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SITE C FISHERIES STUDIES
2011 REVELSTOKE RESERVOIR
FISH INVENTORY DATA REPORT

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Executive Summary

As part of the Site C Clean Energy Project, fisheries studies are presently underway to assist in the environmental and regulatory review phase of the project. The prediction of the transition of fish species composition from the Peace River environment to the future reservoir is currently being assessed. Revelstoke Reservoir is considered a close surrogate to the future Site C reservoir based on physical environment and resident fish species prior to impoundment. The main objective of this project was to obtain an indication of the status of current water quality and fish species presence and abundance 19 years post impoundment in the Revelstoke Reservoir. It is anticipated that the change in fish species composition in Revelstoke Reservoir will provide some insight to the potential changes in fish species in the Site C reservoir.

In 2011, sampling of the Revelstoke Reservoir was completed using both floating and sinking gill nets at sites located at the southern (Revelstoke Forebay), middle (Downie) and northern (Mica) portion of the reservoir. Standard lake water quality data including dissolved oxygen and temperature profiles were also collected at each site. Sampling was completed August 24-27, 2011.

The water quality results showed the Mica site had the lowest surface temperature of the three (~8°C), which was relatively constant over the 9 m depth of the site. The Mica site is located most northerly in the reservoir of the three, and water from the hypolimnion of the Mica Dam is fed into the Revelstoke Reservoir. At the Downie site, located mid-reservoir, there was seen a strong thermal gradient within the water column. The Revelstoke Forebay site is the most southerly location, and exhibited a more gradual thermal gradient with warmer surface temperatures persisted until around 15m. Dissolved oxygen was close to saturation throughout each of the profiles at each site.

Fish sampling results showed that 90% of the fish present at the Mica site, most northern site, were sport fish (Bull Trout, Kokanee, Mountain Whitefish, Rainbow Trout, Burbot). The Downie Site, mid-reservoir, had 21% sport fish and the Revelstoke Forebay, most southerly end, had 53% sport fish. Of all the fish species present in the reservoir, suckers were dominant (31%). Burbot, Red Side Shiners, and Northern Pike Minnow was the least abundant species (2%, 2%, and 1% respectively). Of all the sport fish throughout the reservoir, Mountain Whitefish were the most abundant (16%) (most of which were present at the Mica site), with Bull Trout and Kokanee both being the subdominant sport species (13% each). Rainbow Trout were present at each of the locations, with the majority of Rainbow and Kokanee being found in the floating nets at all three sites.

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1.0 Introduction

As part of the Site C Clean Energy Project, fisheries studies are presently underway to assist in the environmental and regulatory review phase of the project. The prediction of the transition of fish species composition from the Peace River environment to the future reservoir is currently being assessed. Revelstoke Reservoir is considered a close surrogate to the future Site C reservoir based on physical environment and resident fish species prior to impoundment. Triton Environmental Consultants Ltd. completed water quality and fish sampling in the Revelstoke Reservoir in 2011. The main objective was to undertake standard lake sampling to catalogue current fish species relative abundance 19 years post impoundment. It is anticipated that the data collected at the Revelstoke Reservoir will provide insight on expected fisheries resources at Site C.

1.1 Study Area

The study area for the 2011 Revelstoke Reservoir Inventory was the Revelstoke Reservoir on the upper Columbia River in British Columbia. The reservoir rests in the steep Columbia River Valley bounded by the Monashee Mountains on the west and the Selkirk Mountains on the east and was formed in 1984 by the completion of the Revelstoke Dam, which is about 6 km upstream of the city of Revelstoke. The reservoir is the second in a series of three hydroelectric reservoirs on the Canadian part of the Columbia River. To the north is Kinbasket Reservoir, which was formed by the construction of Mica Dam in 1973. Water drawn from the hypolimnion of Kinbasket Reservoir by Mica Dam is the primary inflow into Revelstoke Reservoir. Water drawn from the hypolimnion of Revelstoke Reservoir by Revelstoke Dam in turn flows into upper Arrow Lake, which, together with Lower Arrow Lake, was flooded by the construction of the Hugh Keenleyside Dam in 1968.

The construction of Revelstoke Dam and the filling of its reservoir have caused major changes to the local aquatic ecosystem, both upstream and downstream of the dam. The obvious changes included damming the upper Columbia River near Revelstoke, and thereby obstructing upstream fish passage. In addition, approximately 140 km of mountain river valley was inundated thereby submerging the narrow littoral zone and flood plain of the valley along with the lower reaches of over 30 tributaries.

Less obvious changes to the aquatic ecosystem included altering the physical structure of the water column from a shallow, high-energy vertically homogenous river to a deep, low-energy potentially thermally-stratified lake. Water chemistry may also have changed with time due to a well-known "reservoir effect" (Kennedy and Walker, 1990). This almost always involves a rapid increase in nutrient and metal levels in a reservoir soon after filling due to the release of soil- and vegetation-bound nutrients and metals. This period of increase is invariably followed by the equally rapid depletion of nutrients and metals due to downstream transport. It is estimated that the Revelstoke Reservoir completed its depletion phase in 1987 and is currently classified as oligotrophic (Smith, 1990).

In terms of physical characteristics, there are many similarities between the Revelstoke Reservoir and the Site C Reservoir. Both are relatively long and narrow with Revelstoke Reservoir being 140 km long, with an average width of less than 2 km, while Site C Reservoir will be 83 km long

and 2 to 3 km wide. The total surface area of the Revelstoke Reservoir is 10,125 ha compared to 9,310 ha for Site C Reservoir. The depth of the Revelstoke Reservoir increases from less than 10 m at the tailrace of Mica Dam to 125 m in the forebay north of Revelstoke Dam and there is little littoral habitat due to the steep valley sides. This will be the same for the Site C Reservoir.

Both reservoirs have upstream impoundments and inundate the historic river channel. The Revelstoke Reservoir has a relatively stable surface elevation of 573 m with only minimal fluctuation. The Site C Reservoir will be similar with expected fluctuation of 1.8 m. Revelstoke reservoir has three major tributaries (Goldstream River, Downie Creek, and Bigmouth Creek), and over 30 smaller tributaries. Site C Reservoir will have two major tributaries (Moberly River and Halfway River) and several smaller tributaries.

1.2 Objectives

The main objective of this project was to use standardized lake sampling methods to document the current status of fish assemblages in the Revelstoke Reservoir. Specific tasks included:

- Collecting water quality data associated with secondary lake inventories.
- Collecting biological fish data (species composition, length, weight and age)

2.0 Methods

2.1 Sample Sites

Sampling locations were selected to collect data at the south end of the Reservoir (near the Revelstoke forebay), mid Reservoir (near Downie Arm) and at the north end of the reservoir (near the Mica Dam). The three sites are summarized below and Figure 1 shows the approximate location of each:

1. Revelstoke Forebay – located at the south end of the reservoir within 2 km of Revelstoke Dam.
2. Downie - located at mid reservoir along the west side opposite.
3. Mica – Reservoir sampling at the north end of the reservoir approximately south of the Mica Dam.

Sampling was conducted August 24-27, 2011 and was timed to be done prior to kokanee (*Oncorhynchus nerka*) staging for spawning activity.

2.2 Water Quality

Water quality sampling followed the current standard methodology for Secondary Lake Inventory requirements (RIC, 2001). This included collection of the following water quality parameters at each site:

- Secchi Depth
- Dissolved Oxygen (DO) profile
- Temperature profile

Dissolved oxygen and temperature profiles were collected using a YSI 85 DO/Conductivity/Salinity/Temperature meter while pH was measured with a handheld Hanna Combo Meter.

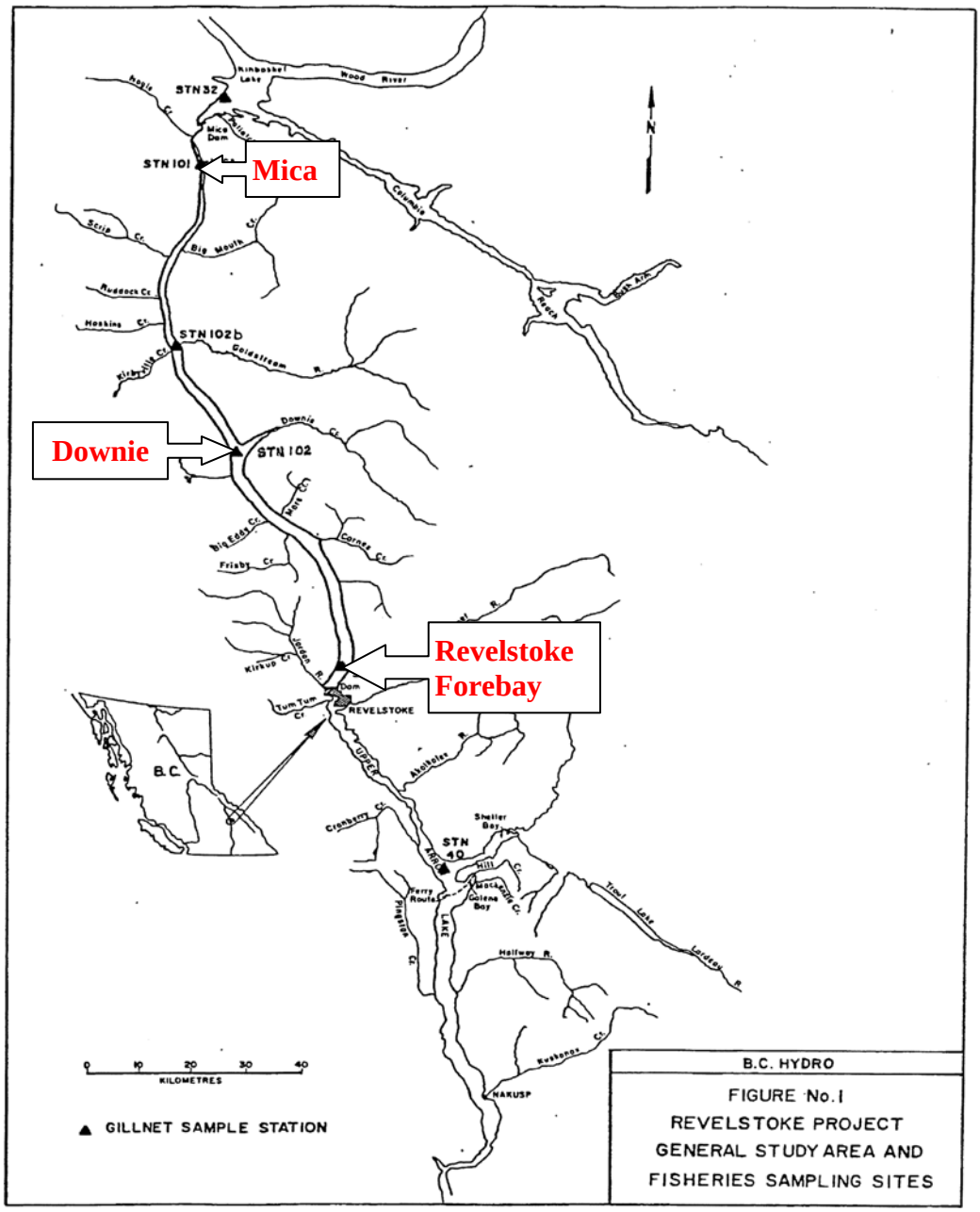

Figure 1. 2011 Sampling Locations.

2.3 Fish Sampling

Standard Lake Inventory (RIC) standards for fish sampling in lakes were implemented. Fish sampling at each of the three sites was completed using both a floating and sinking gill net.

Each of the floating and sinking nets in 2011 consisted of six 15.2 m long panels of different mesh sizes that were strung together in a "gang" to form a net 91.2 m long and 2.4 m deep (218.9 m^2).

Details on the panel order, mesh size, filament size and mean fork length of fish targeted by each panel for nets used in 2011 are summarized in Table 1. The mesh size is measured from knot to knot of a single, diagonally stretched mesh. Each mesh size is selective for a certain size of fish therefore, the individual panels used in the net have been chosen so the net is capable of catching a wide range of fish.

Table 1. Order, mesh size and filament size standard in relation to the mean fork length of fish caught.

Order	Mesh size	Filament size	Fish fork length
1	25 mm	0.20 mm	114 mm
2	76 mm	0.25 mm	345 mm
3	51 mm	0.20 mm	228 mm
4	89 mm	0.30 mm	380 mm
5	38 mm	0.20 mm	178 mm
6	64 mm	0.25 mm	280 mm

The 2011 study used one floating net and one sinking net, both of which were set overnight and perpendicular to shore. The floating net was set directly offshore sampling the 2.4 m at the top of the water column. The sinking net was set 5 to 10 m offshore by connecting the nearshore end of the net to a rope that was tied off to shore and then setting the net from the end of the rope. The approximate depth of the sinking net was 5 to 15 m.

Nets were set between 16:00 and 18:00 hours and were left to soak overnight. Retrieval was generally between 9:00 and 12:00. All fish captured were weighed (to the nearest 0.1 g) and measured (to the nearest mm) to a maximum of 30 per sport fish species (Bull Trout (*Salvelinus confluentus*), Kokanee (*Oncorhynchus nerka*), Rainbow Trout (*O. mykiss*), Mountain Whitefish (*Prosopium williamsoni*), Burbot (*Lota lota*)) and 15 for non-sport fish Suckers (*Catastomus spp*,) Peamouth Chub (*Mylocheilus caurinus*), Redsided Shiner (*Richardsonius balteatus*) and Northern Pikeminnow (*Ptychocheilus oregonensis*). Photographs were taken of fish captured.

2.4 Data Compilation

Fish capture information was recorded on formatted data collection sheets. Lengths and weights were recorded along with fish sex maturity. Any obvious abnormal physical conditions were noted. Photo documentation of fish captured was undertaken.

2.5 Data Analysis

The number of fish caught in each of the floating and sinking gill nets was used to calculate a percent composition by species at each of the sites.

3.0 Results

3.1 Water Quality

The temperature profile collected at the Revelstoke Forebay (Figure 2) for 2011 showed a gradual vertical thermal gradient. Temperature ranges were from 16.6°C (surface) to 9.7°C (30m depth). Warmer surface temperatures persisted to an approximate depth of 15m. Dissolved oxygen ranges were from 9.09 mg/L at the surface to 10.15 mg/L at the cooler temperatures found at the bottom. Secchi depth was 6.4 m.

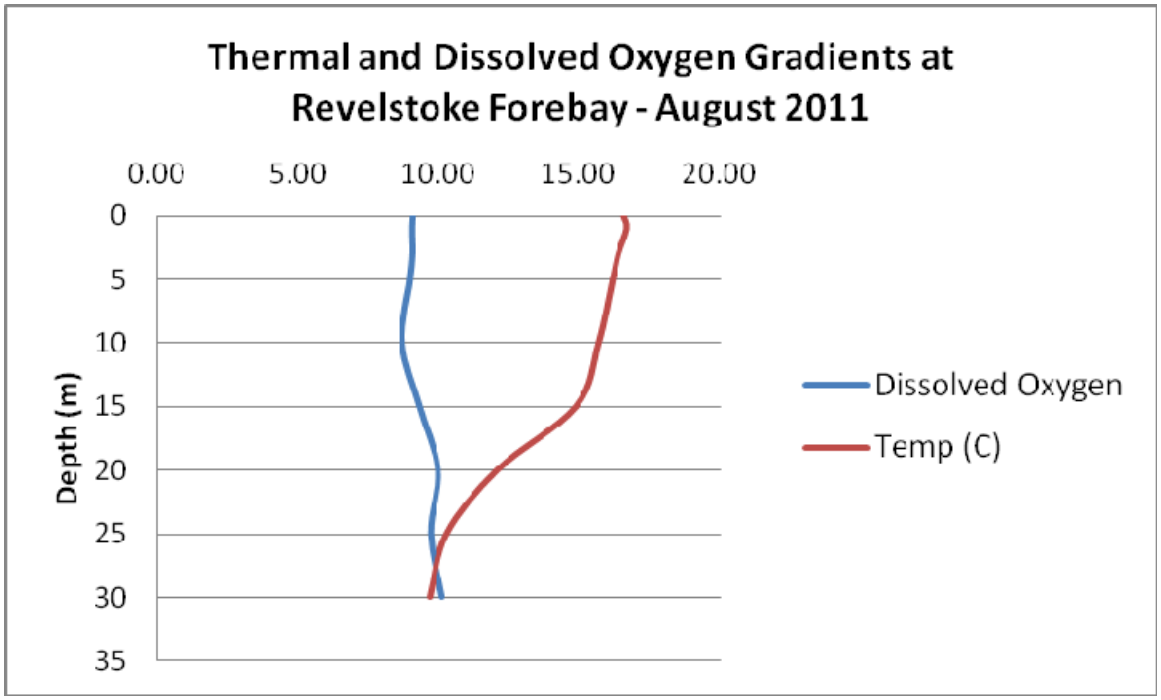

Figure 2. Dissolved oxygen and temperature profile at Revelstoke Forebay site (August, 2011). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

The water quality at the Downie site showed a stronger thermal gradient with surface water temperatures 18.5°C to 9.6°C at the bottom (25m). The dissolved oxygen gradient was fairly stable being 8.90 mg/L at the surface to 10.65mg/L at depth. Secchi depth was 6.1m. (Figure 3)

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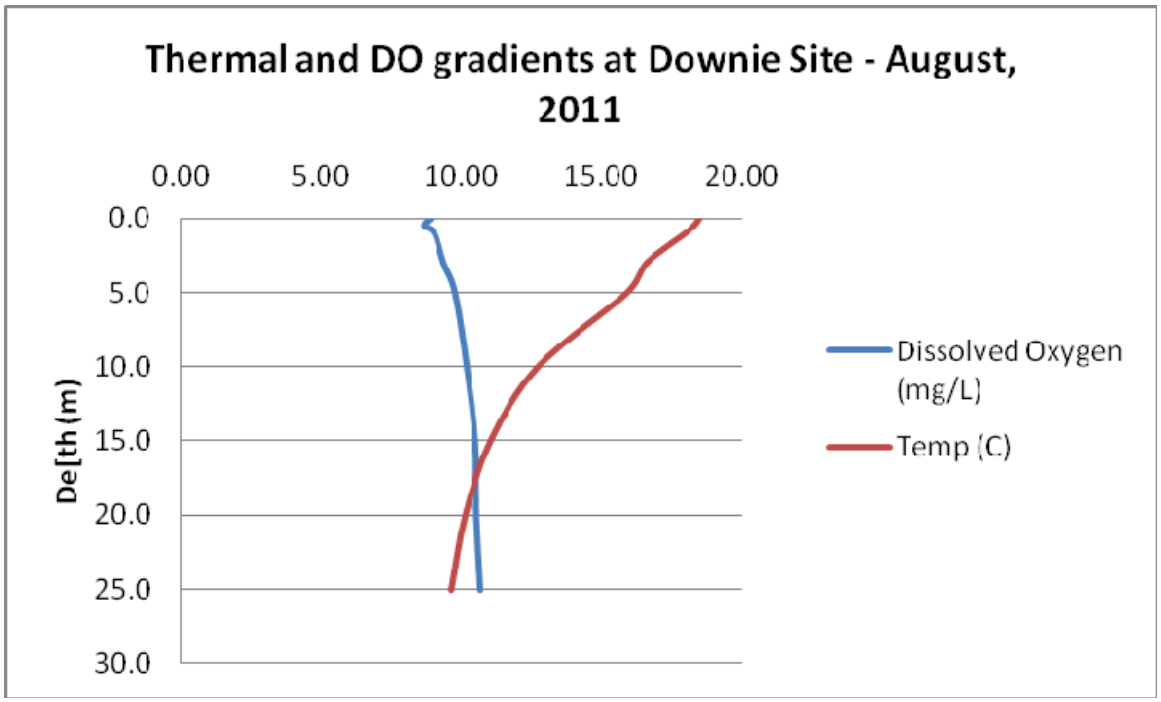

Figure 3. Dissolved oxygen and temperature profile at Downie site, (August 2011). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

Data from the Mica site showed that the temperatures were fairly consistent throughout the 9 m depth, decreasing from 8.6°C at the surface to 8.1°C at the bottom (depth 9m) (Figure 4). Dissolved oxygen concentrations at the surface and the bottom were also fairly consistent. No stratification was observed. Secchi depth was 3.1 m.

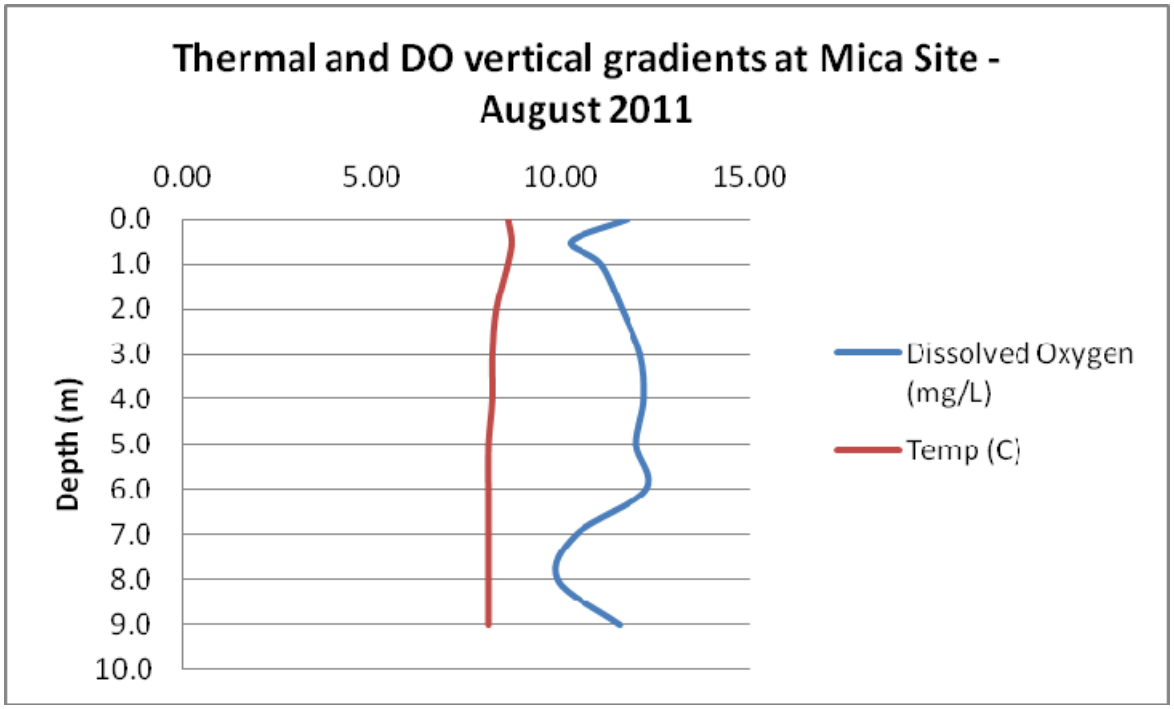

Figure 4. Dissolved oxygen and temperature profile at Mica (August, 2011). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

3.2 Fish Relative Abundance/Percent Composition

The 2011 fish sampling was completed on August 26th & 27th, 2011 and included both sinking and floating nets at all three sites (Revelstoke Forebay, Downie, and Mica). Results of the 2011 fish sampling are presented in Tables 2 and 3 and discussion of the individual sites follows.

Table 2. Summary of fish sampling results for the three sites sampled during the 2011 Revelstoke Reservoir Inventory.

Site	Bull trout	Kokanee	Rainbow Trout	Burbot	Mountain Whitefish	Sucker	Pea-Mouth	Red Side Shiners	Northern Pike-Minnow	Total
Forebay	8	4	3	2	4	17	2	0	0	40
Forebay (%)	20%	10%	8%	5%	10%	43%	5%	0%	0%	100%
Downie	6	6	3	0	1	31	23	4	1	75
Downie (%)	8%	8%	4%	0%	1%	41%	31%	5%	1%	100%
Mica	9	13	8	1	24	6	0	0	0	61
Mica (%)	15%	21%	13%	2%	39%	10%	0%	0%	0%	100%
Total	23	23	14	3	29	54	25	4	1	176
Total (%)	13%	13%	8%	2%	16%	31%	14%	2%	1%	100%

Table 3. Comparison of floating versus sinking net fish numbers and percentages for 2011 Revelstoke Reservoir Inventory.

Site	Bull trout	Kokanee	Rainbow Trout	Burbot	Mountain Whitefish	Sucker	Pea-Mouth	Red Side Shiners	Northern Pike-Minnow	Total
Forebay Float (N)	0	4	2	0	0	0	0	0	0	6
Forebay Float %	0%	67%	33%	0%	0%	0%	0%	0%	0%	100%
Forebay Sink (N)	8	0	1	2	4	17	2	0	0	34
Forebay sink (%)	24%	0%	3%	6%	12%	50%	6%	0%	0%	100%
Downie Float (N)	2	6	3	0	0	0	10	0	0	21
Downie Float (%)	10%	29%	14%	0%	0%	0%	48%	0%	0%	100%
Downie Sink (N)	4	0	0	0	1	31	13	4	1	54
Downie Sink (%)	7%	0%	0%	0%	2%	57%	24%	7%	2%	100%
Mica Float (N)	1	12	6	0	0	0	0	0	0	19
Mica Float (%)	5%	63%	32%	0%	0%	0%	0%	0%	0%	100%
Mica Sink (N)	8	1	2	1	24	6	0	0	0	42
Mica Sink (%)	19%	2%	5%	2%	57%	15%	0%	0%	0%	100%
Total	23	23	14	3	29	54	25	4	1	176
Total (%)	13%	13%	8%	2%	16%	31%	14%	2%	1%	100%

3.2.1 Overview of Fish Abundance and Composition

The total number of fish captured in the 2011 Revelstoke fish sampling was 176 (Table 4). The most abundant fish species throughout the reservoir was suckers (31%), then Mountain Whitefish (16%). The next most abundant fish species was Peamouth (14%), then Bull Trout and Kokanee (13% each). Northern Pike Minnow was the least abundant species (1%) with Burbot and Red Side Shiners a close second (both 2%). The overall percentage of sport fish observed throughout the reservoir was slightly higher than the non-sport fish (51% to 49% respectively). In the individual sites, the percentage of sport fish was 47% (Revelstoke Forebay), 21% (Downie Site), and 88% (Mica site) in 2011 Revelstoke sampling.

Table 4. Summary of the fish measurements for the 2011 Revelstoke Sampling program (all data combined).

Fish Species	N	Average Length (mm)	Average Weight (g)	Range Length (mm)	Range Weight (g)	Average Condition Factor	Range in Condition Factor
Mountain Whitefish	29	279	270	135-360	26-492	1.14	0.95-1.31
Bull Trout	23	315	378	185-505	68-1562	0.94	0.60-1.21
Kokanee	23	276	230	252-300	166-300	1.09	0.91-1.25
Rainbow Trout	14	231	195	130-355	28-581	1.23	1.06-1.30
Burbot	3	460	638	430-490	460-853	0.64	0.58-0.73
Suckers*	36	282	334	109-390	14-774	1.15	0.96-1.35
Pea Mouth Chub	25	202	109	115-280	16-242	1.17	1.02-1.31
Red Side Shiners	4	96	13	85-110	10-16	1.44	1.20-1.62
Northern Pikeminnow	1	115	20			1.32	
Total	158						

(*3 data inputs rejected from Mica site due to predation in net.)

3.2.2 Revelstoke Forebay Site

A total of 40 fish were captured at the Revelstoke Forebay site. Suckers were the most common species encountered at the Revelstoke Forebay site comprising 43% of the catch (Figure 5). There were no Red-side Shiners or Northern Pikeminnow found at this location, and only 2 Peamouth chub. Of the sport fish, Bull Trout were the most abundant at 20% (8), Kokanee and Mountain Whitefish were both 10% , and Rainbow Trout were 8% . Only 5% of the fish caught were Burbot. The only fish that were captured in the floating net at the Forebay site were Kokanee and the 2 of the 3 Rainbow. All the rest of the species were captured in the sinking net in the 2011 sampling.

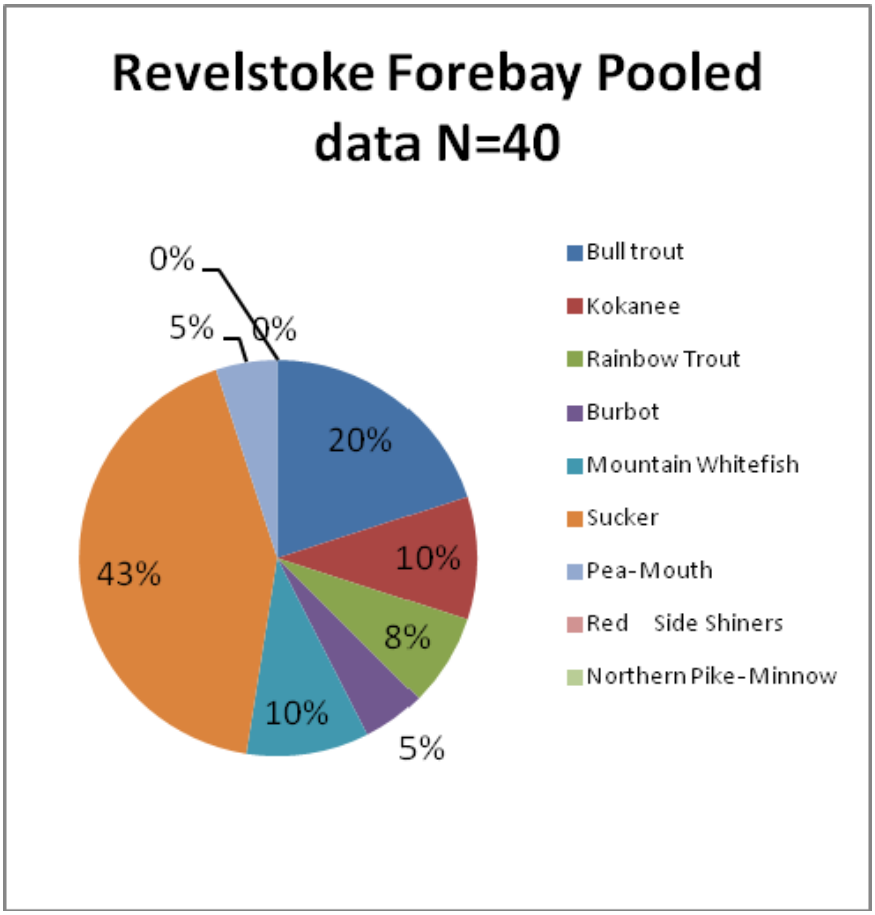

Figure 5. Revelstoke Forebay site relative abundance by species (sinking and floating net combined). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

3.2.3 Downie Site

A total of 75 fish were captured at the Downie site in the 2011 Revelstoke sampling. Suckers again were the most abundant species (41%) followed closely by Peamouth (31%) (Figure 6). Kokanee and Bull Trout were the most abundant sport species (8% each), while Mountain Whitefish were the least abundant (1%). No Burbot were found and only 4% of the species were Rainbow Trout. Other species observed at the Downie site were Northern Pikeminnow (1%) and Red Side Shiners (5%). All the Kokanee and Rainbow Trout captured were in the floating net.

All the other species observed were found in the sinking net except for Bull Trout and Peamouth, which were found in both floating and sinking nets.

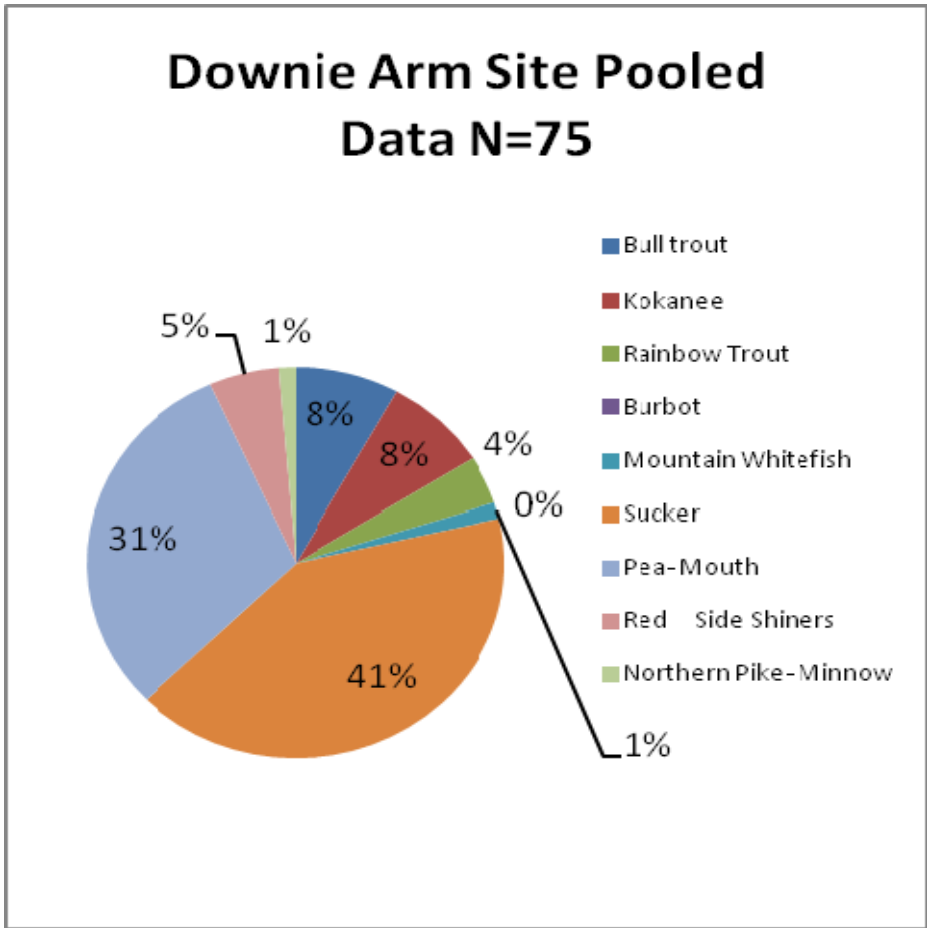

Figure 6. Downie site relative abundance by species (sinking and floating net combined). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

3.2.4 Mica Site

A total of 61 fish were captured at the Mica site. Sportfish dominated the capture at the Mica site. Mountain Whitefish were most abundant comprising 39% of the catch, followed in order of decreasing abundance, Kokanee (21%), Bull Trout (15%), Rainbow Trout (13%), suckers (10%) and Burbot (2%) (Figure 7). Burbot and Mountain Whitefish were only captured in the sinking net. Bull Trout were captured in both the sinking and floating nets, but the majority of the Bull Trout were in the sinking net (81%). Kokanee and Rainbow Trout were mainly in the floating net (92% & 75% respectively).

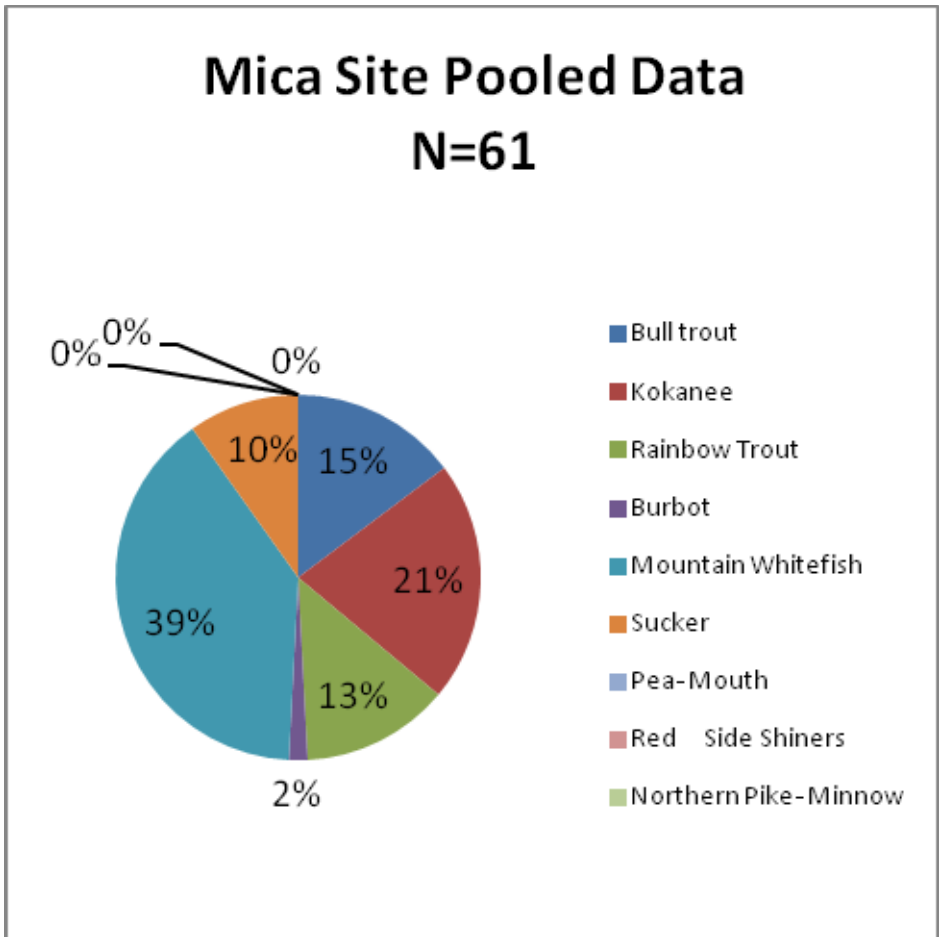

Figure 7. Mica abundance by species (sinking and floating net combined). Data collected as part of the 2011 Revelstoke Reservoir Inventory.

3.3 Comparison Among Sites (2011)

When comparing the sites, the Downie site had the highest overall number of fish (75) with the lowest abundance of sport fish (21%). This site is located mid-reservoir and exhibited a strong thermal gradient with quite warm surface temperatures. The Mica site was the next highest in number of fish (61) with the highest abundance of sport fish (88%). Located closest to the Mica Dam where water from the hypolimnion is placed into the Revelstoke Reservoir, water temperatures were the coolest and consistent throughout the 9m depth. The Revelstoke Forebay had the lowest number of fish (40) with 47% sport fish. Water temperatures at the Forebay site were similar to the Downie site with a more gradual thermal gradient that showed warmer surface temperatures residing until around 15m.

Overall, the majority of the Bull Trout, and Pea-Mouth and all the Mountain Whitefish, Burbot, suckers, Red Side Shiners, and Northern Pike-Minnows were found in the sinking net. The majority of Rainbow Trout and Kokanee were found in the floating nets at each of the three sites. All of the species found in the floating nets, with the exception of Pea-Mouth, were sport fish (Figure 8).

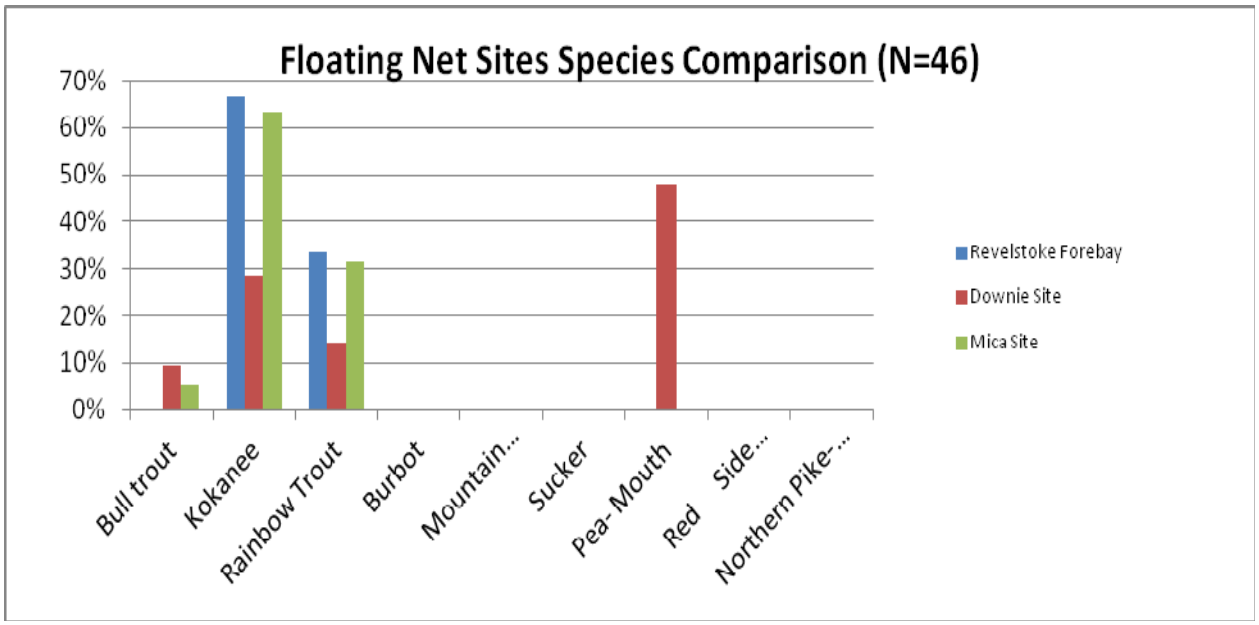

Figure 8. Species comparison for floating nets in the three sites – August 2011. Data compiled from the Revelstoke Reservoir sampling.

A total of 46 fish comprised of Bull Trout, Kokanee, Rainbow Trout, and Pea-Mouth Chub were captured in the floating nets (pooled data), Kokanee and Rainbow were the only species present, in all three floating net sites

A total of 130 fish were captured in the sinking nets in the Revelstoke reservoir 2011 sampling. Species captured with sinking nets varied between sites (Figure 9), but included all species found during the study.

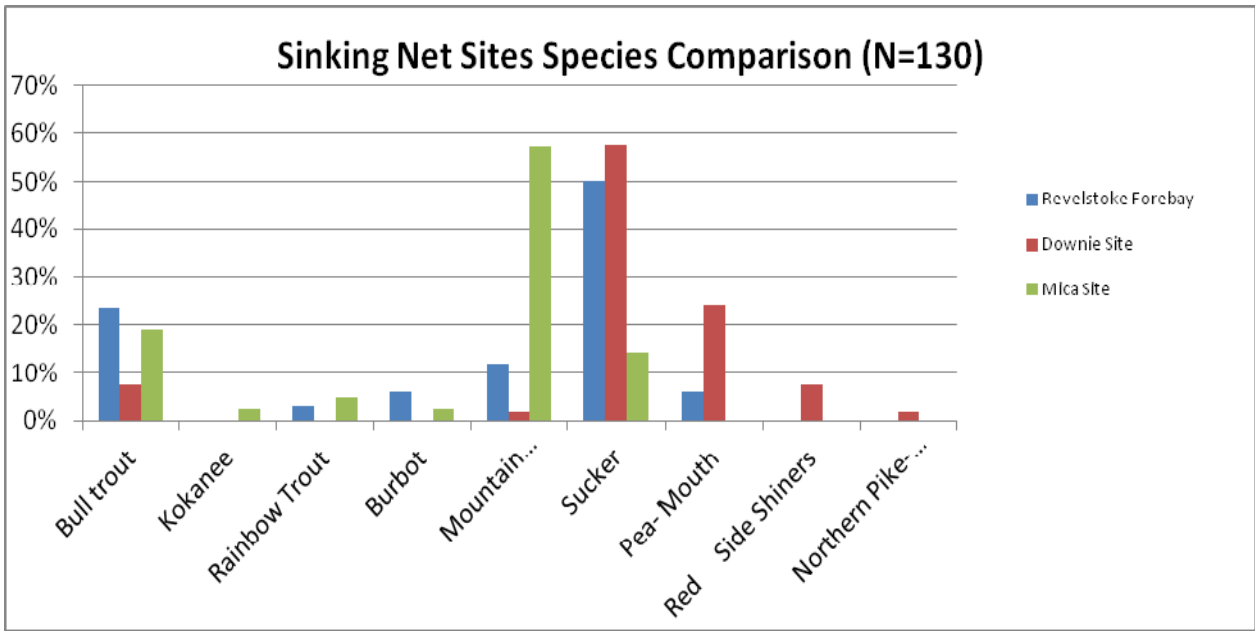

Figure 9. Species relative abundance by site, 2011 Revelstoke Reservoir Inventory. Sinking net data only.

4.0 Discussion

Based on 2011 sampling the species assemblages within the Revelstoke Reservoir are comprised of a mix of both sportfish and non sportfish in similar percentages. While the relative percentage of sportfish is higher in the northern end of the reservoir, where cooler water temperatures are present due to hypolimnetic releases from Mica Dam, sportfish are present through the length of the reservoir.

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APPENDIX 1

FIELD DATA

Location	Net Type	Species	Length (mm)	Weight (g)	Sex
Forebay	GN (Float)	KO	290	221	M
Forebay	GN (Float)	KO	275	213	M
Forebay	GN (Float)	KO	280	226	F
Forebay	GN (Float)	KO	255	166	F
Forebay	GN (Float)	RB	300	332	M
Forebay	GN (Float)	RB	285	288	M
Forebay	GN (Sink)	BT	300	225	Ns
Forebay	GN (Sink)	BT	240	128	Ns
Forebay	GN (Sink)	BT	330	301	Ns
Forebay	GN (Sink)	BT	235	122	Ns
Forebay	GN (Sink)	BT	195	83	Ns
Forebay	GN (Sink)	BT	285	188	M
Forebay	GN (Sink)	BT	230	105	Ns
Forebay	GN (Sink)	BT	200	78	Ns
Forebay	GN (Sink)	PCC	225	125	M
Forebay	GN (Sink)	PCC	210	110	M
Forebay	GN (Sink)	RB	310	391	F
Forebay	GN (Sink)	BB	430	460	Ns
Forebay	GN (Sink)	BB	460	602	M
Forebay	GN (Sink)	MW	350	477	F
Forebay	GN (Sink)	MW	310	358	M
Forebay	GN (Sink)	MW	295	308	F
Forebay	GN (Sink)	MW	320	365	F
Forebay	GN (Sink)	LSU	370	648	M
Forebay	GN (Sink)	LSU	340	428	M
Forebay	GN (Sink)	LSU	380	645	F
Forebay	GN (Sink)	LSU	295	286	F
Forebay	GN (Sink)	LSU	350	500	F
Forebay	GN (Sink)	LSU	370	563	M
Forebay	GN (Sink)	LSU	295	281	M
Forebay	GN (Sink)	LSU	280	255	M
Forebay	GN (Sink)	LSU	275	225	M
Forebay	GN (Sink)	LSU	230	139	M
Forebay	GN (Sink)	CSU	150	37	Ns
Forebay	GN (Sink)	CSU	295	287	M
Forebay	GN (Sink)	CSU	290	283	M
Forebay	GN (Sink)	CSU	275	255	M
Forebay	GN (Sink)	CSU	285	262	M
Forebay	GN (Sink)	CSU	290	290	M

Location	Net Type	Species	Length (mm)	Weight (g)	Sex
Forebay	GN (Sink)	CSU	290	263	F
Downie	GN (Float)	BT	333	307	NS
Downie	GN (Float)	BT	346	332	NS
Downie	GN (Float)	RB	130	28	NS
Downie	GN (Float)	RB	152	47	NS
Downie	GN (Float)	RB	295	315	NS
Downie	GN (Float)	PCC	250	189	M
Downie	GN (Float)	PCC	200	97	M
Downie	GN (Float)	PCC	185	77	NS
Downie	GN (Float)	PCC	200	93	NS
Downie	GN (Float)	PCC	165	52	NS
Downie	GN (Float)	PCC	164	58	NS
Downie	GN (Float)	PCC	174	56	NS
Downie	GN (Float)	PCC	170	61	NS
Downie	GN (Float)	PCC	142	34	NS
Downie	GN (Float)	PCC	140	30	NS
Downie	GN (Float)	KO	285	265	M
Downie	GN (Float)	KO	255	208	M
Downie	GN (Float)	KO	252	187	F
Downie	GN (Float)	KO	255	198	M
Downie	GN (Float)	KO	275	233	F
Downie	GN (Float)	KO	280	217	F
Downie	GN (Sink)	BT	415	774	F
Downie	GN (Sink)	BT	310	266	M
Downie	GN (Sink)	BT	260	152	NS
Downie	GN (Sink)	BT	190	75	NS
Downie	GN (Sink)	CSU	350	467	F
Downie	GN (Sink)	CSU	335	439	M
Downie	GN (Sink)	CSU	295	304	NS
Downie	GN (Sink)	CSU	380	691	F
Downie	GN (Sink)	CSU	305	273	M
Downie	GN (Sink)	LSU	310	306	F
Downie	GN (Sink)	LSU	355	515	F
Downie	GN (Sink)	LSU	340	489	F
Downie	GN (Sink)	LSU	310	321	M
Downie	GN (Sink)	LSU	300	285	F
Downie	GN (Sink)	SU	110	15	NS
Downie	GN (Sink)	SU	115	17	NS
Downie	GN (Sink)	SU	110	15	NS

Location	Net Type	Species	Length (mm)	Weight (g)	Sex
Downie	GN (Sink)	SU	115	19	NS
Downie	GN (Sink)	SU	109	14	NS
Downie	GN (Sink)	SU	120	18	NS
Downie	GN (Sink)	SU	110-120	15-20	NS
Downie	GN (Sink)	NPM	115	20	NS
Downie	GN (Sink)	RSC	110	16	NS
Downie	GN (Sink)	RSC	95	12	NS
Downie	GN (Sink)	RSC	95	13	NS
Downie	GN (Sink)	RSC	85	10	NS
Downie	GN (Sink)	PCC	115	16	NS
Downie	GN (Sink)	PCC	115	17	NS
Downie	GN (Sink)	PCC	245	172	F
Downie	GN (Sink)	PCC	280	242	F
Downie	GN (Sink)	PCC	220	131	F
Downie	GN (Sink)	PCC	225	139	F
Downie	GN (Sink)	PCC	225	124	F
Downie	GN (Sink)	PCC	245	178	M
Downie	GN (Sink)	PCC	235	133	F
Downie	GN (Sink)	PCC	230	147	M
Downie	GN (Sink)	PCC	235	153	F
Downie	GN (Sink)	PCC	235	164	F
Downie	GN (Sink)	PCC	220	123	M
Downie	GN (Sink)	MW	230	123	F
Mica	GN (Float)	BT	505	1562	F
Mica	GN (Float)	KO	284	252	M
Mica	GN (Float)	KO	275	217	M
Mica	GN (Float)	KO	258	173	M
Mica	GN (Float)	KO	276	243	M
Mica	GN (Float)	KO	290	300	M
Mica	GN (Float)	KO	285	268	M
Mica	GN (Float)	KO	300	275	F
Mica	GN (Float)	KO	284	277	F
Mica	GN (Float)	KO	270	200	M
Mica	GN (Float)	KO	279	229	F
Mica	GN (Float)	KO	265	202	M
Mica	GN (Float)	KO	275	231	M
Mica	GN (Float)	MW	285	277	F
Mica	GN (Float)	RB	246	183	M
Mica	GN (Float)	RB	248	195	NS

Location	Net Type	Species	Length (mm)	Weight (g)	Sex
Mica	GN (Float)	RB	225	133	NS
Mica	GN (Float)	RB	205	91	NS
Mica	GN (Float)	RB	145	39	NS
Mica	GN (Float)	RB	160	45	NS
Mica	GN (Sink)	BB	490	853	M
Mica	GN (Sink)	BT	360	450	NS
Mica	GN (Sink)	BT	380	524	NS
Mica	GN (Sink)	BT	400	593	NS
Mica	GN (Sink)	BT	340	382	NS
Mica	GN (Sink)	BT	450	915	F
Mica	GN (Sink)	BT	440	876	F
Mica	GN (Sink)	BT	320	196	NS
Mica	GN (Sink)	BT	185	68	NS
Mica	GN (Sink)	RB	355	581	M
Mica	GN (Sink)	RB	175	65	NS
Mica	GN (Sink)	KO	300	278	M
Mica	GN (Sink)	MW	275	248	F
Mica	GN (Sink)	MW	320	422	M
Mica	GN (Sink)	MW	310	390	F
Mica	GN (Sink)	MW	220	126	NS
Mica	GN (Sink)	MW	295	268	M
Mica	GN (Sink)	MW	320	371	F
Mica	GN (Sink)	MW	310	292	F
Mica	GN (Sink)	MW	360	446	F
Mica	GN (Sink)	MW	275	241	F
Mica	GN (Sink)	MW	290	245	F
Mica	GN (Sink)	MW	275	231	M
Mica	GN (Sink)	MW	265	205	M
Mica	GN (Sink)	MW	300	319	F
Mica	GN (Sink)	MW	345	492	F
Mica	GN (Sink)	MW	265	212	M
Mica	GN (Sink)	MW	270	250	M
Mica	GN (Sink)	MW	290	270	F
Mica	GN (Sink)	MW	260	205	M
Mica	GN (Sink)	MW	220	123	M
Mica	GN (Sink)	MW	245	174	M
Mica	GN (Sink)	MW	300	320	M
Mica	GN (Sink)	MW	135	26	NS
Mica	GN (Sink)	MW	170	54	NS

Location	Net Type	Species	Length (mm)	Weight (g)	Sex
Mica	GN (Sink)	LSU	134	510	F
Mica	GN (Sink)	LSU	400	855	F
Mica	GN (Sink)	LSU	360	740	F
Mica	GN (Sink)	CSU	390	774	M
Mica	GN (Sink)	CSU	385	771	M
Mica	GN (Sink)	CSU	380	660	M

APPENDIX 2

PHOTO LOG

Photo 1. Kokanee Mica Site August 26, 2011

Photo 2. Bull Trout Mica Site Aug 26 2011

Photo 3. Burbot Mica Site August 26, 2011

Photo 4. Rainbow Trout Mica Site August 26, 2011

Photo 5. Site 2 Rainbow Trout Juvenile August 26, 2011

Photo 6. Whitefish Mica Site August 26, 2011

Photo 7. Long Nose Sucker Mica Site August 26, 2011

Photo 8. Coarse Scale Sucker Mica Site August 26, 2011

Photo 9. Kokanee Downie Site August 27, 2011

Photo 10. Bull Trout Downie Site August 27, 2011

Photo 11. Rainbow Trout Downie Site

Photo 12. Long Nose Sucker Downie Site Aug 27, 2011

Photo 13. Coarse Scale Sucker Downie Site, August 27, 2011

Photo 14. Peamouth Chub Downie Site, August 27, 2011