



**FEDERAL AID IN FISH RESTORATION  
1998 Job Performance Report  
Project F-71-R-23**

**Steve Huffaker, Director**

**REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS  
CLEARWATER REGION (Subprojects I-B, II-B, III-B)**

**SUBPROJECT I. SURVEYS AND INVENTORIES**

- Job a. Clearwater Region Mountain Lakes Investigations**
- Job b. Clearwater Region Lowland Lakes Investigations**
- Job c. Clearwater Region Rivers and Streams Investigations**

**SUBPROJECT II. TECHNICAL GUIDANCE**

**SUBPROJECT III. HABITAT MANAGEMENT**

**By**

**Tim Cochnauer, Regional Fishery Manager  
Patrick D. Murphy, Fishery Technician  
Ed Schriever, Regional Fishery Biologist  
Jody Brostrom, Regional Fishery Biologist**

**May 2003  
IDFG 01-19**

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## ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management

Project I: Surveys and Inventories

Subproject I-A: Clearwater Region

Job: a

Title: Mountain Lakes Investigations

Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

Thirty-three mountain lakes were surveyed in the Clearwater National Forest July through September 1998. An additional five lakes in the North Fork Clearwater River drainage were re-surveyed three times each as part of two ongoing graduate projects. These projects are investigating the impacts of introduced fish on zooplankton and amphibian communities. Of the 33 lakes surveyed, 12 were on the active stocking schedule. Eight of these lakes have been removed from the list, leaving Black, Junction, Kid and Mallard lakes on the fish stocking schedule.

Authors:

Tim Cochnauer  
Regional Fishery Manager

Patrick D. Murphy  
Fishery Technician

## INTRODUCTION

The High Lakes Fisheries Project was initiated as a cooperative program of the U.S. Forest Service and the Idaho Department of Fish and Game (IDFG) in 1986. Lewis-Clark State College (Lewiston, Idaho) became a cooperating partner in 1994. The goal of the program is to develop baseline ecological data on lakes within the Clearwater River drainage of northcentral Idaho. During the period 1986 through 1998, 377 individual mountain lakes were surveyed in the Clearwater and Nez Perce National forests (Bahls 1990, Bahls 1992, Cochnauer and Phillips 1994, Cochnauer and Murphy 1996, Cochnauer and Murphy 1997, Cochnauer and Murphy 1998). Of these, 190 lakes are in the Nez Perce National Forest and 187 in the Clearwater National Forest.

In 1998, the project continued in the Clearwater National Forest as a partnership between the Clearwater National Forest and the IDFG. The Clearwater National Forest and the IDFG provided funding for the project. This report presents the findings for the 33 lakes surveyed in 1997. Lakes are located in North Fork Clearwater River drainage. In addition to these 33 lakes, five lakes in the Lochsa River drainage were resurveyed as part of multiple-year graduate projects investigating impacts of introduced fish on zooplankton and amphibian populations. These lakes are North Shoot, West Brushy, Northeast Colt, South Walton and Grouse. Northeast Colt and West Brushy lakes are the control lakes, while North Shoot, South Walton and Grouse lakes each received stocking of cutthroat trout *Oncorhynchus clarki lewisi* fry in 1997. The findings of these two graduate studies will be reported separately at the end of the studies.

## OBJECTIVES

The objectives of the 1998 survey were to obtain, analyze, and summarize data to be used for:

1. Biological, physical, and chemical inventory of mountain lakes.
2. Long-term monitoring.
3. Ecological effect of fish introductions.
4. Development of fish management guidelines for individual lakes.

## METHODS

The standardized high mountain lake survey methodology as described by Bahls (1991) was used to survey 33 mountain lakes located in the North Fork Clearwater River drainage (Figure 1) from July 1 to September 30, 1998.

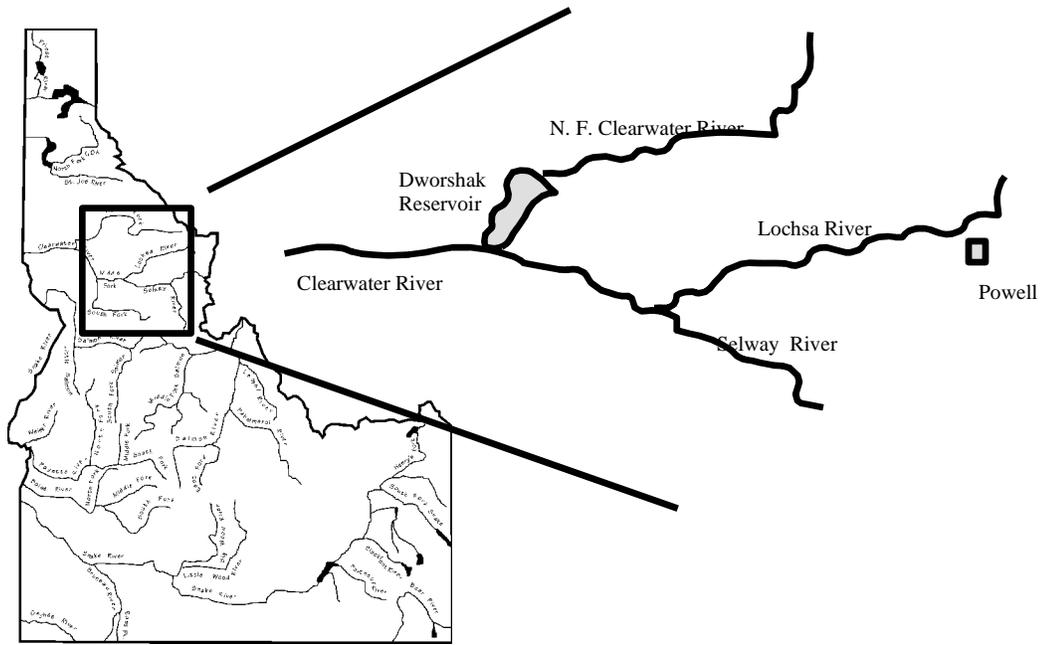


Figure 1. General location of high mountain lakes surveyed in Clearwater National Forest, 1998.

Table 1. Location and proposed management direction for mountain lakes surveyed in the Clearwater National Forest, 1998.

Lake Name	Legal Description			FSY	Class	PSY	Stock	Int.
	Township	Range	Sec.					
Bald Mountain Lake	36N	10E	16	1937	IIa	--	--	--
Berry Lake	42N	9E	25	--	Ib	--	--	--
Black Lake	41N	7E	23	1975	IVb	2000	Ct-750	3
Cliff Lake	41N	8E	19	1982	IIa	--	--	--
Fly Lake	41N	10E	20	--	IIa	--	--	--
Gem Lake	38N	10E	33	--	Ib	--	--	--
Goat Lake	38N	13E	4	1977	IIa	--	--	--
Johnagen Lake	37N	9E	9	--	Ib	--	--	--
Jug Lake	42N	7E	34	1983	Ib	--	--	--
Junction Lake	39N	9E	36	1974	IVb	2000	Ct-1000	3
Kelly Lake	40N	13E	32	1971	IIb	--	--	--
Kid Lake	40N	13E	27	1971	IVb	2000	Ct-1000	3
Leo Lake	39N	13E	12	1972	IIa	--	--	--
Lookout Lake	38N	10E	29	--	Ib	--	--	--
Lost Lake #1	38N	13E	18	--	IIa	--	--	--
Lost Lake #2	38N	13E	24	--	Ib	--	--	--
Lost Lake #3	38N	13E	24	--	Ib	--	--	--
Mallard Lake	42N	7E	36	1970	IVb	2000	Ct-500	3
Monroe Lake	37N	10E	16	1969	Ib	--	--	--
Nub Lake, North	41N	8E	29	--	Ib	--	--	--
Nub Lake, South	41N	8E	31	--	Ib	--	--	--

Table 1. Continued.

Lake Name	Legal Description			FSY	Class	PSY	Stock	Int.
	Township	Range	Sec.					
Platinum Lake	41N	9E	1	--	Ila	--	--	--
Rocky Ridge Lake	36N	8E	20	1952	Ila	--	--	--
Scurvy Lake	39N	11E	30	--	Ib	--	--	--
Seed Lake	42N	9E	25	--	Ib	--	--	--
Slide Lake	41N	8E	19	--	Ib	--	--	--
Smith Creek Lake	37N	9E	22	--	Ib	--	--	--
Smokey Lake	39N	13E	12	1980	Ilb	--	--	--
Steve Lake	41N	8E	20	--	Ib	--	--	--
Unnamed Lake	42N	9E	36	--	Ib	--	--	--
Williams Lake	38N	13E	11	1971	Ila	--	--	--
Williams Lake, NE	38N	13E	2	--	Ib	--	--	--
William Peak Lake	38N	13E	11	--	Ib	--	--	--

FSY-First year stocked; PSY-Proposed next stocking year; Int-Proposed stocking interval; Class Ib-fishless lake with no past stocking record; Ilb-stocked lake with questionable survival; Ila-natural trout reproduction at moderate or high level; IVb-stockable lake; V-further study needed to determine status of natural reproduction.

## RESULTS AND DISCUSSION

The location, description, and proposed management direction based on information collected for each lake are presented in Table 1. Of the 33 lakes initially surveyed, 16 supported fish populations. Amphibians, spotted frog *Rana lutiventris* and long-toed salamander *Ambystoma macrodactylum*, populations were observed in almost all of the lakes. Salamanders were absent or in small numbers in lakes that supported fish. Individual lake narratives, including management prescriptions, follow.

### **Bald Mountain Lake**

Bald Mountain Lake is a medium-sized, relatively deep lake that supports a naturally reproducing population of rainbow trout *O. mykiss*. Spotted frogs were abundant, but no long-toed salamanders were observed. Fish stocking in this lake is not recommended because of the level of natural reproduction.

### **Berry Lake**

Berry Lake is a small (<0.5 ha), relatively deep lake with no fish. No spotted frogs and only one long-toed salamander were observed. Planting records show that Berry Lake was stocked only once in 1969 with rainbow trout. Because of the small nature of Berry Lake, fish stocking is not recommended.

### **Black Lake**

Black Lake is a medium-sized, deep lake that supports trout at low density. Both rainbow and cutthroat trout were found in the lake, but no natural reproduction was evident. A few spotted frogs and long-toed salamanders were observed. Stocking of cutthroat trout (750 fry) should be continued in 2000 on a three-year rotation.

### **Cliff Lake**

Cliff Lake is a long, narrow, deep lake that supports a naturally reproducing population of cutthroat trout. With the high density of fish, the body condition was low. Less than ten spotted frog adults were observed at the time of survey. Fish stocking in Cliff Lake is not recommended because of adequate natural reproduction.

### **Fly Lake**

Fly Lake is a medium-sized, shallow (85% <3 m) lake that supports a population of naturally reproducing brook trout *Salvelinus fontinalis*. Adult and juvenile spotted frogs were observed. Fish stocking in Fly Lake is not recommended because of natural reproduction of brook trout.

### **Gem Lake**

Gem Lake is a medium-sized, shallow lake (100% <3m) that is fishless. Spotted frogs and long-toed salamanders were abundant. Fish stocking in Gem Lake is not recommended because of its shallow nature.

### **Goat Lake**

Goat Lake is a medium-sized, shallow (80% <3 m) lake that supports naturally reproducing cutthroat trout. Spotted frogs were abundant. Fish stocking in Goat Lake is not recommended because of its shallow nature.

### **Johnagan Lake**

Johnagan Lake is a small lake that was dry at the time of the survey. Fish stocking in Johnagan Lake is not recommended due to it being periodically dry.

### **Jug Lake**

Jug Lake is a small, shallow (100% <3 m) lake that is fishless. Both spotted frogs and long-toed salamanders were abundant. Fish stocking in Jug Lake is not recommended because of its shallow nature.

### **Junction Lake**

Junction Lake is a medium-sized lake that supports cutthroat trout by stocking only. There were no spotted frogs and only one long-toed salamander observed. Stocking of cutthroat trout (1,000 fry) should be continued in 2000 on a three-year rotation.

### **Kelly Lake**

Kelly Lake is a medium-sized, relatively shallow (65% <3 m) lake with no fish. Cutthroat trout have been stocked irregularly since 1965 but with questionable survival. There is an abundant spotted frog population. Fish stocking is not recommended for Kelly Lake because of historically poor fish survival.

### **Kid Lake**

Kid Lake is a medium-sized lake with a low density of cutthroat trout. Natural reproduction is non-existent. Spotted frog numbers were high with over 1000 juveniles observed. One long-toed salamander was observed. Fish stocking of 1000 cutthroat trout fry should be continued in 2000 on a three-year rotation.

### **Leo Lake**

Leo Lake is a large, deep mountain lake that has a naturally reproducing cutthroat trout population. Only a few spotted frogs were observed in the lake. Fish stocking in Leo Lake is not recommended because of the natural reproduction level.

### **Lookout Lake**

Lookout Lake is a small, deep lake that is fishless. Long-toed salamanders were abundant and a few spotted frogs were observed. Fish stocking in Lookout Lake is not recommended because of its small nature.

### **Lost Lake #1**

Lost Lake #1 is a small, relatively shallow (90% <3 m) lake that supports naturally reproducing cutthroat trout that can enter the lake via Cayuse Creek. Only spotted frogs were observed in the survey. Fish stocking is not recommended for Lost Lake #1 because of the existing natural reproduction and the access to Cayuse Creek.

### **Lost Lake #2**

Lost Lake #2 is a long, shallow lake that is connected to Lakes #1 and #3. As with the other lakes, this lake supports naturally reproducing cutthroat trout. Spotted frogs are common, but no long-toed salamanders were observed. Fish stocking is not recommended for Lost Lake #2 because of the existing natural reproduction and access to Cayuse Creek.

### **Lost Lake #3**

Lost Lake #3 is connected to the other two Lost lakes and supports natural cutthroat trout populations. Spotted frogs are abundant, but no long-toed salamanders were observed. Fish stocking is not recommended for Lost Lake #2 because of the existing natural reproduction and the access to Cayuse Creek.

### **Mallard Lake**

Mallard Lake is a small, fairly deep lake that supports a low density of cutthroat trout from previous stockings. Spawning potential in the inlet and outlet streams is nonexistent. Spotted frogs and long-toed salamanders were observed in the survey. Stocking of cutthroat trout should be continued in 2000 at the rate of 500 fry on a three-year rotation.

### **Monroe Lake**

Monroe Lake is a medium-sized, shallow (100% <3 m) lake with no fish even though there is a history of stocking. Both spotted frogs and long-toed salamanders were abundant. Fish stocking in Monroe Lake is not recommended because of its shallow nature.

### **Nub Lake, North**

North Nub Lake is a small lake that is fishless. Both spotted frogs and long-toed salamanders were observed. Because of its small size, fish stocking is not recommended.

### **Nub Lake, South**

South Nub Lake is a medium-sized, shallow (100% <3 m) lake that is fishless. Both spotted frogs and long-toed salamanders were abundant. Because of its shallow nature, fish stocking is not recommended.

### **Platinum Lake**

Platinum Lake is a medium-sized, shallow lake that supports a naturally reproducing brook trout population. Spotted frog juveniles were abundant, but no long-toed salamanders were observed. Fish stocking in Platinum Lake is not recommended because of the naturally reproducing brook trout.

### **Scurvy Lake**

Scurvy Lake is a relatively small, shallow (85% <3 m) lake that is fishless. Spotted frogs and long-toed salamanders were abundant. Because of its shallow nature, fish stocking is not recommended.

### **Rocky Ridge Lake**

Rocky Ridge Lake is a medium-sized, deep lake that supports a naturally reproducing population of brook trout. Long-toed salamanders were not observed during the survey, but spotted frogs were abundant. Fish stocking in Rocky Ridge Lake is not recommended because of the naturally reproducing brook trout.

### **Seed Lake**

Seed Lake is a small, shallow (100% <3 m) lake that is fishless. Spotted frogs and long-toed salamanders were present during the survey. Because of its shallow nature, fish stocking is not recommended for Seed Lake.

### **Slide Lake**

Slide Lake is a small, shallow (100% <3 m) lake that is fishless. Both spotted frogs and long-toed salamanders were abundant. Because of its shallow nature, fish stocking is not recommended for Slide Lake.

### **Smith Creek Lake**

Smith Creek Lake was dry at the time of the survey. Three spotted frog juveniles were observed at the location of the lake. Fish stocking is not recommended for Smith Creek Lake.

### **Smokey Lake**

Smokey Lake is a small, shallow (100% <3 m) lake that supports a population of cutthroat trout. No amphibians were observed during the survey. Because of its shallow nature, fish stocking is not recommended for Smokey Lake.

### **Steve Lake**

Steve Lake is a small, shallow (100% <3 m) lake that is fishless. Both spotted frogs and long-toed salamanders were observed during the survey. Fish stocking is not recommended for Steve Lake because of its shallow nature.

### **Unnamed Lake**

Unnamed Lake is a small, shallow (100% <3 m) lake located in the Meadow Creek drainage of the North Fork Clearwater River. There are no fish in this lake. A few spotted frogs and long-toed salamanders were observed. Fish stocking in this lake is not recommended because of Unnamed Lake's shallow nature.

### **Williams Lake**

Williams Lake is a medium-sized, shallow (75% <3 m) lake that supports a naturally reproducing population of cutthroat trout. Spotted frogs were fairly abundant, but no long-toed salamanders were observed. Fish stocking in Williams Lake is not recommended because of the naturally reproducing cutthroat trout.

### **Williams Lake, Northeast**

Northeast Williams Lake is a medium-sized, shallow (100% <3 m) fishless lake that supports abundant numbers of spotted frogs and long-toed salamanders. Fish stocking in Williams Lake, Northeast is not recommended because of its shallow nature.

### **Williams Peak Lake**

Williams Peak Lake is a medium-sized, shallow (100% <3 m) lake that is fishless. Neither spotted frogs nor long-toed salamanders were observed during the survey. Fish stocking in Williams Peak Lake is not recommended because of its shallow nature.

## LITERATURE CITED

- Bahls, P. 1990. Report of the High Lakes Fisheries Project, Nez Perce National Forest. Nez Perce National Forest publ., Idaho.
- Bahls, P. 1991. A Survey Methodology for High Mountain Lakes. High Lakes Fisheries Project. Nez Perce National Forest and Idaho Department of Fish and Game. Boise, Idaho.
- Bahls, P. 1992. Report of the High Lakes Fisheries Project, Clearwater National Forest. Clearwater National Forest and Idaho Department of Fish and Game. Boise, Idaho.
- Cochnauer, T. and L. Phillips. 1994. Report of the High Lakes Fisheries Project in the Clearwater National Forest, 1994, Idaho Department of Fish and Game. Boise, Idaho.
- Cochnauer, T. and P. Murphy. 1996. Report of the High Lakes Fisheries Project in the Clearwater National Forest, 1995, Idaho Department of Fish and Game. Boise, Idaho.
- Cochnauer, T. and P. Murphy. 1997. Report of the High Lakes Fisheries Project in the Clearwater National Forest, 1996, Idaho Department of Fish and Game. Boise, Idaho.
- Cochnauer, T. and P. Murphy. 1998. Report of the High Lakes Fisheries Project in the Clearwater National Forest, 1997, Idaho Department of Fish and Game. Boise, Idaho.

## JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management

Project 1: Surveys and Inventories

Subproject 1-B: Clearwater Region

Job: b

Title: Lowland Lakes Investigations

Contract Period: July 1, 1998 to June 30, 1999

### ABSTRACT

Stocking approximately 629,600 fingerling and 245,808 catchable size fish into lowland lakes, reservoirs, and ponds enhanced resident fish populations and sport fishing in the Clearwater Region. Clearwater Region personnel distributed 410 bluegill *Lepomis macrochirus*, and 212 largemouth bass *Micropterus salmoides* (<180 mm) to local farm pond owners for private pond stocking. These fish were collected from Spring Valley Reservoir on May 22, 1998. Clearwater Region personnel collected 1,156 black crappie *Pomoxis nigromaculatus* from Mann Lake and traded them to Washington Department of Fisheries for 150 tiger muskie *Esox lucius* X *E. masquinongy*.

Clearwater Region fisheries management personnel and conservation officers checked 736 anglers that spent 1,547 hours fishing lakes, ponds and reservoirs and caught 1,515 game fish in 1998. Creel checks at Winchester Lake indicate that recently, illegally introduced black crappie accounted for 63% of all fish checked in 1998, surpassing rainbow trout *Oncorhynchus mykiss* as the primary game fish for the first time in decades. Rainbow trout, kokanee *O. nerka* and smallmouth bass *M. dolomieu* accounted for 44, 34 and 22%, respectively, of the fish checked from Dworshak Reservoir in 1998. This represents a dramatic shift from a typically kokanee dominated fishery in the 1990s. This change is likely the result of increased rainbow trout stocking in response to low kokanee numbers caused by entrainment losses estimated at over 1 million kokanee during flood control operations in 1996. As a result of low kokanee numbers, average total length of kokanee caught in Dworshak Reservoir was 351.4 mm (14 inches), the largest in the 1990s.

Moose Creek Reservoir was drained for physical renovation. We utilized heavy equipment to reshape the bottom, creating two islands, three reefs, and deep-water habitat. The goal of the renovation was to reduce nuisance aquatic macrophytes by 30%.

Author:

Ed Schriever  
Regional Fishery Biologist

## OBJECTIVES

1. Utilize hatchery raised fish to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction or excessive fishing pressure or both.
2. Move naturally produced fish from other waters to provide or enhance fish populations for sport fishing in waters that are limited by a lack of reproduction, excessive fishing pressure, or both.
3. Control, eradicate, or remove undesirable fish from regional waters.
4. Conduct routine, impromptu creel surveys on lowland lakes and reservoirs to track fisheries composition and catch rate.
5. Monitor stock structure of largemouth bass *Micropterus salmoides* in Spring Valley Reservoir.
6. Monitor stock structure of smallmouth bass *M. dolomieu* in Dworshak Reservoir.

## METHODS

We use tanker trucks of various sizes and standard stocking techniques to stock fish in streams, lakes, ponds and reservoirs. We collect fish for transplanting using standard electrofishing, trapping and netting techniques.

We sampled fish in lowland lakes using pulsed D.C. current from a portable generator and a Coffelt VVP-2E pulsator. Booms and electrodes were mounted on a 16-foot johnboat. All electrofishing took place between 2000 hours and 0300 hours. We sampled trout and kokanee *Oncorhynchus nerka* in lowland lakes using gill nets. We used standard floating experimental gill nets 150 feet long by 6 feet deep with six panels of different size mesh. Mesh sizes were 3/4 in, 1 in, 1-1/4 in, 1-1/2 in, 2 in, and 2-1/2 in. One or two nets were set and fished from late afternoon until early the next morning. Total net hours were recorded with the catch.

## RESULTS

### **Fish Stocking and Population Management**

We enhanced resident fish populations and sport fishing in lowland lakes and reservoirs of the Clearwater Region by stocking approximately 145,000 fingerling size rainbow trout *O. mykiss* and 484,680 fingerling size kokanee salmon in 1998 (Table 1). Lakes, ponds and reservoirs were stocked with 245,808 catchable size rainbow trout in 1998 (Table 2).

Clearwater Region personnel distributed 410 bluegill sunfish *Lepomis macrochirus* and 212 largemouth bass to 16 local farm pond owners for private pond stocking. These fish were collected during routine population sampling in Spring Valley Reservoir. Only bass less than 180 millimeters and bluegill sunfish less than 150 millimeters were distributed to farm pond owners.

Table 1. Fingerling rainbow trout and kokanee salmon stocked in the lowland lakes and reservoirs of the Clearwater Region, 1998.

Water	Month	Rainbow trout	Kokanee salmon	Total
Dworshak Reservoir	May		484,600	484,600
Mann Lake	May	55,000		55,000
Soldiers Meadow Reservoir	May	10,000		10,000
Spring Valley Reservoir	May	30,000		30,000
Waha Lake	May	15,000		15,000
Winchester Lake	May	35,000		35,000
Total		145,000	484,600	629,600

Table 2. Catchable size trout stocked in lakes, ponds, and reservoirs of the Clearwater Region, 1998.

Water	March	April	May	June	July	August	September	October	Total
Camp Grizzly Pond				500					500
Campbell's Pond		3,000	1,120	1,950				1,250	7,320
Dworshak Reservoir		9,800	18,840						28,640
Elk Creek Reservoir		11,200	10,800	10,000				5,250	37,250
Fenn Pond			494	940	553	500	440		2,927
Five Mile Pond			532	1,600	512				2,644
Henrys Gulch Pond				1,500					1,500
Hordeman Pond		266					150		416
Karolyns Pond			980	1,825			133		2,938
Levee Pond	400	400	190	200				500	1,690
Mann Lake	5,000	24,858							29,858
Moose Creek Reservoir		5,140							5,140
Powell Pond			1,470	1,000			440		2,910
Robinson Pond		1,000	1,092	1,760				1,250	5,102
Soldiers Meadow Reservoir		5,005		6,375				2,625	14,005
Spring Valley Reservoir	5,000	15,058		10,380				13,750	44,188
Waha Lake		4,200	5,420 <sup>a</sup>					3,250	12,870
Wilkins Pond				250					250
Winchester Lake	5,000	15,050		7,585				18,025 <sup>b</sup>	45,660
Total	15,400	94,977	40,938	45,865	1,065	500	1,163	45,900	245,808

All fish are rainbow trout except:

<sup>a</sup> includes 2,000 splake *S. fontinalis* X *S. namaycush*

<sup>b</sup> includes 5,400 cutthroat trout.

Clearwater Region personnel collected 1,156 black crappie *Pomoxis nigromaculatus* from Mann Lake during April and May 1998. The crappie were collected with electrofishing gear and trap nets and were traded to Washington Department of Fisheries for 150 tiger muskie *Esox lucius* X *E. masquinongy*. Existing populations of tiger muskie in Spring Valley Reservoir and Winchester Lake were supplemented with 50 fish each.

### **Creel Census**

Clearwater Region fisheries management personnel and conservation officers checked 736 anglers that spent 1,547 hours fishing lakes, ponds and reservoirs and caught 1,515 game fish in 1998 (Table 3). These sport fisheries provided a catch rate of 0.98 fish per hour. Salmonid fishes accounted for 69.3% of the catch. The remaining 30.7% of the catch was made up of black crappie, smallmouth bass, yellow perch *Perca flavescens*, bluegill sunfish, and largemouth bass.

Black crappie and yellow perch were recently illegally introduced into Winchester Lake. Black crappie, rainbow trout and yellow perch accounted for 63, 27 and 10 percent of all fish checked from Winchester Lake in 1998, respectively (Table 3). This represents the first time in decades that rainbow trout have been surpassed as the primary game fish in Winchester Lake.

Rainbow trout, kokanee, and smallmouth bass accounted for 44, 34, and 22 percent, respectively, of the fish checked from Dworshak Reservoir in 1998. This represents a dramatic shift from a typically kokanee dominated fishery in the 1990s (Figure 1). This change is likely the result of increased rainbow trout stocking in response to low kokanee numbers caused by entrainment losses of over 1 million kokanee during flood control operations in 1996. As a result of low kokanee numbers, average total length of kokanee caught in Dworshak Reservoir was 351.4 mm, the largest in the 1990s (Figure 2). Based on the total length frequency of rainbow trout harvested from Dworshak Reservoir in 1998 it appears that the 220 to 245 mm (9-10 inch) trout stocked in 1997 grew well and survived to contribute to the 1998 fishery (Figure 3). Ninety-four percent of the smallmouth bass caught in Dworshak reservoir in 1998 were less than 305 mm (12 in; Figure 4).

### **Population Monitoring**

On May 22, 1998 we sampled Spring Valley Reservoir with electrofishing gear to monitor the largemouth bass population. We collected 251 bass with an average length of 173 mm (7 in). Proportional Stock Density (PSD) was estimated at 40. This represents a 36-point reduction in PSD from 1997 and the sixth straight year of PSD of 40 or higher (Table 4).

### **Dworshak Reservoir**

We electrofished selected shoreline transects as part of our annual smallmouth bass monitoring in Dworshak Reservoir on May 25, 1998. We collected 139 smallmouth bass in these transects, the fewest since monitoring began in 1994. We estimated the PSD of this sample at 3, also the lowest since sampling began in 1994 (Figure 5).

Table 3. Impromptu creel census on lowland lakes in Clearwater Region, 1998.

Water/ Date	Number Anglers	Total Hours	Rainbow trout	Brook trout	Bluegill sunfish	Large- mouth bass	Small- mouth bass	Kokanee salmon	Yellow perch	Bull trout	Black crappie	Total	CPUE
<u>Crooked River Dredge Ponds</u>													
1-Aug	11	7	14	0	0	0	0	0	0	0	0	14	2.00
<u>Dworshak Reservoir</u>													
1-Apr	11	32	4	0	0	0	0	1	0	0	0	5	0.16
11-Jun	4	12	0	0	0	0	0	0	0	0	0	0	0.00
14-Jun	10	48	14	0	0	0	0	11	0	0	0	25	0.52
15-Jun	9	38	10	0	0	0	14	3	0	0	0	27	0.71
16-Jun	10	37	9	0	0	0	3	2	0	0	0	14	0.38
17-Jun	11	43	27	0	0	0	0	17	0	0	0	44	1.02
18-Jun	9	38	19	0	0	0	0	0	0	0	0	19	0.50
19-Jun	8	29	10	0	0	0	5	6	0	0	0	21	0.72
20-Jun	2	3	0	0	0	0	0	2	0	0	0	2	0.67
22-Jun	6	29	15	0	0	0	5	3	0	0	0	23	0.79
23-Jun	5	22	6	0	0	0	9	3	0	0	0	18	0.82
28-Jun	3	12	0	0	0	0	0	12	0	0	0	12	1.00
29-Jun	2	4	0	0	0	0	0	6	0	0	0	6	1.50
1-Jul	5	18	10	0	0	0	8	8	0	0	0	26	1.44
2-Jul	7	19	9	0	0	0	2	7	0	0	0	18	0.95
5-Jul	9	21	1	0	0	0	0	6	0	0	0	7	0.33
6-Jul	7	32	9	0	0	0	5	11	0	0	0	25	0.78
10-Jul	7	24	9	0	0	0	5	9	0	0	0	23	0.96
12-Jul	2	12	2	0	0	0	0	6	0	0	0	8	0.67
13-Jul	5	11	8	0	0	0	2	3	0	0	0	13	1.18
20-Jul	1	5	1	0	0	0	0	3	0	0	0	4	0.80
21-Jul	2	11	6	0	0	0	8	0	0	0	0	14	1.27
23-Jul	2	14	0	0	0	0	0	3	0	0	0	3	0.21
28-Jul	3	22	2	0	0	0	0	8	0	1	0	11	0.50
29-Jul	4	24	7	0	0	0	0	4	0	0	0	11	0.46
9-Aug	2	3	2	0	0	0	0	0	0	0	0	2	0.67
16-Aug	1	8	0	0	0	0	30	0	0	0	0	30	3.75
Subtotal	147	571	180	0	0	0	96	134	0	1	0	411	0.72

Table 3. Continued.

Water/ Date	Number Anglers	Total Hours	Rainbow trout	Brook trout	Bluegill sunfish	Large- mouth bass	Small- mouth bass	Kokanee salmon	Yellow perch	Bull trout	Black crappie	Total	CPUE
<u>Elk Creek Reservoir</u>													
31-Jan	12	32	25	8	0	0	0	0	0	0	0	33	1.03
27-Feb	3	5	8	0	0	0	0	0	0	0	0	8	1.60
1-Mar	4	4	4	2	0	0	0	0	0	0	0	6	1.50
7-Apr	8	10	0	0	0	0	0	0	0	0	0	0	0.00
26-Apr	6	7	2	6	0	0	0	0	0	0	0	8	1.14
24-May	30	45	24	10	0	0	0	0	0	0	0	34	0.76
27-Jun	18	41	28	3	0	0	0	0	0	0	0	31	0.76
14-Aug	5	13	17	8	0	0	0	0	0	0	0	25	1.92
Subtotal	86	157	108	37	0	0	0	0	0	0	0	145	0.92
<u>Fenn Pond</u>													
31-May	6	3	3	0	0	0	0	0	0	0	0	3	1.00
28-Jun	5	5	3	0	0	0	0	0	0	0	0	3	0.60
Subtotal	11	8	6	0	0	0	0	0	0	0	0	6	0.75
<u>Mann Lake</u>													
9-Mar	3	2	1	0	0	0	0	0	0	0	0	1	0.50
13-Mar	9	26	21	0	0	0	0	0	0	0	0	21	0.81
24-Mar	2	2	0	0	0	0	0	0	0	0	0	0	0.00
Subtotal	14	30	22	0	0	0	0	0	0	0	0	22	0.73
<u>Moose Cr. Reservoir</u>													
1-Mar	1	1	1	0	0	0	0	0	0	0	0	1	1.00
8-Mar	8	6	8	0	0	0	0	0	0	0	0	8	1.33
21-Mar	1	1	5	0	0	0	0	0	0	0	0	5	5.00
7-Apr	1	1	1	0	0	0	0	0	0	0	0	1	1.00
6-Jun	30	58	16	0	3	0	0	0	0	0	0	19	0.33
13-Jun	9	11	8	0	7	0	0	0	0	0	1	16	1.45

Table 3. Continued.

Water/ Date	Number Anglers	Total Hours	Rainbow trout	Brook trout	Bluegill sunfish	Large- mouth bass	Small- mouth bass	Kokanee salmon	Yellow perch	Bull trout	Black crappie	Total	CPUE
<u>Soldier's Meadow Reservoir</u>													
28-Feb	4	3	7	0	0	0	0	0	0	0	0	7	2.33
<u>Spring Valley Reservoir</u>													
1-Mar	0	1	0	0	0	0	0	0	0	0	0	0	0.00
8-Mar	3	2	1	0	0	0	0	0	0	0	0	1	0.50
15-Mar	11	21	53	0	0	0	0	0	0	0	0	53	2.52
21-Mar	41	80	64	0	0	0	0	0	0	0	0	64	0.80
7-Apr	4	4	1	0	0	0	0	0	0	0	0	1	0.25
19-Apr	11	23	26	0	0	1	0	0	0	0	0	27	1.17
2-May	34	32	64	0	0	0	0	0	0	0	0	64	2.00
10-May	41	50	33	0	5	0	0	0	0	0	0	38	0.76
18-May	16	26	23	0	32	1	0	0	0	0	0	56	2.15
9-Jun	18	39	49	0	11	0	0	0	0	0	0	60	1.54
13-Jun	35	54	40	0	14	2	0	0	0	0	0	56	1.04
4-Jul	6	10	3	0	0	0	0	0	0	0	0	3	0.30
25-Jul	21	41	16	0	42	0	0	0	0	0	0	58	1.41
31-Oct	10	11	26	0	0	0	0	0	0	0	0	26	2.36
Subtotal	251	394	399	0	104	4	0	0	0	0	0	507	1.29
<u>Tolo Lake</u>													
8-Apr	3	3	1	0	0	0	0	0	0	0	0	1	0.33
<u>White Sands Pond</u>													
14-Aug	3	3	0	0	0	0	0	0	0	0	0	0	0.00

Table 3. Continued.

Water/ Date	Number Anglers	Total Hours	Rainbow trout	Brook trout	Bluegill sunfish	Large- mouth bass	Small- mouth bass	Kokanee salmon	Yellow perch	Bull trout	Black crappie	Total	CPUE
<u>Winchester Lake</u>													
4-Feb	4	4	7	0	0	0	0	0	0	0	0	7	1.75
16-Feb	2	1	12	0	0	0	0	0	0	0	0	12	12.00
11-May	4	8	2	0	0	0	0	0	2	0	53	57	7.13
12-May	12	24	10	0	0	0	0	0	2	0	152	164	6.83
7-Jun	52	89	19	0	0	0	0	0	4	0	1	24	0.27
28-Jun	95	176	41	0	0	0	0	0	26	0	6	73	0.41
Subtotal	169	302	91	0	0	0	0	0	34	0	212	337	1.12
TOTALS	749	1,556	867	37	114	4	96	134	34	1	213	1,500	0.96

CPUE-Catch per unit effort

Table 4. Total length frequency of largemouth bass from Spring Valley Reservoir, 1983-1998.

Length mm	Dates										
	9/83	9/84	1988	6/91	5/92	5/93	5/94	5/95	5/96	5/97	5/98
<100	14	0	13	1	31	210	39	3	4	12	48
100	28	0	23	0	0	1	45	33	0	24	0
110	40	5	31	2	0	0	35	137	11	27	2
120	54	4	19	1	2	16	26	122	5	12	4
130	37	4	18	1	6	33	10	109	19	10	9
140	21	18	9	9	11	61	11	38	48	10	20
150	13	29	2	27	15	48	24	31	20	8	24
160	6	33	2	39	9	31	37	42	13	20	30
170	2	14	5	30	19	15	28	49	8	15	30
180	0	12	6	19	15	7	17	26	4	19	28
190	1	9	6	12	3	7	14	9	6	7	13
200	4	4	5	20	6	3	4	1	3	5	8
210	4	0	4	75	11	5	6	2	3	1	7
220	0	0	2	110	19	3	5	2	1	0	0
230	0	0	0	55	29	5	6	2	0	0	1
240	2	1	0	10	26	0	5	1	0	0	3
250	1	0	1	9	22	1	1	2	0	0	0
260	1	0	0	4	14	0	2	0	0	0	0
270	2	0	0	0	9	0	1	2	1	1	4
280	1	0	0	0	3	0	1	0	1	1	3
290	0	0	0	0	2	1	0	4	2	2	0
300	0	0	0	0	3	0	1	5	1	4	0
310	0	1	0	0	0	2	1	8	1	1	2
320	0	0	0	0	2	1	3	3	2	1	3
330	0	0	0	0	0	3	1	5	0	1	0
340	0	0	0	0	3	3	2	1	2	0	1
350	0	0	0	0	0	4	2	0	0	0	2
360	0	0	0	0	2	5	1	0	0	0	1
370	0	0	0	0	0	1	2	0	1	0	0
380	0	0	0	0	0	0	1	0	2	1	1
390	0	0	0	1	0	2	4	0	0	1	2
400	0	0	0	0	0	0	4	3	0	0	2
410	0	0	0	0	0	0	3	0	0	4	0
420	0	0	0	0	0	0	4	1	0	0	2
430	0	0	0	0	0	0	0	1	2	0	0
440	0	0	0	0	0	0	0	0	1	1	0
450	0	0	0	0	0	0	0	1	2	3	0
460	0	0	0	1	1	0	0	0	2	0	0
470	0	0	0	1	0	0	0	0	1	0	0
480	0	0	0	0	1	0	0	0	0	2	1
490	0	0	0	0	0	0	0	0	0	0	0
500	1	0	0	0	0	0	0	0	0	0	0
Number	232	134	146	427	264	468	346	643	166	193	251
Length	129	159	129	203	199	123	161	143	174	174	173
PSD	6	17	0	1	8	54	48	64	57	76	40
%>200 mm	7	4	8	67	58	8	17	7	17	15	17
%>300 mm	0	1	0	1	5	4	8	4	10	11	7

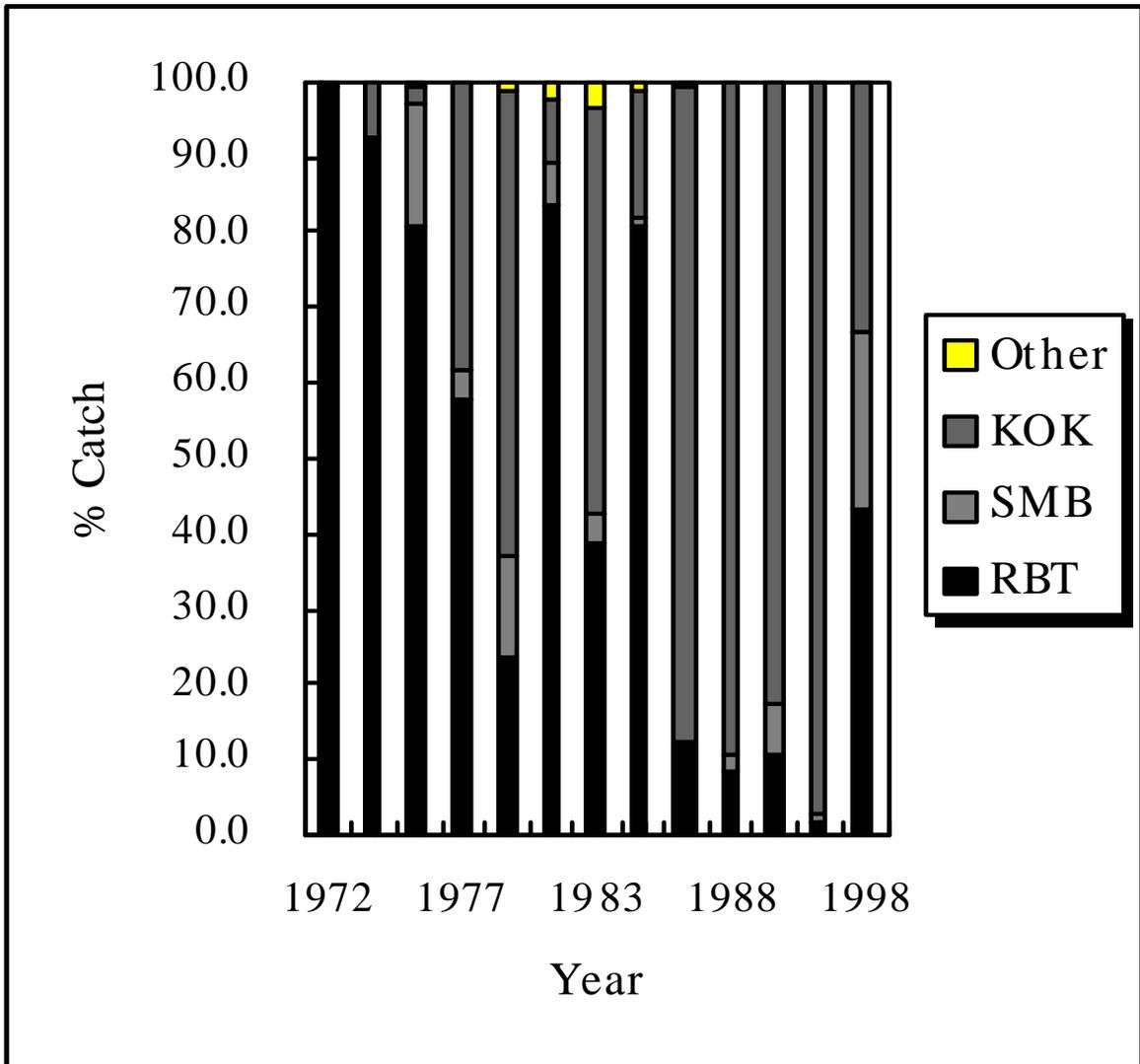


Figure 1. Catch composition from Dworshak Reservoir, Idaho 1972-1998.

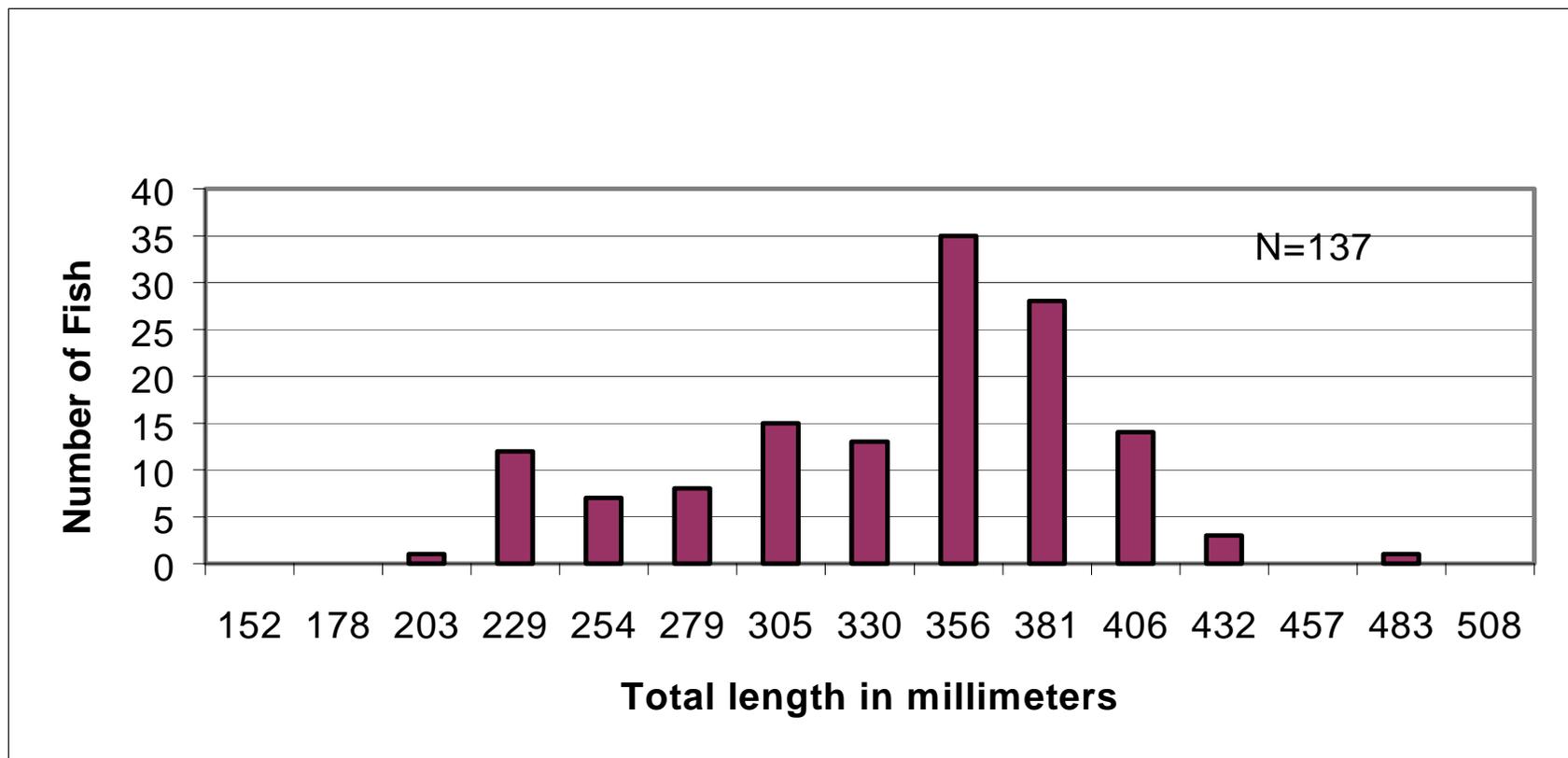


Figure 2. Length frequency of kokanee caught from the sport fishery in Dworshak Reservoir, June 11–August 16, 1998.

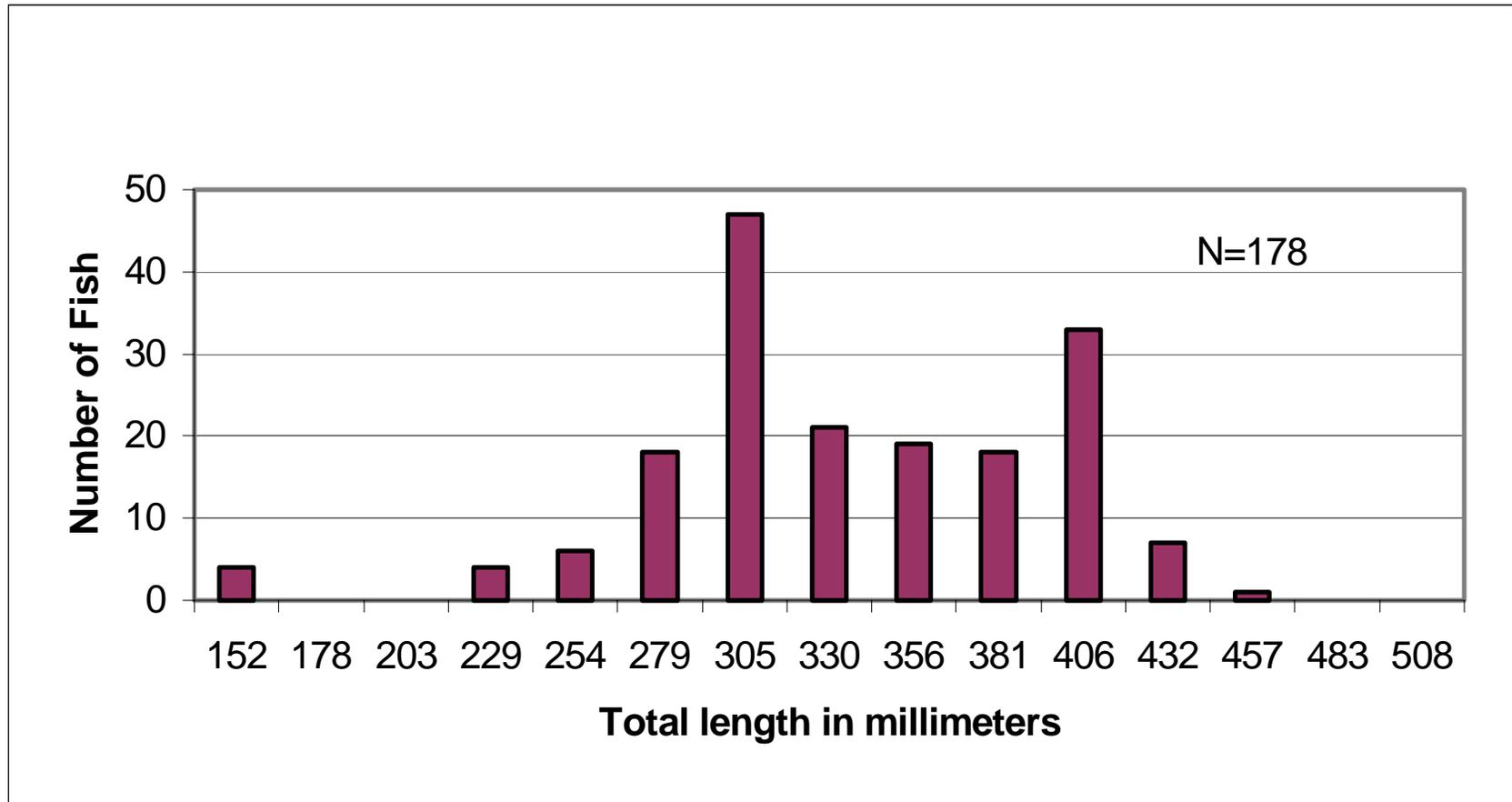


Figure 3. Length frequency of rainbow trout caught from the sport fishery in Dworshak Reservoir, June 11–August 16, 1998.

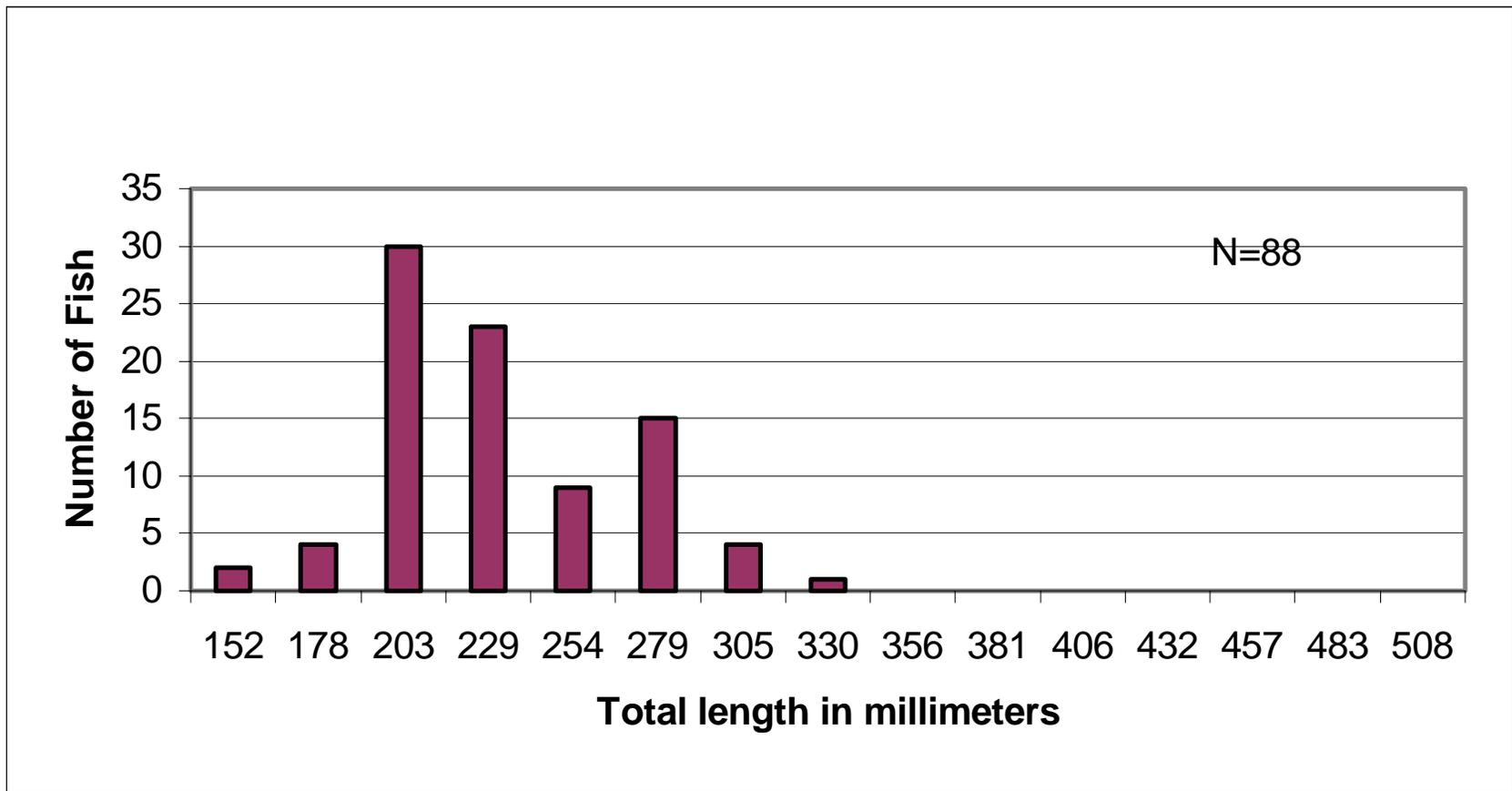


Figure 4. Length frequency of smallmouth bass caught from the sport fishery in Dworshak Reservoir, June 11–August 16, 1998.

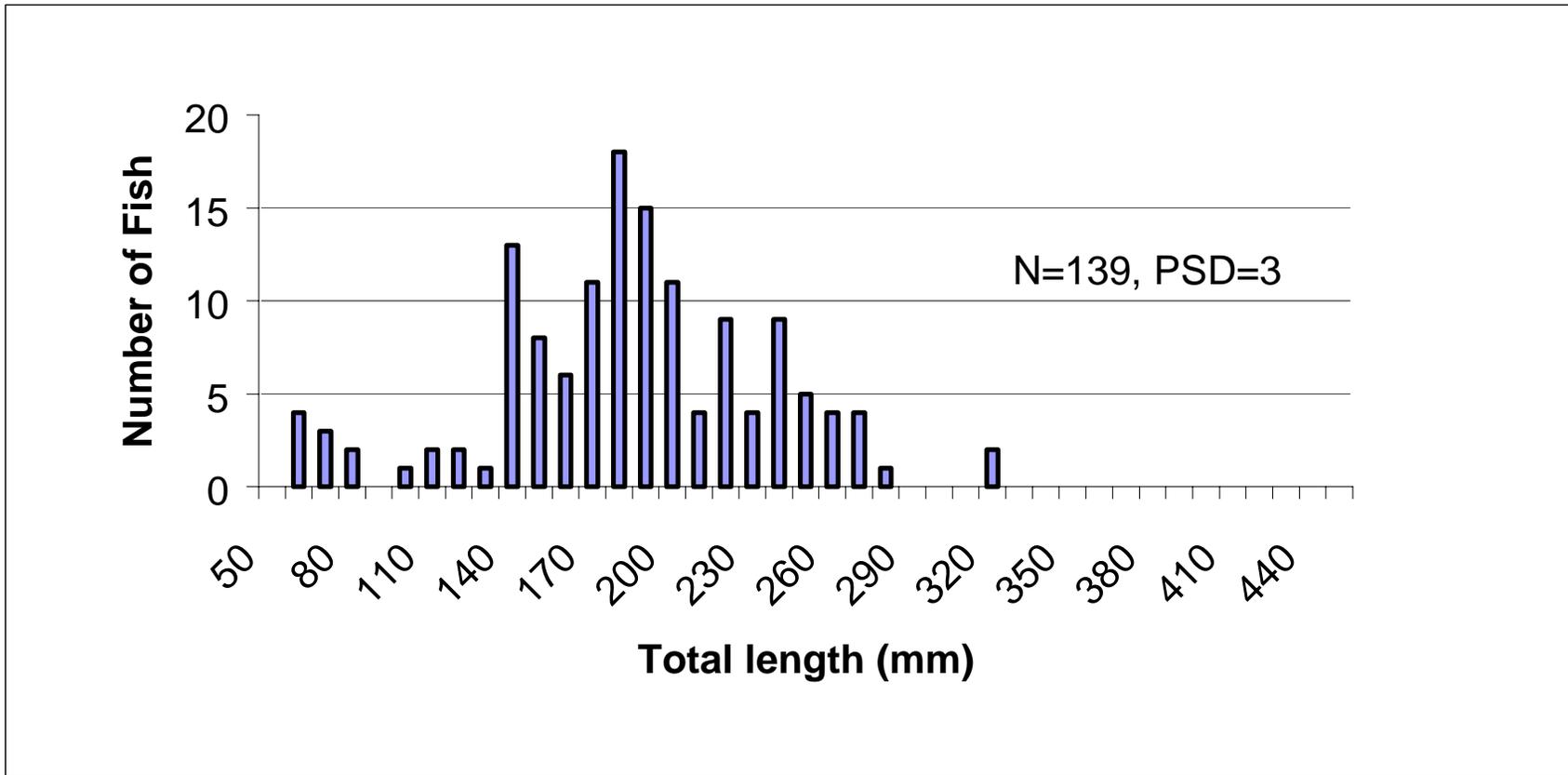


Figure 5. Length frequency of smallmouth bass collected by electrofishing selected transects in Dworshak Reservoir, May 25, 1998.

## 1998 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management

Project I: Surveys and Inventories

Subproject I-B: Clearwater Region

Job: c

Title: Rivers and Streams Investigations

Contract Period: July 1, 1998 to June 30, 1999

Period Covered: January 1, 1998 to December 31, 1998

### ABSTRACT

Clearwater Region fishery management personnel snorkeled or coordinated data collection for 138 stream transects within the Clearwater, Salmon and Snake river drainages to obtain data for the long-term database. Chinook salmon *Oncorhynchus tshawytscha* juvenile numbers were higher than in previous years, as the adult return in 1997 was good. Fifty-seven adult chinook salmon redds were counted in traditional aerial spawning ground counts in the Lochsa and Selway rivers, and 48 were counted in the South Fork Clearwater drainage. Management personnel captured and PIT tagged three white sturgeon *Acipenser transmontanus* from the Snake River. We sampled seven Kamloops rainbow trout *O. mykiss* from the lower Clearwater River and found no fish in diet analysis. We collected 50 rainbow trout on the Salmon River. Residualized hatchery steelhead *O. mykiss gairdneri* smolts represented 32.0% of the sample and stocked fingerling trout accounted for 16% of the sample. No fish or fish parts were identified in the contents of 16 hatchery origin trout stomachs. We collected 180 westslope cutthroat trout *O. clarki lewisi* in the mainstem North Fork Clearwater River from Aquarius (rkm 104.4) up to Kelly Forks (rkm 184.5) using traditional hook and line techniques. We tagged 159 of these cutthroat with jaw tags. We counted 660 kokanee *O. nerka* spawners in three index tributaries of the North Fork Clearwater River.

Authors:

Ed Schriever  
Regional Fishery Biologist

Jody Brostrom  
Regional Fishery Biologist

Tim Cochnauer  
Regional Fishery Manager

## OBJECTIVES

1. Develop long-term fish population database on selected streams throughout the Clearwater Region.
2. PIT tag white sturgeon *Acipenser transmontanus* in the Snake River below Hells Canyon Dam and the Salmon River below Riggins.
3. Assess diet of hatchery rainbow trout *Oncorhynchus mykiss* and residualized hatchery steelhead trout *O. mykiss gairdneri* smolts in the Snake, Salmon, and Clearwater river drainages.
4. Allocate hatchery rainbow trout in regional streams.
5. Collect miscellaneous creel census information from various streams throughout the region.

## SALMONID POPULATION TREND MONITORING

### Methods

We used standard snorkeling techniques to monitor fish densities at established monitoring sites in regional rivers and streams. Snorkeling was conducted in late summer when stream flows were low, clear and accessible. Small streams were snorkeled upstream with one to three observers depending on stream width. Larger streams and river corridors were snorkeled either upstream or free-floating downstream with four to six observers, depending on corridor width and water depth. Population abundance is presented as fish per 100 m<sup>2</sup>. For streams that research or other agency personnel regularly snorkel, we coordinated data collection and have summarized the information in this report.

We sampled rainbow trout and mountain whitefish *Prosopium williamsoni* in the Clearwater River using pulsed D.C. current from a portable generator and a Coffelt VVP-2E pulsator. Booms and electrodes were mounted on a 5.5-m aluminum boat. Sampling was conducted from April 20 to August 30 and occurred during daylight hours to avoid safety hazards.

### Results

#### **Selway River**

The Selway River was stocked with 1,733 Rapid River stock adult chinook salmon *O. tshawytscha* (that were excess to egg take needs) by the Nez Perce Tribe in 1997. Chinook parr raised from Rapid River and Dworshak stock were outplanted in July 1998 into the upper

reaches of the Selway River and the tributaries of Running, White Cap, Moose and Bear creeks by the Nez Perce Tribe. These chinook parr were not marked to distinguish them as hatchery fish, so there was no way to differentiate naturally produced chinook salmon and hatchery fish during our snorkel surveys. Because of these stocking activities, the number of juvenile chinook salmon observed was higher than usual (Table 1). We were unable to snorkel the mainstem river as rain on recent fire activity created water too turbid to snorkel (Table 2). A total of 620 chinook salmon juveniles were observed in 17 tributary transects above Selway Falls, and 130 juvenile chinook salmon were counted in four tributary transects below Selway Falls. In one mainstem transect 10 juvenile chinook salmon were observed. Aerial chinook salmon spawning ground counts in September revealed 34 redds, 21 in tributaries and the rest in the mainstem (Table 3).

A total of three bull trout *Salvelinus confluentus* were observed in the Little Clearwater River and White Cap Creek (Table 1). Coho salmon parr *O. kisutch*, stocked by the Nez Perce Tribe, were observed in Meadow Creek (11) and O'Hara Creek (14).

Size classes of cutthroat trout *O. clarki* and percent of those over 305 mm sampled by angling in the Selway River in 1998 and previous years are shown in Tables 4 and 5, respectively. Tables 6—9 depict historical relative numbers and sizes of cutthroat trout, steelhead trout, and mountain whitefish observed by snorkeling in mainstem transects.

## **Lochsa River**

Fish densities (per 100 m<sup>2</sup>) as determined by snorkeling 20 transects in the Lochsa River drainage are shown in Table 10. A total of 401 suspected natural chinook salmon juveniles were observed in the tributaries surveyed, and 196 were seen in the mainstem. In addition, 25 suspected hatchery juvenile chinook salmon were observed in Warm Springs Creek, and another 18 were observed in the mainstem. These fish were outplanted by the Nez Perce Tribe but were not differentially marked. However, their size and appearance indicated they were likely hatchery produced. A total of three bull trout were observed with one each in Brushy Fork, Post Office, and Colt Killed (White Sands) creeks (Table 10).

Post Office Creek transect #1 was moved in 1998. Recent channel changes and overgrowth made it impossible to find the old site. The new site is located in pocketwater habitat, while the upper site is located in more of a meandering riffle-pool-run habitat.

Chinook salmon aerial spawning ground counts revealed 23 redds in Crooked Fork, Brushy Fork and Colt Killed creeks (Table 11).

## **Snake River**

Nineteen chinook salmon juveniles were observed while employees were snorkeling two Snake River tributaries (Table 12). No bull trout were observed.

Table 1. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling the Selway River drainage, 1998.

Stream	Date	Steelhead trout					Cutthroat trout			Chinook salmon	Mountain whitefish	Bull trout	Coho salmon
		Total	Age 0	Age 1	Age 2	Age >2	Total	<305 mm	>305 mm				
Bear Creek #1, at bridge	8/3	0.79	0	0.43	0.36	0	0.71	0.57	0.14	1.29	0.50	0	0
Bear Creek #2, upper	8/3	1.0	0	1.0	0	0	0.89	0.89	0	0	0.33	0	0
Deep Creek, Cactus	7/30	2.67	0.22	0.89	1.11	0.45	0.89	0.89	0	2.67	0	0	0
Deep Creek, Scimitar	7/30	2.44	0	0	1.46	0.98	4.39	4.39	0	0	0	0	0
East Fork Moose Creek #3	8/4	1.32	0	0.17	1.09	0.06	1.90	1.61	0.29	7.41	0.57	0	0
Gedney Creek # 1	8/3	14.34	6.68	3.83	3.50	0.33	0.11	0	0.11	2.74	0.88	0	0
Gedney Creek # 2	8/3	11.58	7.80	2.56	1.10	0.12	0.12	0.12	0	0.49	0.12	0	0
Little Clearwater River #2, upper	7/31	1.54	0	0.96	0.38	0.19	0.38	0.19	0.19	2.50	0.19	0.19	0.38
Little Clearwater River #1, lower	7/31	0.63	0	0.21	0.42	0	0.21	0.21	0	2.54	0.21	0	0.85
Marten Creek	8/6	5.50	0	4.32	1.18	0	8.24	7.85	0.39	0	0	0	0
Meadow Creek # 1 Slims Camp	8/8	1.41	0	0.76	0.65	0	0	0	0	1.99	0.11	0	0.05
Meadow Creek # 2	8/8	0.72	0.16	0.12	0.40	0.04	0.73	0.73	0	4.63	0.28	0	0.44
Moose Creek #1, at mouth	8/4	1.08	0	0.05	0.62	0.41	0.41	0.36	0.05	0.10	2.89	0	0
Moose Creek #2, at East Fork confluence	8/4	0.21	0.16	0.05	0	0	0.16	0.16	0	1.26	0.02	0	0
North Fork Moose Creek #4	8/4	6.18	0.11	4.77	1.30	0	0	0	0	3.52	0	0	0
O'Hara Creek #1, meadow	8/8	10.71	5.84	4.22	0.65	0	1.30	1.30	0	22.40	0	0	11.69
O'Hara Creek #2, canyon	8/8	7.26	2.51	4.75	0	0	1.12	1.12	0	17.44	0	0	0
Otter Creek	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Running Creek #1, lower	8/1	0.24	0	0	0	0.24	0	0.73	0.73	0	3.87	0	0
Running Creek #2, upper	8/1	5.79	0	5.79	0	0	0.93	0.93	0	0	0	0	0
Selway River at Magruder	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selway River at Hell's-Half	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selway River at Little Clearwater	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selway River at Beaver Point	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Three Links Creek	8/6	9.52	0	5.15	3.35	1.03	0.77	0.51	0.26	0	0	0	0
White Cap Creek #1, lower	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
White Cap Creek #2, middle	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
White Cap Creek #3, upper	7/31	1.43	0	0.26	0.52	0.65	2.99	2.34	0.65	8.18	0.13	0.26	0

Table 2. Number of fish counted in snorkel transects (5 snorkelers) in the unroaded mainstem Selway River, 1992-1998.

Location	Year	Cutthroat trout		Steelhead trout				Chinook salmon	Mountain whitefish	Bull trout
		<305 mm	>305 mm	Age 0	Age 1	Age 2	Age >2			
at Bad Luck Creek	1992	30	14	0	0	0	0	0	106	0
	1993	14	12	9	6	1	0	0	40	0
	1994	10	7	0	0	0	0	20	23	0
	1995	12	4	0	3	0	0	0	68	0
	1996	28	2	0	0	2	2	0	43	0
	1997	23	4	0	1	1	0	0	28	0
	1998	ND	ND	ND	ND	ND	ND	ND	ND	ND
	at North Star Creek	1992	22	2	0	0	0	0	0	56
1993		28	5	0	0	0	0	0	45	0
1994		ND	ND	ND	ND	ND	ND	ND	ND	ND
1995		13	5	0	0	0	0	0	46	0
1996		23	4	0	0	0	0	0	028	0
1997		19	7	6	0	0	0	0	53	0
1998		ND	ND	ND	ND	ND	ND	ND	ND	ND
at Osprey Island		1992	8	8	0	2	0	0	0	32
	1993	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1994	15	5	0	6	3	0	0	56	0
	1995	24	8	0	10	4	0	0	59	0
	1996	26	0	0	22	14	0	0	6	0
	1997	37	12	0	0	1	1	0	69	0
	1998	ND	ND	ND	ND	ND	ND	ND	ND	ND
	at Big Bend	1993	13	7	0	0	0	0	0	32
1994		9	2	0	4	0	0	4	31	0
1995		ND	ND	ND	ND	ND	ND	ND	ND	ND
1996		ND	ND	ND	ND	ND	ND	ND	ND	ND
1997		24	2	3	1	1	0	1	23	1
1998		ND	ND	ND	ND	ND	ND	ND	ND	ND
at Tango Creek	1992	15	26	0	16	9	0	14	50	0
	1993	28	1	3	32	2	0	0	26	0
	1994	28	8							0
	1995	29	3	0	9	2	1	0	35	0
	1996	19	4	0	1	1	0	0	28	0
	1997	23	4	0	4	6	1	0	62	0
	1998	19	4	0	0	3	2	10	22	0

Table 3. Chinook salmon spawning ground survey summary in the Selway River drainage, 1998.

Drainage	Reach	Type	Description	Date	Method	Redds	Fish	
							Live	Dead
White Cap Creek	WC-1	T	Mouth to Coopers Flat	9/16	Aerial	1	0	0
		ISS&C	Coopers Flat to Barrier	9/16	Aerial	3	0	0
Bear Creek	WC-2	T	Mouth to Cub Creek	9/16	Aerial	11	1	1
Moose Creek	WC-3	T	Mouth to Cedar Creek	9/16	Aerial	6	0	0
Running Creek	WC-4	T	Mouth to two miles above Eagle Creek and lower one mile of Eagle Creek	9/16	Aerial	0	0	0
Selway	WC-5	T	Thompson Flat to Magruder RS	9/16	Aerial	0	0	0
Selway	WC-6	T	Magruder RS to Magruder Crossing	9/16	Aerial	1	0	0
Selway	WC-7	T	Magruder Crossing to Little Clearwater River	9/2	Ground	15	15	1
				9/16	Aerial	9	1	0
Selway	WC-8	T	Little Clearwater to White Cap Creek	9/16	Aerial	0	0	0
Selway	WC-9	T	White Cap Creek to Bear Creek	9/16	Aerial	3	0	0
			Selway drainage ground count total:			15	15	1
			Selway drainage aerial count total:			34	2	1

<sup>1</sup>T = traditional transect

Table 4. Percent of cutthroat trout by 50.8 mm (2 in) size groups sampled in the Selway River by angling, 1975-1998.

Length (mm)	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1993	1994	1995	1996	1997	1998
102 to 151	8.7	2.2	8.7	0.8	4.6	2.8	4.2	2.4	12.4	0.1	4.3	2.7	1.5	1.4	1.7	1.9	2.8
152 to 202	31.3	16.4	20.9	20.7	13.6	19.0	22.2	15.8	14.0	22.7	23.3	13.0	12.6	25.1	23.6	22.0	29.8
203 to 253	27.0	24.8	24.5	15.7	22.2	25.2	28.2	23.3	25.1	16.5	23.6	20.2	22.3	17.7	28.5	23.9	25.4
254 to 304	21.0	35.7	27.0	34.1	30.7	31.2	24.7	27.1	24.3	26.2	30.6	36.8	22.8	27.2	24.8	24.3	25.4
305 to 355	11.2	18.4	17.0	23.2	25.3	18.9	16.8	28.0	21.0	25.7	15.7	22.8	34.0	24.0	17.4	22.8	12.7
356 to 405	0.8	2.5	1.3	5.1	3.4	2.3	3.8	3.1	3.0	4.7	2.7	4.5	7.4	3.5	4.1	5.2	3.6
Over 405	0	0	0.6	0.4	0.2	0.6	0	0.3	0.2	0.5	0	0	0	<0.01	0	0	0.4
Number of cutthroat measured	233	238	229	470	352	549	429	322	506	816	301	377	215	283	242	268	504

Table 5. Comparison of cutthroat (CT) trout counted in snorkel transects (1 snorkeler) and cutthroat trout caught by angling in the Selway River between White Cap Creek and Race Creek, 1975-1998.

Year	Counted in snorkel transects		Total no. cutthroat measured	Caught by angling	
	Average no. CT counted/ transect	Percent CT >305 mm in transects		Average CT total length (mm)	Percent CT caught >305 mm
1998 <sup>2</sup>	4.6	8.1	504	241	16.7
1997	13.6	14.0	268	257	29.0
1996	14.2	3.0	242	252	21.5
1995	11.2	3.2	28	254	28.0
1994	5.9	11.0	215	272	29.0
1992	5.4	28.0	301	251	18.0
1990	10.5	19.0	816	259	31.0
1988	17.1	22.0	506	249	24.0
1986	21.5	20.0	322	264	32.0
1984	18.3	23.0	429	249	21.0
1982	16.1	16.0	549	254	22.0
1980	17.0	14.0	352	264	29.0
1978	13.0	19.0	470	262	27.0
1977	15.4	20.0	229	241	19.0
1976	7.1	21.0	238	259	22.0
1975	5.7	13.0	233	239	12.0
1974	5.5	10.0	--	--	--
1973	4.4	18.0	--	--	--

<sup>1</sup> Extremely low flows

<sup>2</sup> Water too turbid from rain and fire debris to get accurate count in most transects. Number of transects = 8

Table 6. Percent of cutthroat trout over 305 mm (12 in.) counted in snorkel transects (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1998.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998
White Cap Creek to Running Creek	9.5	16.7	11.8	22.2	22.6	16.2	13.2	8.9	15.9	21.3	24.5	29.6	6.7	6.7	0	0	8.3	ND <sup>1</sup>
Running Creek to Bear Creek	11.1	8.3	18.2	16.2	21.5	20.8	11.8	10.7	20.7	14.6	22.4	15.9	25.5	11.1	0	0	11.3 <sup>1</sup>	ND
Bear Creek to Moose Creek	34.4	15.5	8.0	25.0	25.0	21.4	9.9	15.0	22.7	18.7	22.9	16.2	48.4	12.1	9.1	0	19.1	0
Weighted means: White Cap Creek to Moose Creek	18.9	12.7	13.0	20.6	21.8	22.3	11.5	12.0	20.6	17.8	23.2	15.6	32.9	10.8	0.8	0	13.3	0
Moose Creek to Halfway Creek	8.3	--	3.6	17.5	12.5	13.6	18.6	17.9	22.1	22.7	21.6	9.5	9.1	--	10.9	0	8.3	0
Halfway Creek to Three Links Creek	19.0	16.2	19.0	26.3	17.5	15.9	17.2	23.8	26.1	22.7	26.7	33.0	6.7	0	0	20.0	22.2	25.0
Three Links Creek to Jim's Creek	23.3	5.8	12.5	38.5	27.5	25.0	17.3	22.3	28.4	24.0	23.7	16.3	11.1	0	0	10.0	10.0	40.0
Jim's Creek to Race Creek	--	10.0	50.0	1.8	26.5	35.7	4.1	11.1	30.4	15.5	13.6	46.7	50.0	--	0	ND	20.0	ND <sup>2</sup>
Weighted means: Moose Creek to Race Creek	17.3	8.0	13.0	21.3	18.9	19.4	17.6	19.9	29.7	21.9	21.0	19.6	18.2	0	7.1	13.5	14.2	20.7

<sup>1</sup> Water too turbid to get accurate count

<sup>2</sup> Fish not broken into length groups

Table 7. Average number of cutthroat trout counted in snorkel transects (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1998.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998
White Cap Creek to Running Creek	4.2	3.4	6.8	7.2	10.8	7.4	13.2	11.2	11.0	15.2	13.3	6.8	4.8	7.5	13.0	10.7	6.0	ND <sup>1</sup>
Running Creek to Bear Creek	7.2	4.8	6.6	6.2	18.6	10.6	18.6	11.2	17.4	19.2	11.6	16.4	9.4	9.0	13.3	15.5	26.5	ND <sup>1</sup>
Bear Creek to Moose Creek	5.3	7.5	5.0	6.0	17.4	19.6	16.0	16.2	19.4	21.4	21.8	7.4	6.2	8.3	13.3	15.0	7.8	1.0
Weighted means: White Cap Creek to Moose Creek	5.6	5.2	6.1	6.5	15.4	12.5	16.2	12.8	16.3	18.8	15.7	10.4	6.9	8.3	13.2	13.6	13.8	1.0
Moose Creek to Halfway Creek	6.0	9.0	5.6	8.0	24.0	19.7	14.3	19.5	28.3	21.7	18.5	10.5	3.7	--	12.0	7.0	12.0	0
Halfway Creek to Three Links Creek	3.0	7.4	7.0	9.5	20.0	22.0	29.0	21.0	23.0	32.5	30.0	3.0	5.0	3.0	0.0	10.0	9.0	4.0
Three Links Creek to Jim's Creek	5.0	4.3	8.0	6.5	11.0	16.0	22.0	23.5	18.5	34.7	20.0	12.3	3.0	6.0	5.7	30.0	12.5	1.7
Jim's Creek to Race Creek	--	2.5	1.2	5.7	7.5	3.5	12.3	18.0	14.0	14.5	14.8	11.0	3.0	--	7.0	ND	17.5	13.5
Weighted means: Moose Creek to Race Creek	3.6	5.9	5.3	7.4	15.3	13.8	18.0	21.1	20.5	24.3	18.7	9.9	3.7	4.5	8.8	15.6	13.3	5.1

<sup>1</sup> Water too turbid to get accurate count

Table 8. Average number of juvenile steelhead trout (<8 inches) counted in snorkel transects (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1998.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998
White Cap Creek to Running Creek	1.2	1.1	5.0	4.0	0.8	3.6	5.0	7.4	10.5	5.5	3.8	4.0	3.7	3.8	9.3	11.6	2.0	ND <sup>1</sup>
Running Creek to Bear Creek	3.2	7.0	2.2	2.0	0.8	3.4	6.0	14.4	3.8	4.4	4.0	2.2	2.4	1.8	2.0	7.8	1.8	ND
Bear Creek to Moose Creek	4.3	3.7	11.0	13.0	3.3	3.4	9.0	19.8	17.2	11.8	18.2	15.6	7.6	10.0	8.3	19.0	3.6	1.0
Weighted means: White Cap Creek to Moose Creek	2.7	2.6	7.7	5.7	1.9	2.6	5.9	11.1	14.3	7.1	9.1	8.4	4.7	5.2	6.6	10.6	2.8	1.0
Moose Creek to Halfway Creek	27.5	17.8	17.8	13.2	5.3	22.0	9.7	40.3	43.8	23.7	22.5	34.3	1.7	--	16.0	4.0	44.0	2.0
Halfway Creek to Three Links Creek	14.0	17.4	25.3	19.5	9.5	12.0	19.0	28.0	31.0	21.0	35.0	42.0	9.3	3.0	0.0	26.0	7.0	0
Three Links Creek to Jim's Creek	19.3	8.8	32.5	23.5	24.7	18.7	18.9	24.2	26.7	28.7	31.8	41.0	2.3	26.0	8.7	34.0	2.25	1.3
Jim's Creek to Race Creek	6.2	6.7	4.3	10.5	5.8	9.8	10.0	13.0	15.0	12.3	3.3	1.8	0.7	--	14.0	ND	0	0.5
Weighted means: Moose Creek to Race Creek	12.8	19.2	13.8	12.0	14.9	13.5	29.6	28.1	21.6	23.2	22.5	15.8	3.5	14.5	13.0	21.33	7.5	1.0

<sup>1</sup> Water too turbid to get accurate count.

Table 9. Average number of mountain whitefish counted in snorkel transects (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1998.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998
White Cap Creek to Running Creek	35.2	31.1	8.4	17.8	32.8	9.4	15.8	18.8	23.2	22.2	17.3	22.8	15.0	20.5	12.0	13.0	5.0	ND <sup>1</sup>
Running Creek to Bear Creek	39.2	36.4	15.0	6.5	77.8	17.4	17.6	21.2	37.4	30.6	24.2	36.8	45.4	55.5	33.3	14.5	18.3	ND <sup>1</sup>
Bear Creek to Moose Creek	31.1	34.2	11.8	9.0	51.3	16.6	19.0	30.2	44.2	31.6	29.6	10.2	13.8	20.0	15.3	25.0	13.8	17.0
<u>Weighted means:</u> White Cap Creek to Moose Creek	34.9	33.9	11.7	10.9	44.9	12.1	17.6	23.4	35.8	28.6	24.1	21.7	25.4	32.0	17.9	15.25	13.8	17.0
Moose Creek to Halfway Creek	48.8	31.5	32.4	16.6	69.5	40.3	32.0	43.8	46.2	41.0	44.7	47.3	12.0	--	42.8	31.0	11.0	0
Halfway Creek to Three Links Creek	17.7	31.4	27.0	16.0	65.0	67.0	27.0	47.0	60.0	38.5	70.0	12.0	10.0	19.0	0.0	7.0	0	4.0
Three Links Creek to Jim's Creek	23.8	19.0	41.0	19.5	49.7	46.0	38.3	59.0	50.0	50.7	35.0	27.3	9.0	5.0	11.0	17.0	9.25	7.7
Jim's Creek to Race Creek	5.2	16.8	18.7	2.0	41.0	20.5	20.0	21.0	32.5	19.7	22.3	8.8	9.0	--	5.0	ND	15.5	6.5
<u>Weighted means:</u> Moose Creek to Race Creek	23.0	21.5	29.3	13.3	50.4	39.6	28.8	47.9	44.2	35.9	36.8	26.5	13.1	12.0	26.1	18.3	9.9	10.0

<sup>1</sup> Water too turbid to get accurate count

Table 10. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling in the Lochsa River drainage, 1998.

Stream	Date	Total	Steelhead trout				Total	Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout
			Age 0	Age 1	Age 2	Age >2		<305 mm	>305 mm			
Brushy Fork Creek, #1	8/6	8.11	1.68	1.68	4.75	0	0	0	0	4.19	1.68	0
Brushy Fork Creek, #2	8/6	7.60	1.40	3.86	2.34	0	0	0	0	4.22	0	0.12
Colt Creek	8/6	0.62	0	0.31	0.31	0	8.52	8.52	0	0	0	0
Crooked Fork Creek, #1B	8/5	4.23	3.11	0.64	0.48	0	0.64	0.64	0	6.0	0	0
Crooked Fork Creek, #2B	8/5	8.81	4.36	3.42	0.93	0.10	1.14	1.14	0	5.81	0.52	0
Fire Creek, #1, lower	8/9	2.87	0	1.72	0.96	0.19	0	0	0	0	0	0
Fire Creek, #2, upper	8/9	1.94	0	1.36	0.58	0	0.58	0.58	0	0	0.19	0
Fish Creek, #1, lower	7/20	14.74	4.02	7.42	3.20	0.10	0.20	0.10	0.10	10.52	0	0
Fish Creek, #2, upper	7/20	20.76	5.65	11.14	3.97	0	0.46	0.46	0	7.33	0	0
Hopeful Creek	8/6	3.21	0.20	0.80	2.21	0	0.80	0.80	0	0	0	0
Lochsa River, #4, at Papoose Creek	8/7	1.14	1.03	0.09	0.02	0	1.52	1.05	0.47	2.55	0	0
Lochsa River, #3, at Warm Springs Creek	8/6	0.19	0.05	0.05	0.09	0	0.35	0.35	0	0.77	0.44	0
Lochsa River, #1, at Fish Creek	8/7	0.1	0.05	0.01	0.04	0	0.23	0.21	0.02	0.51	0	0
Lochsa River, #2, at Pete King Creek	8/8	0.01	0	0.01	0	0	0	0	0	0.05	0	0
Old Man Creek	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Post Office Creek, #1, lower	8/7	21.09	12.26	8.55	0.28	0	3.13	3.13	0	0	0	0.28
Post Office Creek, #2, upper	8/7	19.89	11.93	7.39	0.57	0	6.25	6.25	0	0	0	0
Split Creek, #1, lower	8/7	13.03	7.06	4.09	1.86	0.02	0	0	0	0	1.30	0
Split Creek, #2, upper	8/7	15.15	0.83	9.09	5.23	0	0.55	0.55	0	3.02	3.86	0
Warm Springs Creek	8/6	2.94	1.58	0.68	0.68	0	1.58	1.58	0	4.17	0	0
White Sands Creek	8/5	1.00	0.20	0.28	0.52	0	0.08	0.04	0.04	0.48	0	0.04

Table 11. Chinook salmon redd counts on tributaries of the upper Lochsa River, 1998.

Drainage	Reach	Type <sup>1</sup>	Description	Date	Method	Redds	Fish	
							Live	Dead
Crooked Fork	NC-9	NT	Mouth to Hopeful Creek	9/17	Aerial	9	1	0
	NC-10	T	Rock Creek to Cliff hole	9/3	Ground	16	6	7
Brushy Fork	NC-11	T	Low Gap Bridge to one mile downstream	9/3	Ground	12	2	1
	NC-12		Mouth to Spruce Creek	9/17	Aerial	12	0	1
White Sands	NC-13	NT	Mouth to Big Flat Creek	9/17	Aerial	0	0	0
Big Sand Creek	NT/ISS		Mouth to end of salmon habitat	9/17	Aerial	0	0	0
Storm Creek	NT/ISS		Mouth to end	9/17	Aerial	2	0	0
Lochsa Drainage Ground Total						28	8	8
Lochsa Drainage Aerial Total						23	1	0

<sup>1</sup>NT = non-traditional transect, T = traditional transect

Table 12. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling in the Snake River drainage, 1998.

Stream	Date	Steelhead trout						Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout	
		Total	Age 0	Age 1	Age 2	Age >2	Hatchery	Total	<305 mm				>305 mm
Granite Creek, #1, lower	8/18	10.00	2.25	3.25	3.50	1.00	2.25	0	0	0	0	0	0
Granite Creek, #2, middle	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Granite Creek, #3, upper	8/18	10.76	0.95	4.75	3.17	1.90	0	0.32	0.32	0	0	0	0
Sheep Creek, #1, lower	8/17	15.72	0.37	3.37	5.99	5.99	15.34	0	0	0	1.12	0	0
Sheep Creek, #2, upper	8/17	17.15	0	8.12	5.87	3.16	1.35	0	0	0	3.61	0	0

## **Salmon River**

Nine tributaries of the lower Salmon River were surveyed by snorkeling in 1998 (Table 13). A total of 171 juvenile chinook salmon were found in Bargamin, Big Mallard, Crooked, Sheep, Skookumchuck and Whitebird creeks. Bull trout were observed in Big Mallard (5) and Race creeks (1). Two sites were established in Big Mallard Creek to collect trend information.

## **North Fork Clearwater River**

Fisheries management personnel snorkeled nine streams in this drainage as a continuation of surveys initiated in 1993. Rainbow trout were the most abundant fish observed (Table 14). Bull trout were found in Beaver Creek.

Clearwater Region Fisheries personnel and volunteers collected 180 westslope cutthroat trout *O. clarki lewisi* in the mainstem North Fork Clearwater River from Aquarius (rkm 104.4) up to Kelly Forks (rkm 184.5) using traditional hook and line techniques (Figures 1-2). We sampled in June and July and tagged 159 of these cutthroat with numbered size 6 and 8 metal jaw tags. We recorded, date, tag number, tagging location (rkm) and total length of fish.

## **Clearwater River**

Three tributaries were snorkeled in the drainage. Steelhead trout were the most abundant species observed (Table 15) except for the middle transect on the East Fork of Potlatch River, where brook trout dominated. While we were snorkeling that transect, coho salmon parr were planted just above the site by the Nez Perce Tribe. Since they were too numerous to count, we did not include them in density estimates. We were unable to snorkel Mission Creek in 1998 due to poor visibility.

Twenty-two species were electroshocked in the North Fork Clearwater River below Dworshak Dam and in the mainstem Clearwater River below the North Fork Clearwater River mouth (Cochner and Putnam 1998). Fork length frequencies of the three sport fish species are shown in Figures 3-5. Four bull trout were sampled. Almost 900 mountain whitefish were sampled (Figure 3). Two hundred thirty-nine smallmouth bass were sampled (Figure 4). One hundred forty-four wild steelhead trout juveniles were sampled (Figure 5).

## **South Fork Clearwater River**

A total of 1,536 chinook salmon juveniles were observed while snorkeling in twenty traditional transects on six streams in the South Fork Clearwater River drainage (Table 16). Bull trout were observed in Red River and Johns Creek. Additional transects were snorkeled as part of Idaho Supplementation Studies (ISS), but the data is not presented here. A total of 63 chinook salmon redds were counted in traditional aerial surveys in the South Fork Clearwater drainage (Table 17).

Table 13. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling in the Lower Salmon River drainage, 1998.

Stream	Date	Total	Steelhead trout				Total	Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout
			Age 0	Age 1	Age 2	Age >2		<305 mm	>305 mm			
Bargamin Creek, #1, lower	7/26	5.89	0.62	3.10	1.86	0.31	0.31	0.31	0	0.10	1.03	0
Bargamin Creek, #2, upper	7/26	7.03	0.72	4.73	1.58	0	0	0	0	0	0.15	0
Big Mallard Creek, #1, lower	7/26	20.07	2.97	10.41	5.20	1.49	0	0	0	0.74	0	1.49
Big Mallard Creek, #2, upper	7/26	9.03	0	5.62	2.61	0.80	0.40	0.40	0	0	0.20	0
Crooked Creek, #1, lower	7/26	6.10	2.80	1.90	1.20	0.20	0	0	0	0.90	1.20	0
Crooked Creek, #2, upper	7/26	8.89	5.26	2.56	0.94	0.13	0.13	0.13	0	0	1.21	0
Jersey Creek	7/26	36.36	4.96	29.75	1.65	0	0	0	0	0	0.83	0
John Day Creek, #1, lower	7/28	8.33	1.92	3.85	2.56	0	0	0	0	0	0	0
John Day Creek, #2, upper	7/28	11.94	0.57	9.38	1.99	0	0	0	0	0	0	0
Race Creek	7/28	11.90	1.32	5.82	4.23	0.53	0	0	0	0	0	0.26
Sheep Creek, #1, lower	7/27	8.00	3.46	3.11	1.43	0	0.48	0.36	0.12	17.32	10.16	0
Sheep Creek, #2, upper	7/27	12.84	1.44	6.43	4.71	0.26	0.52	0.39	0.13	0.26	1.05	0
Skookumchuck Creek, #1, lower	7/28	11.40	0	6.84	4.56	0	0	0	0	0.38	0	0
Skookumchuck Creek, #2, upper	7/28	14.28	0	9.31	4.97	0	0	0	0	0	0	0
S.F. White Bird Creek, #2	7/28	22.18	3.73	17.11	1.34	0	0	0	0	0	0	0
S.F. White Bird Creek, #3	7/28	28.81	1.65	23.46	3.70	0	0	0	0	0	0	0
White Bird Creek, #1	7/28	26.65	2.01	19.48	5.16	0	0	0	0	0	0.57	0

Table 14. Summary of snorkeling observations (fish/100 m<sup>2</sup>) in North Fork Clearwater River drainage, 1998

Stream – Year	Area (m <sup>2</sup> )	Rainbow Trout				Cutthroat trout		Bull trout	Mountain whitefish	Brook trout
		Age 0	Age 1	Age 2	Age >2	<305 mm	>305 mm			
Beaver Creek #1	129	0	0	0	0	3.11	0	0	0	0
Beaver Creek #2	228	0	0	0	0	5.71	0	0.44	1.32	0
Beaver Dam Creek #1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beaver Dam Creek #2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Collin's Creek #1	388	2.84	4.13	0	0	0.52	0	0	0	0
Collin's Creek #2	421	2.61	0.24	0	0	2.14	0	0	0	0
Collin's Creek #3	248	4.85	0.40	1.21	0	0	0	0	0	0
French Creek #1	148	0.68	1.35	0	0	11.49	0	0	0	0
French Creek #2	204	0.49	3.43	0	0	1.47	0	0	0	0
French Creek #3	86	1.16	0	0	0	3.49	0	0	0	0
Hemlock Creek #1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hemlock Creek #2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hemlock Creek #3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hemlock Lake Creek	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hemlock Creek #4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isabella Creek #1	251	1.99	2.79	0	0	1.59	0	0	0	0
Isabella Creek #2	79	8.82	6.30	0	0	0	0	0	0	0
Isabella Creek #3	82	1.21	1.21	1.210	0	0	0	0	0	0
Isabella Creek #4	177	2.26	0	0	0	7.33	0	0	0	0
Little Moose Creek #1	153	0	0	0	0	5.23	0	0	0	0
Little Moose Creek #2	179	0	0.56	0	0	1.12	0	0	0	0
Little Moose Creek #3	170	0.59	0	0	0	2.95	0	0	0	0
Little Weitas Creek - L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Little Weitas Creek – U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Middle Creek #1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Middle Creek #2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Middle Creek #3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Middle Creek – L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Middle Creek – U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Orogrande Creek #1	181	0	0	0	0	1.10	0	0	0	0.55
Orogrande Creek #2	266	0	0	0	0	0.75	0	0	0	3.00
Orogrande Creek #3	150	0	2.66	0	0	0	0	0	0	7.31
Quartz Creek #1	203	1.48	11.81	1.97	0	0.49	0	1.48	0	0

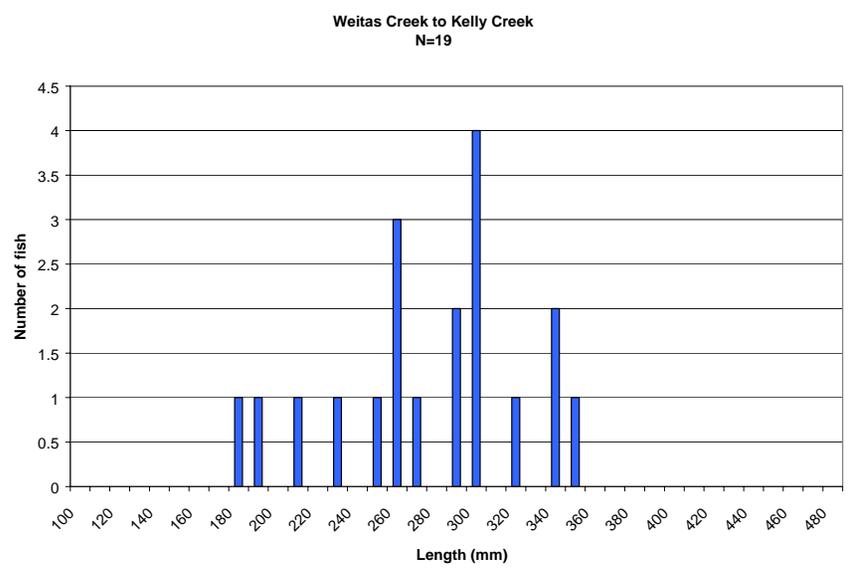
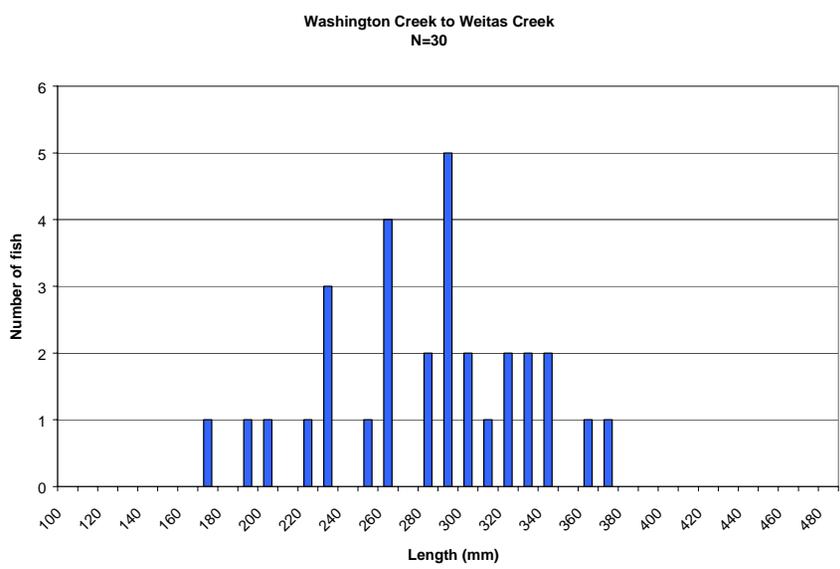
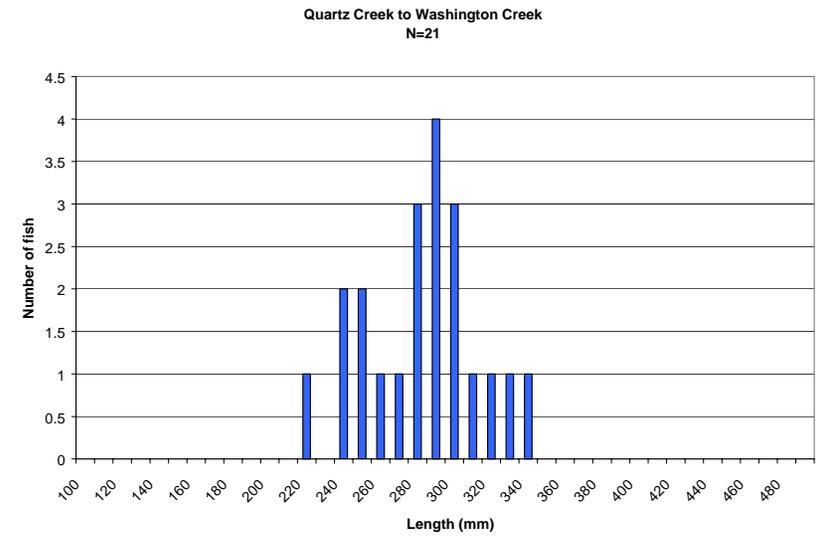
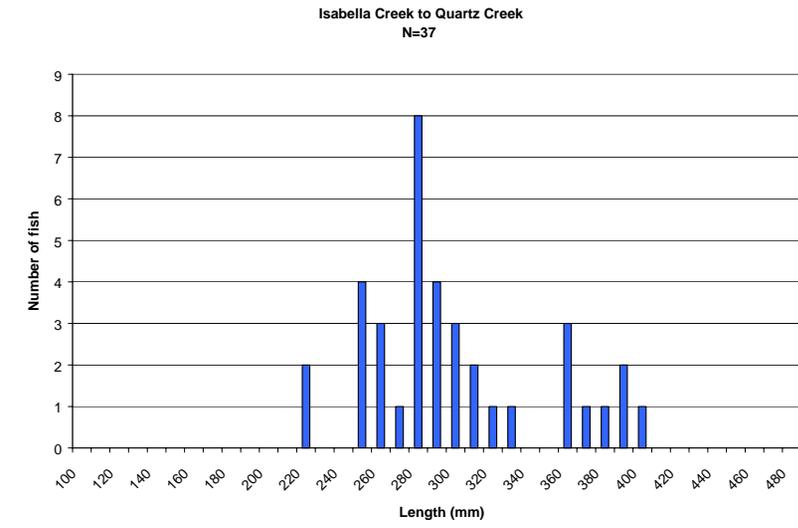


Figure 1. Total length frequency of cutthroat trout sampled in North Fork Clearwater River, June 14-17, 1998.

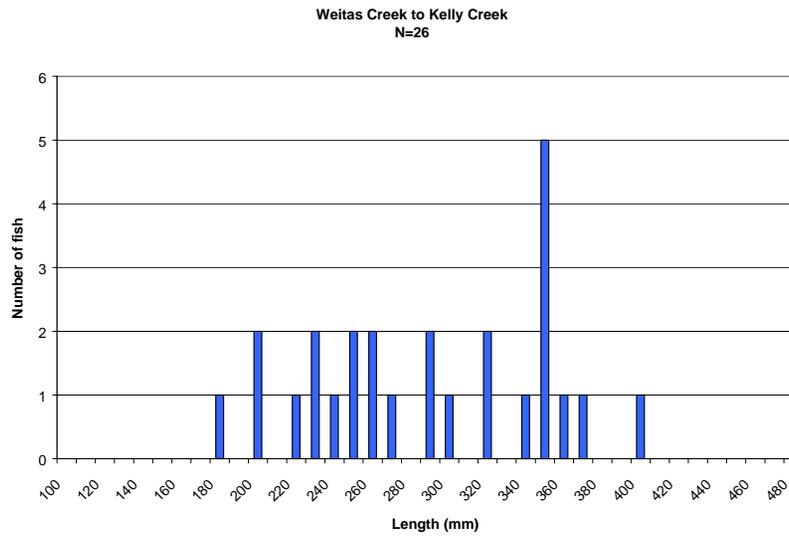
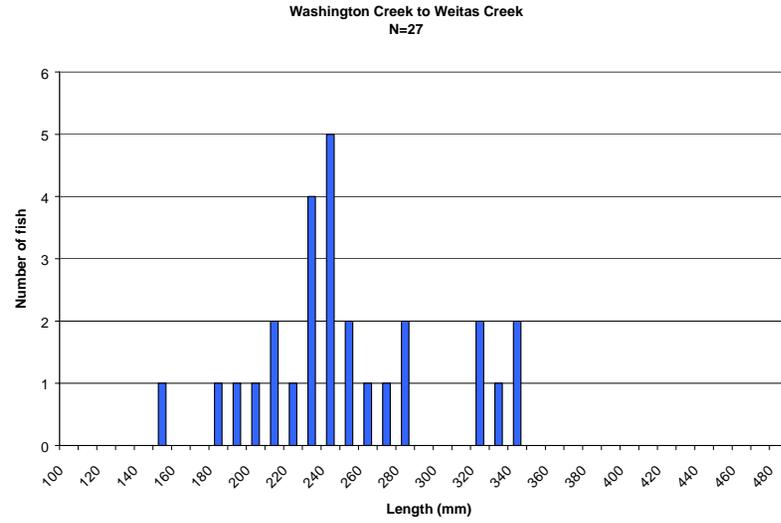
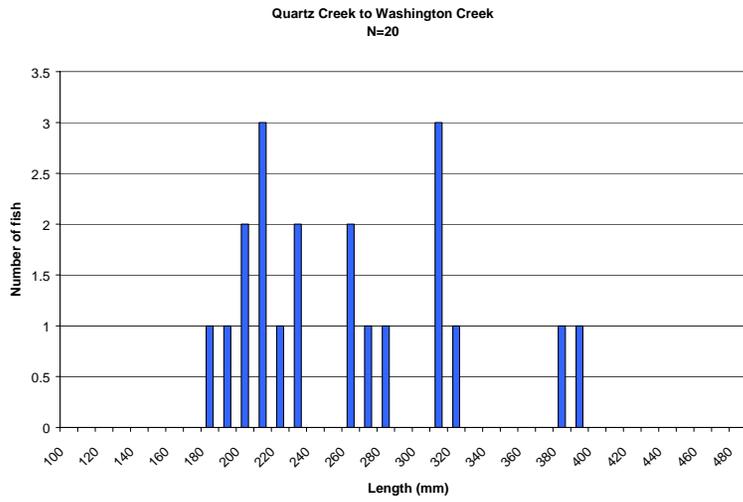


Figure 2. Total length frequency of cutthroat trout sampled in North Fork Clearwater River, July 14-17, 1998.

Table 15. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling in the Lower Clearwater River drainage, 1998.

Stream	Date	Steelhead trout					Cutthroat trout		Smallmouth bass	Mountain whitefish	Brook trout	Chinook salmon
		Total	Age 0	Age 1	Age 2	Age >2	Total	<305 mm				
Big Canyon Creek, #1, bridge	6/23	5.21	3.41	1.80	0	0	0	0	0	0	0	0
E.F. Potlatch River, #1, lower	6/24	0.56	0.28	0.28	0	0	0	0	0	0	0.28	0
E.F. Potlatch River, #2, middle	6/24	6.09	0.74	5.35	0	0	0	0	0	0	7.56	0
E.F. Potlatch River, #3, upper	6/24	5.16	1.29	3.87	0	0	0	0	0	0	0	0
Potlatch River, Kendrick	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Potlatch River, #1, upper	6/24	2.53	0.23	2.22	0.08	0	0	0	0	0	0.23	0
Mission Creek, #1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mission Creek, #2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

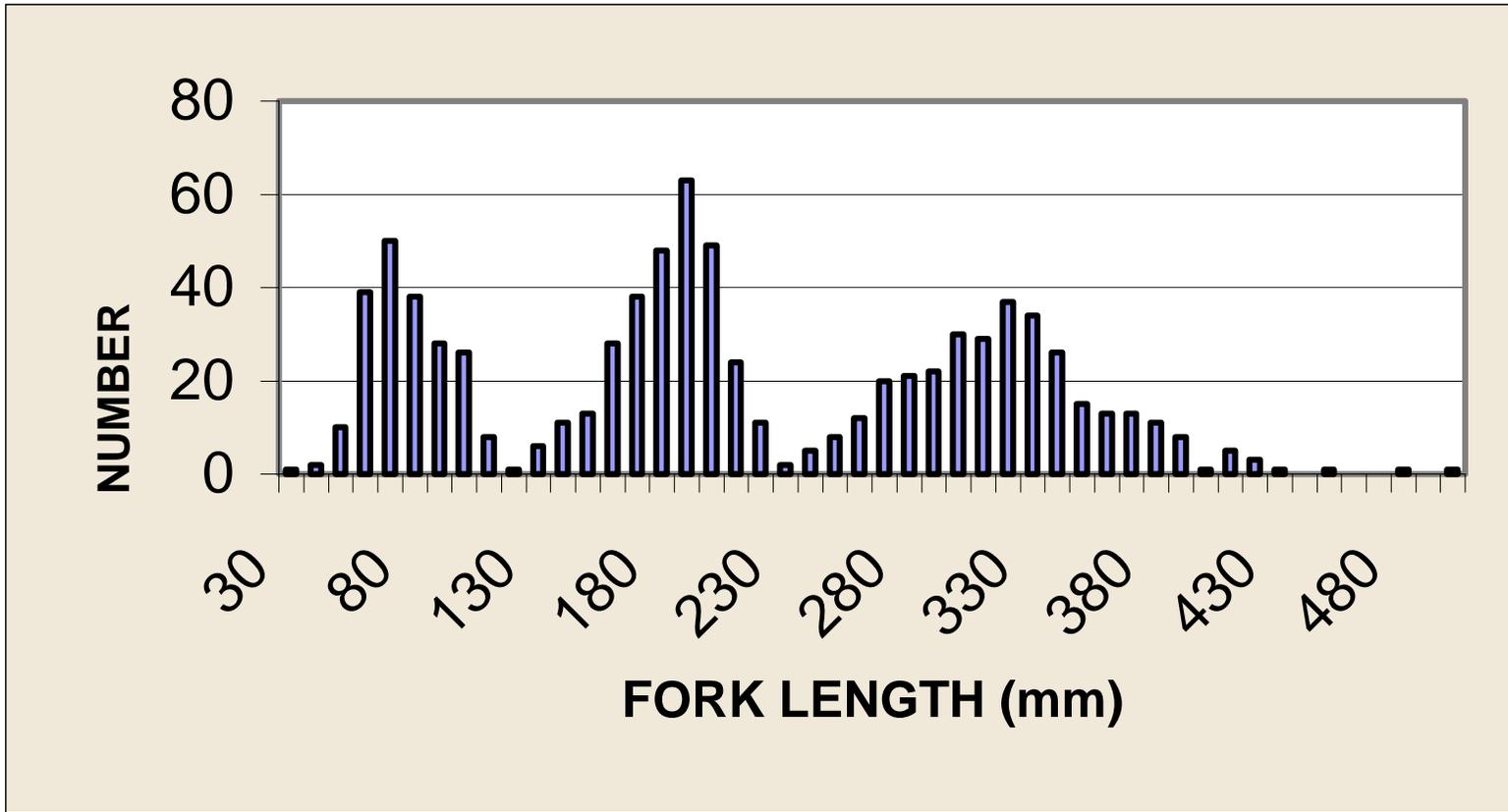


Figure 3. Length frequency of mountain whitefish sampled in Clearwater River, 1998.

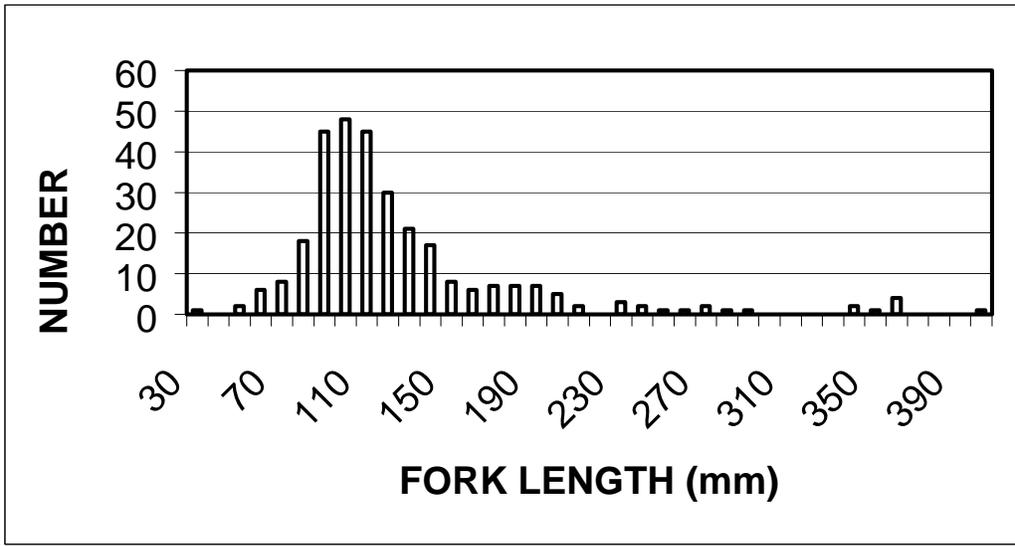


Figure 4. Length frequency of smallmouth bass sampled from Clearwater River, 1998.

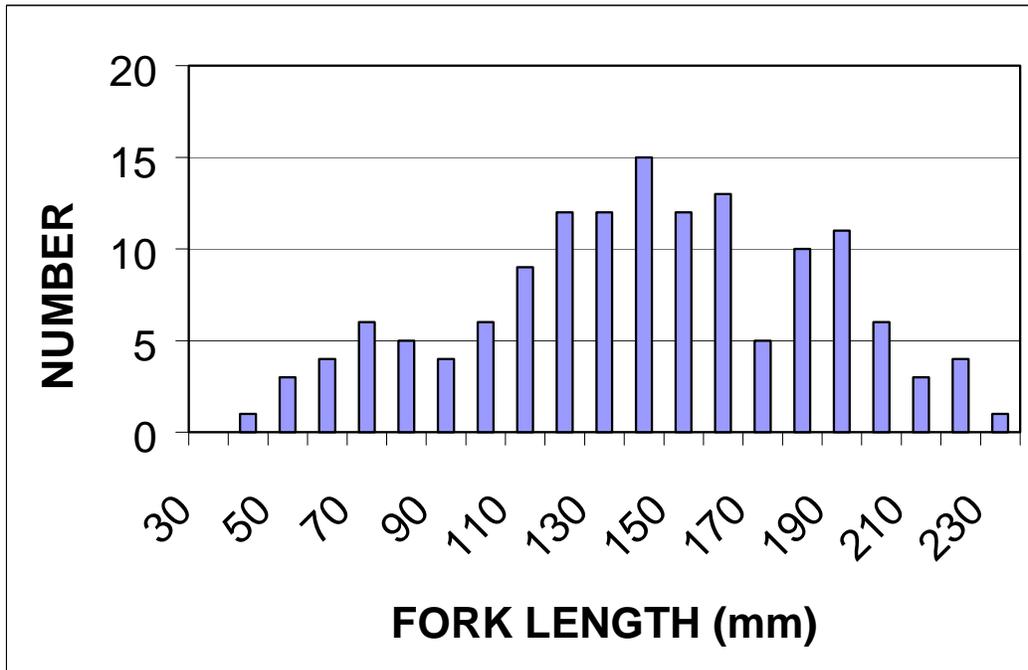


Figure 5. Length frequency of wild steelhead trout juveniles sampled in Clearwater River, 1998.

Table 16. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling parr monitoring sites in the South Fork Clearwater River drainage, 1998.

Stream	Date	Steelhead trout					Cutthroat trout			Chinook salmon	Mountain whitefish	Bull trout	Brook trout
		Total	Age 0	Age 1	Age 2	Age >2	Total	<305 mm	>305 mm				
American River, Strata 2, #1	8/12	1.54	1.54	0	0	0	0	0	0	51.03	0.77	0	0
American River, Strata 3, #2	8/9	0.32	0	0.16	0.16	0	0	0	0	60.26	1.45	0	0
Meadow Creek, #1, MP2	PENDING												
Meadow Creek, #2, meadow	PENDING												
Red River, Strata1 control 2	7/8	2.56	1.28	1.28	0	0	0	0	0	4.80	0	0	0.01
Red River, Strata 2 control 2	8/11	1.00	0	1.00	0	0	0.50	0.50	0	6.88	0.88	0	0.25
Red River, Strata 2 treat 2	8/11	2.29	0	2.29	0	0	0.57	0.57	0	19.17	0.86	0.29	0.29
Red River, Strata 4 control 2	8/11	0	0	0	0	0	0	0	0	21.99	0.88	0	0
Red River, Strata 4 treat 2	8/11	0	0	0	0	0	0	0	0	12.83	1.44	0	0.24
Red River, Strata 5 control 2	8/10	0	0	0	0	0	0	0	0	0.31	0.31	0	0
Red River, Strata 5 treat 2	8/10	0	0	0	0	0	0	0	0	2.43	0.10	0	0
Johns Creek, #1	8/23	9.91	4.16	4.36	1.39	0	0	0	0	0	0.79	0.20	0
Johns Creek, #2	8/23	5.62	3.95	1.06	0.61	0	0	0	0	1.37	0.61	0.15	0
Johns Creek, #3	8/20	3.71	0	3.14	0.57	0	0.86	0.86	0	0	0	0	0
Johns Creek, #4	8/20	4.61	0	2.88	1.73	0	2.88	2.88	0	0	0	0.19	0
Moore Creek, #1, lower	8/20									0	0	0	0
Moore Creek, #2, upper	8/20	0	0	0	0	0	8.08	4.04	4.04	0	0	0	0
Ten Mile Creek, #1, lower	8/22	5.89	0.71	4.11	0.89	0.18	0	0	0	0	0.54	0	0
Ten Mile Creek, #2, upper	8/22	5.12	0.18	4.23	0.71	0	0	0	0	0	0.18	0	0

Table 17. Chinook salmon trend redd counts on four tributaries of the South Fork Clearwater drainage, 1998.

Drainage	Reach	Type <sup>1</sup>	Description	Date	Method	Redds	Live	Dead
American River	NC-4	T	Lick Creek to Kirks Fork	9/15	Aerial	4	0	0
		ISS	Mouth to Limber Luke	9/15	Aerial	15	0	1
Crooked River	NC-6	T	Mouth to Forks above Old Orogrande	9/15	Aerial	7	0	0
Newsome Creek	NC-8	T	Mouth to Radcliffe Creek	9/15	Aerial	10	2	1
Red River	NC-1	T	Weir to Cole 66 Bridge	9/15	Aerial	27	1	2
South Fork Clearwater Drainage Aerial Total						63		

T = traditional transect

Twenty-seven transects were snorkeled as part of ISS field data collection in the Crooked River drainage. Seven of the 11 transects established for the long-term database in 1997 were snorkeled. A total of 2,169 juvenile chinook salmon were observed (Table 18). In addition, seven bull trout were observed: three in the mainstem, three in the West Fork and two in the East Fork (Table 18).

## **WHITE STURGEON**

### **Methods**

We sampled white sturgeon with traditional hook and line methods in the Snake and Salmon rivers. Passive integrated transponder (PIT) tags were inserted in the left side of the fish, just below the base of the dorsal fin, and the second left lateral scute was removed. Sturgeon were inspected for previous marks, tags and hook scars, measured for total length (TL) and/or fork length (FL) and released.

### **Results**

#### **Snake River**

During the 1998 field season, fishery management and enforcement personnel captured and PIT tagged two white sturgeon on the Snake River between Lewiston and Hells Canyon Dam and six on the Salmon River below Whitebird (Table 19). In addition, one white sturgeon was captured that had previously been PIT tagged. This fish had been at large 604 days and was recaptured at the same site of initial capture.

## **SALMONID SAMPLING AND DIET ANALYSIS**

### **Methods**

As in 1992-97, we sampled resident hatchery rainbow trout, residualized hatchery steelhead trout smolts, and wild rainbow trout in the Salmon and Clearwater rivers. In the Clearwater River, we sampled in conjunction with a gas bubble trauma monitoring (GBT) project and used pulsed D.C. current from a portable generator and a Coffelt VVP-2E pulsator. Booms and electrodes were mounted on a 5.5-m aluminum boat. Fish were collected using traditional hook and line methods in the Salmon River.

Table 18. Summary of fish densities (per 100 m<sup>2</sup>) as determined by snorkeling in the Crooked River drainage, 1998.

Stream	Date	Steelhead trout					Cutthroat trout		Chinook Salmon	Mountain whitefish	Bull trout	Brook trout	
		Total	Age 0	Age 1	Age 2	Age >2	Total	<305 mm					>305 mm
Crooked River													
Strata 1, Sill Log B	7/11	0.21	0	0.21	0	0	0	0	0	0	0	0	
Strata 1, Boulder A	7/11	0.12	0	0.12	0	0	0.45	0.45	0	0.12	0	0	
Strata 1, Control B	7/11	0.23	0.23	0	0	0	0	0	4.92	0	0	0	
Strata 1, Control A	7/11	0.17	0	0.17	0	0	0	0	0	0.17	0	0	
Strata 1, Pond A	7/11	0	0	0	0	0	0	0	0	0	0	0	
Strata 2, Control 1	7/12	2.06	1.51	0.43	0.11	0	0.11	0.11	0	18.39	0.87	0	0
Strata 2, Treat 1	7/12	2.75	1.98	0.44	0.22	0.11	0.11	0.11	0	12.42	0.22	0	0
Strata 2, Control 2	7/13	0.35	0.23	0.12	0	0	0	0	0	23.65	0.23	0	0
Strata 2, Treat 2	7/12	0.43	0.11	0	0.32	0	0.11	0.11	0	9.22	0.32	0	0
Strata 2, Pond U	7/12	0.53	0	0.53	0	0	0	0	0	127.72	3.68	0	0
Strata 3, Natural 1	7/13	0.49	0.15	0.34	0	0	0	0	0	23.25	0.69	0.10	0
Strata 3, Natural 2	7/13	1.92	0.14	1.65	0.14	0	0.27	0.27	0	6.32	3.16	0	0.27
Strata 4, B-Ponds S-1	7/13	0	0	0	0	0	0	0	0	10.41	10.70	0	0.44
Strata 4, Meander 1	7/13	0.29	0.10	0.19	0	0	0	0	0	31.83	2.40	0	0
Strata C, Canyon 2	7/13	0.41	0	0.28	0.14	0	0.14	0.14	0	2.75	0	0.14	0
Strata C, Canyon 3	7/13	0.95	0.24	0.63	0.08	0	0.47	0.47	0	6.02	0.24	0	0
Orogrande 1	7/10	0.48	0	0	0.48	0	0.97	0.97	0	2.42	0	0	0
West Fork, WF1	7/10	1.64	0	1.64	0	0	8.20	8.20	0	0	0	0.82	0
West Fork, WF2	7/10	0	0	0	0	0	2.33	2.33	0	0	0	0.29	0
East Fork, EF1	7/10	0	0	0	0	0	2.60	2.60	0	0	0	0.41	0
East Fork, EF2	7/10	0	0	0	0	0	3.37	3.37	0	0	0	0	0
Five Mile Creek, Strata 1, 1-A	7/9	2.64	0	1.76	0	0.88	0.88	0.88	0	0	0	0	0
Five Mile Creek, Strata 1, 1-B	7/9	0	0	0	0	0	2.57	2.57	0	0	0	0	0
Relief Creek, Strata 1, 1-A	7/12	0.24	0	0.24	0	0	0.24	0.24	0	17.03	0	0	0
Relief Creek, Strata 1, 1-B	7/12	0.89	0	0	0.89	0	0.89	0.89	0	0	0	0	0
Relief Creek, Strata 2, 2-A	7/12	0.38	0	0.38	0	0	1.14	1.14	0	0	0	0	0
Relief Creek, Strata 2, 2-B	7/12	0	0	0	0	0	1.02	1.02	0	0	0	0	0

Table 19. White sturgeon captured and PIT tagged in the Salmon and Snake rivers, 1998.

Date	PIT Number	Total Length (cm)	Fork Length (cm)	Rkm	River
7/29/98	7F7D074821	101	89	32	Salmon River
8/2/98	7F7D074865	175	160	25	Salmon River
8/2/98	7F7D052D7A	124	109	25	Salmon River
8/2/98	7F7D052D43	150	122	25	Salmon River
8/12/98	7F7D0E3102	181	164	22	Salmon River
2/19/98	7F7D0D7944	229	--	299	Snake River
4/9/98	7F7D0E3467	78	72	380	Snake River

All trout were measured for length. Due to the labor-intensive nature of the GBT inspection protocol, only domestic Kamloops and Spokane strain rainbow trout were sacrificed for diet analysis on the Clearwater River. All hatchery origin rainbow trout captured in the Salmon River were sacrificed and their stomachs dissected for diet analysis. Wild rainbow trout were released unharmed. A missing adipose fin identified hatchery steelhead trout juveniles. Domestic Kamloops trout were identified by a left ventral clip and Spokane rainbow trout by a right ventral clip. We classified rainbow trout with general fin deformity and/or erosion but no clips as unspecified hatchery trout, and trout with no deformities were classed as wild/natural.

## Results

### **Clearwater River**

We sampled sections within the lower 70 km of the Clearwater River with electrofishing gear from April 26 to August 22, 1998. We collected 918 hatchery steelhead trout smolts, 23 unmarked hatchery rainbow trout, and 14 Kamloops rainbow trout in approximately 3,400 minutes of electrode on time (Table 20). We dissected the stomachs of 14 Kamloops rainbow trout for diet analysis. Diet consisted primarily of aquatic and terrestrial insects, snails, and green algae. One sculpin was found in the stomach of a 255-mm domestic Kamloops rainbow trout. The high number of unmarked hatchery rainbow found in the Clearwater River were most likely catchable-sized hatchery rainbow trout that emigrated from Dworshak Reservoir.

Table 20. Length frequency of domestic Kamloops trout (RV clip) collected by electrofishing in the Clearwater River, 1998.

Total length (mm)	RVrbt
100	
110	
120	
130	
140	
150	
160	
170	
180	
190	
200	
210	2
220	3
230	1
240	1
250	2
260	1
270	1
280	
290	2
300	
310	
320	1
330	
340	
350	
360	
370	
380	
390	
400	
410	
420	
430	
440	
450	
460	
470	
480	
490	
500	
Total	14

## **Salmon River**

We sampled sections of the lower 80 km of the Salmon River with hook and line gear August 9-13, 1998 and collected 50 rainbow trout in 138 hours. Residualized hatchery steelhead trout smolts represented 32% of the sample, and domestic Kamloops rainbow trout accounted for 4% of the sample. No Spokane strain rainbow trout were sampled. Wild rainbow trout represented 52% of the sample, and unspecified hatchery rainbow trout represented 12% of the sample. Two year classes of fingerlings were represented in the sample (Table 21).

## **KOKANEE SALMON SPAWNING GROUND COUNTS**

### **Methods**

Since 1981, four to six tributaries to Dworshak Reservoir are surveyed in late September to estimate the size of the kokanee salmon *O. nerka* spawning run from the reservoir. The survey is conducted by enumerating fish starting from the mouth of each stream upstream until kokanee are no longer observed.

### **Results**

On September 25 and 26, 1998, we counted 660 kokanee spawners in three index tributaries of the North Fork Clearwater River (Table 22). This count is higher than the lowest recorded count of 144 from 1997 but is still only 3.5% of the average count from the previous ten years. This low number is a direct result of kokanee lost through Dworshak Dam during the floods of winter 1995-1996.

## **CREEL CENSUS**

### **Methods**

Clearwater Region fish management personnel and conservation officers performed spot check creel census surveys throughout the region in 1998.

### **Results**

Nineteen rivers and streams, 11 lowland lakes, and 14 mountain lakes were censused on a random basis in 1998 (Tables 23). Regional personnel checked 1,266 anglers who fished 2,442 hours. Anglers reported catching 2,563 game fish, averaging 1.05 fish per hour.

Table 21. Total length frequency of rainbow trout collected by hook and line in the lower 80 km of the Salmon River, 1998.

Length (mm)	Hatchery Steelhead (ad clip)	Colorado strain (LV clip)	Hatchery rainbow (no mark)	Kamloops (LV clip)	Spokane (RV clip)	Wild rainbow	Total
150							
160							
170						2	2
180						5	5
190							
200						4	4
210						1	1
220	1					3	4
230						2	2
240	1		1			1	3
250							
260	1						1
270							
280			1				1
290	5		1				6
300	1					1	2
310	3		1			1	5
320	2		1			1	4
330	1						1
340			1			1	2
350							
360						1	1
370						1	1
380						1	1
390						1	1
400							
410							
420	1						1
430				1			1
440							
450							
460							
470							
480							
490							
500							
510				1			1
Total	16	0	6	2	0	26	50

Table 22. Number of spawning kokanee observed in selected tributaries to Dworshak Reservoir, Idaho, 1981-1998.

Year	Trend Count Area					
	Isabella Creek	Skull Creek	Quartz Creek	Total	Dog Creek	Breakfast Creek
1981	4,000	3,220	850	8,070		
1982	5,000	4,500	1,076	10,576		
1983	2,250	135	66	2,451		
1984	9,000	2,200	1,000	12,200		
1985	10,000	8,000	2,000	20,000		
1986	ND	ND	ND	ND		
1987	3,520	1,351	1,477	6,348	700	23
1988	10,960	5,780	6,080	22,820	1,720	14,760
1989	11,830	5,185	2,970	19,985	1,720	14,402
1990	10,535	3,219	1,702	15,456	1,875	1,149
1991	4,053	1,249	693	5,995	590	3,557
1992	7,085	4,299	1,808	13,192	1,120	
1993	29,171	7,574	2,476	39,221	6,780	
1994	14,613	12,310	4,501	31,424	1,878	
1995	12,850	20,850	2,780	36,480	1,160	
1996	2,552	4	13	2,569	82	
1997	144	0	0	144	0	
1998	627	20	13	660	18	

### INCIDENTAL TRAP CATCHES

Rotary traps have been installed in selected streams in the Clearwater drainage since 1992 to monitor juvenile anadromous emigrations as part of ISS. We summarized incidental catch of resident salmonids and non-target anadromous fish at these traps for which data was available. This information is presented in Table 24. Pacific lamprey *L. tridentata* have only been captured at the Red River trap. Bull trout captured at all traps since 1996 have received PIT tags to monitor movement and growth.

Table 23. Summary of impromptu creel surveys in Clearwater Region streams, 1998.

Water/ Date	Anglers	Hours Fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
Alder Creek										
23-May	5	5	0	0	0	19	0	0	19	3.80
24-May	2	2	0	0	0	4	0	0	4	2.00
Subtotal	7	7	0	0	0	23	0	0	23	3.29
Bargamin Creek										
26-Jul	5	1	0	0	0	0	0	0	0	0
Beaver Creek										
23-May	6	6	1	0	0	0	0	0	1	0.17
Clearwater River (mainstem)										
28-Jan	4	20	0	0	0	0	0	0	0	0.00
8-Feb	3	21	0	0	0	0	0	0	0	0.00
17-Feb	7	16	0	0	0	0	4	0	4	0.25
4-Aug	2	1	0	0	0	0	0	0	0	0.00
Subtotal	16	58	0	0	0	0	4	0	4	0.07
Colt Killed Creek										
18-Jul	4	2	2	6	0	0	0	0	8	4.00
Crooked Fk. Creek										
26-Jul	3	13	90	0	0	0	0	0	90	6.92
East Fk. Potlatch Creek										
27-Jun	4	4	0	4	0	7	0	0	11	2.75
Hoodoo Creek										
22-Jul	1	2	65	0	0	22	0	0	87	43.50

Table 23. Continued.

Water/ Date	Anglers	Hours Fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
Kelly Creek										
23-May	1	3	8	0	0	0	0	0	8	2.67
31-Jul	2	6	58	24	0	0	0	0	82	13.67
8-Aug	6	18	3	2	0	0	0	0	5	0.28
Subtotal	9	27	69	26	0	0	0	0	95	3.52
Lochsa River (below Wilderness Gateway)										
23-May	2	4	0	3	0	0	0	0	3	0.75
28-Jun	4	5	0	0	0	0	0	0	0	0.00
24-Jul	7	3	6	2	0	0	0	0	8	2.67
30-Jul	2	2	0	1	0	0	0	0	1	0.50
2-Aug	4	1	6	0	0	0	0	0	6	6.00
4-Aug	4	9	0	0	0	0	0	0	0	0.00
13-Aug	6	29	46	0	0	0	0	0	46	1.59
14-Aug	12	34	19	0	0	0	0	0	19	0.56
30-Aug	9	6	0	0	0	0	0	0	0	0.00
Subtotal	50	93	77	6	0	0	0	0	83	0.89
Lochsa River (above Wilderness Gateway)										
18-Jan	2	2	0	0	0	0	0	0	0	0.00
21-Jul	5	8	5	2	0	0	0	0	7	0.88
24-Jul	3	6	21	3	0	0	0	0	24	4.00
30-Jul	2	6	8	0	0	0	0	0	8	1.33
2-Aug	3	9	7	0	0	0	0	0	7	0.78
7-Aug	15	34	6	1	0	0	0	0	7	0.21
8-Aug	22	83	80	10	0	0	0	0	90	1.08
9-Aug	30	42	36	0	1	0	0	0	37	0.88
22-Aug	9	10	11	4	3	0	0	0	18	1.80
Subtotal	91	200	174	20	4	0	0	0	198	0.99

Table 23. Continued.

Water/ Date	Anglers	Hours Fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
Middle Fk. Clearwater River										
15-Jan	2	1	0	0	0	0	0	0	0	0.00
1-Feb	4	3	0	0	8	0	0	0	8	2.67
7-Feb	4	5	0	0	0	0	0	0	0	0.00
8-Aug	1	1	0	0	0	0	0	0	0	0.00
15-Aug	4	3	0	0	0	0	0	0	0	0.00
Subtotal	15	13	0	0	8	0	0	0	8	0.62
North Fk. Clearwater										
23-May	33	51	29	2	0	0	0	0	31	0.61
24-May	32	39	32	0	1	0	0	0	33	0.85
6-Jun	10	11	15	2	0	0	0	0	17	1.55
13-Jun	6	4	10	0	0	0	0	0	10	2.50
26-Jun	4	6	7	0	0	0	0	0	7	1.17
30-Jul	6	9	16	0	0	0	0	0	16	1.78
8-Aug	9	18	10	0	0	0	0	0	10	0.56
9-Aug	7	18	16	2	0	0	0	3	21	1.17
5-Sep	7	9	7	2	0	0	0	0	9	1.00
Subtotal	114	165	142	8	1	0	0	3	154	0.93
Orogrande Creek										
23-May	1	3	1	0	0	0	0	0	1	0.33
24-May	2	2	0	0	0	0	0	0	0	0.00
Subtotal	3	5	1	0	0	0	0	0	1	0.20
Red River										
2-Aug	4	8	7	3	0	0	0	0	10	1.25
Salmon River										
5-Feb	9	35	0	0	0	0	1	0	1	0.03

Table 23. Continued.

Water/ Date	Anglers	Hours Fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
Selway River										
21-Feb	2	1	2	0	0	0	0	0	2	2.00
31-May	1	1	0	0	0	0	0	0	0	0.00
12-Aug	6	7	0	0	0	0	0	0	0	0.00
21-Aug	5	4	0	0	0	0	0	0	0	0.00
15-Sep	5	7	0	1	0	0	0	0	1	0.14
Subtotal	19	20	2	1	0	0	0	0	3	0.15
Snake River										
24-Jul	5	9	0	0	0	0	0	10	10	1.11
25-Jul	13	8	0	0	0	0	0	14	14	1.75
Subtotal	18	17	0	0	0	0	0	24	24	1.41
South Fk. Clearwater										
17-Feb	3	10	0	0	31	0	0	0	31	3.10
22-Feb	12	33	0	0	2	0	1	0	3	0.09
18-Jul	6	3	0	2	0	0	0	0	2	0.67
29-Jul	4	4	0	4	0	0	0	0	4	1.00
1-Aug	6	6	0	19	0	0	0	0	19	3.17
2-Aug	8	6	0	0	0	0	0	0	0	0.00
9-Aug	9	10	0	11	0	3	0	0	14	1.40
15-Aug	4	3	0	5	0	0	0	0	5	1.67
18-Aug	3	2	0	2	0	0	0	0	2	1.00
21-Aug	1	1	0	0	0	0	0	0	0	0.00
11-Sep	2	2	0	4	0	0	0	0	4	2.00
Subtotal	58	80	0	47	33	3	1	0	84	1.05
Weitas Creek										
24-May	2	2	0	0	0	0	0	0	0	0.00
1998 TOTALS	438	758	630	121	46	55	6	27	885	1.17

Table 24. Summary of fish trapped incidentally in juvenile smolt traps, Fish Creek, Crooked Fork Creek, Crooked River, Red River, and American River, 1988-1998 (Length is total length in millimeters).

Trap Date	Cutthroat Trout			Bull Trout			Brook Trout			Pacific Lamprey			Mountain Whitefish			Dace	Sucker	Sculpin	Spotted Frog Larvae	Long-toed Salamander
	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range					
<u>Fish Creek</u>																				
3/10-11/13/96	18	ND		0	ND		ND			ND			ND			260	ND	ND	ND	ND
3/21-11/12/97	110	ND		7	ND		ND			ND			ND			530	ND	ND	ND	ND
3/17-11/10/98	191	ND		7	ND		ND			ND			ND			2,528	ND	ND	ND	ND
<u>Crooked Fork Creek</u>																				
3/17-6/8/93	4	135	100-150	0			0			0			1	75		15	0	7	ND	ND
8/20-10/31/93	33	222	55-375	11	269	205-375	0			0			26	271	55-355	148	0	1	ND	ND
3/16-6/1/94	31	134	105-255	6	145	125-175	0			0			2	230	100-360	25	0	9	ND	ND
8/24-10/31/94	42	266	130-370	12	307	205-465	1	320		0			56	218	220-320	559	0	10	ND	ND
4/3-6/7/95	9	128	100-150	3	136	120-160	0			0			1	70		7	0	3	ND	ND
8/27-10/30/95	28	209	100-370	13	238	170-350	0			0			23	256	50-350	193	0	10	ND	ND
3/23-6/30/96	10	130	60-170	2	140	130-150	0			0			0			9	0	27	ND	ND
7/1-8/25/96	90	191	90-380	5	190	140-275	0			0			48	293	240-345	518	0	2	ND	ND
8/26-11/14/96	55	224	95-405	14	282	165-525	1	295		0			51	198	45-355	384	0	24	ND	ND
3/31-5/14/97	0			1	144		0			0			0			0	0	8	2	0
7/1-8/26/97	60	175	25-400	2	159	152-166	0			0			44	110	21-407	367	7	3	0	0
8/27-11/6/97	41	235	121-385	7	276	230-350	0			0			67	ND	50-350	31	0	4	0	0
3/31-11/6/97	102	192	25-355	18	206	25-350	0			0			108	158	25-350	678	0	17	1	0
3/24-11/11/98	130	197	126-350	16	225	144-440	1	ND		0			30	258	83-400	537	0	32	9	0
<u>Crooked River</u>																				
8/16-11/2/88	1	ND		127	332	152-559	3	186	178-203	0			78			993	12	7	0	2
3/18-5/23/89	1	ND		6	ND		1	ND		0			40	ND		46	31	2	0	5
8/31-10/30/89	0			1	ND		1	152		0			12	ND		665	1	4	0	0
3/3-5/24/90	2	ND		1	50		1	ND		0			25	ND		173	22	17	1	6
8/30-11/6/90	4	ND		4	ND		1	ND		0			18	ND		116	5	0	0	0
3/14-6/5/91	2	ND		1	ND		0			0			35	ND		14	11	8	0	13
8/22-11/16/91	0			3	ND		1	ND		0			84	ND		222	1	3	0	9
3/11-6/15/92	3	165	152-178	35	351	98-500	2	102		0			73	ND		689	37	16	0	0
9/2-11/11/92	1	203		0			2	59	50-68	0			49	ND		299	14	5	0	4
3/11-6/9/93	1	ND		0			2	ND		0			100	90		333	82	5	2	4
8/20-11/3/93	0			0			0			0			2	50		97	4	5	0	0
3/18-6/15/94	6	158		1	134		2	91	75-105	0			190	52	50-178	326	14	5	0	0
8/31-11/8/94	0			7	208	123-260	5	114	50-178	0			0			708	18	0	0	0
9/12-10/30/96	0			0			0			0			0	93		18	1	4	1	1
4/6-5/21/97	0			0			1	94		0			15	92	61-136	4	2	1	7	8
9/12-10/30/96	0			0			0			0			0	93		18	1	4	1	1
4/6-5/21/97	0			0			1	94		0			15	92	61-136	4	2	1	7	8

Table 24. Continued.

Trap Date	Cutthroat Trout			Bull Trout			Brook Trout			Pacific Lamprey			Mountain Whitefish			Dace	Sucker	Sculpin	Spotted Frog Larvae	Long-toed Salamander
	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range	N	Avg L	Range					
<u>Crooked River</u>																				
9/5-11/4/97	0			0			0			0			0			12	1	1	0	2
3/13-6/30/98	1	74		3	127	117-136	1	238		0			262	81	55-120	381	50	3	2	11
7/1-10/26/98	1	106		2	335	204-465	2	54	ND	0			19	882	60-116	105	23	1	1	0
<u>Red River</u>																				
9/18-10/22/92	10	237	140-289	1	245		121	146	90-329	2	95	90-99	402	198	50-400	0	0	0	ND	ND
3/30-6/9/93	4	162	64-317	1	102		0			649	173	0-317	30	129	64-317	350	149	2	ND	ND
8/25-11/8/93	34	263	140-318	13	248	140-318	121	135	63-317	12	63	0-63	60	161	0-318	ND	ND	ND	ND	ND
3/28-5/24/94	5	115	65-159	6	124	112-135	0			17	147	125-175	0			5	53	0	ND	ND
8/26-10/11/94	3	163	108-259	4	203	158-254	20	143	108-215	0			14	175	72-295	779	182	0	ND	ND
3/15-5/31/95	3	171	90-220	11	143	104-340	5	127	82-163	123	127	100-160	76	74	50-239	59	7	1	ND	ND
8/31-11/1/95	8	238	178-343	0			47	135	84-235	10	144	137-149	0			349	56	0	ND	ND
3/13-6/30/96	2	149	145-153	3	125	87-154	4	107	83-135	93	144	124-162	14	133	98-242	72	44	0	ND	ND
7/1-8/27/96	0			0			2	146	126-165	0			7	ND	ND	498	359	0	ND	ND
4/3-5/21/97	3	198	165-215	0			1	274		131	141	125-169	1	196		13	8	0	ND	ND
9/3-11/4/97	8	215	190-223	2	216	213-220	69	142	33-231	9	139	49-168	12	157	75-265	209	9	12	4	0
4/2-6/30/98	21	131	73-242	2	138	134-141	10	121	94-176	77	147	130-161	183	104	73=255	57	200	6	0	0
7/1-10/27/98	14	190	124-295	9	238	128-370	23	140	70-232	0			26	131	71-239	639	261	1	1	0
<u>American River</u>																				
7/1-10/26/98	9	156	82-219	8	236	149-309	17	132	59-275	1	ND	ND	91	135	55-300	1,197	1,218	6	10	0

## JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management

Project II: Technical Guidance

Subproject II: Clearwater Region

Contract Period: July 1, 1998 to June 30, 1999

Period Covered: January 1, 1998 to December 31, 1998

### ABSTRACT

Clearwater Region fisheries management personnel provided technical advice and reviews on various projects and activities that affect fishery resources in northcentral Idaho. We participated in multiple meetings with various federal and state agencies and Indian tribes. Technical guidance also included numerous angler informational meetings, presentations, and letters.

Author:

Ed Schriever  
Regional Fishery Biologist

## **JOB PERFORMANCE REPORT**

State of: Idaho

Program: Fisheries Management

Project III: Habitat Management

Subproject III-B: Clearwater Region

Contract Period: July 1, 1998 to June 30, 1999

Period Covered: January 1, 1998 to December 31, 1998

### **ABSTRACT**

Moose Creek Reservoir was drained for physical renovation. We utilized heavy equipment to reshape the bottom, creating two islands, three reefs, and deep-water habitat. The goal of the project was to reduce nuisance aquatic macrophytes by 30 percent.

Author:

Ed Schriever  
Regional Fishery Biologist

## OBJECTIVES

Create improved fish habitat and fishing opportunity in Moose Creek Reservoir, Latah County, ID.

## METHODS

Bulldozers and track-mounted excavators were used to excavate dried reservoir substrate. Islands and other features were constructed using compacted soil excavated from adjacent areas in the reservoir. Clearwater Regional personnel and volunteers constructed fishing dock abutments. New fishing docks were built to specifications by prison labor at Idaho Department of Corrections, Orofino ID. Fish emigrating from Moose Creek Reservoir during draining were trapped and moved to Spring Valley Reservoir and local farm ponds.

## FINDINGS

Clearwater Region personnel drained Moose Creek Reservoir during July 1998. Lake substrate dried and portions of the middle one-third of the reservoir were excavated to provide deeper areas and reduce nuisance aquatic macrophytes. Excavation was performed with heavy equipment. Deeper, plant-free areas will improve predator-prey interactions and fishing access. Excavated material was used to construct two islands and three jetties. Trout *Oncorhynchus spp.* bag limits were removed from the reservoir in June. Numerous largemouth bass a *Micropterus salmoides* and bluegill *Lepomis macrochirus* were salvaged and moved to Spring Valley Reservoir. The physical renovation of Moose Creek Reservoir was part of a larger project that included new docks and fishing platforms, replacing the outlet pipe in the dam, and adding seasonal dam boards to the spillway to increase depth 20 inches from June to October.

Submitted by:

Tim Cochnauer  
Regional Fishery Biologist

Jody Brostrom  
Regional Fishery Biologist

Ed Schriever  
Regional Fishery Biologist

Patrick D. Murphy  
Fishery Technician

Approved by:

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Cal Groen  
Regional Supervisor