FISHERY MANAGEMENT INVESTIGATIONS

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FISHERY MANAGEMENT ANNUAL REPORT

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STANDARD MOUNTAIN LAKE SURVEYS

ABSTRACT

Department fishery management staff conducted 44 mountain lake surveys in 2008. These surveys were mostly in the Big Creek drainage of the Middle Fork Salmon River, a few of the lakes drained into the South Fork Salmon River drainage. Eleven of the lakes were found to contain fish species and 31 of the lakes contained amphibian species. Four of the lakes with fish also contained Columbia spotted frogs, *Rana luteiventris*. Nine lakes had westslope cutthroat trout, *Oncorhynchus clarkii lewisii*, and three lakes contained rainbow trout, *Oncorhynchus mykiss*. Of the 33 fishless lakes, seven did not have amphibians.

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INTRODUCTION

The High Mountain Lakes Project is an ongoing project aimed at gathering information on statewide lakes to determine what further management strategies should be implemented. The information gathered in this survey is an important tool in enabling managers to understand the status of these lakes in regard to fish and amphibian presence, threatened and/or endangered species presence, human use and impact, water quality, and the affect of previous stocking. In 2006, our use of the Geographical Information Systems (GIS) was expanded, enabling us to gain an even better understanding of each lake's management, survey, and stocking history. The newly developed Mountain Lakes Geo-database enables the user to access spatial data, images of the lakes, stocking records, and survey data simultaneously and in an organized fashion.

In July of 2008, 44 lakes were surveyed in the McCall area. Most of these 44 lakes drain into the Middle Fork of the Salmon River, and the remaining few drain into the South Fork of the Salmon. Most of the lakes that were surveyed are encompassed in the Frank Church – River of No Return Wilderness.

METHODS

During the 2008 field season, a team of two researchers gained access to 44 lakes in near the Edwardsburg area. Some of these lakes have excellent trail access, and others require strenuous cross-country hiking. Once a lake was reached, gill nets were set (usually for a 12 hour period) to determine fish population presence. The fish that were obtained through both angling efforts and the gill net method were weighed and measured, then analyzed for condition and stomach contents. Amphibian presence was determined using the Visual Encounter Survey (VES) method. While a researcher was walking around the lake looking for amphibians, data was also gathered relating to human use and impact such as trails, fire rings, and campsite development. Water quality analysis included pH, conductivity, water temperature, and Secchi depth. These measurements were obtained by one of the researchers from a pack-raft out on the lake. The pack-raft was also used to obtain a maximum depth reading of the lake by conducting a depth profile. All of the information gathered in this survey in relation to fish presence, fish condition and abundance, amphibian presence, lake geomorphic and ecological condition, human use and impact, and digital pictures of each lake, were entered into a database for further analysis.

RESULTS

Fish Presence

Eleven of 44 lakes surveyed contained fish species. In nine lakes we captured westslope cutthroat trout, two lakes contained rainbow trout and one lake contained both species. The Department actively stocks only five of these 44 lakes. In four of the stocked lakes the correct stocked species were captured. In one lake the stocking may have failed because no fish were found. Three of the other lakes in which fish were found, had been removed from the stocking list, in the past.

Amphibian Presence

Forty-three of the 44 lake surveys also had completed visual amphibian surveys. At least one species of amphibian was identified in 31 of the waters with12 lakes without any amphibian species. The most numerous species was Columbia spotted frog which was found in 28 waters, the Western long toed salamander *Ambystoma macrodactylum* was in 8 waters and Western toads *Bufo boreas* were found in five. A Pacific tree frog *Pseudacris regilla* was located near one lake. Ten waters had more than one species, (Table 1).

Fish and Amphibian Interaction

Four lakes contained both amphibian and fish species. The only amphibians identified in those four lakes were Columbia spotted frogs. Of the 33 fishless lakes' seven did not have any amphibians, (Table 1).

MANAGEMENT RECOMMENDATIONS

1. Continue annual high lake surveys concentrating on unsurveyed lakes.
2. Continue developing the high lakes GIS database.

Table 1. Mountain lakes surveyed in 2008 with fish species and amphibian species documented present.

Catalog No.	Lake Name	Date	Fish Species	Stocked	CSF	WT	WLT	PTF
070000695.50	Placer Lake #1 (north)	07-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000695.00	Placer lake #2 (south)	07-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000317.00	N.F. Wolf Fang	09-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000317.50	N.F. Wolf Fang frog pond	09-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000693.00	W.F. Beaver Cr Lake #1	09-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	NO	NO	NO	NO	NO
070000694.00	W.F. Beaver Cr Lake #2	09-Jul-08	FISHLESS	NO	YES	NO	NO	YES
070000694.40	Unknown	10-Jul-08	FISHLESS	NO	YES	NO	YES	NO
070000657.00	Bear Lake #1	15-Jul-08	RAINBOW TROUT	NO	YES	NO	NO	NO
070000658.00	Bear Lake #2	15-Jul-08	RAINBOW TROUT	1977*	YES	NO	NO	NO
070000657.50	Unknown Bear Lake	15-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000688.00	Catherine Lake #1	16-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	1971	YES	NO	NO	NO
070000689.00	Catherine Lake #2	16-Jul-08	FISHLESS	1999	YES	NO	NO	NO
070000688.40	Unknown Catherine Lake	16-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000688.20	Unknown Catherine Lake	16-Jul-08	FISHLESS	NO	YES	NO	NO	NO

070000687.00	Taft Lake (WFMC #8)	17-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	C2*	N/A	N/A	N/A	N/A
070000452.00	Tamarack #4	17-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000685.20	Unknown WFMC Lake	17-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000685.00	WFMC lake #7	17-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	C2	NO	NO	NO	NO
070000684.40	Unknown	18-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000684.80	Unknown	18-Jul-08	FISHLESS	NO	YES	NO	YES	NO
070000684.60	Unknown	18-Jul-08	FISHLESS	NO	YES	NO	YES	NO
070000678.00	Unknown	18-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000684.00	WFMC Lake # 6	18-Jul-08	WESTSLOPE CUTTH-ROAT TROUT/RBT	C2	NO	NO	NO	NO
070000683.00	WFMC Lake #5	18-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000679.00	WFMC Lake#3	18-Jul-08	FISHLESS	NO	YES	YES	YES	NO
070000659.00	Bear Lake #3	19-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	1971	NO	NO	NO	NO
070000707.00	Jacobs Ladder lake #1	19-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	NO	NO	NO	NO	NO
070000709.00	Jacobs Ladder lake #3	20-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000713.00	Jacobs Ladder Lake #5	20-Jul-08	FISHLESS	NO	YES	NO	NO	NO

070000709.40	Unknown J.L. lake	20-Jul-08	FISHLESS	NO	YES	NO	YES	NO
070000709.30	Unknown Jacobs Ladder Lake	20-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000709.20	Unknown Jacobs Ladder Lake	20-Jul-08	FISHLESS	NO	YES	NO	YES	NO
070000710.00	Jacobs Ladder Lake #4	21-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	NO	YES	NO	NO	NO
070000714.00	Jacobs Ladder Lake #6	21-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000451.00	Tamarack Lake #3	21-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000712.00	Unknown Jacobs Ladder lake	21-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000711.00	Unknown Jacobs Ladder Lake	21-Jul-08	FISHLESS	NO	NO	NO	NO	NO
070000714.50	Unknown Jacobs Ladder Lake	21-Jul-08	FISHLESS	NO	YES	YES	NO	NO
070000451.50	Unknown Tamarack Lake	21-Jul-08	FISHLESS	NO	NO	YES	NO	NO
070000709.50	Unknown Jacobs Ladder Lake	22-Jul-08	FISHLESS	NO	YES	NO	NO	NO
070000676.00	NFWFMC Lake	23-Jul-08	FISHLESS	NO	NO	NO	YES	NO
070000655.00	Snowslide Creek Lake	23-Jul-08	FISHLESS	NO	YES	YES	NO	NO

070000656.00	Unknown SF Snowslide Lake	23-Jul-08	FISHLESS	NO	YES	YES	YES	NO
070000703.00	Lick Lake	24-Jul-08	WESTSLOPE CUTTH-ROAT TROUT	C2	NO	NO	NO	NO

*=year fish stocking ceased, C2= Westslope cutthroat trout, CFS= Columbia spottd frog, WT= Western toad, WLT= Western long-toed salamander, PTF= Pacific tree frog

2008 Southwest Region (McCall) Fishery Management Annual Report

LOWLAND LAKES SURVEYS

ABSTRACT

We completed lowland lake surveys on Oxbow and Hells Canyon Reservoirs. The biggest change noted from the last surveys completed in 2003 was the large increase in the numbers of white crappie *Pomoxis annularis* in both reservoirs. The quality bass regulation on Oxbow Reservoir continues to work well. Both catch per effort and percent of smallmouth bass *Micropterus dolomieu* catch greater than 300 mm were higher in Oxbow Reservoir than in Hells Canyon Reservoir.

We continued monitoring the yellow perch *Perca flavescens* population in Lake Cascade following the yellow perch restoration work from 2003 through 2006 (Janssen et al. 2006, 2009). We collected an average of 1,140 yellow perch in each bottom trawl sample in 2008. This was the largest number recorded since bottom trawl sampling began in 1998.

We completed the annual holiday angler trend counts and observed the highest average number of shore and boat anglers since 1998.

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OBJECTIVES

To conduct investigations and implement management strategies on lowland lakes and reservoirs to enhance, maintain, and protect McCall area fisheries.

INTRODUCTION

Oxbow and Hells Canyon reservoirs are impoundments located on the Snake River bordering Idaho and Oregon. Fish populations in both reservoirs were sampled to monitor changes in fish composition and to determine effectiveness of current fish management strategies. Hells Canyon Reservoir has been managed under a general regulation which included a bass limit of any six fish while Oxbow Reservoir has been managed as a quality bass fishery since 1992. The Oxbow Reservoir regulation consisted of a no bass harvest before July 1st and a two bass limit with no harvest of fish between 12 and 16 inches (305 mm to 406 mm) in length beginning July 1. The Hells Canyon Reservoir bass regulation was not changed in 1992 as it was to be used as a control to compare smallmouth bass response to Oxbow Reservoir's quality bass regulation (Janssen et. al., 1997).

METHODS

Oxbow and Hells Canyon Reservoirs

Hells Canyon and Oxbow Reservoirs were electrofished and gill netted to complete the lowland lakes standard surveys. Trap nets were not used at either reservoir due to their inefficiencies in these two waters. See intradepartmental memo: Lowland Lakes Standard Surveys, April 8, 1992 for description and methodology.

We set two floating and two diving standard survey gill nets in both Hells Canyon and Oxbow Reservoirs. We electrofished six randomly chosen, ten minute, shoreline transects in each reservoir. We collected length data from all fish and weights from up to five fish from each one-cm length group for all game fish species collected. Nongame fish were counted and mass weighed.

RESULTS

Oxbow Reservoir

We collected a total of 14 species of fish from Oxbow Reservoir (Table 2). White crappie and smallmouth bass were the most abundant species collected. Channel catfish *Ictalurus punctatus* and smallmouth bass *Cyprinus carpio* were the most abundant in terms of weight. Length frequencies, mean weights and mean relative weights (Wr) of all fish are presented in

Table 3. We found that 16.1 percent of the smallmouth bass collected were greater than 300 mm, the minimum length of the protected slot regulation and 0.8% of the smallmouth bass collected were greater than 400 mm.

Hells Canyon Reservoir

We collected a total of 12 species of fish from Hells Canyon Reservoir (Table 4). Smallmouth bass were the most abundant species collected followed by channel catfish and white crappie, respectively. Channel Catfish and carp were the most abundant species in terms of weight. Length frequencies, mean weights and mean Wr of all fish are presented in Table 5. We found that 4.6 percent of the smallmouth bass collected were greater than 300 mm. We collected no smallmouth bass greater than 350 mm.

DISCUSSION

The large numbers of white crappie in both reservoirs and particularly in Oxbow Reservoir were the major changes observed in these fisheries since the last survey in 2003. It was thought that these fish had been flushed out of Brownlee Reservoir during spring snow runoff events over the last two years. Brownlee reservoir had a very large number of similarly sized fish. Also, we did not observe any young-of-year crappie in either survey in 2008.

The smallmouth bass protected slot limit continued to work well in Oxbow Reservoir where 16.1% of the smallmouth bass population were found to be greater than 300 mm. This compares with 4.2% of the smallmouth bass population being greater than 300 mm in Hells Canyon Reservoir. Also, catch per unit effort of fish greater than 300 mm was higher in Oxbow Reservoir than in Hells Canyon Reservoir. We collected 61 smallmouth bass greater than 300 mm from Oxbow Reservoir versus 17 from Hells Canyon Reservoir when sampling similar habitats and for similar time periods. In 2003, smallmouth bass greater than 300 mm made up 7.1 and 0.8 percent respectively of all smallmouth bass collected in the Oxbow and Hells Canyon Reservoir surveys (Janssen et.al. 2006).

MANAGEMENT RECOMMENDATIONS

1. Continue the special bass regulation in Oxbow Reservoir as it has been very effective in increasing numbers and percent of bass greater than 300 mm.

2. Complete another standard lowland lake survey in 5 years (2013).

Lake Cascade Yellow Perch Fishery Restoration - Monitoring and Investigations

INTRODUCTION

The Department continued monitoring the yellow perch population response to the Lake Cascade yellow perch fishery restoration work completed from 2004 through 2006 (Janssen et al. 2009). The two-fold restoration plan entailed stocking large numbers of yellow perch adults to overwhelm predators in the lake (primarily adult northern pikeminnow *Ptychocheilus oregonensis* and secondly to physically reduce the number of northern pikeminnow in the lake. We transplanted over 860,000 adult yellow perch and removed approximately three-quarters of the northern pikeminnow population in the lake from 2004 through 2006. Biologists continued focusing on monitoring yellow perch production and completed surveys to determine lake wide species composition in 2008. We also continued to monitor changes in angler use on the reservoir.

YELLOW PERCH POPULATION TREND MONITORING

INTRODUCTION

A reliable, repeatable method to document annual production is critical to monitoring changes in survival of young-of-year, and recruitment of adult yellow perch, in Lake Cascade. A bottom trawl has been utilized since 1998 to monitor changes in yellow perch population structure and abundance. We continued this sampling again in 2008.

METHODS

We repeated previous years bottom trawl efforts to sample yellow perch. We continued to use the same lake area divisions (east, west, north, and south), effort and transect sites that we developed in 1998 and 1999 and described by Anderson et al. (2001) and Janssen et al. (2003). Trawl transect locations were as close as possible to the established sites. Exact sites change due to water levels and macrophyte bed development. Trawl sites are moved into deeper water to avoid dense macrophyte beds that clog up the mouth of the trawl. We have abandoned trawl sampling in the north area due to the large numbers of stumps and snags that catch the trawl. We counted all yellow perch collected and a representative sample of yellow perch from each sample area. Collected fish were measured for total length to the nearest mm and weighed to the nearest 0.1 g.

We collected a small number of otoliths from a range of sizes of yellow perch for age determination. Otoliths were mounted in epoxy and then sliced perpendicular to the axis at the focus at a thickness of 60 microns with a jewelers saw. Sliced sections were then coated with a 1:1 solution of glycerin and saline solution to clear any surface scratches and then aged using a dissecting scope.

RESULTS

We completed 62 trawl transects in 2008, trawling a total of 310 minutes, collecting 70,674 yellow perch. We averaged 4; 3,032; and 329 yellow perch per five minute transect in June, August and October respectively (Table 6). Length frequencies of fish collected in August and October are presented in Table 7. The average catch for all transects for all months was the highest catch rates since we began trawling in 1998 at 1,140 yellow perch. The annual mean catch per transect has increased annually since 2002 when only seven yellow perch per transect were collected (Table 8). We observed primarily age-0 and age-1 fish in all three months of sampling (Figure 1). Age-0 yellow perch dominated trawl catches in all three collection periods. We collected more age-1 yellow perch in August and October than we have since we began annual trawling surveys in 1998.

Total lengths of aged yellow perch ranged from 69 mm to 240 mm and ranged in age from one to five (Table 7). Age-0 yellow perch were found to be up to 80 mm. Age one fish ranged in total length from 69 mm to 80 mm, age two fish ranged from 96 mm to 173 mm and age three fish ranged from 187 mm to 240 mm.

MANAGEMENT RECOMMENDATION

Continue the annual trawling of Lake Cascade to monitor changes in age class structure and growth of yellow perch.

FISH POPULATION TRENDS

INTRODUCTION

To evaluate the population structure and status of the Lake Cascade fish community and determine if additional northern pikeminnow control actions were needed as identified in Allen et.al. (2010) we completed a lake wide fish sampling effort.

METHODS

Standard Department lake survey gill nets were set mid day, fished all night and then pulled the next morning. Locations and types of net are depicted in Table 9 and Figure 2. All fish collected were identified to species and their total length measured to the nearest cm.

RESULTS

We set a total of nine standard survey gill nets, six sinking and three diving from September 26 – 30, 2008. The west shoreline was only sampled at one site due to shallow water and large weed beds. We collected a total of 862 fish of eleven different species from Lake Cascade (Table 10.). Black bullhead *Ameiurus melas* and yellow perch were the most abundant fish collected and made up 47.3 and 28 percent of the total catch. Northern pikeminnow and largescale suckers *Catostomus macrocheilus* made up 4.9 and 8.8 percent of the total catch. Length frequencies of each fish species collected are presented in Table 11.

DISCUSSION

Since 2005, we've seen a large shift in species composition observed in gill net sampling in Lake Cascade. Northern pikeminnow and largescale suckers made up 21.9 and 15.2 percent of the total catch respectively in 2005 (Allen et.al. in review) compared to 4.9 and 8.8 percent respectively in 2008. Yellow perch increased from 15.4 % of the total catch in 2005 to 28% in 2008. Smallmouth bass catch by percent of total catch remained the same while black bullheads increased from 22.7% to 47.3% from 2005 to 2008.

Northern pikeminnow greater than 350 mm made up 11% of the total pikeminnow catch. This is well below the threshold of caution described by Allen et.al. (2010). Allen noted that any time the majority of the northern pikeminnow population in Lake Cascade consisted of fish greater than 350 mm there was a danger that pikeminnow predation could potentially consume all recruitment of all species of fish. If this were the case corrective actions would be indicated to protect the yellow perch fishery from collapse.

MANAGEMENT RECOMMENDATION

Repeat the gill netting effort in 2011 to monitor fishery population changes and trends.

Holiday Angler Counts

INTRODUCTION

Angler counts were made on Memorial Day, July 4th, and Labor Day to monitor and compare relative angling pressure to past survey years. Annual holiday counts have been conducted since 1996.

METHODS

We completed angler counts on Lake Cascade as described by Janssen (2000). We conducted counts in 2008 using a fixed wing airplane at 0900 and 1400 hrs on each holiday. All shore anglers and all fishing boats were counted.

RESULTS

Angler counts were completed on Memorial Day (May 26th) and July 4th in 2008. Poor weather prevented counts on Labor Day. The 2008 counts were the highest since 1998 with an average of 34 fishing boats and 37 shore anglers (Table 12). Angler use continued to increase slowly from the lows of 2000 through 2003.

MANAGEMENT RECOMMENDATIONS

1. Continue holiday aerial angler counts to monitor angler use and compare results with future creel census studies.

2. Conduct a year-long intensive creel survey on Lake Cascade in 2009/2010.

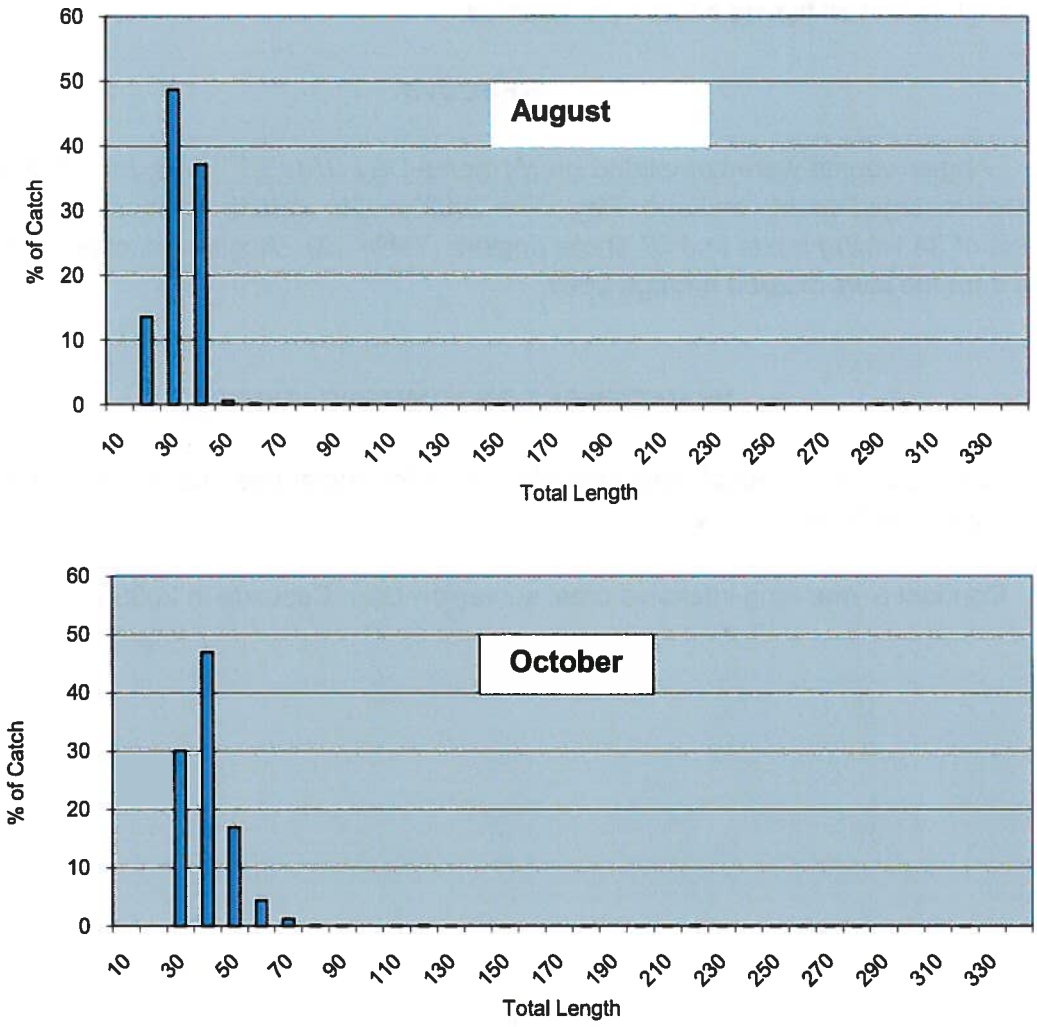

Figure 1. Lake Cascade yellow perch length frequencies collected with a bottom trawl in August and October 2008.

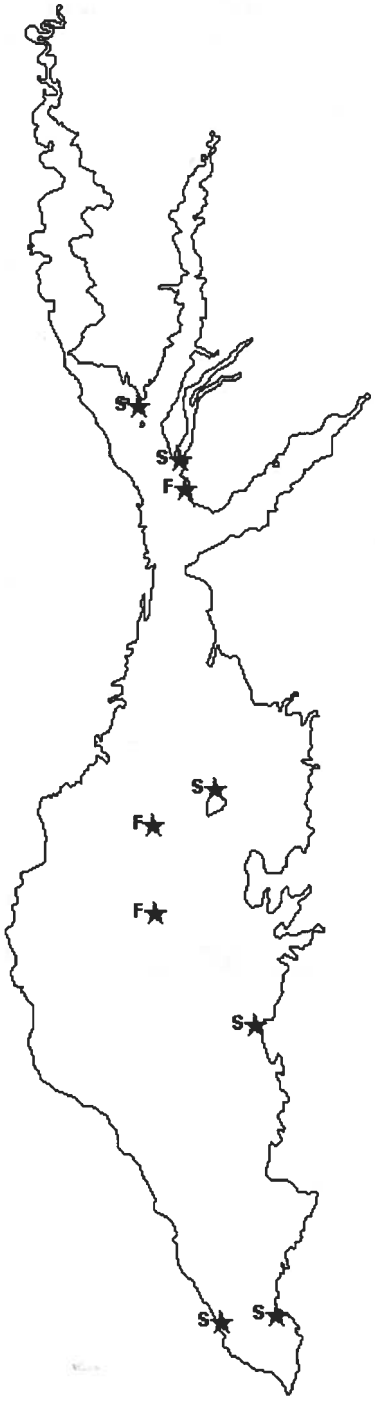

Figure 2. Gill net locations and type set in 2008 in Lake Cascade (S=sinker, F=floater).

Table 2. Species catch, number and weight collected from Oxbow Reservoir in 2008.

Species	Number Collected	% of Catch by Number	Total Weight Collected (kg)	% of Catch by Weight
Black Crappie *Pomoxis nigromaculatus*	34	2.5	2.7	0.9
Bluegill *Lepomis macrochirus*	75	5.4	8.1	2.7
Bridgelip Sucker *Catostomus columbianus*	3	0.2	2.35	0.8
Channel Catfish *Ictalurus punctatus*	137	9.9	82.6	27.3
Chiselmouth *Acrocheilus alutaceus*	2	0.2	.6	0.2
Common Carp *Cyprinus carpio*	13	0.9	56.9	18.8
Flathead Catfish *Pylodictis olivaris*	4	0.3	7.0	2.3
Largescale Sucker *Catostomus macrocheilus*	16	1.2	18.3	6.0
Northern Pikeminnow *Ptychocheilus oregonensis*	38	2.8	12.2	4.0
Rainbow Trout *Oncorhynchus mykiss*	6	0.4	1.75	0.6
Smallmouth Bass *Micropterus dolomieu*	372	27	62.4	20.6
White Crappie *Pomoxis annularis*	672	48.7	46.45	15.4
Yellow Perch *Perca flavescens*	6	0.4	1.36	0.4
Torrent Sculpin *Cottus rhotheus*	1	0.1	.0	.0
Totals	**1,379**	**100.0**	**302.71**	**100.0**

Table 3. Length frequencies, mean weights, and relative weights of fish by species collected in 2008 from Oxbow Reservoir.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Black Crappie	120-129	2.9	1	25	104.17
Black Crappie	130-139	5.9	2	37.5	115.39
Black Crappie	140-149	17.6	6	44.0	108.11
Black Crappie	150-159	14.7	5	59.2	116.45
Black Crappie	160-169	11.8	4	71.8	119.81
Black Crappie	170-179	14.7	5	76.2	103.72
Black Crappie	180-189	14.7	5	100.2	113.31
Black Crappie	190-199	2.9	1	120.0	107.14
Black Crappie	200-209	8.8	3	145.3	113.82
Black Crappie	220-229	2.94	1	153.0	93.29
Black Crappie	270-279	2.94	1	198.0	58.41
Bluegill	70-79	5.3	4	6.0	100
Bluegill	80-89	4.0	3	12.3	124.95
Bluegill	90-99	2.7	2	15.0	96.25
Bluegill	100-109	1.3	1	26.0	123.8
Bluegill	110-119	9.3	7	32.2	120.7
Bluegill	120-129	4.0	3	43.7	123.3
Bluegill	130-139	4.0	3	58.3	119.02
Bluegill	140-149	5.3	4	78.8	127.73
Bluegill	150-159	10.7	8	98.2	135.1
Bluegill	160-169	10.7	8	120.2	133
Bluegill	170-179	16.0	12	126.8	116.25
Bluegill	180-189	14.7	11	171.0	125.17
Bluegill	190-199	6.7	5	185.8	115.82
Bluegill	200-209	4.3	3	231.0	120.17
Bluegill	210-219	1.3	1	268.0	126.42
Bridgelip Sucker	All	100	3	783.0	NA
Channel Catfish	170-179	1.5	2	30.5	83.31
Channel Catfish	180-189	0.7	1	40.0	86.96
Channel Catfish	220-229	0.7	1	83.0	88.3
Channel Catfish	230-239	0.7	1	82.0	86.32
Channel Catfish	240-249	1.5	2	178.5	147.35
Channel Catfish	260-269	2.2	3	130.5	89.23
Channel Catfish	270-279	0.7	1	141.0	87.58
Channel Catfish	280-289	1.5	2	162.5	82.89
Channel Catfish	290-299	4.4	6	178.7	83.86
Channel Catfish	300-309	2.9	4	184.3	78.66
Channel Catfish	310-319	4.4	6	189.4	71.8
Channel Catfish	320-329	2.2	3	269.3	93.64
Channel Catfish	330-339	0.7	1	252.0	76.6

Table 3. Cont.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Channel Catfish	340-349	2.2	3	235.0	65.28
Channel Catfish	350-359	7.3	10	267.8	68.95
Channel Catfish	360-369	6.6	9	30.4.2	71.07
Channel Catfish	370-379	4.4	6	351.0	73.39
Channel Catfish	380-389	3.6	5	396.8	77.08
Channel Catfish	390-399	3.6	5	419.6	75.49
Channel Catfish	400-409	5.1	7	522.8	87.74
Channel Catfish	410-419	4.4	6	474.2	71.51
Channel Catfish	420-429	0.7	1	500.0	69.44
Channel Catfish	430-439	4.4	6	603.7	77.29
Channel Catfish	440-449	3.6	5	761.6	92.62
Channel Catfish	450-459	2.9	4	660.0	74.73
Channel Catfish	460-469	3.6	5	903.6	95.75
Channel Catfish	470-479	2.9	4	781.5	75.09
Channel Catfish	480-489	3.6	5	916.6	83.46
Channel Catfish	490-499	2.9	4	1140.0	97.67
Channel Catfish	500-509	2.9	4	1248.3	99.16
Channel Catfish	510-519	0.7	1	1475.0	110.82
Channel Catfish	520-529	2.2	3	1229.7	85.11
Channel Catfish	530-539	1.5	2	1436.0	94.19
Channel Catfish	540-549	0.7	1	1640.0	104.03
Channel Catfish	550-559	1.5	2	2082.5	118.02
Channel Catfish	560-569	0.7	1	1900.0	106.26
Channel Catfish	570-579	1.5	2	1700.0	94.08
Channel Catfish	580-589	1.5	2	1584.0	76.69
Channel Catfish	>600	0.7	1	3650.0	87.57
Common Carp	All	100.0	13	438.0	NA
Flathead Catfish	450-459	25.0	1	963.0	180.34
Flathead Catfish	570-579	25.0	1	1450.0	129.12
Flathead Catfish	580-589	25.0	1	2342.0	191.81
Flathead Catfish	590-599	25.0	1	2240.0	178.49
Largescale Sucker	All	100.0	16	1143	NA
Northern Pikeminnow	All	100.0	38	320	NA
Rainbow Trout	240-249	30.0	2	138.5	86.99
Rainbow Trout	280-289	30.0	2	244.5	94.82
Rainbow Trout	300-309	20.0	1	341.0	116.38
Rainbow Trout	420-429	20.0	1	647.0	78.05
Smallmouth Bass	60-69	0.8	3	15.0	222.22
Smallmouth Bass	70-79	1.3	5	11.25	187.5
Smallmouth Bass	80-89	0.8	3	29.0	138.1

Table 3. Cont.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Smallmouth Bass	90-99	0.3	1	10.0	111.11
Smallmouth Bass	100-109	0.5	2	34.0	143.36
Smallmouth Bass	130-139	0.3	1	37.0	112.12
Smallmouth Bass	140-149	8.9	33	134.4	97.61
Smallmouth Bass	150-159	5.9	22	164.5	101.41
Smallmouth Bass	160-169	8.6	32	193.2	98.83
Smallmouth Bass	170-179	5.6	21	444.5	93.92
Smallmouth Bass	180-189	7.5	28	234	82.13
Smallmouth Bass	190-199	4.6	17	241.8	85.52
Smallmouth Bass	200-209	3.0	11	264.1	96.15
Smallmouth Bass	210-219	3.2	12	523.25	97.32
Smallmouth Bass	220-229	1.1	4	548.0	89.74
Smallmouth Bass	230-239	1.1	4	644.0	89.53
Smallmouth Bass	240-249	7.8	29	606.2	84.54
Smallmouth Bass	250-259	5.9	22	513.0	74.15
Smallmouth Bass	260-269	4.7	17	595.2	77.48
Smallmouth Bass	270-279	4.7	17	804.3	76.48
Smallmouth Bass	280-289	4.9	18	653.5	80.03
Smallmouth Bass	290-299	2.4	9	723.13	79.22
Smallmouth Bass	300-309	3.2	12	796.88	76.9
Smallmouth Bass	310-319	2.4	9	1230.6	75.71
Smallmouth Bass	320-329	2.4	9	1381.6	74.98
Smallmouth Bass	330-339	1.3	5	1998.0	71.61
Smallmouth Bass	340-349	2.4	9	1372.8	73.79
Smallmouth Bass	350-359	1.6	6	1536.0	77.21
Smallmouth Bass	360-369	0.5	2	1048.0	71.81
Smallmouth Bass	370-379	0.5	2	1218.0	77.01
Smallmouth Bass	380-389	0.5	2	1266.0	75.09
Smallmouth Bass	390-399	0.5	2	1200.0	63.34
Smallmouth Bass	400-409	0.3	1	649.0	62.28
Smallmouth Bass	450-459	0.5	2	1024.0	33.75
White Crappie	150-159	14.1	95	38.3	90.28
White Crappie	160-169	30.4	204	56.8	105.14
White Crappie	170-179	27.4	184	74.0	113.2
White Crappie	180-189	15.8	106	84.0	104.85
White Crappie	190-199	6.7	45	89.8	95.69
White Crappie	200-209	4.8	32	114.7	107.08
White Crappie	210-219	0.4	3	118.0	95.16
White Crappie	260-269	0.4	3	217.0	85.77
Yellow Perch	230-239	20	1	219.0	125.86
Yellow Perch	240-249	20	1	181.0	87.02
Yellow Perch	250-259	30	2	184.0	79.44
Yellow Perch	260-269	20	1	190.0	85.14
Yellow Perch	280-289	20	1	250.0	71.63

Table 4. Species catch, number and weight collected from Hells Canyon Reservoir in 2008.

Species	Number of Fish Caught	Percent of Catch by Number	Biomass By Species (kg)	Percent of Catch by Total Weight
Black Crappie	99	11.6	6.7	3.7
Bluegill	12	1.4	.5	0.3
Channel Catfish	123	14.3	45.8	24.9
Chiselmouth	6	0.7	.8	0.4
Common Carp	15	1.8	34.8	19.0
Flathead Catfish	9	1.0	5.0	2.7
Largescale Sucker	53	6.2	22.4	12.2
Northern Pikeminnow	47	5.5	17.8	9.7
Rainbow Trout	2	0.2	.45	0.2
Smallmouth Bass	363	42.5	38.1	20.7
White Crappie	122	14.3	11.1	6.0
Yellow Perch	4	0.5	.4	0.2
Total	855	100	183.85	100.0

Table 5. Length frequencies, mean weights, and relative weights of fish by species collected from Hells Canyon Reservoir.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Black Crappie	120-129	2.0	2	25	100.40
Black Crappie	130-139	9.1	9	38	122.78
Black Crappie	140-149	22.2	22	46	121.56
Black Crappie	150-159	16.2	16	61	130.89
Black Crappie	160-169	17.2	17	64	107.89
Black Crappie	170-179	10.1	10	77	104.65
Black Crappie	180-189	11.1	11	90	100.09
Black Crappie	190-199	7.1	7	110	103.82
Black Crappie	200-209	2.0	2	101	76.83
Black Crappie	210-219	2.0	2	150	98.68
Black Crappie	230-239	1.0	1	225	109.76
Bluegill	80-89	33.3	4	9	100.0
Bluegill	90-99	25.0	3	14	106.25
Bluegill	150-159	8.3	1	90	116.17
Bluegill	160-169	8.3	1	100	116.28
Bluegill	170-179	16.7	2	121	105.22
Channel Catfish	200-209	0.81	1	50	83.33
Channel Catfish	220-229	2.4	3	56	65.05
Channel Catfish	230-239	1.6	2	88	92.11
Channel Catfish	240-249	4.1	5	75	68.81
Channel Catfish	250-259	0.8	1	77	61.6
Channel Catfish	260-269	4.1	5	156	105.62
Channel Catfish	270-279	2.4	3	150	89.19
Channel Catfish	290-299	5.7	7	183	87.38
Channel Catfish	300-309	8.9	11	206	88.8
Channel Catfish	310-319	4.9	6	217	83.04
Channel Catfish	320-329	11.4	14	248	86.38
Channel Catfish	330-339	10.6	13	270	82.36
Channel Catfish	340-349	10.6	13	243	95.39
Channel Catfish	350-359	7.3	9	310	79.63
Channel Catfish	360-369	3.2	4	306	71.61
Channel Catfish	370-379	2.4	3	367	78.0
Channel Catfish	380-389	2.4	3	332	64.47
Channel Catfish	390-399	0.8	1	450	79.5
Channel Catfish	400-409	0.8	1	650	105.69
Channel Catfish	410-419	0.8	1	400	62.5
Channel Catfish	440-449	0.8	1	700	86.63
Channel Catfish	450-459	2.4	3	840	95.25
Channel Catfish	460-469	2.4	3	823	88.06
Channel Catfish	480-489	1.6	2	1065	95.94

Table 5. Cont.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Channel Catfish	500-509	0.8	1	1200	94.34
Channel Catfish	510-519	1.6	2	1150	87.51
Channel Catfish	540-549	0.8	1	1720	105.2
Channel Catfish	560-569	3.2	4	2017	110.43
Chiselmouth	unknown	100.0	6	133	NA
Common Carp	Unknown	100.0	15	2323	NA
Flathead Catfish	230-239	11.1	1	182	284.38
Flathead Catfish	310-319	11.1	1	70	44.59
Flathead Catfish	330-339	11.1	1	430	223.96
Flathead Catfish	350-359	22.2	2	100	43.1
Flathead Catfish	400-409	11.1	1	670	183.06
Flathead Catfish	450-459	11.1	1	890	164.21
Flathead Catfish	510-519	11.1	1	1330	169.64
Flathead Catfish	520-529	11.1	1	1200	0.72
Largescale Sucker	Unknown	100.0	53	422	NA
Northern Pikeminnow	Unknown	100.0	47	378	NA
Rainbow Trout	200-209	50.0	1	50	58.14
Rainbow Trout	380-389	50.0	1	400	63.09
Smallmouth Bass	50-59	1.1	4	5	Bad weights
Smallmouth Bass	60-69	1.4	5	6	Bad weights
Smallmouth Bass	70-79	2.7	10	6	177.78
Smallmouth Bass	80-89	1.1	4	9	168.34
Smallmouth Bass	90-99	0.8	3	10	119.44
Smallmouth Bass	100-109	0.3	1	18	115.75
Smallmouth Bass	110-119	2.2	8	21	116.67
Smallmouth Bass	120-129	3.6	13	23	1.22
Smallmouth Bass	130-139	5.5	20	28	98.04
Smallmouth Bass	140-149	6.3	23	40	106.5
Smallmouth Bass	150-159	5.0	18	46	103.49
Smallmouth Bass	160-169	7.8	28	57	106.23
Smallmouth Bass	170-179	7.2	26	63	95.15
Smallmouth Bass	180-189	9.4	34	79	98.77
Smallmouth Bass	190-199	6.6	24	79	82.45
Smallmouth Bass	200-209	8.0	29	102	91.86
Smallmouth Bass	210-219	2.2	8	150	109.62
Smallmouth Bass	220-229	3.3	12	140	103.61
Smallmouth Bass	230-239	3.0	11	150	84.2
Smallmouth Bass	240-249	2.7	10	182	93.19
Smallmouth Bass	250-259	3.9	14	211	89.87

Table 5. Cont.

Species	Length Group (mm)	Percent Total	Number Fish	Mean Weight (g)	Mean Wr
Smallmouth Bass	260-269	5.2	19	214	83.5
Smallmouth Bass	270-279	2.5	9	228	78.34
Smallmouth Bass	280-289	2.5	9	271	83.64
Smallmouth Bass	290-299	1.1	4	286	78.47
Smallmouth Bass	300-309	1.4	5	315	76.47
Smallmouth Bass	310-319	1.1	4	364	80.4
Smallmouth Bass	320-329	0.5	2	416	85.59
Smallmouth Bass	330-339	1.1	4	465	83.49
Smallmouth Bass	340-349	0.5	2	619	99.33
White Crappie	150-159	0.8	1	45	100
White Crappie	160-169	4.1	5	60	114.98
White Crappie	170-179	14.8	18	73	112.88
White Crappie	180-189	41.8	51	83	103.73
White Crappie	190-199	27.0	33	105	109.13
White Crappie	200-209	8.2	10	115	103.61
White Crappie	210-219	2.5	3	133	106.91
White Crappie	260-269	0.8	1	215	79.63
Yellow Perch	180-189	25	1	50	63.29
Yellow Perch	190-199	50	2	73	77.13
Yellow Perch	250-259	25	1	175	72.02

Table 6. Total and mean catch of yellow perch by area collected in June, August and October 2008 with a bottom trawl from Lake Cascade with 95% confidence intervals (+/-)

	June			August			October		
AREA	**Number of Transects**	**Total Number Perch**	**Average Catch per Transect**	**Number of Transects**	**Total Num-ber Perch**	**Average Catch per Transect**	**Number Transects**	**Total Number Perch**	**Average Catch per Transect**
East	7	14	2 (+/-2)	7	22,463	3,209 (+/2200)	7	3,384	483 (+/-557)
West	7	29	4 (+/-2.5)	7	16,049	2,293 (+/-1,448)	7	8,20	117 (+/-206)
South	7	34	6 (+/-7)	7	25,179	3,597 (+/-2,084)	7	2,702	3869 (+/-266)
Totals/Averages	**21**	**77**	**3.85**	**21**	**63,691**	**3,033**	**21**	**6,906**	**329**

Table 7. Length frequencies of yellow perch collected with a bottom trawl from Lake Cascade in August and October 2008 and ages of fish collected in October 2008.

Total Length	August	October	Otolith Ages (October)
10	0	0	
20	8,629	0	0+
30	31,001	2,073	0+
40	23,651	3,242	0+
50	334	1,168	0+
60	42	302	0+,1+
70	12	81	1+
80	7	7	1+
90	6	2	2+
100	3	0	2+
110	1	2	2+
120	0	6	2+
130	0	1	2+
140	0	0	
150	1	1	3+
160	0	0	
170	0	0	
180	1	1	3+
190	0	0	
200	0	3	3+
210	0	1	3+
220	0	5	3+, 4+
230	0	1	3+
240	0	3	4+
250	1	1	
260	0	1	
270	0	1	
280	0	3	
290	1	0	
300	1	0	
310	0	0	
320	0	1	
330	0	0	
340	0	0	
TOTALS	**63691**	**6906**	

Table 8. Average yellow perch catch per trawl transect for all transects and areas in Lake Cascade from 1998 through 2008.

YEAR	Average Yellow Perch Catch per 5 Minute Trawl
1998	2
1999	21
2000	10
2001	18
2002	7
2003	12
2004	93
2005	220
2006	436
2007	651
2008	1,140

Table 9. 2008 gill net locations in Lake Cascade.

Site Name	Gill net Type	GPS Easting	GPS Northing
Point Between Lake Fork Creek and North Fork Payette River Bays	Sinking	570345	4848529
Point adjacent to Boulder Creek boat ramp	Sinking	571349	4948144
South shore of bay south of Boulder Creek boat ramp	Floating	571586	4947279
North shore of Sugar-loaf Island	Sinker	572642	4940304
Mid lake, South East of Sugarloaf Island	Floater	571231	4939591
Mid lake, West of Su-garloaf boat ramp	Floater	571484	4936971
Vista Point	Sinker	573865	4934573
North of Campbell Creek boat ramp	Sinker	572206	4928664
Primary point West of Blue Heron boat ramp	Sinker	574626	4927391

Table 10. Number of fish collected with gill nets September 26 - 30, 2008 from Lake Cascade by species and percent of catch.

SPECIES	TOTAL CAUGHT	PERCENT OF TOTAL
Black Bullhead *Ameiurus melas*	408	47.3
Black Crappie *Pomoxis nigromaculatus*	2	0.2
Coho Salmon *Oncorhynchus kisutch*	16	1.9
Largemouth Bass *Micropterus salmoides*	13	1.5
Largescale Sucker *Catostomus macrocheilus*	76	8.8
Mountain Whitefish *Prosopium williamsoni*	5	0.6
Northern Pikeminnow *Ptychocheilus oregonensis*	42	4.9
Pumpkinseed *Lepomis gibbosus*	1	0.1
Rainbow Trout *Oncorhynchus mykiss*	9	1.0
Smallmouth Bass *Micropterus dolomieu*	47	5.4
Tiger Musky *Esox lucius x E. Masquinongy*	2	0.3
Yellow Perch *Perca flavescens*	241	28
TOTAL	**862**	**100**

Table 11. Length Frequencies of Lake Cascade fish collected with gill nets in September, 2008.

LENGTH GROUP (MM)	SPECIES											
	BBH	BC	COHO	LMB	LSS	MWF	NPM		PS	RBT	SMB	TM	YP
							<350mm	>350mm					
130-139	0	0	0	6	0	0	0		0	0	0	0	0
140-149	1	0	0	4	0	0	0		0	0	0	0	3
150-159	10	0	0	3	0	0	0		0	0	0	0	0
160-169	6	0	0	0	0	0	2		0	0	0	0	3
170-179	4	0	0	0	0	0	0		1	1	0	0	1
180-189	28	0	2	0	0	0	0		0	0	0	0	1
190-199	20	0	0	0	0	0	1		0	0	0	0	1
200-209	25	0	0	0	1	0	2		0	0	0	0	3
210-219	28	0	0	0	0	0	2		0	2	0	0	7
220-229	29	0	0	0	1	0	3		0	1	0	0	6
230-239	33	0	0	0	0	0	1		0	0	1	0	25
240-249	47	1	0	0	0	0	0		0	3	0	0	30
250-259	41	1	0	0	1	0	2		0	0	1	0	39
260-269	31	0	0	0	0	0	1		0	0	1	0	35
270-279	40	0	0	0	0	0	1		0	0	1	0	22
280-289	20	0	0	0	0	0	1		0	0	0	0	31
290-299	14	0	0	0	1	0	3		0	0	0	0	17
300-309	12	0	0	0	0	0	0		0	0	3	0	10
310-319	7	0	0	0	2	0	4		0	0	3	0	4
320-329	5	0	0	0	1	1	4		0	0	3	0	2
330-339	2	0	1	0	1	0	1		0	1	1	0	1
340-349	1	0	0	0	1	3	3		0	0	1	0	0
350-359	2	0	0	0	3	0		1	0	1	0	0	0
360-369	0	0	2	0	0	1		2	0	0	8	0	0
370-379	0	0	2	0	2	0		2	0	0	2	0	0
380-389	0	0	4	0	2	0		0	0	0	8	0	0
390-399	0	0	1	0	3	0		0	0	0	2	0	0
400-409	1	0	1	0	4	0		0	0	0	3	0	0
410-419	1	0	2	0	2	0		1	0	0	2	0	0
420-429	0	0	0	0	2	0		1	0	0	1	0	0
430-439	0	0	1	0	4	0		0	0	0	2	0	0
440-449	0	0	0	0	3	0		0	0	0	1	0	0
450-459	0	0	0	0	2	0		0	0	0	1	0	0
460-469	0	0	0	0	4	0		0	0	0	0	0	0
470-479	0	0	0	0	1	0		0	0	0	0	0	0
480-489	0	0	0	0	1	0		1	0	0	0	0	0
490-499	0	0	0	0	2	0		1	0	0	1	0	0
500-509	0	0	0	0	5	0		0	0	0	1	0	0

Table 11. Cont.

510-519	0	0	0	0	5	0		0	0	0	0	0	0
520-529	0	0	0	0	2	0		0	0	0	0	0	0
530-539	0	0	0	0	1	0		1	0	0	0	0	0
540-549	0	0	0	0	4	0		0	0	0	0	0	0
550-559	0	0	0	0	2	0		0	0	0	0	0	0
570-579	0	0	0	0	3	0		1	0	0	0	0	0
580-589	0	0	0	0	1	0		0	0	0	0	0	0
590-595	0	0	0	0	0	0		0	0	0	0	0	0
>600	0	0	0	0	9	0		0	0	0	0	2	0
TOTALS	408	2	16	13	76	5	31	11	1	9	47	2	241
% of TOTAL	47.3	0.2	1.9	1.5	8.8	0.6	3.6	1.3	0.1	1.0	5.5	0.2	28.0

Species Codes: BBH-black bullhead, BC-black crappie, LMB-largemouth bass, LSS-largescale sucker, MWF-mountain whitefish, NPM-northern pikeminnow, PS-pumpkinseed, RBT-rainbow trout, SMB-smallmouth bass, TM-tiger musky, YP-yellow perch.

Table 12. Average boat and shore angler counts on Lake Cascade on three major holidays: Memorial Day, July 4th, and Labor Day, in 1982, 1991, 1992 and 1996 through 2008 with corresponding intensive creel survey angler hour estimates for 1982, 1991 and 1992.

	Holiday Counts		**Estimated Angler Hours (hours * 1000)**		
Year	**Ave. # Boats**	**Ave. # Shore Anglers**	**Boat Anglers**	**Shore Anglers**	**Total Pressure[1]**
1982	154	85	255.6	129.8	385.4
1991	41.5	32	135.2	102	237.2
1992	52.5	116	144.2	177.3	321.5
1996	35	27	-	-	-
1997	36.5	19	-	-	-
1998	58	39.5	-	-	-
1999	27	31	-	-	-
2000	15	12	-	-	-
2001	11	12	-	-	-
2002	16.5	12	-	-	-
2003	17	6	-	-	-
2004	23	8.5	-	-	-
2005	28	12.5	-	-	-
2006	25	23	-	-	-
2007	24	28	-	-	-
2008	34	37	-	-	-

[1] Does not include ice fishing hours.

2008 Southwest Region (McCall) Fishery Management Annual Report

RIVERS AND STREAMS

ABSTRACT

The 2008 kokanee *Oncorhynchus nerka kennerlyi* spawning run in the North Fork Payette River above Payette Lake was estimated to be 4,195 fish.

We completed a total of sixteen Department standard stream surveys in thirteen streams in the Weiser River, Little Salmon River and North Fork Payette River drainages in 2008. We collected only rainbow trout and bull trout *Salvelinus confluentus* in the Hornet Creek drainage streams and rainbow trout and brook trout *S. fontinalis* in the North Fork Payette River drainage.

In 2008, temperature recorders were used to monitor the upper Little Salmon River and upper North Fork Payette River drainages throughout summer and early fall. Mean daily stream temperatures in the main stem Little Salmon River peaked in July and early August, reaching occasional highs of 23°C, and 21°C at the Circle C Ranch Bridge and downstream from Meadow Creek Bridge, respectively. Temperature recorders placed in Mud Creek, a tributary to the Little Salmon, and the upper North Fork Payette River were lost due to vandalism.

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North Fork Payette River Kokanee Counts Above Payette Lake

INTRODUCTION

The spawning run of kokanee in the North Fork Payette River (NFPR) from Payette Lake has been enumerated since 1988 to assess spawning escapement and to serve as a method of validating kokanee population/density estimates and survival estimates from in-lake population work. This estimate was completed again in 2008.

METHODS

We completed kokanee spawner counts by walking the entire stretch of river utilized by spawning kokanee and counting all live spawners. Kokanee were first observed in the river on September 5, 2008. Three counts were completed during spawning. Counts were made weekly until a peak count was established. The total spawning run estimate was made by multiplying the largest daily count by 1.73 (Frost and Bennett 1994).

RESULTS

We counted 2,025; 2,425 and 2,150 live kokanee spawners on September 10, 16, and 19, 2008 respectively. The total spawning run estimate was 4,195 (2,425*1.73) fish (Table 13). Average total length of 22 spawners sampled was 336 mm.

DISCUSSION

Kokanee spawner counts continue to decline to the lowest count ever made on Payette Lake. Reasons for the decline are probably due to the recent stockings of small lake trout and the lack of kokanee stocking since 1993. We stocked 87,500 and 460,000 kokanee fingerling in 2007 and 2008 respectively. As noted by Janssen et.al. (2009) stocked kokanee do not show up as spawners until the fourth year following the year stocked. Therefore, we do not expect the spawning kokanee run size to increase significantly until at least the year 2011. Also the small number of fish stocked in 2007 may not recruit a large number of spawning fish.

Kokanee population estimates must be completed in each of the next several years to ensure that kokanee numbers increase in the midst of increased lake trout numbers.

MANAGEMENT RECOMMENDATIONS

1. Continue monitoring kokanee spawning runs to ensure kokanee viability in Payette Lake.
2. Make annual kokanee population estimates in Payette Lake.

STANDARD STREAM SURVEYS

INTRODUCTION

Over the past three years we concentrated our standard stream survey work in the Weiser River drainage. The majority of these streams had never been surveyed and baseline data was needed to document fish populations in the drainage. We began this survey effort in 2004 in the headwater areas of the Weiser River and have worked our way downstream in subsequent years. We conducted surveys in the Hornet Creek drainage in 2008. Many of these streams were located on Idaho Department of Lands (IDL) and had been surveyed by IDL in 1998. We repeated many of these same survey sites this year. Our focus on Hornet creek streams on IDL lands was to update presence/absence data for bull trout.

We also completed surveys in the North Fork Payette River and Little Salmon River drainages.

METHODS

We used the Department's standard stream survey methodology (B. Horton memo 8/15/1994) to conduct the surveys. We typically made one pass with backpack electrofishing equipment to collect all fish. Fish collected were identified and total length measured to the nearest mm. Habitat data were collected in all streams even if no fish were found.

RESULTS

We completed a total of sixteen IDFG standard stream surveys in thirteen streams in the Weiser River, Little Salmon River and North Fork Payette River drainages in 2008. These included Fish Creek in the Little Salmon River Drainage, Lemah Creek, Copeland Creek, Brush Creek, Poorman Creek in the North Fork Payette River drainage and Olive Creek, South Fork Olive Creek, North Fork Olive Creek, North Creek, Placer Creek, and Grouse Creek, Disappointment Creek and Hornet Creek in the Hornet Creek (Weiser River) drainage. GPS coordinates of stream survey locations are presented in Table 14 and maps of locations are presented in Figures 3 thru 7.

We observed no fish in four of the 16 surveys and one stream was not sampled due to high flows (Table 15). We collected redband trout *O. mykiss gairdneri* in Olive Creek, South Fork Olive Creek, North Fork Olive Creek, Grouse Creek, Disappointment Creek and Hornet Creek. We collected bull trout in Olive Creek, North Fork Olive Creek, North Creek, and Placer Creek. Brook trout were collected from Poor Man's Creek in the North Fork Payette River drainage. No brook trout were observed in any of the Weiser River drainage streams sampled (Table 16). Length frequencies of all trout and char collected are presented in Table 15. Specific habitat data for these surveys can be found in the Department Standard Stream Survey Database.

LITTLE SALMON RIVER AND NORTH FORK PAYETTE RIVER

TEMPERATURE MONITORING

INTRODUCTION

For the past 14 years, the upper Little Salmon River (LSR) drainage has been the focus of ongoing riparian habitat improvement projects along with some conservation efforts with agricultural land use practices. Debate has risen among stakeholders regarding what specific factors limit salmonid populations throughout the drainage. Summer stream temperature monitoring began in 1994 to establish baseline data and to track changes that may be influenced by recovery of riparian habitat. Monitoring of stream temperatures was intensified in 2004 to assist with Idaho Department of Environmental Quality's 2006 water quality assessment for development of Total Maximum Daily Load (TMDL) allowances. We consider the sites monitored in 2008 adequate to characterize long-term trends in the upper LSR. The LSR and some tributaries are currently listed as water quality limited for support of cold water biota, with high summer water temperature, fine sediment, and nutrients listed as pollutants of concern.

Summer stream temperature is monitored annually in the North Fork Payette River (NFPR) as part of ongoing evaluation of a minimum in-stream flow that was established in 2000 to provide for salmonid spawning and rearing (Idaho Department of Water Resources permit #65-13894).

Hobo temperature recorders (either Onset model HTI or U10, -5 to +35°C) were deployed to monitor water temperature continuously, recording a temperature every 2.5 hours from June 8th through October 16th. Each recorder was placed in a waterproof Onset model container and secured by cable to a cinder block. The cinder block was placed in the stream and cabled to shore. Protocol described by Zaroban (2000) was followed to calibrate recorders prior to use.

Little Salmon River Drainage

Two recorders were placed in the main LSR. Recorders were located at the Circle C Bridge and approximately 0.4 km downstream from Meadow Creek Subdivision Bridge, on Campbell Ranch. Additionally, one recorder was placed in Mud Creek, a headwater tributary to the LSR, immediately below the confluence with Little Mud Creek, under the Highway 95 Bridge. A map of the location of each recorder can be found in Appendix A.

North Fork Payette River

One temperature recorder was secured to the steel staff gauge that is associated with the United States Geological Survey gauging station in the NFPR approximately 0.4 km downstream from Fisher Creek. A map of the location of this recorder can be found in Appendix A.

RESULTS

Little Salmon River

Figure 8 and Appendices B and C show graphically and in table format the daily mean, minimum and maximum stream temperatures for the upper LSR in 2008. Mean daily temperatures were highest from mid-July through mid-August in the mainstem LSR; and were generally higher at the downstream site at the Circle C Bridge. Mean daily temperatures were ≥ 20°C on 44 and 17 days at the downstream and upstream sites, respectively during July and August. Maximum daily temperatures exceeded 25°C on one day at the downstream site, and exceeded 24°C one day at the upstream site. The temperature recorder placed in Mud Creek was vandalized, and no data recovered.

North Fork Payette River

Appendix A shows the location of the upper NFPR station, however the temperature recorder was missing from the site in the fall, 2008, presumably stolen.

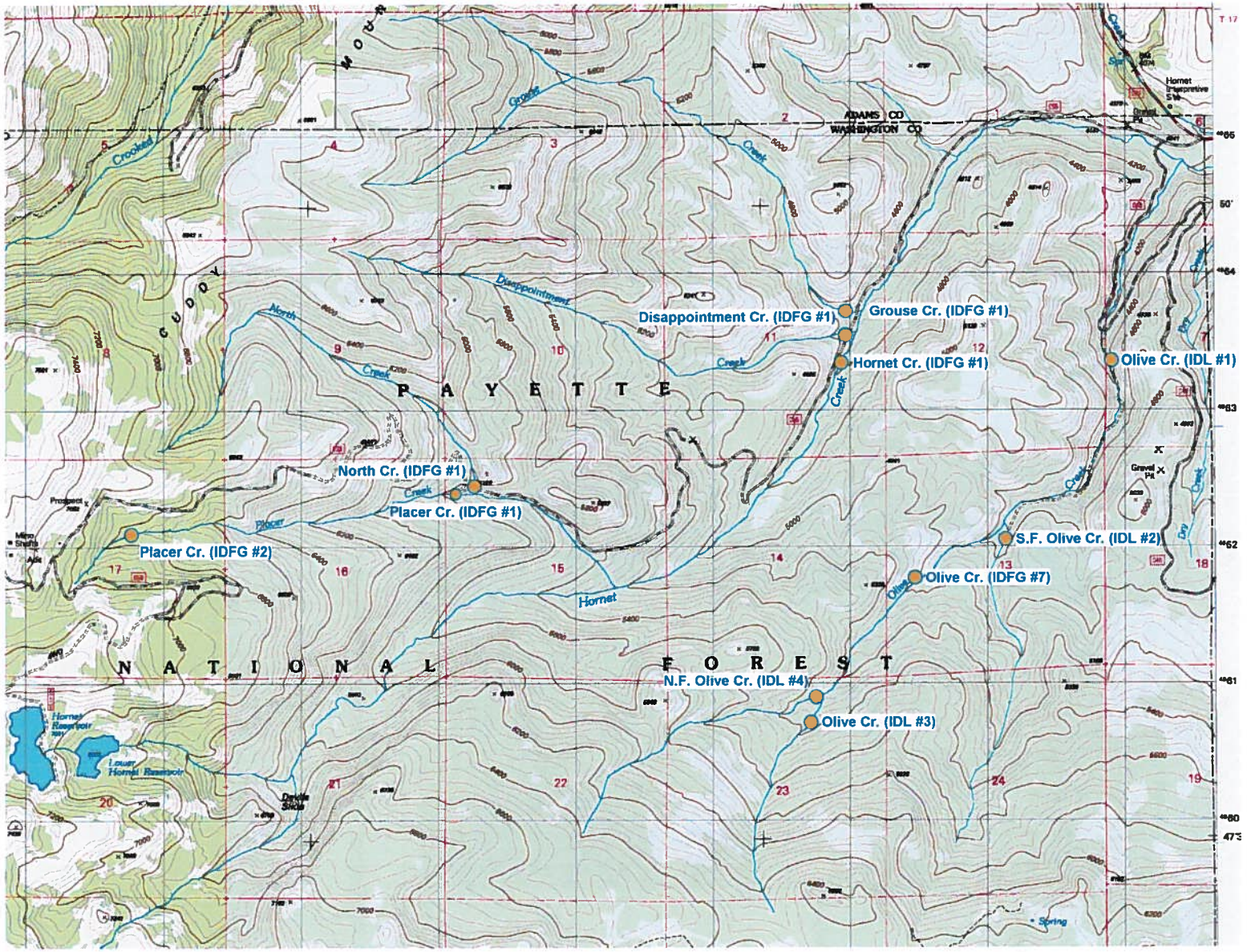

Figure 3. Map of Hornet Creek drainage stream survey sites.

Figure 4. Map of North Fork Payette River drainage stream survey sites.

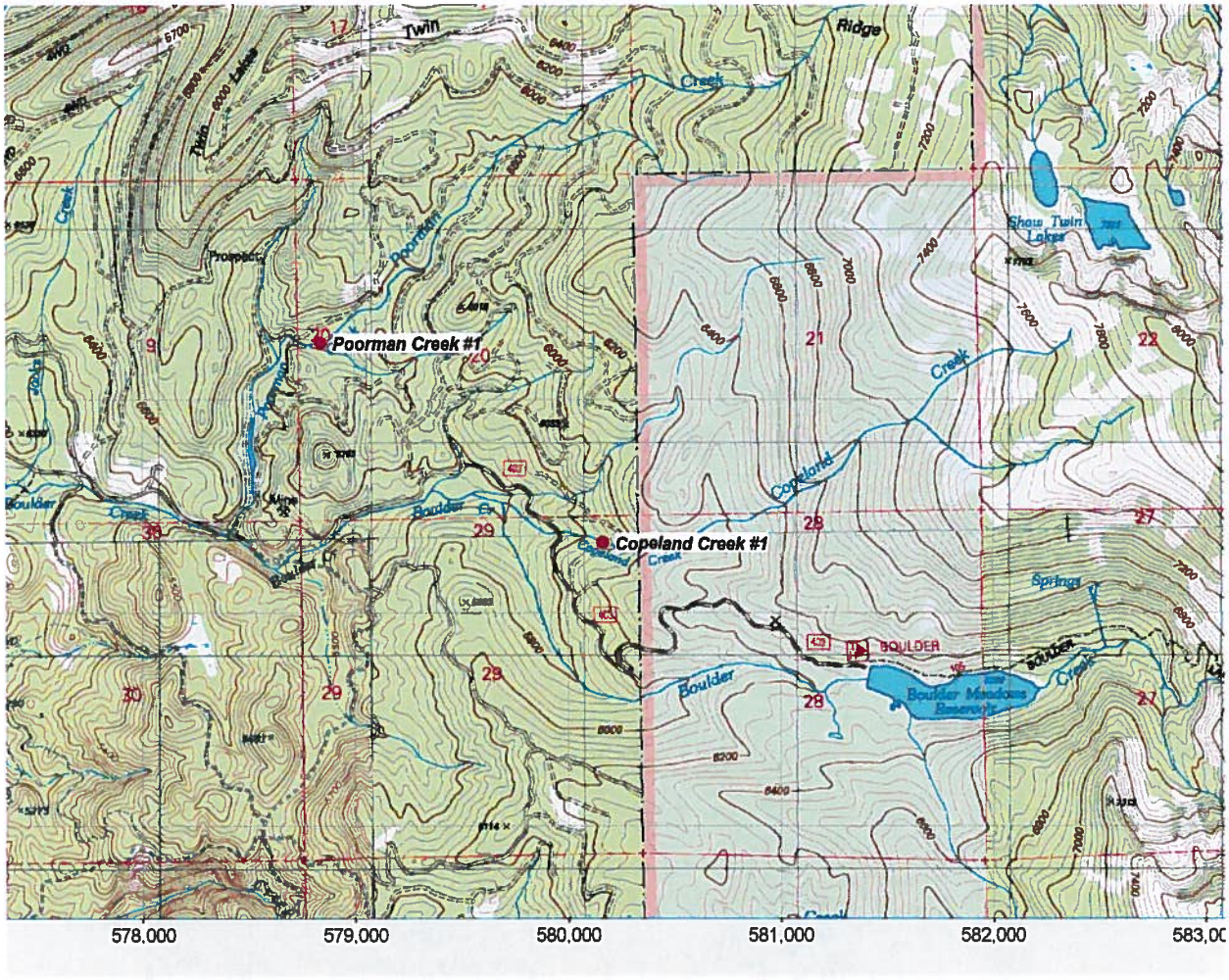

Figure 5. Map of North Fork Payette River drainage stream survey sites.

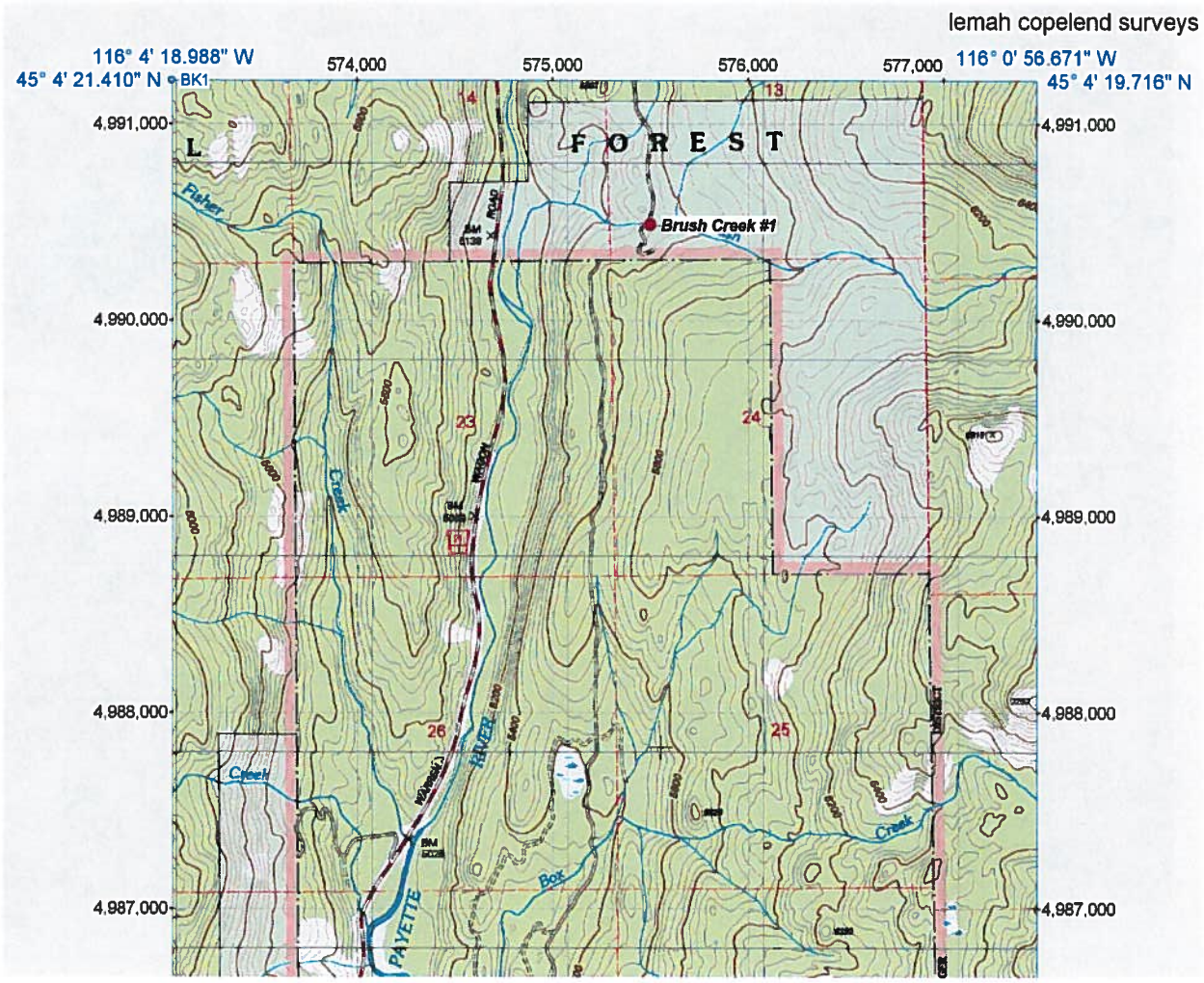

Figure 6. Map of North Fork Payette River drainage stream survey sites.

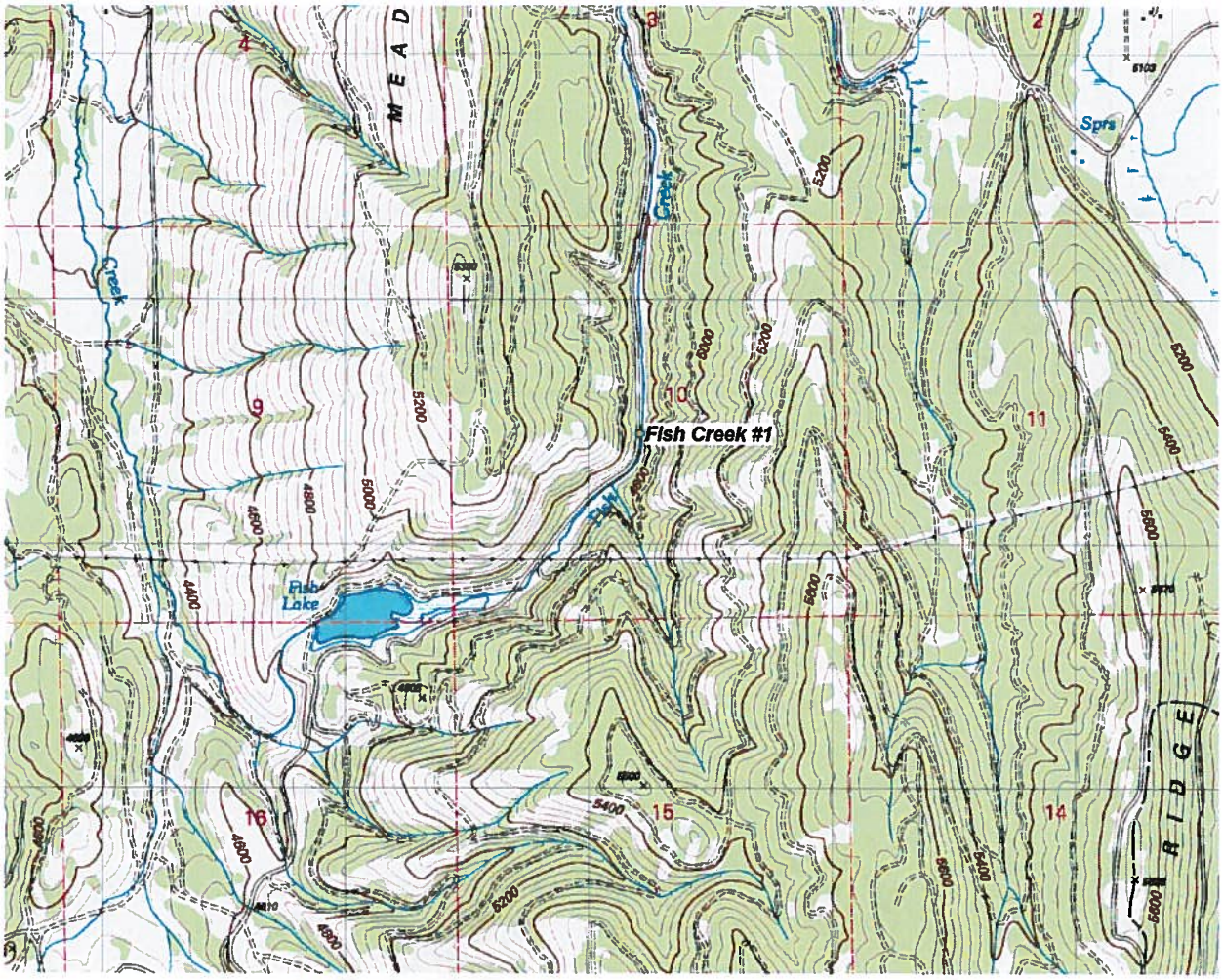

Figure 7. Map of Little Salmon River drainage (Fish Creek) stream survey site.

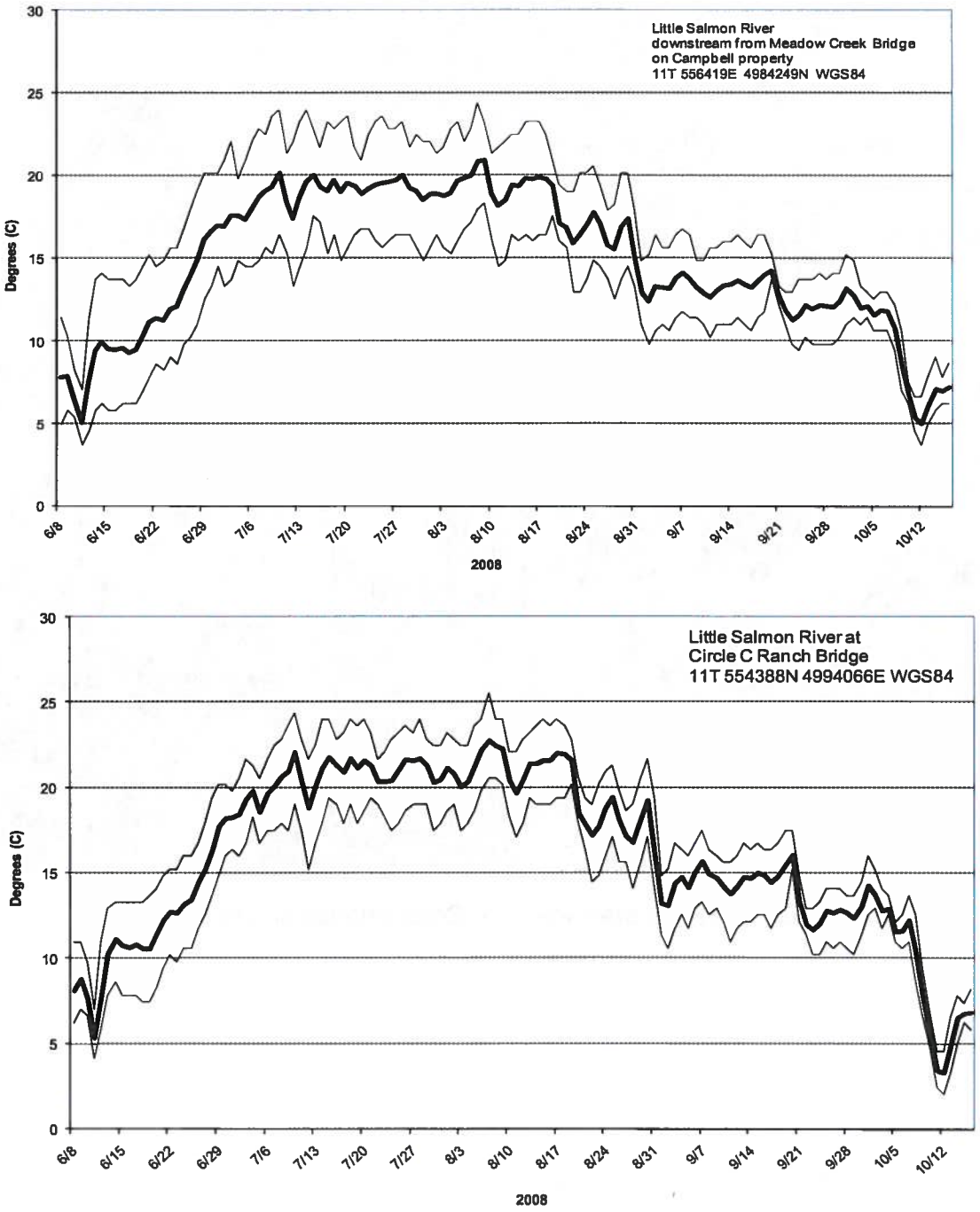

Figure 8. Daily mean, minimum, and maximum stream temperatures in the Little Salmon River, at Circle C Ranch Bridge and downstream from Meadow Creek Bridge, 2008.

Table 13. Payette Lake kokanee spawner counts and estimated spawning run size and biomass in the North Fork Payette River from 1988 through 2008.

Year	Peak Count	Estimated Number of Spawners	KG/Lake HA_1	Number/Lake HA_1	Average Spawner Weight(g	Average Spawner Total Length (mm)
1988	13,200	22,800	4.6	13.3	346	--
1989	8,400	14,500	2.9	8.4	349	--
1990	9,642	16,700	3.5	9.7	358	--
1991	10,400	18,000	5.3	10.5	505	365
1992	16,945	29,300	6.4	17.1	377	--
1993	34,994	59,310[a]	8.5	34.6	245	--
1994	25,550	44,200	5.5	25.8	214	--
1995	32,050	55,450	4.8	32.3	147	260
1996	35,090	60,707	5.7	35.4	162 [c]	--
1997	36,300[e]	64,891[d]	5.6	37.8	148	265
1998	14,585	25,232	2.1	14.7	143	254
1999	15,590	26,971	2.9	15.7	184	276
2000	15,520	26,850	2.9	15.6	188	286
2001	15,690[g]	30,144[f]	4.4	17.6	250[b]	--
2002	9,430	16,314	--	9.5	--	--
2003	5,430	9,394	1.5	5.5	279	--
2004	11,290	19,532	--	11.4	--	--
2005	11,780	20,780	--	12.1	--	--
2006	5,580	9,650	--	5.6	--	317
2007	3,925	6,790	1.6	4.0	401	340
2008	2,425	4,195		2.4	--	336

[1] 1,717 ha usable kokanee habitat in Payette Lake (Area with depth greater than 40 feet).

[a] Estimate made from stream and weir counts (Frost and Bennett, 1994)

[b] From gill net data of captured spawners in Payette Lake during lake survey.

[c] From trawling collections made in September 1996.

[d] Includes 2,092 fish spawned and removed by Nampa Fish Hatchery.

[e] Does not include 2,092 fish spawned and removed by Nampa Fish Hatchery.

[f] Includes 3,000 fish spawned and removed by Nampa Fish Hatchery.

[g] Does not include 3,000 fish spawned and removed by Nampa Fish Hatchery.

Table 14. UTM coordinates of standard IDFG stream survey sites completed in 2008.

Stream	Parent Drainage	Site #	Easting UTM Coordinate (NAD 83)	Northing UTM Coordinate (NAD 83)
Fish Creek	Little Salmon River	1	563101	4973255
Lemah Creek	N.F. Payette River	1	574548	4981399
Copeland Creek	N.F. Payette River	1	579909	4969572
Brush Creek	N.F. Payette River	1	575364	4990619
Poorman Creek	N.F. Payette River	1	578659	4970468
Olive Creek	Hornet Creek	1 (IDL)	528903	4963355
Olive Creek	Hornet Creek	3 (IDL)	526793	4960513
Olive Creek	Hornet Creek	7 (IDFG)	527552	4961568
S.F. Olive Creek	Hornet Creek	2 (IDL)	528211	4961849
N.F. Olive Creek	Hornet Creek	4 (IDL)	526833	4960695
North Creek	Hornet Creek	1 (IDFG)	524341	4962241
Placer Creek	Hornet Creek	1 (IDFG)	524203	4962184
Placer Creek	Hornet Creek	2 (IDFG)	521846	4961890
Grouse Creek	Hornet Creek	1 (IDFG)	527047	4963520
Disappointment Creek	Hornet Creek	1 (IDFG)	527044	4963347
Hornet Creek	Hornet Creek	1 (IDFG)	527014	4963142

Table 15. Salmonid and char presence in streams surveyed in 2008.

Stream	Transect Length (m)	Fish Species Collected	Estimated #/transect +/-95% CI
Fish Creek	70	0	0
Lemah Creek	82	0	0
Copeland Creek	56	0	0
Brush Creek	Not Sampled	flows too high	NA
Poorman Creek	71	Brook trout	9 (1 pass)
Olive Creek (IDL #1)	50	Rainbow trout	23 (1 pass)
Olive Creek (IDL #3)	30	Bull trout	2 (1 pass)
" "	"	Rainbow trout	4 (1 pass)
Olive Creek (IDFG #7)	59	Rainbow trout	7 (1 pass)
S.F. Olive Creek (IDL #2)	48	Rainbow trout	10 (1 pass)
N.F. Olive Creek (IDL #4)	38	Rainbow trout	5.3 +/-1.95 (2 pass)
" "	38	Bull trout	3 (2 pass)
North Creek (IDFG #1)	33	Bull trout	2 (1 pass)
Placer Creek (IDFG #1)	18	Bull trout	12 (1 pass)
Placer Creek (IDFG #2)	30	0	0
Grouse Creek (IDFG #1)	23	Rainbow trout	3 (1 pass)
Disappointment Creek (IDFG#1)	22	Rainbow trout	6 (1 pass)
Hornet Creek (IDFG #1)	38	Rainbow trout	11 (1pass)

Table 16. Length frequencies of salmonids collected from Weiser River tributary streams surveyed in 2008.

Stream	Species Collected	TOTAL LENGTH GROUPS													
		<50	50-75	76-99	100-125	126-149	150-175	176-199	200-225	226-249	250-275	276-299	300-325	326-349	>349
Fish Creek	none														
Lemah Creek	none														
Copeland Creek	none														
Brush Creek	none														
Poorman Creek	brook		4	3	2										
Olive Creek (IDL #1)	rainbow		4	4	4	3	5	1	2						
Olive Creek (IDL #3)	bull				2										
" "	rainbow					2	2								
Olive Creek (IDFG #7)	rainbow			3	1	2	1								
S.F. Olive Creek (IDFG #2)	rainbow		4	2	2	1	1								
N.F. Olive Creek (IDL #4)	rainbow				2	3									
N.F. Olive Creek (IDL #4)	bull		1		1	1									
North Creek (IDFG #1)	bull				2										
Placer Creek (IDFG #1)	bull		1	3	1	4	2	1							
Placer Creek (IDFG #2)	none														
Grouse Creek (IDFG #1)	rainbow			1	1	1									
Disappointment Creek (IDFG #1)	rainbow		1	1	2	2									
Hornet Creek (IDFG #1)	rainbow		1	2	1	3	2	2	1						

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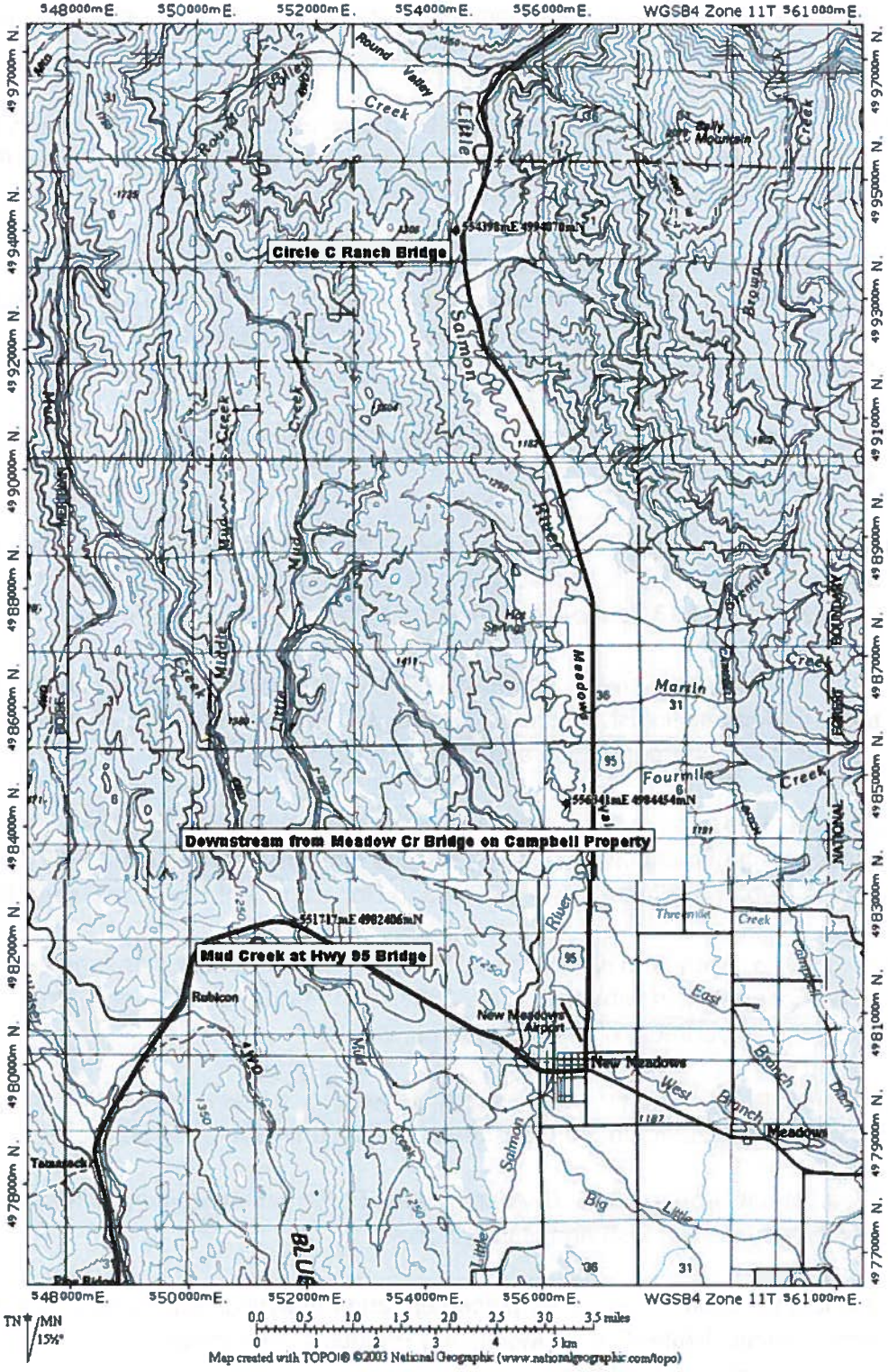
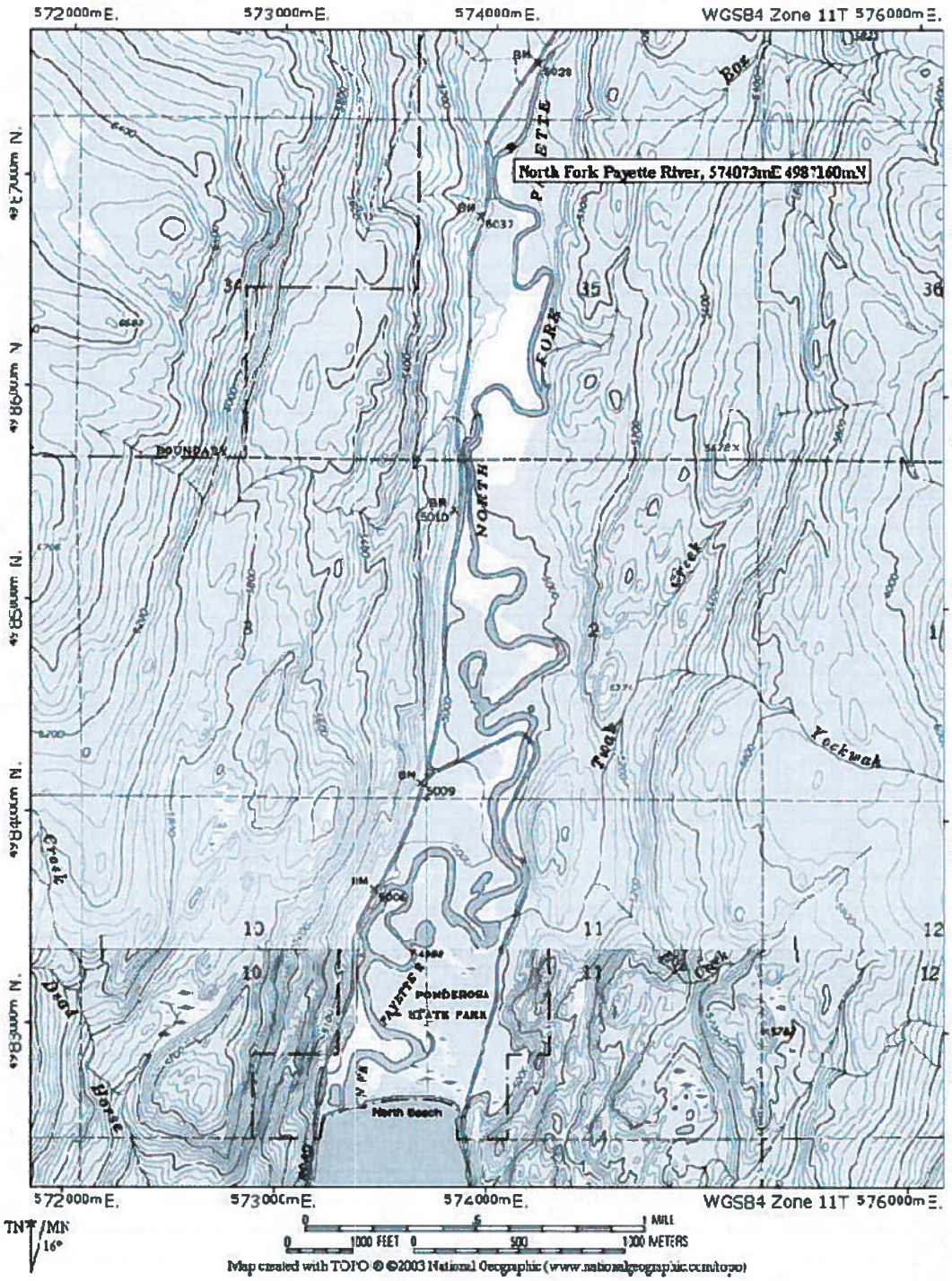
Appendix A. Location of the Hobo temperature recorders in the Little Salmon River and North Fork Payette River drainages, 2008.



Appendix. Continued.



Appendix B. Daily mean, minimum, and maximum water temperature (C) in the Little Salmon River, at Circle C Ranch Bridge, 2008.

Date	Mean	Min	Max	Date	Mean	Min	Max	Date	Mean	Min	Max
6/8	8.1	6.2	11.0	7/24	20.4	17.5	22.9	9/8	14.9	12.6	16.4
6/9	8.8	7.0	11.0	7/25	21.0	17.9	23.2	9/9	14.7	12.9	16.0
6/10	7.7	6.6	9.8	7/26	21.7	18.7	23.6	9/10	14.2	12.2	15.6
6/11	5.4	4.2	7.0	7/27	21.6	19.0	23.2	9/11	13.8	11.0	15.6
6/12	7.7	5.8	11.0	7/28	21.7	19.0	24.0	9/12	14.2	11.8	16.0
6/13	10.3	7.8	12.9	7/29	21.3	19.0	22.9	9/13	14.8	12.2	16.8
6/14	11.1	8.6	13.3	7/30	20.3	17.5	22.5	9/14	14.7	12.2	16.4
6/15	10.8	7.8	13.3	7/31	20.5	17.9	22.5	9/15	15.0	12.6	16.8
6/16	10.7	7.8	13.3	8/1	21.1	18.7	23.2	9/16	14.9	12.6	16.4
6/17	10.8	7.8	13.3	8/2	20.8	19.0	22.9	9/17	14.5	11.8	16.4
6/18	10.6	7.4	13.3	8/3	20.1	17.5	22.5	9/18	14.8	12.6	16.8
6/19	10.6	7.4	13.7	8/4	20.3	17.9	22.5	9/19	15.5	12.9	17.5
6/20	11.4	8.2	14.1	8/5	21.3	18.7	23.6	9/20	16.1	15.2	17.5
6/21	12.3	9.4	14.9	8/6	22.2	19.8	24.0	9/21	13.3	12.2	14.9
6/22	12.8	10.2	15.2	8/7	22.8	20.6	25.6	9/22	12.0	11.4	12.9
6/23	12.7	9.8	15.2	8/8	22.4	20.6	24.0	9/23	11.7	10.2	12.9
6/24	13.2	10.6	16.0	8/9	22.3	20.2	24.0	9/24	12.0	10.2	13.3
6/25	13.5	10.6	16.0	8/10	20.4	18.3	22.1	9/25	12.8	11.0	14.1
6/26	14.5	11.8	16.8	8/11	19.7	17.1	22.1	9/26	12.7	10.6	14.1
6/27	15.3	12.6	17.9	8/12	20.5	17.9	22.9	9/27	12.8	11.0	14.1
6/28	16.3	13.7	19.4	8/13	21.4	19.4	23.2	9/28	12.7	10.6	13.7
6/29	17.7	14.9	20.2	8/14	21.4	19.0	23.6	9/29	12.4	10.2	13.7
6/30	18.2	16.0	20.2	8/15	21.6	19.0	24.0	9/30	13.1	11.4	14.5
7/1	18.3	16.4	19.8	8/16	21.6	19.0	23.6	10/1	14.2	12.6	16.0
7/2	18.5	16.0	20.6	8/17	22.0	19.4	24.0	10/2	13.7	12.9	15.2
7/3	19.3	16.8	21.7	8/18	22.0	19.4	23.6	10/3	12.8	11.8	14.1
7/4	19.8	18.3	21.3	8/19	21.6	20.2	22.9	10/4	12.9	12.6	13.7
7/5	18.6	16.8	20.6	8/20	18.5	17.9	20.6	10/5	11.6	11.0	12.2
7/6	19.7	17.5	21.7	8/21	17.9	16.4	19.4	10/6	11.6	10.6	12.6
7/7	20.1	17.5	22.5	8/22	17.2	14.5	19.0	10/7	12.3	11.0	13.7
7/8	20.6	17.9	22.9	8/23	17.7	14.9	20.2	10/8	10.4	8.6	12.6
7/9	21.0	17.5	23.6	8/24	18.8	16.0	21.0	10/9	7.8	6.6	9.4
7/10	22.1	19.0	24.4	8/25	19.4	17.1	21.3	10/10	5.8	5.0	7.0
7/11	20.3	17.5	22.9	8/26	18.1	15.6	19.8	10/11	3.5	2.5	4.6
7/12	18.8	15.2	21.7	8/27	17.2	15.6	18.7	10/12	3.3	2.0	4.6
7/13	20.1	16.8	22.5	8/28	16.8	14.1	19.0	10/13	4.9	3.3	6.6
7/14	21.2	17.9	24.0	8/29	18.2	15.6	20.6	10/14	6.5	5.0	7.8
7/15	21.8	19.4	24.0	8/30	19.3	17.1	21.7	10/15	6.8	6.2	7.4
7/16	21.3	19.0	22.9	8/31	16.1	14.1	19.4	10/16	6.8	5.8	8.2
7/17	20.9	17.9	23.2	9/1	13.2	11.4	14.9				
7/18	21.7	19.0	24.0	9/2	13.1	10.6	15.2				
7/19	21.1	17.9	23.6	9/3	14.4	11.8	16.8				
7/20	21.6	18.7	24.0	9/4	14.8	12.6	16.4				
7/21	21.3	19.4	23.2	9/5	14.2	11.8	16.0				
7/22	20.3	19.0	21.7	9/6	15.1	12.9	16.8				
7/23	20.3	18.3	22.1	9/7	15.7	13.3	17.5				

Appendix C. Daily mean, minimum, and maximum water temperature (C) in the Little Salmon River, at Campbell property downstream from Meadow Creek Bridge, 2008.

Date	Mean	Min	Max	Date	Mean	Min	Max	Date	Mean	Min	Max
6/8	7.8	5.0	11.4	7/27	19.7	16.4	22.9	9/14	13.4	11.0	16.0
6/9	7.9	5.8	10.2	7/28	20.0	16.4	23.2	9/15	13.7	11.4	16.4
6/10	6.5	5.4	8.2	7/29	19.2	16.4	21.7	9/16	13.4	11.0	16.0
6/11	5.1	3.7	7.0	7/30	19.0	15.6	22.5	9/17	13.2	10.6	15.6
6/12	7.5	4.6	11.4	7/31	18.5	14.9	22.1	9/18	13.6	11.4	16.4
6/13	9.4	5.8	13.7	8/1	18.8	15.6	22.1	9/19	14.0	11.8	16.4
6/14	9.9	6.2	14.1	8/2	18.9	16.4	21.3	9/20	14.2	13.7	15.2
6/15	9.5	5.8	13.7	8/3	18.7	15.6	21.7	9/21	12.7	12.2	13.3
6/16	9.5	5.8	13.7	8/4	18.9	15.2	22.9	9/22	11.8	11.0	12.9
6/17	9.6	6.2	13.7	8/5	19.6	16.0	23.2	9/23	11.2	9.8	12.9
6/18	9.3	6.2	13.3	8/6	19.8	16.8	22.1	9/24	11.6	9.4	13.7
6/19	9.4	6.2	13.7	8/7	20.0	17.1	22.9	9/25	12.1	10.2	13.7
6/20	10.3	7.0	14.5	8/8	20.8	17.9	24.4	9/26	11.9	9.8	13.7
6/21	11.1	7.8	15.2	8/9	20.9	18.3	23.2	9/27	12.1	9.8	14.1
6/22	11.4	8.6	14.5	8/10	18.9	16.0	21.3	9/28	12.1	9.8	13.7
6/23	11.3	8.2	14.9	8/11	18.2	14.5	21.7	9/29	12.0	9.8	14.1
6/24	11.9	9.0	15.6	8/12	18.5	14.9	22.1	9/30	12.4	10.2	14.1
6/25	12.1	8.6	15.6	8/13	19.4	16.4	22.5	10/1	13.2	11.0	15.2
6/26	13.0	9.8	16.8	8/14	19.4	16.0	22.5	10/2	12.7	11.4	14.9
6/27	13.8	10.2	17.9	8/15	19.8	16.4	23.2	10/3	12.0	11.0	13.3
6/28	15.0	11.0	19.0	8/16	19.8	16.0	23.2	10/4	12.1	11.4	12.9
6/29	16.1	12.6	20.2	8/17	19.9	16.4	23.2	10/5	11.6	10.6	12.6
6/30	16.6	13.3	20.2	8/18	19.7	16.4	22.5	10/6	11.8	10.6	12.9
7/1	17.0	14.5	20.2	8/19	19.3	17.5	21.0	10/7	11.8	10.6	12.9
7/2	16.9	13.3	21.0	8/20	17.1	16.0	19.4	10/8	10.7	9.4	12.2
7/3	17.6	13.7	22.1	8/21	16.9	15.6	19.0	10/9	8.5	7.0	10.6
7/4	17.6	14.9	19.8	8/22	15.9	12.9	19.0	10/10	6.8	6.2	7.4
7/5	17.3	14.5	21.0	8/23	16.4	12.9	20.2	10/11	5.4	4.6	6.6
7/6	18.0	14.5	22.1	8/24	17.0	13.7	20.2	10/12	5.0	3.7	6.6
7/7	18.6	14.9	22.9	8/25	17.7	14.9	20.6	10/13	6.1	5.0	7.8
7/8	19.1	15.6	22.5	8/26	17.0	14.5	19.4	10/14	7.1	5.8	9.0
7/9	19.3	15.2	23.6	8/27	15.8	13.7	17.9	10/15	7.0	6.2	7.8
7/10	20.1	16.4	24.0	8/28	15.5	12.6	18.3	10/16	7.2	6.2	8.6
7/11	18.4	15.2	21.3	8/29	16.9	13.7	20.2				
7/12	17.4	13.3	22.1	8/30	17.4	14.5	20.2				
7/13	18.6	14.5	23.2	8/31	14.9	13.3	17.9				
7/14	19.6	15.6	24.0	9/1	12.9	11.0	14.9				
7/15	20.0	17.5	22.9	9/2	12.4	9.8	15.2				
7/16	19.3	17.1	21.7	9/3	13.3	10.6	16.4				
7/17	19.0	15.2	23.2	9/4	13.2	11.0	15.6				
7/18	19.7	16.4	22.9	9/5	13.1	10.6	15.6				
7/19	19.0	14.9	23.2	9/6	13.8	11.4	16.4				
7/20	19.5	15.6	23.6	9/7	14.1	11.8	16.8				
7/21	19.4	16.4	21.7	9/8	13.8	11.4	16.4				
7/22	18.8	16.8	21.0	9/9	13.3	11.4	14.9				
7/23	19.2	16.8	22.5	9/10	12.9	11.0	14.9				
7/24	19.4	16.0	23.2	9/11	12.7	10.2	15.6				
7/25	19.5	15.6	23.6	9/12	13.1	11.0	15.6				
7/26	19.6	16.0	22.9	9/13	13.3	11.0	16.0				

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