FISHERY MANAGEMENT INVESTIGATIONS

IDAHO DEPARTMENT OF FISH AND GAME

FISHERY MANAGEMENT ANNUAL REPORT

Cal Groen, Director

MCCALL REGION

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2007 Southwest Region – McCall Fishery Management Report

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MOUNTAIN LAKES SURVEY

ABSTRACT

In 2007, 98 lakes were surveyed in the McCall sub region. The majority of these were located in the Salmon River drainage, and the remaining few drained into the Snake River drainage. Eighteen of the 98 lakes were found to support both fish and amphibian populations. Of the 98 lakes surveyed, 39 have been stocked by the Department in years past. There were 35 lakes surveyed during the 2007 field season that contained fish. Not all of these lakes, however, have a stocking history.

Analysis of 345 lakes surveyed since the year 2000, indicates that fish could affect the presence of amphibians in a given lake – depending on the species of fish and amphibians, present. Over the landscape the number of lakes with and without fish was almost equal. There was no difference between the affect of native western trout species and brook trout *Salvelinus fontinalis* on amphibian presence. Columbia spotted frog *Rana luteiventris* presence was not significantly different in lakes with fish versus fishless waters. The Columbia spotted frog was the most widespread of the amphibians. Long-toed salamanders *Ambystoma macrodactylum* and western toad *Bufo boreas* populations appeared to be more sensitive to the presence of fish.

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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 GIS (Geographical Information Systems) 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.

Between the months of June and August, 2007, 98 lakes were surveyed in the McCall area of the Southwest Region. Of these 98 lakes, the great majority of them were part of the Salmon River drainage, and the remaining few drained into the Snake River. A large number of the lakes that were surveyed in the eastern part of the region are encompassed in the Frank Church – River of No Return Wilderness area, and are therefore likely to see little use, leaving them fairly undisturbed.

METHODS

During the 2007 field season, a team of two researchers gained access to 98 lakes in the McCall sub-region. 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. In lakes where the federally listed bull trout, *Salvelinus confluentus*, was suspected, nets were set for a two hour period, and then pulled to avoid killing any of these fish. 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, was entered into the Mountain Lakes Geodatabase for further analysis by fisheries managers.

Preliminary analysis was completed on 345 high lake surveys conducted from 2000 to 2007. The surveys were completed to look for the presence of both fish and amphibians at each lake. A series of contingency table comparisons were done to understand how the presence or absence of fish species affected the presence of amphibians in a lake.

RESULTS

As mentioned, the majority of the mountain lakes that were visited during the 2007 field season were relatively isolated and undisturbed. A large number of these lakes supported an abundance of amphibians, while less than half of them contained fish populations. The number of lakes supporting various populations of amphibians is shown in Table 1. Fish species presence is shown in Table 2. There were 18 of the 98 lakes that were found to support both fish and amphibian populations.

Of the 98 lakes that were surveyed, 39 of them have been stocked by the Department in years past. Many of these lakes still hold fish populations, and some do not. There were 35 lakes surveyed during the 2007 field season that contained fish. Not all of these lakes, however, have a stocking history. Table 3 gives an overall comparison of all of the lakes that were surveyed between June 4 and August 4, 2007, along with their fish and amphibian presence, stocking history, and level of human use (High, Medium, Low, and Rare).

Tables 4, 5 and 6 provide a gross overview of differences between mountain lakes with and without fish. Fish presence did not affect the presence of amphibians in a given lake. Within the survey area, the number of lakes with and without fish was almost equal.

There was no difference between impacts of western trout species and brook trout and amphibian presence. Columbia spotted frog presence was not significantly different in lakes with fish versus fishless waters. The Columbia spotted frog, was the most widespread of the amphibians. Long-toed salamanders and western toad populations appeared to be more sensitive to the presence of fish, Table 7.

MANAGEMENT RECOMMENDATIONS

1. Continue surveys in 2008 with a two person crew.
2. Focus on the completing the South Fork Salmon basin lakes then begin Middle Fork Salmon watershed.
3. Continue to add old surveys into the databases.
4. Analyze lake groups in 4th and 5th order HUC watersheds for distribution of fish and amphibians.
5. Work with other Regions to produce Mountain Lakes Management Plan.

Table 1. Number of lakes found to possess species of amphibians in 2007.

	Columbia Spotted Frog	**Long-Toed Salamanders**	**Western Toad**	**No Visual survey**
Number of Lakes Species Present	53	21	4	9

Table 2. Number of lakes found to possess species of fish in 2007.

	Rainbow Trout	**Cutthroat Trout**	**Brook Trout**	**Bull Trout**	**Mt. Whitefish**	**Fishless**
Number of Lakes Species Present	9	27	3	1	1	63

Table 3. All lakes surveyed between June 4 and August 4, 2007, and associated data. Table includes fish species present, amphibian presence, stocking history, and level of human use (H=High, M=Medium, L=Low, R=Rare).

LLID	CATALOG NUMBER	LAKE NAME	SURVEY DATE	PRIMARY FISH SPECIES	STOCKED	AMPHIBS PRES.	HUMAN USE
1158240453261	07-404.3	UNKNOWN	June 4	FISHLESS	NO	YES	L
1158328453321	07-249.4	UNKNOWN	June 4	FISHLESS	NO	NO	R
1158437453323	07-250.00	MID CALIFORNIA LAKE	June 4	FISHLESS	YES	NO	R
1158296453301	07-249.00	LOWER CALIFORNIA LAKE	June 4	RAINBOW TROUT	YES	YES	H
1158485453384	07-253.00	UPPER CALIFORNIA LAKE	June 4	CUTTHROAT TROUT	YES	YES	L
1158258453288	07-249.20	UNKNOWN	June 4	FISHLESS	NO	YES	L
1158659453388	07-405.00	SAND CREEK LAKE 2	June 5	FISHLESS	NO	NO	L
1158632453355	07-404.00	SAND CREEK LAKE 1	June 5	FISHLESS	NO	NO	L
1158471453630	07-248.50	UPPER UNION LAKE	June 5	FISHLESS	O	YES	R
1158235453095	07-404.10	UNKNOWN	June 6	FISHLESS	NO	NO VES	R
1158220453266	07-404.20	UNKNOWN	June 6	FISHLESS	NO	NO	L
1158086453564	07-248.00	UNION LAKE	June 11	CUTTHROAT TROUT	YES	YES	R
1159730452239	07-407.00	JOSEPHINE LAKE	June 12	RAINBOW TROUT	YES	NO	H
1154422450522	07-734.00	BIG CREEK LAKE #3	June 18	FISHLESS	NO	YES	R
1154408450533	07-733.00	BIG CREEK LAKE #2	June 18	FISHLESS	NO	NO	R
1154388450537	07-730.00	BIG CREEK LAKE #1	June 18	BULL TROUT	NO	NO	R
1154280450468	07-448.2	UNKNOWN	June 19	FISHLESS	NO	YES	M
1153779540389	07-725.2	UNKNOWN	June 19	FISHLESS	NO	YES	M
1154519450304	07-438.00	VEIN CREEK LAKE #1	June 19	FISHLESS	YES	NO	R
1154469450307	07-439.00	VEIN CREEK LAKE #2	June 19	RAINBOW TROUT	NO	YES	R
1154529450306	07-437.00	UNKNOWN	June 19	FISHLESS	NO	NO	R
1154260450471	07-448.00	CRATER LAKE #2	June 19	FISHLESS	NO	YES	R
1154292450449	07-447.00	CRATER LAKE	June 19	RAINBOW TROUT	YES	NO	H
1154306450373	07-445.1	UNKNOWN	June 19	FISHLESS	NO	YES	R

LLID	CATALOG NUMBER	LAKE NAME	SURVEY DATE	PRIMARY FISH SPECIES	STOCKED	AMPHIBS PRES.	HUMAN USE
1154439450310	07-439.5	VEIN CREEK LAKE #3	June 19	FISHLESS	NO	YES	R
1154326450351	07-445.00	MIDDLE LAKE	June 19	CUTTHROAT TROUT	YES	NO	M
1154306450373	07-445.1	UNKNOWN	June 19	FISHLESS	NO	YES	R
1154298450375	07-445.2	UNKNOWN	June 19	FISHLESS	NO	YES	R
1154298450375	07-445.2	UNKNOWN	June 19	FISHLESS	NO	ES	R
1154336450220	07-444.6	UNKNOWN	June 20	FISHLESS	NO	NO VES	R
1154332450275	07-443.4	UNKNOWN	June 20	FISHLESS	NO	YES	L
1154315450304	07-440.00	FISH LAKE #1	June 20	CUTTHROAT TROUT	YES	YES	M
1154317450275	07-440.2	UNKNOWN	June 20	CUTTHROAT TROUT	NO	YES	M
1154362450273	07-443.00	FISH LAKE #2	June 20	FISHLESS	YES	NO	L
1154320450222	07-444.4	UNKNOWN	June 20	FISHLESS	NO	NO	L
1154339450273	07-443.2	UNKNOWN	June 20	FISHLESS	NO	YES	L
1154299450225	07-444.00	FISH LAKE #3	June 20	CUTTHROAT TROUT	YES	YES	H
1154255450230	07-444.2	UNKNOWN	June 21	CUTTHROAT	NO	NO	H
1153720450361	07-726.00	BELVIDERE LAKE #6	June 22	CUTTHROAT TROUT	YES	NO	L
1153682450345	07-727.00	BELVIDERE LAKE #7	June 22	FISHLESS	YES	YES	R
1153929450364	07-444.1	SPRING CREEK LAKE	June 22	FISHLESS	NO	NO VES	R
1153465450358	07-720.2	UNKNOWN	June 23	CUTTHROAT TROUT	NO	NO	R
1153468450366	07-720.4	UNKNOWN	June 23	CUTTHROAT TROUT	NO	NO	L
1153579450398	07-718.00	BELVIDERE LAKE #1	June 23	CUTTHROAT TROUT	ES	YES	R
1153490450421	07-728.00	BELVIDERE LAKE #8	June 23	FISHLESS	NO	NO	R
1153461450353	07-720.00	BELVIDERE LAKE #3	June 23	CUTTHROAT TROUT	YES	NO	R
1153883450461	07-723.00	BELVIDERE LAKE #4	June 24	FISHLESS	YES	YES	L
1153614450346	07-719.00	BELVIDERE LAKE #2	June 24	CUTTHROAT TROUT	YES	NO	R
1153843450399	07-725.00	BELVIDERE LAKE #5	June 24	FISHLESS	YES	YES	R
1154979450480	07-433.00	QUARTZ CREEK LAKE #5	July 1	CUTTHROAT TROUT	YES	YES	M
1154935450511	07-735.00	QUARTZ CREEK LAKE #7	July 1	FISHLESS	YES	YES	R
1154989450492	07-434.00	QUARTZ CREEK LAKE #6	July 1	FISHLESS	YES	YES	L

LLID	CATALOG NUMBER	LAKE NAME	SURVEY DATE	PRIMARY FISH SPECIES	STOCKED	AMPHIBS PRES.	HUMAN USE
1154931450471	07-430.00	QUARTZ CREEK LAKE #4	July 1	FISHLESS	NO	NO	L
1155410450329	07-335.00	ROCK LAKE	July 2	FISHLESS	NO	YES	R
1155121450228	07-427.00	QUARTZ CREEK LAKE #1	July 2	CUTTHROAT TROUT	YES	YES	M
1155073450381	07-428.00	QUARTZ CREEK LAKE #2	July 2	CUTTHROAT TROUT	YES	YES	L
1155142450234	07-429.00	QUARTZ CREEK LAKE #3	July 2	CUTTHROAT TROUT	YES	YES	H
1151727446978	07-690.00	ROOSEVELT LAKE	July 9	CUTTHROAT TROUT	YES	NO	M
1150862450458	07-660.00	MILK LAKE	July 9	FISHLESS	NO	YES	R
1151712450420	07-668.00	MUD CREEK LAKE #3	July 10	FISHLESS	NO	YES	R
1151789450411	07-669.00	MUD CREEK LAKE #4	July 10	FISHLESS	NO	YES	R
1151789450461	07-673.00	MUD CREEK LAKE #6	July 10	FISHLESS	NO	YES	R
1151743450443	07-671.00	UNKNOWN	July 10	FISHLESS	NO	YES	R
1151794450415	07-672.00	UNKNOWN	July 10	FISHLESS	NO	YES	R
1151735450480	07-670.00	MUD CREEK LAKE #5	July 10	CUTTHROAT TROUT	YES	YES	L
1165587451735	07-144.00	ROCK LAKE	July 17	FISHLESS	YES	YES	R
1165846451490	05-144.00	LAKE WINIFRED	July 17	FISHLESS	YES	YES	R
1165155451544	07-147.00	TWIN LAKE #1	July 18	FISHLESS	NO	NO	M
1165205451544	07-148.00	TWIN LAKE #2	July 18	BROOK TROUT	YES	YES	H
1154125450733	07-706.00	UNKNOWN	July 24	FISHLESS	NO	NO VES	R
1153700450863	07-705.00	LOGAN LAKE	July 24	BROOK TROUT	NO	NO	R
1148346452435	07-640.00	PAPOOSE LAKE	July 31	CUTTHROAT TROUT	YES	YES	L
1148267453302	07-560.00	BLACK LAKE	July 31	RAINBOW TROUT	YES	NO	M
1147852453159	07-556.00	BASIN CREEK LAKE #2	Aug 1	RAINBOW X CUTTHROAT HYBRIDS	YES	NO	R
1147904453184	07-555.00	BASIN CREEK LAKE #1	Aug 1	CUTTHROAT TROUT	YES	YES	M
1147870453146	07-557.40	UNKNOWN	Aug 1	FISHLESS	NO	NO VES	R
1147875453141	07-557.2	UNKNOWN	Aug 1	FISHLESS	NO	NO VES	R
1147890453145	07-557.00	BASIN CREEK LAKE #3	Aug 1	FISHLESS	ES	YES	R
1148362452297	07-639.00	TRAPPER CREEK LAKE	Aug 1	FISHLESS	NO	YES	R

LLID	CATALOG NUMBER	LAKE NAME	SURVEY DATE	PRIMARY FISH SPECIES	STOCKED	AMPHIBS PRES.	HUMAN USE
1148311452184	07-637.00	SF TRAPPER CREEK	Aug 1	CUTTHROAT TROUT	YES	NO	M
1148074452062	07-634.00	PAPOOSE PEAK 1	Aug 1	FISHLESS	NO	NO	R
148229451941	07-635.00	PAPOOSE PEAK 2	Aug 1	FISHLESS	NO	YES	L
1147871453153	07-556.10	UNKNOWN	Aug 1	FISHLESS	NO	YES	R
1147454453169	07-583.10	LITTLE BUTTS LAKE	Aug 2	FISHLESS	NO	NO VES	R
1147598453183	07-580.00	SWAMP ANGEL LAKE	Aug 2	RAINBOW TROUT	YES	YES	L
1147683453218	07-554.00	MOSQUITO LAKE	Aug 2	FISHLESS	YES	YES	R
1147881452835	07-593.00	KITCHEN CREEK #6	Aug 2	FISHLESS	YES	YES	L
1147721453281	07-554.10	UNKNOWN	Aug 2	FISHLESS	NO	NO VES	R
1148378452503	07-640.30	UNKNOWN	Aug 2	FISHLESS	NO	YES	R
1147473453159	07-583.00	BUTTS CREEK LAKE	Aug 2	RAINBOW TROUT	YES	YES	R
1147698452922	07-589.00	KITCHEN CREEK #4	Aug 3	FISHLESS	NO	YES	R
1147689452996	07-588.30	UNKNOWN	Aug 3	FISHLESS	NO	YES	R
1147898452820	07-593.20	UNKNOWN	Aug 3	FISHLESS	NO	NO VES	R
1147778452880	07-589.20	UNKNOWN	Aug 3	FISHLESS	NO	YES	R
1147838452897	07-589.3	UNKNOWN	Aug 3	FISHLESS	NO	YES	R
1147846452890	07-589.40	UNKNOWN	Aug 3	FISHLESS	NO	YES	R
1147872452899	07-590.00	KITCHEN CREEK #5	Aug 4	CUTTHROAT TROUT	NO	YES	M

Table 4. Number of mountain lakes surveyed for fish or amphibians or both from 2000 to 2007 in the McCall sub region.

	Fish	Fish and Amphibians
Number of Lakes Surveyed For	357	345
Number of Lakes Not surveyed For	0	12
Number of Lakes Yet to be Surveyed	316	0

Table 5. Fish and amphibian presence by number and percentage in mountain lakes surveyed between the 2000 and 2007 in the McCall sub-region.

	NUMBER						
	Total	With Fish	With Fish/ With Amphibians	With Fish/ Without Amphibians	Without Fish	Without Fish/ With Amphibians	Without Fish/ Without Amphibians
Number of Lakes Surveyed for Fish and Amphibians	345	189	102	87	156	100	56
Percent		54.8	29.6	25.2	45.2	28.9	16.2

Table 6. Number of lakes surveyed in 2007 with and without fish and with and without amphibians by class and region.

	McCall		Region 7	Region 2
	Number	%	%	%
Number of Lakes With Fish and:				
-with Spotted Frogs	79	41.8	22.8	82.8
-with Salamanders	4	2.1	8.4	18.1
-with Frogs and salamanders	1	0.5	3.8	15.9
-with western toads	37	19.6		
-with no Amphibians	87	46.0	69.6	15
Number of Lakes Without Fish and:				
-with Spotted Frogs	78	50.0	24	86.5
-with Salamanders	39	25.0	22.2	72.5
-with Frogs and salamanders	24	15.4	4.1	66.5
-with western toads	17	10.9		
-with no Amphibians	56	35.9	56.4	7.5
Number of Lakes With western Trout Species and:				
-with Spotted Frogs	53	41.1	22.7	71.1
-with Salamanders	4	3.1	6.2	18
-with Frogs and salamanders	1	0.8	4	15.6
-with western toads	17	13.2		
-with no Amphibians	63	48.8	47.7	12.8
Number of Lakes with Brook Trout and:				
-with Spotted Frogs	21	42.0	17.9	84.4
-with Salamanders	0	0.0	3.6	6.7
-with Frogs and salamanders	0	0.0	0	6.7
-with western toads	18	36.0		
-with no Amphibians	20	40.0	71.4	15.6

Table 7. Summary of contingency table analysis of the McCall sub-regional mountain lakes surveyed for the presence of amphibians and fish.

Amphibian Species	P-value	Significance
Columbia Spotted Frog	0.10	ns
Long-toed Salamander	0.0000	**
Western Toad	0.025	**

2007 Southwest Region McCall - Fishery Management Report

LOWLAND LAKES
And
LAKE CASCADE YELLOW PERCH RESTORATION AND INVESTIGATIONS

ABSTRACT

Standard lowland fishery surveys were conducted on Brundage Reservoir, Granite Lake, Goose Lake, Hazard Lake, and Upper Payette Lake. Results will be used to assess stocking rates and develop a local lakes management plan.

Lake Fork Creek was chemically treated to remove spawning adult largescale suckers *Catostomus macrocheilus* migrating up the creek. We estimated removing 3,640 largescale suckers from the creek and subsequently the lake. We planned to remove spawning northern pikeminnow *Ptychocheilus oregonensis* from the creek as well but no run was observed. We then completed a fishery survey on Little Payette Lake which documented the dominance of the fish population by largescale suckers and northern pikeminnow. These two nongame fish made up 63% of the total biomass of all fish collected. This compared to 70% of total biomass found in 1998.

A fish survey on Lost Valley Reservoir documented a large population of yellow perch *Perca flavescens* of which no fish were found greater than 210 mm length. The reservoir was drained by the irrigation company due to drought conditions and high water demands. Staff chemically treated the lake proper and inflowing tributaries with rotenone to remove the unwanted yellow perch population.

We continued our hydroacoustic kokanee *Oncorhynchus nerka* population estimates in Payette Lake. Results indicated there were 79,748 (90% CI = 47,493 to 133,191) age-0 and 34,613 (90% CI = 27,281 to 43,805) age-1 and greater kokanee. The spawner sized kokanee estimate was 8,397. Spawner numbers and stocking histories were examined to determine contribution of past stockings on spawner numbers. Results indicated that kokanee were not replacing themselves through natural production and that supplemental hatchery stockings were required at this time.

Payette Lake lake trout *Salvelinus namaycush* growth rates from tagged lake trout recoveries were examined and indicated that lake trout greater than 700 mm total length grow an average of 29.5 mm annually. Lake Trout less than 700 mm grew an average of 54.7 mm annually. We collected fish that had carried tags for up to 217 months.

We completed a largemouth bass *Micropterus salmoides* aging study and population estimate in C. Ben Ross Reservoir to help evaluate the effects of a requested increase in the upper length in the largemouth bass slot limit to 18 or 20 inches. The population estimate of bass greater than 300 mm was 1,984 +/- 1,157 and 1,092 +/- bass between 300 and 400 mm. Largemouth bass were not being harvested after growing out of the slot limit. Ageing studies determined that it took 8 to 12 years for a bass to reach 400 mm in total length.

We continued monitoring the yellow perch population in Cascade Lake following the yellow perch restoration work from 2003 through 2006. Average yellow perch catch rates in

trawl and beach seine sampling continued to increase from previous years. With the annual increase in yellow perch numbers since 2003 we have observed an annual decline in the Zooplankton Quality Index (ZQI). The average number of anglers counted on holidays continued to increase from its low in 2003.

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MCCALL AREA LOWLAND LAKE SURVEYS

OBJECTIVES

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

INTRODUCTION

Fish populations in Brundage Reservoir, Granite Lake, Goose Lake, Hazard Lake, and Upper Payette Lake were sampled to determine effectiveness of current fish management strategies. All of these lakes with the exception of Brundage Reservoir were stocked annually with catchable size rainbow trout *Oncorhynchus mykiss* to maintain a trout fishery. Brundage Reservoir has been stocked semi-annually with westslope cutthroat trout *O. clarkii lewisi* fry since 1999. All rainbow trout found in Brundage Reservoir were of natural origin.

METHODS

We set two pairs (sinking and floating) of standard IDFG survey gill nets in each of Brundage Reservoir, Goose Lake, Little Payette Lake, and Upper Payette Lake. We set one pair of nets in Granite and Hazard Lakes. Nets at all lakes were set in the afternoon, fished all night and pulled the next morning. All fish collected were identified, measured to the nearest mm and weighed to the nearest 5 g.

RESULTS

We sampled Brundage Reservoir on July 11, Goose Lake on June 28, Granite Lake on July 13, Hazard Lake on July 19, and Upper Payette Lake on June 27, 2007. We collected only trout in Brundage Reservoir, Goose Lake, Granite Lake and Hazard Lake. We captured rainbow trout, brook trout and largescale suckers in Upper Payette Lake. Length frequencies by species of all fish collected in each lake are presented in Table 8.

We collected 71 rainbow trout, 10 brook trout, and 51 largescale suckers in Upper Payette Lake. Only one of the 71 rainbow trout collected appeared to be a holdover from 2006 stockings.

We collected only two trout from Granite Lake both of which were greater than 290 mm. This is a concern as stocking records indicated the lake was stocked with 3,000 catchables on June 18, 2007.

We collected a small number of holdover rainbow trout (stocked in 2006) in three of the four lakes that are stocked with catchables. However, in Goose Lake approximately 33% of the rainbow trout collected were thought to be holdovers (> 280 mm) Table 8.

MANAGEMENT RECOMMENDATIONS

1. Resample Granite Lake to determine fate of stocked fish. Determine if gill nets just missed recently stocked fish in 2007 or if more fish are required in stocking.
2. Survey these waters again in five to seven years.

LITTLE PAYETTE LAKE

FISH SURVEY AND NONGAME FISH REMOVAL

INTRODUCTION

Little Payette Lake has a long history as a marginal rainbow trout fishery. The rainbow trout fishery has been compromised by large numbers of northern pikeminnow and largescale suckers. These nongame species compete directly with rainbow trout for food and the northern pikeminnow prey on trout less than around 125 mm.

The lake was chemically treated in 1987 to remove these nongame species with excellent results. A trophy trout fishery had been established by 1989 with angler use in 1990 measured at 9,360 hours (Janssen and Anderson 1992). However, largescale sucker and northern pikeminnow biomass had exceeded game fish biomass in fish surveys by 1993 (Janssen et al. 1997). Since the mid 1990's angler use had dropped to near zero as trout survival and resulting angler success was very poor.

Most angling in recent years has been driven by small numbers of trophy size smallmouth bass *Micropterus dolomieu* and tiger muskellunge *Esox lucius x E. masquinongy*. Smallmouth bass were originally stocked in 1989 to help slow down the return of large numbers of largescale suckers and northern pikeminnow and the tiger muskellunge were first introduced in 1998 and have been stocked intermittently since. Tiger muskellunge were stocked as a means of utilizing nongame fish to produce some kind of fishery. Because of lack of natural recruitment smallmouth bass have been stocked nearly annually with fish transplanted from Hells Canyon and Oxbow Reservoirs. Both of these species have performed well and grown to trophy size but interest of anglers in these species has been limited to specialized anglers. They did not attract large numbers of anglers like the strong trout fishery had in the past.

METHODS

Fish Survey

We set three IDFG standard lake survey gill nets in Little Payette Lake. The nets were set in the afternoon, allowed to fish all night and then pulled the next day. Two sinking nets were attached to shore; one off the point on the south side of the lake and one on the east shoreline. One floating net was set near the dam. All fish collected were measured to the nearest mm and weighed to the nearest g.

Nongame Fish Removal

Lake Fork Creek was monitored biweekly for the presence of spawning adult largescale sucker and northern pikeminnow. When largescale suckers were observed a sample was collected and a bioassay was completed to determine the appropriate piscicide dosage to kill largescale suckers effectively in a two hour treatment period. Rotenone dosages were kept to a minimum to reduce the kill of non target species in Little Payette Lake itself. A rotenone drip station was then setup just upstream of the bridge that accesses the United States Geological Survey gauging station on Lake Fork Creek. The UTM coordinates of the drip station were 11T 0579102 E 4973864N (WGS84 Datum). This site was approximately 1.6 km upstream from the lake proper and just downstream of a series of fish migration barrier/waterfalls.

After each treatment the area was surveyed and the lake was boated with all dead fish observed identified to species and counted.

RESULTS

Fish Survey

We collected 48 fish from Little Payette Lake on June 26, 2007. This included 15 largescale suckers, 11 northern pikeminnow, 14 rainbow trout, and eight smallmouth bass (Table 9). Smallmouth bass made up 17% of the biomass and 26% by number and rainbow trout made up 11% of the biomass and 29% by number of all fish collected (Table 9). Northern pikeminnow and largescale suckers made up the remaining 54% of biomass and 63% of the total number of fish collected. This compares with 70% of the biomass and 84.4 % of the total sample that northern pikeminnow and largescale suckers made up in 1998 (Anderson et al. 2001). No tiger muskellunge were collected even though present in the lake.

Two of the 24 rainbow trout were holdovers from stockings in 2006 or earlier (Table 10). Smallmouth bass were large and ranged from 319 mm and 463 g to 455 mm and 1400 g.

Nongame Fish Removal

Largescale sucker spawners were first observed in Lake Fork Creek on May 30, 2007. A bioassay was competed and the results indicated that a 1 ppm rotenone dosage for two hours was needed to remove largescale suckers. The rotenone dripper was setup and run on June 4, June 5 and June 11, 2007. The dripper on June 4 was setup to run for two hours at a dosage of 1 ppm of the rotenone product brand Chemfish® Regular (CR). This treatment was not totally effective as many of the fish survived the treatment and were observed live and swimming in the stream the next day. The subsequent treatments on June 5th and June 11th were made at a dosage of 1.2 ppm of CR for two hours resulting in total kills.

We estimated killing a total of 3,640 largescale suckers of which 2,540 were killed on the June 5th and 6th treatments and 1,100 on June 11th. We observed only 7 trout killed for the three days of treatments. Dead fish observed on shore and exposed to the air were placed back into the creek. All fish were left in the creek to decompose and release nutrients into the lake.

After the June 11 treatment we observed very few fish moving into the creek and we never observed a large spawning run of northern pikeminnow. We continued monitoring the creek bi-weekly until July 16, 2007.

MANAGEMENT RECOMMENDATIONS

1. Continue to work towards improving growth and survival of stocked rainbow trout.
2. Continue to treat spawning migration of nongame fish with rotenone to reduce their numbers and improve hatchery stocked rainbow trout survival and growth in the lake.
3. Continue annual surveys of fish populations to monitor effects of nongame fish removal on game fish and nongame fish species abundance and growth in the lake.

LOST VALLEY RESERVOIR

RAINBOW TROUT FISHERY RESTORATION PROJECT

INTRODUCTION

Since the initial filling of Lost Valley Reservoir it has been managed by the IDFG as a rainbow trout fishery. Lost Valley Reservoir has a long history of overpopulation by yellow perch and subsequent chemical rehabilitation by IDFG. It was rehabilitated in 1959, 1964, 1985, 1991, 1994, 1998 and 2000 using rotenone and in 1972 using Antimycin (Fintrol). Each treatment resulted in greatly improved fishing for rainbow trout for the following 4-5 years. Some of the treatments coincided with the lake being drained for irrigation needs which explains the short duration between some of the treatments.

Incomplete kills and/or illegal reintroductions have allowed the yellow perch populations to rebuild to the point of overpopulation and stunting after each treatment. The perch reduce survival and growth of rainbow trout and become a nuisance to anglers. The overpopulated yellow perch average 150 mm – 175 mm in length and were unacceptable to most anglers as a harvestable size. They also eat baits intended for trout further frustrating trout anglers.

Following each treatment, catchable-size rainbow trout plants produced excellent fishing in the next 4-5 years. This resulting fishery was very popular. In 1987, two years after a rotenone treatment in Lost Valley Reservoir, anglers spent 59,323 hours harvesting 25,000 rainbow trout (Scully and Anderson 1989).

Since the last treatment in 2000, juvenile perch had again become so numerous they seriously impacted trout growth and survival and interfered with trout angling. This occurred even after the removal of over 530,000 yellow perch from the lake in 2005 and 2006 for stocking into Lake Cascade (Allen et al. In review). Communications with the Weiser Irrigation District confirmed that the reservoir would be drained as low as possible by mid October due to drought conditions and irrigator water demands. This presented a good opportunity for an effective and cost minimizing chemical rehabilitation of the reservoir.

The reservoir was gill netted prior to the treatment to document the fish population structure in the lake.

METHODS

Due to low water conditions and large numbers of yellow perch we set only one sinking net in Lost Valley Reservoir. The net was set off the point on the south side of the lake on the east side of the dam channel entrance. The sinking gill net was set in the afternoon, fished all night and pulled the next morning. All fish were measured to the nearest mm and weighed to the nearest g. Relative weights were calculated for yellow perch but not rainbow trout as they were recently stocked fish.

Fish salvage regulations were implemented in mid September in anticipation of the treatment to maximize use of the rainbow trout present in the reservoir. Public notice signs of our intent to use rotenone to treat the lake and when, were posted around the lake approximately one-month before the treatment. A newspaper article of our intent and methods proposed to treat the reservoir was also published approximately 1.5 months prior to the treatment.

Flows in Lost Creek and its two tributaries (East Fork and West Fork) and the dam outlet were measured within three days of the treatment to determine amounts of rotenone needed for the treatment. The difference in stream flows coming in and going out of the reservoir were used to determine amount of rotenone needed to treat the stream flowing through the reservoir proper as there were large numbers of seeps, springs and drainage from the reservoir bottom.

Lost Creek and its two forks above the reservoir were also electrofished to determine yellow perch distribution and subsequent locations of rotenone drip stations. Flows in two major springs, one on the west side of the reservoir and one 150 yards southeast of the United States Forest Service's (USFS) interpretive site, were also measured.

We calculated the area of mud flats, pot holes, seeps, springs and remaining pool in the reservoir proper using aerial photographs and the topographical map computer program "All Topo Maps: Idaho". This program had the capability of calculating areas of computer mouse drawn shapes on the computer generated topographical map of the lake. These area calculations were used to determine the standing water volume to be treated.

We employed a fixed wing, crop duster airplane to apply the rotenone to the mud flats, pot holes, seeps and springs and remaining pool in the reservoir proper above the dam. Constant flow drip barrels described by Finlayson et al. (2000) were utilized to directly apply diluted rotenone to Lost Creek, its tributaries, and springs flowing into the reservoir. Diluted rotenone was applied to oxbows, seeps and marshy areas adjacent to Lost Creek and tributaries below dripper barrels with back pack sprayers.

The dam outlet valve was closed immediately upon the start of rotenone application to the reservoir proper. Lost Creek was dewatered below the dam outlet except for a small amount of leakage through the gate. The small plunge pool below the dam was also treated as large numbers of perch were found there. Because of dewatering, the outlet gate leakage, and the plunge pool treatment, we expected to kill fish in Lost Creek below the dam for up to 7.24 km to its confluence with Bear Gulch.

RESULTS

We collected a total of 99 yellow perch and 20 hatchery stocked rainbow trout on September 5, 2007. The largest trout collected was 292 mm and the largest yellow perch was 210 mm. The majority of yellow perch ranged from 145 mm to 190 mm. Relative weights of yellow perch averaged 84.4 (Table 11).

Fish salvage regulations were authorized in Mid-September in preparation of the treatment.

We received no public comments concerning the rotenone treatment of the reservoir as a result of the public notice signs and newspaper article. The reservoir was drained completely by October 22, leaving a large mud flat, several creek channels, numerous seeps and springs and a shallow 2.8 ha pond holding approximately 9.8 ha-m of water directly above the dam. We measured 0.39 m^3/sec entering the reservoir proper via Lost Creek and 0.82 m^3/sec flowing out of the dam outlet for a net gain of .42 m^3/sec coming off of the mud flat, seeps and springs in and around the reservoir.

IDFG personnel chemically eradicated yellow perch in Lost Valley Reservoir and its tributaries on October 24, 2007. Paul Janssen and Dale Allen of IDFG were the licensed aquatic pesticide personnel present on site and Frankie Amen the fixed wing pilot with Valley Air Service in Caldwell, Idaho was also a licensed aquatic pesticide applicator. A pesticide application inspection was completed during the treatment by the Idaho Department of Agriculture's pesticide application inspector, Vic Mason.

We applied a total of 440.6 l of Prentiss Synpren-Fish® Toxicant (PSFT), a 2½% synergized rotenone solution to complete the entire treatment.

We installed eight-hour rotenone drip stations at four different sites on Lost Creek. Drip stations on East Fork Lost Creek (EFLC) just upstream of Lost Creek and West Fork Lost Creek (WFLC) just upstream of the EFLC confluence were set to deliver rotenone at 2 mg/l for the measured stream flow at each site. Stream flows were measured at 0.22 and 0.16 m^3/sec for the EFLC and WFLC, respectively. The second two drip stations were placed on Lost Creek on the edge of and in the middle of the reservoir proper to treat at the dam outlet flow volume of 0.82 m^3/sec at a concentration of 2.0 mg/l of PSFT. Specifically the upper reservoir dripper was set on Lost Creek at the USFS interpretive site, which is at the upper edge of the reservoir influence when the reservoir is full. The mid reservoir dripper was set on Lost Creek approximately 500 m southwest of the mouth of Slaughter Gulch.

We installed four-hour rotenone drip stations on two large springs that flow directly into the reservoir proper. The first spring was located approximately 0.14 km downstream and southwest of the USFS interpretive site and flows were measured at 0.02 m^3/sec. The other spring was located on the west side of the reservoir and flows were measured at 0.01 m^3/sec. Drippers were set to deliver 2.0 mg/l PSFT to the spring flow.

Two bladder bag backpack hand sprayers were each loaded with 1l of PSFT and 10 l of water. Two people walked Lost Creek channel from the most upstream drip station down to the mud flat spraying the toxicant into isolated ponds, oxbows, pocket water and seeps. The bags were filled twice to cover the entire length treated.

We calculated that there were 97 ha with 102 mm of water equaling 9.8 ha-m of water in the reservoir proper. We also calculated that there were 6.5 additional ha-m of water in the reservoir proper in excess of the 102 mm treated. Therefore, we treated a total of 16.3 ha-m of water in the reservoir proper at 1.88 mg/l PSFT. We applied a total of 303 of PSFT to the reservoir proper.

The crop duster, a fixed wing airplane, covered a 27.4 m swath with each pass and was equipped with a global positioning system and mapping computer which allowed the pilot to instantly know where he had sprayed and how many times. The aircraft was calibrated to deliver 1.88 mg/l PSFT @ 102 mm of water/acre.

The pilot was instructed to spray the entire 97 ha with one pass and then use multiple passes in areas where water was deeper than 102 mm. The deeper the water the more passes made. It was impossible to physically get to most of the deeper pools to measure volumes due to deep mud and shallow water therefore it was up to the pilots discretion to determine how many passes to make over each deeper pool of water. The cost of the airplane application was $7.02/acre.

The weather on the day of the treatment was clear with air temperatures peaking at around 12°C in the afternoon. Winds were calm in the morning and averaged 8 to 10 km/hr during the aerial application of rotenone.

After completion of the treatment we observed thousands of dead and dying perch and less than 20 rainbow trout in the reservoir proper, primarily in the pool and stream immediately above the reservoir dam. No perch were observed in either fork of Lost Creek or below the confluence of the two forks for approximately 402 m. Dead perch were observed above the culvert on USFS Road 089. Numerous brook trout and a few rainbow trout were observed killed in the tributaries.

We do not believe we attained a total kill within the treatment area due to the large numbers of springs and seeps on the mud flats. Future treatments at Lost Valley should be accomplished in a similar manner to this treatment as we feel that this treatment was the most effective to date in terms of manpower, cost, time, and percent of target fish killed.

PAYETTE LAKE

KOKANEE INVESTIGATIONS

INTRODUCTION

Kokanee are the primary forage for lake trout in Payette Lake and kokanee eggs are usually in high demand by Department hatcheries for statewide stocking requests. Therefore, kokanee population estimates have been made on Payette Lake since 1990 to monitor this important lake trout forage and to predict kokanee surpluses in the lake for egg taking opportunities for state hatchery needs. To continue this monitoring a population estimate was made again in 2007.

Adult kokanee spawner counts in the North Fork Payette River had been declining steadily since the mid 1990's. Spawner counts had been below 10,000 fish since 2006 (see Rivers and Streams Section this report) and hydroacoustic population estimates suggested there would be no increase in number of spawners from cohorts present in the lake. Kokanee have been stocked into Payette Lake off and on over the past few decades however no kokanee were stocked from 1976 through 1988. We examined the contribution of kokanee fingerling stockings since 1988 in Payette Lake on adult spawner numbers to help determine need for future stockings.

We examined lake trout growth rates in Payette Lake using tagging data collected since 1988. There have been two lake trout tagging efforts completed on Payette Lake since 1988 and are described by Grunder et al. (1990) and Janssen et al. (2000). This report compiles recorded growth of fish recaptured since these studies.

METHODS

We utilized the IDFG hydroacoustic fish survey crew from Lake Pend Oreille to estimate kokanee numbers in the lake. Maiolie et al. (2006) gives a general description of the equipment and methodology used. A total of 18 transects were completed, nine in the east basin (Included narrows) and nine in the west basin.

To examine contribution of stocked kokanee fingerling on numbers of spawners we graphed number of kokanee stocked and numbers of adult kokanee spawners each year since 1988.

Documented growth rates of lake trout tagged over a 20 year period in Payette Lake are presented in this report. To insure growth rate accuracy only fish lengths from tag returns recorded by Department fisheries personnel were used.

RESULTS

The hydroacoustic surveys on Payette Lake were completed on July 10, 2007. The estimate for age-0 kokanee was 79,748 (90% CI = 47,493 to 133,191) and for age-1 and greater was 34,613 (90% CI = 27,281 to 43,805). The 2007 spawner size component was 8,397. Figure 1 depicts the frequency of fish signal strengths observed.

Past kokanee fingerling plants appeared to have contributed significantly to the adult kokanee spawning run up the North Fork Payette River four years after stocking. Table 12 and Figure 2 present the number of adult kokanee spawners each year since 1988 and the number of kokanee stocked each year since 1988. Spawner numbers increased four years after every kokanee stocking. We stocked 87,500 kokanee fingerlings in 2007.

We utilized 25 recaptured lake trout to examine growth rates in Payette Lake. Fish carried tags an average of 54.6 months before being recaptured (Table 13). We had four fish carry tags 140 or more months and one fish carried a tag for 217 months. Average growth per month and year was 2.5 mm and 29.5 mm respectively. Smaller fish generally exhibited faster growth rates than did larger fish (Figure 3). Growth rates averaged 4.56 mm per month for fish less than 700 mm when tagged and 1.89 mm per month for fish greater than 700 mm when tagged. However, growth rates varied dramatically between individual fish and ranged from 2.2 mm to 45.0 mm per year for fish greater than 700 mm (when tagged) and 15.3 mm and 88.0 mm per year for fish less than 700 mm (when tagged).

C. BEN ROSS RESERVOIR

LARGEMOUTH BASS INVESTIGATIONS

INTRODUCTION

At C. Ben Ross Reservoir, the quality bass regulation of no harvest before July 1 and a two bass limit after July 1 none of which could be between 305 mm and 406 mm had been in effect since 1994. Anglers had expressed a desire to increase the minimum size limit to 508 mm to increase numbers of largemouth bass over 406 mm. To help examine the effects of such a regulation we aged older fish and completed a population estimate of fish greater than 260 mm. Past fishery surveys on the reservoir had utilized scales to age largemouth bass. Biologists felt that larger largemouth bass had been under aged in past studies utilizing scales therefore, we collected otoliths in 2007 to more accurately age older fish. We also examined the changes in the largemouth bass population since the regulation was changed in 1994.

METHODS

Largemouth bass in C. Ben Ross Reservoir were collected with electrofishing boats for tagging as part of a statewide exploitation and tag return study. This afforded an opportunity to collect otoliths from adult largemouth bass for aging. We also electrofished a second time in 2007 to tag more fish and to utilize the earlier tagged bass to complete a simple mark recapture population estimate for fish greater than 300 mm.

All largemouth bass tagged were measured to the nearest 10 mm and recorded. We kept a small sample of largemouth bass which were measured to the nearest cm and their otoliths were removed. Bass under 260 mm were not tagged or measured for the study. Within 2 weeks of the first fish tagging effort in 2007 we electrofished the reservoir again to tag more fish and all fish were examined for tags. Fish that did not have a tag were tagged and released for the exploitation study. We then used this data to calculate a Petersen single mark-recapture estimate.

Otoliths were mounted in epoxy and then sliced perpendicular to the axis at the focus at a thickness of 60.0 microns with a Buehler Isomet low speed saw. Sliced sections were then coated with a 1:1 solution of glycerin and saline solution to clear any surface scratches and aged using a dissecting scope.

We utilized length frequency data collected in 1993, 1996, 1999, 2003 and 2007 to examine changes in population structure as a result of the regulation change.

RESULTS

We collected and tagged a total of 249 largemouth bass with two electrofishing boats on May 16, 2007 and 86 largemouth bass with one electrofishing boat on May 29, 2007. We collected bass up to 490 mm (Table 14). We observed eight tagged fish; three between 300 mm and 399 mm and five from 380 to 489 mm. The total largemouth bass estimate for fish greater than 300 mm was 1,984 +/- 1157 (95% confidence interval). The largemouth bass estimate for the 300 mm to 399 mm and 400 mm and larger was 1,092 +/- 907 and 720 +/- 492 respectively.

We collected otoliths from 15 largemouth bass ranging in size from 216 mm to 465 mm. Ages ranged from 2 to fifteen years of age (Table 15). All fish over 400 mm were aged at 8 years or older and averaged 10 years old.

Length frequencies of fish collected in surveys since 1993 are presented in Table 14. The maximum size of largemouth bass collected each year has continued to increase since 1993. We collected 287 fish over 300 mm in 2007 of which 141 (49%) were greater than 400 mm. It took approximately 10 years for fish to grow out of the slot limit and become vulnerable to harvest. Harvest effects have been minimal as the number of fish greater than 400 mm has increased with each survey since the regulation change.

DISCUSSION

A change in the largemouth bass size regulation is not warranted at this time. It is apparent that harvest pressure on largemouth bass on C. Ben Ross Reservoir is minimal as large numbers of old largemouth bass greater than 400 mm were sampled in 2007. We collected a large number of fish greater than 300 mm in 2007 with virtually half of these fish greater than 400 mm and out of the slot limit. Therefore, protecting these fish with a larger minimum size limit would accomplish little. Life expectancy of fish greater than 400 mm would also severely limit the number of fish we would expect to survive and achieve a total length greater than 506 mm.

LAKE CASCADE YELLOW PERCH FISHERY RESTORATION

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. In review). The two-fold restoration plan entailed stocking large numbers of yellow perch adults to overwhelm predators in the lake (primarily adult northern pikeminnow, and secondly to physically reduce the number of northern pikeminnow in the lake. We transplanted over 860,000 adult yellow perch and removed an estimated three-quarters of the northern pikeminnow population in the lake from 2004 through 2006 (Allen et al. In review). Biologists focused on monitoring yellow perch production and changes in plankton size as a result of increased yellow perch production in 2007. We also continued to monitor changes in angler use on holidays.

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 1999 to monitor changes in yellow perch population structure and abundance. We continued this sampling again in 2007.

Methods

We repeated previous years sampling of yellow perch using the bottom trawl. 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 weed bed development. We did not complete any trawl sampling in the north area due to the large numbers of stumps that catch the trawl. We counted all yellow perch collected and a representative sample of yellow perch from each sample area was measured in total length to the nearest 1 mm and weighed to the nearest 0.1 g.

Results

We completed 62 trawl transects in 2007, trawling a total of 310 minutes, collecting 27,060 yellow perch. We averaged 635, 1,235, and 66 yellow perch per five minute transect in June, August and October respectively (Table 16). The average catch for all transects for all months was 652 yellow perch (Table 17). Catch rates in June and August were the highest since we began trawling in 1998. We observed primarily age-0 and age-1 fish in all three months of sampling (Figure 4). Age-0 yellow perch dominated trawl catches in all three collection periods. Age-1 and older yellow perch were still present in the lake in August and

October unlike years 1998 through 2004. We collected more age-1 perch in August and October than we have since we began annual trawling surveys in 1998. The mean catch per transect for all months has increased annually since 2003 (Table 18).

The large number of age-0 fish collected in August and October 2007 would have been the third cohort produced by the adult yellow perch transplanted into the lake in 2004, 2005, and 2006 and the first cohort produced by all three years of transplanted fish (Allen et al. In review). The survival of age-1 and age-2 yellow perch through October 2007 is thought to be the direct result of northern pikeminnow population reductions in the lake.

Yellow Perch Young-Of-Year Production Monitoring

Introduction

To help monitor the response in annual yellow perch production to the yellow perch restoration efforts begun in 2004 we initiated a beach seining effort targeted at sampling young-of-year yellow perch in 2004. We repeated this effort in 2007 as we had annually since 2004.

Methods

Yellow perch were sampled with a 2.4 m deep x 15.2 m long beach seine with a 1.2 m x 1.2 m x 1.2 m bag in the center. The entire seine was constructed with 4.8 mm Delta mesh nylon netting. A standard haul consisted of anchoring one end of the seine on shore and pulling the other end straight out, perpendicular to shore as far as possible. The deep water end of the seine was then pulled in an arc back to shore.

Universal Transverse Mercator (UTM) coordinates for all sample sites were presented in Allen et al. (In review). We sampled the same sites as we did in 2006 (Table 19). Lake water levels dictated exactly how close we actually sample to the original sites.

Results

We sampled 11 sites in September 2007. We collected a total of 16,663 age-0 and 61 age-1 and greater yellow perch (Table 20). We collected more age-0 yellow perch in 2007 than in the previous three years of sampling and we collected the fewest age-1 and older fish than in the last three years of sampling.

Zooplankton Quality Index Monitoring

Introduction

To monitor impacts of increased yellow perch production as a result of the yellow perch restoration project we began monitoring zooplankton size and quality as a food source in the lake. We began monitoring zooplankton in 2004 before the yellow perch restoration project recommendations were implemented and have continued annual sampling.

Methods

We monitored zooplankton quality and abundance using the Zooplankton Quality Index (ZQI) technique described by Teuscher (1999). The same sites were sampled in 2007 as in the past three years. The approximate NAD 27 map datum UTM coordinates for the Cascade City boat ramp, Sugarloaf Island, and Poison Creek sample sites were 573509 E, 4929565 N, 570065 E, 4941978 N and 571331 E, and 4945528 E respectively.

Results

Zooplankton sampling was completed in May through October in 2007. The ZQI values in 2007 averaged 0.333, 0.644, and 0.344 for the Poison Creek, Sugarloaf Island and Cascade City boat ramp, respectively (Table 21). Average ZQI values were markedly lower in 2007 than in 2004 and somewhat lower than those recorded in 2005 and 2006 (Figure 5). However, average ZQI values for 2005, 2006, and 2007 still rank in the top 30% of Idaho waters sampled and reported by Teuscher (1999). Low ZQI values in August, September, October and November of 2005, 2006, and 2007 were thought to be the result of zooplankton cropping by large numbers of juvenile yellow perch.

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 Memorial Day, July 4th and Labor Day on Lake Cascade as described by Janssen (2000). We conducted counts in 2007 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 28), July 4th and Labor Day (September 3). The 2007 counts were the highest since 1999 with an average of 24 fishing boats and 28 shore anglers (Table 22). Angler use continued to increase slowly from the lows of 1999 through 2003.

Management Recommendations - Lake Cascade

1. Continue holiday aerial angler counts.
2. Conduct a year-long creel survey in 2009 or 2010.
3. Continue hydroacoustic surveys for northern pikeminnow and yellow perch.
4. Continue trawling as primary method to monitor yellow perch production.
5. Continue beach seining at a reduced number of sites for several more years.
6. Conduct fall trend gill netting every other year.

Table 8. Length frequencies of fish collected from Brundage Reservoir, Goose Lake, Granite Lake, Hazard Lake, and Upper Payette Lake with gill nets in 2007.

Total Length	Brundage Reservoir		Goose Lake		Granite Lake	Hazard Lake		Upper Payette Lake		
	Rainbow Trout	Cutthroat Trout	Rainbow Trout	Brook Trout	Rainbow Trout	Rainbow Trout	Brook Trout	Rainbow Trout	Brook Trout	Largescale Sucker
60	0	0	0	0	0	0	0	0	1	
70	0	0	0	0	0	0	1	0	1	0
80	0	0	0	0	0	0	1	0	1	0
90	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0
150	0	0	1	0	0	0	0	0	0	0
160	1	0	4	0	0	0	1	0	0	0
170	0	0	4	0	0	0	0	0	2	1
180	0	0	1	0	0	0	1	0	1	1
190	0	0	2	0	0	0	0	1	0	0
200	0	0	3	0	0	0	0	3	2	0
210	0	0	4	1	0	0	0	2	0	0
220	0	0	3	1	0	0	1	3	2	0
230	0	0	6	2	0	2	0	4	0	2
240	1	0	2	0	0	1	0	18	0	1
250	1	0	4	7	0	0	1	6	0	3
260	1	1	1	1	0	0	0	11	0	2
270	3	1	1	2	0	1	0	8	0	0
280	0	0	0	1	0	0	0	3	0	0
290	1	3	3	2	1	0	0	5	0	0
300	2	2	3	3	0	1	0	1	0	3
310	2	0	0	2	0	0	0	0	0	2
320	1	1	2	1	0	0	0	0	0	5
330	0	0	4	1	0	0	0	0	0	4
340	3	1	1	0	0	0	0	0	0	2
350	0	0	2	0	0	0	0	0	0	5
360	0	1	2	0	0	0	0	0	0	1
370	0	0	1	0	0	0	0	0	0	1
380	1	0	0	0	0	1	0	1	0	3
390	0	0	0	0	1	0	0	0	0	2
>400	0	0	0	0	0	0	0	0	0	12
TOTAL	**17**	**10**	**54**	**24**	**2**	**6**	**6**	**66**	**10**	**50**

Table 9. Numbers and biomass of all fish species collected from Little Payette Lake with gill nets on June 27, 2007.

Species	N	% of Total by Number	Total Weight (kg)	% of Total by Weight
Rainbow trout	14	29	3.6	11
Northern pikeminnow	11	23	7.9	24
Largescale sucker	15	31	12.7	39
Smallmouth bass	8	17	8.6	26
Total	48	100	32.8	100

Table 10. Length frequencies, weights and condition of fish collected from Little Payette Lake on June 27, 2007.

Total Length	Rainbow Trout			Smallmouth Bass			Largescale Sucker	Northern Pikeminnow
	#	Average Weight	Average Ktl	#	Average Weight	Average Wr	#	#
200	1	90	1.13	0			0	0
210	0			0			0	0
220	0			0			0	0
230	0			0			0	0
240	5	140	1.01	0			0	0
250	2	145	0.93	0			0	0
260	1	180	1.02	0			0	0
270	2	205	1.04	0			0	0
280	0			0			0	0
290	0			0			0	0
300	0			0			0	1
310	0			1	450	97.1	0	3
320	0			0			0	1
330	0			0			0	0
340	0			0			0	0
350	0			0			0	0
360	0			0			0	0
370	0			0			0	0
380	0			2	820	100.2	0	0
390	0			0			0	1
400	0			1	900	97.3	3	0
410	0			0			1	2
420	0			1	1050	97.8	1	1
430	0			0			2	0
440	1	810	.95	1	--	--	1	0
450	1	900	.99	1	1400	102.1	2	0
460	0			0			3	0
470	0			0			1	0
480	0			0			0	1
490	0			0			0	0
500	0			0			1	0
510	0			0			0	0
520	0			0			0	0
530	0			0			0	0
540	0			0			0	0
550	0			0			0	1
TOTALS	13			7			15	

Table 11. Length frequencies of rainbow trout and yellow perch and average and relative weights of yellow perch collected from Lost Valley Reservoir on September 5, 2007.

Total Length	Rainbow Trout	Yellow Perch	Average Weight	Wr
120	0			
130	0	1	31	99.2
140	0	6	36	94.3
150	0	25	45	95.2
160	0	18	51	86.3
170	0	19	61	86.1
180	0	16	73	84.4
190	0	4	84.5	86.7
200	0	9	92	76.6
210	0	1	106	81.4
220	1	0		
230	3	0		
240	2	0		
250	5	0		
260	3	0		
270	5	0		
280	1	0		
290	0	0		
300	0	0		
TOTAL	**20**	**99**		

Table 12. Number of kokanee fingerlings stocked and number of spawners in the North Fork Payette River from 1988 through 2005.

Year	Estimated # Spawners	# kokanee stocked
1988	22,800	300000
1989	14,500	351000
1990	16,700	301000
1991	18,000	160420
1992	29,300	130530
1993	59,310	125400
1994	44,200	0
1995	55,450	0
1996	60,707	0
1997	64,891	0
1998	25,232	0
1999	26,971	0
2000	26,850	0
2001	30,144	0
2002	16,314	0
2003	9,394	0
2004	19,532	0
2005	20,780	0
2006	9,650	0

Table 13. Payette Lake lake trout monthly growth rates from fish tag recaptures from fish tagged from 1988 thru 1996.

Date Tagged	Total Length at Tagging	Date Recaptured	Total Length at Recapture	Months Tagged	Growth (mm/month)	Growth (mm/year)
6/20/1989	572	6/26/1990	660	12.00	7.33	88.0
6/22/1995	600	2/15/2007	778	140.00	1.27	15.3
6/21/1995	615	8/11/1996	695	14.00	5.71	68.6
6/16/1995	620	9/17/1997	756	27.00	5.04	60.4
2/22/1996	690	8/10/1996	725	6.00	5.83	70.0
7/6/1988	690	5/30/1995	880	82.00	2.32	27.8
7/6/1994	710	9/17/1997	793	38.00	2.18	26.2
3/1/1995	730	2/6/2007	850	143.00	0.84	10.1
7/29/1991	737	6/16/1995	845	47.00	2.30	27.6
3/1/1995	745	2/27/1997	825	23.00	3.48	41.7
3/7/1996	755	2/3/2002	838	71.00	1.17	14.0
3/15/1995	765	8/15/2007	840	149.00	0.50	6.0
2/25/95	790	2/18/96	832	12.00	3.50	42.0
6/21/1988	800	6/19/1990	838	24.00	1.58	19.0
2/25/95	805	8/11/95	810	6.00	0.83	10.0
6/14/1988	810	3/21/1996	915	93.00	1.13	13.5
6/17/95	835	2/4/96	865	8.00	3.75	45.0
6/21/1988	835	7/30/2006	875	217.00	0.18	2.2
6/21/1988	835	7/1/1995	960	85.00	1.47	17.6
5/25/1995	840	6/11/1999	885	49.00	0.92	11.0
6/29/1988	840	6/18/1990	890	24.00	2.08	25.0
6/22/1988	880	6/8/1991	965	36.00	2.36	28.3
7/21/1988	880	6/25/1991	965	35.00	2.43	29.1
9/16/93	902	1/28/95	915	16.00	0.81	9.8
7/15/94	920	3/15/95	940	8.00	2.50	30.0
Averages				**54.6**	**2.5**	**29.5**

Table 14. Total length frequencies of all largemouth bass collected in 1993, 1996, 1999, and 2004, and largemouth bass over 260 mm collected in 2007 for tagging in C. Ben Ross Reservoir.

Total Length (mm)	YEAR				
	1993	1996	1999	2004	2007
30	0	0	4	4	0
40	0	0	1	15	0
50	0	0	0	10	0
60	0	0	1	4	0
70	0	1	0	1	0
80	0	0	0	4	0
90	26	3	0	2	0
100	1	1	2	1	0
110	6	2	3	0	0
120	14	2	0	0	0
130	6	0	7	0	NO
140	7	2	10	2	FISH
150	4	0	6	0	0
160	2	0	8	1	UNDER
170	2	0	2	1	260 MM
180	6	0	3	0	MEASURED
190	5	0	3	1	0
200	5	0	4	0	0
210	20	1	8	0	0
220	12	0	3	1	0
230	9	2	1	0	0
240	9	1	2	0	0
250	7	0	1	0	0
260	5	2	1	1	3
270	6	4	3	6	4
280	14	5	7	2	8
290	8	4	9	4	25
300	7	1	4	0	38
310	9	2	2	2	16
320	1	1	0	3	7
330	0	3	1	3	7
340	2	1	2	0	9
350	-	1	2	4	10
360	-	3	1	6	10
370	-	1	3	13	10
380	-	-	1	7	15
390	-	-	2	9	24
400	-	-	-	5	42

Total Length (mm)	YEAR				
	1993	1996	1999	2004	2007
410	-	-	-	1	47
420	-	-	-	-	26
430	-	-	-	-	18
440	-	-	-	-	5
450	-	-	-	-	0
460	-	-	-	-	1
470	-	-	-	-	1
480	-	-	-	-	1

Table 15. Total lengths and ages read from otoliths from largemouth bass collected from C. Ben Ross Reservoir in 2007.

Total Length (mm)	Otolith Age
216	2+
244	2+
261	3+
337	4+
392	9+
394	12+
402	9+
411	15+
423	9+
426	9+
432	13+
442	8+
465	9+

Table 16. Total and mean catch of yellow perch collected from Lake Cascade with a bottom trawl with 95% confidence intervals (+/-) by area in June, August and October, 2007.

	MONTH								
	June			**August**			**October**		
AREA	Total # Perch	Average Catch per Transect	# Transects	Total # Perch	Average Catch per Transect	# Transects	Total # Perch	Average Catch per Transect	# Transects
East	357	60 (615)	6	3248	464 (1430)	7	432	62 (74)	7
West	9027	1290 (1986)	7	11063	1580 (1814)	7	249	36 (30)	7
South	3681	526 (81)	7	11634	1662 (378)	7	707	101 (40)	7
Totals/Averages	13065	653	20	25945	1235	21	1388	66	21

Table 17. Average yellow perch catch per trawl transect for all transects and areas in Lake Cascade from 1998 through 2006.

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

Table 18. Length frequencies of yellow perch collected with a bottom trawl from Lake Cascade in June, August and October 2007.

Total Length	June	August	October
10	1975	0	0
20	10423	1075	0
30	439	13356	15
40	110	7523	475
50	50	1996	387
60	28	461	140
70	8	461	153
80	2	461	29
90	1	155	57
100	8	157	36
110	3	1	28
120	4	4	5
130	2	155	9
140	2	1	0
150	1	159	0
160	1	0	2
170	2	0	2
180	1	2	0
190	1	0	2
200	1	0	2
210	1	0	12
220	0	0	4
230	0	0	6
240	0	0	6
250	1	0	10
260	0	0	3
270	1	0	1
280	0	0	2
290	0	0	1
300	0	0	0
310	0	0	0
320	0	0	0
330	1	0	0
340	0	0	0
TOTALS	13066	25967	1387

Table 19. UTM, 11T coordinates (WGS 84 Datum) of each seine haul site on Lake Cascade in 2007.

Site #	Easting	Northing
1	0569831	4950642
12	0574192	4937635
13	0574356	4936855
14	0574230	4935595
15	0574430	4933644
16	0574405	4932212
17	0574684	4930827
18	0575045	4929705
19	0574618	4927551
21	0573182	4927358
22	0572079	4928753

Table 20. Number of young-of-year and older perch collected annually at each September seine haul site from 2004 through 2007 in Lake Cascade.

	2004		2005		2006*		2007	
Site #	# YOY Perch	# Perch > YOY	# YOY Perch	# Perch > YOY	# YOY Perch	# Perch > YOY	# YOY Perch	# Perch > YOY
1	294	0	176	0	24	0	23	0
2	0	0	1071	0	0	0	0	0
3	0	0	0	25	0	0	0	0
4	2	1	8	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	1	0	0	0	0
8	0	0	0	1	0	0	0	0
9	0	0	0	0	0	0	0	0
10	6	0	0	0	0	0	0	0
11	52	0	2	0	0	0	0	0
12	14	0	415	6	954	1	207	7
13	1493	0	237	3	1845	131	1789	4
14	2	0	48	1	17	0	667	0
15	8	0	134	5	4	0	63	0
16	0	0	69	20	22	1	14	0
17	0	0	563	12	546	5	0	0
18	0	0	64	31	0	0	38	0
19	77	0	866	15	844	419	575	50
20	1	0	81	0	0	0	0	0
21	35	0	21	0	2	0	10000	0
22	6341	0	16	0	14	0	3317	0
23	1	0	NA	NA	0	0	0	0
24	0	0	11	0	0	0	0	0
25	1	0	1071	0	0	0	0	0
26	3	0	17	1	0	0	0	0
27	62	0	72	0	0	0	0	0
28	4	0	29	1	0	0	0	0
29	75	1	33	0	0	0	0	0
30	0	0	16	0	0	0	0	0
Total	8471	2	5020	122	4272	557	16693	61
Mean	282.4	0.1	173.1	4.2	388.4	50.6	1517	15

* Sampled in October.

Table 21. Zooplankton quality index values for Lake Cascade by sample area and date collected in 2006.

Date	ZQI		
	Poison Creek	Sugarloaf Island	Cascade Boat Ramp
5/10/2007	0.034	0.044	--.--
5/24/2007	0.066	0.714	0.281
6/11/2007	0.400	0.357	0.587
6/21/2007	0.263	0.475	0.165
7/3/2007	0.262	0.033	0.146
7/8/2007	0.437	0.122	0.158
8/14/2007	0.182	0.412	0.132
8/27/2007	0.044	0.073	0.045
9/20/2007	0.044	0.014	0.044
10/17/2007	0.109	0.158	0.073
Average ZQI	0.184	0.24	0.181

Table 22. 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 2007 with corresponding intensive creel survey angler hour estimates for 1982, 1991 and 1992.

Year	**Holiday Counts**		**Estimated Angler Hours (hours * 1000)**		
	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	–	–	–

[1] Does not include ice fishing hours.

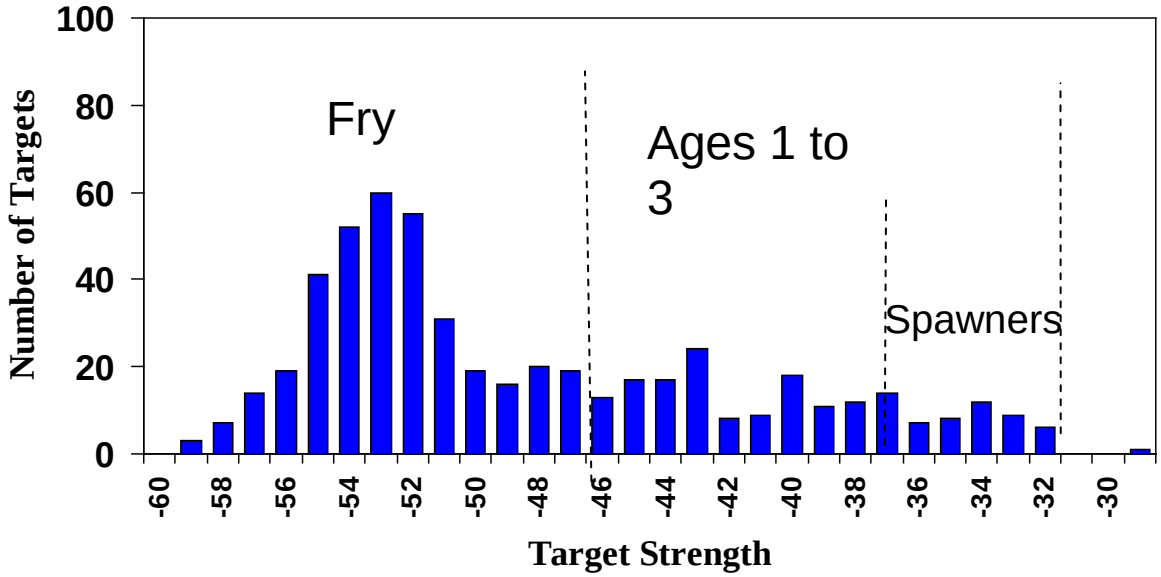

Figure 1. Hydroacoustic target strengths with age estimates of kokanee in Payette Lake on July 10, 2007.

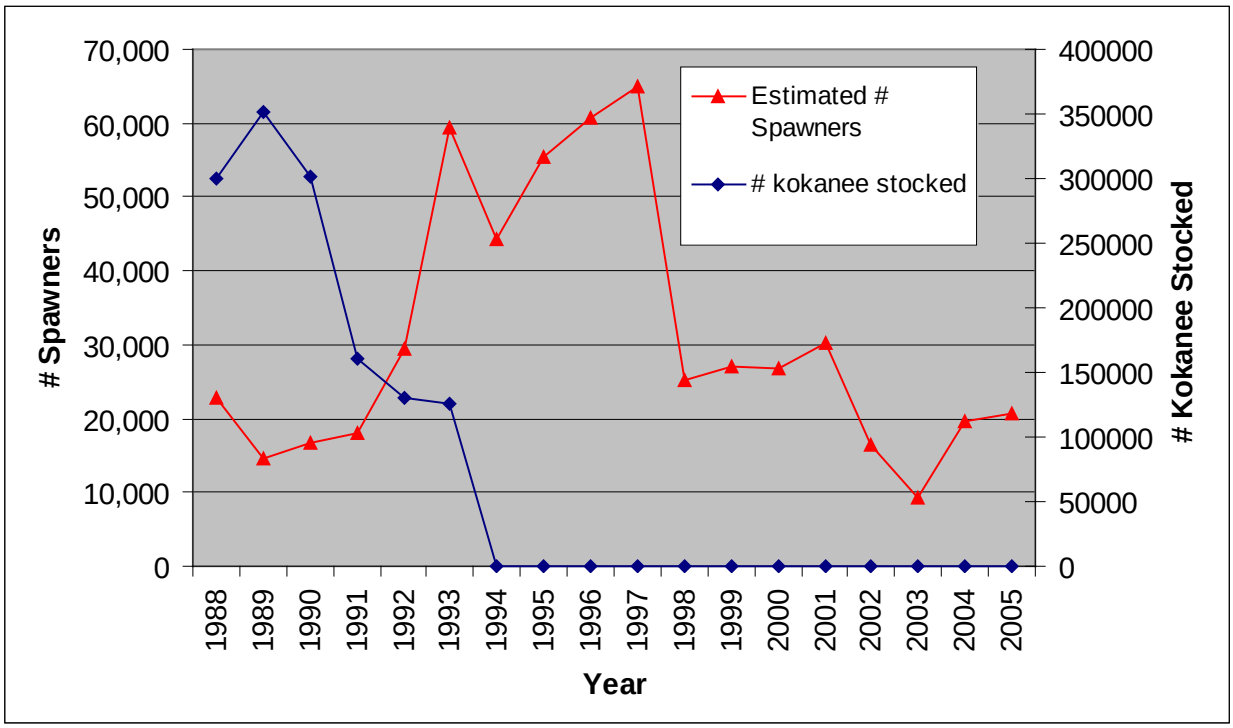

Figure 2. Number of kokanee stocked and number of spawners in the North Fork Payette River from 1988 through 2005.

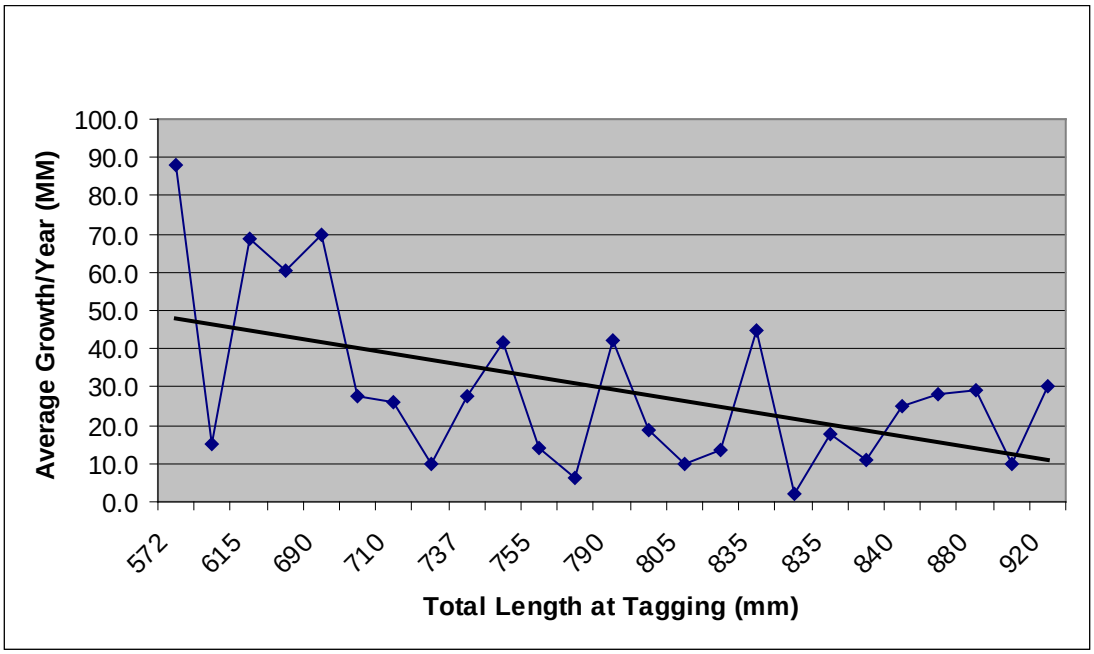

Figure 3. Average yearly growth rates (mm) of Payette Lake lake trout by total length at tagging.

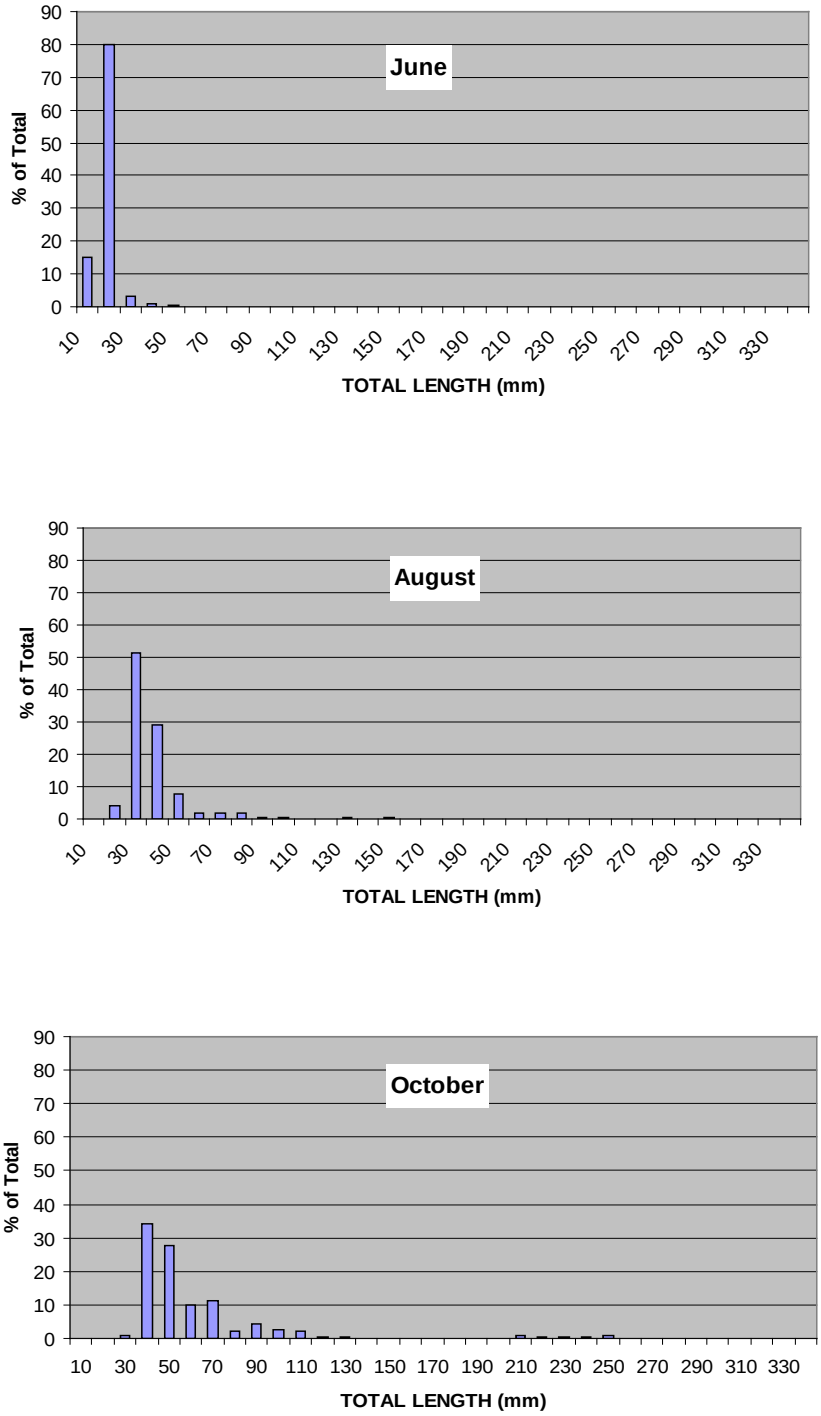

Figure 4. Lake Cascade yellow perch length frequencies collected with a bottom trawl in June (top), August (middle) and October 2007.

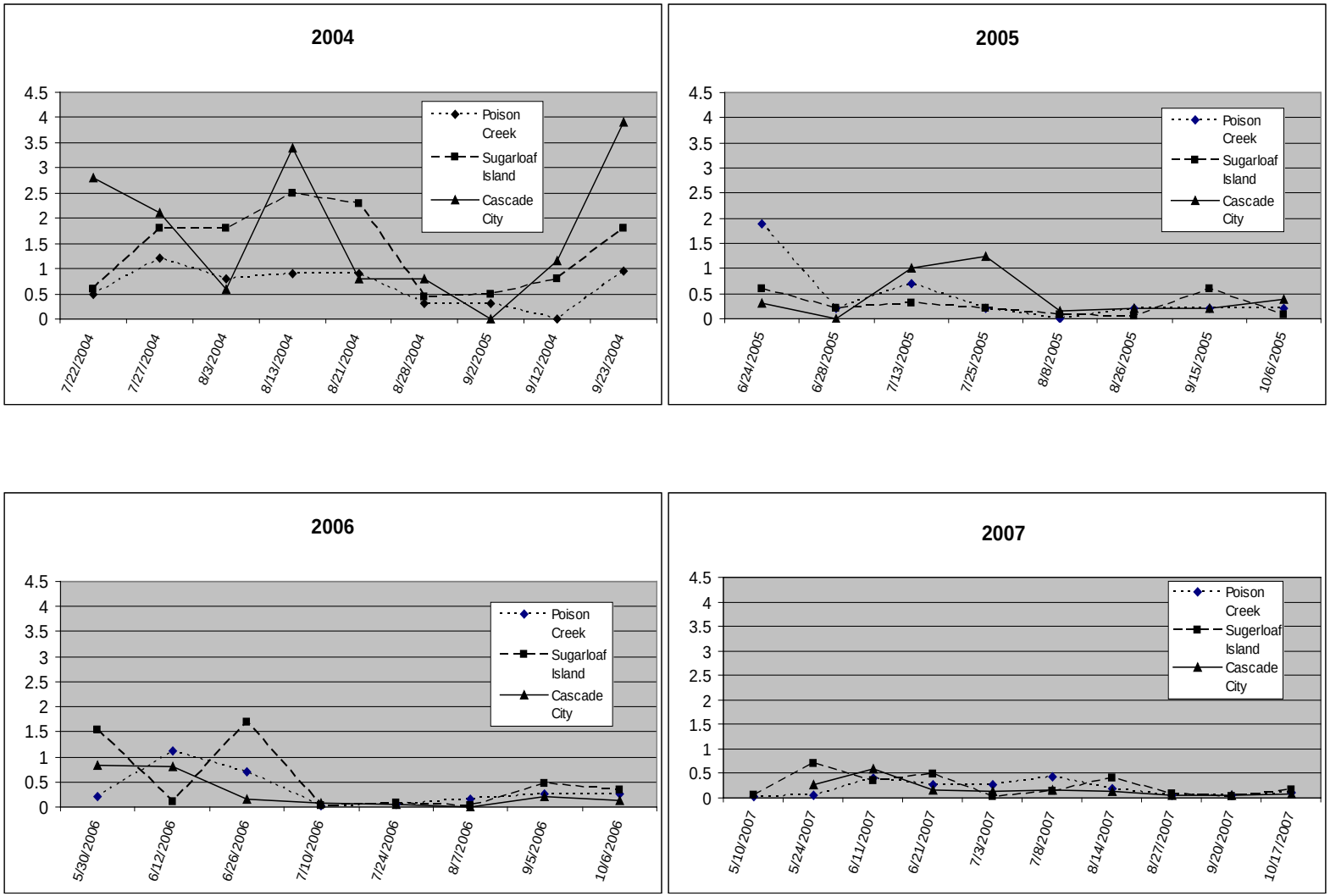

Figure 5. Lake Cascade Zooplankton Quality Index values at the Poison Creek, Sugarloaf Island, and Cascade City sample sites in 2004, 2005, 2006 and 2007.

2007 Southwest Region McCall - Fishery Management Report

RIVERS AND STREAMS

ABSTRACT

The 2007 kokanee spawning run in the North Fork Payette River above Payette Lake was estimated to be 6,790 fish.

We completed a total of fourteen standard stream surveys in thirteen streams in the Weiser River drainage in 2007. These included North Fork Mill Creek, Warm Springs Gulch, Warm Springs Creek, and Beaver Creek in the main Weiser River drainage and Weasel Gulch, North Hornet Creek, Cottonwood Creek, Summit Creek, West Mill Creek, Left Fork Hanson Creek, Lakey Creek, and Pole Creek in the Hornet Creek drainage and Fourth Gulch in the East Fork Weiser River Drainage. We observed no fish in nine of the 14 surveys completed due to the stream having very low flows or being completely dry. We collected wild redband trout *Oncorhynchus mykiss gairdneri* in Pole Creek, Fourth Gulch, Beaver Creek, North Fork Mill Creek, and the lowest Warm Springs Gulch transect. We also collected brook trout in North Fork Mill Creek.

In 2007, temperature recorders were used to monitor the upper Little Salmon River and upper North Fork Payette River drainages throughout summer and early fall. Mean stream temperatures in the mainstem Little Salmon River ranged from 19 to 23°C from late June through early August. Mud Creek, a tributary to the Little Salmon, remained generally cooler with mean daily temperatures ranging from 16 to 19°C throughout July. Mean daily temperatures in the upper North Fork Payette River exceeded 20°C on only six days, during July.

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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 2007.

METHODS

We completed kokanee spawner counts by walking the entire stretch of river utilized by spawning kokanee and counting all live spawners. Counts were made every three to four days 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 2,793, 3,925, and 2,920 live kokanee spawners on September 10, 14, and 18, 2007 respectively. The total spawning run estimate was 6,790 (3,925*1.73) fish (Table 23). Average total length and weight of 11 spawners sampled was 340 mm and 401 g.

WEISER RIVER DRAINAGE
STANDARD STREAM SURVEYS

INTRODUCTION

Over the past three years we have 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 completed surveys in tributaries between Beaver Creek downstream to Cottonwood Creek in 2007.

METHODS

We used the Department's standard stream survey methodology (B. Horton memo 8/15/1994) to complete the surveys. We made two passes with backpack electrofishing equipment to collect all fish and make population estimates. Fish collected were identified and total length measured to the nearest mm and weighed to the nearest 5 g. Habitat data was only collected in streams where fish were found.

RESULTS

We completed a total of fourteen standard stream surveys in thirteen streams in the Weiser River drainage in 2007. These included North Fork Mill Creek, Warm Springs Gulch, Warm Springs Creek, and Beaver Creek in the main Weiser River drainage and Weasel Gulch, North Hornet Creek, Cottonwood Creek, Summit Creek, West Mill Creek, Left Fork Hanson Creek, Lakey Creek, and Pole Creek in the Hornet Creek drainage and Fourth Gulch in the East Fork Weiser River Drainage. GPS coordinates of stream survey locations are presented in Table 24 and maps of locations are depicted in Figures 6 and 7.

We observed no fish in nine of the 14 surveys completed due to the stream having very low flows or being completely dry (Table 25). Lakey Creek had a road culvert that was a total fish barrier and no fish were found above it. We collected wild redband trout in Pole Creek, Fourth Gulch, Beaver Creek, North Fork Mill Creek, and the lowest Warm Springs Gulch transect. We also collected brook trout in North Fork Mill Creek. Length frequencies of all trout collected are presented in Table 26. 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 13 years, the upper Little Salmon River (LSR) drainage has been the focus of ongoing riparian habitat improvement projects and some improvements in 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 2007 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 (Onset model HTI, -5 to +35°C) were deployed to monitor water temperature continuously, recording a temperature every 2.5 hours from June 20 through September 29. 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

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 and Mud Creek in 2007. Mean daily temperatures remained below 20°C in Mud Creek, and maximum daily temperatures reached 21° C on only two days during July.

July temperatures in the mainstem LSR consistently exceeded 20°C, averaging at 22°C, and ranging from minimums of 17 to maximums of 26°C. The recorder at the downstream LSR site was damaged and all data were lost.

North Fork Payette River

Figure 9 and Appendix D show daily mean, minimum, and maximum stream temperatures for the upper NFPR station in 2007. Summer stream temperatures in the NFPR generally remain adequate for rainbow trout rearing. Mean daily temperature exceeded 20°C on six days during July.

Table 23. Payette Lake kokanee spawner counts and estimated spawning run size and biomass in the North Fork Payette River from 1988 through 2005.

Year	Peak Count	Estimated # Spawners	KG/Lake HA_1	Number/Lake HA_1	Average Weight (g)
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
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 [b]
1995	32,050	55,450	4.8	32.3	147
1996	35,090	60,707	5.7	35.4	162 [c]
1997	36,300[e]	64,891[d]	5.6	37.8	148
1998	14,585	25,232	2.1	14.7	143
1999	15,590	26,971	2.9	15.7	184
2000	15,520	26,850	2.9	15.6	188.5
2001	15,690[e]	30,144[f]	4.4	17.6	250.5
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	--
2007	3,925	6,790	1.6	4.0	401

[1] 1,717 ha usable kokanee habitat in Payette Lake (Area w/depth greater than 40').
[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 killed by Nampa Fish Hatchery.
[e] Does not include 3,000 fish spawned and killed by Nampa Fish Hatchery.
[f] Includes 3,000 fish spawned and killed by Nampa Fish Hatchery.

Table 24. UTM coordinates of standard IDFG stream survey sites.

Stream	Parent Drainage	Site #	Easting UTM Coordinate (NAD 83)	Northing UTM Coordinate (NAD 83)
Weasel Gulch	Hornet Creek	1	0534751	4976084
North Hornet Creek	Hornet Creek	1	0533169	4975490
Cottonwood Creek	Hornet Creek	1	0528845	4972163
Summit Creek	Hornet Creek	1	052606	4969783
West Mill Creek	Hornet Creek	1	0526275	4966844
L.F. Hanson Creek	Hornet Creek	1	0534239	4959572
Lakey Creek	Hornet Creek	1	0531462	4959698
Pole Creek	Hornet Creek	1	0536067	4957023
Warm Springs Gulch	Weiser River	1	0543978	4967476
Warm Springs Gulch	Weiser River	2	0543824	4969026
Warm Springs Creek	Weiser River	1	0545654	4968586
Beaver Creek	Weiser River	1	0553099	4969163
N.F. Mill Creek	Weiser River	1	0548460	4956696
Fourth Gulch	E.F. Weiser River	1	0550604	4963039

Table 25**.** Estimates of salmonid abundance in streams surveyed in 2007.

Stream	Transect Length (m)	Fish Species	Estimated #/transect +/-95% CI
Weasel Gulch	Trickle	None	0
North Hornet Creek	Dry	None	0
Cottonwood Creek	Intermittent	None	0
Summit Creek	Dry	None	0
West Mill Creek	40	None	0
Left Fork Hanson Creek	46	None	0
Lakey Creek	Culvert Barrier	None	0
Pole Creek	46	Rainbow Trout	24.1+/-5.4
Warm Springs Gulch (Site #1)	52	Rainbow Trout	29 (1 pass)
Warm Springs Gulch (Site #2)	Dry	None	0
Warm Springs Creek	Dry	None	0
Beaver Creek	80	Rainbow Trout	40+/-21.5
North Fork Mill Creek	77	Rainbow Trout	49.5+/-15.1
North Fork Mill Creek	77	Brook Trout	5.3+/-1.9
Fourth Gulch	80	Rainbow trout	15 (1 pass)

Table 26. Length frequencies of salmonids collected from Weiser River tributary streams surveyed in 2007.

Stream	Species	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
Weasel Gulch	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Hornet Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cottonwood Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Summit Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
West Mill Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
L.F. Hanson Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lakey Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pole Creek	RBT	0	0	5	7	5	4	1	0	0	0	0	0	0	0
Warm Springs Gulch #1	RBT	1	0	5	16	6	1	0	0	0	0	0	0	0	0
Warm Springs Gulch #2	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Warm Springs Creek	None	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Beaver Creek	RBT	0	0	9	16	3	2	0	0	0	0	0	0	0	0
Fourth Gulch	RBT	0	0	6	2	3	3	0	1	0	0	0	0	0	0
North Fork Mill Creek	RBT	0	4	9	11	4	9	2	2	0	0	0	0	0	0
North Fork Mill Creek	BRK	0	0	0	0	0	3	0	1	1	0	0	0	0	0

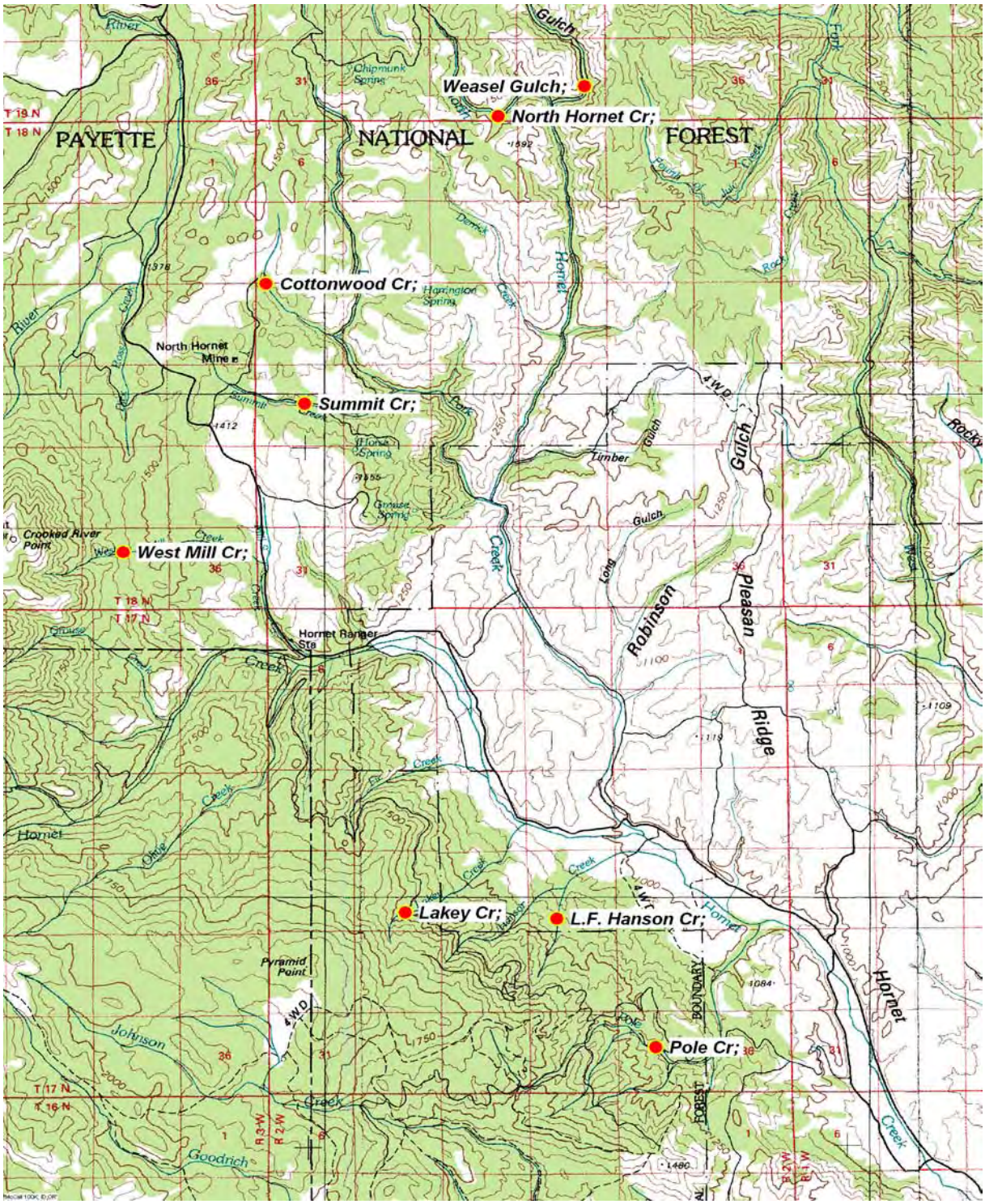


Figure 6. Locations of standard stream surveys sampled in 2007 in the Hornet Creek drainage.

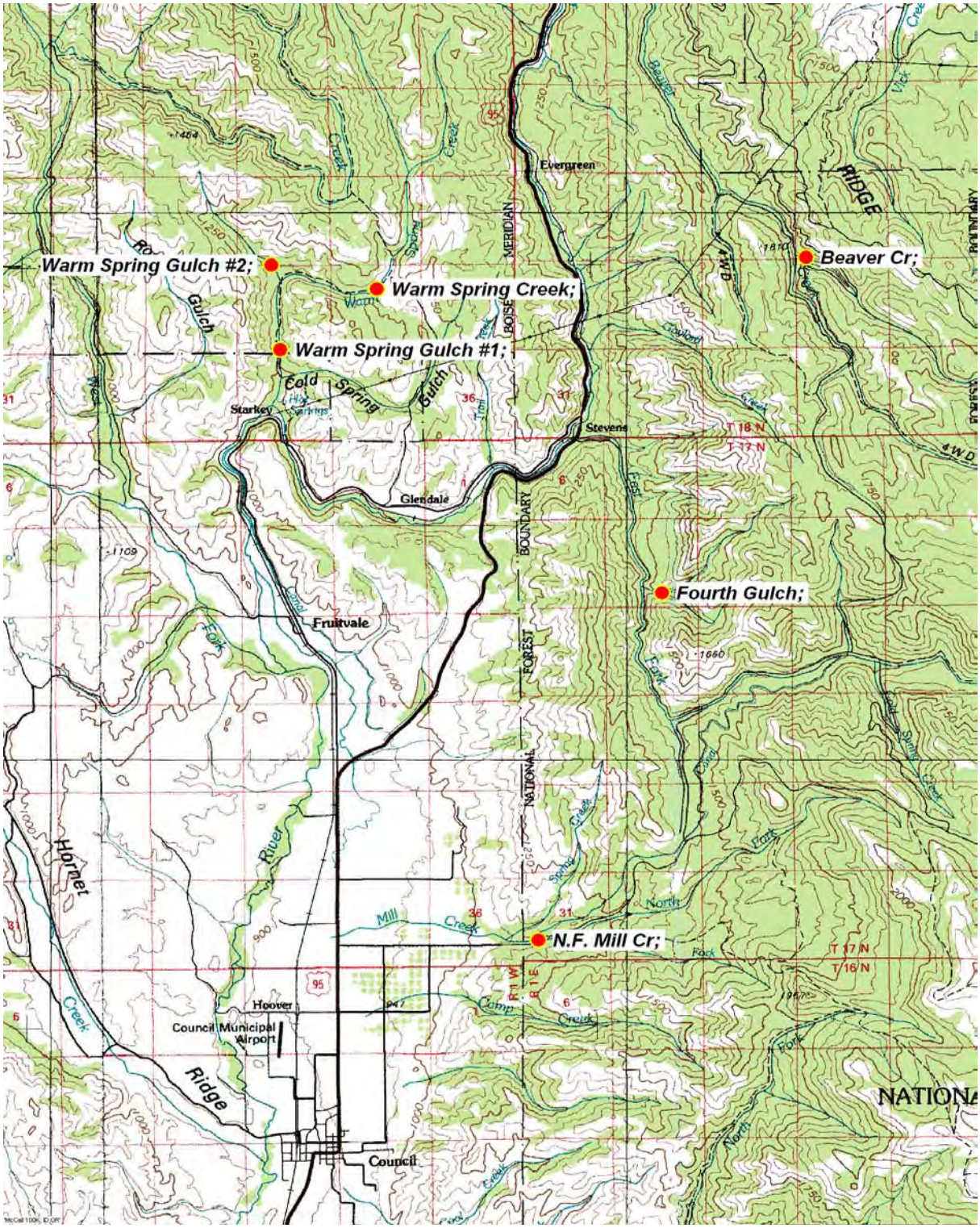


Figure 7. Locations of standard stream surveys sampled in 2007 in the Weiser River drainage.

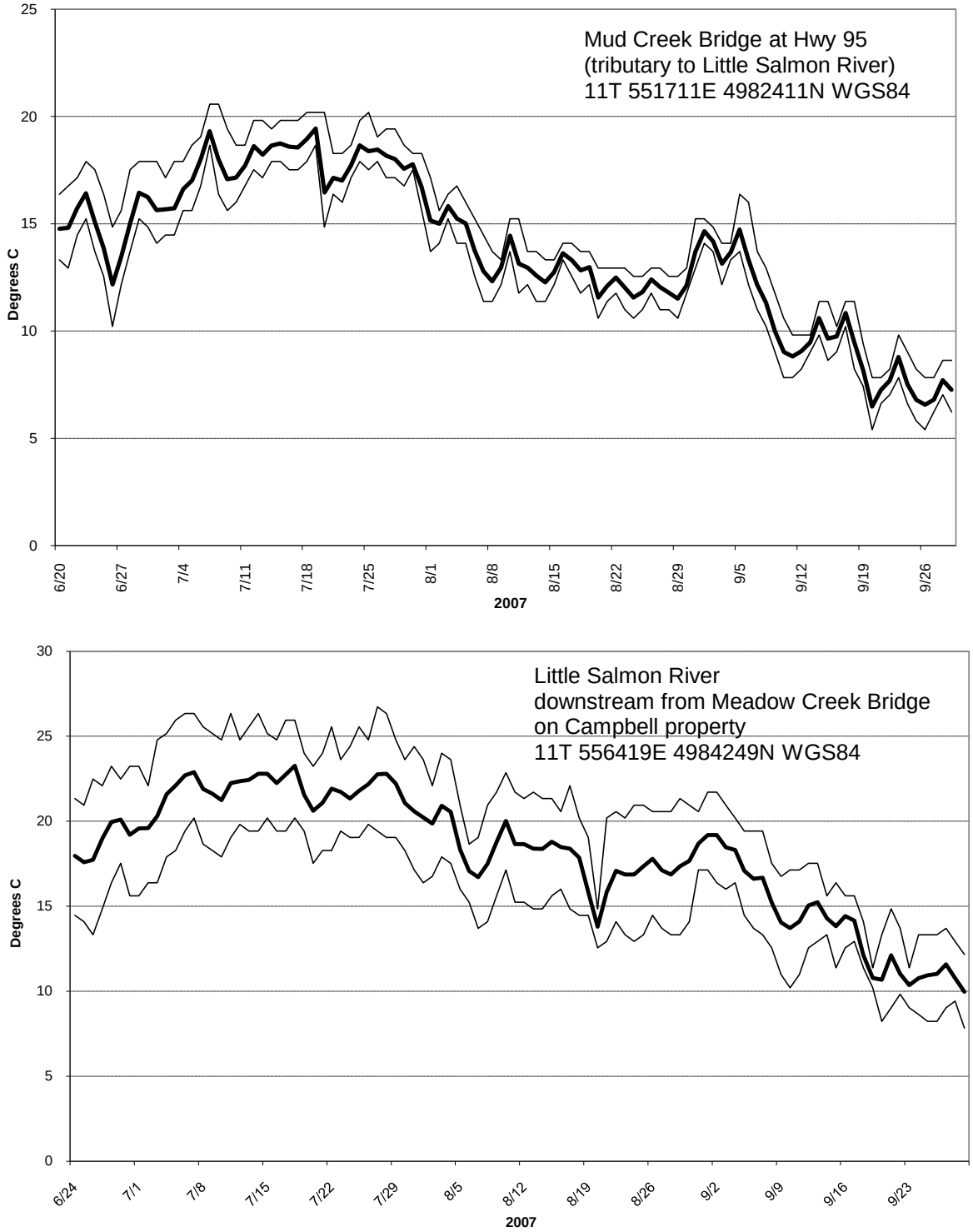


Figure 8. Daily mean, minimum, and maximum stream temperatures in Mud Creek and the upper Little Salmon River, 2007.

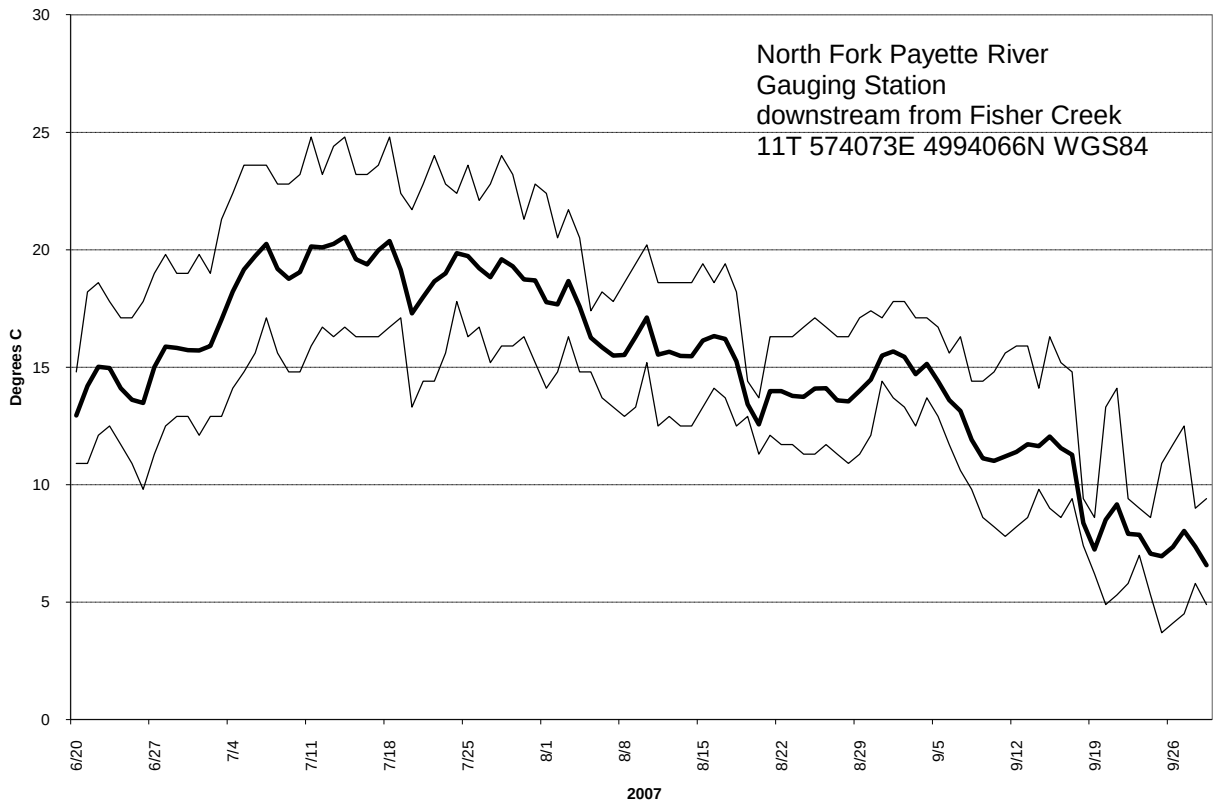
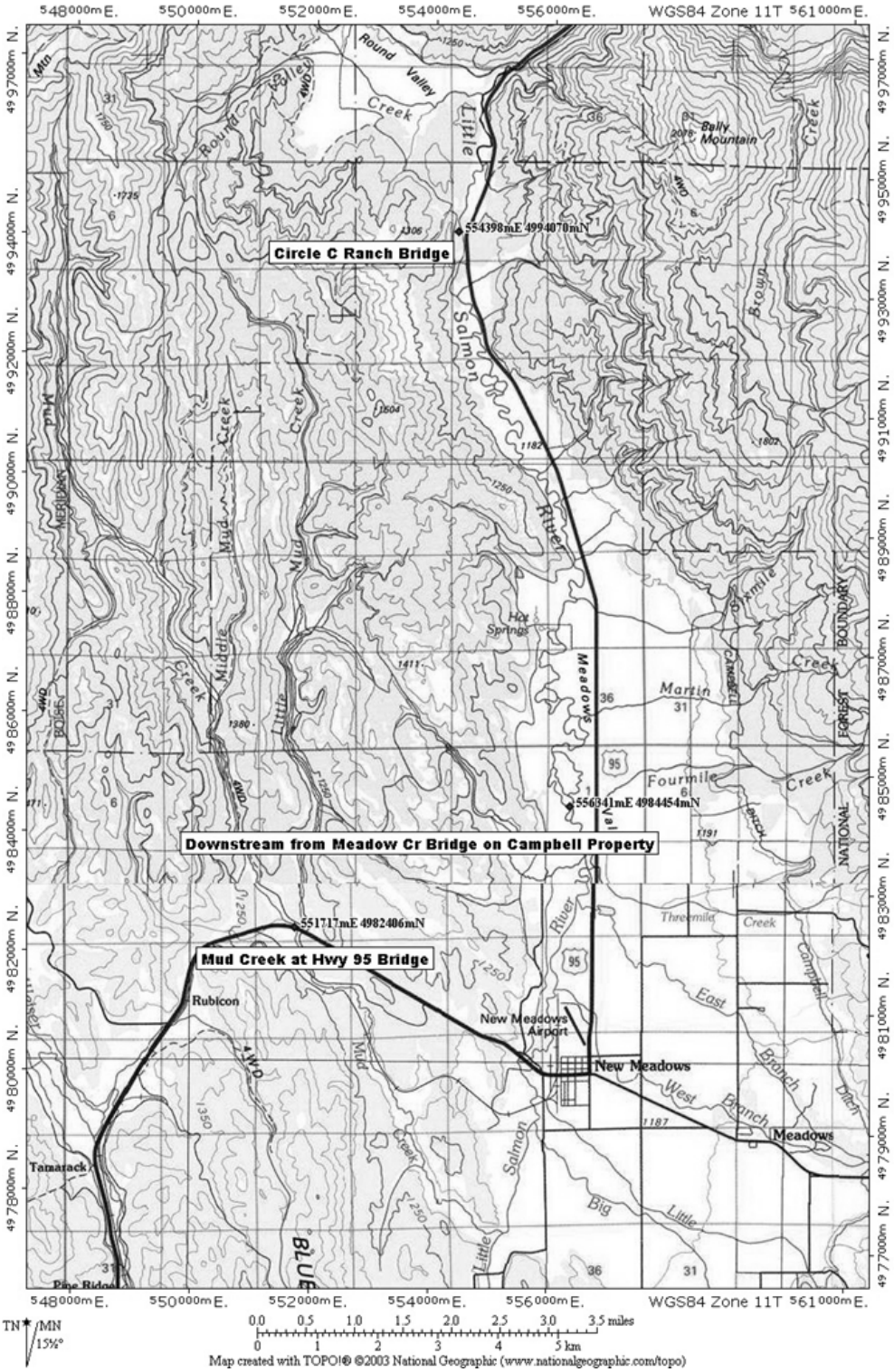


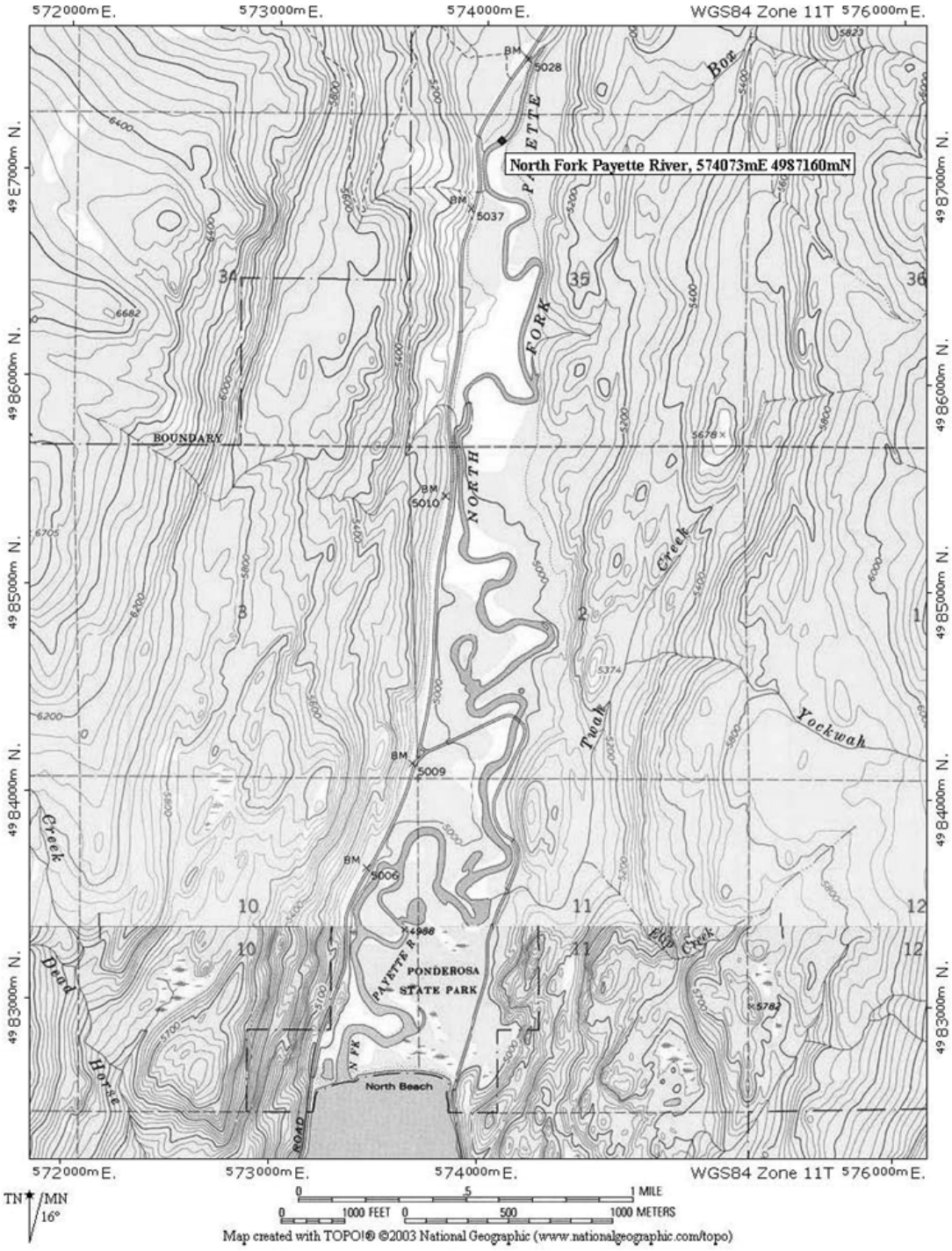
Figure 9. Daily mean, minimum, and maximum stream temperature in the upper North Fork Payette River at the USGS gauge downstream from Fisher Creek, 2007

APPENDICES

Appendix A. Location of the Hobo temperature recorders in the Little Salmon River and North Fork Payette River drainages, 2007.



Appendix A. Continued.



Appendix B. Daily mean, minimum, and maximum water temperature (C) in Mud Creek, tributary to Little Salmon River, at Highway 95 bridge, 2007.

Date	Mean	Minimum	Maximum	Date	Mean	Minimum	Maximum
6/20	14.8	13.3	16.4	8/10	14.4	13.7	15.2
6/21	14.8	12.9	16.8	8/11	13.1	11.8	15.2
6/22	15.7	14.5	17.1	8/12	12.9	12.2	13.7
6/23	16.4	15.2	17.9	8/13	12.6	11.4	13.7
6/24	15.1	13.7	17.5	8/14	12.3	11.4	13.3
6/25	13.8	12.6	16.4	8/15	12.7	12.2	13.3
6/26	12.2	10.2	14.9	8/16	13.6	13.3	14.1
6/27	13.5	12.2	15.6	8/17	13.3	12.6	14.1
6/28	15.0	13.7	17.5	8/18	12.8	11.8	13.7
6/29	16.4	15.2	17.9	8/19	13.0	12.2	13.7
6/30	16.3	14.9	17.9	8/20	11.6	10.6	12.9
7/1	15.6	14.1	17.9	8/21	12.1	11.4	12.9
7/2	15.7	14.5	17.1	8/22	12.5	11.8	12.9
7/3	15.7	14.5	17.9	8/23	12.0	11.0	12.9
7/4	16.6	15.6	17.9	8/24	11.6	10.6	12.6
7/5	17.0	15.6	18.7	8/25	11.8	11.0	12.6
7/6	18.0	16.8	19.0	8/26	12.4	11.8	12.9
7/7	19.3	18.7	20.6	8/27	12.0	11.0	12.9
7/8	18.0	16.4	20.6	8/28	11.8	11.0	12.6
7/9	17.1	15.6	19.4	8/29	11.5	10.6	12.6
7/10	17.2	16.0	18.7	8/30	12.1	11.8	12.9
7/11	17.7	16.8	18.7	8/31	13.7	12.9	15.2
7/12	18.6	17.5	19.8	9/1	14.7	14.1	15.2
7/13	18.2	17.1	19.8	9/2	14.2	13.7	14.9
7/14	18.6	17.9	19.4	9/3	13.1	12.2	14.1
7/15	18.7	17.9	19.8	9/4	13.7	13.3	14.1
7/16	18.6	17.5	19.8	9/5	14.7	13.7	16.4
7/17	18.6	17.5	19.8	9/6	13.3	12.2	16.0
7/18	18.9	17.9	20.2	9/7	12.2	11.0	13.7
7/19	19.4	18.7	20.2	9/8	11.3	10.2	12.9
7/20	16.5	14.9	20.2	9/9	10.0	9.0	11.8
7/21	17.1	16.4	18.3	9/10	9.0	7.8	10.6
7/22	17.0	16.0	18.3	9/11	8.8	7.8	9.8
7/23	17.7	17.1	18.7	9/12	9.1	8.2	9.8
7/24	18.7	17.9	19.8	9/13	9.5	9.0	9.8
7/25	18.4	17.5	20.2	9/14	10.6	9.8	11.4
7/26	18.5	17.9	19.0	9/15	9.6	8.6	11.4
7/27	18.2	17.1	19.4	9/16	9.8	9.0	10.2
7/28	18.0	17.1	19.4	9/17	10.8	10.2	11.4
7/29	17.6	16.8	18.7	9/18	9.5	8.2	11.4
7/30	17.8	17.5	18.3	9/19	8.2	7.4	9.4
7/31	16.7	15.6	18.3	9/20	6.5	5.4	7.8
8/1	15.2	13.7	17.1	9/21	7.2	6.6	7.8
8/2	15.0	14.1	15.6	9/22	7.7	7.0	8.2
8/3	15.8	15.2	16.4	9/23	8.8	7.8	9.8
8/4	15.2	14.1	16.8	9/24	7.5	6.6	9.0
8/5	15.0	14.1	16.0	9/25	6.8	5.8	8.2
8/6	13.8	12.6	15.2	9/26	6.6	5.4	7.8
8/7	12.8	11.4	14.5	9/27	6.8	6.2	7.8
8/8	12.3	11.4	13.7	9/28	7.7	7.0	8.6
8/9	12.9	12.2	13.3	9/29	7.3	6.2	8.6

Appendix C. Daily mean, minimum, and maximum water temperature (C) in the Little Salmon River, at Campbell property downstream from Meadow Creek Bridge, 2007.

Date	Mean	Minimum	Maximum	Date	Mean	Minimum	Maximum
6/24	18.0	14.5	21.3	8/12	18.6	15.2	21.3
6/25	17.6	14.1	21.0	8/13	18.4	14.9	21.7
6/26	17.7	13.3	22.5	8/14	18.4	14.9	21.3
6/27	19.0	14.9	22.1	8/15	18.8	15.6	21.3
6/28	20.0	16.4	23.2	8/16	18.5	16.0	20.6
6/29	20.1	17.5	22.5	8/17	18.4	14.9	22.1
6/30	19.2	15.6	23.2	8/18	17.9	14.5	20.2
7/1	19.6	15.6	23.2	8/19	15.8	14.5	19.0
7/2	19.6	16.4	22.1	8/20	13.8	12.6	14.9
7/3	20.3	16.4	24.8	8/21	15.8	12.9	20.2
7/4	21.6	17.9	25.2	8/22	17.1	14.1	20.6
7/5	22.1	18.3	26.0	8/23	16.9	13.3	20.2
7/6	22.7	19.4	26.3	8/24	16.9	12.9	21.0
7/7	22.9	20.2	26.3	8/25	17.4	13.3	21.0
7/8	21.9	18.7	25.6	8/26	17.8	14.5	20.6
7/9	21.6	18.3	25.2	8/27	17.1	13.7	20.6
7/10	21.2	17.9	24.8	8/28	16.9	13.3	20.6
7/11	22.2	19.0	26.3	8/29	17.4	13.3	21.3
7/12	22.4	19.8	24.8	8/30	17.7	14.1	21.0
7/13	22.4	19.4	25.6	8/31	18.7	17.1	20.6
7/14	22.8	19.4	26.3	9/1	19.2	17.1	21.7
7/15	22.8	20.2	25.2	9/2	19.2	16.4	21.7
7/16	22.2	19.4	24.8	9/3	18.5	16.0	21.0
7/17	22.7	19.4	26.0	9/4	18.3	16.4	20.2
7/18	23.3	20.2	26.0	9/5	17.1	14.5	19.4
7/19	21.6	19.4	24.0	9/6	16.6	13.7	19.4
7/20	20.6	17.5	23.2	9/7	16.7	13.3	19.4
7/21	21.1	18.3	24.0	9/8	15.2	12.6	17.5
7/22	21.9	18.3	25.6	9/9	14.0	11.0	16.8
7/23	21.7	19.4	23.6	9/10	13.7	10.2	17.1
7/24	21.3	19.0	24.4	9/11	14.1	11.0	17.1
7/25	21.8	19.0	25.6	9/12	15.1	12.6	17.5
7/26	22.2	19.8	24.8	9/13	15.2	12.9	17.5
7/27	22.8	19.4	26.7	9/14	14.3	13.3	15.6
7/28	22.8	19.0	26.3	9/15	13.8	11.4	16.4
7/29	22.2	19.0	24.8	9/16	14.4	12.6	15.6
7/30	21.1	18.3	23.6	9/17	14.1	12.9	15.6
7/31	20.6	17.1	24.4	9/18	12.1	11.4	14.1
8/1	20.2	16.4	23.6	9/19	10.8	10.2	11.4
8/2	19.9	16.8	22.1	9/20	10.7	8.2	13.3
8/3	20.9	17.9	24.0	9/21	12.1	9.0	14.9
8/4	20.6	17.5	23.6	9/22	11.0	9.8	13.7
8/5	18.3	16.0	21.0	9/23	10.4	9.0	11.4
8/6	17.1	15.2	18.7	9/24	10.8	8.6	13.3
8/7	16.7	13.7	19.0	9/25	10.9	8.2	13.3
8/8	17.5	14.1	21.0	9/26	11.0	8.2	13.3
8/9	18.8	15.6	21.7	9/27	11.6	9.0	13.7
8/10	20.0	17.1	22.9	9/28	10.8	9.4	12.9
8/11	18.6	15.2	21.7	9/29	10.0	7.8	12.2

Appendix D. Daily mean, minimum, and maximum water temperatures (C) in the North Fork Payette River at USGS gauge upstream from Fisher Creek, 2007.

Date	Mean	Minimum	Maximum	Date	Mean	Minimum	Maximum
6/20	13.0	10.9	14.8	8/10	17.1	15.2	20.2
6/21	14.2	10.9	18.2	8/11	15.5	12.5	18.6
6/22	15.0	12.1	18.6	8/12	15.7	12.9	18.6
6/23	15.0	12.5	17.8	8/13	15.5	12.5	18.6
6/24	14.1	11.7	17.1	8/14	15.5	12.5	18.6
6/25	13.6	10.9	17.1	8/15	16.1	13.3	19.4
6/26	13.5	9.8	17.8	8/16	16.3	14.1	18.6
6/27	15.0	11.3	19.0	8/17	16.2	13.7	19.4
6/28	15.9	12.5	19.8	8/18	15.3	12.5	18.2
6/29	15.8	12.9	19.0	8/19	13.4	12.9	14.4
6/30	15.7	12.9	19.0	8/20	12.6	11.3	13.7
7/1	15.7	12.1	19.8	8/21	14.0	12.1	16.3
7/2	15.9	12.9	19.0	8/22	14.0	11.7	16.3
7/3	17.0	12.9	21.3	8/23	13.8	11.7	16.3
7/4	18.2	14.1	22.4	8/24	13.7	11.3	16.7
7/5	19.2	14.8	23.6	8/25	14.1	11.3	17.1
7/6	19.7	15.6	23.6	8/26	14.1	11.7	16.7
7/7	20.3	17.1	23.6	8/27	13.6	11.3	16.3
7/8	19.2	15.6	22.8	8/28	13.5	10.9	16.3
7/9	18.8	14.8	22.8	8/29	14.0	11.3	17.1
7/10	19.1	14.8	23.2	8/30	14.5	12.1	17.4
7/11	20.1	15.9	24.8	8/31	15.5	14.4	17.1
7/12	20.1	16.7	23.2	9/1	15.7	13.7	17.8
7/13	20.3	16.3	24.4	9/2	15.4	13.3	17.8
7/14	20.5	16.7	24.8	9/3	14.7	12.5	17.1
7/15	19.6	16.3	23.2	9/4	15.1	13.7	17.1
7/16	19.4	16.3	23.2	9/5	14.4	12.9	16.7
7/17	20.0	16.3	23.6	9/6	13.6	11.7	15.6
7/18	20.4	16.7	24.8	9/7	13.1	10.6	16.3
7/19	19.1	17.1	22.4	9/8	11.9	9.8	14.4
7/20	17.3	13.3	21.7	9/9	11.1	8.6	14.4
7/21	18.0	14.4	22.8	9/10	11.0	8.2	14.8
7/22	18.7	14.4	24.0	9/11	11.2	7.8	15.6
7/23	19.0	15.6	22.8	9/12	11.4	8.2	15.9
7/24	19.9	17.8	22.4	9/13	11.7	8.6	15.9
7/25	19.7	16.3	23.6	9/14	11.6	9.8	14.1
7/26	19.2	16.7	22.1	9/15	12.0	9.0	16.3
7/27	18.8	15.2	22.8	9/16	11.6	8.6	15.2
7/28	19.6	15.9	24.0	9/17	11.3	9.4	14.8
7/29	19.3	15.9	23.2	9/18	8.4	7.4	9.4
7/30	18.7	16.3	21.3	9/19	7.2	6.2	8.6
7/31	18.7	15.2	22.8	9/20	8.5	4.9	13.3
8/1	17.8	14.1	22.4	9/21	9.2	5.3	14.1
8/2	17.7	14.8	20.5	9/22	7.9	5.8	9.4
8/3	18.7	16.3	21.7	9/23	7.9	7.0	9.0
8/4	17.6	14.8	20.5	9/24	7.1	5.3	8.6
8/5	16.3	14.8	17.4	9/25	7.0	3.7	10.9
8/6	15.9	13.7	18.2	9/26	7.4	4.1	11.7
8/7	15.5	13.3	17.8	9/27	8.0	4.5	12.5
8/8	15.5	12.9	18.6	9/28	7.4	5.8	9.0
8/9	16.3	13.3	19.4	9/29	6.6	4.9	9.4

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