# LAKE TROUT POPULATION ASSESSMENT

# LOUISE (JACKSON) LAKE

# 2011

***Prepared By:***
**Lars Jessup and Nathan Millar**

Yukon
Environment
*Environnement*

**March 2012**

# LAKE TROUT POPULATION ASSESSMENT
# LOUISE (JACKSON) LAKE
# 2011

## Yukon Fish and Wildlife Branch
## TR-12-15


## Acknowledgements

Matt Larsen assisted with the survey. Jean Carey and Rob Florkiewicz reviewed and edited the report.





Copies available from:

Yukon Department of Environment
Fish and Wildlife Branch, V-5A
Box 2703, Whitehorse, Yukon Y1A 2C6
Phone (867) 667-5721, Fax (867) 393-6263
Email: environmentyukon@gov.yk.ca

Also available online at www.env.gov.yk.ca

Suggested citation:

JESSUP, L. AND N. MILLAR. 2012. Lake Trout Population Assessment: Louise (Jackson) Lake 2011. Yukon Fish and Wildlife Branch Report TR-12-15, Whitehorse, Yukon, Canada.

## Summary

Environment Yukon has been surveying important fish stocks since 1991. We use these surveys to detect population changes and monitor population health. Along with angler harvest surveys, this data is also used to assess the sustainability and impact of fisheries.

Environment Yukon works with First Nations, Renewable Resources Councils, and user groups to determine priority lakes for surveys. Criteria for identification of priority lakes include accessibility, sensitivity, and management concern. The surveys focus on lake trout, an indicator of the health of northern lake ecosystems.

We surveyed Louise (Jackson) Lake in 2011 using Summer Profundal Index Netting (SPIN). Environment Yukon previously surveyed the lake using a different index netting technique in 2002. SPIN provides more statistically robust data and improves confidence in survey results (Jessup and Millar, 2011).

Lake wide CPUE (catch per unit effort) in 2011 was 2.02 lake trout per set, which is less than average for similar lakes sampled in Yukon. Lake trout density was estimated at 29.8 lake trout / hectare.

## Key Findings

- Louise (Jackson) Lake is a small, highly productive lake with a simple fish community and a small population of lake trout.
- Lake trout density was low for a lake of this type when compared with similar Yukon lakes sampled with SPIN, but is high compared to most Yukon lakes.

## Table of Contents

Acknowledgements....................................................Inside Cover
Summary.......................................................................i
Key Findings..................................................................i
Table of Contents.............................................................ii
List of Tables................................................................ii
List of Figures...............................................................ii
Introduction..................................................................1
Study Area....................................................................1
Methods.......................................................................3
Results and Discussion........................................................4
Temperature and Dissolved Oxygen..............................................4
CPUE, Density, and Population Size............................................6
Biological Characteristics....................................................7
Results from previous surveys.................................................9
Population Status and Conclusions.............................................9
Future Surveys................................................................9
Literature Cited..............................................................11
APPENDIX 1 – Estimated CPUE (SPIN) and density from Yukon Lakes to 2011 ......13
APPENDIX 2 – Louise (Jackson) Lake SPIN set and capture locations (non-adjusted catch data)......14
APPENDIX 3 – Louise (Jackson) Lake SPIN capture details 2011..........15

## List of Tables

Table 1. Effort breakdown by stratum. ........................................3
Table 2. Selectivity-adjusted catch by stratum...............................6
Table 3. Stomach contents of sampled lake trout..............................8

## List of Figures

Figure 1. Location of Louise (Jackson) Lake, Yukon...........................2
Figure 2. Location of temperature and dissolved oxygen profiles taken in Louise Lake. ......5
Figure 3. Temperature and dissolved oxygen profiles from the large and small basins on June 27 and 28 respectively......6
Figure 4. Length distribution of captured lake trout. .......................7
Figure 5. Length at age of sampled lake trout................................8

# Introduction

Each year, Environment Yukon conducts assessment of fish populations, with a focus on lake trout. Between 1991 and 2009, over 100 Yukon lakes were surveyed using small-mesh netting, a method based on the index netting techniques described by Lester et al. (1991). Beginning in 2010, we began to assess fish populations using a new method, Summer Profundal Index Netting (SPIN; Sandstrom and Lester 2009). SPIN provides more statistically robust data and improves confidence in survey results (Jessup and Millar 2011).

We choose lakes for assessment based on the size of the active recreational fishery, the aboriginal subsistence fishery, and the commercial and domestic fisheries, as well as other available information. Lakes with heavy harvest pressure are surveyed on a regular basis.

The SPIN assessment involves setting gillnets at various sites in the lake and recording the catch and biological information about each fish caught. The survey usually tells us:

- relative abundance of lake trout as measured by an index (CPUE, or catch per unit effort);
- changes in relative abundance from previous surveys;
- the estimated density (number of lake trout per hectare) and abundance (number of lake trout) in the lake;
- length and weight of individual lake trout as well as other species captured; and
- age and diet of any fish killed.

Environment Yukon surveyed Louise (Jackson) Lake using SPIN in 2011 and using small-mesh netting in 2002. Differences in methodology between the two methods mean that results from this survey cannot be compared statistically with the past survey. Here we report the results of the 2011 SPIN survey and make only subjective comparisons with the 2002 survey.

### *Study Area*

Louise (locally known as Jackson) Lake is located approximately 12 km west of Whitehorse off the Fish Lake Road (Figure 1). The lake sits at an elevation of 1020 m above sea level, is approximately 2 km long, and covers an area of 65 hectares (ha). Mean depth is approximately 6.8 m and maximum depth is 13 m. The lake is fed by Fish Creek and one other unnamed creek. The lake drains via Porter Creek to the northeast where most flows get diverted through a micro-hydroelectric generating facility into McIntyre Creek, part of the Yukon River system. The lake lies within the traditional territory of the Kwanlin Dün First Nation.

There are several private residences, mostly along the north shoreline. There are no formal campgrounds, day use areas or boat launches on the lake. However, it is a popular recreational spot and is highly valued by many local area residents and user groups. Fish species present in the lake include lake trout, Arctic grayling, round whitefish, and rainbow trout (introduced in the 1950s).

The recreational fishery at Louise Lake has been managed under the Yukon Territory Fisheries Regulations since 1990. These regulations provide for lake trout catch and possession limits of 3 and 6 respectively; only one lake trout may be over 65 cm.

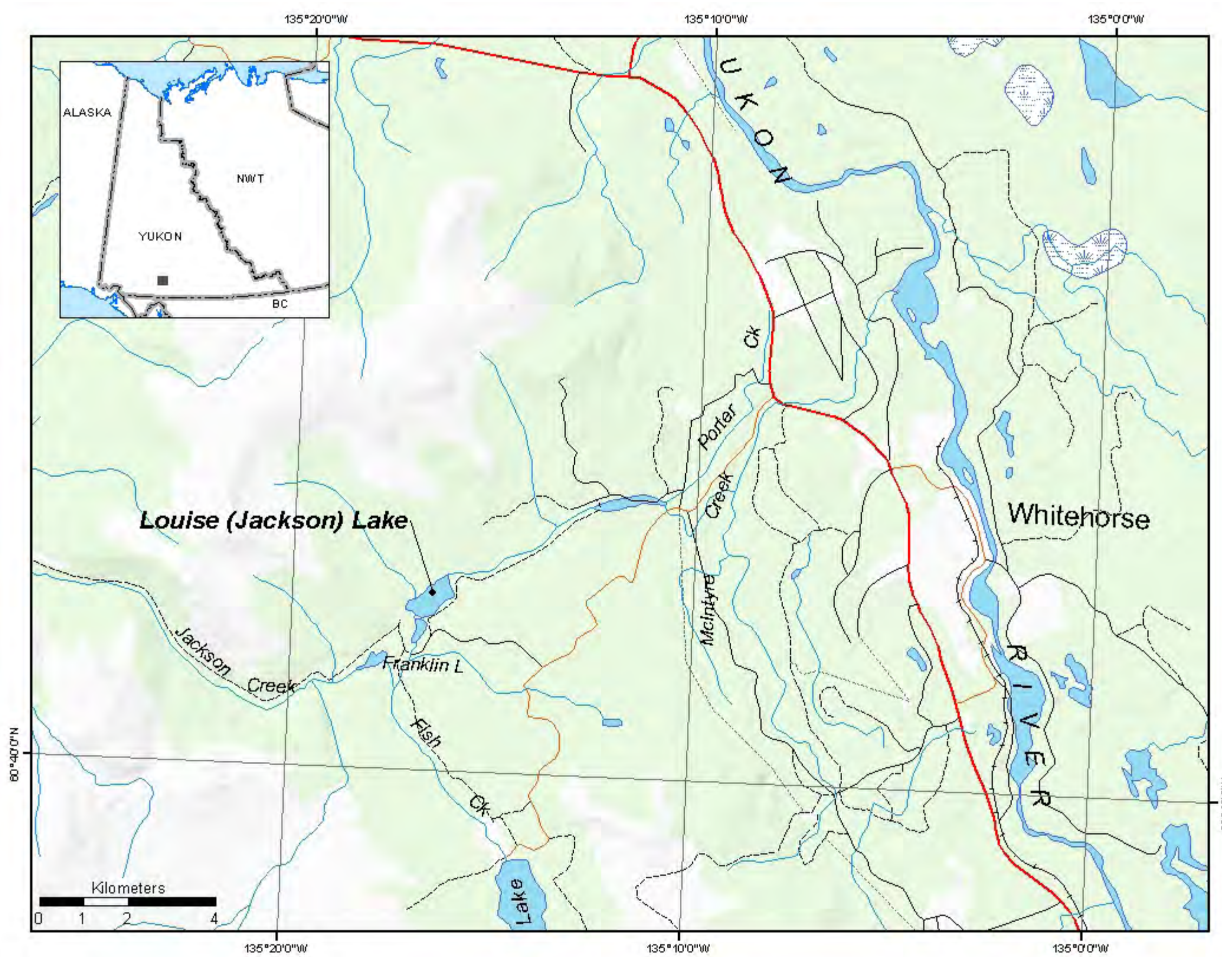



**Figure 1**. Location of Louise (Jackson) Lake, Yukon.

## Methods

Louise Lake was surveyed 27 – 29 June 2011. We followed the Summer Profundal Index Netting (SPIN) methodology for lake trout assessment (Sandstrom and Lester 2009, Jessup and Millar 2011). We set a total of 24 nets, divided among 3 depth strata (Table 1). Each 64 m gillnet was made up of 8 panels of monofilament web with mesh sizes from 57 mm to 127 mm. We set each net for 2 hours. The number of sets in each stratum was initially weighted by stratum surface area. However, we adjusted the final distribution of effort midway through the survey by concentrating on those strata with the highest catch rates. Initial set locations within each stratum were chosen using random point generation in ArcGIS 9.3. Any clumped distributions of points were dispersed manually to ensure coverage of the entire lake.

**Table 1.** Effort breakdown by stratum.

| Stratum (depth range) | Area | | Sets | |
|---|---|---|---|---|
| | Ha | % | Number | % |
| **0 – 4 m** | 24 | 37 | 5 | 21 |
| **4 – 8 m** | 20 | 31 | 10 | 42 |
| **8 – 13 m** | 21 | 32 | 9 | 38 |
| **Total** | 65 | 100 | 24 | 100 |

Catch per unit effort (CPUE), or the number of lake trout of “harvestable” size (300 mm and up) caught per net was calculated for each stratum. The total stratified lakewide CPUE was calculated as:

$$\text{Lakewide CPUE} = \sum(\text{CPUE}_i \bullet W_i)$$

where:

$\text{CPUE}_i$ = selectivity adjusted CPUE of stratum $_i$

$W_i$ = area of stratum $_i$ / lake area

CPUE is considered an index of abundance and changes in the CPUE are thought to reflect actual changes in the lake trout population. Therefore, CPUE can be compared between surveys and used to detect population growth or decline. The method excludes fish smaller than 300 mm because they are not usually caught by anglers.

We then converted CPUE to density (fish/ha) based on an empirical relationship between CPUE and density that has been established for Ontario lakes. From this, we estimated absolute abundance (i.e., the total population size) by multiplying density by lake size (number of fish/ha • lake area (ha) = number of fish in lake).

We used SPIN Support Systems Ver. 9.04 for calculations of CPUE, density, and population size, as well as predictions of sample size and power for future surveys. Temperature and dissolved oxygen profiles were taken in the same location after both surveys using a multi-parameter probe (YSI 600QS; YSI Inc., Yellow Springs, OH).

We measured, weighed, and released all fish captured. Any fish that died was sampled for age (using otoliths or ear “bones”) and diet (stomach contents).

## Results and Discussion

### *Temperature and Dissolved Oxygen*

Temperature and dissolved oxygen are water quality variables critical to lake trout and they determine suitable habitat within a lake. Following Clark et al. (2004), we define lake trout habitat as *suitable* where temperatures are less than 15˚C and dissolved oxygen is greater than 4 mg/L. At temperatures above 15˚C and dissolved oxygen less than 4 mg/L the habitat is *unsuitable*. The *optimal* temperature range for Yukon lake trout is between 2 and 12°C (Mackenzie-Grieve and Post 2006). The *optimal* dissolved oxygen level for lake trout is greater or equal to 7 mg/L (Evans 2005).

Temperature and dissolved oxygen profiles were taken in the large basin on June 27 and in the small basin on June 28 (Figure 2). The lake was strongly stratified in the larger basin, with the thermocline (zone of steep temperature gradient, also called the metalimnion) from 6.5 – 9.5 m, while the small basin was not stratified (Figure 3). Profiles of both basins also show that dissolved oxygen never dropped below 4 mg/L but did drop below 7 mg/L in the large basin below about 7 m (Figure 3).

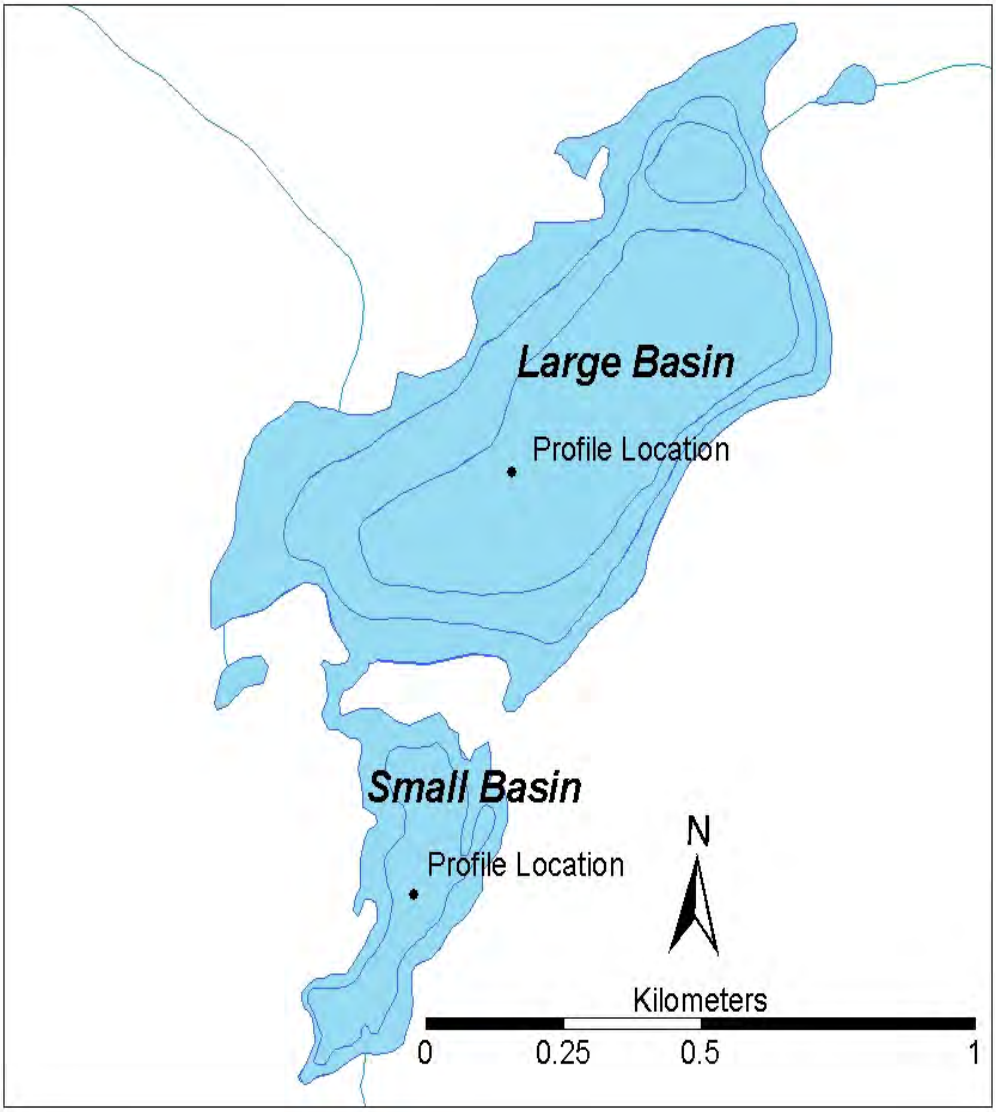



**Figure 2**. Location of temperature and dissolved oxygen profiles taken in Louise Lake.

In the small basin, we found optimal dissolved oxygen and near-optimal temperatures; lake trout were expected to be found throughout the small basin. In the large basin we found temperatures to be suitable above the thermocline and optimal from the top of the thermocline down. Dissolved oxygen was suitable at the bottom, becoming optimal from the thermocline to the surface. We expected that we would be most likely to encounter lake trout near the thermocline (or in the $2^{nd}$ and part of the $3^{rd}$ strata) where the combination of oxygen and temperature conditions was best, but that we might find lake trout distributed throughout the entire water column.

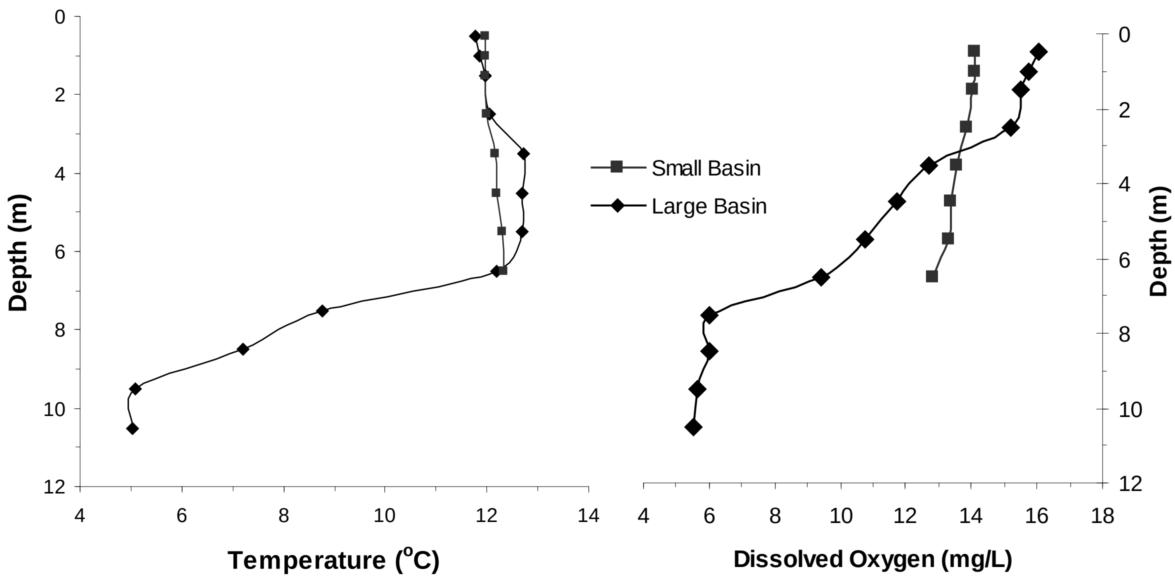



**Figure 3.** Temperature and dissolved oxygen profiles from the large and small basins on June 27 and 28 respectively.

The large basin was strongly stratified with the thermocline from 6.5 –9.5m. The small basin was not stratified.

### *CPUE, Density, and Population Size*

We captured a total of 40 lake trout in this survey (not including 1 fish smaller than 300 mm; see Appendix 2 for set and capture locations and Appendix 3 for capture details). We also captured round whitefish and Arctic grayling. Total mortalities during the survey were 18 lake trout (44% mortality rate), 30 round whitefish (34%), and 1 Arctic grayling (8%).

We adjusted the total catch for net selectivity bias based on the lengths of lake trout captured, resulting in a selectivity-adjusted total catch of 57 lake trout. After weighting the data by catch in each strata, we found a lake-wide CPUE of 2.02 (SE = 0.30).

**Table 2.** Selectivity-adjusted catch by stratum.

| Stratum (depth range) | # (%) Sample Sites | Catch | CPUE |
|---|---|---|---|
| **1 (0-4 m)** | 5 (21%) | 6 | 1.15 |
| **2 (4-8 m)** | 10 (42%) | 39 | 3.94 |
| **3 (8-12+ m)** | 9 (38%) | 12 | 1.30 |
| **Total** | 24 (100%) | 57 | 2.02 |

Lake trout density was estimated at 29.8 lake trout / ha and lake-wide abundance was estimated at 2,024 lake trout (68% confidence interval: 1,534 –

2,546). Note that before full confidence can be placed on estimates of density and population size, the relationship between CPUE and density should be tested in Yukon.

### *Biological Characteristics*

Average length and weight of lake trout was 409 mm and 971 g respectively. The length distribution of lake trout captured is presented in Figure 4. Mean age of sampled lake trout was 14, the youngest was 7 and the oldest was 26. Growth appears to slow and lake trout appear to reach near-maximum size at age 11 (Figure 5). Only 15 lake trout were aged, so conclusions regarding length-at-age should be considered with caution.

Combined with the observed length and age data, stomach contents can reveal whether a lake contains small-body lake trout that feed mostly on invertebrates or large-body lake trout that feed mostly on fish. Maximum size and size at maturity is smaller and growth is slower in the small-body, invertebrate-eating life history form than the large-body, fish-eating form.

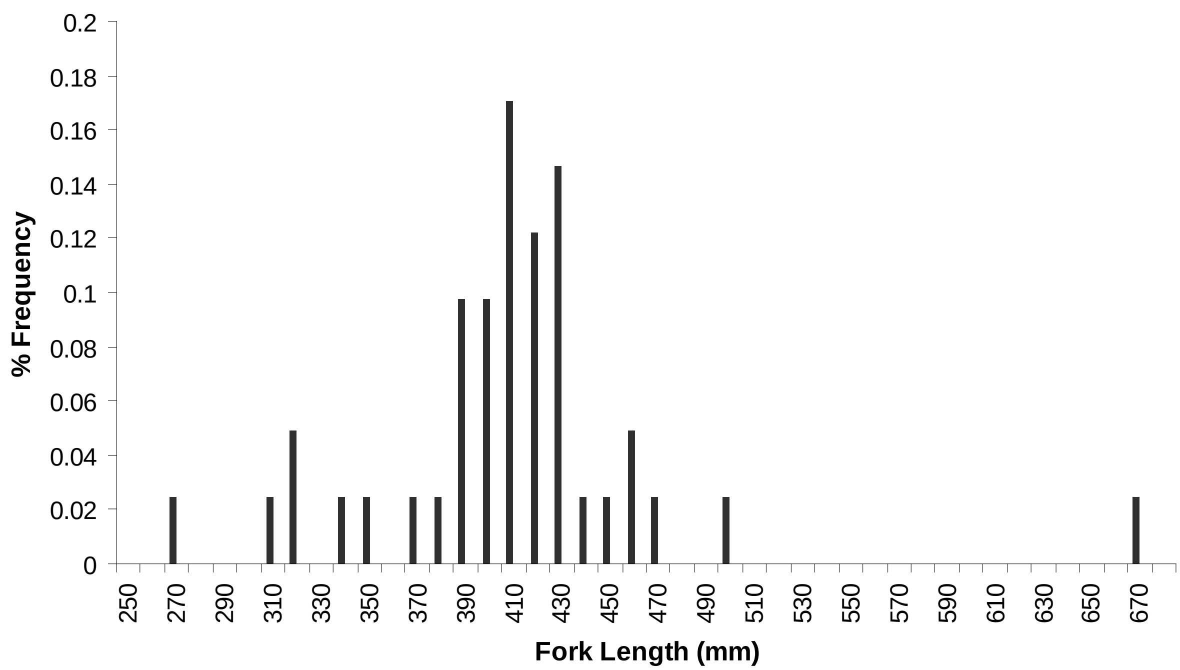



**Figure 4.** Length distribution of captured lake trout.

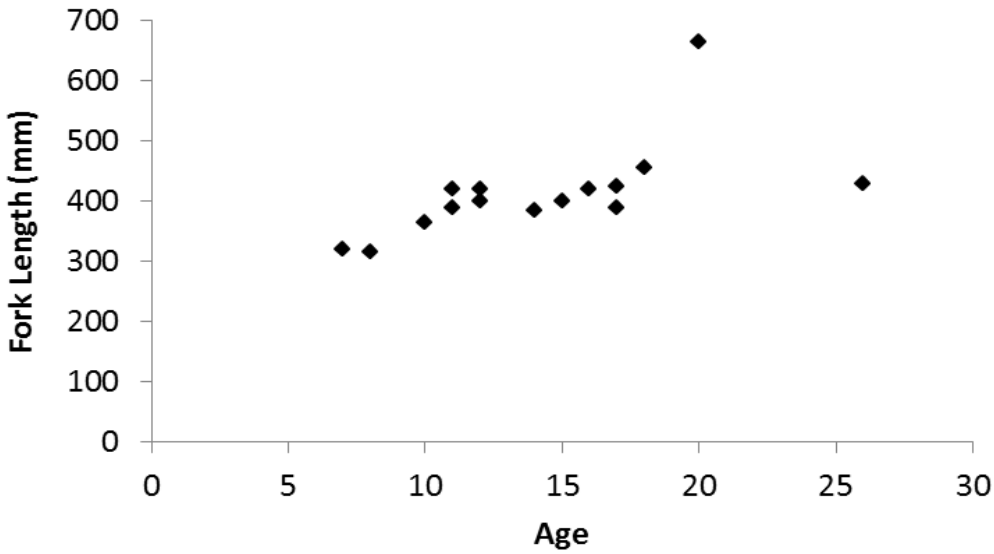



**Figure 5.** Length at age of sampled lake trout.

Stomachs retained for diet analysis from Louise Lake in 2011 revealed that lake trout feed on both fish and invertebrates (Table 3). While fish make up a significant portion of the diet, the smaller average size indicates that the majority of lake trout in Louise Lake are the small-body type.

One lake trout caught in the survey, a female 665 cm in total length, was much larger than the other lake trout caught (Figures 4, 5); its length, age and stomach contents (100% fish) suggest that a small number of large, fast-growing, piscivorous lake trout may coexist with smaller, slower-growing lake trout in Louise/Jackson Lake.

**Table 3.** Stomach contents of sampled lake trout.

| | **Percent Volume** |
|---|---|
| Slimy sculpin | 48.9 |
| Scuds, Sideswimmers | 43.9 |
| Unidentified fish | 2.4 |
| Vegetation, and unknown | 2.2 |

### *Results from previous surveys*

The small-mesh netting survey in 2002 resulted in a CPUE of 1.00 (6 net sets), which is slightly lower than the Yukon average of 1.15 for lakes with small-body lake trout. This survey used methodology which is quite different from the current methods in terms of set location, net materials and size, set duration, and total number of sets so we can only make subjective comparisons with this data.

Environment Yukon has performed 2 angler harvest surveys on Louise Lake in 2004 and 2011. The 2011 survey show a decline of effort compared with 2004 survey, but it is still the highest per hectare effort of any fishery in Yukon. Harvest was above estimated sustainable levels in both surveys (Foos 2011, Millar and Barker in prep.).

### *Population Status and Conclusions*

Smaller, more productive lakes with small-body lake trout usually have higher densities than larger, less productive lakes with large-body lake trout (Burr 1997). Lakes that have fewer competing predator species (lake trout, northern pike, and burbot) are also expected to have higher densities than lakes with more predators (Carl et al. 1990).

Louise Lake is a small, productive lake with mainly small-body lake trout, and contains rainbow trout but no other top predator species. We compared density to other small-body lake trout lakes with similar fish communities sampled with SPIN such as Caribou, Fish, Lewes, and Kathleen lakes (Appendix 1). We found that Louise Lake, despite having one of the highest productivities, had one of the lower lake trout densities of this group. Based on the results of the 2011 survey, and in the context of the lakes surveyed to date, the abundance of lake trout in Louise Lake is on the low-end for a lake of its type. Results from the previous small-mesh netting survey in 2002 also showed a lake with CPUE slightly less than similar lakes.

Louise Lake is extremely vulnerable to overharvest because of its small size, low sustainable harvest, high angling pressure, and liberal catch and possession limits. Harvest estimates exceeded sustainable levels in both 2004 and 2011.

### *Future Surveys*

Because this population is vulnerable, future monitoring with SPIN is recommended to detect any potential declines which might require management action. To facilitate responsive management, we target the ability to detect 25% changes in CPUE with a power of 80%. Power refers to the probability of detecting a change when that change is real. In other words, we want to have an 80% chance to detect a drop in CPUE of 25%.

At the current sample size (n = 24), we have a predicted power of 52% to detect future declines in CPUE of 25%. Power can be increased by raising the sample size, reducing the variation in catch data, or relaxing the magnitude of change to be detected. Raising sample size to 36 net sets in future years should allow us to detect declines of 30% in CPUE with 80% power.

# Literature Cited

BURR, J. M. 1997. Growth, density and biomass of lake trout in Arctic and subarctic Alaska. Pages 109-118 *in* J.B. Reynolds, ed., Fish ecology in Arctic North America. American Fisheries Society Symposium 19, Bethesda, Maryland.

CARL, L., M.-F. BERNIER, W. CHRISTIE, L. DEACON, P. HULSMAN, D. MARALDO, T. MARSHALL, AND P. RYAN. 1990. Fish community and environmental effects on lake trout. Lake Trout Synthesis. Ministry of Natural Resources, Toronto, Ontario.

CLARK, B. J., P. J. DILLON, AND L. A. MOLOT. 2004. Lake trout (*Salvelinus namaycush*) habitat volumes and boundaries in Canadian shield lakes. Chapter 6 *in* Boreal Shield Watersheds: Lake Trout Ecosystems in a Changing Environment. J.M. Gunn, R.J. Steedman, and R.A. Ryder, Editors. Lewis Publishers, Boca Raton, Florida.

EVANS, D. O. 2005. Effects of hypoxia on scope-for-activity of lake trout: defining a new dissolved oxygen criterion for protection of lake trout habitat. Technical Report 2005-01. Habitat and Fisheries Unit, Aquatic Research and Development Section. Ontario Ministry of Natural Resources, Peterborough, Ontario.

FOOS, A. 2011. Angler harvest survey: McIntyre Creek 2004. Yukon Fish and Wildlife Branch Report TR-11-06. Whitehorse, Yukon, Canada.

JESSUP, L. G., AND N. P. MILLAR. 2011. Methods development for assessment of lake trout populations in Yukon: summer profundal index netting (SPIN). Yukon Fish and Wildlife Branch Report TR-11-11. Whitehorse, Yukon, Canada.

JESSUP, L. G. 2012. Lake trout population assessment: Lewes Lake 2010. Yukon Fish and Wildlife Branch Report TR-12-01. Whitehorse, Yukon, Canada.

LESTER, N., M. PETZOLD, W. DUNLOP, B. MONROE, S. ORSATTI, T. SCHANER, AND D. WOOD. 1991. Sampling Ontario lake trout stocks: issues and standards. Lake trout synthesis sampling issues and methodology working group, Ontario Ministry of Natural Resources. <http://www.mnr.gov.on.ca/226944.pdf>. Accessed 2009 March 23.

MACKENZIE-GRIEVE, J. L., AND J. R. POST. 2006. Thermal habitat use by lake trout in two contrasting Yukon Territory lakes. Transactions of the American Fisheries Society 135(3): 727-738.

MILLAR, N., AND O. BARKER. In prep. Angler harvest survey: Louise (Jackson) Lake 2011. Yukon Fish and Wildlife Branch Report Whitehorse, Yukon, Canada.

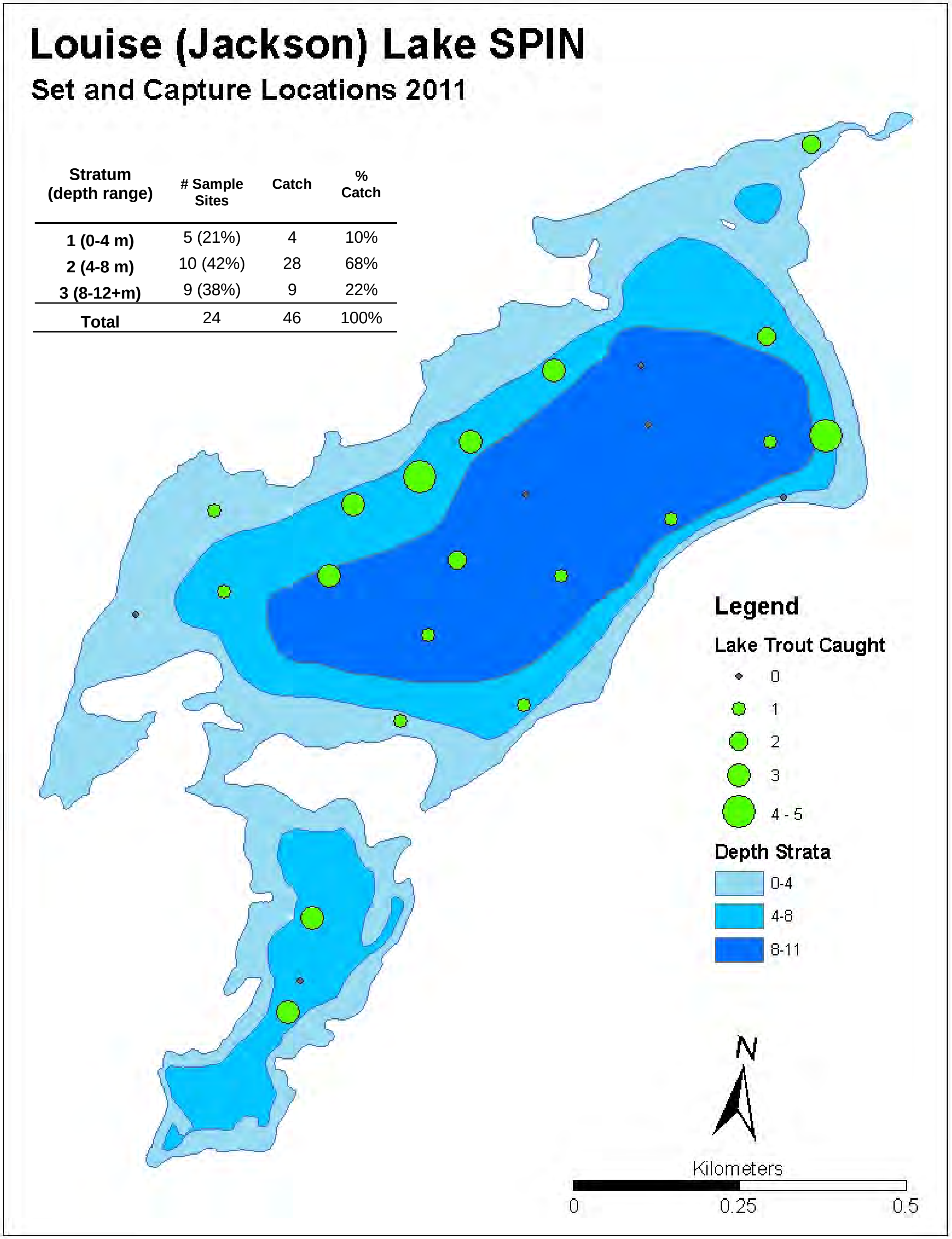
SANDSTOM, S. J., AND N. LESTER. 2009. Summer Profundal index netting protocol; a lake trout assessment tool. Ontario Ministry of Natural Resources. Peterborough, Ontario. Version 2009.1.

## APPENDIX 1 – Estimated CPUE (SPIN) and density from Yukon Lakes to 2011

Lakes are arranged in descending order of lake trout density (last column). Information on lake trout morphology and life history (small body vs. large body), and the presence of other top predators is included. Lake productivity refers to the annual maximum sustainable yield of all fish in kilograms per hectare. It is estimated following the method proposed by Schlesinger and Regier (1982) of relating mean annual air temperature to the morphoedaphic index (Ryder, 1965). This information is presented so that comparisons can be made between lakes with similar characteristics.

| Lake | Lake Characteristics | | | | SPIN Results | | |
|---|---|---|---|---|---|---|---|
| | Surface Area (ha) | Productivity (kg fish / ha) | Lake Trout Morphology | Other Top Predators | Year | CPUE | Density (fish/ha) |
| Caribou | 51 | 3.89 | Small body | None | 2011 | 3.63 | 53.2 |
| Lewes | 131 | 3.17 | Small body | None | 2010 | 3.31 | 48.6 |
| Fish | 1386 | 2.44 | Small body | None | 2009 | 2.64 | 38.9 |
| Kathleen | 3398 | 1.87 | Small body | None | 2011 | 2.11 | 31.2 |
| Louise (Jackson) | 68 | 3.27 | Small body | Rainbow trout | 2011 | 2.02 | 29.8 |
| Fish | 1386 | 2.44 | Small body | None | 2010 | 2.01 | 29.7 |
| Kathleen | 3398 | 1.87 | Small body | None | 2010 | 1.94 | 28.6 |
| Ta'tla Mun | 3265 | 2.05 | Large body | Pike/burbot | 2011 | 1.00 | 4.1 |
| Sekulmun | 4985 | 1.16 | Large body | Pike/burbot | 2010 | 0.88 | 3.7 |
| Ethel | 4610 | 1.42 | Large body | Pike/burbot | 2011 | 0.30 | 2.0 |
| Tarfu | 405 | 2.74 | Large body | Pike | 2010 | 0.2 | 1.7 |
| Pine | 603 | 2.87 | Small body | Pike/burbot | 2010 | 0.08 | 1.5 |
| Lower Snafu | 284 | 3.54 | Large Body | Pike | 2010 | 0 | 0 |

## APPENDIX 2 – Louise (Jackson) Lake SPIN set and capture locations (non-adjusted catch data)




| Stratum (depth range) | # Sample Sites | Catch | % Catch |
|---|---|---|---|
| **1 (0-4 m)** | 5 (21%) | 4 | 10% |
| **2 (4-8 m)** | 10 (42%) | 28 | 68% |
| **3 (8-12+m)** | 9 (38%) | 9 | 22% |
| **Total** | 24 | 46 | 100% |

# APPENDIX 3 – Louise (Jackson) Lake SPIN capture details 2011

| Date | Effort (Set #) | Stratum | Species | Fork Length (mm) | Weight (g) | Fate | Sex |
|---|---|---|---|---|---|---|---|
| June 27, 2011 | 1 | 1 | RW | 335 | 325 | RP | |
| June 27, 2011 | 1 | 1 | RW | 380 | 600 | R | |
| June 27, 2011 | 1 | 1 | RW | 370 | 450 | D | |
| June 27, 2011 | 2 | 1 | AG | 240 | 200 | R | |
| June 27, 2011 | 2 | 1 | AG | 300 | 325 | R | |
| June 27, 2011 | 2 | 1 | AG | 260 | 225 | R | |
| June 27, 2011 | 2 | 1 | LT | 340 | 500 | R | |
| June 27, 2011 | 2 | 1 | RW | 375 | 550 | R | |
| June 27, 2011 | 2 | 1 | RW | 330 | 400 | R | |
| June 27, 2011 | 2 | 1 | RW | 310 | 325 | R | |
| June 27, 2011 | 2 | 1 | RW | 345 | 375 | R | |
| June 27, 2011 | 2 | 1 | RW | 320 | 300 | R | |
| June 27, 2011 | 2 | 1 | RW | 375 | 525 | R | |
| June 27, 2011 | 2 | 1 | RW | 350 | 500 | R | |
| June 27, 2011 | 2 | 1 | RW | 300 | 275 | RP | |
| June 27, 2011 | 2 | 1 | RW | 365 | 500 | D | F |
| June 27, 2011 | 2 | 1 | RW | 330 | 350 | D | F |
| June 27, 2011 | 2 | 1 | RW | 305 | 200 | D | F |
| June 27, 2011 | 3 | 3 | LT | 315 | 350 | D | M |
| June 27, 2011 | 3 | 3 | LT | 320 | 400 | D | M |
| June 27, 2011 | 3 | 3 | LT | 265 | 200 | R | |
| June 27, 2011 | 3 | 3 | RW | 335 | 325 | RP | |
| June 27, 2011 | 3 | 3 | RW | 340 | 375 | R | |
| June 27, 2011 | 3 | 3 | RW | 340 | 400 | R | |
| June 27, 2011 | 3 | 3 | RW | 315 | 272 | R | |
| June 27, 2011 | 3 | 3 | RW | 345 | 450 | R | |
| June 27, 2011 | 3 | 3 | RW | 335 | 325 | R | |
| June 27, 2011 | 3 | 3 | RW | 365 | 525 | D | F |
| June 27, 2011 | 3 | 3 | RW | 345 | 400 | D | F |
| June 27, 2011 | 3 | 3 | RW | 360 | 425 | D | F |
| June 27, 2011 | 4 | 1 | LT | 400 | 800 | D | M |
| June 27, 2011 | 4 | 1 | RW | 310 | 325 | R | |
| June 27, 2011 | 4 | 1 | RW | 360 | 450 | R | |
| June 27, 2011 | 4 | 1 | RW | 330 | 325 | RP | |
| June 27, 2011 | 4 | 1 | RW | 335 | 450 | RP | |
| June 27, 2011 | 4 | 1 | RW | 390 | 550 | D | F |
| June 27, 2011 | 4 | 1 | RW | 345 | 475 | D | F |
| June 27, 2011 | 4 | 1 | RW | 390 | 625 | D | F |
| June 27, 2011 | 4 | 1 | RW | 370 | 475 | D | F |
| June 27, 2011 | 5 | 2 | LT | 410 | 850 | R | |
| June 27, 2011 | 5 | 2 | RW | 370 | 500 | R | |
| June 27, 2011 | 6 | 3 | LT | 430 | 900 | D | M |
| June 27, 2011 | 6 | 3 | RW | 360 | 475 | RP | |



AG=Arctic grayling; LT=lake trout; RW=round whitefish
R=released; RP=released, poor condition; D=dead; S=sacrificed; ESC=escaped

Appendix 3 table continued.

| Date | Effort (Set #) | Stratum | Species | Fork Length (mm) | Weight (g) | Fate | Sex |
|---|---|---|---|---|---|---|---|
| June 27, 2011 | 6 | 3 | RW | 355 | 475 | D | M |
| June 27, 2011 | 7 | 2 | LT | 420 | 900 | D | F |
| June 27, 2011 | 7 | 2 | LT | 420 | 775 | D | F |
| June 27, 2011 | 7 | 2 | LT | 400 | 775 | R | |
| June 27, 2011 | 7 | 2 | RW | 350 | 475 | R | |
| June 28, 2011 | 8 | 3 | LT | 665 | 5125 | D | F |
| June 28, 2011 | 8 | 3 | LT | 425 | 1050 | D | F |
| June 28, 2011 | 8 | 3 | RW | 350 | 425 | R | |
| June 28, 2011 | 8 | 3 | RW | 380 | 510 | R | |
| June 28, 2011 | 8 | 3 | RW | 320 | 300 | R | |
| June 28, 2011 | 8 | 3 | RW | 325 | 325 | R | |
| June 28, 2011 | 8 | 3 | RW | 340 | 400 | RP | |
| June 28, 2011 | 8 | 3 | RW | 370 | 550 | RP | |
| June 28, 2011 | 8 | 3 | RW | 375 | 500 | D | M |
| June 28, 2011 | 8 | 3 | RW | 400 | 650 | D | F |
| June 28, 2011 | 9 | 2 | LT | 420 | 925 | D | F |
| June 28, 2011 | 9 | 2 | LT | 410 | 750 | R | |
| June 28, 2011 | 9 | 2 | LT | 425 | 1000 | R | |
| June 28, 2011 | 9 | 2 | RW | 385 | 525 | D | F |
| June 28, 2011 | 10 | 1 | No Catch | | | | |
| June 28, 2011 | 11 | 1 | LT | 420 | 875 | D | F |
| June 28, 2011 | 11 | 1 | LT | 450 | 1300 | R | |
| June 28, 2011 | 11 | 1 | RW | 355 | 475 | R | |
| June 28, 2011 | 11 | 1 | RW | 430 | 800 | D | F |
| June 28, 2011 | 11 | 1 | RW | 345 | 425 | D | M |
| June 28, 2011 | 11 | 1 | RW | 350 | 500 | D | M |
| June 28, 2011 | 12 | 2 | LT | 405 | 825 | R | |
| June 28, 2011 | 12 | 2 | LT | 470 | 1450 | R | |
| June 28, 2011 | 12 | 2 | LT | 425 | 1125 | R | |
| June 28, 2011 | 13 | 3 | RW | 390 | 650 | R | |
| June 28, 2011 | 13 | 3 | RW | 345 | 425 | R | |
| June 28, 2011 | 13 | 3 | RW | 345 | 400 | R | |
| June 28, 2011 | 14 | 3 | LT | 400 | 725 | D | F |
| June 28, 2011 | 14 | 3 | RW | 360 | 475 | R | |
| June 28, 2011 | 14 | 3 | RW | 405 | 515 | RP | |
| June 28, 2011 | 14 | 3 | RW | 370 | 600 | D | M |
| June 28, 2011 | 14 | 3 | RW | 390 | 675 | D | F |
| June 28, 2011 | 14 | 3 | RW | 375 | 600 | D | F |
| June 28, 2011 | 15 | 2 | LT | 410 | 750 | R | |
| June 28, 2011 | 15 | 2 | RW | 345 | 500 | R | |
| June 28, 2011 | 15 | 2 | RW | 390 | 700 | R | |
| June 28, 2011 | 15 | 2 | RW | 370 | 510 | D | M |
| June 28, 2011 | 15 | 2 | RW | 375 | 700 | D | M |
| June 28, 2011 | 15 | 2 | RW | 330 | 475 | D | M |
| June 28, 2011 | 16 | 3 | AG | 310 | 400 | R | |
| June 28, 2011 | 16 | 3 | RW | 320 | 350 | R | |
| June 28, 2011 | 16 | 3 | RW | 370 | 550 | R | |



AG=Arctic grayling; LT=lake trout; RW=round whitefish
R=released; RP=released, poor condition; D=dead; S=sacrificed; ESC=escaped

Appendix 3 table continued.

| Date | Effort (Set #) | Stratum | Species | Fork Length (mm) | Weight (g) | Fate | Sex |
|---|---|---|---|---|---|---|---|
| June 28, 2011 | 16 | 3 | RW | 405 | 700 | R | |
| June 28, 2011 | 16 | 3 | RW | 385 | 600 | RP | |
| June 28, 2011 | 17 | 3 | LT | 410 | 1100 | R | |
| June 28, 2011 | 17 | 3 | RW | 370 | 550 | RP | |
| June 28, 2011 | 18 | 2 | LT | 410 | 925 | R | |
| June 28, 2011 | 18 | 2 | LT | 390 | 700 | R | |
| June 28, 2011 | 18 | 2 | RW | 395 | 650 | R | |
| June 28, 2011 | 18 | 2 | RW | 335 | 400 | R | |
| June 28, 2011 | 18 | 2 | RW | 365 | 500 | R | |
| June 28, 2011 | 18 | 2 | RW | 385 | 600 | R | |
| June 28, 2011 | 18 | 2 | RW | 310 | 300 | R | |
| June 29, 2011 | 19 | 2 | AG | 340 | 500 | R | |
| June 29, 2011 | 19 | 2 | AG | 295 | 350 | R | |
| June 29, 2011 | 19 | 2 | LT | 400 | 900 | D | F |
| June 29, 2011 | 19 | 2 | LT | 385 | 700 | D | F |
| June 29, 2011 | 19 | 2 | LT | 365 | 600 | D | M |
| June 29, 2011 | 19 | 2 | LT | 310 | 400 | R | |
| June 29, 2011 | 19 | 2 | RW | 360 | 525 | R | |
| June 29, 2011 | 19 | 2 | RW | 370 | 575 | RP | |
| June 29, 2011 | 19 | 2 | RW | 345 | 475 | R | |
| June 29, 2011 | 20 | 2 | LT | 455 | 1400 | D | M |
| June 29, 2011 | 20 | 2 | LT | 390 | 775 | D | M |
| June 29, 2011 | 20 | 2 | LT | 380 | 800 | R | |
| June 29, 2011 | 20 | 2 | LT | 460 | 1300 | R | |
| June 29, 2011 | 20 | 2 | LT | 410 | 800 | RP | |
| June 29, 2011 | 21 | 2 | AG | 260 | 225 | R | |
| June 29, 2011 | 21 | 2 | AG | 255 | 200 | R | |
| June 29, 2011 | 21 | 2 | AG | 240 | 200 | R | |
| June 29, 2011 | 21 | 2 | AG | 270 | 300 | RP | |
| June 29, 2011 | 21 | 2 | AG | 250 | 225 | R | |
| June 29, 2011 | 21 | 2 | LT | 390 | 700 | D | F |
| June 29, 2011 | 21 | 2 | LT | 430 | 1200 | R | |
| June 29, 2011 | 21 | 2 | LT | 440 | 1000 | R | |
| June 29, 2011 | 21 | 2 | RW | 290 | 275 | RP | |
| June 29, 2011 | 21 | 2 | RW | 365 | 600 | D | M |
| June 29, 2011 | 22 | 3 | RW | 360 | 450 | R | |
| June 29, 2011 | 22 | 3 | RW | 376 | 500 | RP | |
| June 29, 2011 | 22 | 3 | RW | 360 | 475 | R | |
| June 29, 2011 | 22 | 3 | RW | 370 | 500 | R | |
| June 29, 2011 | 22 | 3 | RW | 360 | 500 | R | |
| June 29, 2011 | 22 | 3 | RW | 380 | 600 | R | |
| June 29, 2011 | 22 | 3 | RW | 360 | 500 | D | F |
| June 29, 2011 | 22 | 3 | RW | 370 | 525 | D | F |
| June 29, 2011 | 22 | 3 | RW | 400 | 725 | D | F |
| June 29, 2011 | 22 | 3 | RW | 380 | 650 | D | F |
| June 29, 2011 | 23 | 3 | LT | 495 | 1700 | RP | |
| June 29, 2011 | 24 | 2 | AG | 260 | 300 | R | |



AG=Arctic grayling; LT=lake trout; RW=round whitefish
R=released; RP=released, poor condition; D=dead; S=sacrificed; ESC=escaped

Appendix 3 table continued.

| Date | Effort (Set #) | Stratum | Species | Fork Length (mm) | Weight (g) | Fate | Sex |
|---|---|---|---|---|---|---|---|
| June 29, 2011 | 24 | 2 | AG | 250 | 285 | D | M |
| June 29, 2011 | 24 | 2 | LT | 420 | 900 | D | F |
| June 29, 2011 | 24 | 2 | LT | 430 | 950 | R | |
| June 29, 2011 | 24 | 2 | LT | 350 | 600 | R | |
| June 29, 2011 | 24 | 2 | RW | 345 | 475 | R | |
| June 29, 2011 | 24 | 2 | RW | 360 | 500 | R | |
| June 29, 2011 | 24 | 2 | RW | 380 | 725 | D | M |


AG=Arctic grayling; LT=lake trout; RW=round whitefish
R=released; RP=released, poor condition; D=dead; S=sacrificed; ESC=escaped