OTO | — | none D 5 |
| RNWH | INUG-01.18 | 76 | 430 | 826 | N | F | MA | RI | PEC/OTO | — | none D |
| RNWH | INUG-01.19 | 76 | 438 | 884 | N | M | MA | RI | PEC/OTO | — | none D |
| RNWH | INUG-01.20 | 76 | 370 | 578 | N | M | MA | RI | PCE/OTO | — | none D |
| RNWH | INUG-01.21 | 76 | 385 | 652 | N | M | MA | RI | PEC/OTO | — | none D |
| RNWH | INUG-01.22 | 76 | 388 | 530 | N | F | MA | RI | PEC/OTO | — | none D |
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**CODES**

**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A- NIGHT

**Set ID:** INUG-02
Recorder: Mike / Laura
**Set date:** Aug 16/11
**Set time:** 18:25
*Start UTMs* (14)
*End UTMs* (14)
Easting: 623061
Easting: 622923
Northing: 7216287
Northing: 7216335
Number of panels by mesh size (mm):
25: (8) 1 38: 1 51: 1 76: 1 102: 1 126: (5) 1
**Lift date:** Aug 17/11
**Lift time:** 11:33

Water Body: INUG
Net Length (m): 22.7×6
Net Height (m): 1.8m
Net depth at each end (m): 6 / 6.1
Weather / Comments: overcast, windy & rain
Water Temp (at lift) (°C): 13.5°C
Air Temp (at lift) (°C): 8°

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-02.01 | 25 | 310 | 290 | Y | — | — | — | PEC | — | none |
| LKTR | INUG-02.02 | 38 | — | — | N | — | — | — | — | — | → Escaped |
| LKTR | INUG-02.03 | 38 | — | — | N | — | — | — | — | — | → Escaped |
| RNWH | INUG-02.04 | 38 | 241 | 126 | N | IM | IM | UN | PEC/OT | — | none D |
| LKTR | INUG-02.05 | 38 | 217 | 100 | N | IM | IM | UN | PEC/OTO | — | none D 1 |
| LKTR | INUG-02.06 | 38 | 225 | 114 | N | IM | IM | UN | PEC/OTO | — | none D 2 |
| LKTR | INUG-02.07 | 38 | 626 | 2400 | Y | — | — | — | PEC | 87942 | none |
| RNWH | INUG-02.08 | 51 | 332 | 328 | N | IF | IM | UD | PEC/OT | — | none D |
| LKTR | INUG-02.09 | 51 | 514 | 1500 | Y | — | — | — | PEC | 87915 | none |
| LKTR | INUG-02.10 | 51 | 544 | 1508 | Y | — | — | — | PEC | 87916 | none |
| LKTR | INUG-02.11 | 51 | 555 | 1550 | Y | — | — | — | PEC | 87917 | slight dorsal fin deformity + caudal fin |
| LKTR | INUG-02.12 | 51 | 598 | 2150 | Y | — | — | — | PEC | 87919 | dorsal fin slightly deformed |
| ARCH | INUG-02.13 | 51 | 270 | 194 | N | IF | IM | UD. | OT/PEC | — | none D 1 |
| RNWH | INUG-02.14 | 76 | 406 | 716 | N | F | MA | RI | OT/PEC | — | none D |
| LKTR | INUG-02.15 | 76 | 406 | 654 | N | M | IMM | UD | OT/PEC | — | none D 3 |

CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-02.16 | 102 | 705 | 3712 | N | F | MA | RS | PEC/OTO | — | bi-lobed adipose fin. deformed dorsal. D | 4 |
| LKTR | INUG-02.17 | 102 | 560 | 1650 | N | M | IM | UD | PEC/OTO | — | none D | 5 |
| LKTR | INUG-02.18 | 102 | 496 | 1192 | N | F | MA | RS | PEC/OTO | — | none D | 6 |
| LKTR | INUG-02.19 | 126 | 903 | 6350 | Y | — | — | — | PEC | 87920 | none | |
| LKTR | INUG-02.20 | 126 | 517 | 1500 | Y | — | — | — | PEC | 87921 | none | |
| LKTR | INUG-02.21 | 25 | 152 | 36 | N | IM | IM | UN. | OTO/PEC | — | none D | 7 |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 5 **of** 19

**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-03 Recorder: Laura

**Set date:** Aug 17/11 **Set time:** 9:57

*Start UTMs* (Wypt 463) *End UTMs* (14) (wypt 464)

Easting: 0623060 Easting: 0622922

Northing: 7217055 Northing: 7217078

Number of panels by mesh size (mm):

25: S 38:___ 51:___ 76:___ 102:___ 126: E

**Lift date:** Aug 17/11 **Lift time:** 16:31

Water Body: INUG

Net Length (m): 22.7×6

Net Height (m): 1.8

Net depth at each end (m): 2m / 4.4m

Weather / Comments:

Water Temp (at lift) (°C): 13° (on eagle)

Air Temp (at lift) (°C): 7°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RNWH | INUG-03.01 | 51 | 362 | 542 | N | F | MA | RI | PECOT | — | normal / none D |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-04 Recorder: Laura

**Set date:** Aug 17/11 **Set time:** 10:12

*Start UTMs* (14) (Wypt 465) *End UTMs* (14) (Wypt 466)

Easting: 0623297 Easting: 0623163

Northing: 7216702 Northing: 7216681

Number of panels by mesh size (mm):

25: ✓ E 38: ✓ ___ 51: ✓ E 76: ✓ S 102: ✓ ___ 126: S

**Lift date:** Aug 17/11 **Lift time:** 17:32

Water Body: INUG

Net Length (m): 22.7 x 6

Net Height (m): 1.8

Net depth at each end (m): 2.8 / 2.9

Weather / Comments:

Water Temp (at lift) (°C): 13.2°

Air Temp (at lift) (°C):

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-04.01 | 51 | 322 | 425 | Y | — | — | — | PEC | — | none |
| LKTR | INUG-04.02 | 51 | 688 | 3255 | Y | — | — | — | PEC | 87924 | none |
| LKTR | INUG-04.03 | 51 | 365 | 458 | N | M | IM | UD | PEC+OT | — | none D |
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CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-05
Recorder: Laura / Claire
**Set date:** Aug 17/11
**Set time:** 11:15
*Start UTMs* (14) (Wypt 467)
*End UTMs* (14) (Wypt 468)
Easting: 0623206
Easting: 0623158
Northing: 7216367
Northing: 7216393
Number of panels by mesh size (mm):
25:___ 38:___ 51: E 76: S 102:___ 126:___
**Lift date:** August 17, 2011
**Lift time:** 17:44

Water Body: INUG
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 1.6 / 5.7
Weather / Comments:
Water Temp (at lift) (°C): 13.2°
Air Temp (at lift) (°C): 9°

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RNWH | INUG-05.01 | 51 | 382 | 600 | N | F | MA | RI | PEC/OT | – | NORMAL D |
| RNWH | INUG-05.02 | 51 | 365 | 425 | Y | – | – | – | PEC | – | *was released<br>Released No DELTS |
| LKTR | INUG-05.03 | 51 | 885 | 10300 | Y | – | – | – | PEC | 87922 | none |
| LKTR | INUG-05.04 | 76 | 394 | 575 | Y | – | – | – | PEC | 87923 | none |
| LKTR | INUG-05.05 | 76 | 522 | 1420 | N | M | MA | RS | PEC/OT | – | NORMAL D |
| LKTR | INUG-05.06 | 76 | 524 | 1638 | N | M | MA | RS | PEC/OT | – | NORMAL D |
| LKTR | INUG-05.07 | 76 | 665 | 3302 | N | M | MA | RS | PEC/OT | – | NORMAL D |
| LKTR | INUG-05.08 | 76 | 508 | 1360 | N | M | MA | RS | PEC/OT | – | NORMAL D |
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**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-06
Recorder: Laura
**Set date:** Aug 17/11
**Set time:** 12:20
*Start UTMs* (14) (Wypt 469)
*End UTMs* (Wypt 470)
Easting: 0623367
Easting: 0623248
Northing: 7216493
Northing: 7216519
Number of panels by mesh size (mm):
25: 38: 51: S 76: E 102: 126:
(2 panels)
**Lift date:** Aug 17/11
**Lift time:** 17:53

Water Body: INUG.
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 1.7 18m
Weather / Comments:
Water Temp (at lift) (°C): 13.2°c.
Air Temp (at lift) (°C):

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-0601 | 76 | 300 | 270 | Y | — | — | — | PEC | — | none A |
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CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

NIGHT

**Set ID:** INUG-07
Recorder: Laura
**Set date:** Aug 17/11
**Set time:** 16:51
*Start UTMs* (14) (Wypt 471)
*End UTMs* (14) (Wypt 472)
Easting: 0623141
Easting: 0623138
Northing: 7215666
Northing: 7215746
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E
**Lift date:** Aug 18/11
**Lift time:** 8:40

Water Body: INUG
Net Length (m): 22.746
Net Height (m): 1.8
Net depth at each end (m): 1.5m / 3.5
Weather / Comments:
Water Temp (at lift) (°C): 12.7°C
Air Temp (at lift) (°C): 7.0°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-07.01 | 102 | 504 | 1294 | N | M | MA | RS | PEC/OT | – | NONE D |
| ARCH | INUG-07.02 | 76 | 868 | 7650 | Y | – | – | – | PEL | – | none |
| LKTR | INUG-07.03 | 76 | 519 | 1104 | N | M | IM | UD | PEC/OT | – | NONE D |
| LKTR | INUG-07.04 | 51 | 558 | 1750 | Y | – | – | – | PEL | 87925 | none |
| LKTR | INUG-07.05 | 51 | 740 | 4600 | Y | – | – | – | PEC | 87438 | none |
| LKTR | INUG-07.06 | 51 | 261 | 168 | N | F | IM | UD | PEC/OT | – | NONE D |
| LKTR | INUG-07.07 | 51 | 518 | 1400 | Y | – | – | – | PEC | 87439 | none |
| LKTR | INUG-07.08 | 51 | 243 | 170 | Y | – | – | – | PEL | – | none |
| LKTR | INUG-07.09 | 38 | 206 | 84 | N | F | IM | UD | PEC/OT | – | NORMAL D |
| LKTR | INUG-07.10 | 38 | 219 | 94 | N | UN | IM | UD | PEC/OT | – | NORMAL D |
| LKTR | INUG-07.11 | 28 | 554 | 1775 | Y | – | – | – | PEC | 87440 | none |
| LKTR | INUG-07.12 | 38 | 223 | 112 | N | F | IM | UD | PEC/OT | – | NONE D |
| LKTR | INUG-07.13 | 38 | 232 | 170 | Y +/no | ~~–~~ | ~~–~~ | ~~–~~ | ~~PEC~~ | – | NONE |
| LKTR | INUG-07.14 | 25 | ESCAPED | | | | | | | | |
| ARCH | INUG-07.15 | 25 | 150 | 40 | N | UN | IM | UP | PEC/OT | – | NONE D |

CODES
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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## GILLNET SET & LIFT DATA

NIGHT

**Set ID:** INUG-08
**Recorder:** Laura
**Set date:** Aug 17/11
**Set time:** 17:34
*Start UTMs* (Wypt 473)
*End UTMs* (14) (Wypt 474)
Easting: 0623193
Easting: 0623150
Northing: 7215863
Northing: 7215868
Number of panels by mesh size (mm):
25:___ 38:___ 51: E 76: S 102:___ 126:___
**Lift date:** 18 Aug 11
**Lift time:** 9:50

Water Body: INUG
Net Length (m): 22.7 x 2
Net Height (m): 1.8
Net depth at each end (m): 1.8 / 5.4
Weather / Comments:
Water Temp (at lift) (°C): 12.7°C
Air Temp (at lift) (°C): 7.5°C

## CATCH DATA

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-08.01 | 51 | 514 | 1450 | Y | – | – | – | PEC | 87441 | none |
| LKTR | INUG-08.02 | 51 | 584 | 1950 | Y | – | – | – | PEC | 87442 | none |
| LKTR | INUG-08.03 | 51 | 564 | 1650 | Y | – | – | – | PEC | 87443 | none |
| RNWH | INUG-08.04 | ↓ | 370 | 528 | N | F | MA | RI | PEC/OT | – | NONE D |
| RNWH | INUG-08.05 | | 392 | 600 | N | M | MA | RI | PEC/OT | – | none D |
| LKTR | INUG-08.06 | | 258 | 172 | N | M | IM | UD | PEC/OT | – | NONE D |
| LKTR | INUG-08.07 | | 518 | 1500 | Y | – | – | – | PEC | 87444 | scar on belly |
| RNWH | INUG-08.08 | | 384 | 572 | N | M | MA | RI | PEC/OT | – | none D |
| RNWH | INUG-08.09 | | 376 | 536 | N | M | MA | RI | PEC/OT | – | NONE D |
| ARCH | INUG-08.10 | | 297 | 176 | Y (t=10) | – | – | – | PEC | – | Mangled tail |
| RNWH | INUG-08.11 | | 370 | 500 | N | F | MA | RI | PEC/OT | – | NORMAL D |
| '' | INUG-08.12 | | 365 | 468 | N | F | MA | RI | PEC/OT | – | normal D |
| '' | INUG-08.13 | | 281 | 204 | N | F | IMM | UD | PEC/OT | – | normal D |
| '' | INUG-08.14 | | 282 | 234 | N | F | IMM | UD | PEC/OT | – | none D |
| LKTR | INUG-08.15 | | 231 | 132 | N | UN | IM | UD | PEC/OT | – | NONE D |

**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

pounds

2011 EEM for Meadowbank Gold Mine: ***FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RNWH | INUG-08.16 | 76 | 364 | 1035 | N | M | MA | RI | Pec/OT | – | none D |
| LKTR | INUG-08,17 | ↓ | 515 | 2850 | N | M | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-08,18 | | 598 | 4510 | N | M | MA | RS | PEC/OT | – | NONE D |
| LKTR | INUG-08,19 | | 525 | 3310 | N | M | MA | RS | PEC/OT | – | NONE D |
| LKTR | INUG-08,20 | | 543 | 3555 | N | F | MA | RI | PEC/OT | – | NONE D |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 12 **of** 19

**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-09
Recorder: Mike
**Set date:** 18 Aug 11
**Set time:** 8:20
*Start UTMs*
*End UTMs*
Easting: 622449 (475)
Easting: 622318 (476)
Northing: 7217011
Northing: 7217101
Number of panels by mesh size (mm):
25(E) 1 38: 1 51: 1 76: 1 102: 1 126: 1 (S)
**Lift date:** 18 Aug 11
**Lift time:** 15:30

Water Body: INUG
Net Length (m): 22.7x6
Net Height (m): 1.8
Net depth at each end (m): 2.0 / 6.3
Weather / Comments:
Water Temp (at lift) (°C): 11.6°C
Air Temp (at lift) (°C): 8°C.

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-09.01 | 51 | 332 | 450 | Y | – | – | – | PEC | 87445 | none |
| LKTR | INUG-09.02 | 76 | 875 | 5900 | Y | – | – | – | PEC | 87446 | none |
| " | INUG.09.03 | 76 | 616 | 2425 | Y | – | – | – | PEC | 48476 | none |
| RNWH | INUG.09.04 | 76 | 420 | 722 | N | M | MA | RI | PEC/OT | – | none D |
| LKTR | INUG.09.05 | 102 | 499 | 1550 | Y | – | – | – | PEC | 48477 | none |
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CODES
<u>SEX</u> M = Male; F = Female; IM = Immature; UN = Unknown
<u>MAT.</u> MA = Mature; IM = Immature; UN = Unknown
<u>REPRO STATUS</u> UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
<u>AGE STRUCT.</u> PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-10

Recorder: Mike

**Set date:** 18 Aug 11

**Set time:** 8:25

*Start UTMs*

*End UTMs*

Easting: 622600 (407)

Easting: 622562

Northing: 7217068

Northing: 7217162

Number of panels by mesh size (mm):

25:____ 38:____ 51:(E) 1 76: 1 (S) 102:____ 126:____

**Lift date:** Aug 18 /11

**Lift time:** 15:55

Water Body: INUG

Net Length (m): 22.7×2

Net Height (m): 1.8

Net depth at each end (m): 2.0 / 4.1

Weather / Comments:

Water Temp (at lift) (°C): 11.6°C

Air Temp (at lift) (°C): 9.0°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-10,01 | 51 | 705 | 3900 | Y | – | – | – | PEC | 48478 | adipose missing |
| LKTR | INUG-10,02 | 51 | 524 | 1700 | N | F | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-10,03 | 51 | Escaped | | | | | | | | |
| LKTR | INUG-10,04 | 76 | 562 | 1602 | N | F | MA | RS | PEC/OT | – | NONE D. |
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CODES

**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

**Page** 14 **of** 19

**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-11
**Recorder:** Mike
**Set date:** 18Aug11
**Set time:** 9:40

*Start UTMs*
**Easting:** 623243 (479)
**Northing:** 7215796

*End UTMs*
**Easting:** 623092 (480)
**Northing:** 7215795

Number of panels by mesh size (mm):
25: (S) 1 38: 1 51: 1 76: 1 102: 1 126: (E)

**Lift date:** Aug18/11
**Lift time:** 16:20

Water Body: INUG
Net Length (m): 22.7×6
Net Height (m): 1.8
Net depth at each end (m): 2.4 / 5.2
Weather / Comments:
Water Temp (at lift) (°C): 12.4
Air Temp (at lift) (°C): 8

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
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| | NO FISH !!! | | | | | | | | | | |
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CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

## 2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET*

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**GILLNET SET & LIFT DATA**

DAY

**Set ID:** INUG-12
**Recorder:** Mike
**Set date:** 18 Aug 11
**Set time:** 10:20
*Start UTMs*
*End UTMs*
Easting: 623 656 (481)
Easting: 623005 (482)
Northing: 7216254
Northing: 7216299
Number of panels by mesh size (mm):
25:____ 38:____ 51: (5) 1 76: 1 (5) 102:____ 126:____
**Lift date:** 18 Aug/11
**Lift time:** 16:30

Water Body: INUG
Net Length (m): 22.7+2
Net Height (m): 1.8
Net depth at each end (m): 1.6 14.3
Weather / Comments:
Water Temp (at lift) (°C): 12.4
Air Temp (at lift) (°C): 8

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NO FISH | | \|\|\| | | | | | | | | |
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**CODES**
**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown
**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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NIGHT

## GILLNET SET & LIFT DATA

| | | | | | |
|---|---|---|---|---|---|
| **Set ID:** | INUG-13 | **Recorder:** | Mike | **Water Body:** | INUG |
| **Set date:** | Aug 18/11 | **Set time:** | 15:50 | **Net Length (m):** | 22.7×6 |
| *Start UTMs* | WP 486 | *End UTMs* | | **Net Height (m):** | 1.8 |
| **Easting:** | 0622369 | **Easting:** | 622349 (483) | **Net depth at each end (m):** | 1.6 / 7.6 |
| **Northing:** | 7217026 | **Northing:** | 7217156 | **Weather / Comments:** | |

Number of panels by mesh size (mm):

25: [illegible] 38: 1 51: 1 76: 1 102: 1 126: 1(8)

**Lift date:** Aug 19/11 **Lift time:** 8:25

**Water Temp (at lift) (°C):** 11.6

**Air Temp (at lift) (°C):** 7

## CATCH DATA

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-13.01 | 76 | 538 | 1500 | Y | – | – | – | PEC | 48479 | none |
| RNWH | INUG-13.02 | 76 | 398 | 664 | N | M | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-13.03 | 76 | 494 | 1400 | Y | – | – | – | PEC | 48480 | none |
| RNWH | INUG-13.04 | ↓ | 420 | 748 | N | M | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-13.05 | | 741 | 4032 | N | F | MA | RS | PEC/OT | – | NONE D |
| ARGR | INUG-13.06 | | 341 | 450 | Y | – | – | – | PEC | – | none |
| LKTR | INUG-13.07 | | 515 | 1386 | N | F | MA | RS | PEC/OT | – | NONE D |
| LKTR | INUG-13.08 | 51 | 253 | 160 | Y(±10) | – | – | – | PEC | – | none |
| RNWH | INUG-13.09 | 51 | 385 | 596 | N | M | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-13.10 | ↓ | 356 | 460 | N | M | IM | UD | PEC/OT | – | NONE D |
| LKTR | INUG-13.11 | | 542 | 1550 | Y | – | – | – | PEC | 48481 | none |
| RNWH | INUG-13.12 | | 385 | 602 | N | F | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-13.13 | | 205 | 100 | Y(±10 | – | – | – | PEC | – | none |
| RNWH | INUG-13.14 | | 352 | 434 | N | M | MA | RI | PEC/OT | – | NONE D |
| LKTR | INUG-13.15 | 38 | 175 | – | N(too small) | – | – | – | PEC | – | none |

**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-13.16 | 38 | 217 | 110 | Y(±10 | – | – | – | PEC | – | none |
| LKTR | INUG-13.17 | 76 | 449 | 1008 | N | F | MA | RI | PEC/OT | – | NONE D |
| RNWH | INUG-13.18 | 76 | 400 | 634 | N | M | MA | RI | PEC/OT | – | NONE D |
| RNWH | INUG-13.19 | 76 | 375 | 512 | N | F | MA | RI | PEC/OT | – | NONE D |
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CODES

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

NIGHT

| | | | | | |
|---|---|---|---|---|---|
| **Set ID:** | INUG-14 | **Recorder:** | Mike | **Water Body:** | INUG |
| **Set date:** | Aug 18/11 | **Set time:** | 16:15 | **Net Length (m):** | 22.7 x 2 |
| *Start UTMs* | | *End UTMs* | | **Net Height (m):** | 1.8 |
| **Easting:** | 623105 (484) | **Easting:** | 623043 | **Net depth at each end (m):** | 1.9 / 6.5 |
| **Northing:** | 7216136 | **Northing:** | 7216127 | **Weather / Comments:** | |
| **Number of panels by mesh size (mm):** 25:___ 38:___ 51: (5) 76: (8) 102:___ 126:___ | | | | **Water Temp (at lift) (°C):** | 12.4 |
| **Lift date:** | 19 Aug 11 | **Lift time:** | 9:05 | **Air Temp (at lift) (°C):** | 7 |

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-14.01 | 51 | 283 | 238 | N | F | IM | UD | PEC/OT | — | NONE D |
| RNWH | INUG-14.02 | ↓ | 405 | 646 | N | ~~F~~ | MA | RI | PEC/OT | — | NONE D |
| LKTR | INUG-14.03 | ↓ | 357 | 490 | N | M | IM | UD | PEC/OT | — | NONE D |
| LKTR | INUG-14.04 | ↓ | — | — | — | — | — | — | — | 87908 | recap |
| LKTR | INUG-14.05 | ↓ | 245 | 144 | N | F | IM | UD | PEC/OT | — | NONE D |
| LKTR | INUG-14.06 | ↓ | 375 | 625 | Y | — | — | — | PEC | 48482 | none |
| ARCH | INUG-14.07 | ↓ | 253 | 158 | Y (± 1g) | — | — | — | PEC | — | none |
| RNWH | INUG-14.08 | ↓ | 375 | 502 | N | M | MA | RI | PEC/OT | — | NONE D |
| RNWH | INUG-14.09 | ↓ | 383 | 602 | N | M | MA | RI | PEC/OT | — | NONE D |
| RNWH | INUG-14.10 | ↓ | 343 | 436 | N | M | MA | RI | PEC/OT | — | NONE D |
| RNWH | INUG-14.11 | 76 | 375 | 532 | N | M | MA | RI | PEC/OT | — | NONE D |
| LKTR | INUG-14.12 | ↓ | 577 | 1700 | Y | — | — | — | PEC | 48483 | none |
| LKTR | INUG-14.13 | ↓ | 625 | 2884 | N | M | MA | RS | PEC/OT | — | NONE D |
| RNWH | INUG-14.14 | ↓ | 385 | 570 | N | M | MA | RI | PEC/OT | — | NONE D |
| LKTR | INUG-14.15 | ↓ | 548 | 1788 | N | F | MA | RI | PEC/OT | — | NORMAL D |

**CODES**

**SEX** M = Male; **F** = Female; **IM** = Immature; **UN** = Unknown **REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown **AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine:** ***FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | INUG-14.16 | 76 | 487 | 1142 | N | F | MA | RS | PEC/OTO | — | none D |
| LKTR | INUG-14.17 | ↓ | 499 | 1525 | Y | — | — | — | PEC | 48484 | none |
| LKTR | INUG-14.18 |  | 542 | 1506 | N | M | MA | RS | PEC/OT | — | none D |
| LKTR | INUG-14.19 |  | 411 | 720 | N | F | IM | UD | PEC/OT | — | NONE D |
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**CODES**

**SEX** **M** = Male; **F** = Female; **IM** = Immature; **UN** = Unknown

**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

| Sp. |  | M |
|---|---|---|
| LKTR - | 22 | 11 |
| RNWH - | 11 | 11 |
| ARGR | 1 | 0 |

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page i of ii

**GILLNET SET & LIFT DATA**

A-NIGHT

| | | | | | |
|---|---|---|---|---|---|
| **Set ID:** | PD-01 | **Recorder:** | Susan Hertam / Claire | **Water Body:** | Pipedream Lake. |
| **Set date:** | August 16, 2011 | **Set time:** | 1830 | **Net Length (m):** | 22.7×5 |
| *Start UTMs* | WP 108 14W | *End UTMs* | WP109. 14W | **Net Height (m):** | 1.8 |
| **Easting:** | 0630472 | **Easting:** | 0630350 | **Net depth at each end (m):** | 3.7 / 6.4. |
| **Northing:** | 7222914 | **Northing:** | 7223012 | **Weather / Comments:** | overcast, rain, wind E ~20 km/hr |
| **Number of panels by mesh size (mm):** 25: S 38: ✓ 51: ✗ 76: ✓ 102: ✓ 126: E | | | | **Water Temp (at lift) (°C):** | 11°c |
| **Lift date:** | August 17, 2011 | **Lift time:** | 1030 | **Air Temp (at lift) (°C):** | ~~11~~ 9.5°c |

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD-01.01 | 126 | 621 | 2600 | Y | — | — | — | PEC | 77152. | NORMAL A |
| LKTR | PD-01.02 | 102 | 869. | 7600 | Y | — | — | — | PEC | 77153 | Dorsal fin form A |
| RNWH | PD-01.03 | ~~126~~ 126 | 390. | 748 | N | F | MA | RI | PEC/OT | — | NORMAL D |
| RNWH. | PD.01.04 | 102 | 386 | 742 | N | F | MA | RI | PEC/OT | — | NORMAL D |
| LKTR | PD.01.05 | 76 | 820 | 6000 | Y | — | — | — | PEC | 77154 | likely net damage<br>small scratch dorsal side A |
| LKTR. | PD-01.06 | 76 | 344 | 396 | N | M | IM | UD | PEC/OT | — | NORMAL D |
| RNWH | PD.01.07 | 76 | 372 | 558 | N | F | MA | RI | PEC/OT | — | NORMAL D |
| RNWH | PD.01.08 | 76 | 247 | 158 | N | M | IM | UN | PEC/OT | — | NORMAL D |
| LKTR | PD.01.09 | 76 | 282 | 220 | N | F | IM | UD | PEC/OT | — | NORMAL D |
| LKTR | PD.01.10 | 76 | 283 | 228 | N | F | IM | UD | PEC/OT | — | NORMAL D |
| LKTR | PD-01.11 | 76 | 278 | 212 | N | M | IM | UD | PEC/OT | — | NORMAL Net damage D |
| LKTR | PD-01.12 | 5/38 | 804 | 6100 | Y | — | — | — | PEC | 77155 | damage on dorsal (pict 3768)<br>red spots btwn pectorals A |
| LKTR | PD.01.13 | 38 | 811 | 4450 | Y | — | — | — | PEC | 77156 | unusually skinny, flaccid belly A |
| ARCH | PD.01.14 | 38 | 243 | 152. | N | M | IMM | UD | PEC/OT | — | None. D |
| ARCH | PD.01.15 | 38 | 255 | 172 | N | F | IM | UD | PEC/OT | — | NONE D |

**CODES**

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**MAT.** **MA** = Mature; **IM** = Immature; **UN** = Unknown

**REPRO STATUS** **UD** = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown

**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET*** Page 2 of 11

**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD-01.16 | 38 | 212 | 108 | N | F | IM | UD | PEC/OT | – | NORMAL D |
| LKTR | PD-01.17 | 38 | 250 | 146 | N | F | IM | UD | PEC/OT | – | NORMAL D |
| ARCH | PD-01.18 | 38mm | 205 | 100 | Y +/- 28g | – | – | – | None. | – | None (gill net marks) A |
| LKTR | PD.01.19 | 25 | 135 | 36 -14g | Y +/-1 60g | – | – | – | None | – | none. A |
| ARCH | PD.01.20 | 25 | 154 | 48 -14g | Y +/-1 60g | – | – | – | None. | – | torn LH operculum. A |
| LKTR | PD.01.21 | 25 | 142 | 42 -14g | Y +/-1 60g | – | – | – | None | – | none A |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown    **REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown    **AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 3 of 11

## GILLNET SET & LIFT DATA

A-NIGHT

**Set ID:** PD-02.
**Recorder:** Susan Hertam.
**Set date:** August 16, 2011
**Set time:** 1840
*Start UTMs* wp 110 14W
*End UTMs* wp 111 14W
Easting: 0630313
Easting: 0630251
Northing: 7223152
Northing: 7223190
Number of panels by mesh size (mm):
25:___ 38:___ 51: 8 76: E 102:___ 126:___
**Lift date:** August 17, 2011
**Lift time:** 1135

Water Body: Pipedream.
Net Length (m): 22.7 × 2
Net Height (m): 1.8
Net depth at each end (m): 6.2 m / 8m.
Weather / Comments: overcast windy E ~20km/hr
Water Temp (at lift) (°C): 11°C
Air Temp (at lift) (°C): 8°C

## CATCH DATA

Ⓐ ✓

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD.02.01 | 51 | 295 | 272 | N | M | IM | UD | PEC/OT | — | NORMAL D |
| LKTR | PD.02.02 | 51 | 268 | 184 | N | M | IM | UD | PEC/OT | — | NORMAL D |
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**CODES**
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**MAT.** MA = Mature; **IM** = Immature; **UN** = Unknown
**REPRO STATUS** UD = Undeveloped; **RI** = Ripe; **RU** = Running; **SP** = Spent; **RS** = Resting; **UN** = Unknown
**AGE STRUCT.** PEL = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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R : 1
A - 1

**GILLNET SET & LIFT DATA**

A - DAY B- NIGHT

**Set ID:** PD-03
**Recorder:** Susan Mertam
**Set date:** August 17, 2011
**Set time:** 1150
*Start UTMs* WP 112 14W
*End UTMs* WP 113 14W
Easting: 0630766
Easting: 0630709
Northing: 7223440
Northing: 7223964
Number of panels by mesh size (mm):
25:____ 38:____ 51: 5 76: 5 102:____ 126:____
**Lift date:** August 17, 2011
**Lift time:** ~~1445~~

Ⓑ set 1435 lift Aug 18 08 50

**Water Body:** Pipedream
**Net Length (m):** 22.7×2
**Net Height (m):** 1.8
**Net depth at each end (m):** 3.1 / 7.6
**Weather / Comments:** overcast, wind E 20-30 km/hr.
**Water Temp (at lift) (°C):** Ⓐ 11°C / Ⓑ 11°C
**Air Temp (at lift) (°C):** 9.5°C / 7.5°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ LKTR | PD-03.01 | 51 | 403 | 640 | Y | — | — | — | PEC | 77157 | none A |
| Ⓑ LKTR | PD-03.02 | 51 | 280 | .465 lbs. | N | M | IM | UD | PEC/OT | — | none. D |
| LKTR | PD-03.03 | 51 | 281 | .545 lbs | N | M | IM | UD | PEC/OT | — | none. D |
| LKTR | PD-03 04 | 51 | 482 | 1090 | N | F | MA | RS | PEC/OT | — | none. D |
| LKTR | PD-03.05 | 51 | 496 | 1418 | N | F | MA | RI | PEC/OT | — | none. D |
| ARCH | PD-03.06 | 51 | 246 | .355 lbs | N | M | IM | UD | PEC,OT | — | none D |
| ~~LKTR~~ | ~~PD-03.07~~ | ~~51~~ | | | ~~N~~ | | | | | | ~~A~~ |
| RNWH | PD-03.08 | ~~51~~ | ~~547~~ | 564 | N | M | MA | RI | PEC,OT | — | none. D |
| 6 LKTR | PD-03.09 | 76 | 522 | 1316 | N | F | MA | RS | PEC,OT | — | none D? -died after release |
| 7 LKTR | PD-03.10 | 51 | 710 | 4100 | Y | — | — | — | PEC | 77158 | none. D |
| LKTR | PD-03.11 | 51 | 269 | 250-14 | Y +/- 10 (600g) | — | — | — | PEC | — | none A |
| ARCH | PD-03.12 | 51 | .272 | .470 lbs | N | U | IM | UD. | PEC,OT | — | None D |
| LKTR | PD-03.13 | 51 | .253 | .330 lbs | N | F | IM | UD | PEC,OT | — | none. D |
| LKTR | PD-03 14 | 51 | .220 | .265 lbs | N | U | IM | UD | PEC,OT | — | none. D |

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**AGE STRUCT.** **PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD-03.15 | 76 | 577 | 2126 | N | F | MA | RI | PEC/OT | — | none. D |
| LKTR | PD-03.16 | 76 | 534 | 1518 | N | F | MA | RS | PEC/OT | — | none. D |
| LKTR | PD-03.17 | 76 | 565 | 1740 | N | M | MA | RI | PEC/OT | — | none D |
| RNWH | PD-03.18 | 76 | 412 | 838 | N | M | MA | RI | PEC/OT | — | none D |
| LKTR | PD-03.19 | 76 | 189 | (80-14) | Y +/-10 (600g) | — | — | — | PEC | — | none. A |
| LKTR | PD-03.20 | 76 | 508 | 1470 | N | M | MA | RI | PEC/OT | — | none D |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

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**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**GILLNET SET & LIFT DATA**

A-DAY B-NIGHT

| | | | |
|---|---|---|---|
| **Set ID:** PD-04 A,B | **Recorder:** Sue Hertam | **Water Body:** | Pipedream |
| **Set date:** August 17, 2011 | **Set time:** 1215 | **Net Length (m):** | 22.7×6 |
| *Start UTMs* Wp 114 14W | *End UTMs* Wp 115 14W | **Net Height (m):** | 1.8 |
| Easting: 0630601 | Easting: 0630458 | Net depth at each end (m): | 9.5 / 9.9 |
| Northing: 7223313 | Northing: 7223363 | Weather / Comments: | overcast & windy ~20-30km/h east |
| Number of panels by mesh size (mm): 25: 5 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E | | Water Temp (at lift) (°C): | Ⓐ 11°C \| Ⓑ 11°C |
| **Lift date:** August 17, 2011 | **Lift time:** 1702 | Air Temp (at lift) (°C): | 9.5°C \| 7.5°C |

Ⓑ set Aug 17, 2011 17:15 Ⓑ LIFT 0935 Aug 18

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ no catch | | | | | | | | | | | |
| | | | | | | | | | | | |
| Ⓑ LKTR | PD.04.01 | 126 | 304 | 236 | Y | — | — | — | PEC | 77159 | none A |
| LKTR | PD.04.02 | 102 | 534 | 1600 | Y | — | — | — | PEC | 77160 | none A |
| LKTR | PD-04.03 | 102 | 818 | 6300 | Y | — | — | — | PEC | 77161 | none A |
| LKTR | PD.04.04 | 102 | 584 | 2188 | N | M | MA | RS | PEC/OTO | — | none D |
| LKTR | PD-04.05 | 76 | 521 | 1598 | N | M | MA | RI | PEC/OTO | — | none D |
| LKTR | PD-04.06 | 76 | 566 | 1966 | N | F | MA | RI | PEC/OTO | — | none D |
| LKTR | PD-04.07 | 76 | 532 | 1700 | Y | — | — | — | | 77162 | nick in adipose A |
| * LKTR | PD-04.08 | 51 | 638 | 2552 | N | M | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-04.09 | 51 | 390 | 554 | N | F | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-04.10 | 51 | 697 | 3960 | Y | — | — | — | | 77163 | A |
| LKTR | PD-04.11 | 38 | 184 | 61 | N | F | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-04.12 | 38 | 203 | 80 | N | M | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-04.13 | 38 | 193 | 78 | N | F | IM | UD | PEC/OTO | — | none D |

**CODES**

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**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

15 ua

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

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**CATCH DATA (continued)**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD-04, 14 | ~~38~~ 25 | 136 | 23 | N | F | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-04. 15 | 25 | 132 | 430g | Y (60g) | — | — | — | — | — | None A |
| ARCH | PD-04.16 | 25 | 114 | 38 20 | Y (60g) | — | — | — | — | — | None A |
| ~~LKTR~~ | | ~~2~~ | | | | | | | | | |
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**MAT.** MA = Mature; IM = Immature; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET*** Page 8 of 11

**GILLNET SET & LIFT DATA** Ⓐ-DAY

**Set ID:** PD-05 Recorder: Su Murtam
**Set date:** Aug 18, 2011 **Set time:** 0930
*Start UTMs* WP 118 (14)W *End UTMs* WP 117 (14)W
Easting: 0630422 Easting: 0630452
Northing: 7223258 Northing: 7222898
Number of panels by mesh size (mm):
25:____ 38:____ 51: E ✓ 76: 5 ✓ 102:____ 126:____
**Lift date:** Aug 18/11 **Lift time:** 15:42

Water Body: Pipedream
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 1.5 / 6.7
Weather / Comments: overcast wind ESE ≈20km/hr
Water Temp (at lift) (°C): 10.5°C
Air Temp (at lift) (°C): 8°C

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ LKTR | PD-05.01 | 76 | 620 | 2175 | Y | — | — | — | PEC | 77164 | none A. |
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**CODES**
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

2011 EEM for Meadowbank Gold Mine: ***FIELD DATA SHEET***

Page 9 of 11

**GILLNET SET & LIFT DATA**

Ⓐ-DAY

**Set ID:** PD-06

**Recorder:** Sue/Laura

**Set date:** August 18, 2011

**Set time:** 1044

*Start UTMs* WP (119) 14 W

*End UTMs* WP (120) 14 W

**Easting:** 0630452

**Easting:** 0630305

**Northing:** 7222898

**Northing:** 7222869

Number of panels by mesh size (mm):

25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E

**Lift date:** Aug 18/11

**Lift time:** 16:00

**Water Body:** Pipedream

**Net Length (m):** 22.7×6

**Net Height (m):** 1.8

**Net depth at each end (m):** 2.7 / 4.3

**Weather / Comments:** overcast winds ESE ~20 km/hr

**Water Temp (at lift) (°C):** 10.5°C

**Air Temp (at lift) (°C):** 8°C

**CATCH DATA**

Ⓐ

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LKTR | PD-06.01 | 126 | 584 | 1850 | Y | — | — | — | PEC | 77165 | none A |
| LKTR | PD-06.02 | 102 | 548 | 1675 | Y | — | — | — | PEC | 77166 | none A |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown

**MAT.** MA = Mature; IM = Immature; UN = Unknown

**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown

**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 10 of 11

Ⓐ DAY. Ⓑ NIGHT

**GILLNET SET & LIFT DATA**

**Set ID:** PD-07 A,B
**Recorder:**
**Set date:** Aug 18, 2011
**Set time:** 1101
*Start UTMs* WP 121 14W
*End UTMs* WP 122 14W
Easting: 0630403
Easting: 0630365
Northing: 7222842
Northing: 7222885
Number of panels by mesh size (mm):
25:____ 38:____ 51: ✓ 5 76: ✓ 5 102:____ 126:____
**Lift date:** Ⓐ Aug 18/11
**Lift time:** Ⓐ 16:15 / Ⓑ set time 16:22

Water Body: Pipedream
Net Length (m): 22.7×2
Net Height (m): 1.8
Net depth at each end (m): 4.3 / 5.8
Weather / Comments: overcast - winds ESE ~20km/hr
Water Temp (at lift) (°C): Ⓐ 10.5°C | Ⓑ 10.5°C
Air Temp (at lift) (°C): 8°C | 7°C

Ⓑ lift Aug 19 lift time 0815

**CATCH DATA**

| | Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ | NO | CATCH. | | | | | | | | | | |
| | | | | | | | | | | | | |
| Ⓑ | LKTR | PD-07.01 | 76 | 251 | 150 | Y +/-10 (60g) | — | — | — | PEL | — | none A |
| | LKTR | PD-07.02 | 76 | 237 | 140 | Y +/-10 (600g) | — | — | — | PEL | — | none A |
| | RNWH | PD-07.03 | 51 | 322 | 388 | N | F | MA | RI | PEC/OT | — | none D |
| | LKTR | PD-07.04 | 51 | 157 | 55 | y (60g) +/-1 | — | — | — | PEL | — | none. A |
| | | | ~~51~~ | | | | | | | | | |

CODES
**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

| Ⓑ | | | morts |
|---|---|---|---|
| | LKTR | 3 | 0 |
| | ARCH | 0 | 0 |
| | RNWH. | 1 | 1 |

**2011 EEM for Meadowbank Gold Mine: *FIELD DATA SHEET***

Page 11 of 11

**GILLNET SET & LIFT DATA**

Ⓐ-DAY Ⓑ-NIGHT

**Set ID:** PD-08 A,B
**Recorder:** Sue/Laura
**Set date:** August 18, 2011
**Set time:** 1110
*Start UTMs* 123
*End UTMs* 124
Easting: 0630412
Easting: 0630263
Northing: 7222688
Northing: 7222712
Number of panels by mesh size (mm):
25: S 38: ✓ 51: ✓ 76: ✓ 102: ✓ 126: E Ⓐ
**Lift date:** Aug 18/11
**Lift time:** 16:28

Water Body: Pipedream
Net Length (m): 22.7 × 6
Net Height (m): 1.8
Net depth at each end (m): 3.1/8.5
Weather / Comments: overcast, wind ESE ~20km/hr
Water Temp (at lift) (°C): Ⓐ 10.5 | Ⓑ 10.5°C
Air Temp (at lift) (°C): 8°C | 7°C

Ⓑ set Aug 18/11 1640

Ⓑ 0845 lift Aug 19, 2011

**CATCH DATA**

| Species | Sample ID | Mesh Size (mm) | Fork Length (mm) | Weight (g) | Weighed in field? (Y/N) | Sex | Mat. | Repro Status | Age Struct. | Tag ID | Ext. DELT / Parasites? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ⓐ LKTR | PD-08.01a | 102 | 629 | 2746 | N | F | MA | RI | PEC/OT | — | none D |
| | | | | | | | | | | | |
| Ⓑ | | | | | | | | | | | |
| | | | | | | | | | | | |
| ARCH | PD-08.01 | 102 | 255 | 174 | N | U | IM | UD | PEC/OT | — | none D |
| LKTR | PD-08.02 | 76 | 559 | 1675 | Y | — | — | — | PEC | 77167 | none A |
| LKTR | PD-08.03 | 76 | 686 | 3400 | Y | — | — | — | PEC | 77168 | ~~none~~ adipose clip on fin A |
| LKTR | PD-08.04 | 51 | 282 | 225 | Y +/-10 (600) | — | — | — | PEC | 77169 | none A |
| LKTR | PD-08.05 | 38 | 235 | 136 | N | M | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-08.06 | 38 | 202 | 80 | N | F | IM | UD | PEC/OTO | — | none D |
| LKTR | PD-08.07 | 38 | 168 | 52 | Y (60g) +/-1 | — | — | — | PEC | — | none A |
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**CODES**

**SEX** M = Male; F = Female; IM = Immature; UN = Unknown
**MAT.** MA = Mature; IM = Immature; UN = Unknown
**REPRO STATUS** UD = Undeveloped; RI = Ripe; RU = Running; SP = Spent; RS = Resting; UN = Unknown
**AGE STRUCT.** PEL = Pelvic fin; PEC = Pectoral fin; DR = Dorsal ray

"stomach/gut parasites - always on surface of stomach & amongst caecae"
↓

2011 EEM for Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Laura Henderson

Date: Aug 13/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | ~~Total # of eggs~~ | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| VOS ✓ TPN-05. 11 | OT/PEC | — | normal | — | — | — | normal | normal | — | 60% full; zooplankton stomach. |
| ✓ TPN-05. 13 | OT/PEC | — | normal | — | — | — | normal | normal | mod pic 3732/3733 insisted parasites around gut | Lower Intes. 100% full chironomids. |
| ✓ TPN-05.09 | OT/PEC | — | normal. | — | — | — | normal | normal | gut parasites HIGH | Lower intestine 100% chironomids. |
| ✓ TPN-05.07 | OT/PEC | — | normal | — | — | — | normal | normal | gut parasites moderate | MT stomach; full intestine (100%). |
| ✓ TPN-05.12. | OT/PEC | — | normal | — | — | — | normal | normal | gut parasites moderate | Stom. Empty. Intes. full. |
| ✓ TPN-05. 15. | OT/PEC | — | normal | — | — | — | normal | normal | gut parasites low | Stom. 50% full Intes. full. (100) |
| ✓ TPN-05. 01 | OT/PEC | — | normal | — | — | — | normal | normal. | mod stomach parasites. | Stomach MT |
| ✓ TPN-05. 03. | OT/PEC | — | normal | — | — | — | normal | normal | gut parasites (moderate) | Stomach 10% full |
| ✓ TPN-05.02 | OT/PEC | — | pic 3735 normal | — | — | — | normal | normal | gut parasites low (3) | Stomach 10% full |
| ✓ TPN-06. 08 | OT/PEC | — | pic 3736 normal. | — | — | — | normal | normal | moderate gut parasites | Stomach 20% full. |
| ✓ TPN-06. 03 | OT/PEC | — | normal | — | — | — | normal | normal | gut paras. Moderate. | Stomach 50% full |
| ✓ TPN-06-05 | OT/PEC | — | normal | — | — | — | normal | normal | low gut | Stomach 50% full |
| TPN-06. 14 | OT/PEC | — | normal | — | — | — | normal | normal | mod para cysts on [illegible] outside of stomach etc. | Stomach 10% full |
| ✓ TPN-06.11 | OT/PEC | — | appears to have parasitic cyst pic 3737, 38 | — | — | — | normal | normal | mod para on stomach + ovaries | empty |

Stomachs empty

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

1/18

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Sue Hertam / Claire Hrenchuk Date: August 13, 2011

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ TPN-06.02 | OT/PEC | — | normal | — | — | — | slightly lighty colored<br>pic 3739 | normal | light (low)<br>stomach | LKTR, chironomids<br>↓ 40% ↓ few |
| ✓ TPN-06.20 | OT/PEC | — | normal | — | — | — | normal | normal | low<br>stomach | 10%, zoo<br>full |
| ✓ TPN-06.15 | OT/PEC | — | normal | — | — | — | normal | deformed (pinched ½ way)<br>swim bladder | NONE | 10% full, zoo |
| ✓ TPN-06.17 | OT/PEC | — | normal | — | — | — | normal | none | none | empty |
| ✓ TPN-06.19 | OT/PEC | — | normal | — | — | — | normal | normal | light (one) | 10% full, zoo |
| ✓ TPN-06.21 | OT/PEC | — | normal | — | — | — | 1 parasitic cyst<br>3741, 3742 | normal | light (one). | 20% full<br>sculpin 1.5cm. |
| ✓ TPN-06.23 | OT/PEC | — | normal | — | — | — | 1 parasite or discoloration<br>3743, 3744 | normal<br>w̄ parasites | mod<br>stomach +<br>~~tapeworm~~ | 10%, zoo |
| ✓ TPN-06.18 | OT/PEL | — | normal | — | — | — | normal | normal | mod<br>stomach<br>cysts. | 10%, zoo |
| ✓ TPN-07.01 | OT/PEC | — | normal | — | — | — | normal | normal w̄<br>parasites | low ~~light~~ | 10%, ephem, fish, chiron |
| ✓ TPN-05.21 | OT/PEC | — | normal<br>★very large eggs → current year spawner | — | — | — | normal | normal w̄<br>parasites | low ~~light~~ | 20%, fish remains |
| ✓ TPN-08.002 | OT/PEC | — | normal | — | — | — | normal | normal | none | 5%, pupa, larval fish |
| ✓ TPN-08.003 | OT/PEC | — | normal | — | — | — | normal | normal | none | 60%; chiron, trichop |
| ✓ TPN-08.006 | OT/PEC | — | normal | — | — | — | normal | normal | none | 20%; chiron, sculpin ×2 |
| ✓ TPN-08.009 | OT/PEC | — | normal | — | — | — | normal | normal | none | 5%; chiron |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

2011 EEM for Meadowbank Gold Mine: *DETAILED BIOLOGICAL ANALYSIS LAB SHEET*

Recorder: Mike

Date: Aug 14/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| CTR 51 TPN-11.01 | pect OTO | — | Normal | — | — | — | Normal | Normal | moderate gut para | 10% fish remains |
| 51 TPN-11.02 | pect/ OTO | — | Normal | — | — | — | Normal<br>1 cyst | Normal | low gut para | 25% fish remains |
| 51 TPN-11.03 | PECT/ OTO | — | Normal | — | — | — | Normal<br>Few sm. white embedded cysts | Normal | low para in gut. | ~~<10%~~ (2%) + ephem, chiron |
| 76 TPN-11:05 | pect OTO | — | Normal | — | — | — | Normal | Normal | low gut para. | 60% fish + chiron |
| NWH 76 TPN-11.06 | pect OTO | 29.6 ♀ | Normal | 1.02 | — | 8.20 | Normal | Normal | No parasites | 70% chiron, ephem, ostracod |
| CTR 76 TPN-11.08 | pect/ OTO | — | Normal | — | — | — | Normal | Normal | No parasites | 20% sculpin |
| 76 TPN-11.09 | PECT/ OTO | — | Normal | — | — | — | Normal<br>1 liver cyst | Normal | No parasites | 90% chiron, trich., fish |
| ARCH TPN-10.03 | PEC/OT | — | Normal | — | — | — | Normal | Normal<br>None | low<br>1 cyst. | 50% Ephem |
| TPN-10.04 | ~~PEC~~/OT | — | " | — | — | — | " | None | None | 5% chiron. |
| TPN-10.05 | ~~PEC~~/OT | — | — | — | — | — | — | — | — | — |
| NWA TPN-10.08 | pect OTO | 19.50 male | Normal | — | — | 4.97 | Normal | lots fat<br>Normal | No parasite | 10% Ephem + chiron. |
| KTR TPN-10.09 | pect/ OTO | — | Normal | — | — | — | Normal | Normal | low para | 10% zoop |
| TPN-10.10 | pect/ OTO | — | Normal | — | — | — | Normal | Normal | low para | MT |
| ARCH TPN-10.12 | ~~pect~~ otolith | — | Normal | — | — | — | Normal | Normal | low gut para | 80% zoop. |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

2011 EEM for Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Mike

Date: Aug 14/11

| | Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| KTR ↓ | TPN-10.13 | pect OTO | — | Normal | — | — | ~~Normal~~ | Normal | Normal | Low parasite | 10% chiron |
| | TPN-10.14 | pect OTO | — | " | — | — | — | " | " | low parasite | 90% fish remains LKTR+ |
| ARCH | TPN-10.15 | OTO | — | Normal | — | — | — | Normal | Normal | None observed | 80% zoopl. |
| ARCH | TPN-10.16 | OTO | — | Normal | — | — | — | Normal | Normal | low parasites. | 50% zoop. |
| LKTR | TPN-10.19 | pect OTO- | — | Normal | — | — | — | Normal | Normal | low gut parasite | 40% zoopl. |
| | TPN-10.20 | pect OTO | — | Normal | — | — | — | Normal | Normal | low parasite. | ~~MT~~ |
| | TPN-10.21 | pect/OTO | — | Normal | — | — | — | Normal | Normal | None | 30% fish remains + chiron. |
| | TPN-10.22 | pect/OTO | — | Resting normal | — | — | — | Normal | ~~Low gut parasite~~ Normal | low gut parasite | 50% sculpin, trichop- |
| | TPN-10.23 | pect/OTO | — | Normal resting | — | — | — | Normal | Normal | low gut parasite | 10% chiron. |
| | TPN-10.25 | pect OTO | — | Normal resting | — | — | — | Normal | Normal | low gut parasite | 5% chiron |
| ↓ | TPN-10.26 | pect OTO | — | Normal resting | — | — | — | Normal | Normal | low gut parasite | 80% fish remains & chiron |
| | | | | | | | | | | | |
| ✓ | TPN-17.01 | pect oto | — | Normal resting | — | — | — | Normal | Normal | low gut para | 5% fish remains |
| ✓ | TPN-16.04 | PEC/OT | — | " | — | — | — | " | " | low gut parasites | MT |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Laura

Date: Aug 15 2011.

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| TPN-11. 10 | PEC/OT | — | normal | — | — | — | normal | normal | low<br>low | 10% fish remains. |
| ✓ TPN-16.06 | PEC/OT | — | normal | — | — | — | normal | normal | low | 20% fish |
| ✓ TPN-16.21 | PEC/OT | — | normal | — | — | — | normal | normal | Moderate | 100% LKTR remains |
| ✓ TPN-16.22 | PEC/OT | — | normal | — | — | — | normal | normal | none | 5% inverts. |
| ✓ TPN-16. 09 | PEC/OT | — | normal | — | — | — | normal | normal | low | MT. |
| ✓ TPN-16. 12 | PEC/OT | — | normal | — | — | — | normal | normal | low | 20% chironomids/ inverts. |
| ✓ TPN-16.13 | PEC/OT | — | normal | — | — | — | normal | normal | low | MT. |
| ✓ TPN-16. 14 | PEC/OT. | — | normal | — | — | — | normal | normal | low | 30% fish/chironomids |
| ✓ TPN-16. 17 | PEC/OT | — | normal | — | — | — | normal | normal | low | 10% inverts (diptera) |
| ✓ TPN-16. 29 | PEC/OT | — | normal. | — | — | — | normal | normal | moderate | 50% inverts. (chiron/diptera) |
| ✓ TPN-16. 25 | PEC/OT | — | normal | — | — | — | normal | normal | low | MT. |
| ✓ TPN-16.26 | PEC/OT | — | normal | — | — | — | normal | normal | low | 20% fish + invert remains. |
| ✓ TPN-16.27 | PEC/OT | — | normal | — | — | — | normal | normal | low • | MT |
| ✓ TPN-16.28 | PEC/OT | — | normal | *wt of all eggs: 1664g | — | — | 3759, 3760, 3761. (photos) | normal | low | MT photo 3762 |

3754 - 3758

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

Slightly
lightly colored

5/18

## 2011 EEM for Meadowbank Gold Mine: *DETAILED BIOLOGICAL ANALYSIS LAB SHEET*

Recorder: Claire

Date: Aug 15/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ TPN-22.02 | PEC/OT | – | Normal | – | – | – | Normal | Normal | None | 20% ; UNID fish |
| ✓ TPN-22.03 | PEC/OT | – | NORMAL | – | – | – | NORMAL | NORMAL | 1 cyst | 20% ; chiron |
| ✓ TPN-23.01 | PEC/OT | – | NORMAL | – | – | – | Parasite CYST | NORMAL | 1 cyst (liver | 80% ; zoo |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

2011 EEM for Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Susan Hertam

Date: August 16, 2011

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| TPN-24.09 | PEC, OT | — | normal | — | — | — | normal | light parasites. stomach. | light cysts. | 10% Trichopteran w/ win pupae. |
| TPN-25.07 | OT | — | normal. | — | — | — | 1 cyst/ tumor. | normal | none. | 10% zoo |
| TPN-25.03 | OT | — | normal | — | — | — | normal | normal | mod-heavy cysts. | empty. |
| TPN-25.02 | PEC, OT | — | normal | — | — | — | normal | normal | low, | 20% trichopterans |
| TPN-25.01 | PEC, OT | — | normal | — | — | — | normal | normal | low cysts | 50% fish remains + chironomids. |
| TPN-24.05 | PEC, OT | — | normal | — | — | — | light mottled | normal | low cysts. | MT |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

entered MJ

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Laura

Date: Aug 17/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 40 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ INUG-01.12 | OTO/PEC | 24.64 | normal | 0.89 | | 7.25 | normal | none | none | 100% clam shrimp<br>chironomid<br>zooplankton; ostracods |
| ✓ INUG-01.13 | OTO/PEC | 22.20 | normal | 0.94 | | 8.73 | normal | none | none | 80% " |
| ✓ INUG-01.14 | OTO/PEC | 11.13 | normal | 0.97 | | 4.38 | normal | none | none | 100% " |
| ✓ INUG-01.15 | OTO/PEC | 3.28 | normal | — | — | 1.60 | normal | none | none | 60% " |
| ✓ INUG-01.08 | OTO/PEC | — | normal | — | — | 13.75 | normal | none | low | MT |
| ✓ INUG-01.16 | OTO/PEC | — | normal | — | — | 11.44 | normal | none | high | MT |
| ✓ INUG-01.17 | OTO/PEC | 31.24 | Normal | — | — | 11.39 | normal | none | low | 70% clam shrimp |
| ✓ INUG-01.18 | OTO/PEC | 30.91 | normal | 0.99 | | 9.98 | normal | none | none | MT |
| ✓ INUG-01.19 | OTO/PEC | 32.28 | normal | — | — | 8.14 | normal | none | none | 10% clam shrimp |
| ✓ INUG-01.20 | OTO/PEC | 22.03 | normal | — | — | 2.21 | normal | none | none | 50% clamshrimp<br>ostracods |
| ✓ INUG-01.21 | OTO/PEC | 25.02 | normal | — | — | 2.58 | normal | none | none | MT |
| ✓ INUG-01.22 | OTO/PEC | 16.86 | normal | 0.97 | | 2.65 | normal | none | none | 50% clamshrimp |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

8/18

entered SH

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

**Recorder:** Laura

**Date:** Aug 17/11

| **Fish Sample ID (from field data sheet)** | **Age Structure** | **Gonad weight (g)** | **Gonad appearance** | **Weight of ~~100~~ 400 eggs (g)** | **Total # of eggs** | **Liver weight (g)** | **Liver appearance** | **Internal DELT** | **Internal parasites?** | **Stomach contents (identifiable items; fullness)** |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ INUG-02.15 | OTO/PEC | 0.42 | normal | — | — | 5.06 | normal | none | moderate | 10% fish remains (salmonis) |
| ✓ INUG-02.14 | OTO/PEC | 33.69 | normal | 1.25 | | 10.06 | normal | none | no. | 100% full clam shrimp chironomids/clams |
| ✓ INUG-02.06 | OTO/PEC | — too small | normal | — | — | 1.45 | normal | none | low | 50% Full Fish remains / [illegible] |
| ✓ INUG-02.05 | OTO/PEC | too Small | normal | — | — | 0.86 | a couple parasitic cysts | none. | low | MT |
| ✓ INUG-02.04 | OTO/PEC | 0.07 | normal | — | — | 0.79 | normal | none | no. | 80% clam shrimp. |
| ✓ INUG-02.13 | OTO/PEC | 0.36 | normal | — | — | 2.15 | normal | none | low | 40% zooplankton |
| ✓ INUG-02.08 | OTO/PEC | 1.15 | normal | — | — | 2.26 | normal | none. | none | 80% clams, chironomids. clam shrimp |
| INUG-02.21 | OTO/PEC | too small | normal | — | — | 0.45 | normal | none | moderate | 70% chironomid + sculpin. |
| ✓ INUG-02.16 | OTO/PEC | 35.53 | normal | — | — | 59.68 | normal | none | low | 90% LKTR. (1 large) 1 other fish. (un) |
| ✓ INUG-02.17 | OTO/PEC | 1.69 | normal | — | — | 14.49 | normal | none | moderate | 40% fish remains |
| ✓ INUG-02.18 | OTO/PEC | 12.10 | normal | — | — | 20.44 | normal | none | low | 100% clam shrimp fish; ephemeroptera; ostracods |
| ✓ INUG-01.09 | OTO/PEC | — | normal | — | — | 12.0 | normal | none | moderate | MT |
| ✓ INUG-01.10 | OTO/PEC | — | normal | — | — | 3.26 | normal | none | low | 80% clam shrimp |
| ✓ INUG-01.11 | OTO/PEC | 23.72 | normal | — | — | 5.13 | normal | none | none | 70% clam shrimp chironom, zooplankton; ostracods. |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

9/18

entered 8/11, MJ

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Claire Hrenchuk

Date: Aug 17/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ eggs 400 (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ INUG-05.01 | PEC/OT | 23.09 | NORMAL | 0.92 | – | 8.23 | NORMAL | NORMAL | NONE | 50%; Clam shrimp |
| ✓ INUG-03.01 | PEC/OT | 19.23 | NORMAL | 0.91 | – | 6.85 | NORMAL | NORMAL | NONE | 30%; cladocera clam shrimp |
| ✓ INUG-04.03 | PEC/OT | — | NORMAL | — | — | 4.15 | NORMAL | NORMAL | MOD cysts | 20% fish remains |
| ✓ INUG-05.05 | PEC/OT | — | NORMAL | – | – | 14.84 | NORMAL | NORMAL | MODERATE | EMPTY |
| ✓ INUG-05.06 | PEC/OT | – | NORMAL | — | — | 20.73 | slightly light coloured | NORMAL | NONE | 30%; Fish remains wasp (hymenoptera) |
| ✓ INUG-05.07 | PEC/OT | – | NORMAL | — | — | 68.46 | Discoloured + blotchy | NORMAL | MODERATE | 80%; Fish remains |
| ✓ INUG-05.08 | PEC/OT | – | NORMAL | – | — | 13.00 | NORMAL | NORMAL | HEAVY | 20%; Clam shrimp |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

Aug 18/11

| Fish Sample ID | Age Struct | Gonad Weight | Gonad App | Weight 400 eggs | total # | Liver Weight | Liv app | Int Delt | Parasites | Stomach |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ INUG-07.09 | PEC/OT | – | NORMAL | – | – | 2.18 | Normal | NORMAL | LOW | EMPTY |
| ✓ INUG-07.10 | PEC/OT | – | NORMAL | – | – | 1.24 | NORMAL | NORMAL | LOW | EMPTY |
| ✓ INUG-07.12 | PEC/OT | – | NORMAL | – | – | 1.32 | NORMAL | NONE | Moderate | EMPTY |
| ✓ INUG-07.01 | PEC/OT | – | NORMAL | – | – | 14.24 | NORMAL | NONE | Low | 50%; clam shrimp |
| ✓ INUG-07.03 | PEC/OT | – | NORMAL | – | – | 8.63 | NORMAL | NONE | LOW | 100%; mammal (pic=3769 !! |
| ✓ INUG-07.06 | PEC/OT | – | NORMAL | – | – | 1.56 | NORMAL | NONE | Moderate | 90%; clam shrimp |
| ✓ INUG-07.15 | (PEC)<br>PEC/OT | – | NORMAL | – | – | 0.46 | NORMAL | NONE | HIGH | 20%; Zoo |
| ✓ INUG-08.06 | PEC/OT | – | NORMAL | – | – | 1.93 | NORMAL | NONE | Moderate | EMPTY |
| ✓ INUG-08.15 | PEC/OT | – | NORMAL | – | – | 1.49 | NORMAL | NONE | LOW | 30%; fish |
| ✓ INUG-08.04 | (one only)<br>PEC/OT | 20.21 | NORMAL | 1.06 | – | 6.54 | NORMAL | NONE | NONE | 40%; Clamshrim chiron |
| ✓ INUG-08.05 | PEC/OT | 21.40 | normal | – | – | 3.39 | normal | none | none | 60%; clamshrimp ostracods chir |
| ✓ INUG-08.08 | PEC/OT | 15.71 | NORMAL | – | – | 4.07 | NORMAL | NONE | NONE | 60%; clam shrimp ostracods |

Aug [illegible]/11

| Fish Sample | Age Struct | Gonad Weight | Gonad App | Weight of 400 eggs | total# | Liver Weight | Liv App | Int DELT | Parasites | Stomach |
|---|---|---|---|---|---|---|---|---|---|---|
| √ INUG-08.09 | PEC/OT | 14.39 | NORMAL | — | — | 4.36 | NORMAL | NONE | NONE | 30%; clam shrimp, ostra chiron |
| √ INUG-08.11 | PEC/OT | 15.85 | NORMAL | 0,79 | — | 4.19 | NORMAL | NONE | NONE | 30%; Clam Ship, ostracod chiron |
| √ INUG-08.12 | PEC/OT | 14.11 | normal | 6,73 |  | 6.88 | normal | none | none | 10%; Clam shrimp |
| √ INUG-08.13 | PEC/OT | [illegible] | normal | — | — | 1,10 | normal | none | none | 10%; chir |
| √ INUG-08.14 | PEC/OT | [illegible] | normal | — | — | 1,81 | normal | none | none | 20%; chir Clam shr |
| √ INUG-08.17 | PEC/OT | 42.79 | NORMAL | — | — | 11.20 | NORMAL | NONE | MODERATE | 50%; Clam shrimp, ostracods |
| √ INUG-08.18 | PEC/OT | — | NORMAL | — | — | 19.25 | NORMAL | NONE | MODERATE | 40%; fish (trout) |
| √ INUG-08.19 | PEC/OT | — | NORMAL | — | — | 18.81 | NORMAL | NONE | MODERATE | 30%; Clam shrimp |
| √ INUG-08.20 | PEC/OT | 194.43 | NORMAL | 35.08 | — | 34.39 | NORMAL | NONE | LOW | EMPTY |
| √ INUG-08.16 | PEC/OT | 4,06 | normal | — | — | 3,65 | normal | none | none | 10% Clam Shrimp |
| √ INUG-10.04 | PEC/OT | ~~35.08~~ | NORMAL | — | — | 16.49 | NORMAL | NONE | LOW | EMPTY |
| √ INUG-10.02 | PEC/OT | 191.21 | NORMAL | 29.07 | — | 40.93 | NORMAL | NONE | LOW | 20%; clam shrimp |
| √ INUG-09.04 | PEC/OT | 27,82 | normal | — | — | 4.16 | normal | none | none | 30%: clam shrimp ostracods, chi |
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8/18

entered SH, MJ

2011 EEM for Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Claire Hrenchuk

Date: Aug 19/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| INUG-14.13 | pec/OT | – | NORMAL | – | – | 44.09 | NORMAL | NONE | ~~LOW~~ HIGH | EMPTY |
| INUG-14.15 | PEC/OT | 22.60 | NORMAL | 29.57 | – | 42.75 | NORMAL | NONE | LOW | 50%; clam Shrip |
| INUG 14.16 | PEC/OT | – | normal | – | – | 16.11 | normal | none | low | 60%; clam shrimp |
| INUG-14.18 | PEC/OT | – | NORMAL | – | – | 17.06 | NORMAL | NONE | LOW | 40%; fish (burb) |
| INUG-14.19 | PEC/OT | – | NORMAL | – | – | 8.68 | NORMAL | NONE | LOW | 50%; Clam shrimp |
| INUG-14.11 | PEC/OT | 15.11 | NORMAL | – | – | 3.34 | NORMAL | NONE | NONE | 70%; chiron |
| INUG-14.14 | PEC/OT | 14.75 | NORMAL | – | – | 3.32 | NORMAL | NONE | NONE | 10%; clam shrimp chiron |
| INUG-14.01 | PEC/OT | – | NORMAL | – | – | 2.54 | NORMAL | NONE | MODERATE | 20%; fish ~~clam shrimp~~ ~~chiron~~ zoo; tape worm; |
| INUG-14.03 | PEC/OT | – | NORMAL | – | – | 5.37 | NORMAL | NONE | LOW | 20%; fish (sculpin |
| INUG-14.05 | PEC/OT | – | NORMAL | – | – | 1.34 | NORMAL | NONE | LOW | 10%; fish |
| INUG-14.02 | PEC/OT | 27.85 | NORMAL | * 1.81<br>pic 3782,3,4 | – | 10.01 | NORMAL | NONE | LOW | 30%; clam shr, ostracods |
| INUG-14.08 | PEC/OT | 12.54 | NORMAL | – | – | 3.86 | NORMAL | NONE | NONE | 20%; trichop, zoo → photo #3780,378 |
| INUG-14.09 | PEC/OT | 16.42 | NORMAL | – | – | 5.46 | NORMAL | NONE | NONE | 30%; Clam shr. ostracods |
| INUG-14.10 | PEC/OT | 7.99 | NORMAL | | | 3.25 | NORMAL | NONE | NONE | 40%; clam shr. ostra trichop |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

13/18

**2011 EEM for Meadowbank Gold Mine: *DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

entered SH+MJ

Recorder: Claire

Date: Aug 19/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| INUG-13.10 | PEC/OT | — | NORMAL | — | — | 4.54 | NORMAL | NONE ~~NORMAL~~ | HIGH | 30% clam shrimp |
| INUG-13.09 | PEC/OT | 20.66 | NORMAL | — | — | 4.70 | NORMAL | NONE ~~NORMAL~~ | NONE | EMPTY |
| INUG-13.12 | PEC/OT | 22.18 | NORMAL | * 0.47 | — | 5.53 | NORMAL | NONE ~~NORMAL~~ | NONE | 20% ; clam shrims ostracods |
| INUG-13.14 | (ONE) PEC/OT | 12.68 | NORMAL | — | — | 4.27 | NORMAL | NONE | NONE | EMPTY |
| INUG-13.05 | PEC/OT | — | NORMAL | — | — | 41.68 | NORMAL | NONE | LOW | EMPTY |
| INUG-13.07 | PEC/OT | — | NORMAL | — | — | 16.56 | NORMAL | NONE | MODERATE | 30% ; Clam shrimp |
| INUG-13.02 | PEC/OT | 20.68 | NORMAL | — | — | 4.81 | NORMAL | NONE | NONE | 20% ; clam shrimp zoo inverts |
| INUG-13.04 | PEC/OT | 28.80 | NORMAL | — | — | 3.0 | NORMAL | NONE | NONE | 10% ; trichop clam shrimp |
| INUG-13.18 | PEC/OT | 23.62 | NORMAL | — | — | 4.62 | NORMAL | NONE | NONE | 20% ; Clam shrimp ostracods |
| INUG-13.17 | PEC/OT | 117.88 | NORMAL | 22.98 | — | 21.07 | NORMAL | NONE | MODERATE | 40% ; clam shrimp |
| INUG-13.19 | PEC/OT | 17.00 | NORMAL | 0.85 | — | 5.37 | NORMAL | NONE | LOW | 40% ; clam shrimp zoo |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

14/18

entered SH, MJ

2011 EEM for Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

Recorder: Claire

Date: Aug 17/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| PD-01.03 | PEC/OT | 28.77 | NORMAL | 0.84 | – | 11.82 | NORMAL | Lots of fat in body cavity<br>NORMAL | NONE | 80%; Chiron, zoo |
| PD-04.04 | PEC/OT | 29.98 | NORMAL | 0.91 | – | 8.39 | NORMAL | LOTS of fat<br>NORMAL | NONE | 90%; chiron, Trichop |
| PD-01.14 | PEC/OT | – | normal | – | – | 1.89 | normal. | none. | none | 80%; zooplankton |
| PD-01.15 | PEC/OT | – | NORMAL | – | – | 2.15 | CYST | CYST IN LIVER | very low | 70%; zoo |
| PD-01.16 | PEC/OT | – | NORMAL | – | – | 0.93 | NORMAL | NORMAL | LOW | 96%; Fish Remains |
| PD-01.17 | PEC/OT | – | NORMAL | – | – | 1.14 | NORMAL | NORMAL | MODERATE | 90%; Fish remains, chiron |
| PD-02.01 | PEC/OT | – | NORMAL | – | – | 2.79 | NORMAL | NONE | Low | EMPTY |
| PD-02.02 | PEC/OT | – | NORMAL | – | – | 1.62 | NORMAL | NONE | LOW | EMPTY |
| PD-01.07 | PEC/OT | 17.76 | NORMAL | 0.76 | – | 8.84 | NORMAL | Lots of fat<br>NORMAL | NONE | 90%; trichop, chiron |
| PD-01.08 | PEC/OT | – | NORMAL | – | – | 1.19 | NORMAL | lots of fat<br>NORMAL | NONE | EMPTY |
| PD-01.06 | PEC/OT | – | NORMAL | – | – | 4.52 | NORMAL | NORMAL | LOW | EMPTY |
| PD-01.09 | PEC/OT | – | NORMAL | – | – | 1.70 | NORMAL | NORMAL | MODERATE (CESTODES) | 5%; cestode |
| PD-01.10 | PEC/OT | – | NORMAL | – | – | 1.93 | Parasite cyst<br>NORMAL | NORMAL | LOW | 20%; unknown |
| PD-01.11 | PEC/OT | – | NORMAL | – | – | 1.79 | NORMAL | NORMAL | LOW | EMPTY |

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

entered SH, MJ

**2011 EEM for Meadowbank Gold Mine:** ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

PIPEDREAM

Recorder: Laura

Date: Aug 18/11

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓PD-04.11 | PEC/OTO | — | normal | — | — | 0.50 | normal | none | low | 20% chironomid/ other inverts. UNID |
| ✓PD-04.12 | PEC/OTO | — | normal | — | — | 0.68 | pic. 3771<br>cyst | cyst on liver. | low | MT |
| ✓PD-04.13 | PEC/OTO | — | normal | — | — | 0.83 | normal | none. | moderate | MT |
| ✓PD-04.08 | PEC/OTO | — | normal | — | — | 3.22 | normal | none | moderate | 100% fish LKTR. Remains. |
| ✓PD-04.09 | PEC/OTO | — | normal | — | — | 5.84 | normal | none | low | 80% fish remains (1 sculpin) |
| PD-04.14 | PEC/OTO | — | normal | — | — | 0.22 | normal | none | none | MT |
| ✓PD-04.04 | PEC/OTO | — | normal | — | — | 20.51 | normal | none | low | 10% Sculpin. fish remains |
| ✓PD-04.05 | PEC/OTO | ~~75.14~~ | pic 3773<br>normal | — | — | 16.11 | normal | none | low | 20% inverts (diptera) & fish remains UNID |
| ✓PD-04.06 | PEC/OTO | 236 | normal | 30.52 | - | 45.07 | normal | none | low | 10% inverts (diptera) |
| ✓PD-03.06 | PEC/OTO | ~~246~~ | normal | — | — | 1.79 | normal | none. | low | 10% zooplankton |
| ✓PD-03.12 | PEC/OTO | ~~2.22~~. | normal. | — | — | 2.22 | normal | none | low | 30% zooplankton. |
| ✓PD-03.13 | PEC/OTO | — | normal. | — | — | 1.13 | normal | none. | low | empty. |
| ✓PD-03.14 | PEC/OTO | — | normal | — | — | 1.05 | normal | none | Mod | 10% inverts (diptera) |
| ✓PD-03.02 | PEC/OTO | — | normal | — | — | 1.79 | normal | none | low | 60% fish remains. |

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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

2011 EEM for Meadowbank Gold Mine: *DETAILED BIOLOGICAL ANALYSIS LAB SHEET*

entered SM, MJ.

PIPEDREAM

Recorder: Susan.

Date: August 18, 2011

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of ~~100~~ 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| PD-03.03 | PEC/OT | — | normal | — | — | 2.33 | normal. | none | *cestodes low. | 50% ostracods tapeworms. |
| PD-03.08 | PEC/OT | 24.87 | normal | — | — | 4.62 | normal | none | none | 20% trichoptera, diptera. |
| PD-03.04 | PEC/OT | — | normal | — | — | 9.91 | 1 parasite. cyst | none. | low. | empty. |
| PD-03.05 | PEC/OT | 71.31 | normal | 11.26 | — | 28.85 | normal | none. | low. | empty |
| PD-03.09 | PEC/OT | — | normal | — | — | 14.21 | normal | none | low. | empty. |
| PD-03.18 | PEC/OT | 48.78 | normal | — | — | 5.93 | normal. | none | none. | 10% tricopterans. |
| PD-03.15 | PEC/OT | 230. | normal | 27.33 | — | 49.74 | normal | none. | mod. | empty. |
| PD-03.16 | PEC/OT | — | normal. | — | — | 16.05 | 1 parasite cyst | none. | low | 5% diptera. |
| PD-03.17 | PEC/OT | 76.63 | normal | — | — | 15.97 | 1 parasite. cyst | none | none. | empty. |
| PD-03.20 | PEC/OT | 62.71 | normal | — | — | 19.23 | normal | none. | low. | 10% fish remains |
| PD-08.01a | PEC/OT | 390 | normal | 35.19 | — | 68.74 | normal | none. | mod. | empty. |
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**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

17/18

2011 EEM f Meadowbank Gold Mine: ***DETAILED BIOLOGICAL ANALYSIS LAB SHEET***

entered
SH, MJ.

Recorder: Sue

Date: August 19, 2011

| Fish Sample ID (from field data sheet) | Age Structure | Gonad weight (g) | Gonad appearance | Weight of 400 eggs (g) | Total # of eggs | Liver weight (g) | Liver appearance | Internal DELT | Internal parasites? | Stomach contents (identifiable items; fullness) |
|---|---|---|---|---|---|---|---|---|---|---|
| ✓ PD-08.01 | PEC/OT | — | normal | — | — | 2.02. | normal | none. | low. | 30% zooplankton |
| ✓ PD-07.03 | PEC/OT | 10.27 | normal | 0.92 | - | 4.83 | parasitic cyst | none | low (just the liver) | 60% tricopterans diptera |
| ✓ PD-08.05 | PEC/OTO | — | normal | — | — | 1.23 | normal | none | low. | 10% zooplankton |
| ✓ PD-08.06 | PEC/OTO | — | normal | — | — | 0.72 | normal | none | low | 30% fish remains sculpin |
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pic
3779
gonads

claire's
pic 116, 117, 118
sue's 3777
3778

**Age Structure Codes:**

**PEL** = Pelvic fin; **PEC** = Pectoral fin; **DR** = Dorsal ray; **OTO** = Otolith

18/18

# APPENDIX H

# FISH DATABASE

| Lake | Set ID | Date | Mesh Size (mm) | Day/Night | Species | Sample ID | Mortality | Length.mm | Weight.g | K |
|---|---|---|---|---|---|---|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | 38 | Day | ARCH | TPN-03.03 | N | 214 | 100 | 1.020372346 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | ARCH | TPN-05.07 | Y | 272 | 190 | 0.944162808 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | ARCH | TPN-05.09 | Y | 275 | 216 | 1.038617581 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | ARCH | TPN-05.11 | Y | 338 | 390 | 1.009984029 |
| TPN | TPN-06a | 13-Aug-11 | 102 | Night | ARCH | TPN-06.04 | N | 581 | 2025 | 1.03251562 |
| TPN | TPN-06a | 13-Aug-11 | 102 | Night | ARCH | TPN-06.06 | N | 576 | 2150 | 1.12504789 |
| TPN | TPN-06a | 13-Aug-11 | 76 | Night | ARCH | TPN-06.08 | Y | 345 | 454 | 1.105601369 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | ARCH | TPN-06.11 | Y | 488 | 1125 | 0.96803945 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | ARCH | TPN-06.17 | Y | 201 | 78 | 0.96052004 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | ARCH | TPN-06.19 | Y | 218 | 90 | 0.868706415 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | ARCH | TPN-06.20 | Y | 257 | 146 | 0.860108988 |
| TPN | TPN-06a | 13-Aug-11 | 25 | Night | ARCH | TPN-06.24 | N | 115 | | |
| TPN | TPN-06a | 13-Aug-11 | 25 | Night | ARCH | TPN-06.25 | N | 136 | | |
| TPN | TPN-06b | 13-Aug-11 | 102 | Day | ARCH | TPN-06.26 | N | 577 | 2125 | 1.1061945 |
| TPN | TPN-10 | 14-Aug-11 | 25 | Night | ARCH | TPN-10.02 | N | 135 | 25 | 1.016105269 |
| TPN | TPN-10 | 14-Aug-11 | 25 | Night | ARCH | TPN-10.03 | Y | 126 | 20 | 0.999812035 |
| TPN | TPN-10 | 14-Aug-11 | 25 | Night | ARCH | TPN-10.04 | Y | 134 | 24 | 0.997463119 |
| TPN | TPN-10 | 14-Aug-11 | 25 | Night | ARCH | TPN-10.05 | Y | 135 | 20 | 0.812884215 |
| TPN | TPN-10 | 14-Aug-11 | 38 | Night | ARCH | TPN-10.07 | N | 580 | 2050 | 1.050678585 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | ARCH | TPN-10.12 | Y | 310 | 300 | 1.007015542 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | ARCH | TPN-10.15 | Y | 302 | 294 | 1.067398287 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | ARCH | TPN-10.16 | Y | 256 | 168 | 1.001358032 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | ARCH | TPN-10.17 | N | 340 | 450 | 1.144921636 |
| TPN | TPN-11a | 14-Aug-11 | 76 | Night | ARCH | TPN-11.07 | N | 378 | 650 | 1.20347745 |
| TPN | TPN-16a | 14-Aug-11 | 126 | Day | ARCH | TPN-16.01 | N | 604 | 2425 | 1.100527571 |
| TPN | TPN-16b | 15-Aug-11 | 102 | Night | ARCH | TPN-16.19 | N | 558 | 1800 | 1.03602422 |
| TPN | TPN-23 | 15-Aug-11 | 76 | Day | ARCH | TPN-23.01 | Y | 596 | 1926 | 0.909740446 |
| TPN | TPN-24b | 16-Aug-11 | 51 | Night | ARCH | TPN-24.03 | N | 284 | 225 | 0.98226235 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | ARCH | TPN-25.03 | Y | 284 | 236 | 1.030284065 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | ARCH | TPN-25.06 | N | 278 | 230 | 1.070516704 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | ARCH | TPN-25.07 | Y | 233 | 122 | 0.964477427 |
| TPN | TPN-25 | 16-Aug-11 | 76 | Night | ARCH | TPN-25.09 | N | 585 | 1675 | 0.836656546 |
| TPN | TPN-25 | 16-Aug-11 | 76 | Night | ARCH | TPN-25.11 | N | 416 | 825 | 1.145971869 |
| TPN | TPN-01 | 11-Aug-11 | 102 | Day | LKTR | TPN-01.01 | Y | 567 | 1800 | 0.987468677 |
| TPN | TPN-01 | 11-Aug-11 | 76 | Day | LKTR | TPN-01.02 | N | 560 | 1700 | 0.968021137 |
| TPN | TPN-01 | 11-Aug-11 | 51 | Day | LKTR | TPN-01.03 | N | 517 | 1400 | 1.013109543 |
| TPN | TPN-02 | 11-Aug-11 | 51 | Day | LKTR | TPN-02.02 | N | 498 | 1225 | 0.991854711 |
| TPN | TPN-02 | 11-Aug-11 | 25 | Day | LKTR | TPN-02.04 | N | 123 | 50 | 2.686919592 |
| TPN | TPN-03 | 11-Aug-11 | 76 | Day | LKTR | TPN-03.01 | N | 527 | 1700 | 1.161494281 |
| TPN | TPN-03 | 11-Aug-11 | 51 | Day | LKTR | TPN-03.02 | N | 575 | 2050 | 1.078326621 |
| TPN | TPN-05a | 13-Aug-11 | 126 | Night | LKTR | TPN-05.01 | Y | 518 | 1418 | 1.020203835 |
| TPN | TPN-05a | 13-Aug-11 | 126 | Night | LKTR | TPN-05.02 | Y | 503 | 1150 | 0.903636751 |
| TPN | TPN-05a | 13-Aug-11 | 126 | Night | LKTR | TPN-05.03 | Y | 392 | 605 | 1.004377959 |
| TPN | TPN-05a | 13-Aug-11 | 76 | Night | LKTR | TPN-05.04 | N | 567 | 1425 | 0.781746036 |
| TPN | TPN-05a | 13-Aug-11 | 76 | Night | LKTR | TPN-05.05 | N | 690 | 3100 | 0.943657556 |
| TPN | TPN-05a | 13-Aug-11 | 76 | Night | LKTR | TPN-05.06 | N | 345 | 400 | 0.974098122 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.08 | Y | 190 | 50 | 0.728969237 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.10 | N | 294 | 225 | 0.885402058 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.12 | Y | 250 | 144 | 0.9216 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.13 | Y | 301 | 278 | 1.019401596 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.14 | N | 190 | 50 | 0.728969237 |
| TPN | TPN-05a | 13-Aug-11 | 51 | Night | LKTR | TPN-05.15 | Y | 229 | 118 | 0.982597286 |
| TPN | TPN-05a | 13-Aug-11 | 25 | Night | LKTR | TPN-05.16 | Y | 120 | | |
| TPN | TPN-05a | 13-Aug-11 | 25 | Night | LKTR | TPN-05.17 | N | 126 | 50 | 2.499530088 |
| TPN | TPN-05a | 13-Aug-11 | 25 | Night | LKTR | TPN-05.18 | Y | 130 | | |
| TPN | TPN-05a | 13-Aug-11 | 25 | Night | LKTR | TPN-05.19 | N | 771 | 5000 | 1.090955083 |
| TPN | TPN-05b | 13-Aug-11 | 38 | Day | LKTR | TPN-05.20 | N | 748 | 4450 | 1.06329854 |
| TPN | TPN-05b | 13-Aug-11 | 102 | Day | LKTR | TPN-05.21 | Y | 506 | 1620 | 1.250441746 |
| TPN | TPN-05c | 13-Aug-11 | 51 | Day | LKTR | TPN-05.23 | N | 539 | 1625 | 1.037736446 |
| TPN | TPN-06a | 13-Aug-11 | 126 | Night | LKTR | TPN-06.01 | N | 565 | 1525 | 0.845521198 |
| TPN | TPN-06a | 13-Aug-11 | 126 | Night | LKTR | TPN-06.02 | Y | 664 | 2944 | 1.005619225 |
| TPN | TPN-06a | 13-Aug-11 | 102 | Night | LKTR | TPN-06.03 | Y | 510 | 1438 | 1.084047614 |
| TPN | TPN-06a | 13-Aug-11 | 102 | Night | LKTR | TPN-06.05 | Y | 538 | 1686 | 1.082706498 |
| TPN | TPN-06a | 13-Aug-11 | 102 | Night | LKTR | TPN-06.07 | N | 535 | 1600 | 1.044861282 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | LKTR | TPN-06.09 | N | 551 | 1750 | 1.046124208 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | LKTR | TPN-06.10 | N | 425 | 700 | 0.911866477 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | LKTR | TPN-06.12 | N | 606 | 1925 | 0.864993535 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | LKTR | TPN-06.13 | N | 547 | 1775 | 1.084517036 |
| TPN | TPN-06a | 13-Aug-11 | 51 | Night | LKTR | TPN-06.14 | Y | 266 | 178 | 0.945747261 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.15 | Y | 231 | 126 | 1.022197008 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.16 | N | 609 | 2450 | 1.084711405 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.18 | Y | 176 | 54 | 0.990502911 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.21 | Y | 169 | 50 | 1.035881055 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.22 | N | 536 | 1525 | 0.990319828 |
| TPN | TPN-06a | 13-Aug-11 | 38 | Night | LKTR | TPN-06.23 | Y | 203 | 74 | 0.884593219 |
| TPN | TPN-06b | 13-Aug-11 | 51 | Day | LKTR | TPN-06.27 | N | 565 | 1875 | 1.039575243 |
| TPN | TPN-06c | 13-Aug-11 | 76 | Day | LKTR | TPN-06.28 | N | 525 | 1475 | 1.019328366 |
| TPN | TPN-06c | 13-Aug-11 | 51 | Day | LKTR | TPN-06.29 | N | 562 | 1725 | 0.97180729 |
| TPN | TPN-06c | 13-Aug-11 | 38 | Day | LKTR | TPN-06.30 | N | 668 | 2900 | 0.972900912 |

| Lake | Set ID | Date | Mesh Size (mm) | Day/Night | Species | Sample ID | Mortality | Length.mm | Weight.g | K |
|---|---|---|---|---|---|---|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | 76 | Day | LKTR | TPN-07.01 | Y | 534 | 1474 | 0.967996334 |
| TPN | TPN-08a | 13-Aug-11 | 76 | Day | LKTR | TPN-08.02 | Y | 503 | 1464 | 1.150368872 |
| TPN | TPN-08a | 13-Aug-11 | 51 | Day | LKTR | TPN-08.03 | Y | 548 | 1720 | 1.045169605 |
| TPN | TPN-08b | 13-Aug-11 | 102 | Day | LKTR | TPN-08.04 | N | 569 | 1950 | 1.058516939 |
| TPN | TPN-08b | 13-Aug-11 | 76 | Day | LKTR | TPN-08.05 | N | 575 | 2025 | 1.065176297 |
| TPN | TPN-08b | 13-Aug-11 | 76 | Day | LKTR | TPN-08.06 | Y | 495 | 1194 | 0.984438817 |
| TPN | TPN-08b | 13-Aug-11 | 51 | Day | LKTR | TPN-08.07 | Y | 633 | 2470 | 0.973835996 |
| TPN | TPN-08b | 13-Aug-11 | 38 | Day | LKTR | TPN-08.08 | N | 915 | 9050 | 1.181368256 |
| TPN | TPN-08b | 13-Aug-11 | 38 | Day | LKTR | TPN-08.09 | N | 549 | 1875 | 1.133141744 |
| TPN | TPN-10 | 14-Aug-11 | 25 | Night | LKTR | TPN-10.01 | N | 579 | 1900 | 0.978853977 |
| TPN | TPN-10 | 14-Aug-11 | 38 | Night | LKTR | TPN-10.06 | N | 535 | 1500 | 0.979557452 |
| TPN | TPN-10 | 14-Aug-11 | 38 | Night | LKTR | TPN-10.09 | Y | 222 | 102 | 0.932269011 |
| TPN | TPN-10 | 14-Aug-11 | 38 | Night | LKTR | TPN-10.10 | Y | 186 | 61 | 0.947962161 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.11 | N | 530 | 1750 | 1.175466996 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.13 | Y | 385 | 574 | 1.005841856 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.14 | Y | 252 | 162 | 1.012309686 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.18 | N | 268 | 170 | 0.88317047 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.19 | Y | 252 | 162 | 1.012309686 |
| TPN | TPN-10 | 14-Aug-11 | 51 | Night | LKTR | TPN-10.20 | Y | 179 | 50 | 0.871788049 |
| TPN | TPN-10 | 14-Aug-11 | 76 | Night | LKTR | TPN-10.21 | Y | 203 | 80 | 0.956316994 |
| TPN | TPN-10 | 14-Aug-11 | 76 | Night | LKTR | TPN-10.22 | Y | 502 | 1406 | 1.111409665 |
| TPN | TPN-10 | 14-Aug-11 | 76 | Night | LKTR | TPN-10.23 | Y | 569 | 1944 | 1.055259964 |
| TPN | TPN-10 | 14-Aug-11 | 76 | Night | LKTR | TPN-10.24 | N | 467 | 1200 | 1.178231432 |
| TPN | TPN-10 | 14-Aug-11 | 102 | Night | LKTR | TPN-10.25 | Y | 601 | 2214 | 1.019892036 |
| TPN | TPN-10 | 14-Aug-11 | 102 | Night | LKTR | TPN-10.26 | Y | 535 | 1424 | 0.929926541 |
| TPN | TPN-11a | 14-Aug-11 | 51 | Night | LKTR | TPN-11.01 | Y | 255 | 160 | 0.964938071 |
| TPN | TPN-11a | 14-Aug-11 | 51 | Night | LKTR | TPN-11.02 | Y | 513 | 1350 | 0.999957802 |
| TPN | TPN-11a | 14-Aug-11 | 51 | Night | LKTR | TPN-11.03 | Y | 561 | 1735 | 0.982677235 |
| TPN | TPN-11a | 14-Aug-11 | 51 | Night | LKTR | TPN-11.04 | N | 224 | 150 | 1.334587965 |
| TPN | TPN-11a | 14-Aug-11 | 76 | Night | LKTR | TPN-11.05 | Y | 543 | 1670 | 1.043078473 |
| TPN | TPN-11a | 14-Aug-11 | 76 | Night | LKTR | TPN-11.08 | Y | 503 | 1408 | 1.106365691 |
| TPN | TPN-11a | 14-Aug-11 | 76 | Night | LKTR | TPN-11.09 | Y | 432 | 806 | 0.999732479 |
| TPN | TPN-11c | 14-Aug-11 | 51 | Night | LKTR | TPN-11.10 | Y | 268 | 153 | 0.794853423 |
| TPN | TPN-11c | 14-Aug-11 | 51 | Night | LKTR | TPN-11.11 | N | 652 | 3225 | 1.16355504 |
| TPN | TPN-11c | 14-Aug-11 | 51 | Night | LKTR | TPN-11.12 | N | 608 | 2400 | 1.067826031 |
| TPN | TPN-14 | 14-Aug-11 | 76 | Day | LKTR | TPN-14.01 | N | 497 | 1260 | 1.026363925 |
| TPN | TPN-16a | 14-Aug-11 | 102 | Day | LKTR | TPN-16.02 | N | 629 | 2125 | 0.85389997 |
| TPN | TPN-16a | 14-Aug-11 | 76 | Day | LKTR | TPN-16.03 | N | 590 | 1750 | 0.852083222 |
| TPN | TPN-16a | 14-Aug-11 | 76 | Day | LKTR | TPN-16.04 | Y | 585 | 2000 | 0.99899289 |
| TPN | TPN-16b | 15-Aug-11 | 38 | Night | LKTR | TPN-16.05 | N | 175 | 60 | 1.119533528 |
| TPN | TPN-16b | 15-Aug-11 | 38 | Night | LKTR | TPN-16.06 | Y | 184 | 58 | 0.931053259 |
| TPN | TPN-16b | 15-Aug-11 | 51 | Night | LKTR | TPN-16.07 | N | 275 | 190 | 0.913598798 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.08 | N | 502 | 1450 | 1.146190622 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.09 | Y | 610 | 1625 | 0.715918954 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.10 | N | 562 | 1850 | 1.042228108 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.11 | N | 536 | 1725 | 1.120197838 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.12 | Y | 492 | 1226 | 1.029426069 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.13 | Y | 560 | 1732 | 0.986242711 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.14 | Y | 484 | 1258 | 1.109544069 |
| TPN | **TPN-16b** | **15-Aug-11** | **76** | Night | LKTR | TPN-16.15 | N | 757 | 3825 | 0.881746615 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.17 | Y | 514 | 1438 | 1.058935552 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.18 | N | 752 | 4675 | 1.099330035 |
| TPN | TPN-16b | 15-Aug-11 | 102 | Night | LKTR | TPN-16.20 | N | 515 | 1575 | 1.153078491 |
| TPN | TPN-16b | 15-Aug-11 | 102 | Night | LKTR | TPN-16.21 | Y | 591 | 2100 | 1.017318289 |
| TPN | TPN-16b | 15-Aug-11 | 102 | Night | LKTR | TPN-16.22 | Y | 496 | 1538 | 1.26040845 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.23 | N | 624 | 2975 | 1.224427855 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.24 | N | 544 | 1800 | 1.118087536 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.25 | Y | 670 | 3122 | 1.038026619 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.26 | Y | 548 | 1722 | 1.046384919 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.27 | Y | 786 | 4384 | 0.902823609 |
| TPN | TPN-16b | 15-Aug-11 | 126 | Night | LKTR | TPN-16.28 | Y | 961 | 10294 | 1.159882513 |
| TPN | TPN-16b | 15-Aug-11 | 76 | Night | LKTR | TPN-16.29 | Y | 573 | 1782 | 0.947204677 |
| TPN | TPN-17 | 14-Aug-11 | 76 | Day | LKTR | TPN-17.01 | Y | 506 | 1394 | 1.075997403 |
| TPN | TPN-20 | 15-Aug-11 | 51 | Day | LKTR | TPN-20.01 | N | 241 | 150 | 1.071618324 |
| TPN | TPN-22 | 15-Aug-11 | 76 | Day | LKTR | TPN-22.01 | N | 643 | 2525 | 0.949791905 |
| TPN | TPN-22 | 15-Aug-11 | 76 | Day | LKTR | TPN-22.02 | Y | 598 | 2260 | 1.056829402 |
| TPN | TPN-22 | 15-Aug-11 | 76 | Day | LKTR | TPN-22.03 | Y | 494 | 1498 | 1.242598905 |
| TPN | TPN-22 | 15-Aug-11 | 51 | Day | LKTR | TPN-22.04 | N | 616 | 1600 | 0.684506925 |
| TPN | TPN-22 | 15-Aug-11 | 38 | Day | LKTR | TPN-22.05 | N | 600 | 2450 | 1.134259259 |
| TPN | TPN-24b | 16-Aug-11 | 51 | Night | LKTR | TPN-24.01 | N | 267 | 200 | 1.050742289 |
| TPN | TPN-24b | 16-Aug-11 | 51 | Night | LKTR | TPN-24.02 | N | 410 | 700 | 1.015655606 |
| TPN | TPN-24b | 16-Aug-11 | 51 | Night | LKTR | TPN-24.04 | Y | 313 | 318 | 1.037036655 |
| TPN | TPN-24b | 16-Aug-11 | 76 | Night | LKTR | TPN-24.05 | Y | 727 | 3806 | 0.990525251 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | LKTR | TPN-25.01 | Y | 385 | 630 | 1.103972769 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | LKTR | TPN-25.02 | Y | 346 | 392 | 0.94636304 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | LKTR | TPN-25.04 | N | 593 | 1925 | 0.923138053 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | LKTR | TPN-25.05 | N | 574 | 2175 | 1.150068171 |
| TPN | TPN-25 | 16-Aug-11 | 51 | Night | LKTR | TPN-25.08 | N | 638 | 3025 | 1.164832134 |
| TPN | TPN-25 | 16-Aug-11 | 76 | Night | LKTR | TPN-25.10 | N | 572 | 1725 | 0.921724249 |
| TPN | TPN-10 | 14-Aug-11 | 38 | Night | RNWH | TPN-10.08 | Y | 360 | 550 | 1.178840878 |
| TPN | TPN-11a | 14-Aug-11 | 76 | Night | RNWH | TPN-11.06 | Y | 383 | 618 | 1.099998653 |

| Lake | Set ID | Date | Weighed with 25 g scale | Sex | Maturity | Repro Status | Age Structure | Age.OTO.yr | Age.PEC.yr |
|---|---|---|---|---|---|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | Y | | | | | | |
| TPN | TPN-05a | 13-Aug-11 | N | F | IM | UD | PEC, OTO | 5 | 5 |
| TPN | TPN-05a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 5 | 4 |
| TPN | TPN-05a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 2 | 7 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 10 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 9 |
| TPN | TPN-06a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 8 | 7 |
| TPN | TPN-06a | 13-Aug-11 | Y | F | MA | RS | PEC, OTO | 9 | 8 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 3 | 2 |
| TPN | TPN-06a | 13-Aug-11 | N | F | IM | UD | PEC, OTO | 4 | 2 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 5 | 3 |
| TPN | TPN-06a | 13-Aug-11 | N | | | | | | |
| TPN | TPN-06a | 13-Aug-11 | N | | | | | | |
| TPN | TPN-06b | 13-Aug-11 | Y | | | | | | |
| TPN | TPN-10 | 14-Aug-11 | N (± 1) | | | | | | |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 3 | 1 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 4 | 2 |
| TPN | TPN-10 | 14-Aug-11 | N | | | | PEC, OTO | 3 | 2 |
| TPN | TPN-10 | 14-Aug-11 | Y | | | | PEC | | 10 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | OTO | 6 | |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | OTO | 5 | |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | OTO | 4 | |
| TPN | TPN-10 | 14-Aug-11 | Y | | | | PEC | | 6 |
| TPN | TPN-11a | 14-Aug-11 | Y | | | | PEC | | 5 |
| TPN | TPN-16a | 14-Aug-11 | Y | | | | PEC | | 9 |
| TPN | TPN-16b | 15-Aug-11 | Y | | | | PEC | | 7 |
| TPN | TPN-23 | 15-Aug-11 | N | F | MA | RS | OTO | 11 | |
| TPN | TPN-24b | 16-Aug-11 | Y | | | | PEC | | 4 |
| TPN | TPN-25 | 16-Aug-11 | N | F | IM | UD | OTO | 5 | |
| TPN | TPN-25 | 16-Aug-11 | N (± 10) | | | | PEC | | 5 |
| TPN | TPN-25 | 16-Aug-11 | N | F | IM | UD | OTO | 4 | |
| TPN | TPN-25 | 16-Aug-11 | Y | | | | PEC | | 10 |
| TPN | TPN-25 | 16-Aug-11 | Y | | | | PEC | | 8 |
| TPN | TPN-01 | 11-Aug-11 | Y | F | MA | RS | PEC, OTO | 15 | 17 |
| TPN | TPN-01 | 11-Aug-11 | Y | | | | PEC | | 13 |
| TPN | TPN-01 | 11-Aug-11 | Y | | | | PEC | | 10 |
| TPN | TPN-02 | 11-Aug-11 | Y | | | | PEC | | 11 |
| TPN | TPN-02 | 11-Aug-11 | Y | | | | | | |
| TPN | TPN-03 | 11-Aug-11 | Y | | | | PEC | | 14 |
| TPN | TPN-03 | 11-Aug-11 | Y | | | | PEC | | 13 |
| TPN | TPN-05a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 21 | 10 |
| TPN | TPN-05a | 13-Aug-11 | N | M | MA | RS | PEC, OTO | 19 | 15 |
| TPN | TPN-05a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 14 | 11 |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 16 |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 17 |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 6 |
| TPN | TPN-05a | 13-Aug-11 | N | M | IM | UD | PEC | | 3 |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | | | |
| TPN | TPN-05a | 13-Aug-11 | N | F | IM | UD | PEC, OTO | 6 | 4 |
| TPN | TPN-05a | 13-Aug-11 | N | F | IM | UD | PEC, OTO | 5 | 5 |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 3 |
| TPN | TPN-05a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 3 | 4 |
| TPN | TPN-05a | 13-Aug-11 | N | UN | IM | UD | | | |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 2 |
| TPN | TPN-05a | 13-Aug-11 | N | | | | | | |
| TPN | TPN-05a | 13-Aug-11 | Y | | | | PEC | | 25 |
| TPN | TPN-05b | 13-Aug-11 | Y | | | | PEC | | 21 |
| TPN | TPN-05b | 13-Aug-11 | N | F | MA | RI | PEC, OTO | 15 | 15 |
| TPN | TPN-05c | 13-Aug-11 | Y | | | | PEC | | 17 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 17 |
| TPN | TPN-06a | 13-Aug-11 | N | M | MA | RS | PEC, OTO | 26 | 15 |
| TPN | TPN-06a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 18 | 14 |
| TPN | TPN-06a | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 19 | 14 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 17 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 12 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 10 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 18 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 15 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 12 | 8 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 5 | 4 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 18 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 6 | ua |
| TPN | TPN-06a | 13-Aug-11 | N | F | IM | UD | PEC, OTO | 6 | 3 |
| TPN | TPN-06a | 13-Aug-11 | Y | | | | PEC | | 15 |
| TPN | TPN-06a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 6 | 4 |
| TPN | TPN-06b | 13-Aug-11 | Y | | | | | | |
| TPN | TPN-06c | 13-Aug-11 | Y | | | | Adipose | | |
| TPN | TPN-06c | 13-Aug-11 | Y | | | | PEC | | 14 |
| TPN | TPN-06c | 13-Aug-11 | Y | | | | PEC | | 17 |

| Lake | Set ID | Date | Weighed with 25 g scale | Sex | Maturity | Repro Status | Age Structure | Age.OTO.yr | Age.PEC.yr |
|---|---|---|---|---|---|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | N | UN | IM | UD | PEC, OTO | 13 | 13 |
| TPN | TPN-08a | 13-Aug-11 | N | M | MA | RI | PEC, OTO | 19 | 15 |
| TPN | TPN-08a | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 17 | 14 |
| TPN | TPN-08b | 13-Aug-11 | Y |  |  |  | PEC |  | 12 |
| TPN | TPN-08b | 13-Aug-11 | Y |  |  |  | PEC |  | 15 |
| TPN | TPN-08b | 13-Aug-11 | N | M | IM | UD | PEC, OTO | 22 | 11 |
| TPN | TPN-08b | 13-Aug-11 | N | F | MA | RS | PEC, OTO | 22 | 14 |
| TPN | TPN-08b | 13-Aug-11 | Y |  |  |  | PEC |  | 26 |
| TPN | TPN-08b | 13-Aug-11 | Y |  |  |  | PEC |  | 14 |
| TPN | TPN-10 | 14-Aug-11 | Y |  |  |  | PEC |  | 22 |
| TPN | TPN-10 | 14-Aug-11 | Y |  |  |  | PEC |  | 14 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 7 | 4 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 5 | 4 |
| TPN | TPN-10 | 14-Aug-11 | Y |  |  |  | PEC |  | 11 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 16 | 9 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 13 | 6 |
| TPN | TPN-10 | 14-Aug-11 | N (± 10) |  |  |  | PEC |  | 8 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 6 | 4 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 5 | 4 |
| TPN | TPN-10 | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 4 | 3 |
| TPN | TPN-10 | 14-Aug-11 | N | F | MA | RS | PEC, OTO | 18 | 9 |
| TPN | TPN-10 | 14-Aug-11 | N | M | MA | RS | PEC, OTO | 23 | 17 |
| TPN | TPN-10 | 14-Aug-11 | Y |  |  |  | PEC |  | 14 |
| TPN | TPN-10 | 14-Aug-11 | N | M | MA | RS | PEC, OTO | 17 | 16 |
| TPN | TPN-10 | 14-Aug-11 | N | F | MA | RS | PEC, OTO | 40 | 15 |
| TPN | TPN-11a | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 8 | 5 |
| TPN | TPN-11a | 14-Aug-11 | N | M | MA | RI | PEC, OTO | 21 | 14 |
| TPN | TPN-11a | 14-Aug-11 | N | M | MA | RS | PEC, OTO | 19 | 14 |
| TPN | TPN-11a | 14-Aug-11 | N (± 10) |  |  |  | PEC |  | 5 |
| TPN | TPN-11a | 14-Aug-11 | N | M | MA | RS | PEC, OTO | 26 | 13 |
| TPN | TPN-11a | 14-Aug-11 | N | F | MA | RI | PEC, OTO | 20 | 13 |
| TPN | TPN-11a | 14-Aug-11 | N | F | MA | RS | PEC, OTO | 15 | 11 |
| TPN | TPN-11c | 14-Aug-11 | N | UN | IM | UD | PEC, OTO | 7 | 7 |
| TPN | TPN-11c | 14-Aug-11 | Y |  |  |  | PEC |  | 20 |
| TPN | TPN-11c | 14-Aug-11 | Y |  |  |  | PEC |  | 17 |
| TPN | TPN-14 | 14-Aug-11 | Y |  |  |  | PEC |  | 14 |
| TPN | TPN-16a | 14-Aug-11 | Y |  |  |  | PEC |  | 19 |
| TPN | TPN-16a | 14-Aug-11 | Y |  |  |  | PEC |  | 17 |
| TPN | TPN-16a | 14-Aug-11 | N | M | IM | UD | PEC, OTO | 25 | 21 |
| TPN | TPN-16b | 15-Aug-11 | N (± 1) |  |  |  |  |  |  |
| TPN | TPN-16b | 15-Aug-11 | N | UN | IM | UD | PEC, OTO | 8 | 3 |
| TPN | TPN-16b | 15-Aug-11 | N (± 10) |  |  |  | PEC |  | 6 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 18 |
| TPN | TPN-16b | 15-Aug-11 | Y | F | MA | RS | PEC, OTO | 18 | 14 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 16 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 15 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 22 | 14 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 20 | 11 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 15 | 11 |
| TPN | **TPN-16b** | **15-Aug-11** | Y |  |  |  | PEC |  | 18 |
| TPN | TPN-16b | 15-Aug-11 | N | M | MA | RS | PEC, OTO | 21 | 19 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 26 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 14 |
| TPN | TPN-16b | 15-Aug-11 | N | UN | IM | UD | PEC, OTO | 19 | 17 |
| TPN | TPN-16b | 15-Aug-11 | N | M | MA | RI | PEC, OTO | 15 | 15 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 18 |
| TPN | TPN-16b | 15-Aug-11 | Y |  |  |  | PEC |  | 15 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 28 | 26 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 17 | 17 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 34 | 25 |
| TPN | TPN-16b | 15-Aug-11 | N | F | MA | RI | PEC, OTO | 37 | ua |
| TPN | TPN-16b | 15-Aug-11 | N | M | MA | RS | PEC, OTO | 34 | 20 |
| TPN | TPN-17 | 14-Aug-11 | N | F | MA | RS | PEC, OTO | 16 | 12 |
| TPN | TPN-20 | 15-Aug-11 | N (± 10) |  |  |  | PEC |  | 6 |
| TPN | TPN-22 | 15-Aug-11 | Y |  |  |  | PEC |  | 18 |
| TPN | TPN-22 | 15-Aug-11 | N | F | MA | RS | PEC, OTO | 20 | 15 |
| TPN | TPN-22 | 15-Aug-11 | N | F | MA | RI | PEC, OTO | 18 | 13 |
| TPN | TPN-22 | 15-Aug-11 | Y |  |  |  | PEC |  | 16 |
| TPN | TPN-22 | 15-Aug-11 | Y |  |  |  | PEC |  | 25 |
| TPN | TPN-24b | 16-Aug-11 | Y |  |  |  | PEC |  | 6 |
| TPN | TPN-24b | 16-Aug-11 | Y |  |  |  | PEC |  | 10 |
| TPN | TPN-24b | 16-Aug-11 | N | M | IM | UD | PEC, OTO | 9 | 5 |
| TPN | TPN-24b | 16-Aug-11 | N | M | MA | RI | PEC, OTO | 29 | 22 |
| TPN | TPN-25 | 16-Aug-11 | N | F | IM | UD | PEC, OTO | 13 | 9 |
| TPN | TPN-25 | 16-Aug-11 | N | F | IM | UD | PEC, OTO | 14 | 7 |
| TPN | TPN-25 | 16-Aug-11 | Y |  |  |  | PEC |  | 22 |
| TPN | TPN-25 | 16-Aug-11 | Y |  |  |  | PEC |  | 18 |
| TPN | TPN-25 | 16-Aug-11 | Y |  |  |  | PEC |  | 19 |
| TPN | TPN-25 | 16-Aug-11 | Y |  |  |  | PEC |  | 21 |
| TPN | TPN-10 | 14-Aug-11 | N | M | MA | RI | PEC, OTO | 14 | 14 |
| TPN | TPN-11a | 14-Aug-11 | N | F | MA | RI | PEC, OTO | 14 | 14 |

| Lake | Set ID | Date | Ext. DELT | Ext. Parasites | Tagged? | Tag ID | RECAP? | Gonad weight (g) |
|---|---|---|---|---|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06b | 13-Aug-11 | NONE | NONE | Y | 87465 | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | missing part of left operculum | none | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-16a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | redness (spots) around anus and peduncle | NONE |  |  | N |  |
| TPN | TPN-23 | 15-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-24b | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-01 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-01 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-01 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-02 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-02 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-03 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-03 | 11-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | Y | 87451 | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | Y | 87452 | N |  |
| TPN | TPN-05a | 13-Aug-11 | Lower lobe of caudal missing | none | Y | 87453 | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE | Y | 87454 | N |  |
| TPN | TPN-05b | 13-Aug-11 | NONE | NONE | Y | 87464 | N |  |
| TPN | TPN-05b | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-05c | 13-Aug-11 |  |  | Y | 87467 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N | 87455 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87456 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87457 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87458 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87459 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87460 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87461 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | Y | 87462 | N |  |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06b | 13-Aug-11 | NONE | NONE | Y | 87466 | N |  |
| TPN | TPN-06c | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-06c | 13-Aug-11 | NONE | NONE | Y | 87468 | N |  |
| TPN | TPN-06c | 13-Aug-11 | NONE | NONE | Y | 87469 | N |  |

| Lake | Set ID | Date | Ext. DELT | Ext. Parasites | Tagged? | Tag ID | RECAP? | Gonad weight (g) |
|---|---|---|---|---|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-08a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-08a | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | Y | 87473 | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | Y | 87472 | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | Y | 87470 | N |  |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE | Y | 87471 | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | Y | 87449 | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | Y | 87448 | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | upper caudal fin lobe deformed | none | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11c | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-11c | 14-Aug-11 | NONE | NONE | Y | 87437 | N |  |
| TPN | TPN-11c | 14-Aug-11 | missing adipose fin | none | Y | 87438 | N |  |
| TPN | TPN-14 | 14-Aug-11 | NONE | NONE | Y | 87426 | N |  |
| TPN | TPN-16a | 14-Aug-11 | NONE | NONE | N | 87427 | N |  |
| TPN | TPN-16a | 14-Aug-11 | NONE | NONE | N | 87428 | N |  |
| TPN | TPN-16a | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87474 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87475 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87430 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87431 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | **TPN-16b** | **15-Aug-11** |  |  | Y | 87361 | Y |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87432 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87433 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87435 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE | Y | 87436 | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |  |  | N |  |
| TPN | TPN-17 | 14-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-20 | 15-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-22 | 15-Aug-11 | adipose clip | none | Y | 87434 | N |  |
| TPN | TPN-22 | 15-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-22 | 15-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-22 | 15-Aug-11 | very skinny fish for its size | none | Y | 87901 | N |  |
| TPN | TPN-22 | 15-Aug-11 | adipose damaged | none | Y | 87902 | N |  |
| TPN | TPN-24b | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-24b | 16-Aug-11 | NONE | NONE | Y | 87903 | N |  |
| TPN | TPN-24b | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-24b | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | N |  | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | Y | 87904 | N |  |
| TPN | TPN-25 | 16-Aug-11 | damaged dorsal fin | none | Y | 87905 | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | Y | 87906 | N |  |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE | Y | 87907 | N |  |
| TPN | TPN-10 | 14-Aug-11 | deformed left pec | none | N |  | N | 19.5 |
| TPN | TPN-11a | 14-Aug-11 | stunted adipose | none | N |  | N | 29.6 |

| Lake | Set ID | Date | Gonad appearance | Weight of 400 eggs (g) | Liver weight (g) | Liver appearance |
|---|---|---|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06b | 13-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-11a | 14-Aug-11 | | | | |
| TPN | TPN-16a | 14-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-23 | 15-Aug-11 | normal | | | ONE PARASITIC CYST |
| TPN | TPN-24b | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | normal | | | NORMAL |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | normal | | | ONE PARASITIC CYST/TUMOR |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-01 | 11-Aug-11 | | | | |
| TPN | TPN-01 | 11-Aug-11 | | | | |
| TPN | TPN-01 | 11-Aug-11 | | | | |
| TPN | TPN-02 | 11-Aug-11 | | | | |
| TPN | TPN-02 | 11-Aug-11 | | | | |
| TPN | TPN-03 | 11-Aug-11 | | | | |
| TPN | TPN-03 | 11-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05a | 13-Aug-11 | | | | |
| TPN | TPN-05b | 13-Aug-11 | | | | |
| TPN | TPN-05b | 13-Aug-11 | Normal, very large eggs | | | NORMAL |
| TPN | TPN-05c | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | slightly, lightly coloured |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | ONE PARASITIC CYST |
| TPN | TPN-06a | 13-Aug-11 | | | | |
| TPN | TPN-06a | 13-Aug-11 | Normal | | | ONE PARASITIC CYST OR DISCOLORATION |
| TPN | TPN-06b | 13-Aug-11 | | | | |
| TPN | TPN-06c | 13-Aug-11 | | | | |
| TPN | TPN-06c | 13-Aug-11 | | | | |
| TPN | TPN-06c | 13-Aug-11 | | | | |

| Lake | Set ID | Date | Gonad appearance | Weight of 400 eggs (g) | Liver weight (g) | Liver appearance |
|---|---|---|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-08a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-08a | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-08b | 13-Aug-11 | | | | |
| TPN | TPN-08b | 13-Aug-11 | | | | |
| TPN | TPN-08b | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-08b | 13-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-08b | 13-Aug-11 | | | | |
| TPN | TPN-08b | 13-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | ONE PARASITIC CYST |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | FEW SMALL PARASITIC CYSTS |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-11a | 14-Aug-11 | Normal | | | ONE PARASITIC CYST |
| TPN | TPN-11c | 14-Aug-11 | normal | | | NORMAL |
| TPN | TPN-11c | 14-Aug-11 | | | | |
| TPN | TPN-11c | 14-Aug-11 | | | | |
| TPN | TPN-14 | 14-Aug-11 | | | | |
| TPN | TPN-16a | 14-Aug-11 | | | | |
| TPN | TPN-16a | 14-Aug-11 | | | | |
| TPN | TPN-16a | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | **TPN-16b** | **15-Aug-11** | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | | | | |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-16b | 15-Aug-11 | normal | | | slightly, lightly coloured |
| TPN | TPN-16b | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-17 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-20 | 15-Aug-11 | | | | |
| TPN | TPN-22 | 15-Aug-11 | | | | |
| TPN | TPN-22 | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-22 | 15-Aug-11 | normal | | | NORMAL |
| TPN | TPN-22 | 15-Aug-11 | | | | |
| TPN | TPN-22 | 15-Aug-11 | | | | |
| TPN | TPN-24b | 16-Aug-11 | | | | |
| TPN | TPN-24b | 16-Aug-11 | | | | |
| TPN | TPN-24b | 16-Aug-11 | normal | | | NORMAL |
| TPN | TPN-24b | 16-Aug-11 | normal | | | NORMAL |
| TPN | TPN-25 | 16-Aug-11 | normal | | | NORMAL |
| TPN | TPN-25 | 16-Aug-11 | normal | | | NORMAL |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-25 | 16-Aug-11 | | | | |
| TPN | TPN-10 | 14-Aug-11 | Normal | | | NORMAL |
| TPN | TPN-11a | 14-Aug-11 | normal | 1.02 | 8.2 | NORMAL |

| Lake | Set ID | Date | Int. DELT | Int. Parasites |
|---|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-05a | 13-Aug-11 | NONE | HIGH |
| TPN | TPN-05a | 13-Aug-11 | NONE | NONE |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-06a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-06a | 13-Aug-11 | NONE | NONE |
| TPN | TPN-06a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-06a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06b | 13-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW (1 cyst) |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-11a | 14-Aug-11 | | |
| TPN | TPN-16a | 14-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-23 | 15-Aug-11 | NONE | LOW (parasitic cyst) |
| TPN | TPN-24b | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | NONE | MODERATE |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | NONE | NONE |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-01 | 11-Aug-11 | | |
| TPN | TPN-01 | 11-Aug-11 | | |
| TPN | TPN-01 | 11-Aug-11 | | |
| TPN | TPN-02 | 11-Aug-11 | | |
| TPN | TPN-02 | 11-Aug-11 | | |
| TPN | TPN-03 | 11-Aug-11 | | |
| TPN | TPN-03 | 11-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-05a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-05a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-05a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05a | 13-Aug-11 | | |
| TPN | TPN-05b | 13-Aug-11 | | |
| TPN | TPN-05b | 13-Aug-11 | NONE | LOW |
| TPN | TPN-05c | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-06a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-06a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-06a | 13-Aug-11 | Pinched swim bladder | NONE |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | NONE | MODERATE |
| TPN | TPN-06a | 13-Aug-11 | one parasite cyst | LOW |
| TPN | TPN-06a | 13-Aug-11 | | |
| TPN | TPN-06a | 13-Aug-11 | one parasite or discolouration to liver | moderate gut parasites; tapeworm |
| TPN | TPN-06b | 13-Aug-11 | | |
| TPN | TPN-06c | 13-Aug-11 | | |
| TPN | TPN-06c | 13-Aug-11 | | |
| TPN | TPN-06c | 13-Aug-11 | | |

| Lake | Set ID | Date | Int. DELT | Int. Parasites |
|---|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | NONE | LOW |
| TPN | TPN-08a | 13-Aug-11 | NONE | NONE |
| TPN | TPN-08a | 13-Aug-11 | NONE | NONE |
| TPN | TPN-08b | 13-Aug-11 | | |
| TPN | TPN-08b | 13-Aug-11 | | |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE |
| TPN | TPN-08b | 13-Aug-11 | NONE | NONE |
| TPN | TPN-08b | 13-Aug-11 | | |
| TPN | TPN-08b | 13-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-10 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-11a | 14-Aug-11 | NONE | MODERATE |
| TPN | TPN-11a | 14-Aug-11 | NONE | LOW |
| TPN | TPN-11a | 14-Aug-11 | NONE | LOW |
| TPN | TPN-11a | 14-Aug-11 | | |
| TPN | TPN-11a | 14-Aug-11 | NONE | LOW |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE |
| TPN | TPN-11c | 14-Aug-11 | NONE | LOW |
| TPN | TPN-11c | 14-Aug-11 | | |
| TPN | TPN-11c | 14-Aug-11 | | |
| TPN | TPN-14 | 14-Aug-11 | | |
| TPN | TPN-16a | 14-Aug-11 | | |
| TPN | TPN-16a | 14-Aug-11 | | |
| TPN | TPN-16a | 14-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | **TPN-16b** | **15-Aug-11** | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | MODERATE |
| TPN | TPN-16b | 15-Aug-11 | NONE | NONE |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | | |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | LOW |
| TPN | TPN-16b | 15-Aug-11 | NONE | MODERATE |
| TPN | TPN-17 | 14-Aug-11 | NONE | LOW |
| TPN | TPN-20 | 15-Aug-11 | | |
| TPN | TPN-22 | 15-Aug-11 | | |
| TPN | TPN-22 | 15-Aug-11 | NONE | NONE |
| TPN | TPN-22 | 15-Aug-11 | NONE | LOW (1 CYST) |
| TPN | TPN-22 | 15-Aug-11 | | |
| TPN | TPN-22 | 15-Aug-11 | | |
| TPN | TPN-24b | 16-Aug-11 | | |
| TPN | TPN-24b | 16-Aug-11 | | |
| TPN | TPN-24b | 16-Aug-11 | NONE | LOW |
| TPN | TPN-24b | 16-Aug-11 | NONE | LOW |
| TPN | TPN-25 | 16-Aug-11 | NONE | LOW |
| TPN | TPN-25 | 16-Aug-11 | NONE | LOW |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-25 | 16-Aug-11 | | |
| TPN | TPN-10 | 14-Aug-11 | NONE | NONE |
| TPN | TPN-11a | 14-Aug-11 | NONE | NONE |

| Lake | Set ID | Date | Stomach contents |
|---|---|---|---|
| TPN | TPN-03 | 11-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | MT stomach full intestine |
| TPN | TPN-05a | 13-Aug-11 | MT stomach full intestine - Chir |
| TPN | TPN-05a | 13-Aug-11 | 60% full of zoops |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | 20% full |
| TPN | TPN-06a | 13-Aug-11 | MT |
| TPN | TPN-06a | 13-Aug-11 | MT |
| TPN | TPN-06a | 13-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-06a | 13-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06b | 13-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 50% - EPHEMEROPTERA |
| TPN | TPN-10 | 14-Aug-11 | 5% - CHIRONOMIDS |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 80% ZOOPLANKTON |
| TPN | TPN-10 | 14-Aug-11 | 80% ZOOPLANKTON |
| TPN | TPN-10 | 14-Aug-11 | 50% ZOOPLANKTON |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-11a | 14-Aug-11 | |
| TPN | TPN-16a | 14-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-23 | 15-Aug-11 | 80% ZOOPLANKTON |
| TPN | TPN-24b | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | MT |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-01 | 11-Aug-11 | |
| TPN | TPN-01 | 11-Aug-11 | |
| TPN | TPN-01 | 11-Aug-11 | |
| TPN | TPN-02 | 11-Aug-11 | |
| TPN | TPN-02 | 11-Aug-11 | |
| TPN | TPN-03 | 11-Aug-11 | |
| TPN | TPN-03 | 11-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | MT |
| TPN | TPN-05a | 13-Aug-11 | 10% |
| TPN | TPN-05a | 13-Aug-11 | 10% |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | MT stomach full intestine |
| TPN | TPN-05a | 13-Aug-11 | MT, full intestine |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | 50% stomach, full intestine |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05a | 13-Aug-11 | |
| TPN | TPN-05b | 13-Aug-11 | |
| TPN | TPN-05b | 13-Aug-11 | 20% - fish remains |
| TPN | TPN-05c | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | 40% -LKTR remains, Chir |
| TPN | TPN-06a | 13-Aug-11 | 50% full |
| TPN | TPN-06a | 13-Aug-11 | 50% full |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | 10% full |
| TPN | TPN-06a | 13-Aug-11 | 10% - zoops |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-06a | 13-Aug-11 | 20%  FISH REMAINS (SCULPIN) |
| TPN | TPN-06a | 13-Aug-11 | |
| TPN | TPN-06a | 13-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-06b | 13-Aug-11 | |
| TPN | TPN-06c | 13-Aug-11 | |
| TPN | TPN-06c | 13-Aug-11 | |
| TPN | TPN-06c | 13-Aug-11 | |

| Lake | Set ID | Date | Stomach contents |
|---|---|---|---|
| TPN | TPN-07a | 13-Aug-11 | 10% - EPHEMEROPTERA, FISH REMAINS, CHIRONOMIDS |
| TPN | TPN-08a | 13-Aug-11 | 5%  LARVAL FISH, PUPA UNID |
| TPN | TPN-08a | 13-Aug-11 | 60% - CHIRONOMIDS, TRICHOPTERANS |
| TPN | TPN-08b | 13-Aug-11 | |
| TPN | TPN-08b | 13-Aug-11 | |
| TPN | TPN-08b | 13-Aug-11 | 20% CHIRONOMIDS, FISH REMAINS (SCULPIN) |
| TPN | TPN-08b | 13-Aug-11 | 5% - CHIRONOMIDS |
| TPN | TPN-08b | 13-Aug-11 | |
| TPN | TPN-08b | 13-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 10% ZOOPLANKTON |
| TPN | TPN-10 | 14-Aug-11 | MT |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 10% CHIRONOMIDS |
| TPN | TPN-10 | 14-Aug-11 | 90% FISH REMAINS (LKTR) |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 40% ZOOPLANKTON |
| TPN | TPN-10 | 14-Aug-11 | MT |
| TPN | TPN-10 | 14-Aug-11 | 30% CHIRONOMIDS, FISH REMAINS UNID |
| TPN | TPN-10 | 14-Aug-11 | 50% TRICHOPTERA, FISH REMAINS (SCULPIN) |
| TPN | TPN-10 | 14-Aug-11 | 10% CHIRONOMIDS |
| TPN | TPN-10 | 14-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 5% CHIRONOMIDS |
| TPN | TPN-10 | 14-Aug-11 | 80% CHIRONOMIDS, FISH REMAINS UNID |
| TPN | TPN-11a | 14-Aug-11 | 10% FISH REMAINS UNID |
| TPN | TPN-11a | 14-Aug-11 | 25% FISH REMAINS UNID |
| TPN | TPN-11a | 14-Aug-11 | < 10% EPHEMEROPTHERA, CHIRONOMIDS |
| TPN | TPN-11a | 14-Aug-11 | |
| TPN | TPN-11a | 14-Aug-11 | 60% FISH REMAINS, CHIRONOMIDS |
| TPN | TPN-11a | 14-Aug-11 | 20% FISH REMAINS (SCULPIN) |
| TPN | TPN-11a | 14-Aug-11 | 90% CHIRONOMIDS, TRICHOPTERANS, FISH REMAINS UNID |
| TPN | TPN-11c | 14-Aug-11 | 10% FISH REMAINS UNID |
| TPN | TPN-11c | 14-Aug-11 | |
| TPN | TPN-11c | 14-Aug-11 | |
| TPN | TPN-14 | 14-Aug-11 | |
| TPN | TPN-16a | 14-Aug-11 | |
| TPN | TPN-16a | 14-Aug-11 | |
| TPN | TPN-16a | 14-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | 20% FISH REMAINS UNID |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | 20% CHIRONOMIDDS, UNID INVERTS |
| TPN | TPN-16b | 15-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | 30% CHIRONOMIDS, FISH REMAINS UNID |
| TPN | **TPN-16b** | **15-Aug-11** | |
| TPN | TPN-16b | 15-Aug-11 | 10% DIPTERA |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | 100% FISH REMAINS (LKTR) |
| TPN | TPN-16b | 15-Aug-11 | 5% INVERTS UNID |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | |
| TPN | TPN-16b | 15-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | 20% FISH REMAINS UNID, INVERT REMAINS UNID |
| TPN | TPN-16b | 15-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | MT |
| TPN | TPN-16b | 15-Aug-11 | 50% CHIRONOMIDS, DIPTERANS |
| TPN | TPN-17 | 14-Aug-11 | 5% FISH REMAINS UNID |
| TPN | TPN-20 | 15-Aug-11 | |
| TPN | TPN-22 | 15-Aug-11 | |
| TPN | TPN-22 | 15-Aug-11 | 20% FISH REMAINS (UNID) |
| TPN | TPN-22 | 15-Aug-11 | 20% CHIRONOMIDS |
| TPN | TPN-22 | 15-Aug-11 | |
| TPN | TPN-22 | 15-Aug-11 | |
| TPN | TPN-24b | 16-Aug-11 | |
| TPN | TPN-24b | 16-Aug-11 | |
| TPN | TPN-24b | 16-Aug-11 | 10% TRICHOPTERAN PUPAE |
| TPN | TPN-24b | 16-Aug-11 | MT |
| TPN | TPN-25 | 16-Aug-11 | 50% CHIRONOMIDS, FISH REMAINS UNID |
| TPN | TPN-25 | 16-Aug-11 | 20% TRICHOPTERANS |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-25 | 16-Aug-11 | |
| TPN | TPN-10 | 14-Aug-11 | 10% EPHEMEROPTERA, CHIRONOMIDS |
| TPN | TPN-11a | 14-Aug-11 | 70% CHIRONOMIDS, EPHEMEROPTERA, OSTRACODA |

| Lake | Set ID | Date | Mesh Size (mm) | Day/Night | Species | Sample ID | Mortality | Length.mm | Weight.g |
|---|---|---|---|---|---|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | ARCH | INUG-02.13 | Y | 270 | 194 |
| INUG | INUG-07 | 18-Aug-11 | 76 | NIGHT | ARCH | INUG-07.02 | N | 868 | 7650 |
| INUG | INUG-07 | 18-Aug-11 | 25 | NIGHT | ARCH | INUG-07.15 | Y | 150 | 40 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | ARCH | INUG-08.10 | N | 297 | 170 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | ARCH | INUG-14.07 | N | 253 | 150 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.01 | N | 558 | 1450 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.02 | N | 750 | 4550 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.03 | N | 789 | 5600 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.04 | N | 792 | 6750 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.05 | N | 505 | 1300 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | LKTR | INUG-01.06 | N | 630 | 2575 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | LKTR | INUG-01.07 | N | 548 | 1600 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | LKTR | INUG-01.08 | Y | 549 | 1556 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.09 | Y | 278 | 208 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | LKTR | INUG-01.10 | Y | 267 | 204 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | LKTR | INUG-01.16 | Y | 506 | 1142 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | LKTR | INUG-01.17 | Y | 467 | 1150 |
| INUG | INUG-02 | 17-Aug-11 | 25 | NIGHT | LKTR | INUG-02.01 | N | 310 | 290 |
| INUG | INUG-02 | 17-Aug-11 | 38 | NIGHT | LKTR | INUG-02.05 | Y | 217 | 100 |
| INUG | INUG-02 | 17-Aug-11 | 38 | NIGHT | LKTR | INUG-02.06 | Y | 225 | 114 |
| INUG | INUG-02 | 17-Aug-11 | 38 | NIGHT | LKTR | INUG-02.07 | N | 626 | 2400 |
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | LKTR | INUG-02.09 | N | 514 | 1500 |
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | LKTR | INUG-02.10 | N | 544 | 1508 |
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | LKTR | INUG-02.11 | N | 555 | 1550 |
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | LKTR | INUG-02.12 | N | 598 | 2150 |
| INUG | INUG-02 | 17-Aug-11 | 76 | NIGHT | LKTR | INUG-02.15 | Y | 406 | 654 |
| INUG | INUG-02 | 17-Aug-11 | 102 | NIGHT | LKTR | INUG-02.16 | Y | 705 | 3712 |
| INUG | INUG-02 | 17-Aug-11 | 102 | NIGHT | LKTR | INUG-02.17 | Y | 560 | 1650 |
| INUG | INUG-02 | 17-Aug-11 | 102 | NIGHT | LKTR | INUG-02.18 | Y | 496 | 1192 |
| INUG | INUG-02 | 17-Aug-11 | 126 | NIGHT | LKTR | INUG-02.19 | N | 903 | 6350 |
| INUG | INUG-02 | 17-Aug-11 | 126 | NIGHT | LKTR | INUG-02.20 | N | 517 | 1500 |
| INUG | INUG-02 | 17-Aug-11 | 25 | NIGHT | LKTR | INUG-02.21 | Y | 152 | 36 |
| INUG | INUG-04 | 17-Aug-11 | 51 | DAY | LKTR | INUG-04.01 | N | 322 | 425 |
| INUG | INUG-04 | 17-Aug-11 | 51 | DAY | LKTR | INUG-04.02 | N | 688 | 3255 |
| INUG | INUG-04 | 17-Aug-11 | 51 | DAY | LKTR | INUG-04.03 | Y | 365 | 458 |
| INUG | INUG-05 | 17-Aug-11 | 51 | DAY | LKTR | INUG-05.03 | N | 885 | 10300 |
| INUG | INUG-05 | 17-Aug-11 | 76 | DAY | LKTR | INUG-05.04 | N | 394 | 575 |
| INUG | INUG-05 | 17-Aug-11 | 76 | DAY | LKTR | INUG-05.05 | Y | 522 | 1420 |
| INUG | INUG-05 | 17-Aug-11 | 76 | DAY | LKTR | INUG-05.06 | Y | 524 | 1638 |
| INUG | INUG-05 | 17-Aug-11 | 76 | DAY | LKTR | INUG-05.07 | Y | 665 | 3302 |
| INUG | INUG-05 | 17-Aug-11 | 76 | DAY | LKTR | INUG-05.08 | Y | 508 | 1360 |
| INUG | INUG-06 | 17-Aug-11 | 76 | DAY | LKTR | INUG-06.01 | N | 300 | 270 |
| INUG | INUG-07 | 18-Aug-11 | 102 | NIGHT | LKTR | INUG-07.01 | Y | 504 | 1214 |
| INUG | INUG-07 | 18-Aug-11 | 76 | NIGHT | LKTR | INUG-07.03 | Y | 519 | 1104 |
| INUG | INUG-07 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-07.04 | N | 558 | 1750 |
| INUG | INUG-07 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-07.05 | N | 740 | 4600 |
| INUG | INUG-07 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-07.06 | Y | 261 | 168 |
| INUG | INUG-07 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-07.07 | N | 518 | 1400 |
| INUG | INUG-07 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-07.08 | N | 243 | 170 |
| INUG | INUG-07 | 18-Aug-11 | 38 | NIGHT | LKTR | INUG-07.09 | Y | 206 | 84 |
| INUG | INUG-07 | 18-Aug-11 | 38 | NIGHT | LKTR | INUG-07.10 | Y | 219 | 94 |
| INUG | INUG-07 | 18-Aug-11 | 38 | NIGHT | LKTR | INUG-07.11 | N | 554 | 1775 |
| INUG | INUG-07 | 18-Aug-11 | 38 | NIGHT | LKTR | INUG-07.12 | Y | 223 | 112 |
| INUG | INUG-07 | 18-Aug-11 | 38 | NIGHT | LKTR | INUG-07.13 | N | 232 | 170 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.01 | N | 514 | 1450 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.02 | N | 584 | 1950 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.03 | N | 564 | 1650 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.06 | Y | 258 | 172 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.07 | N | 518 | 1500 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | LKTR | INUG-08.15 | Y | 231 | 132 |
| INUG | INUG-08 | 18-Aug-11 | 76 | NIGHT | LKTR | INUG-08.17 | Y | 515 | 1293 |
| INUG | INUG-08 | 18-Aug-11 | 76 | NIGHT | LKTR | INUG-08.18 | Y | 598 | 2046 |
| INUG | INUG-08 | 18-Aug-11 | 76 | NIGHT | LKTR | INUG-08.19 | Y | 525 | 1501 |
| INUG | INUG-08 | 18-Aug-11 | 76 | NIGHT | LKTR | INUG-08.20 | Y | 543 | 1613 |
| INUG | INUG-09 | 18-Aug-11 | 51 | DAY | LKTR | INUG-09.01 | N | 332 | 450 |
| INUG | INUG-09 | 18-Aug-11 | 76 | DAY | LKTR | INUG-09.02 | N | 875 | 5900 |
| INUG | INUG-09 | 18-Aug-11 | 76 | DAY | LKTR | INUG-09.03 | N | 616 | 2425 |
| INUG | INUG-09 | 18-Aug-11 | 102 | DAY | LKTR | INUG-09.05 | N | 499 | 1550 |
| INUG | INUG-10 | 18-Aug-11 | 51 | DAY | LKTR | INUG-10.01 | N | 705 | 3900 |

| Lake | Set ID | Date | Mesh Size (mm) | Day/Night | Species | Sample ID | Mortality | Length.mm | Weight.g |
|---|---|---|---|---|---|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | 51 | DAY | LKTR | INUG-10.02 | Y | 524 | 1700 |
| INUG | INUG-10 | 18-Aug-11 | 76 | DAY | LKTR | INUG-10.04 | Y | 562 | 1602 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-13.01 | N | 538 | 1500 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-13.03 | N | 494 | 1400 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-13.05 | Y | 741 | 4032 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-13.07 | Y | 515 | 1386 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-13.08 | N | 253 | 160 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-13.10 | Y | 356 | 460 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-13.11 | N | 542 | 1550 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-13.13 | N | 205 | 100 |
| INUG | INUG-13 | 19-Aug-11 | 38 | NIGHT | LKTR | INUG-13.15 | N | 175 |  |
| INUG | INUG-13 | 19-Aug-11 | 38 | NIGHT | LKTR | INUG-13.16 | N | 217 | 110 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-13.17 | Y | 449 | 1008 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-14.01 | Y | 283 | 238 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-14.03 | Y | 357 | 490 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-14.05 | Y | 245 | 144 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | LKTR | INUG-14.06 | N | 375 | 625 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.12 | N | 577 | 1700 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.13 | Y | 625 | 2884 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.15 | Y | 548 | 1788 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.16 | Y | 487 | 1142 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.17 | N | 499 | 1525 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.18 | Y | 542 | 1506 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | LKTR | INUG-14.19 | Y | 411 | 720 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | RNWH | INUG-01.11 | Y | 413 | 656 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | RNWH | INUG-01.12 | Y | 408 | 664 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | RNWH | INUG-01.13 | Y | 400 | 642 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | RNWH | INUG-01.14 | Y | 360 | 488 |
| INUG | INUG-01 | 17-Aug-11 | 51 | DAY | RNWH | INUG-01.15 | Y | 310 | 292 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | RNWH | INUG-01.18 | Y | 430 | 826 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | RNWH | INUG-01.19 | Y | 430 | 884 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | RNWH | INUG-01.20 | Y | 370 | 578 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | RNWH | INUG-01.21 | Y | 385 | 652 |
| INUG | INUG-01 | 17-Aug-11 | 76 | DAY | RNWH | INUG-01.22 | Y | 388 | 530 |
| INUG | INUG-02 | 17-Aug-11 | 38 | NIGHT | RNWH | INUG-02.04 | Y | 241 | 126 |
| INUG | INUG-02 | 17-Aug-11 | 51 | NIGHT | RNWH | INUG-02.08 | Y | 332 | 328 |
| INUG | INUG-02 | 17-Aug-11 | 76 | NIGHT | RNWH | INUG-02.14 | Y | 406 | 716 |
| INUG | INUG-03 | 17-Aug-11 | 51 | DAY | RNWH | INUG-03-01 | Y | 362 | 542 |
| INUG | INUG-05 | 17-Aug-11 | 51 | DAY | RNWH | INUG-05.01 | Y | 382 | 600 |
| INUG | INUG-05 | 17-Aug-11 | 51 | DAY | RNWH | INUG-05.02 | N | 365 | 425 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.04 | Y | 370 | 528 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.05 | Y | 392 | 600 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.08 | Y | 384 | 572 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.09 | Y | 376 | 536 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.11 | Y | 370 | 500 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.12 | Y | 365 | 468 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.13 | Y | 281 | 204 |
| INUG | INUG-08 | 18-Aug-11 | 51 | NIGHT | RNWH | INUG-08.14 | Y | 282 | 234 |
| INUG | INUG-08 | 18-Aug-11 | 76 | NIGHT | RNWH | INUG-08.16 | Y | 364 | 469 |
| INUG | INUG-09 | 18-Aug-11 | 76 | DAY | RNWH | INUG-09.04 | Y | 420 | 722 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-13.02 | Y | 398 | 664 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-13.04 | Y | 420 | 748 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-13.09 | Y | 385 | 596 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-13.12 | Y | 385 | 602 |
| INUG | INUG-13 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-13.14 | Y | 352 | 434 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-13.18 | Y | 400 | 634 |
| INUG | INUG-13 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-13.19 | Y | 375 | 512 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-14.02 | Y | 405 | 646 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-14.08 | Y | 375 | 502 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-14.09 | Y | 383 | 602 |
| INUG | INUG-14 | 19-Aug-11 | 51 | NIGHT | RNWH | INUG-14.10 | Y | 343 | 436 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-14.11 | Y | 375 | 532 |
| INUG | INUG-14 | 19-Aug-11 | 76 | NIGHT | RNWH | INUG-14.14 | Y | 385 | 570 |

| Lake | Set ID | Date | K | Weighed with 25 g scale | Sex | Maturity | Repro Status | Age Structure |
|---|---|---|---|---|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | 0.98562211 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 1.169774796 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 1.185185185 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.648902688 | N (± 10) | | | | PEC |
| INUG | INUG-14 | 19-Aug-11 | 0.926253145 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 0.834575066 | Y | | | | |
| INUG | INUG-01 | 17-Aug-11 | 1.078518519 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 1.140136941 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 1.358714556 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 1.009413754 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 1.029806396 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 0.972250796 | Y | | | | PEC |
| INUG | INUG-01 | 17-Aug-11 | 0.940356562 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.968119454 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.071757135 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.881484243 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.129138456 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.973448357 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 0.978635123 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 1.000823045 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.978336467 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 1.104592022 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 0.936708891 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 0.906677313 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 1.005390803 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 0.977236428 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 1.059352795 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.939549927 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.976857524 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.862403428 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 1.085474511 | Y | | | | PEC |
| INUG | INUG-02 | 17-Aug-11 | 1.02511299 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-04 | 17-Aug-11 | 1.272979222 | Y | | | | PEC |
| INUG | INUG-04 | 17-Aug-11 | 0.999506628 | Y | | | | PEC |
| INUG | INUG-04 | 17-Aug-11 | 0.941861153 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 1.485961005 | Y | | | | PEC |
| INUG | INUG-05 | 17-Aug-11 | 0.940111097 | Y | | | | PEC |
| INUG | INUG-05 | 17-Aug-11 | 0.998336238 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 1.138465925 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 1.122825153 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 1.03740365 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-06 | 17-Aug-11 | 1 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 0.948259227 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 0.789708841 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 1.007245769 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 1.135174619 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 0.944904157 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 1.007253433 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 1.184759229 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 0.960898742 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 0.894943275 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 1.043924435 | Y | | | | PEC |
| INUG | INUG-07 | 18-Aug-11 | 1.009958279 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-07 | 18-Aug-11 | 1.361397556 | N (± 10) | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 1.067772288 | Y | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 0.979030158 | Y | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 0.919700944 | Y | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 1.001542375 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.079200107 | Y | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 1.070873056 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.946622532 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.956757945 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.037296188 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.007476393 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-09 | 18-Aug-11 | 1.229697422 | Y | | | | PEC |
| INUG | INUG-09 | 18-Aug-11 | 0.880699708 | Y | | | | PEC |
| INUG | INUG-09 | 18-Aug-11 | 1.037455808 | Y | | | | PEC |
| INUG | INUG-09 | 18-Aug-11 | 1.247469859 | Y | | | | PEC |
| INUG | INUG-10 | 18-Aug-11 | 1.113005361 | Y | | | | PEC |

| Lake | Set ID | Date | K | Weighed with 25 g scale | Sex | Maturity | Repro Status | Age Structure |
|---|---|---|---|---|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | 1.181558042 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-10 | 18-Aug-11 | 0.902513205 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.963262009 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 1.161307388 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 0.990982304 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 1.014709072 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.988003355 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 1.019548377 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.973495254 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 1.160749264 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 1.076498635 | Y | | | | PEC |
| INUG | INUG-13 | 19-Aug-11 | 1.113580222 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.050068548 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.076939811 | N | M | IM | UD | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 0.979183843 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.185185185 | Y | | | | PEC |
| INUG | INUG-14 | 19-Aug-11 | 0.8849556 | Y | | | | PEC |
| INUG | INUG-14 | 19-Aug-11 | 1.1812864 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.086490264 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 0.988733434 | N | F | MA | RS | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.227349378 | Y | | | | PEC |
| INUG | INUG-14 | 19-Aug-11 | 0.94586055 | N | M | MA | RS | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.037067515 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.93122298 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.977659422 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.003125 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.045953361 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.980161794 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.038902235 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.111851787 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.14109727 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 1.142524199 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-01 | 17-Aug-11 | 0.907362221 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.900159393 | N | UN | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 0.896312788 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-02 | 17-Aug-11 | 1.069879637 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-03 | 17-Aug-11 | 1.142545686 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 1.076368951 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-05 | 17-Aug-11 | 0.873997794 | Y | | | | PEC |
| INUG | INUG-08 | 18-Aug-11 | 1.042386433 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.996077315 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.01018835 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.008326671 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.987108365 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.962425807 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.919414202 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 1.043442526 | N | F | IM | UD | PEC/OTO |
| INUG | INUG-08 | 18-Aug-11 | 0.97245316 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-09 | 18-Aug-11 | 0.974516791 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 1.053219432 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 1.009610193 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 1.044393286 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 1.054907312 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.995088573 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.990625 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-13 | 19-Aug-11 | 0.970903704 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 0.972450375 | N | F | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 0.951940741 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.071519723 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.080448645 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 1.00882963 | N | M | MA | RI | PEC/OTO |
| INUG | INUG-14 | 19-Aug-11 | 0.998832505 | N | M | MA | RI | PEC/OTO |

| Lake | Set ID | Date | Age.OTO.yr | Age.PEC.yr | Ext. DELT | Ext. Parasites | Tagged? | Tag ID |
|---|---|---|---|---|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | ns | 4 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | | 14 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | 5 | 2 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | | 4 | damaged caudal fin | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | | 3 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | | | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | | 24 | NONE | NONE | Y | 87908 |
| INUG | INUG-01 | 17-Aug-11 | | 22 | NONE | NONE | Y | 87909 |
| INUG | INUG-01 | 17-Aug-11 | | 27 | NONE | NONE | Y | 87910 |
| INUG | INUG-01 | 17-Aug-11 | | 14 | NONE | NONE | Y | 87911 |
| INUG | INUG-01 | 17-Aug-11 | | 16 | NONE | NONE | Y | 87912 |
| INUG | INUG-01 | 17-Aug-11 | | 17 | NONE | NONE | Y | 87913 |
| INUG | INUG-01 | 17-Aug-11 | ns | 17 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 10 | 5 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 7 | 5 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 19 | 17 | Tiny lower lobe of caudal fin | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 17 | 14 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | | 8 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 8 | 3 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 13 | 3 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | | 15 | NONE | NONE | Y | 87942 |
| INUG | INUG-02 | 17-Aug-11 | | 14 | NONE | NONE | Y | 87915 |
| INUG | INUG-02 | 17-Aug-11 | | 16 | NONE | NONE | Y | 87916 |
| INUG | INUG-02 | 17-Aug-11 | | 22 | slight dorsal fin deformity | NONE | Y | 87917 |
| INUG | INUG-02 | 17-Aug-11 | | 17 | slight dorsal fin deformity | NONE | Y | 87919 |
| INUG | INUG-02 | 17-Aug-11 | 12 | 7 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 21 | 12 | bi-lobed adipose fin; deformed dorsal | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 22 | 16 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 26 | 13 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | | 30+ | NONE | NONE | Y | 87920 |
| INUG | INUG-02 | 17-Aug-11 | | 16 | NONE | NONE | Y | 87921 |
| INUG | INUG-02 | 17-Aug-11 | 4 | 2 | NONE | NONE | N | |
| INUG | INUG-04 | 17-Aug-11 | | 7 | NONE | NONE | N | |
| INUG | INUG-04 | 17-Aug-11 | | 20 | NONE | NONE | Y | 87924 |
| INUG | INUG-04 | 17-Aug-11 | 9 | 9 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | | 19 | NONE | NONE | Y | 87922 |
| INUG | INUG-05 | 17-Aug-11 | | 9 | NONE | NONE | Y | 87923 |
| INUG | INUG-05 | 17-Aug-11 | 18 | 15 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | 17 | 14 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | 23 | 19 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | 18 | 17 | NONE | NONE | N | |
| INUG | INUG-06 | 17-Aug-11 | | 5 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | 18 | 13 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | 17 | 13 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | | 15 | NONE | NONE | Y | 87925 |
| INUG | INUG-07 | 18-Aug-11 | | 14 | NONE | NONE | Y | 87438 |
| INUG | INUG-07 | 18-Aug-11 | 10 | 5 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | | 17 | NONE | NONE | Y | 87439 |
| INUG | INUG-07 | 18-Aug-11 | | 4 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | 6 | 1 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | 7 | 1 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | | 12 | NONE | NONE | Y | 87440 |
| INUG | INUG-07 | 18-Aug-11 | 8 | 4 | NONE | NONE | N | |
| INUG | INUG-07 | 18-Aug-11 | | 5 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | | 15 | NONE | NONE | Y | 87441 |
| INUG | INUG-08 | 18-Aug-11 | | 18 | NONE | NONE | Y | 87442 |
| INUG | INUG-08 | 18-Aug-11 | | 13 | NONE | NONE | Y | 87443 |
| INUG | INUG-08 | 18-Aug-11 | 8 | 5 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | | 15 | scar on stomach | NONE | Y | 87444 |
| INUG | INUG-08 | 18-Aug-11 | 8 | 3 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 22 | 16 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 28 | 20 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 21 | 12 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 28 | 13 | NONE | NONE | N | |
| INUG | INUG-09 | 18-Aug-11 | | 6 | NONE | NONE | Y | 87445 |
| INUG | INUG-09 | 18-Aug-11 | | 28 | NONE | NONE | Y | 87446 |
| INUG | INUG-09 | 18-Aug-11 | | 19 | NONE | NONE | Y | 48476 |
| INUG | INUG-09 | 18-Aug-11 | | 12 | NONE | NONE | Y | 48477 |
| INUG | INUG-10 | 18-Aug-11 | | 27 | missing adipose fin | NONE | Y | 48478 |

| Lake | Set ID | Date | Age.OTO.yr | Age.PEC.yr | Ext. DELT | Ext. Parasites | Tagged? | Tag ID |
|---|---|---|---|---|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | 22 | 15 | NONE | NONE | N | |
| INUG | INUG-10 | 18-Aug-11 | 23 | 19 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | | 13 | NONE | NONE | Y | 48479 |
| INUG | INUG-13 | 19-Aug-11 | | 17 | NONE | NONE | Y | 48480 |
| INUG | INUG-13 | 19-Aug-11 | 40 | 25 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 17 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | | 4 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 11 | 6 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | | 14 | NONE | NONE | Y | 48481 |
| INUG | INUG-13 | 19-Aug-11 | | 4 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | | 3 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | | 3 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 20 | 14 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 10 | 5 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 13 | 9 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 9 | 4 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | | 8 | NONE | NONE | Y | 48482 |
| INUG | INUG-14 | 19-Aug-11 | | 20 | NONE | NONE | Y | 48483 |
| INUG | INUG-14 | 19-Aug-11 | 24 | 21 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 20 | 11 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 14 | 14 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | | 14 | NONE | NONE | Y | 48484 |
| INUG | INUG-14 | 19-Aug-11 | 21 | 16 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 9 | 7 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 24 | 14 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 16 | 10 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 15 | 12 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 9 | 8 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 9 | 6 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 19 | 13 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 14 | 16 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 16 | 13 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 14 | 14 | NONE | NONE | N | |
| INUG | INUG-01 | 17-Aug-11 | 13 | 9 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 6 | 4 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 11 | 9 | NONE | NONE | N | |
| INUG | INUG-02 | 17-Aug-11 | 13 | 10 | NONE | NONE | N | |
| INUG | INUG-03 | 17-Aug-11 | 9 | 11 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | 15 | 14 | NONE | NONE | N | |
| INUG | INUG-05 | 17-Aug-11 | | 8 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 16 | 13 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 15 | 15 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 17 | 12 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 16 | 11 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 20 | 12 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 18 | 14 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 7 | 5 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 8 | 7 | NONE | NONE | N | |
| INUG | INUG-08 | 18-Aug-11 | 13 | 12 | NONE | NONE | N | |
| INUG | INUG-09 | 18-Aug-11 | 19 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 15 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 17 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 22 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 15 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 15 | 12 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 19 | 14 | NONE | NONE | N | |
| INUG | INUG-13 | 19-Aug-11 | 17 | 13 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 12 | 12 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 13 | 12 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 18 | 13 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 10 | 8 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 17 | 12 | NONE | NONE | N | |
| INUG | INUG-14 | 19-Aug-11 | 12 | 12 | NONE | NONE | N | |

| Lake | Set ID | Date | RECAP? | Gonad weight (g) | Gonad appearance | Weight of 400 eggs (g) | Liver weight (g) |
|---|---|---|---|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | N | 0.36 | NORMAL |  | 2.15 |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 0.46 |
| INUG | INUG-08 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-14 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-01 | 17-Aug-11 | N |  | NORMAL |  | 13.75 |
| INUG | INUG-01 | 17-Aug-11 | N |  | NORMAL |  | 2 |
| INUG | INUG-01 | 17-Aug-11 | N |  | NORMAL |  | 3.26 |
| INUG | INUG-01 | 17-Aug-11 | N |  | NORMAL |  | 11.44 |
| INUG | INUG-01 | 17-Aug-11 | N | 31.24 | NORMAL |  | 11.39 |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  | NORMAL |  | 0.86 |
| INUG | INUG-02 | 17-Aug-11 | N |  | NORMAL |  | 1.45 |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N | 0.42 | NORMAL |  | 5.06 |
| INUG | INUG-02 | 17-Aug-11 | N | 35.53 | NORMAL |  | 59.68 |
| INUG | INUG-02 | 17-Aug-11 | N | 1.69 | NORMAL |  | 14.49 |
| INUG | INUG-02 | 17-Aug-11 | N | 12.1 | NORMAL |  | 20.44 |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-02 | 17-Aug-11 | N |  | NORMAL |  | 0.45 |
| INUG | INUG-04 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-04 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-04 | 17-Aug-11 | N |  | NORMAL |  | 4.15 |
| INUG | INUG-05 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-05 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-05 | 17-Aug-11 | N |  | NORMAL |  | 14.84 |
| INUG | INUG-05 | 17-Aug-11 | N |  | NORMAL |  | 20.73 |
| INUG | INUG-05 | 17-Aug-11 | N |  | NORMAL |  | 68.46 |
| INUG | INUG-05 | 17-Aug-11 | N |  | NORMAL |  | 13 |
| INUG | INUG-06 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 14.24 |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 8.63 |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 1.56 |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 2.18 |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 1.24 |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-07 | 18-Aug-11 | N |  | NORMAL |  | 1.32 |
| INUG | INUG-07 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 1.93 |
| INUG | INUG-08 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 1.49 |
| INUG | INUG-08 | 18-Aug-11 | N | 42.79 | NORMAL |  | 11.2 |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 19.25 |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 18.81 |
| INUG | INUG-08 | 18-Aug-11 | N | 194.43 | NORMAL | 35.08 | 34.39 |
| INUG | INUG-09 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-09 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-09 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-09 | 18-Aug-11 | N |  |  |  |  |
| INUG | INUG-10 | 18-Aug-11 | N |  |  |  |  |

| Lake | Set ID | Date | RECAP? | Gonad weight (g) | Gonad appearance | Weight of 400 eggs (g) | Liver weight (g) |
|---|---|---|---|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | N | 191.21 | NORMAL | 29.07 | 40.93 |
| INUG | INUG-10 | 18-Aug-11 | N |  | NORMAL |  | 16.49 |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  | NORMAL |  | 41.68 |
| INUG | INUG-13 | 19-Aug-11 | N |  | NORMAL |  | 16.56 |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  | NORMAL |  | 4.54 |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-13 | 19-Aug-11 | N | 117.88 | NORMAL | 22.98 | 21.07 |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 2.54 |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 5.37 |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 1.34 |
| INUG | INUG-14 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-14 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 44.09 |
| INUG | INUG-14 | 19-Aug-11 | N | 226 | NORMAL | 29.57 | 42.75 |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 16.11 |
| INUG | INUG-14 | 19-Aug-11 | N |  |  |  |  |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 17.06 |
| INUG | INUG-14 | 19-Aug-11 | N |  | NORMAL |  | 8.68 |
| INUG | INUG-01 | 17-Aug-11 | N | 23.72 | NORMAL |  | 5.13 |
| INUG | INUG-01 | 17-Aug-11 | N | 24.64 | NORMAL | 0.89 | 7.25 |
| INUG | INUG-01 | 17-Aug-11 | N | 22.2 | NORMAL | 0.94 | 8.73 |
| INUG | INUG-01 | 17-Aug-11 | N | 11.13 | NORMAL | 0.97 | 4.38 |
| INUG | INUG-01 | 17-Aug-11 | N | 3.28 | NORMAL |  | 1.6 |
| INUG | INUG-01 | 17-Aug-11 | N | 30.91 | NORMAL | 0.99 | 9.98 |
| INUG | INUG-01 | 17-Aug-11 | N | 32.28 | NORMAL |  | 8.14 |
| INUG | INUG-01 | 17-Aug-11 | N | 22.03 | NORMAL |  | 2.21 |
| INUG | INUG-01 | 17-Aug-11 | N | 25.02 | NORMAL |  | 2.58 |
| INUG | INUG-01 | 17-Aug-11 | N | 16.86 | NORMAL | 0.97 | 2.65 |
| INUG | INUG-02 | 17-Aug-11 | N | 0.07 | NORMAL |  | 0.79 |
| INUG | INUG-02 | 17-Aug-11 | N | 1.15 | NORMAL |  | 2.26 |
| INUG | INUG-02 | 17-Aug-11 | N | 33.69 | NORMAL | 1.25 | 10.06 |
| INUG | INUG-03 | 17-Aug-11 | N | 19.23 | NORMAL | 0.91 | 6.85 |
| INUG | INUG-05 | 17-Aug-11 | N | 23.09 | NORMAL | 0.92 | 8.23 |
| INUG | INUG-05 | 17-Aug-11 | N |  |  |  |  |
| INUG | INUG-08 | 18-Aug-11 | N | 20.21 | NORMAL | 1.06 | 6.54 |
| INUG | INUG-08 | 18-Aug-11 | N | 21.4 | NORMAL |  | 3.39 |
| INUG | INUG-08 | 18-Aug-11 | N | 15.71 | NORMAL |  | 4.07 |
| INUG | INUG-08 | 18-Aug-11 | N | 14.39 | NORMAL |  | 4.36 |
| INUG | INUG-08 | 18-Aug-11 | N | 15.85 | NORMAL | 0.79 | 4.19 |
| INUG | INUG-08 | 18-Aug-11 | N | 14.11 | NORMAL | 0.73 | 6.88 |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 1.1 |
| INUG | INUG-08 | 18-Aug-11 | N |  | NORMAL |  | 1.81 |
| INUG | INUG-08 | 18-Aug-11 | N | 4.06 | NORMAL |  | 3.65 |
| INUG | INUG-09 | 18-Aug-11 | N | 27.82 | NORMAL |  | 4.16 |
| INUG | INUG-13 | 19-Aug-11 | N | 20.68 | NORMAL |  | 4.81 |
| INUG | INUG-13 | 19-Aug-11 | N | 28.8 | NORMAL |  | 3 |
| INUG | INUG-13 | 19-Aug-11 | N | 20.66 | NORMAL |  | 4.7 |
| INUG | INUG-13 | 19-Aug-11 | N | 22.18 | NORMAL | 0.47 | 5.53 |
| INUG | INUG-13 | 19-Aug-11 | N | 12.68 | NORMAL |  | 4.27 |
| INUG | INUG-13 | 19-Aug-11 | N | 23.62 | NORMAL |  | 4.62 |
| INUG | INUG-13 | 19-Aug-11 | N | 17 | NORMAL | 0.85 | 5.37 |
| INUG | INUG-14 | 19-Aug-11 | N | 27.85 | NORMAL | 1.81 | 10.01 |
| INUG | INUG-14 | 19-Aug-11 | N | 12.54 | NORMAL |  | 3.86 |
| INUG | INUG-14 | 19-Aug-11 | N | 16.42 | NORMAL |  | 5.46 |
| INUG | INUG-14 | 19-Aug-11 | N | 7.99 | NORMAL |  | 3.25 |
| INUG | INUG-14 | 19-Aug-11 | N | 15.11 | NORMAL |  | 3.34 |
| INUG | INUG-14 | 19-Aug-11 | N | 14.75 | NORMAL |  | 3.32 |

| Lake | Set ID | Date | Liver appearance | Int. DELT | Int. Parasites |
|---|---|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | HIGH |
| INUG | INUG-08 | 18-Aug-11 | | | |
| INUG | INUG-14 | 19-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | | | |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | HIGH |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | 2 PARASITE CYSTS | NONE | LOW |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | | | |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-04 | 17-Aug-11 | | | |
| INUG | INUG-04 | 17-Aug-11 | | | |
| INUG | INUG-04 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-05 | 17-Aug-11 | | | |
| INUG | INUG-05 | 17-Aug-11 | | | |
| INUG | INUG-05 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-05 | 17-Aug-11 | SLIGHTLY LIGHT COLOURED | NONE | NONE |
| INUG | INUG-05 | 17-Aug-11 | DISCOLOURED & BLOTCHY | NONE | MODERATE |
| INUG | INUG-05 | 17-Aug-11 | NORMAL | NONE | HIGH |
| INUG | INUG-06 | 17-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-07 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-07 | 18-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-08 | 18-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-09 | 18-Aug-11 | | | |
| INUG | INUG-09 | 18-Aug-11 | | | |
| INUG | INUG-09 | 18-Aug-11 | | | |
| INUG | INUG-09 | 18-Aug-11 | | | |
| INUG | INUG-10 | 18-Aug-11 | | | |

| Lake | Set ID | Date | Liver appearance | Int. DELT | Int. Parasites |
|---|---|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-10 | 18-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | HIGH |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | | | |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | MODERATE |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | MODERATE (with cestodes in gut) |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | | | |
| INUG | INUG-14 | 19-Aug-11 | | | |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | HIGH |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | | | |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-02 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-03 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-05 | 17-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-05 | 17-Aug-11 | | | |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-08 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-09 | 18-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-13 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | LOW |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | NONE |
| INUG | INUG-14 | 19-Aug-11 | NORMAL | NONE | NONE |

| Lake | Set ID | Date | Stomach contents |
|---|---|---|---|
| INUG | INUG-02 | 17-Aug-11 | 40% ZOOPLANKTON |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | 20% ZOOPLANKTON |
| INUG | INUG-08 | 18-Aug-11 | |
| INUG | INUG-14 | 19-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | |
| INUG | INUG-01 | 17-Aug-11 | MT |
| INUG | INUG-01 | 17-Aug-11 | MT |
| INUG | INUG-01 | 17-Aug-11 | 80% CLAM SHRIMP |
| INUG | INUG-01 | 17-Aug-11 | MT |
| INUG | INUG-01 | 17-Aug-11 | 70% CLAM SHRIMP |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | MT |
| INUG | INUG-02 | 17-Aug-11 | 50% FISH REMAINS, CLAM SHRIMP |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | 10% SALVELINUS REMAINS |
| INUG | INUG-02 | 17-Aug-11 | 90% LKTR & OTHER UNID FISH |
| INUG | INUG-02 | 17-Aug-11 | 40% FISH REMAINS |
| INUG | INUG-02 | 17-Aug-11 | 100% CLAM SHRIMP, FISH REMAINS, EPHEMEROPTERA, OSTRACODS |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | |
| INUG | INUG-02 | 17-Aug-11 | 70% CHIRONOMIDS, SCULPIN |
| INUG | INUG-04 | 17-Aug-11 | |
| INUG | INUG-04 | 17-Aug-11 | |
| INUG | INUG-04 | 17-Aug-11 | 20% FISH REMAINS |
| INUG | INUG-05 | 17-Aug-11 | |
| INUG | INUG-05 | 17-Aug-11 | |
| INUG | INUG-05 | 17-Aug-11 | MT |
| INUG | INUG-05 | 17-Aug-11 | 30% FISH REMAINS, ADULT HYMENOPTERA |
| INUG | INUG-05 | 17-Aug-11 | 80% FISH REMAINS |
| INUG | INUG-05 | 17-Aug-11 | 20% CLAM SHRIMP |
| INUG | INUG-06 | 17-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | 50% CLAM SHRIMP |
| INUG | INUG-07 | 18-Aug-11 | 100% MAMMAL (VOLE?) |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | 90% CLAM SHRIMP |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | MT |
| INUG | INUG-07 | 18-Aug-11 | MT |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-07 | 18-Aug-11 | MT |
| INUG | INUG-07 | 18-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | MT |
| INUG | INUG-08 | 18-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | 30% FISH REMAINS |
| INUG | INUG-08 | 18-Aug-11 | 50% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-08 | 18-Aug-11 | 40% LKTR |
| INUG | INUG-08 | 18-Aug-11 | 30% CLAM SHRIMP |
| INUG | INUG-08 | 18-Aug-11 | MT |
| INUG | INUG-09 | 18-Aug-11 | |
| INUG | INUG-09 | 18-Aug-11 | |
| INUG | INUG-09 | 18-Aug-11 | |
| INUG | INUG-09 | 18-Aug-11 | |
| INUG | INUG-10 | 18-Aug-11 | |

| Lake | Set ID | Date | Stomach contents |
|---|---|---|---|
| INUG | INUG-10 | 18-Aug-11 | 20% CLAM SHRIMP |
| INUG | INUG-10 | 18-Aug-11 | MT |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | MT |
| INUG | INUG-13 | 19-Aug-11 | 30% CLAM SHRIMP |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | 30% CLAM SHRIMP |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | |
| INUG | INUG-13 | 19-Aug-11 | 40% CLAM SHRIMP |
| INUG | INUG-14 | 19-Aug-11 | 20% FISH REMAINS, CESTODES, ZOOPLANKTON |
| INUG | INUG-14 | 19-Aug-11 | 20% FISH REMAINS (SCULPIN) |
| INUG | INUG-14 | 19-Aug-11 | 10% FISH REMAINS |
| INUG | INUG-14 | 19-Aug-11 | |
| INUG | INUG-14 | 19-Aug-11 | |
| INUG | INUG-14 | 19-Aug-11 | MT |
| INUG | INUG-14 | 19-Aug-11 | 50% CLAM SHRIMP |
| INUG | INUG-14 | 19-Aug-11 | 60% CLAM SHRIMP |
| INUG | INUG-14 | 19-Aug-11 | |
| INUG | INUG-14 | 19-Aug-11 | 40% BURB REMAINS |
| INUG | INUG-14 | 19-Aug-11 | 50% CLAM SHRIMP |
| INUG | INUG-01 | 17-Aug-11 | 70% CLAM SHRIMP, ZOOPLANKTON, CHIRONOMIDS, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | 100% CLAM SHRIMP, CHIRONOMID, ZOOPLANKTON, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | 80% CLAM SHRIMP, CHIRONOMID, ZOOPLANKTON, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | 100% CLAM SHRIMP, CHIRONOMID, ZOOPLANKTON, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | 60% CLAM SHRIMP, CHIRONOMID, ZOOPLANKTON, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | MT |
| INUG | INUG-01 | 17-Aug-11 | 10% CLAM SHRIMP |
| INUG | INUG-01 | 17-Aug-11 | 50% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-01 | 17-Aug-11 | MT |
| INUG | INUG-01 | 17-Aug-11 | 50% CLAM SHRIMP |
| INUG | INUG-02 | 17-Aug-11 | 80% CLAM SHRIMP |
| INUG | INUG-02 | 17-Aug-11 | 80% CLAMS, CHIRONOMIDS, CLAM SHRIMP |
| INUG | INUG-02 | 17-Aug-11 | 100% CLAM SHRIMP, CHIRONOMID, CLAMS |
| INUG | INUG-03 | 17-Aug-11 | 30% CLADOCERA, CLAM SHRIMP |
| INUG | INUG-05 | 17-Aug-11 | 50% CLAM SHRIMP |
| INUG | INUG-05 | 17-Aug-11 | |
| INUG | INUG-08 | 18-Aug-11 | 40% CLAM SHRIMP, CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 60% CLAM SHRIMP, OSTRACODS, CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 60% CLAM SHRIMP, OSTRACODS, CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 30% CLAM SHRIMP, OSTRACODS, CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 30% CLAM SHRIMP, OSTRACODS, CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 10% CLAM SHRIMP |
| INUG | INUG-08 | 18-Aug-11 | 10% CHIRONOMIDS |
| INUG | INUG-08 | 18-Aug-11 | 20% CHIRONOMIDS, CLAM SHRIMP |
| INUG | INUG-08 | 18-Aug-11 | 10% CLAM SHRIMP |
| INUG | INUG-09 | 18-Aug-11 | 30% CLAM SHRIMP, OSTRACODS, CHIRONOMIDS |
| INUG | INUG-13 | 19-Aug-11 | 20% CLAM SHRIMP, ZOOPLANKTON, OTHER INVERTS |
| INUG | INUG-13 | 19-Aug-11 | 10% TRICHOPTERANS, CLAM SHRIMP |
| INUG | INUG-13 | 19-Aug-11 | MT |
| INUG | INUG-13 | 19-Aug-11 | 20% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-13 | 19-Aug-11 | MT |
| INUG | INUG-13 | 19-Aug-11 | 20% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-13 | 19-Aug-11 | 40% CLAM SHRIMP, ZOOPLANKTON |
| INUG | INUG-14 | 19-Aug-11 | 30% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-14 | 19-Aug-11 | 20% TRICHOPTERA, ZOOPLANKTON |
| INUG | INUG-14 | 19-Aug-11 | 30% CLAM SHRIMP, OSTRACODS |
| INUG | INUG-14 | 19-Aug-11 | 40% CLAM SHRIMP, OSTRACODS, TRICHOPTERA |
| INUG | INUG-14 | 19-Aug-11 | 70% CHIRONOMIDS |
| INUG | INUG-14 | 19-Aug-11 | 10% CLAM SHRIMP, CHIRONOMIDS |

| Lake | Set ID | Date | Mesh Size (mm) | Day/Night | Species | Sample ID | Mortality |
|---|---|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | ARCH | PD-01.14 | Y |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | ARCH | PD-01.15 | Y |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | ARCH | PD-01.18 | N |
| PDL | PD-01 | 17-Aug-11 | 25 | NIGHT | ARCH | PD-01.20 | N |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | ARCH | PD-03.06 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | ARCH | PD-03.12 | Y |
| PDL | PD-04B | 18-Aug-11 | 25 | NIGHT | ARCH | PD-04.16 | N |
| PDL | PD-08B | 19-Aug-11 | 102 | NIGHT | ARCH | PD-08.01 | Y |
| PDL | PD-01 | 17-Aug-11 | 126 | NIGHT | LKTR | PD-01.01 | N |
| PDL | PD-01 | 17-Aug-11 | 102 | NIGHT | LKTR | PD-01.02 | N |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | LKTR | PD-01.05 | N |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | LKTR | PD-01.06 | Y |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | LKTR | PD-01.09 | Y |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | LKTR | PD-01.10 | Y |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | LKTR | PD-01.11 | Y |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | LKTR | PD-01.12 | N |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | LKTR | PD-01.13 | N |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | LKTR | PD-01.16 | Y |
| PDL | PD-01 | 17-Aug-11 | 38 | NIGHT | LKTR | PD-01.17 | Y |
| PDL | PD-01 | 17-Aug-11 | 25 | NIGHT | LKTR | PD-01.19 | N |
| PDL | PD-01 | 17-Aug-11 | 25 | NIGHT | LKTR | PD-01.21 | N |
| PDL | PD-02 | 17-Aug-11 | 51 | NIGHT | LKTR | PD-02.01 | Y |
| PDL | PD-02 | 17-Aug-11 | 51 | NIGHT | LKTR | PD-02.02 | Y |
| PDL | PD-03A | 17-Aug-11 | 51 | DAY | LKTR | PD-03.01 | N |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.02 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.03 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.04 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.05 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.09 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.10 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.11 | N |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.13 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-03.14 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.15 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.16 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.17 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.19 | N |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-03.20 | Y |
| PDL | PD-04B | 18-Aug-11 | 126 | NIGHT | LKTR | PD-04.01 | N |
| PDL | PD-04B | 18-Aug-11 | 102 | NIGHT | LKTR | PD-04.02 | N |
| PDL | PD-04B | 18-Aug-11 | 102 | NIGHT | LKTR | PD-04.03 | N |
| PDL | PD-04B | 18-Aug-11 | 102 | NIGHT | LKTR | PD-04.04 | Y |
| PDL | PD-04B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-04.05 | Y |
| PDL | PD-04B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-04.06 | Y |
| PDL | PD-04B | 18-Aug-11 | 76 | NIGHT | LKTR | PD-04.07 | N |
| PDL | PD-04B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-04.08 | Y |
| PDL | PD-04B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-04.09 | Y |
| PDL | PD-04B | 18-Aug-11 | 51 | NIGHT | LKTR | PD-04.10 | N |
| PDL | PD-04B | 18-Aug-11 | 38 | NIGHT | LKTR | PD-04.11 | Y |
| PDL | PD-04B | 18-Aug-11 | 38 | NIGHT | LKTR | PD-04.12 | Y |
| PDL | PD-04B | 18-Aug-11 | 38 | NIGHT | LKTR | PD-04.13 | Y |
| PDL | PD-04B | 18-Aug-11 | 25 | NIGHT | LKTR | PD-04.14 | Y |
| PDL | PD-04B | 18-Aug-11 | 25 | NIGHT | LKTR | PD-04.15 | N |
| PDL | PD-05A | 18-Aug-11 | 76 | DAY | LKTR | PD-05.01 | N |
| PDL | PD-06A | 18-Aug-11 | 126 | DAY | LKTR | PD-06.01 | N |
| PDL | PD-06A | 18-Aug-11 | 102 | DAY | LKTR | PD-06.02 | N |
| PDL | PD-07B | 19-Aug-11 | 76 | NIGHT | LKTR | PD-07.01 | N |
| PDL | PD-07B | 19-Aug-11 | 76 | NIGHT | LKTR | PD-07.02 | N |
| PDL | PD-07B | 19-Aug-11 | 51 | NIGHT | LKTR | PD-07.04 | N |
| PDL | PD-08A | 18-Aug-11 | 102 | DAY | LKTR | PD-08.01A | Y |
| PDL | PD-08B | 19-Aug-11 | 76 | NIGHT | LKTR | PD-08.02 | N |
| PDL | PD-08B | 19-Aug-11 | 76 | NIGHT | LKTR | PD-08.03 | N |
| PDL | PD-08B | 19-Aug-11 | 51 | NIGHT | LKTR | PD-08.04 | N |
| PDL | PD-08B | 19-Aug-11 | 38 | NIGHT | LKTR | PD-08.05 | Y |
| PDL | PD-08B | 19-Aug-11 | 38 | NIGHT | LKTR | PD-08.06 | Y |
| PDL | PD-08B | 19-Aug-11 | 38 | NIGHT | LKTR | PD-08.07 | N |
| PDL | PD-01 | 17-Aug-11 | 126 | NIGHT | RNWH | PD-01.03 | Y |
| PDL | PD-01 | 17-Aug-11 | 102 | NIGHT | RNWH | PD-01.04 | Y |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | RNWH | PD-01.07 | Y |
| PDL | PD-01 | 17-Aug-11 | 76 | NIGHT | RNWH | PD-01.08 | Y |
| PDL | PD-03B | 18-Aug-11 | 51 | NIGHT | RNWH | PD-03.08 | Y |
| PDL | PD-03B | 18-Aug-11 | 76 | NIGHT | RNWH | PD-03.18 | Y |
| PDL | PD-07B | 19-Aug-11 | 51 | NIGHT | RNWH | PD-07.03 | Y |

| Lake | Set ID | Date | Length.mm | Weight.g | K | Weighed with 25 g scale | Sex |
|---|---|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | 243 | 152 | 1.059314135 | N | M |
| PDL | PD-01 | 17-Aug-11 | 255 | 172 | 1.037308426 | N | F |
| PDL | PD-01 | 17-Aug-11 | 205 | 100 | 1.160749264 | N (± 10) | |
| PDL | PD-01 | 17-Aug-11 | 154 | 48 | 1.314253296 | N (± 1) | |
| PDL | PD-03B | 18-Aug-11 | 246 | 161 | 1.081485136 | N | M |
| PDL | PD-03B | 18-Aug-11 | 272 | 213 | 1.0584562 | N | U |
| PDL | PD-04B | 18-Aug-11 | 114 | 18 | 1.214948729 | N (± 1) | |
| PDL | PD-08B | 19-Aug-11 | 255 | 174 | 1.049370152 | N | U |
| PDL | PD-01 | 17-Aug-11 | 621 | 2600 | 1.085671775 | Y | |
| PDL | PD-01 | 17-Aug-11 | 869 | 7600 | 1.15812187 | Y | |
| PDL | PD-01 | 17-Aug-11 | 820 | 6000 | 1.088202435 | Y | |
| PDL | PD-01 | 17-Aug-11 | 344 | 396 | 0.972791704 | N | M |
| PDL | PD-01 | 17-Aug-11 | 282 | 220 | 0.98101434 | N | F |
| PDL | PD-01 | 17-Aug-11 | 283 | 228 | 1.005948021 | N | F |
| PDL | PD-01 | 17-Aug-11 | 278 | 212 | 0.986737136 | N | M |
| PDL | PD-01 | 17-Aug-11 | 804 | 6100 | 1.173712389 | Y | |
| PDL | PD-01 | 17-Aug-11 | 811 | 4450 | 0.834252369 | Y | |
| PDL | PD-01 | 17-Aug-11 | 212 | 108 | 1.133486032 | N | F |
| PDL | PD-01 | 17-Aug-11 | 250 | 146 | 0.9344 | N | F |
| PDL | PD-01 | 17-Aug-11 | 135 | 36 | 1.463191587 | N (± 1) | |
| PDL | PD-01 | 17-Aug-11 | 142 | 42 | 1.46684511 | N (± 1) | |
| PDL | PD-02 | 17-Aug-11 | 295 | 272 | 1.059504623 | N | M |
| PDL | PD-02 | 17-Aug-11 | 268 | 184 | 0.955902156 | N | M |
| PDL | PD-03A | 17-Aug-11 | 403 | 640 | 0.977833328 | Y | |
| PDL | PD-03B | 18-Aug-11 | 280 | 211 | 0.961188047 | N | M |
| PDL | PD-03B | 18-Aug-11 | 281 | 247 | 1.113212293 | N | M |
| PDL | PD-03B | 18-Aug-11 | 482 | 1090 | 0.973386645 | N | F |
| PDL | PD-03B | 18-Aug-11 | 496 | 1418 | 1.162067088 | N | F |
| PDL | PD-03B | 18-Aug-11 | 522 | 1316 | 0.925218654 | N | F |
| PDL | PD-03B | 18-Aug-11 | 710 | 4100 | 1.145536181 | Y | |
| PDL | PD-03B | 18-Aug-11 | 269 | 236 | 1.212425782 | N (± 10) | |
| PDL | PD-03B | 18-Aug-11 | 253 | 150 | 0.926253145 | N | F |
| PDL | PD-03B | 18-Aug-11 | 220 | 120 | 1.126972201 | N | U |
| PDL | PD-03B | 18-Aug-11 | 577 | 2126 | 1.106715062 | N | F |
| PDL | PD-03B | 18-Aug-11 | 534 | 1518 | 0.996891747 | N | F |
| PDL | PD-03B | 18-Aug-11 | 565 | 1740 | 0.964725826 | N | M |
| PDL | PD-03B | 18-Aug-11 | 189 | 66 | 0.97759399 | N (± 10) | |
| PDL | PD-03B | 18-Aug-11 | 508 | 1470 | 1.121311298 | N | M |
| PDL | PD-04B | 18-Aug-11 | 304 | 236 | 0.840023145 | Y | |
| PDL | PD-04B | 18-Aug-11 | 534 | 1600 | 1.050742289 | Y | |
| PDL | PD-04B | 18-Aug-11 | 818 | 6300 | 1.151014086 | Y | |
| PDL | PD-04B | 18-Aug-11 | 584 | 2188 | 1.098522044 | N | M |
| PDL | PD-04B | 18-Aug-11 | 521 | 1598 | 1.129961392 | N | M |
| PDL | PD-04B | 18-Aug-11 | 566 | 1966 | 1.084261956 | N | F |
| PDL | PD-04B | 18-Aug-11 | 532 | 1700 | 1.129052208 | Y | |
| PDL | PD-04B | 18-Aug-11 | 638 | 2552 | 0.982694746 | N | M |
| PDL | PD-04B | 18-Aug-11 | 390 | 554 | 0.933933478 | N | F |
| PDL | PD-04B | 18-Aug-11 | 697 | 3900 | 1.151771354 | Y | |
| PDL | PD-04B | 18-Aug-11 | 184 | 61 | 0.979211186 | N | F |
| PDL | PD-04B | 18-Aug-11 | 203 | 80 | 0.956316994 | N | M |
| PDL | PD-04B | 18-Aug-11 | 193 | 78 | 1.084982356 | N | F |
| PDL | PD-04B | 18-Aug-11 | 136 | 23 | 0.91434714 | N | F |
| PDL | PD-04B | 18-Aug-11 | 132 | 30 | 1.304365974 | N (± 1) | |
| PDL | PD-05A | 18-Aug-11 | 620 | 2175 | 0.912607835 | Y | |
| PDL | PD-06A | 18-Aug-11 | 584 | 1850 | 0.928823483 | Y | |
| PDL | PD-06A | 18-Aug-11 | 548 | 1675 | 1.017825052 | Y | |
| PDL | PD-07B | 19-Aug-11 | 251 | 150 | 0.948571549 | N (± 10) | |
| PDL | PD-07B | 19-Aug-11 | 237 | 140 | 1.051678505 | N (± 10) | |
| PDL | PD-07B | 19-Aug-11 | 151 | 55 | 1.597466824 | N (± 1) | |
| PDL | PD-08A | 18-Aug-11 | 629 | 2746 | 1.103439678 | N | F |
| PDL | PD-08B | 19-Aug-11 | 559 | 1675 | 0.9589134 | Y | |
| PDL | PD-08B | 19-Aug-11 | 686 | 3400 | 1.053189619 | Y | |
| PDL | PD-08B | 19-Aug-11 | 282 | 225 | 1.003310121 | N (± 10) | |
| PDL | PD-08B | 19-Aug-11 | 235 | 136 | 1.047937355 | N | M |
| PDL | PD-08B | 19-Aug-11 | 202 | 80 | 0.970590148 | N | F |
| PDL | PD-08B | 19-Aug-11 | 168 | 52 | 1.096668826 | N (± 1) | |
| PDL | PD-01 | 17-Aug-11 | 390 | 748 | 1.260978776 | N | F |
| PDL | PD-01 | 17-Aug-11 | 386 | 742 | 1.290155301 | N | F |
| PDL | PD-01 | 17-Aug-11 | 372 | 558 | 1.08394034 | N | F |
| PDL | PD-01 | 17-Aug-11 | 247 | 158 | 1.04849467 | N | M |
| PDL | PD-03B | 18-Aug-11 | 377 | 564 | 1.052579854 | N | M |
| PDL | PD-03B | 18-Aug-11 | 412 | 838 | 1.19826361 | N | M |
| PDL | PD-07B | 19-Aug-11 | 322 | 388 | 1.162155148 | N | F |

| Lake | Set ID | Date | Maturity | Repro Status | Age Structure | Age.OTO.yr | Age.PEC.yr |
|---|---|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 5 | |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 10 | |
| PDL | PD-01 | 17-Aug-11 | | | | | |
| PDL | PD-01 | 17-Aug-11 | | | | | |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 6 | |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 11 | |
| PDL | PD-04B | 18-Aug-11 | | | | | |
| PDL | PD-08B | 19-Aug-11 | IM | UD | PEC/OTO | 6 | |
| PDL | PD-01 | 17-Aug-11 | | | PEC | | 20 |
| PDL | PD-01 | 17-Aug-11 | | | PEC | | 26 |
| PDL | PD-01 | 17-Aug-11 | | | PEC | | 21 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 15 | 10 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 10 | 7 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 12 | 8 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 10 | 8 |
| PDL | PD-01 | 17-Aug-11 | | | PEC | | 30 |
| PDL | PD-01 | 17-Aug-11 | | | PEC | | ua |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 11 | 5 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 12 | 5 |
| PDL | PD-01 | 17-Aug-11 | | | | | |
| PDL | PD-01 | 17-Aug-11 | | | | | |
| PDL | PD-02 | 17-Aug-11 | IM | UD | PEC/OTO | 10 | 8 |
| PDL | PD-02 | 17-Aug-11 | IM | UD | PEC/OTO | 8 | 7 |
| PDL | PD-03A | 17-Aug-11 | | | PEC | | 14 |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 8 | 8 |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 8 | 5 |
| PDL | PD-03B | 18-Aug-11 | MA | RS | PEC/OTO | 15 | 12 |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 24 | 13 |
| PDL | PD-03B | 18-Aug-11 | MA | RS | PEC/OTO | 15 | 10 |
| PDL | PD-03B | 18-Aug-11 | | | PEC | | 18 |
| PDL | PD-03B | 18-Aug-11 | | | PEC | | 5 |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 10 | 6 |
| PDL | PD-03B | 18-Aug-11 | IM | UD | PEC/OTO | 15 | 4 |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 22 | 12 |
| PDL | PD-03B | 18-Aug-11 | MA | RS | PEC/OTO | 18 | 11 |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 24 | 14 |
| PDL | PD-03B | 18-Aug-11 | | | PEC | | ns |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 14 | 10 |
| PDL | PD-04B | 18-Aug-11 | | | PEC | | 9 |
| PDL | PD-04B | 18-Aug-11 | | | PEC | | 20 |
| PDL | PD-04B | 18-Aug-11 | | | PEC | | 28 |
| PDL | PD-04B | 18-Aug-11 | MA | RS | PEC/OTO | 29 | 16 |
| PDL | PD-04B | 18-Aug-11 | MA | RI | PEC/OTO | 23 | 10 |
| PDL | PD-04B | 18-Aug-11 | MA | RI | PEC/OTO | 20 | 12 |
| PDL | PD-04B | 18-Aug-11 | | | PEC | | 17 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 16 | 6 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 18 | 10 |
| PDL | PD-04B | 18-Aug-11 | | | PEC | | 24 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 10 | 4 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 6 | 4 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 10 | 4 |
| PDL | PD-04B | 18-Aug-11 | IM | UD | PEC/OTO | 4 | 3 |
| PDL | PD-04B | 18-Aug-11 | | | | | |
| PDL | PD-05A | 18-Aug-11 | | | PEC | | 22 |
| PDL | PD-06A | 18-Aug-11 | | | PEC | | 16 |
| PDL | PD-06A | 18-Aug-11 | | | PEC | | 17 |
| PDL | PD-07B | 19-Aug-11 | | | PEC | | 4 |
| PDL | PD-07B | 19-Aug-11 | | | PEC | | 3 |
| PDL | PD-07B | 19-Aug-11 | | | PEC | | 4 |
| PDL | PD-08A | 18-Aug-11 | MA | RI | PEC/OTO | 20 | 18 |
| PDL | PD-08B | 19-Aug-11 | | | PEC | | 20 |
| PDL | PD-08B | 19-Aug-11 | | | PEC | | 22 |
| PDL | PD-08B | 19-Aug-11 | | | PEC | | 6 |
| PDL | PD-08B | 19-Aug-11 | IM | UD | PEC/OTO | 10 | 4 |
| PDL | PD-08B | 19-Aug-11 | IM | UD | PEC/OTO | 10 | 4 |
| PDL | PD-08B | 19-Aug-11 | | | PEC | | 2 |
| PDL | PD-01 | 17-Aug-11 | MA | RI | PEC/OTO | 12 | 12 |
| PDL | PD-01 | 17-Aug-11 | MA | RI | PEC/OTO | 22 | 14 |
| PDL | PD-01 | 17-Aug-11 | MA | RI | PEC/OTO | 14 | 8 |
| PDL | PD-01 | 17-Aug-11 | IM | UD | PEC/OTO | 12 | 5 |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 16 | 14 |
| PDL | PD-03B | 18-Aug-11 | MA | RI | PEC/OTO | 16 | 12 |
| PDL | PD-07B | 19-Aug-11 | MA | RI | PEC/OTO | 9 | 6 |

| Lake | Set ID | Date | Ext. DELT | Ext. Parasites | Tagged? | Tag ID |
|---|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | TORN LEFT OPERCULUM | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | Y | 77152 |
| PDL | PD-01 | 17-Aug-11 | DORSAL FIN DEFORM | NONE | Y | 77153 |
| PDL | PD-01 | 17-Aug-11 | SMALL SCRATCH DORSAL | NONE | Y | 77154 |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | RED SPOTS BW PECS - DORSAL DAMAGE | NONE | Y | 77155 |
| PDL | PD-01 | 17-Aug-11 | UNUSUALLY SKINNY - FLACID BELLY | NONE | Y | 77156 |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-02 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-02 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-03A | 17-Aug-11 | NONE | NONE | Y | 77157 |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | Y | 77158 |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | Y | 77159 |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | Y | 77160 |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | Y | 77161 |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NICK IN ADIPOSE | NONE | Y | 77162 |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | Y | 77163 |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-04B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-05A | 18-Aug-11 | NONE | NONE | Y | 77164 |
| PDL | PD-06A | 18-Aug-11 | NONE | NONE | Y | 77165 |
| PDL | PD-06A | 18-Aug-11 | NONE | NONE | Y | 77166 |
| PDL | PD-07B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-07B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-07B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-08A | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | Y | 77167 |
| PDL | PD-08B | 19-Aug-11 | ADIPOSE FIN CLIP | NONE | Y | 77168 |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | Y | 77169 |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-08B | 19-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-01 | 17-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-03B | 18-Aug-11 | NONE | NONE | N | |
| PDL | PD-07B | 19-Aug-11 | NONE | NONE | N | |

| Lake | Set ID | Date | RECAP? | Gonad weight (g) | Gonad appearance |
|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-08B | 19-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | | |
| PDL | PD-02 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-02 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-03A | 17-Aug-11 | N | | |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | 71.31 | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | |
| PDL | PD-03B | 18-Aug-11 | N | | |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | 230 | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | 76.63 | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | | |
| PDL | PD-03B | 18-Aug-11 | N | 62.71 | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | 75.14 | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | 236 | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | NORMAL |
| PDL | PD-04B | 18-Aug-11 | N | | |
| PDL | PD-05A | 18-Aug-11 | N | | |
| PDL | PD-06A | 18-Aug-11 | N | | |
| PDL | PD-06A | 18-Aug-11 | N | | |
| PDL | PD-07B | 19-Aug-11 | N | | |
| PDL | PD-07B | 19-Aug-11 | N | | |
| PDL | PD-07B | 19-Aug-11 | N | | |
| PDL | PD-08A | 18-Aug-11 | N | 390 | NORMAL |
| PDL | PD-08B | 19-Aug-11 | N | | |
| PDL | PD-08B | 19-Aug-11 | N | | |
| PDL | PD-08B | 19-Aug-11 | N | | |
| PDL | PD-08B | 19-Aug-11 | N | | NORMAL |
| PDL | PD-08B | 19-Aug-11 | N | | NORMAL |
| PDL | PD-08B | 19-Aug-11 | N | | |
| PDL | PD-01 | 17-Aug-11 | N | 28.77 | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | 29.98 | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | 17.76 | NORMAL |
| PDL | PD-01 | 17-Aug-11 | N | | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | 24.87 | NORMAL |
| PDL | PD-03B | 18-Aug-11 | N | 48.78 | NORMAL |
| PDL | PD-07B | 19-Aug-11 | N | 10.27 | NORMAL |

| Lake | Set ID | Date | Weight of 400 eggs (g) | Liver weight (g) |
|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | | 1.89 |
| PDL | PD-01 | 17-Aug-11 | | 2.15 |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-03B | 18-Aug-11 | | 1.79 |
| PDL | PD-03B | 18-Aug-11 | | 2.22 |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-08B | 19-Aug-11 | | 2.02 |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | 4.52 |
| PDL | PD-01 | 17-Aug-11 | | 1.7 |
| PDL | PD-01 | 17-Aug-11 | | 1.93 |
| PDL | PD-01 | 17-Aug-11 | | 1.79 |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | 0.93 |
| PDL | PD-01 | 17-Aug-11 | | 1.14 |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | | |
| PDL | PD-02 | 17-Aug-11 | | 2.79 |
| PDL | PD-02 | 17-Aug-11 | | 1.62 |
| PDL | PD-03A | 17-Aug-11 | | |
| PDL | PD-03B | 18-Aug-11 | | 1.79 |
| PDL | PD-03B | 18-Aug-11 | | 2.33 |
| PDL | PD-03B | 18-Aug-11 | | 9.91 |
| PDL | PD-03B | 18-Aug-11 | 11.26 | 28.85 |
| PDL | PD-03B | 18-Aug-11 | | 14.21 |
| PDL | PD-03B | 18-Aug-11 | | |
| PDL | PD-03B | 18-Aug-11 | | |
| PDL | PD-03B | 18-Aug-11 | | 1.13 |
| PDL | PD-03B | 18-Aug-11 | | 1.05 |
| PDL | PD-03B | 18-Aug-11 | 27.33 | 49.74 |
| PDL | PD-03B | 18-Aug-11 | | 16.05 |
| PDL | PD-03B | 18-Aug-11 | | 15.97 |
| PDL | PD-03B | 18-Aug-11 | | |
| PDL | PD-03B | 18-Aug-11 | | 19.23 |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-04B | 18-Aug-11 | | 20.51 |
| PDL | PD-04B | 18-Aug-11 | | 16.11 |
| PDL | PD-04B | 18-Aug-11 | 30.52 | 45.07 |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-04B | 18-Aug-11 | | 3.22 |
| PDL | PD-04B | 18-Aug-11 | | 5.84 |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-04B | 18-Aug-11 | | 0.5 |
| PDL | PD-04B | 18-Aug-11 | | 0.68 |
| PDL | PD-04B | 18-Aug-11 | | 0.83 |
| PDL | PD-04B | 18-Aug-11 | | 0.22 |
| PDL | PD-04B | 18-Aug-11 | | |
| PDL | PD-05A | 18-Aug-11 | | |
| PDL | PD-06A | 18-Aug-11 | | |
| PDL | PD-06A | 18-Aug-11 | | |
| PDL | PD-07B | 19-Aug-11 | | |
| PDL | PD-07B | 19-Aug-11 | | |
| PDL | PD-07B | 19-Aug-11 | | |
| PDL | PD-08A | 18-Aug-11 | 35.19 | 68.74 |
| PDL | PD-08B | 19-Aug-11 | | |
| PDL | PD-08B | 19-Aug-11 | | |
| PDL | PD-08B | 19-Aug-11 | | |
| PDL | PD-08B | 19-Aug-11 | | 1.23 |
| PDL | PD-08B | 19-Aug-11 | | 0.72 |
| PDL | PD-08B | 19-Aug-11 | | |
| PDL | PD-01 | 17-Aug-11 | 0.84 | 11.82 |
| PDL | PD-01 | 17-Aug-11 | 0.91 | 8.39 |
| PDL | PD-01 | 17-Aug-11 | 0.76 | 8.84 |
| PDL | PD-01 | 17-Aug-11 | | 1.19 |
| PDL | PD-03B | 18-Aug-11 | | 4.62 |
| PDL | PD-03B | 18-Aug-11 | | 5.93 |
| PDL | PD-07B | 19-Aug-11 | 0.92 | 4.82 |

| Lake | Set ID | Date | Liver appearance | Int. DELT | Int. Parasites |
|---|---|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-01 | 17-Aug-11 | CYST IN LIVER | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-08B | 19-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | MODERATE (cestodes) |
| PDL | PD-01 | 17-Aug-11 | CYST IN LIVER | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | | | |
| PDL | PD-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-02 | 17-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03A | 17-Aug-11 | | | |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW (cestodes and cysts) |
| PDL | PD-03B | 18-Aug-11 | CYST IN LIVER | NONE | L0W |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | | | |
| PDL | PD-03B | 18-Aug-11 | | | |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-03B | 18-Aug-11 | CYST IN LIVER | NONE | LOW |
| PDL | PD-03B | 18-Aug-11 | CYST IN LIVER | NONE | NONE |
| PDL | PD-03B | 18-Aug-11 | | | |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-04B | 18-Aug-11 | CYST ON LIVER | CYST ON LIVER | LOW |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-04B | 18-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-04B | 18-Aug-11 | | | |
| PDL | PD-05A | 18-Aug-11 | | | |
| PDL | PD-06A | 18-Aug-11 | | | |
| PDL | PD-06A | 18-Aug-11 | | | |
| PDL | PD-07B | 19-Aug-11 | | | |
| PDL | PD-07B | 19-Aug-11 | | | |
| PDL | PD-07B | 19-Aug-11 | | | |
| PDL | PD-08A | 18-Aug-11 | NORMAL | NONE | MODERATE |
| PDL | PD-08B | 19-Aug-11 | | | |
| PDL | PD-08B | 19-Aug-11 | | | |
| PDL | PD-08B | 19-Aug-11 | | | |
| PDL | PD-08B | 19-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-08B | 19-Aug-11 | NORMAL | NONE | LOW |
| PDL | PD-08B | 19-Aug-11 | | | |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-01 | 17-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-03B | 18-Aug-11 | NORMAL | NONE | NONE |
| PDL | PD-07B | 19-Aug-11 | CYST IN LIVER | NONE | LOW |

| Lake | Set ID | Date | Stomach contents |
|---|---|---|---|
| PDL | PD-01 | 17-Aug-11 | 80% ZOOPLANKTON |
| PDL | PD-01 | 17-Aug-11 | 70% ZOOPLANKTON |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-03B | 18-Aug-11 | 10% ZOOPLANKTON |
| PDL | PD-03B | 18-Aug-11 | 30% ZOOPLANKTON |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-08B | 19-Aug-11 | 30% ZOOPLANKTON |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | MT |
| PDL | PD-01 | 17-Aug-11 | 5% cestodes |
| PDL | PD-01 | 17-Aug-11 | 20% UNID REMAINS |
| PDL | PD-01 | 17-Aug-11 | MT |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | 90% FISH REMAINS |
| PDL | PD-01 | 17-Aug-11 | 90% CHIRONOMIDS, FISH REMAINS |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | |
| PDL | PD-02 | 17-Aug-11 | MT |
| PDL | PD-02 | 17-Aug-11 | MT |
| PDL | PD-03A | 17-Aug-11 | |
| PDL | PD-03B | 18-Aug-11 | 60% FISH REMAINS |
| PDL | PD-03B | 18-Aug-11 | 50% OSTRACODS, CESTODES |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | |
| PDL | PD-03B | 18-Aug-11 | |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | 10% DIPTERA |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | 5% DIPTERA |
| PDL | PD-03B | 18-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | |
| PDL | PD-03B | 18-Aug-11 | 10% FISH REMAINS |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-04B | 18-Aug-11 | 10% FISH REMAINS (SCULPIN) |
| PDL | PD-04B | 18-Aug-11 | 20% INVERTS (DIPTERA), FISH REMAINS |
| PDL | PD-04B | 18-Aug-11 | 10% DIPTERA |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-04B | 18-Aug-11 | 100% LKTR REMAINS |
| PDL | PD-04B | 18-Aug-11 | 80% FISH REMAINS (SCULPIN) |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-04B | 18-Aug-11 | 20% CHIRONOMIDS, OTHER UNID INVERTS |
| PDL | PD-04B | 18-Aug-11 | MT |
| PDL | PD-04B | 18-Aug-11 | MT |
| PDL | PD-04B | 18-Aug-11 | MT |
| PDL | PD-04B | 18-Aug-11 | |
| PDL | PD-05A | 18-Aug-11 | |
| PDL | PD-06A | 18-Aug-11 | |
| PDL | PD-06A | 18-Aug-11 | |
| PDL | PD-07B | 19-Aug-11 | |
| PDL | PD-07B | 19-Aug-11 | |
| PDL | PD-07B | 19-Aug-11 | |
| PDL | PD-08A | 18-Aug-11 | MT |
| PDL | PD-08B | 19-Aug-11 | |
| PDL | PD-08B | 19-Aug-11 | |
| PDL | PD-08B | 19-Aug-11 | |
| PDL | PD-08B | 19-Aug-11 | 10% ZOOPLANKTON |
| PDL | PD-08B | 19-Aug-11 | 30% FISH REMAINS (SCULPIN) |
| PDL | PD-08B | 19-Aug-11 | |
| PDL | PD-01 | 17-Aug-11 | 80% CHIRONOMIDS, ZOOPLANKTON |
| PDL | PD-01 | 17-Aug-11 | 90% CHIRONOMIDS, TRICHOPTERA |
| PDL | PD-01 | 17-Aug-11 | 90% TRICHOPTERA, CHIRONOMIDS |
| PDL | PD-01 | 17-Aug-11 | MT |
| PDL | PD-03B | 18-Aug-11 | 20% TRICHOPTERA, DIPTERA |
| PDL | PD-03B | 18-Aug-11 | 10% TRICHOPTERA |
| PDL | PD-07B | 19-Aug-11 | 60% TRICHOPTERA, DIPTERA |

# APPENDIX I

# NORTH/SOUTH CONSULTANTS FISH AGEING LABORATORY REPORT

**NSC Ageing ID:** 237
**Company Name:** Azimuth
**Project Name:** Meadowbank
**Client Contact:** R.Baker/G.Mann
**# & Type of Structures:** 205 OT
**Work to be Completed:** Set/cut

| Location | Date | Structures | Total | Species | Site # | Fish # | Final | Comments |
|---|---|---|---|---|---|---|---|---|
| INUG | Aug-11 | OT | 1 | ARCH | 2 | 13 | **ns** | |
| INUG | Aug-11 | OT | 1 | ARCH | 7 | 15 | **5** | |
| INUG | Aug-11 | OT | 1 | LKTR | 1 | 1 | **7** | |
| INUG | Aug-11 | OT | 1 | LKTR | 1 | 8 | **ns** | |
| INUG | Aug-11 | OT | 1 | LKTR | 1 | 9 | **10** | |
| INUG | Aug-11 | OT | 1 | LKTR | 1 | 16 | **19** | |
| INUG | Aug-11 | OT | 1 | LKTR | 1 | 17 | **17** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 5 | **8** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 6 | **13** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 15 | **12** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 16 | **21** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 17 | **22** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 18 | **26** | |
| INUG | Aug-11 | OT | 1 | LKTR | 2 | 21 | **4** | |
| INUG | Aug-11 | OT | 1 | LKTR | 4 | 3 | **9** | |
| INUG | Aug-11 | OT | 1 | LKTR | 5 | 5 | **18** | |
| INUG | Aug-11 | OT | 1 | LKTR | 5 | 6 | **17** | |
| INUG | Aug-11 | OT | 1 | LKTR | 5 | 7 | **23** | |
| INUG | Aug-11 | OT | 1 | LKTR | 5 | 8 | **18** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 1 | **18** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 1 | **7** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 3 | **17** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 6 | **10** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 9 | **6** | |
| INUG | Aug-11 | OT | 1 | LKTR | 7 | 12 | **8** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 2 | **28** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 6 | **8** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 15 | **8** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 17 | **22** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 18 | **28** | |
| INUG | Aug-11 | OT | 1 | LKTR | 8 | 19 | **21** | |
| INUG | Aug-11 | OT | 1 | LKTR | 10 | 2 | **22** | |
| INUG | Aug-11 | OT | 1 | LKTR | 10 | 4 | **23** | |
| INUG | Aug-11 | OT | 1 | LKTR | 13 | 1 | **11** | |
| INUG | Aug-11 | OT | 1 | LKTR | 13 | 5 | **40** | |
| INUG | Aug-11 | OT | 1 | LKTR | 13 | 7 | **17** | |
| INUG | Aug-11 | OT | 1 | LKTR | 13 | 17 | **20** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 1 | **10** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 3 | **13** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 5 | **9** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 13 | **24** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 15 | **20** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 16 | **14** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 18 | **21** | |
| INUG | Aug-11 | OT | 1 | LKTR | 14 | 19 | **9** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 2 | **16** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 11 | **24** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 12 | **16** | |

| Location | Date | Structures | Total | Species | Site # | Fish # | Final | Comments |
|---|---|---|---|---|---|---|---|---|
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 13 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 14 | **9** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 15 | **9** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 18 | **19** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 19 | **14** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 21 | **14** | |
| INUG | Aug-11 | OT | 1 | RNWH | 1 | 22 | **13** | |
| INUG | Aug-11 | OT | 1 | RNWH | 2 | 4 | **6** | |
| INUG | Aug-11 | OT | 1 | RNWH | 2 | 8 | **11** | |
| INUG | Aug-11 | OT | 1 | RNWH | 2 | 14 | **13** | |
| INUG | Aug-11 | OT | 1 | RNWH | 3 | 1 | **9** | 03.01 on slide |
| INUG | Aug-11 | OT | 1 | RNWH | 5 | 1 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 4 | **16** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 5 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 8 | **17** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 9 | **16** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 11 | **20** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 12 | **18** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 13 | **7** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 14 | **8** | |
| INUG | Aug-11 | OT | 1 | RNWH | 8 | 16 | **13** | |
| INUG | Aug-11 | OT | 1 | RNWH | 9 | 4 | **19** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 2 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 4 | **17** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 9 | **22** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 12 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 14 | **15** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 18 | **19** | |
| INUG | Aug-11 | OT | 1 | RNWH | 13 | 19 | **17** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 1 | **10** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 2 | **12** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 8 | **13** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 9 | **18** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 11 | **17** | |
| INUG | Aug-11 | OT | 1 | RNWH | 14 | 14 | **12** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 12 | **6** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 15 | **5** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 16 | **4** | |
| TPN | Aug-11 | OT | 1 | ARCH | 23 | 1 | **11** | |
| TPN | Aug-11 | OT | 1 | ARCH | 25 | 3 | **5** | |
| TPN | Aug-11 | OT | 1 | ARCH | 25 | 7 | **4** | |
| TPN | Aug-11 | OT | 1 | ARCH | 5 | 7 | **5** | |
| TPN | Aug-11 | OT | 1 | ARCH | 5 | 9 | **5** | |
| TPN | Aug-11 | OT | 1 | ARCH | 5 | 11 | **2** | |
| TPN | Aug-11 | OT | 1 | ARCH | 6 | 8 | **8** | |
| TPN | Aug-11 | OT | 1 | ARCH | 6 | 11 | **9** | |
| TPN | Aug-11 | OT | 1 | ARCH | 6 | 17 | **3** | |
| TPN | Aug-11 | OT | 1 | ARCH | 6 | 19 | **4** | |
| TPN | Aug-11 | OT | 1 | ARCH | 6 | 2 | **5** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 3 | **3** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 4 | **4** | |
| TPN | Aug-11 | OT | 1 | ARCH | 10 | 5 | **3** | |
| TPN | Aug-11 | OT | 1 | LKTR | 1 | 1 | **15** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 1 | **21** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 2 | **19** | |

| Location | Date | Structures | Total | Species | Site # | Fish # | Final | Comments |
|---|---|---|---|---|---|---|---|---|
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 3 | **14** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 12 | **6** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 13 | **5** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 15 | **3** | |
| TPN | Aug-11 | OT | 1 | LKTR | 5 | 21 | **15** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 2 | **26** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 3 | **18** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 5 | **19** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 14 | **12** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 15 | **5** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 18 | **6** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 21 | **6** | |
| TPN | Aug-11 | OT | 1 | LKTR | 6 | 23 | **6** | |
| TPN | Aug-11 | OT | 1 | LKTR | 7 | 1 | **13** | |
| TPN | Aug-11 | OT | 1 | LKTR | 8 | 2 | **19** | |
| TPN | Aug-11 | OT | 1 | LKTR | 8 | 3 | **17** | |
| TPN | Aug-11 | OT | 1 | LKTR | 8 | 6 | **22** | |
| TPN | Aug-11 | OT | 1 | LKTR | 8 | 7 | **22** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 9 | **7** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 1 | **5** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 13 | **16** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 14 | **13** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 19 | **6** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 2 | **5** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 21 | **4** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 22 | **18** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 23 | **23** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 25 | **17** | |
| TPN | Aug-11 | OT | 1 | LKTR | 10 | 26 | **40** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 1 | **8** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 2 | **21** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 3 | **19** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 5 | **26** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 8 | **20** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 9 | **15** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 4 | **25** | |
| TPN | Aug-11 | OT | 1 | LKTR | 17 | 1 | **16** | |
| TPN | Aug-11 | OT | 1 | LKTR | 11 | 1 | **7** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 6 | **8** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 9 | **18** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 12 | **22** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 13 | **20** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 14 | **15** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 17 | **21** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 21 | **19** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 22 | **15** | |

| Location | Date | Structures | Total | Species | Site # | Fish # | Final | Comments |
|---|---|---|---|---|---|---|---|---|
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 25 | **28** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 26 | **17** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 27 | **34** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 28 | **37** | |
| TPN | Aug-11 | OT | 1 | LKTR | 16 | 29 | **34** | |
| TPN | Aug-11 | OT | 1 | LKTR | 22 | 2 | **20** | |
| TPN | Aug-11 | OT | 1 | LKTR | 22 | 3 | **18** | |
| TPN | Aug-11 | OT | 1 | LKTR | 24 | 4 | **9** | |
| TPN | Aug-11 | OT | 1 | LKTR | 24 | 5 | **29** | |
| TPN | Aug-11 | OT | 1 | LKTR | 25 | 1 | **13** | |
| TPN | Aug-11 | OT | 1 | LKTR | 25 | 2 | **14** | |
| TPN | Aug-11 | OT | 1 | RNWH | 10 | 8 | **14** | |
| TPN | Aug-11 | OT | 1 | RNWH | 11 | 6 | **14** | |
| PDL | Aug-11 | OT | 1 | ARCH | 1 | 14 | **5** | |
| PDL | Aug-11 | OT | 1 | ARCH | 1 | 15 | **10** | |
| PDL | Aug-11 | OT | 1 | ARCH | 3 | 6 | **6** | |
| PDL | Aug-11 | OT | 1 | ARCH | 3 | 12 | **11** | |
| PDL | Aug-11 | OT | 1 | ARCH | 8 | 1 | **6** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 6 | **15** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 9 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 1 | **12** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 11 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 16 | **11** | |
| PDL | Aug-11 | OT | 1 | LKTR | 1 | 17 | **12** | |
| PDL | Aug-11 | OT | 1 | LKTR | 2 | 1 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 2 | 2 | **8** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 2 | **8** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 3 | **8** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 4 | **15** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 5 | **24** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 9 | **15** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 13 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 14 | **15** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 15 | **22** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 16 | **18** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 17 | **24** | |
| PDL | Aug-11 | OT | 1 | LKTR | 3 | 2 | **14** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 4 | **29** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 5 | **23** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 6 | **20** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 8 | **16** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 9 | **18** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 11 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 12 | **6** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 13 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 4 | 14 | **4** | |
| PDL | Aug-11 | OT | 1 | LKTR | 8 | 01A | **20** | |
| PDL | Aug-11 | OT | 1 | LKTR | 8 | 5 | **10** | |
| PDL | Aug-11 | OT | 1 | LKTR | 8 | 6 | **10** | |
| PDL | Aug-11 | OT | 1 | RNWH | 1 | 3 | **12** | |
| PDL | Aug-11 | OT | 1 | RNWH | 1 | 4 | **22** | |
| PDL | Aug-11 | OT | 1 | RNWH | 1 | 7 | **14** | |
| PDL | Aug-11 | OT | 1 | RNWH | 1 | 8 | **12** | |
| PDL | Aug-11 | OT | 1 | RNWH | 3 | 8 | **16** | |
| PDL | Aug-11 | OT | 1 | RNWH | 3 | 18 | **16** | |
| PDL | Aug-11 | OT | 1 | RNWH | 7 | 3 | **9** | |

**NSC Ageing ID:** 237
**Company Name:** Azimuth
**Project Name:** Meadowbank
**Client Contact:** R.Baker/G.Mann
**# & Type of Structures:** 336 FR
**Work to be Completed:** Set/cut

| Location | Date | Structures | Total | Species | Site # | Fish # | Final | Comments |
|---|---|---|---|---|---|---|---|---|
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 8 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 9 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 10 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 16 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 17 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 5 | **3** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 6 | **3** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 15 | **7** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 16 | **12** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 17 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 18 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 21 | **2** | |
| INUG | Aug-11 | FR | 1 | LKTR | 4 | 3 | **9** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 5 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 6 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 7 | **19** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 8 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 1 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 3 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 6 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 9 | **1** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 10 | **1** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 12 | **4** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 6 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 15 | **3** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 17 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 18 | **20** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 19 | **12** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 20 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 10 | 2 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 10 | 4 | **19** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 5 | **25** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 7 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 10 | **6** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 17 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 1 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 3 | **9** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 5 | **4** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 13 | **21** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 15 | **11** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 16 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 18 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 19 | **7** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 2 | **13** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 11 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 12 | **10** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 13 | **12** | |

| **Location** | **Date** | **Structures** | **Total** | **Species** | **Site #** | **Fish #** | **Final** | **Comments** |
|---|---|---|---|---|---|---|---|---|
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 14 | **8** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 15 | **6** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 18 | **13** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 19 | **16** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 21 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 1 | 22 | **9** | |
| INUG | Aug-11 | FR | 1 | RNWH | 2 | 4 | **4** | |
| INUG | Aug-11 | FR | 1 | RNWH | 2 | 8 | **9** | |
| INUG | Aug-11 | FR | 1 | RNWH | 2 | 14 | **10** | |
| INUG | Aug-11 | FR | 1 | RNWH | 3 | 1 | **11** | |
| INUG | Aug-11 | FR | 1 | RNWH | 5 | 1 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 5 | 2 | **8** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 4 | **13** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 5 | **15** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 8 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 9 | **11** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 11 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 12 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 13 | **5** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 14 | **7** | |
| INUG | Aug-11 | FR | 1 | RNWH | 8 | 16 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 9 | 4 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 2 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 4 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 9 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 12 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 14 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 18 | **14** | |
| INUG | Aug-11 | FR | 1 | RNWH | 13 | 19 | **13** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 2 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 8 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 9 | **13** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 10 | **8** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 11 | **12** | |
| INUG | Aug-11 | FR | 1 | RNWH | 14 | 14 | **12** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 4 | **10** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 6 | **9** | |
| TPN | Aug-11 | FR | 1 | ARCH | 10 | 7 | **10** | |
| TPN | Aug-11 | FR | 1 | ARCH | 10 | 17 | **6** | |
| TPN | Aug-11 | FR | 1 | ARCH | 11 | 7 | **5** | |
| TPN | Aug-11 | FR | 1 | ARCH | 16 | 1 | **9** | |
| TPN | Aug-11 | FR | 1 | ARCH | 16 | 19 | **7** | |
| TPN | Aug-11 | FR | 1 | ARCH | 24 | 3 | **4** | |
| TPN | Aug-11 | FR | 1 | ARCH | 25 | 6 | **5** | |
| TPN | Aug-11 | FR | 1 | ARCH | 25 | 9 | **10** | |
| TPN | Aug-11 | FR | 1 | ARCH | 25 | 11 | **8** | |
| TPN | Aug-11 | FR | 1 | ARCH | 5 | 7 | **5** | |
| TPN | Aug-11 | FR | 1 | ARCH | 5 | 9 | **4** | |
| TPN | Aug-11 | FR | 1 | ARCH | 5 | 11 | **7** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 8 | **7** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 11 | **8** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 17 | **2** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 19 | **2** | |
| TPN | Aug-11 | FR | 1 | ARCH | 6 | 20 | **3** | |
| TPN | Aug-11 | FR | 1 | ARCH | 10 | 3 | **1** | |
| TPN | Aug-11 | FR | 1 | ARCH | 10 | 4 | **2** | |
| TPN | Aug-11 | FR | 1 | ARCH | 10 | 5 | **2** | |
| TPN | Aug-11 | FR | 1 | LKTR | 1 | 2 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 1 | 3 | **10** | |
| TPN | Aug-11 | FR | 1 | LKTR | 2 | 2 | **11** | |

| **Location** | **Date** | **Structures** | **Total** | **Species** | **Site #** | **Fish #** | **Final** | **Comments** |
|---|---|---|---|---|---|---|---|---|
| TPN | Aug-11 | FR | 1 | LKTR | 3 | 1 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 3 | 2 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 4 | **16** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 5 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 6 | **6** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 8 | **3** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 14 | **3** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 17 | **2** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 19 | **25** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 2 | **21** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 23 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 1 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 7 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 9 | **12** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 1 | **10** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 12 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 13 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 16 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 22 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 29 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 3 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 4 | **12** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 5 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 8 | **26** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 9 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 1 | **22** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 6 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 11 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 18 | **8** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 24 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 4 | **5** | |
| TPN | Aug-11 | FR | 1 | LKTR | 14 | 1 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 2 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 3 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 11 | **20** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 12 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 7 | **6** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 8 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 1 | **16** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 11 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 15 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 18 | **26** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 2 | **19** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 23 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 24 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 20 | 1 | **6** | |
| TPN | Aug-11 | FR | 1 | LKTR | 22 | 1 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 22 | 4 | **16** | |
| TPN | Aug-11 | FR | 1 | LKTR | 22 | 5 | **25** | |
| TPN | Aug-11 | FR | 1 | LKTR | 24 | 1 | **6** | |
| TPN | Aug-11 | FR | 1 | LKTR | 24 | 2 | **10** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 4 | **22** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 5 | **18** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 8 | **19** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 10 | **21** | |
| TPN | Aug-11 | FR | 1 | LKTR | 1 | 1 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 1 | **10** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 2 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 3 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 12 | **4** | |

| **Location** | **Date** | **Structures** | **Total** | **Species** | **Site #** | **Fish #** | **Final** | **Comments** |
|---|---|---|---|---|---|---|---|---|
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 13 | **5** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 15 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 5 | 21 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 2 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 3 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 5 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 14 | **8** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 15 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 18 | **ua** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 21 | **3** | |
| TPN | Aug-11 | FR | 1 | LKTR | 6 | 23 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 7 | 1 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 2 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 3 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 6 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 8 | 7 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 9 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 1 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 13 | **9** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 14 | **6** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 19 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 20 | **4** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 21 | **3** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 22 | **9** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 23 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 25 | **16** | |
| TPN | Aug-11 | FR | 1 | LKTR | 10 | 26 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 1 | **5** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 2 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 3 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 5 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 8 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 9 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 4 | **21** | |
| TPN | Aug-11 | FR | 1 | LKTR | 17 | 1 | **12** | |
| TPN | Aug-11 | FR | 1 | LKTR | 11 | 10 | **7** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 6 | **3** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 9 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 12 | **14** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 13 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 14 | **11** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 17 | **19** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 21 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 22 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 25 | **26** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 26 | **17** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 27 | **25** | |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 28 | **ua** | cut too high |
| TPN | Aug-11 | FR | 1 | LKTR | 16 | 29 | **20** | |
| TPN | Aug-11 | FR | 1 | LKTR | 22 | 2 | **15** | |
| TPN | Aug-11 | FR | 1 | LKTR | 22 | 3 | **13** | |
| TPN | Aug-11 | FR | 1 | LKTR | 24 | 4 | **5** | |
| TPN | Aug-11 | FR | 1 | LKTR | 24 | 5 | **22** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 1 | **9** | |
| TPN | Aug-11 | FR | 1 | LKTR | 25 | 2 | **7** | |
| TPN | Aug-11 | FR | 1 | RNWH | 10 | 8 | **14** | |
| TPN | Aug-11 | FR | 1 | RNWH | 11 | 6 | **14** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 1 | **20** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 2 | **26** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 5 | **21** | |

| **Location** | **Date** | **Structures** | **Total** | **Species** | **Site #** | **Fish #** | **Final** | **Comments** |
|---|---|---|---|---|---|---|---|---|
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 12 | **30** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 13 | **ua** | too high |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 1 | **14** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 1 | **18** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 11 | **5** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 19 | **ns** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 1 | **9** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 2 | **20** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 3 | **28** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 7 | **17** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 1 | **24** | |
| PDL | Aug-11 | FR | 1 | LKTR | 5 | 1 | **22** | |
| PDL | Aug-11 | FR | 1 | LKTR | 6 | 1 | **16** | |
| PDL | Aug-11 | FR | 1 | LKTR | 6 | 2 | **17** | |
| PDL | Aug-11 | FR | 1 | LKTR | 7 | 1 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 7 | 2 | **3** | |
| PDL | Aug-11 | FR | 1 | LKTR | 7 | 4 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 2 | **20** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 3 | **22** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 4 | **6** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 7 | **2** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 6 | **10** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 9 | **7** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 1 | **8** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 11 | **8** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 16 | **5** | |
| PDL | Aug-11 | FR | 1 | LKTR | 1 | 17 | **5** | |
| PDL | Aug-11 | FR | 1 | LKTR | 2 | 1 | **8** | |
| PDL | Aug-11 | FR | 1 | LKTR | 2 | 2 | **7** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 2 | **8** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 3 | **5** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 4 | **12** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 5 | **13** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 9 | **10** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 13 | **6** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 14 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 15 | **12** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 16 | **11** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 17 | **14** | |
| PDL | Aug-11 | FR | 1 | LKTR | 3 | 2 | **10** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 4 | **16** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 5 | **10** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 6 | **12** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 8 | **6** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 9 | **10** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 11 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 12 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 13 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 4 | 14 | **3** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 01A | **18** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 5 | **4** | |
| PDL | Aug-11 | FR | 1 | LKTR | 8 | 6 | **4** | |
| PDL | Aug-11 | FR | 1 | RNWH | 1 | 3 | **12** | |
| PDL | Aug-11 | FR | 1 | RNWH | 1 | 4 | **14** | |
| PDL | Aug-11 | FR | 1 | RNWH | 1 | 7 | **8** | |
| PDL | Aug-11 | FR | 1 | RNWH | 1 | 8 | **5** | |
| PDL | Aug-11 | FR | 1 | RNWH | 3 | 8 | **14** | |
| PDL | Aug-11 | FR | 1 | RNWH | 3 | 18 | **12** | |
| PDL | Aug-11 | FR | 1 | RNWH | 7 | 3 | **6** | |
| INUG | Aug-11 | FR | 1 | ARCH | 2 | 13 | **4** | |

| **Location** | **Date** | **Structures** | **Total** | **Species** | **Site #** | **Fish #** | **Final** | **Comments** |
|---|---|---|---|---|---|---|---|---|
| INUG | Aug-11 | FR | 1 | ARCH | 7 | 2 | **14** | |
| INUG | Aug-11 | FR | 1 | ARCH | 7 | 15 | **2** | |
| INUG | Aug-11 | FR | 1 | ARCH | 8 | 1 | **4** | |
| INUG | Aug-11 | FR | 1 | ARCH | 14 | 7 | **3** | |
| INUG | Aug-11 | FR | 1 | ARGR | 13 | 6 | **6** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 2 | **24** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 3 | **22** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 4 | **27** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 5 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 6 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 1 | 7 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 1 | **8** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 1 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 2 | **16** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 7 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 9 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 11 | **22** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 12 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 2 | 19 | **30+** | |
| INUG | Aug-11 | FR | 1 | LKTR | 4 | 1 | **7** | |
| INUG | Aug-11 | FR | 1 | LKTR | 4 | 2 | **20** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 3 | **19** | |
| INUG | Aug-11 | FR | 1 | LKTR | 5 | 4 | **9** | |
| INUG | Aug-11 | FR | 1 | LKTR | 6 | 1 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 4 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 5 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 7 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 8 | **4** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 11 | **12** | |
| INUG | Aug-11 | FR | 1 | LKTR | 7 | 13 | **5** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 1 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 2 | **18** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 3 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 8 | 7 | **15** | |
| INUG | Aug-11 | FR | 1 | LKTR | 9 | 1 | **6** | |
| INUG | Aug-11 | FR | 1 | LKTR | 9 | 2 | **28** | |
| INUG | Aug-11 | FR | 1 | LKTR | 9 | 3 | **19** | |
| INUG | Aug-11 | FR | 1 | LKTR | 9 | 5 | **12** | |
| INUG | Aug-11 | FR | 1 | LKTR | 10 | 1 | **27** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 1 | **13** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 3 | **17** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 8 | **4** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 11 | **14** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 13 | **4** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 15 | **3** | |
| INUG | Aug-11 | FR | 1 | LKTR | 13 | 16 | **3** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 6 | **8** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 12 | **20** | |
| INUG | Aug-11 | FR | 1 | LKTR | 14 | 17 | **14** | |

# APPENDIX J

# SUMMARY STATISTICS FOR OPPORTUNISTICALLY-COLLECTED LETHAL PARAMETERS

| | | Gonad Weight (g)** | | | | | | | Egg Weight (g/400 eggs)** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **Area** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** |
| LKTR | TPN | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |
| LKTR | INUG | 8 | 106.4 | 80.3 | 87.0 | 30.8 | 12.1 | 226.0 | 4 | 29.18 | 29.32 | 4.95 | 2.47 | 22.98 | 35.08 |
| LKTR | PDL | 7 | 163.1 | 76.6 | 125.8 | 47.6 | 62.7 | 390.0 | 4 | 26.08 | 28.93 | 10.39 | 5.20 | 11.26 | 35.19 |
| RNWH* | TPN | 2 | 24.6 | 24.6 | 7.1 | 5.1 | 19.5 | 29.6 | 1 | 1.02 | 1.02 | -- | -- | 1.02 | 1.02 |
| RNWH* | INUG | 34 | 19.5 | 20.4 | 7.4 | 1.3 | 3.3 | 33.7 | 14 | 0.97 | 0.93 | 0.30 | 0.08 | 0.47 | 1.81 |
| RNWH* | PDL | 6 | 26.7 | 26.8 | 13.1 | 5.3 | 10.3 | 48.8 | 4 | 0.86 | 0.88 | 0.07 | 0.04 | 0.76 | 0.92 |
| ARCH* | TPN | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |
| ARCH* | INUG | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |
| ARCH* | PDL | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |

| | | Fecundity (number of eggs)** | | | | | | | Liver Weight (g) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Species** | **Area** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** | **n** | **mean** | **median** | **SD** | **SE** | **min** | **max** |
| LKTR | TPN | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |
| LKTR | INUG | 4 | 2489 | 2424 | 450 | 225 | 2052 | 3057 | 43 | 15.37 | 11.44 | 16.35 | 2.49 | 0.45 | 68.46 |
| LKTR | PDL | 4 | 3356 | 3230 | 797 | 399 | 2533 | 4433 | 31 | 10.98 | 2.33 | 16.62 | 2.99 | 0.22 | 68.74 |
| RNWH* | TPN | 1 | 11608 | 11608 | NA | NA | 11608 | 11608 | 1 | 8.20 | 8.20 | -- | -- | 8.20 | 8.20 |
| RNWH* | INUG | 14 | 9303 | 8239 | 3449 | 922 | 4590 | 18877 | 38 | 4.80 | 4.32 | 2.48 | 0.40 | 0.79 | 10.06 |
| RNWH* | PDL | 4 | 10173 | 11263 | 4271 | 2136 | 4465 | 13700 | 7 | 6.52 | 5.93 | 3.47 | 1.31 | 1.19 | 11.82 |
| ARCH* | TPN | 0 | -- | -- | -- | -- | -- | -- | 0 | -- | -- | -- | -- | -- | -- |
| ARCH* | INUG | 0 | -- | -- | -- | -- | -- | -- | 2 | 1.31 | 1.31 | 1.20 | 0.85 | 0.46 | 2.15 |
| ARCH* | PDL | 0 | -- | -- | -- | -- | -- | -- | 5 | 2.01 | 2.02 | 0.18 | 0.08 | 1.79 | 2.22 |

**Notes:** n = sample size; SD = standard deviation; SE = standard error; min = minumum; max = maximum; -- = not applicable.

* = non-sentinel species.

** = mature fish only.

# APPENDIX K

# ZEAS BENTHIC INVERTEBRATE TAXONOMIC IDENTIFICATION RAW DATA

TABLE 1: BENTHIC MACROINVERTEBRATES COLLECTED FROM NUNAVUT MINE LAKES - EEM (2011).

| Project Number | AE-11-01--EEM | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Station | INUG | | | | | PDL | | | | | TPN | | | | |
| Replicate | 1-A | 2-A | 3-A | 4-A | 5-A | 1-A | 2-A | 3-A | 4-A | 5-A | 1-A | 2-A | 3-A | 4-A | 5-A |
| **ROUNDWORMS** | | | | | | | | | | | | | | | |
| **P. Nemata** | - | 2 | 1 | - | 1 | - | 2 | - | 1 | - | 1 | - | 1 | - | - |
| **ANNELIDS** | | | | | | | | | | | | | | | |
| **P. Annelida** | | | | | | | | | | | | | | | |
| **WORMS** | | | | | | | | | | | | | | | |
| Cl. Oligochaeta | | | | | | | | | | | | | | | |
| **F. Tubificidae** | | | | | | | | | | | | | | | |
| *Tasserkidrilus americanus* | - | - | - | - | - | - | - | - | - | 2 | 1 | - | - | - | - |
| immatures with hair chaetae | - | - | - | - | - | - | - | - | - | - | - | 2 | - | - | - |
| **F. Lumbriculidae** | | | | | | | | | | | | | | | |
| *Lumbriculus* | - | 2 | - | 1 | - | - | - | - | - | 3 | - | 1 | - | - | - |
| **ARTHROPODS** | | | | | | | | | | | | | | | |
| **P. Arthropoda** | | | | | | | | | | | | | | | |
| **MITES** | | | | | | | | | | | | | | | |
| Cl. Arachnida | | | | | | | | | | | | | | | |
| O. Acarina | - | - | - | 1 | - | 1 | 1 | - | 1 | - | 2 | - | - | - | - |
| **SEED SHRIMPS** | | | | | | | | | | | | | | | |
| Cl. Ostracoda | - | - | - | - | - | - | 2 | - | - | - | - | - | 1 | - | - |
| **INSECTS** | | | | | | | | | | | | | | | |
| Cl. Insecta | | | | | | | | | | | | | | | |
| **CADDISFLIES** | | | | | | | | | | | | | | | |
| O. Trichoptera | | | | | | | | | | | | | | | |
| **F. Limnephilidae** | | | | | | | | | | | | | | | |
| *Grensia praeterita* | - | - | - | - | - | - | - | 1 | - | - | - | - | - | - | - |
| **TRUE FLIES** | | | | | | | | | | | | | | | |
| O. Diptera | | | | | | | | | | | | | | | |
| **MIDGES** | | | | | | | | | | | | | | | |
| **F. Chironomidae** | | | | | | | | | | | | | | | |
| chironomid pupae | - | - | **1** | - | - | - | - | **2** | - | - | - | **1** | - | **1** | **1** |
| S.F. Chironominae | | | | | | | | | | | | | | | |
| *Corynocera* | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| *Micropsectra* | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | - | - |
| *Microtendipes* | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| *Paratanytarsus* | - | - | - | - | 2 | - | - | - | - | - | - | - | - | - | - |
| *Stictochironomus* | - | - | 1 | - | 1 | - | 13 | 14 | - | 1 | 4 | - | - | - | - |
| *Tanytarsus* | - | - | 2 | 1 | 1 | - | 2 | - | - | - | 2 | - | - | - | - |
| S.F. Diamesinae | | | | | | | | | | | | | | | |
| *Protanypus* | - | - | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| *Pseudodiamesa* | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| S.F. Orthocladiinae | | | | | | | | | | | | | | | |
| *Heterotrissocladius* | - | - | - | 1 | 1 | - | - | - | 1 | - | - | - | 1 | - | - |
| *Paracladius* | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| *Psectrocladius* | 1 | - | - | 1 | - | - | 2 | - | 1 | - | - | - | - | - | 1 |
| *Zalutschia* | - | - | - | - | - | - | - | 1 | 1 | 1 | - | - | - | - | - |
| indeterminate | - | - | - | - | - | - | - | - | - | 1 | - | - | - | - | - |
| S.F. Prodiamesinae | | | | | | | | | | | | | | | |
| *Monodiamesa* | - | - | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - |
| S.F. Tanypodinae | | | | | | | | | | | | | | | |
| *Ablabesmyia* | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| *Procladius* | - | 3 | 5 | 3 | 6 | - | 1 | 1 | 2 | 6 | 1 | 3 | - | 1 | - |
| *Thienemannimyia* complex | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| **MOLLUSCS** | | | | | | | | | | | | | | | |
| **P. Mollusca** | | | | | | | | | | | | | | | |
| **CLAMS** | | | | | | | | | | | | | | | |
| Cl. Bivalvia | | | | | | | | | | | | | | | |
| **F. Sphaeriidae** | | | | | | | | | | | | | | | |
| *Cyclocalyx/Neopisidium* | - | 9 | 10 | 11 | 4 | 1 | 3 | 10 | 7 | 1 | 15 | 14 | 5 | 2 | - |
| *Cyclocalyx* | - | - | 4 | - | - | - | - | - | - | 5 | - | - | - | - | - |
| *Sphaerium nitidum* | - | - | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| **TOTAL NUMBER OF ORGANISMS** | 1 | 16 | 30 | 22 | 21 | 2 | 26 | 29 | 14 | 21 | 28 | 21 | 8 | 4 | 3 |
| **TOTAL NUMBER OF TAXA** [a] | 1 | 4 | 9 | 9 | 11 | 2 | 8 | 5 | 7 | 9 | 8 | 4 | 4 | 2 | 2 |

[a] Bold entries excluded from taxa count

# APPENDIX L

# BENTHIC INVERTEBRATE SUPPORTING TABLES: FAMILY DENSITY, FAMILY PROPORTION, FAMILY PRESENCE/ABSENCE MATRIX, RAW FAMILY DATA, AND RAW LOWEST PRACTICAL LEVEL DATA

| | Family Density (#/m²) | | | | | | |
|---|---|---|---|---|---|---|---|
| | F. Tubificidae | F. Lumbriculidae | O. Acarina | F. Triopsidae | F. Limnephilidae | F. Chironomidae | F. Sphaeriidae |
| **INUG** | | | | | | | |
| 1 | 14 | 14 | 0 | 0 | 0 | 174 | 116 |
| 2 | 0 | 58 | 14 | 0 | 0 | 304 | 406 |
| 3 | 0 | 43 | 29 | 0 | 0 | 377 | 522 |
| 4 | 0 | 72 | 29 | 72 | 0 | 797 | 812 |
| 5 | 0 | 43 | 14 | 0 | 0 | 464 | 261 |
| **Mean** | **2.9** | **46** | **17** | **14** | **0** | **423** | **423** |
| **SE** | **2.9** | **9.6** | **5.4** | **14** | **0** | **105** | **119** |
| **PDL** | | | | | | | |
| 1 | 43 | 0 | 58 | 0 | 0 | 420 | 217 |
| 2 | 0 | 14 | 14 | 0 | 14 | 580 | 275 |
| 3 | 43 | 58 | 43 | 0 | 14 | 623 | 420 |
| 4 | 0 | 0 | 29 | 0 | 0 | 304 | 304 |
| 5 | 58 | 43 | 14 | 0 | 14 | 609 | 188 |
| **Mean** | **29** | **23** | **32** | **0** | **8.7** | **507** | **281** |
| **SE** | **12** | **12** | **8.5** | **0** | **3.5** | **62** | **40** |
| **TPN** | | | | | | | |
| 1 | 14 | 14 | 29 | 0 | 0 | 377 | 464 |
| 2 | 58 | 14 | 0 | 0 | 0 | 391 | 391 |
| 3 | 0 | 0 | 14 | 0 | 0 | 159 | 87 |
| 4 | 0 | 0 | 29 | 0 | 0 | 290 | 217 |
| 5 | 0 | 0 | 0 | 0 | 14 | 130 | 72 |
| **Mean** | **14** | **5.8** | **14** | **0** | **2.9** | **270** | **246** |
| **SE** | **11** | **3.5** | **6.5** | **0** | **2.9** | **54** | **79** |

|  | Family Proportion (%) |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|
|  | F. Tubificidae | F. Lumbriculidae | O. Acarina | F. Triopsidae | F. Limnephilidae | F. Chironomidae | F. Sphaeriidae |
| **INUG** |  |  |  |  |  |  |  |
| 1 | 4.5 | 4.5 | 0 | 0 | 0 | 55 | 36 |
| 2 | 0 | 7.4 | 1.9 | 0 | 0 | 39 | 52 |
| 3 | 0 | 4.5 | 3.0 | 0 | 0 | 39 | 54 |
| 4 | 0 | 4.1 | 1.6 | 4.1 | 0 | 45 | 46 |
| 5 | 0 | 5.6 | 1.9 | 0 | 0 | 59 | 33 |
| **Mean** | **0.9** | **5.2** | **1.7** | **0.8** | **0** | **47** | **44** |
| **SE** | **0.9** | **0.6** | **0.5** | **0.8** | **0** | **4.2** | **4.1** |
| **PDL** |  |  |  |  |  |  |  |
| 1 | 5.9 | 0 | 7.8 | 0 | 0 | 57 | 29 |
| 2 | 0 | 1.6 | 1.6 | 0 | 1.6 | 65 | 31 |
| 3 | 3.6 | 4.8 | 3.6 | 0 | 1.2 | 52 | 35 |
| 4 | 0 | 0 | 4.5 | 0 | 0 | 48 | 48 |
| 5 | 6.2 | 4.7 | 1.6 | 0 | 1.6 | 66 | 20 |
| **Mean** | **3.1** | **2.2** | **3.8** | **0** | **0.9** | **57** | **33** |
| **SE** | **1.4** | **1.1** | **1.2** | **0** | **0** | **3.5** | **4.5** |
| **TPN** |  |  |  |  |  |  |  |
| 1 | 1.6 | 1.6 | 3.2 | 0 | 0 | 42 | 52 |
| 2 | 6.8 | 1.7 | 0 | 0 | 0 | 46 | 46 |
| 3 | 0 | 0 | 5.6 | 0 | 0 | 61 | 33 |
| 4 | 0 | 0 | 5.4 | 0 | 0 | 54 | 41 |
| 5 | 0 | 0 | 0 | 0 | 6.7 | 60 | 33 |
| **Mean** | **1.7** | **0.7** | **2.8** | **0** | **1** | **53** | **41** |
| **SE** | **1.3** | **0.4** | **1.2** | **0** | **1** | **3.8** | **3.6** |

Presence (+) / Absence (-) matrix of benthic invertebrate families for each replicate station.

| **Area ID** | **INUG** | **INUG** | **INUG** | **INUG** | **INUG** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.9 | 6.8 | 7.6 | 8.5 | 9.2 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 |
| **ANNELIDS (P. Annelida)** | | | | | |
| Cl. Oligochaeta (Worms) | | | | | |
| **F. Tubificidae** | + | - | - | - | - |
| **F. Lumbriculidae** | + | + | + | + | + |
| | | | | | |
| **ARTHROPODS** (P. Arthropoda) | | | | | |
| Cl. Arachnida | | | | | |
| **O. Acarina** (Mites) | - | + | + | + | + |
| Cl. Branchiopoda (Fairy shrimp) | | | | | |
| O. Notostraca | | | | | |
| **F. Triopsidae** | - | - | - | + | - |
| | | | | | |
| **INSECTS** (Cl. Insecta) | | | | | |
| O. Trichoptera (Caddisflies) | | | | | |
| **F. Limnephilidae** | - | - | - | - | - |
| O. Diptera (True flies) | | | | | |
| **F. Chironomidae** (Midges) | + | + | + | + | + |
| | | | | | |
| **MOLLUSCS** (P. Mollusca) | | | | | |
| Cl. Bivalvia (Bivalves) | | | | | |
| **F. Sphaeriidae** (Fingernail clams) | + | + | + | + | + |

Presence (+) / Absence (-) matrix of benthic invertebrate families for each replicate station.

| **Area ID** | **PDL** | **PDL** | **PDL** | **PDL** | **PDL** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.5 | 6.8 | 6.9 | 7.6 | 6.7 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 |
| **ANNELIDS (P. Annelida)** | | | | | |
| Cl. Oligochaeta (Worms) | | | | | |
| **F. Tubificidae** | + | - | + | - | + |
| **F. Lumbriculidae** | - | + | + | - | + |
| | | | | | |
| **ARTHROPODS** (P. Arthropoda) | | | | | |
| Cl. Arachnida | | | | | |
| **O. Acarina** (Mites) | + | + | + | + | + |
| Cl. Branchiopoda (Fairy shrimp) | | | | | |
| O. Notostraca | | | | | |
| **F. Triopsidae** | - | - | - | - | - |
| | | | | | |
| **INSECTS** (Cl. Insecta) | | | | | |
| O. Trichoptera (Caddisflies) | | | | | |
| **F. Limnephilidae** | - | + | + | - | + |
| O. Diptera (True flies) | | | | | |
| **F. Chironomidae** (Midges) | + | + | + | + | + |
| | | | | | |
| **MOLLUSCS** (P. Mollusca) | | | | | |
| Cl. Bivalvia (Bivalves) | | | | | |
| **F. Sphaeriidae** (Fingernail clams) | + | + | + | + | + |

Presence (+) / Absence (-) matrix of benthic invertebrate families for each replicate station.

| **Area ID** | **TPN** | **TPN** | **TPN** | **TPN** | **TPN** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 7.0 | 9.0 | 9.2 | 8.6 | 8.4 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 |
| **ANNELIDS (P. Annelida)** | | | | | |
| Cl. Oligochaeta (Worms) | | | | | |
| **F. Tubificidae** | + | + | - | - | - |
| **F. Lumbriculidae** | + | + | - | - | - |
| | | | | | |
| **ARTHROPODS** (P. Arthropoda) | | | | | |
| Cl. Arachnida | | | | | |
| **O. Acarina** (Mites) | + | - | + | + | - |
| Cl. Branchiopoda (Fairy shrimp) | | | | | |
| O. Notostraca | | | | | |
| **F. Triopsidae** | - | - | - | - | - |
| | | | | | |
| **INSECTS** (Cl. Insecta) | | | | | |
| O. Trichoptera (Caddisflies) | | | | | |
| **F. Limnephilidae** | - | - | - | - | + |
| O. Diptera (True flies) | | | | | |
| **F. Chironomidae** (Midges) | + | + | + | + | + |
| | | | | | |
| **MOLLUSCS** (P. Mollusca) | | | | | |
| Cl. Bivalvia (Bivalves) | | | | | |
| **F. Sphaeriidae** (Fingernail clams) | + | + | + | + | + |

Raw benthic invertebrate family data for each replicate station.

| **Area ID** | **INUG** | **INUG** | **INUG** | **INUG** | **INUG** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.9 | 6.8 | 7.6 | 8.5 | 9.2 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 |
| **ROUNDWORMS** (P. Nemata)[1] |  | 3 | 2 | 2 | 4 |
| **ANNELIDS (P. Annelida)** |  |  |  |  |  |
| Cl. Oligochaeta (Worms) |  |  |  |  |  |
| **F. Tubificidae** | 1 |  |  |  |  |
| **F. Lumbriculidae** | 1 | 4 | 3 | 5 | 3 |
| **ARTHROPODS** (P. Arthropoda) |  |  |  |  |  |
| Cl. Arachnida |  |  |  |  |  |
| O. Acarina (Mites) |  | 1 | 2 | 2 | 1 |
| Cl. Ostracoda (Seed shrimp)[1] | 2 | 1 | 3 | 5 |  |
| Cl. Branchiopoda (Fairy shrimp) |  |  |  |  |  |
| O. Notostraca |  |  |  |  |  |
| **F. Triopsidae** |  |  |  | 5 |  |
| **INSECTS** (Cl. Insecta) |  |  |  |  |  |
| O. Trichoptera (Caddisflies) |  |  |  |  |  |
| **F. Limnephilidae** |  |  |  |  |  |
| O. Diptera (True flies) |  |  |  |  |  |
| **F. Chironomidae** (Midges) | 12 | 21 | 26 | 55 | 32 |
| **MOLLUSCS** (P. Mollusca) |  |  |  |  |  |
| Cl. Bivalvia (Bivalves) |  |  |  |  |  |
| **F. Sphaeriidae** (Fingernail clams) | 8 | 28 | 36 | 56 | 18 |

Raw benthic invertebrate family data for each replicate station.

| **Area ID** | **PDL** | **PDL** | **PDL** | **PDL** | **PDL** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.5 | 6.8 | 6.9 | 7.6 | 6.7 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 |
| **ROUNDWORMS** (P. Nemata)[1] | 1 | 2 |  | 2 | 2 |
| **ANNELIDS (P. Annelida)** |  |  |  |  |  |
| Cl. Oligochaeta (Worms) |  |  |  |  |  |
| **F. Tubificidae** | 3 |  | 3 |  | 4 |
| **F. Lumbriculidae** |  | 1 | 4 |  | 3 |
| **ARTHROPODS** (P. Arthropoda) |  |  |  |  |  |
| Cl. Arachnida |  |  |  |  |  |
| O. Acarina (Mites) | 4 | 1 | 3 | 2 | 1 |
| Cl. Ostracoda (Seed shrimp)[1] | 5 | 4 |  |  |  |
| Cl. Branchiopoda (Fairy shrimp) |  |  |  |  |  |
| O. Notostraca |  |  |  |  |  |
| **F. Triopsidae** |  |  |  |  |  |
| **INSECTS** (Cl. Insecta) |  |  |  |  |  |
| O. Trichoptera (Caddisflies) |  |  |  |  |  |
| **F. Limnephilidae** |  | 1 | 1 |  | 1 |
| O. Diptera (True flies) |  |  |  |  |  |
| **F. Chironomidae** (Midges) | 29 | 40 | 43 | 21 | 42 |
| **MOLLUSCS** (P. Mollusca) |  |  |  |  |  |
| Cl. Bivalvia (Bivalves) |  |  |  |  |  |
| **F. Sphaeriidae** (Fingernail clams) | 15 | 19 | 29 | 21 | 13 |

Raw benthic invertebrate family data for each replicate station.

| **Area ID** | **TPN** | **TPN** | **TPN** | **TPN** | **TPN** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 7.0 | 9.0 | 9.2 | 8.6 | 8.4 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 |
| **ROUNDWORMS** (P. Nemata)[1] | 4 | | 2 | | |
| **ANNELIDS (P. Annelida)** | | | | | |
| Cl. Oligochaeta (Worms) | | | | | |
| **F. Tubificidae** | 1 | 4 | | | |
| **F. Lumbriculidae** | 1 | 1 | | | |
| **ARTHROPODS** (P. Arthropoda) | | | | | |
| Cl. Arachnida | | | | | |
| O. Acarina (Mites) | 2 | | 1 | 2 | |
| Cl. Ostracoda (Seed shrimp)[1] | 1 | 1 | 2 | 2 | 6 |
| Cl. Branchiopoda (Fairy shrimp) | | | | | |
| O. Notostraca | | | | | |
| **F. Triopsidae** | | | | | |
| **INSECTS** (Cl. Insecta) | | | | | |
| O. Trichoptera (Caddisflies) | | | | | |
| **F. Limnephilidae** | | | | | 1 |
| O. Diptera (True flies) | | | | | |
| **F. Chironomidae** (Midges) | 26 | 27 | 11 | 20 | 9 |
| **MOLLUSCS** (P. Mollusca) | | | | | |
| Cl. Bivalvia (Bivalves) | | | | | |
| **F. Sphaeriidae** (Fingernail clams) | 32 | 27 | 6 | 15 | 5 |

Raw benthic invertebrate data identified to the lowest practical level.

| **Area ID** | **INUG** | **INUG** | **INUG** | **INUG** | **INUG** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.9 | 6.8 | 7.6 | 8.5 | 9.2 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 | 14-Aug-11 |
| ROUNDWORMS (P. Nemata)[1] |  | 3 | 2 | 2 | 4 |
|  |  |  |  |  |  |
| **ANNELIDS (P. Annelida)** |  |  |  |  |  |
| Cl. Oligochaeta (Worms) |  |  |  |  |  |
| **F. Tubificidae** |  |  |  |  |  |
| *Tasserkidrilus americanus* |  |  |  |  |  |
| immatures with hair chaetae[2] | 1 |  |  |  |  |
| **F. Lumbriculidae** |  |  |  |  |  |
| *Lumbriculus* | 1 | 4 | 3 | 5 | 3 |
|  |  |  |  |  |  |
| ARTHROPODS (P. Arthropoda) |  |  |  |  |  |
| Cl. Arachnida |  |  |  |  |  |
| O. Acarina (Mites) |  | 1 | 2 | 2 | 1 |
| Cl. Ostracoda (Seed shrimp)[1] | 2 | 1 | 3 | 5 |  |
| Cl. Branchiopoda (Fairy shrimp) |  |  |  |  |  |
| O. Notostraca |  |  |  |  |  |
| **F. Triopsidae** |  |  |  |  |  |
| *Lepidurus arcticus* |  |  |  | 5 |  |
|  |  |  |  |  |  |
| INSECTS (Cl. Insecta) |  |  |  |  |  |
| O. Trichoptera (Caddisflies) |  |  |  |  |  |
| **F. Limnephilidae** |  |  |  |  |  |
| *Grensia praeterita* |  |  |  |  |  |
| O. Diptera (True flies) |  |  |  |  |  |
| **F. Chironomidae** (Midges) |  |  |  |  |  |
| chironomid pupae[2] |  |  | 1 |  | 1 |
| S.F. Chironominae |  |  |  |  |  |
| *Corynocera* |  |  |  |  | 1 |
| *Micropsectra* |  | 1 | 2 | 5 | 1 |
| *Microtendipes* |  | 1 |  | 3 | 3 |
| *Paratanytarsus* |  |  |  | 2 | 4 |
| *Stictochironomus* | 2 | 9 | 3 | 1 | 2 |
| *Tanytarsus* |  |  | 4 | 3 | 1 |
| S.F. Diamesinae |  |  |  |  |  |
| *Protanypus* | 1 |  | 2 |  |  |
| *Pseudodiamesa* |  |  |  |  |  |
| S.F. Orthocladiinae |  |  |  |  |  |
| *Abiskomyia* | 2 |  |  |  |  |
| *Cricotopus* |  |  |  |  |  |
| *Heterotrissocladius* |  |  |  | 2 | 3 |
| *Hydrobaenus* |  |  |  |  |  |
| *Paracladius* |  |  | 1 |  |  |
| *Psectrocladius* | 1 |  |  | 1 |  |
| *Psectrocladius* | 1 |  |  | 5 |  |
| *Zalutschia* |  |  |  | 1 |  |
| indeterminate[2] |  |  |  |  |  |
| S.F. Prodiamesinae |  |  |  |  |  |
| *Monodiamesa* | 1 |  | 3 | 2 | 1 |
| S.F. Tanypodinae |  |  |  |  |  |
| *Ablabesmyia* |  |  |  | 1 |  |
| *Procladius* | 4 | 10 | 10 | 29 | 15 |
| *Thienemannimyia* complex |  |  |  |  |  |
|  |  |  |  |  |  |
| MOLLUSCS (P. Mollusca) |  |  |  |  |  |
| Cl. Bivalvia (Bivalves) |  |  |  |  |  |
| **F. Sphaeriidae** (Fingernail clams) |  |  |  |  |  |
| *Cyclocalyx/Neopisidium* | 8 | 22 | 27 | 51 | 13 |
| *Cyclocalyx* |  | 5 | 5 | 1 | 2 |
| *Cyclocalyx nitidium* |  |  |  |  | 1 |
| *Sphaerium nitidum* |  | 1 | 4 | 4 | 2 |

Raw benthic invertebrate data identified to the lowest practical level.

| **Area ID** | **PDL** | **PDL** | **PDL** | **PDL** | **PDL** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 6.5 | 6.8 | 6.9 | 7.6 | 6.7 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 | 13-Aug-11 |
| ROUNDWORMS (P. Nemata)[1] | 1 | 2 |  | 2 | 2 |
| **ANNELIDS (P. Annelida)** |  |  |  |  |  |
| Cl. Oligochaeta (Worms) |  |  |  |  |  |
| **F. Tubificidae** |  |  |  |  |  |
| *Tasserkidrilus americanus* |  |  | 3 |  | 3 |
| immatures with hair chaetae[2] | 3 |  |  |  | 1 |
| **F. Lumbriculidae** |  |  |  |  |  |
| *Lumbriculus* |  | 1 | 4 |  | 3 |
| ARTHROPODS (P. Arthropoda) |  |  |  |  |  |
| Cl. Arachnida |  |  |  |  |  |
| O. Acarina (Mites) | 4 | 1 | 3 | 2 | 1 |
| Cl. Ostracoda (Seed shrimp)[1] | 5 | 4 |  |  |  |
| Cl. Branchiopoda (Fairy shrimp) |  |  |  |  |  |
| O. Notostraca |  |  |  |  |  |
| **F. Triopsidae** |  |  |  |  |  |
| *Lepidurus arcticus* |  |  |  |  |  |
| INSECTS (Cl. Insecta) |  |  |  |  |  |
| O. Trichoptera (Caddisflies) |  |  |  |  |  |
| **F. Limnephilidae** |  |  |  |  |  |
| *Grensia praeterita* |  | 1 | 1 |  | 1 |
| O. Diptera (True flies) |  |  |  |  |  |
| **F. Chironomidae** (Midges) |  |  |  |  |  |
| chironomid pupae[2] |  | 1 | 2 | 1 | 1 |
| S.F. Chironominae |  |  |  |  |  |
| *Corynocera* |  |  |  |  |  |
| *Micropsectra* | 1 |  |  |  |  |
| *Microtendipes* |  |  |  |  |  |
| *Paratanytarsus* |  |  |  |  | 2 |
| *Stictochironomus* | 15 | 21 | 31 | 5 | 17 |
| *Tanytarsus* |  | 3 |  |  | 2 |
| S.F. Diamesinae |  |  |  |  |  |
| *Protanypus* | 2 | 1 | 1 |  |  |
| *Pseudodiamesa* |  |  |  |  | 1 |
| S.F. Orthocladiinae |  |  |  |  |  |
| *Abiskomyia* | 1 |  |  | 2 |  |
| *Cricotopus* | 2 |  |  |  |  |
| *Heterotrissocladius* |  | 1 | 4 | 2 | 2 |
| *Hydrobaenus* | 1 |  |  |  |  |
| *Paracladius* |  |  |  |  |  |
| *Psectrocladius* |  | 2 |  | 1 |  |
| *Psectrocladius* | 1 | 6 |  |  | 2 |
| *Zalutschia* |  |  | 1 | 1 | 1 |
| indeterminate[2] |  |  |  |  | 1 |
| S.F. Prodiamesinae |  |  |  |  |  |
| *Monodiamesa* | 1 |  |  |  |  |
| S.F. Tanypodinae |  |  |  |  |  |
| *Ablabesmyia* |  |  |  |  |  |
| *Procladius* | 5 | 5 | 4 | 9 | 13 |
| *Thienemannimyia* complex |  |  |  |  |  |
| MOLLUSCS (P. Mollusca) |  |  |  |  |  |
| Cl. Bivalvia (Bivalves) |  |  |  |  |  |
| **F. Sphaeriidae** (Fingernail clams) |  |  |  |  |  |
| *Cyclocalyx/Neopisidium* | 13 | 16 | 29 | 21 | 3 |
| *Cyclocalyx* | 2 | 3 |  |  | 10 |
| *Cyclocalyx nitidium* |  |  |  |  |  |
| *Sphaerium nitidum* |  |  |  |  |  |

Raw benthic invertebrate data identified to the lowest practical level.

| **Area ID** | **TPN** | **TPN** | **TPN** | **TPN** | **TPN** |
|---|---|---|---|---|---|
| **Replicate ID** | 1 | 2 | 3 | 4 | 5 |
| **Depth (m)** | 7.0 | 9.0 | 9.2 | 8.6 | 8.4 |
| **# Subsamples/replicate** | 3 | 3 | 3 | 3 | 3 |
| **Mesh Size (µm)** | 500 | 500 | 500 | 500 | 500 |
| **Collection Date** | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 | 19-Aug-11 |
| **ROUNDWORMS** (P. Nemata)[1] | 4 |  | 2 |  |  |
| **ANNELIDS (P. Annelida)** |  |  |  |  |  |
| Cl. Oligochaeta (Worms) |  |  |  |  |  |
| **F. Tubificidae** |  |  |  |  |  |
| *Tasserkidrilus americanus* | 1 | 1 |  |  |  |
| immatures with hair chaetae[2] |  | 3 |  |  |  |
| **F. Lumbriculidae** |  |  |  |  |  |
| *Lumbriculus* | 1 | 1 |  |  |  |
| **ARTHROPODS** (P. Arthropoda) |  |  |  |  |  |
| Cl. Arachnida |  |  |  |  |  |
| O. Acarina (Mites) | 2 |  | 1 | 2 |  |
| Cl. Ostracoda (Seed shrimp)[1] | 1 | 1 | 2 | 2 | 6 |
| Cl. Branchiopoda (Fairy shrimp) |  |  |  |  |  |
| O. Notostraca |  |  |  |  |  |
| **F. Triopsidae** |  |  |  |  |  |
| *Lepidurus arcticus* |  |  |  |  |  |
| **INSECTS** (Cl. Insecta) |  |  |  |  |  |
| O. Trichoptera (Caddisflies) |  |  |  |  |  |
| **F. Limnephilidae** |  |  |  |  |  |
| *Grensia praeterita* |  |  |  |  | 1 |
| O. Diptera (True flies) |  |  |  |  |  |
| **F. Chironomidae** (Midges) |  |  |  |  |  |
| chironomid pupae[2] |  | 5 | 3 | 1 | 2 |
| S.F. Chironominae |  |  |  |  |  |
| *Corynocera* |  |  |  |  |  |
| *Micropsectra* | 4 | 2 |  | 1 | 2 |
| *Microtendipes* |  |  |  |  |  |
| *Paratanytarsus* | 1 |  |  | 1 |  |
| *Stictochironomus* | 10 | 1 |  | 1 |  |
| *Tanytarsus* | 4 | 2 |  | 2 |  |
| S.F. Diamesinae |  |  |  |  |  |
| *Protanypus* |  |  |  | 1 |  |
| *Pseudodiamesa* |  |  |  |  |  |
| S.F. Orthocladiinae |  |  |  |  |  |
| *Abiskomyia* |  |  |  |  |  |
| *Cricotopus* |  |  |  |  |  |
| *Heterotrissocladius* | 2 | 3 | 4 | 7 | 1 |
| *Hydrobaenus* |  |  |  |  |  |
| *Paracladius* |  |  |  |  |  |
| *Psectrocladius* |  |  |  |  | 1 |
| *Psectrocladius* |  |  |  | 2 | 1 |
| *Zalutschia* |  | 3 | 1 |  |  |
| indeterminate[2] |  |  |  |  |  |
| S.F. Prodiamesinae |  |  |  |  |  |
| *Monodiamesa* |  |  |  |  |  |
| S.F. Tanypodinae |  |  |  |  |  |
| *Ablabesmyia* |  |  |  |  |  |
| *Procladius* | 5 | 9 | 2 | 2 | 1 |
| *Thienemannimyia* complex |  | 2 | 1 | 2 | 1 |
| **MOLLUSCS** (P. Mollusca) |  |  |  |  |  |
| Cl. Bivalvia (Bivalves) |  |  |  |  |  |
| **F. Sphaeriidae** (Fingernail clams) |  |  |  |  |  |
| *Cyclocalyx/Neopisidium* | 32 | 27 | 6 | 15 | 5 |
| *Cyclocalyx* |  |  |  |  |  |
| *Cyclocalyx nitidium* |  |  |  |  |  |
| *Sphaerium nitidum* |  |  |  |  |  |