



**FEDERAL AID IN FISH RESTORATIONS
1999 JOB PERFORMANCE REPORT
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Steven M. 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

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JOB PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management

Project I: Surveys and Inventories

Subproject I-B: Clearwater Region

Job: a

Title: Mountain Lakes Investigations

Contract Period: July 1, 2000 to June 30, 2001

Period Covered: January 1, 1999 to December 31, 1999

ABSTRACT

Seventeen mountain lakes were surveyed in the Clearwater National Forest July through September 1999. Five additional lakes in the North Fork Clearwater River drainage were resurveyed 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 17 lakes surveyed, five were resurveyed because of inconclusive information obtained initially. None of the lakes surveyed in 1999 are recommended for stocking with hatchery-reared trout *Oncorhynchus spp.*

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INTRODUCTION

The High Lakes Fisheries Project was initiated in 1986 as a cooperative program of the U.S. Forest Service and the Idaho Department of Fish and Game. Lewis Clark State College (Lewiston, Idaho) became a cooperating partner in 1994. The goal of the program is to develop baseline ecological data on high mountain lakes within the Clearwater River drainage of north central Idaho. During the period 1986 through 1999, 410 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, Cochnauer and Murphy 1999). Of these, 190 lakes are in the Nez Perce National Forest, and 220 are in the Clearwater National Forest.

In 1999, the project continued on the Clearwater National Forest as a partnership between the Clearwater National Forest and the Idaho Department of Fish and Game. The Clearwater National Forest and the Idaho Department of Fish and Game provided funding for the project. This report presents the findings for the 22 lakes surveyed in 1999. Fourteen lakes were located in North Fork Clearwater River drainage. 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 were 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 each received stocking of westslope cutthroat trout (*Oncorhynchus clarki lewisi*) fry in 1997. The findings of these two graduate studies will be reported separately at the end of their respective studies.

OBJECTIVES

The objectives of the 1999 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; and
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 mountain lakes located in the North Fork Clearwater River and Lochsa River drainages (Figure 1) from July 1 to September 30, 1999.

RESULTS AND DISCUSSION

The location description and proposed management direction based in information collected for each lake are presented in Table 1. Of the 13 lakes surveyed for the initial time, only one, North Porphyry Lake, supported fish. Amphibians, spotted frogs *Rana lutiventris* and long-toed salamanders

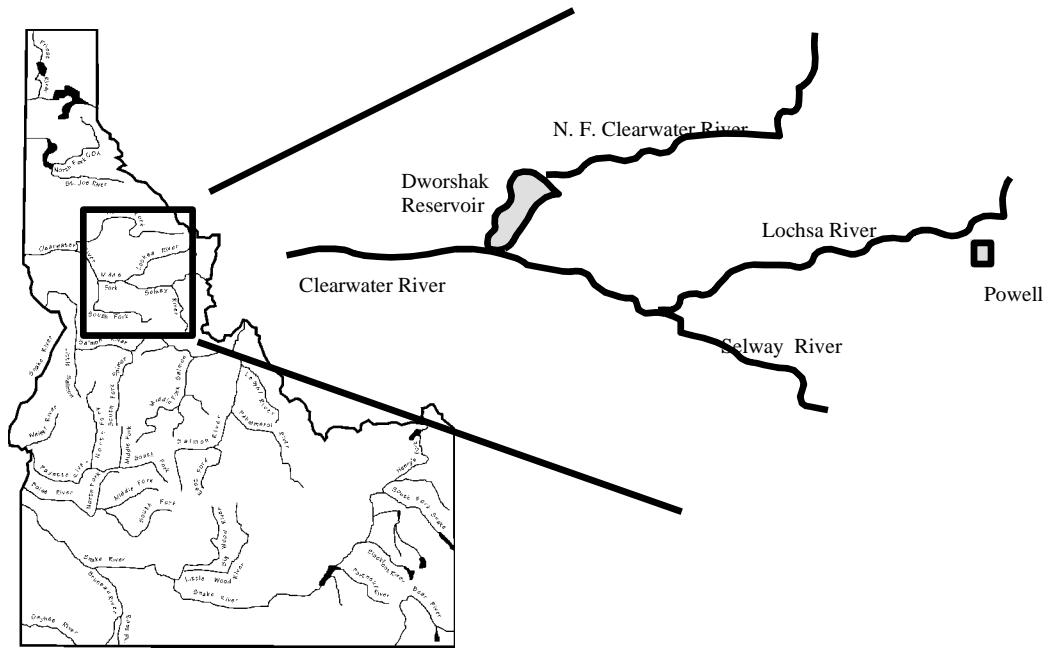


Figure 1. General location of high mountain lakes surveyed in Clearwater National Forest, 1999.

Table 1. Location and proposed management direction for mountain lakes surveyed in the Clearwater National Forest, 1999.

Legal Description								
Lake Name	Town	Range	Sec.	FSY	Class	PSY	Stock	Int
Buckingham Lake	T39N	R8E	29	---	Ib	---	---	---
Cold Springs Lake	T39N	R9E	14	---	IVb	---	---	---
Fourth of July	T38N	R10E	29	---	Ib	---	---	---
Fox Creek Lake #1	T38N	R9E	30	---	Ib	---	---	---
Fox Creek Lake #2	T38N	R9E	30	---	Ib	---	---	---
Moore Lake	T38N	R16E	33	---	IIa	---	---	---
Moose Lake	T38N	R16E	29	---	Ib	---	---	---
Moose Creek Lake #1	T39N	R10E	3	---	Ib	---	---	---
Moose Creek Lake #2	T39N	R10E	3	---	Ib	---	---	---
Moose Mountain Lake	T40N	R10E	27	---	Ib	---	---	---
Porphyry Lake, North	T34N	R14E	7	---	Ib	---	---	---
Pot Mountain Lake East	T39N	R8E	13	---	Ib	---	---	---
Pot Mountain Lake, West	T39N	R8E	13	---	Ib	---	---	---
Pothole Lake	T36N	R16E	21	---	Ib	---	---	---
Shattuck Lake	T34N	R16E	16	---	Ib	---	---	---
Siah Lake	T37N	R16E	27	---	IIa	---	---	---
Spruce Lake, South	T37N	R16E	12	---	IIa	---	---	---
Storm Lake, S.F.	T37N	R17E	29	---	Ib	---	---	---

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

Ambystoma macrodactylum populations, were observed in almost all of the lakes. In general, salamanders were absent or in small numbers in lakes that supported fish.

Buckingham Lake

Buckingham Lake is a small, shallow lake that supports no fish. Spotted frogs were abundant and two age classes of long-toed salamanders were observed. Fish stocking in this lake is not recommended because of its shallow nature.

Cold Springs Pond

Cold Springs Pond is not a high mountain lake but rather a man-made pond. Water is diverted from Cold Springs Creek into a 10-acre basin. The pond is suitable for fish rearing but needs installation of fish barriers on the inlet and outlet before hatchery reared fish can be released.

Fourth of July Lake

Fourth of July Lake is a small meadow depression and was dry at the time of survey. Fish stocking in this lake is not recommended because of the small size.

Fox Creek Lake #1

Fox Creek Lake #1 is the upper of the two Fox Creek lakes. It is a small and very shallow lake that does not support fish. The lake does support abundant populations of spotted frogs and long-toed salamanders. Fish stocking in this lake is not recommended because of its shallow nature and the abundant amphibian community.

Fox Creek Lake #2

Fox Creek Lake #2 is the lower of the two Fox Creek lakes and was dry at the time of the survey. Fish stocking in this lake is not recommended because of its small, shallow nature.

Moore Lake

Moore Lake was originally surveyed in 1997 and resurveyed in 1999. Cutthroat trout *O. clarki* were abundant in the gill net and several age classes were noted. Stocking of hatchery reared trout is not recommended because of the adequate natural reproduction.

Moose Lake

Moose Lake was originally surveyed in 1996 and resurveyed in 1999. Rainbow trout *O. mykiss* are abundant in the lake and several age classes were noted. Stocking of hatchery reared trout is not recommended because of the adequate natural reproduction.

Moose Creek Lake #1

Moose Creek Lake #1 is a small and shallow lake that does not support fish populations. Several spotted frogs and long-toed salamanders were observed in the lake. Fish stocking is not recommended because of its shallow nature.

Moose Creek Lake #2

Moose Creek Lake #2 is a large, flooded meadow with a maximum depth of 0.5 m. Spotted frogs were common and a few long-toed salamanders were observed. Fish stocking is not recommended in this lake because of its shallow nature.

Moose Mountain Lake

Moose Mountain Lake is a small and shallow lake that does not support fish populations. Several long-toed salamanders and one spotted frog egg mass were observed in the lake. Fish stocking is not recommended because of its shallow nature.

Porphyry Lake, North

North Porphyry Lake was originally surveyed in 1991 and resurveyed in 1999. Cutthroat trout are abundant in the lake and several age classes were noted. Stocking of hatchery reared trout is not recommended because of the adequate natural reproduction.

Pot Mountain Lake, East

East Pot Mountain Lake is essentially a large meadow that is underwater because of snowmelt at the time of the survey. The lake/meadow area probably becomes dry during the late summer months. No fish were observed. Spotted frog adults and subadults were observed. Fish stocking is not recommended because of its shallow nature.

Pot Mountain Lake, West

West Pot Mountain Lake is essentially a large meadow that is underwater because of snowmelt at the time of the survey. There are however several deep areas that might retain water throughout wetter years. No fish were observed. Spotted frogs and long-toed salamanders were observed in the lake. Fish stocking is not recommended because of its shallow nature.

Pothole Lake

Pothole Lake was dry at the time of the survey. Fish stocking is not recommended in this lake because of its shallow nature.

Shattuck Lake

Shattuck Lake is a small, shallow lake that does not support fish. No spotted frogs were observed and only one long-toed salamander larvae was noted. Fish stocking is not recommended because of its shallow nature.

Siah Lake

Siah Lake was originally surveyed in 1996 and resurveyed in 1999. Rainbow, cutthroat, and hybrid trout are abundant in the lake, and several age classes of each were observed. There is also an abundant population of spotted frogs. Fish stocking is not recommended because of the adequate natural reproduction.

South Fork Storm Creek Lake

South Fork Storm Creek Lake is essentially a wet meadow with no pools capable of supporting fish. No amphibians were observed. Fish stocking is not recommended because of its shallow nature.

Spruce Lake, South

South Spruce Lake was originally surveyed in 1996 and resurveyed in 1999. Cutthroat trout are abundant in the lake with several age classes noted. Only two spotted frog adults were observed in this lake. Fish stocking is not recommended because of adequate natural reproduction.

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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, 1999 to June 30,2000

ABSTRACT

Stocking approximately 1,080,482 fingerling, and 339,603 catchable size fish into lowland lakes, reservoirs and ponds supplemented resident fish populations and sport fishing in the Clearwater Region. Clearwater Region personnel transplanted 404 bluegill sunfish *Lepomis macrochirus* and 165 largemouth bass *Micropterus salmoides* into Moose Creek Reservoir for population reestablishment. These fish were collected from Spring Valley Reservoir and Mann Lake.

Creel census surveys were conducted on seven lowland lakes in the Clearwater Region in 1999. Anglers spent an estimated 127,867 hours fishing to catch 153,258 fish. These fish species included hatchery rainbow trout *Oncorhynchus mykiss*, naturally produced brook trout *Salvelinus fontinalis*, splake trout *S. fontinalis* x *S. namaycush*, black crappie *Pomoxis nigromaculatus*, largemouth bass, smallmouth bass *M. dolomieu*, bluegill, pumpkinseed *L. gibbosus*, yellow perch *Perca flavescens*, and black bullhead catfish *Ameiurus melas*. These lowland lakes supported an average of 126 hours of angling effort per hectare in 1999 (311 hours per acre). Return rate of catchable size rainbow stocked in these lakes was estimated at an average of 50 percent.

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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 or 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 used tanker trucks of various sizes and standard stocking techniques to stock fish in streams, lakes, ponds and reservoirs. We collected 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 *Oncorhynchus spp.* and kokanee *O. nerka* in lowland lakes using gill nets. We used standard floating experimental gill nets 150 feet long by six feet deep with six panels of different size mesh. Mesh sizes were 3/4", 1", 1-1/4", 1-1/2", 2", and 2-1/2". One or two nets were set and fished from late afternoon until early the next morning. Total net hours were recorded with the catch.

Regional fishery management staff and conservation officers conducted creel surveys in 1999. We recorded instantaneous counts of anglers, total hours fished, number of fish caught, fish species, and fish lengths. We used the creel census computer program developed by the Idaho Department of Fish and Game (IDFG) to calculate estimates and confidence intervals (Boydston & McArthur 1993). Creel survey counts were done a minimum of 2 weekdays and 2 weekend days per interval. Intervals are two weeks long beginning on January 9, 1999 and ending December 31, 1999.

RESULTS

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 mm and bluegill sunfish less than 150 mm were distributed to farm pond owners.

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.

On May 18, 1999 we collected 151 bluegill and 162 largemouth bass from Spring Valley Reservoir with approximately 2 hours of electrode-on electrofishing effort. Of these 313 fish, 59 were young-of-year (YOY) bluegill and 49 were YOY largemouth bass. These YOY fish were counted and immediately released back into Spring Valley Reservoir. We moved 206 fish, 93 bluegill and 113 largemouth bass, to Moose Creek Reservoir. Size of these relocated largemouth bass averaged of 129 mm and ranged from 70 to 230 mm in length. The bluegill ranged from 70 to 180 mm in length and had an average length of 142 mm.

We used four nights of trap net effort in Spring Valley Reservoir on 5/19 and 5/20/99 to collect 311 bluegill and 11 largemouth bass. The bluegill ranged from 90 to 210 mm in length and had an average length of 167 mm. The 11 largemouth bass ranged from 120 to 140 mm and had an average length of 131 mm. These fish were transported and released into Moose Creek Reservoir.

We stocked a total of 165 largemouth bass into Moose Creek Reservoir. Forty-one came from Mann Lake and 124 came from Spring Valley Reservoir. The fish collected from Spring Valley Reservoir were stocked to fill in the age classes between the brood stock and their future progeny in Moose Creek Reservoir. We also moved 404 bluegill from Spring Valley Reservoir to Moose Creek Reservoir. The majority of these bluegill are adults and will serve as the brood stock for Moose Creek Reservoir.

Creel Census

General

The seven reservoirs involved in the creel census are Winchester Lake, Spring Valley, Moose Creek, Elk Creek, Soldiers Meadow, Waha Lake, and Mann Lake. These reservoirs represent 1,015 ha (411 acres) of total surface area between them. They are located in the Clearwater region in northcentral Idaho and are relatively easy to access by the public.

Effort

We estimated total angling effort on seven lowland lakes in the Clearwater region at 127,867 hours in 1999. Angler effort consisted of 72.7% bank, 17.7% boat, and 9.6% ice hours. Effort ranged from a high of 33,926 hours on Winchester to a low of 4,103 hours on Waha (Figure 1). With the

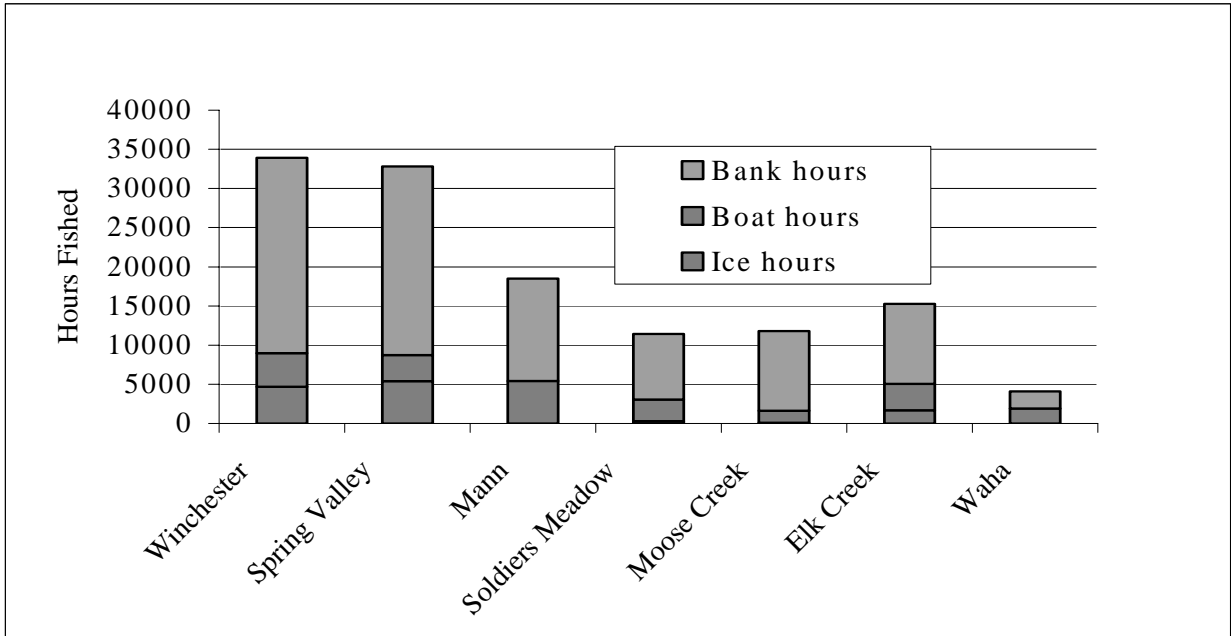


Figure 1. Summary of angler effort by type for seven lowland lakes in northcentral Idaho, 1999.

exclusion of Waha Lake in the 1999 census, total angling effort was 20% less than creel census estimates in 1993 (1993 estimates did not include Waha Lake).

Catch Rate

Anglers caught an estimated 153,258 fish from the seven lowland lakes during 1999, generating an overall catch rate of 1.2 fish per hour. Catch rate during 1993 was estimated at 1.13 fish per hour (Schriever 1993). The highest season average catch rate was reported on Elk Creek Reservoir at 1.36 fish per hour and lowest catch rate was reported on Waha Lake at 0.59 fish per hour (Figure 2). An overall harvest rate for the lowland lakes was estimated to be 0.97 fish per hour.

Harvest and Catch Composition

Anglers harvested a total of 123,632 fish from the seven lowland lakes during 1999, 80.7% of the total 153,258 fish caught. The harvest composition consisted of 68.1% hatchery rainbow trout, 19.1% black crappie, 5.4% bluegill, 4.3% naturally produced brook trout *Salvelinus fontinalis*, 1.9% yellow perch *Perca flavescens*, 0.5% largemouth bass, 0.3% smallmouth bass, 0.3% black bullhead *Ameiurus melas*, and 0.1% splake *S. fontinalis* x *S. namaycush* (Figure 3).

Winchester Lake

Winchester Lake is a 185 ha (75 acre) reservoir located in Lewis County one mile north of Winchester, Idaho. Winchester Lake has a state park with overnight camping and multiple docks for easy lake access. Fish species present include hatchery rainbow trout, largemouth bass, bluegill, black bullhead catfish, tiger muskie, black crappie and yellow perch. Statewide general fishing regulations apply to Winchester Reservoir.

Effort

We estimated total angling effort on Winchester Lake during 1999 at 33,926 hours, 11% less than the 1993 creel census estimate. The effort consisted of 77.6% bank, 13.5% boat, and 8.9% ice anglers. Winchester Lake supported 183 angler effort hours per hectare (452 hours per acre) in 1999. Effort was reported highest during interval 11 (May 28–June 10) at 4,244 hours and interval 13 (June 25–July 8) at 4,450 hours. Effort was reported lowest during interval 4 (February 20–March 3) at 44 hours (Figure 4).

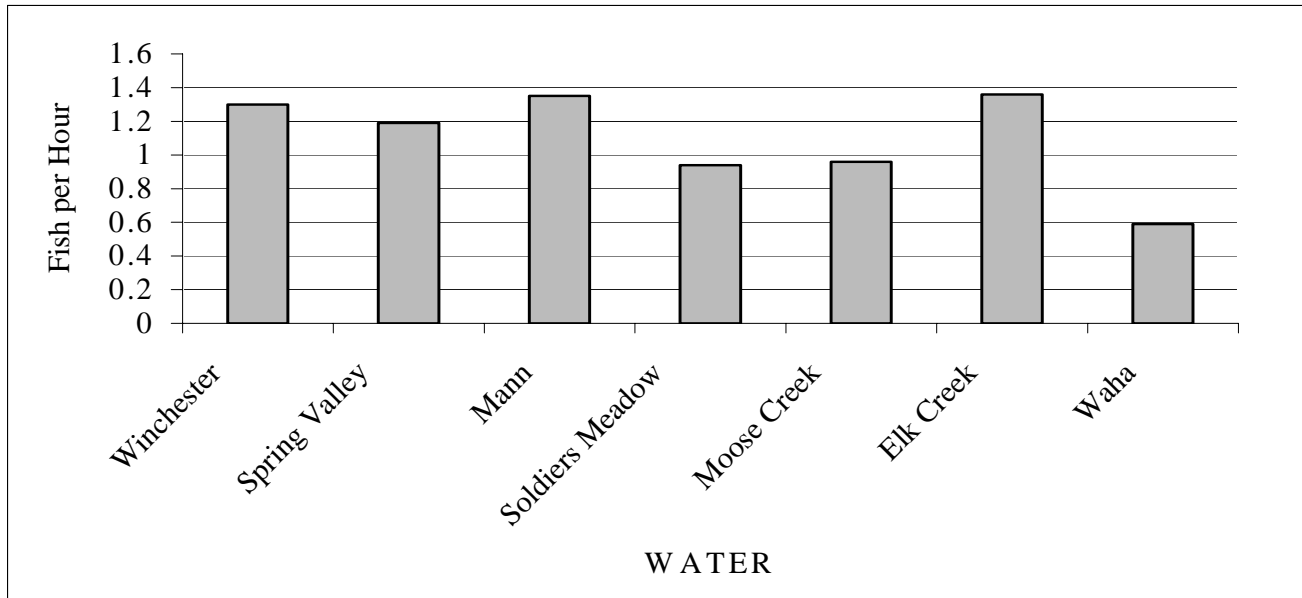


Figure 2. Summary of average season catch rates for seven lowland lakes in northcentral Idaho, 1999.

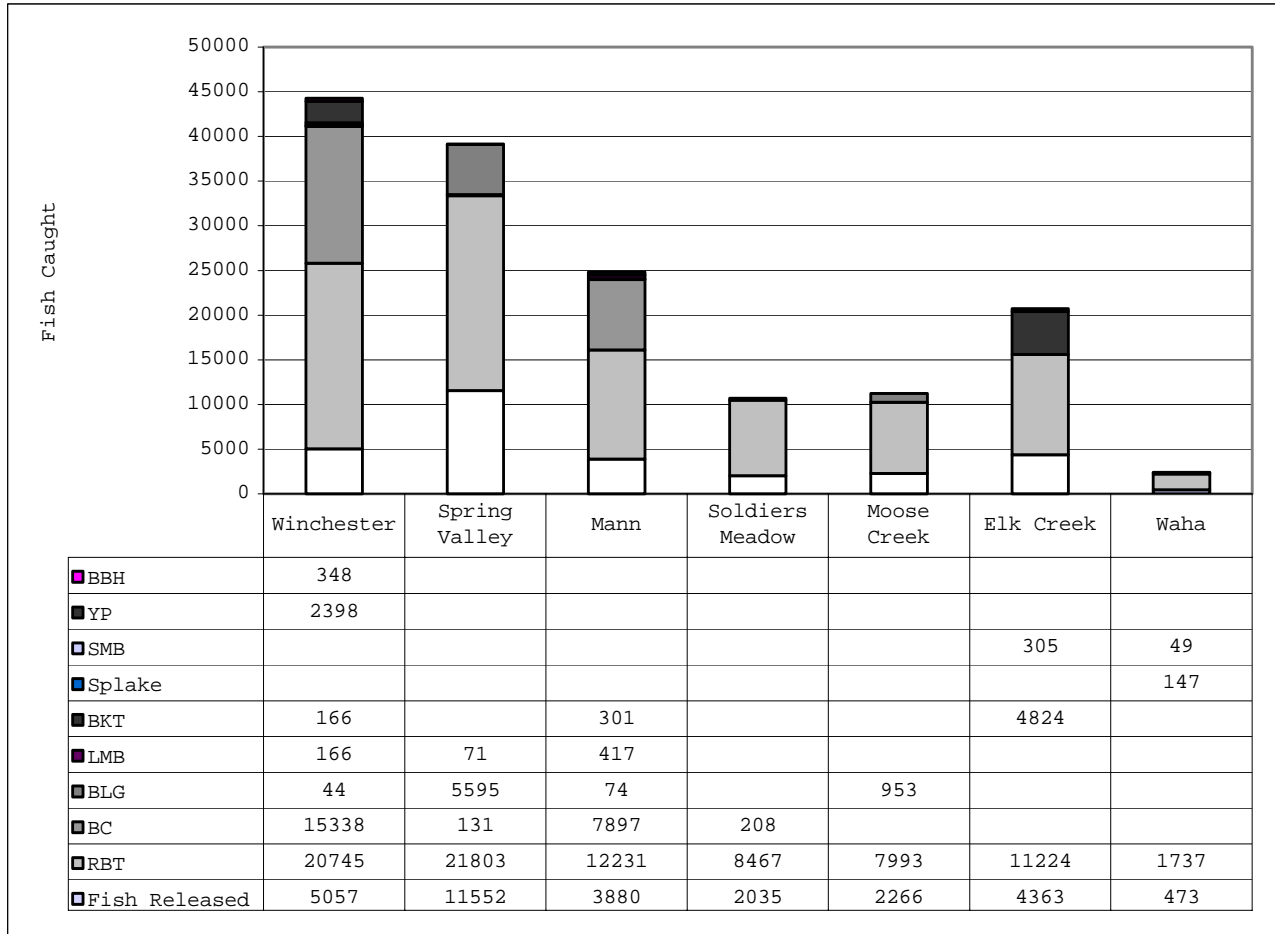


Figure 3. Summary of harvest, by species, and fish released from seven lowland lakes in northcentral Idaho, 1999.

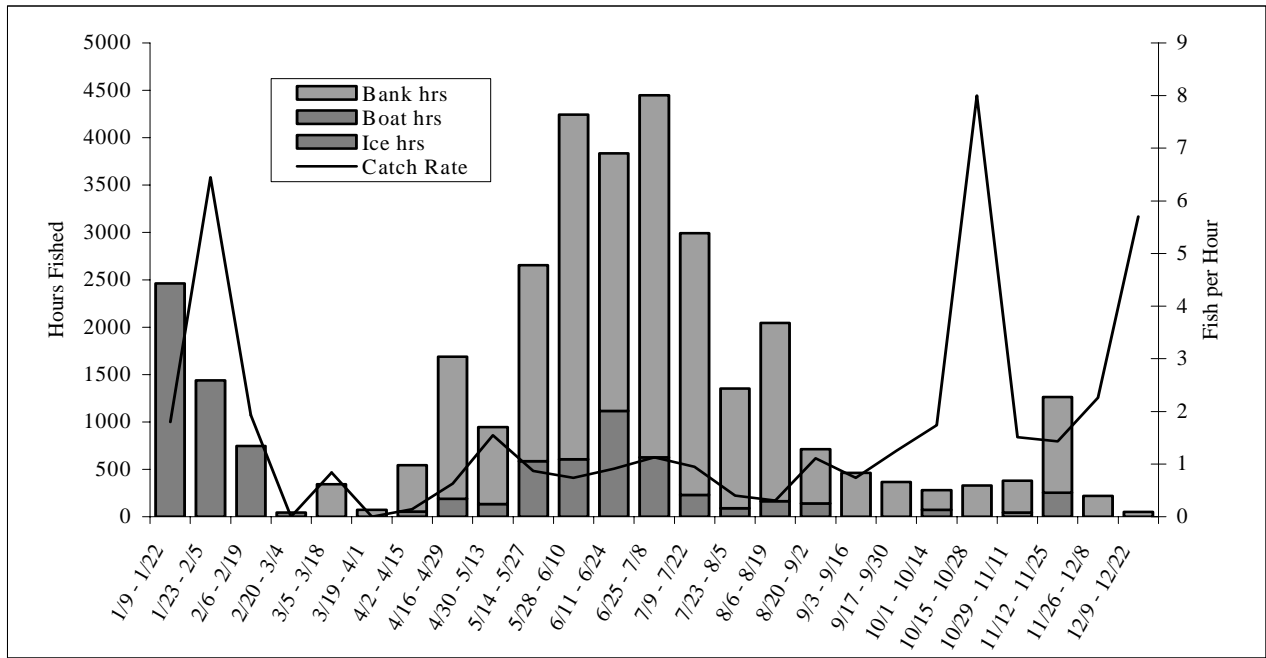


Figure 4. Estimated angler effort hours and catch rate per interval on Winchester Lake, 1999.

Catch Rate

Anglers caught an estimated 44,227 fish from Winchester Lake during 1999, resulting in a catch rate of 1.3 fish per hour. Catch rate during 1993 was estimated at 1.11 fish per hour (Schriever 1993). The highest catch rates were reported during interval 2 (January 23–February 5) at 6.45 fish per hour and interval 21 (October 15–October 28) at 8 fish per hour. Catch rates of zero were reported for intervals 4 and 6 due to zero fish being caught. Harvest rate was estimated to be 1.15 fish per hour during 1999 (Figure 4).

Harvest

Anglers harvested 39,171 fish from Winchester Lake during 1999, 88.6% of the total 44,227 fish caught. Harvest of hatchery rainbow trout dropped from 40,739 in 1993 to 21,622 in 1999. Of the 40,739 trout harvested in 1993, 25,573 were stocked as catchable size and 15,166 were stocked as fingerlings (Schriever 1993). Black crappie and yellow perch have been added to the reservoir since 1993 and now represent a major component of the fishery, accounting for 41.4% of the total harvest.

Catch Composition

The harvest composition consisted of 55.2% hatchery trout, 33.1% black crappie, 8.3% yellow perch, 2.3% bullhead catfish, 1% largemouth bass, and the remaining 0.1% bluegill. Creel census in 1993 estimated a harvest composition of 98.6% hatchery trout, 1.2% largemouth bass, and 0.2% brown bullhead *A. nebulosus* (Schriever 1993) (Figures 5 and 6).

Discussion

Winchester Lake has experienced a dramatic shift in the catch composition since 1993 due to the establishment of illegally introduced yellow perch and black crappie. Hatchery rainbow trout accounted for 55.3% of the total fish harvested in 1999, resulting in 21,622 trout creeled. This represents a 47% reduction in the total rainbow trout harvest from the 1993 census estimate. However, trout originating from fingerlings planted in 1993 accounted for 37.2% of the total harvest (15,166 trout), and catchable size trout accounted for 61.9% of the total fish harvest (25,573 trout) in 1993 (Schriever 1993). Observations made in the field by creel checkers concluded that no fingerlings were harvested in 1999. This observation shows a sharp decline in fingerling return since 1993 while catchable return is relatively similar (25,573 trout in 1993 and 21,622 trout in 1999). The failure of fingerling establishment in Winchester Lake is likely due to competition from perch and crappie.

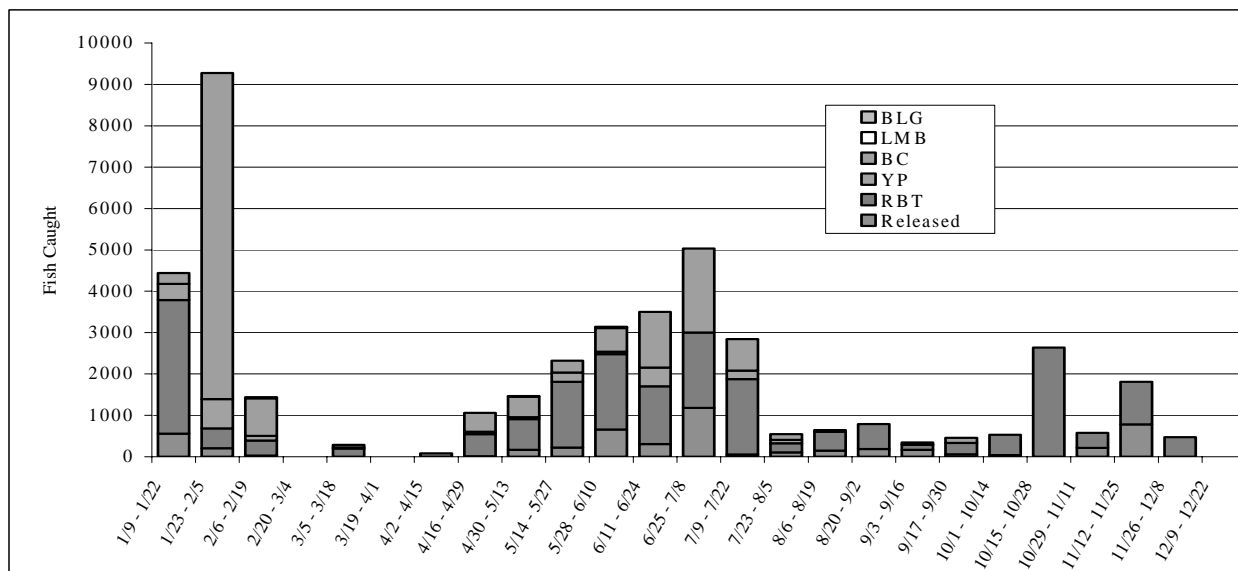


Figure 5. Estimated fish caught by species and fish released per interval on Winchester Lake, 1999.

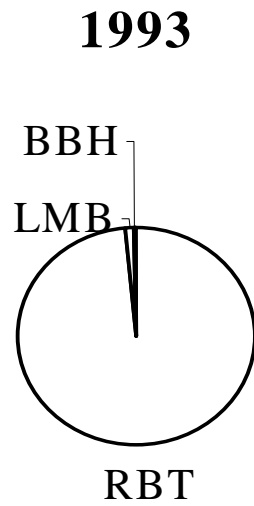
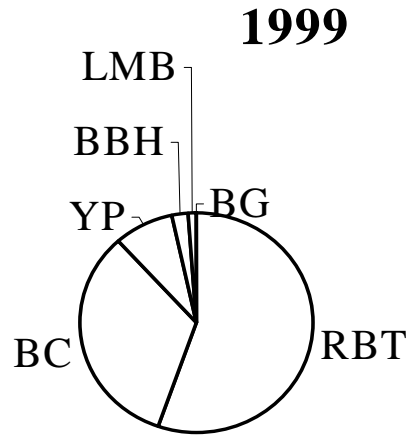


Figure 6. Comparison of harvest composition between 1993 and 1999 creel census estimates on Winchester Lake.

Soldiers Meadow Reservoir

Soldiers Meadow is a 249 ha reservoir located in Nez Perce County seven miles southeast of Waha, Idaho. The reservoir provides recreational activities such as fishing and overnight camping. Fish species present in Soldiers Meadow include hatchery rainbow trout and black crappie and kokanee.

Effort

Total angling effort on Soldiers Meadow Reservoir during 1999 was estimated at 11,434 hours, 14% less than the 1993 creel census estimate. The effort consisted of 72.1% bank, 26.6% boat, and 1.3% ice anglers. Soldiers Meadow supported 46 hours of angler effort per hectare (113 hours per acre) in 1999. Effort was reported highest during interval 14 (July 9–July 22) at 1,612 hours. No effort was reported during intervals 3, 4, 7, and 24 (Figure 7).

Catch Rate

Anglers caught an estimated 10,702 fish from Soldiers Meadow Reservoir during 1999, resulting in a catch rate of 0.94 fish per hour. Catch rate during 1993 was estimated at 1.5 fish per hour (Schriever 1993). The highest catch rate was reported during interval 18 (September 3–September 16) at 5.02 fish per hour. Catch rates of zero were reported for intervals 3, 4, 7, and 24 due to lack of angler effort and intervals 21 and 23 due to no fish being caught. Harvest rate was estimated to 0.76 fish per hour (Figure 7).

Harvest

Anglers harvested 8,667 fish from Soldiers Meadow Reservoir during 1999, 81% of the total fish caught. Harvest of hatchery rainbow trout dropped from an estimated 15,893 in 1993 to 8,407 in 1999. Of the 15,893 trout harvested in 1993, 4,001 were stocked as fingerling trout and kokanee, and 11,892 were stocked as catchable size (Schriever 1993).

Catch Composition

Hatchery trout made up 97% of the harvest, the remaining 3% were black crappie. Creel census in 1993 estimated a harvest composition of 90.2% hatchery trout, 5.0% kokanee, and 4.8% black crappie (Schriever 1993) (Figures 8 and 9).

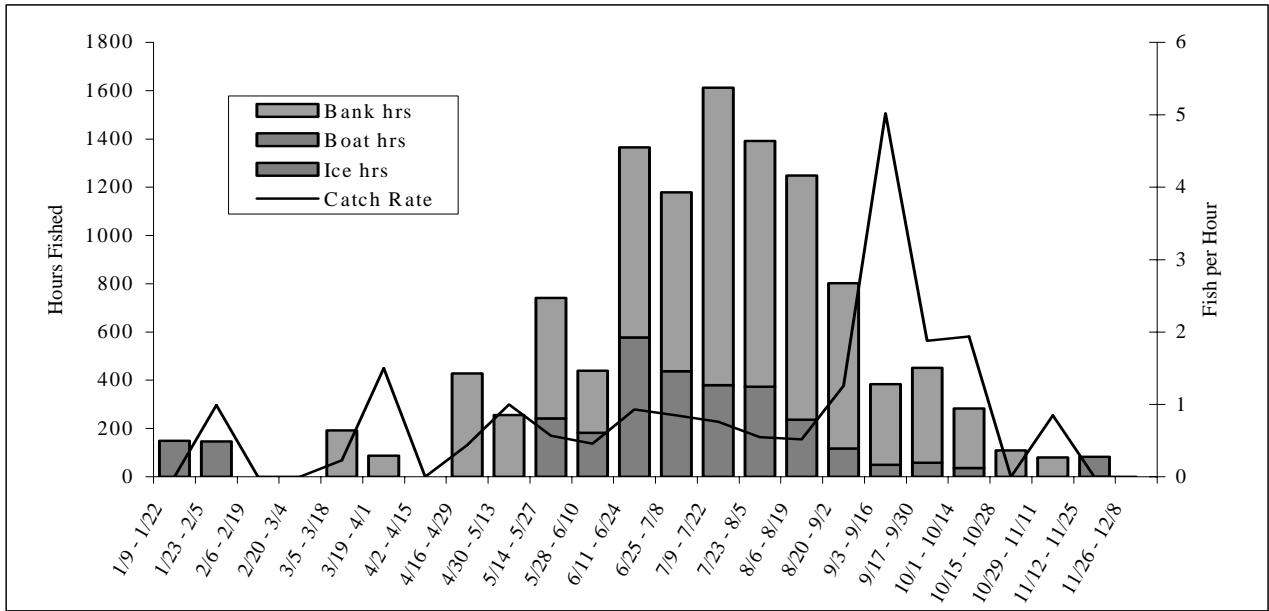


Figure 7. Estimated angler effort hours and catch rate per interval on Soldiers Meadow Reservoir, 1999.

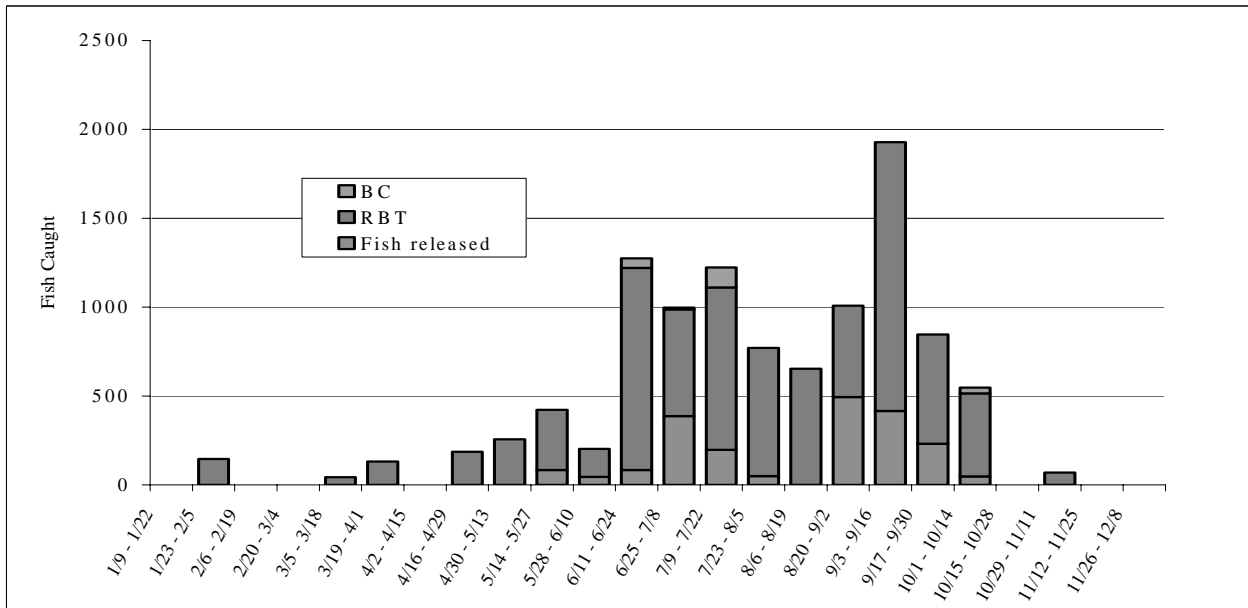
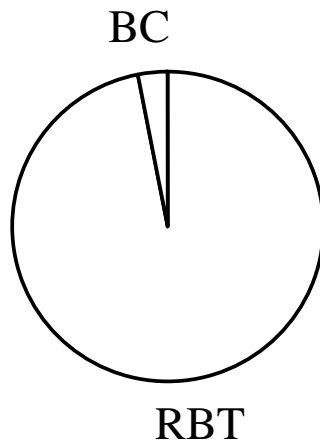


Figure 8. Estimated fish caught by species and fish released per interval on Soldiers Meadow Reservoir, 1999.

1999



1993

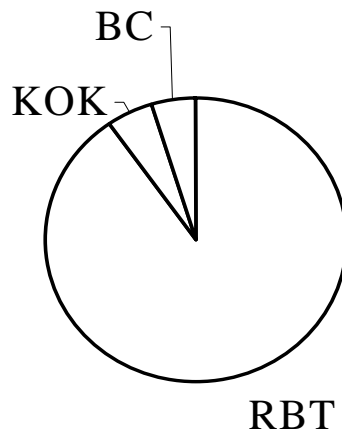


Figure 9. Comparison of harvest composition between 1999 and 1993 creel census estimates on Soldiers Meadow Reservoir.

Discussion

Compared to 1993 creel estimates, Soldiers Meadow Reservoir experienced a 47% drop in the amount of hatchery rainbow trout harvested in 1999. However, fingerling trout and kokanee accounted for 18% of the total harvest (4,001 fish) and catchable size trout accounted for 53% of the total harvest (11,892 trout) in 1993. Observations made in the field by creel checkers concluded that very few fingerling trout and no kokanee were harvested in 1999. This observation shows a sharp decline in fingerling trout and kokanee harvest since 1993 while catchable return is more similar (8,407 trout in 1999 and 11,892 trout in 1993).

Spring Valley Reservoir

Spring Valley Reservoir is a 133 ha reservoir located in Latah County, eight miles east of Troy, Idaho. The reservoir provides recreational activities such as fishing, swimming, and camping. Fish species present in Spring Valley Reservoir include hatchery rainbow trout, bluegill, largemouth bass, tiger muskie, and illegally introduced black crappie. Statewide general regulations apply to Spring Valley Reservoir.

Effort

Total angling effort on Spring Valley Reservoir during 1999 was estimated at 32,822 hours, 7% less than the 1993 creel census estimate. The effort consisted of 80.2% bank, 9.9% boat, and 9.9% ice anglers. Effort was reported highest during interval 8 (April 16–April 29) at 4,682 hours. No effort was reported during interval 24 (Figure 9).

Catch Rate

Anglers caught an estimated 39,251 fish from Spring Valley Reservoir during 1999, resulting in a catch rate of 1.19 fish per hour. Catch rate during 1993 was estimated at 0.97 fish per hour (Schriever 1993). The highest catch rate was reported during interval 21 (Oct. 15–Oct. 28) at 3.82 fish per hour. A catch rate of zero was reported only for interval 24 due to lack of angler effort. Harvest rate for Spring Valley was estimated to be 0.84 fish per hour during 1999 (Figure 10).

Harvest

Anglers harvested 27,668 fish from Spring Valley Reservoir during 1999, 70.5% of the total 39,251 fish caught. Harvest of rainbow trout dropped from an estimated 26,923 in 1993 to 22,826 in 1999. Of the 26,923 trout harvested in 1993, 24,200 were stocked as catchable size and 2,723 were stocked as fingerlings (Schriever 1993). Bluegill harvest increased from 274 in 1993 to 4,621 in 1999. Black crappie have also become present in the harvest due to an illegal introduction since 1993.

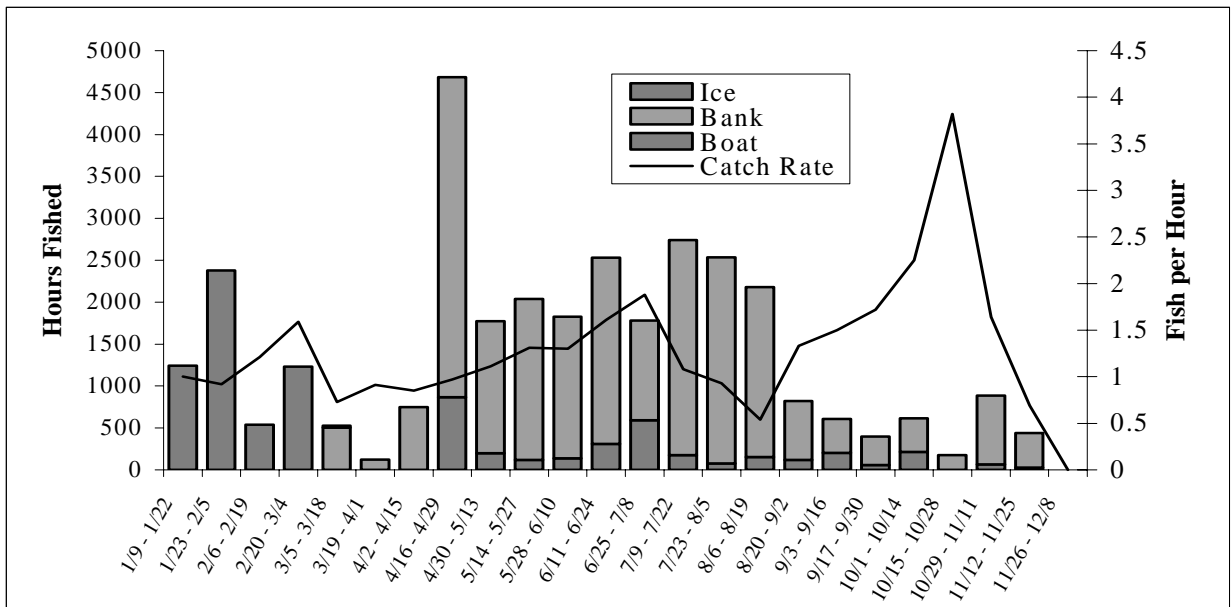


Figure 10. Estimated angler effort hours and catch rate per interval on Spring Valley Reservoir, 1999.

Catch Composition

Harvest from Spring Valley Reservoir consisted of 82.5% hatchery trout, 16.7% bluegill, 0.6% largemouth bass, and 0.3% black crappie. Creel census in 1993 estimated a harvest composition of 98.2% hatchery trout, 0.8% largemouth bass, and 1.0% bluegill (Schriever 1993) (Figures 11 and 12).

Discussion

Spring Valley Reservoir has shifted from a hatchery trout driven fishery in 1993 to include bluegill in 1999. The number of hatchery trout caught has dropped by 15% and bluegill has raised by over 1,600% since the 1993 estimates. However, trout originating from fingerlings planted in 1993 accounted for 8% of the total harvest (2,723 trout) and catchable size trout accounted for 71% of the total harvest (24,200 trout). Observations made in the field by creel checkers concluded that no fingerlings were harvested in 1999. This observation indicates a decline in the success of the fingerling put-and-grow program while catchable trout returns are relatively similar (22,826 in 1999 and 24,200 in 1993). The failure of the put-and-grow fingerling program in Spring Valley Reservoir is likely due to competition by bluegill. The black crappie in Spring Valley Reservoir may further impact the fingerling program.

Mann Lake

Mann Lake is a 247 ha reservoir located in Nez Perce County, two miles east of Lewiston, Idaho. The reservoir provides recreational activities such as fishing and boating and has no overnight camping facilities. Fish species present in Mann Lake include rainbow trout, largemouth bass, black crappie, bluegill, pumpkinseed *Lepomis gibbosus*, and channel catfish *Ictalurus punctatus*.

Effort

Total angling effort on Mann Lake during 1999 was estimated at 18,489 hours, 41% less than the 1993 creel census estimate. The effort consisted of 69.4% bank, 30.6% boat, and 0% ice anglers. Mann Lake supported 75 hours of angling effort per hectare.

Catch Rate

Anglers caught an estimated 24,959 fish from Mann Lake during 1999, resulting in a catch rate of 1.35 fish per hour. Catch rate during 1993 was estimated at 1.03 fish per hour (Schriever 1993). Highest catch rates were reported during interval 10 (May 14–May 27) at 2.37 fish per hour and interval 22 (October 29–November 11) at 3 fish per hour. Catch rates of zero were reported during intervals 1, 2, 4, and 21 due to lack of angler effort and interval 24 due to zero fish caught. Harvest rate for Mann lake was estimated to be 1.14 fish per hour during 1999 (Figure 13).

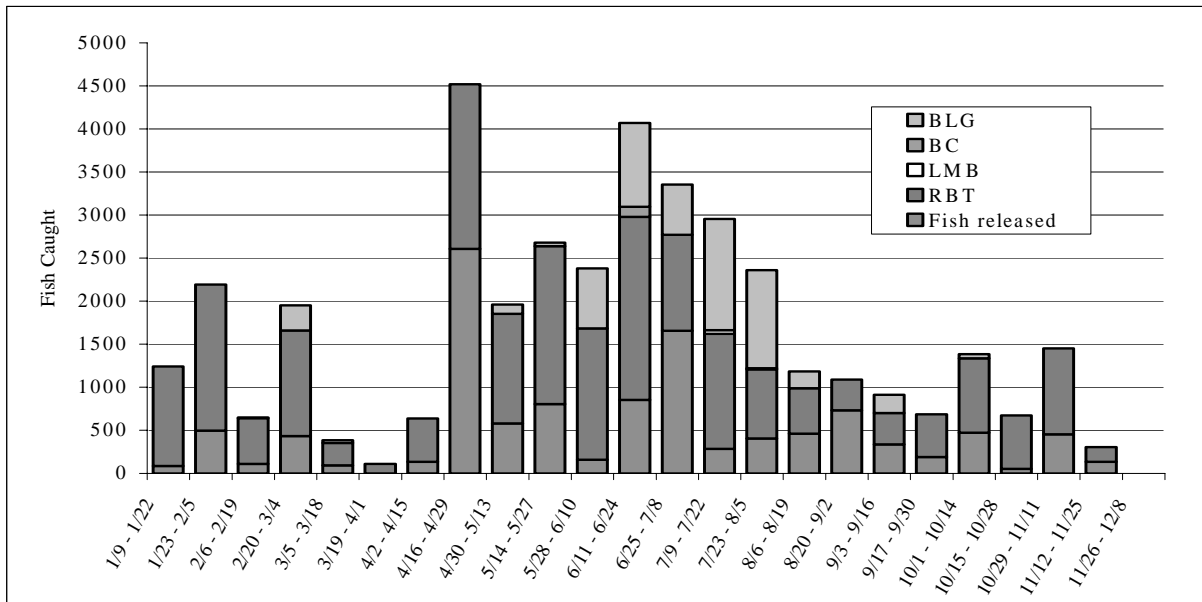
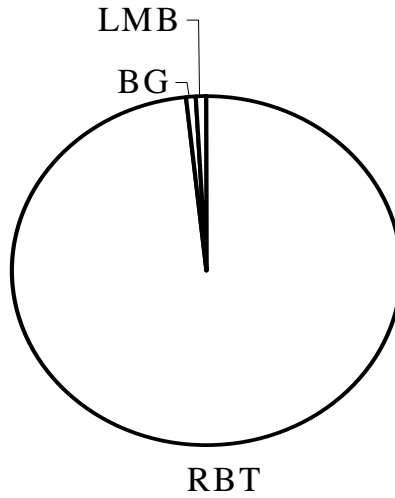


Figure 11. Estimated fish caught by species and fish released per interval on Spring Valley Reservoir, 1999.

1993



1999

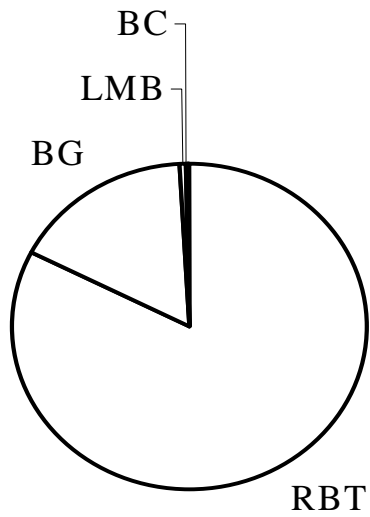


Figure 12. Comparison of harvest composition between 1993 and 1999 creel census estimates on Spring Valley Reservoir.

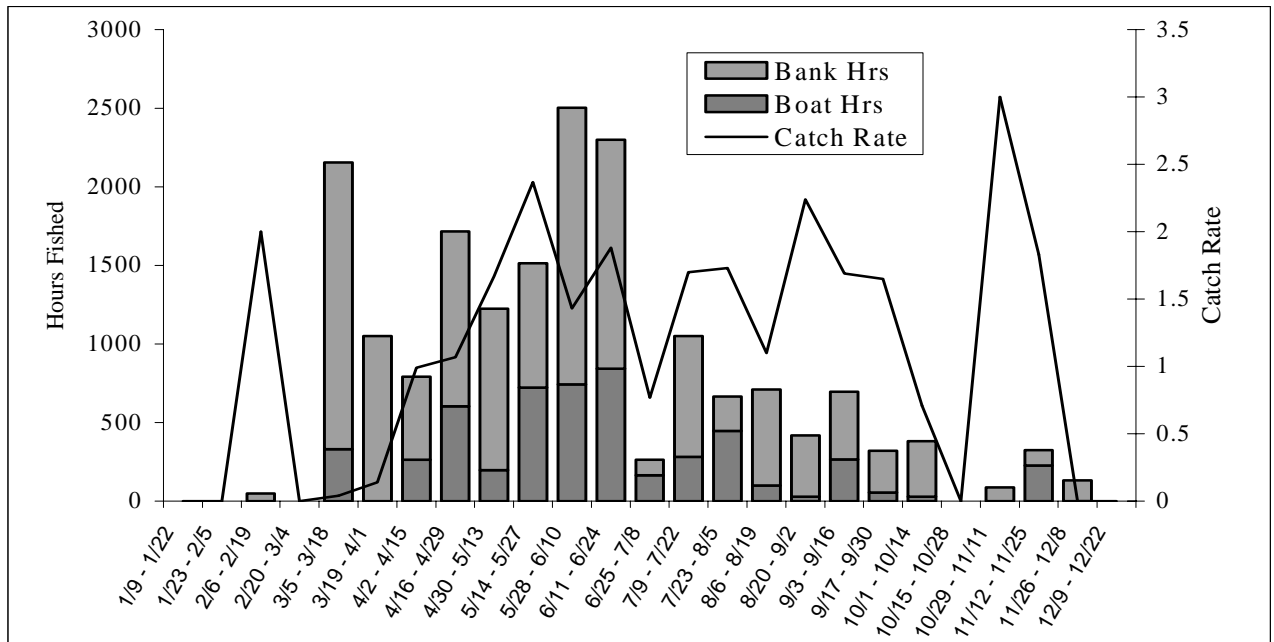


Figure 13. Estimated angler effort hours and catch rate per interval on Mann Lake, 1999.

Harvest

Anglers harvested 21,085 fish from Mann Lake during 1999, 84.5% of the total 24,959 fish caught. Harvest of hatchery trout dropped from 27,133 in 1993 to 12,546 in 1999. Of the 27,133 trout harvested in 1993, 24,204 were stocked as catchable rainbow trout and 2,929 were stocked as fingerlings or lake trout *Salvelinus namaycush* (Schriever 1993). Black crappie harvest increased from 683 in 1993 to 7,970 in 1999.

Catch Composition

Harvest from Mann Lake consisted of a catch composition of 59.5% hatchery trout, 37.8% black crappie, 1.9% largemouth bass, and the remaining 1% bluegill. Creel census in 1993 estimated a harvest composition of 95.3% hatchery trout, 1% largemouth bass, 2.4% black crappie and 0.1% channel catfish (Schriever 1993) (Figures 14 and 15).

Discussion

Mann Lake experienced the largest drop in angling effort out of the seven reservoirs from 1993 to 1999. The reservoir has shifted from primarily a hatchery trout fishery to include black crappie. The number of hatchery trout caught has dropped by 64% and black crappie has increased by over 1,100% since 1993. Observations in the field by creel census checkers concluded that no lake trout or fingerlings were harvested in 1999. The amount of catchable hatchery rainbow trout harvested in 1999 is still considerably less when compared to the catchable trout harvest in 1993 (12,546 trout in 1999 and 24,204 trout in 1993).

Elk Creek Reservoir

Elk Creek Reservoir is a 119 ha body of water located in Clearwater County two miles southeast of Elk River, Idaho. The reservoir provides recreational activities such as fishing, swimming, overnight camping, and organized boat racing. Fish species present include hatchery rainbow trout, naturally produced brook trout, largemouth bass, and smallmouth bass. A limit of 2 bass was allowed for fish below 12" or above 16" in 1999, consumptive from July 1 through December 31. Statewide general regulations apply for all other fish species present in Elk Creek Reservoir.

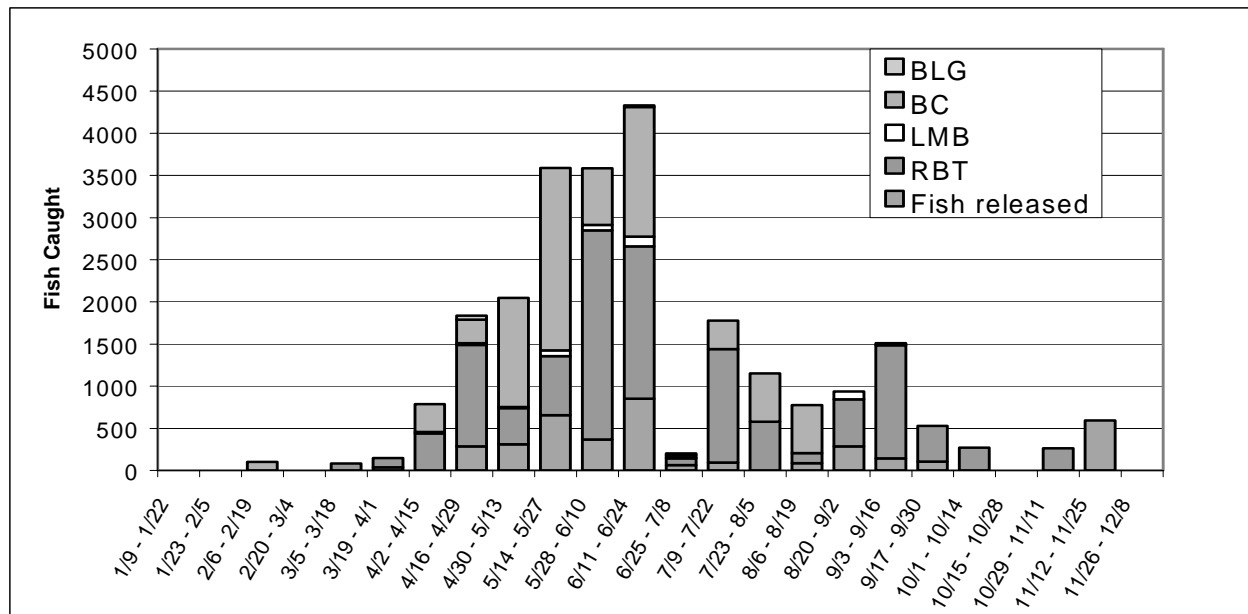


Figure 14. Estimated fish caught by species and fish released on Mann Lake, 1999.

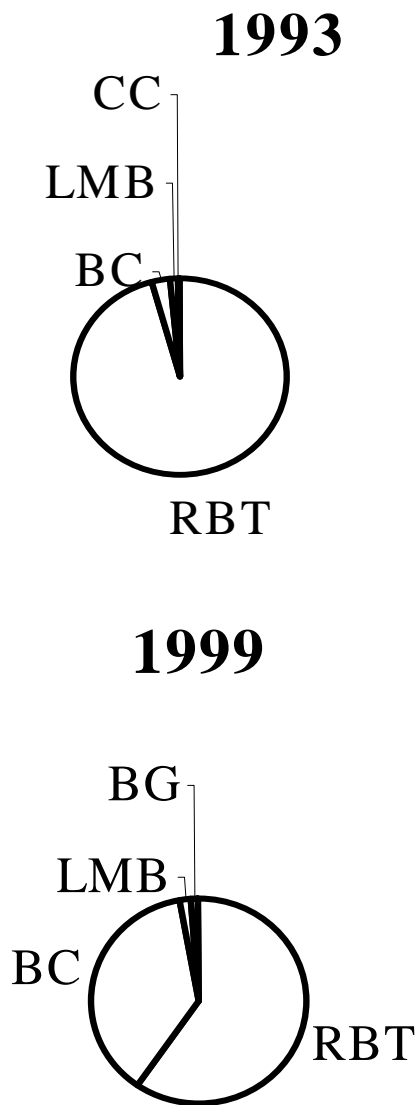


Figure 15. Comparison of harvest composition between 1999 and 1993 creel census estimates on Mann Lake.

Effort

Total angling effort on Elk Creek Reservoir during 1999 was estimated at 15,266 hours, 9.5% less than the 1993 creel census estimate. The effort consisted of 70.9% bank, 23.5% boat, and 5.6% ice anglers. Elk Creek Reservoir supported 128 hours of angling effort per hectare (318 hours per acre) in 1999. Effort was reported highest during interval 12 (June 11–June 24) at 1,645 hours. No effort was reported during intervals 6, 21, 24, and 25 (Figure 16).

Catch Rate

Anglers caught an estimated 20,702 fish from Elk Creek during 1999, resulting in a catch rate of 1.36 fish per hour. Catch rate during 1993 was estimated at 1.31 fish per hour (Schriever 1993). The highest catch rate was reported during interval 22 (October 29–November 11) at 7.78 fish per hour. A catch rate of zero was reported during intervals 6, 21, 24, and 25 due to lack of angler effort. Harvest rate was estimated to be 1.07 fish per hour during 1999 (Figure 16).

Harvest

Anglers harvested 16,337 fish from Elk Creek Reservoir during 1999, 81% of the total 20,702 fish caught. Harvest of hatchery rainbow trout dropped from an estimated 15,988 in 1993 to 10,962 in 1999. Of the 15,998 trout harvested in 1993, 11,891 were stocked as catchable size and 4,107 were stocked as fingerlings (Schriever 1993). Brook trout harvest increased from an estimated 766 in 1993 to 5,097 in 1999. Brook trout lengths ranged from 16 to 33cm (6 to 13 in) with an average length of 20 cm (8 in) (Figure 17).

Catch Composition

The harvest composition consisted of 67.1% hatchery trout, 31.2% naturally produced brook trout, and 1.7% smallmouth bass. Creel census in 1993 estimated a harvest composition of 93.9% hatchery trout, 4.5% naturally produced brook trout, 0.7% bass, and 0.9% black bullhead (Schriever 1993) (Figures 18 and 19).

Discussion

Elk Creek Reservoir has shifted from a hatchery trout driven fishery to include naturally produced brook trout. The number of hatchery trout caught has dropped by 31%; brook trout caught has risen by over 660% since 1993. However, trout originating from fingerlings planted in 1993 accounted for 18.5% of the total fish harvested (4,107 trout) and catchable size trout accounted for 53.5% of the total catch

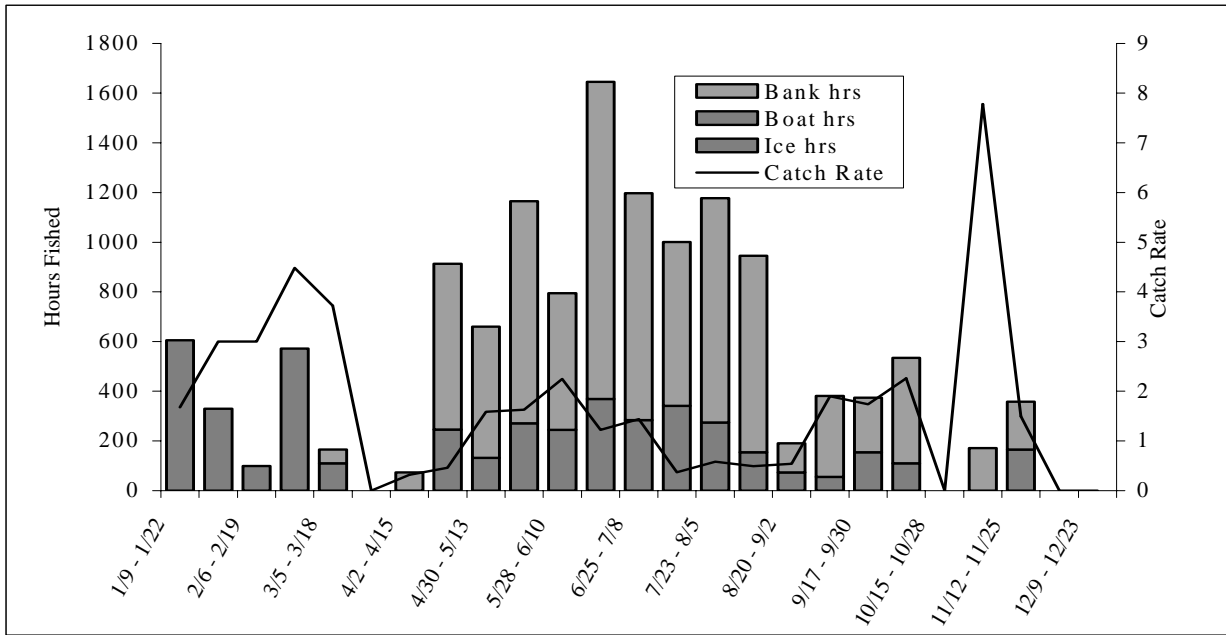


Figure 16. Estimated angler effort hours and catch rate per interval on Elk Creek Reservoir, 1999.

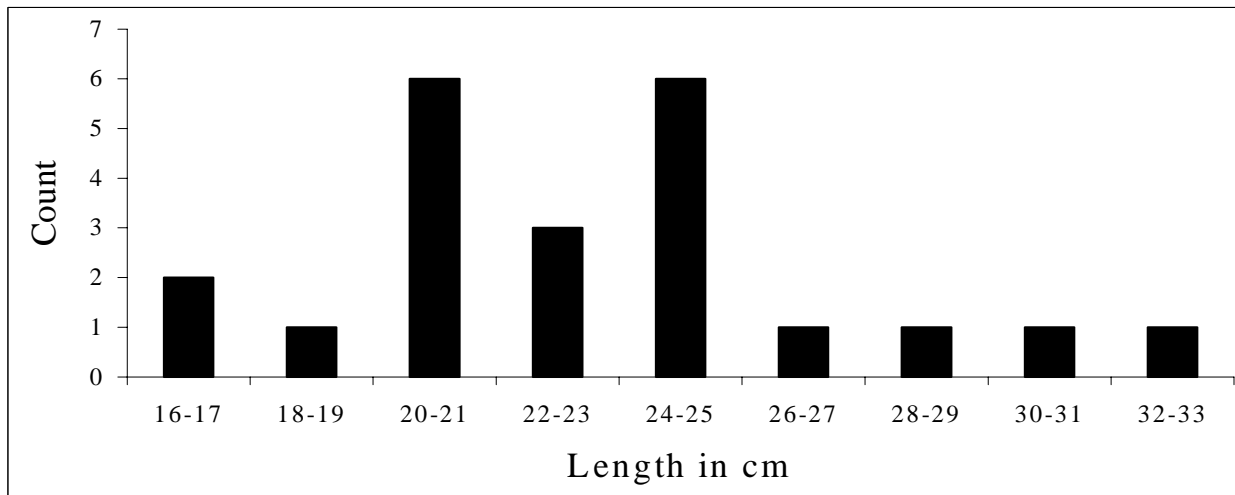


Figure 17. Estimated length frequency of harvested brook trout on Elk Creek Reservoir, 1999.

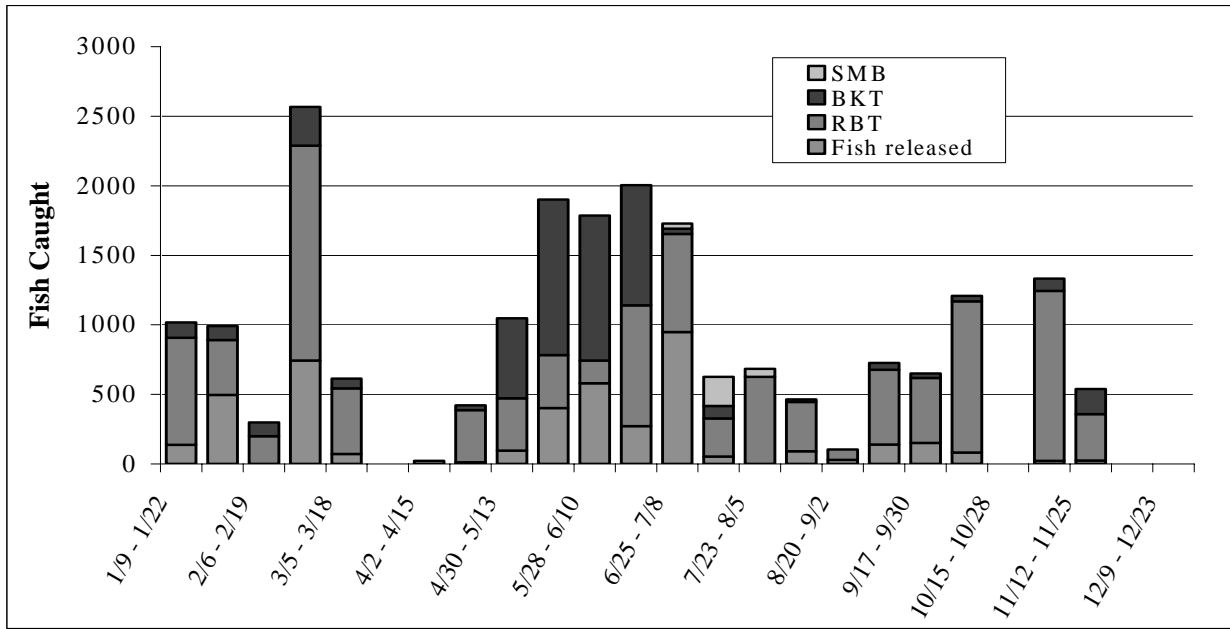
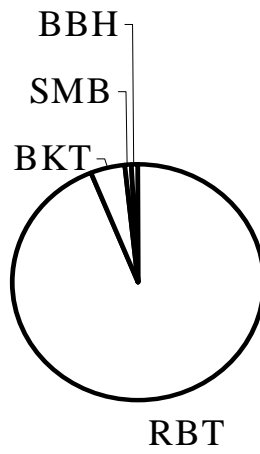


Figure 18. Estimated fish caught by species and fish released on Elk Creek Reservoir, 1999.

1993



1999

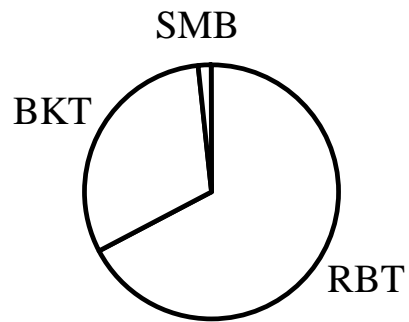


Figure 19. Comparison of harvest composition between 1999 and 1993 creel census estimates on Elk Creek Reservoir.

(11,891 trout) in 1993 (Schriever 1993). This observation shows a sharp decline in fingerling return since 1993 while catchable return is relatively similar (10,962 trout in 1999 and 11,891 trout in 1993).

Moose Creek Reservoir

Moose Creek Reservoir is an 81.5-ha body of water located in Latah County, two miles west of Bovill, Idaho. The reservoir provides recreational activities such as fishing and overnight camping. Fish species present in Moose Creek Reservoir include hatchery rainbow trout, bluegill, and largemouth bass. It was drained and dredged in 1998 to reduce nuisance aquatic macrophytes and improve angler access. Largemouth bass harvest in 1999 was limited to fish greater than 20 in. Statewide general regulations apply to all other fish species present in Moose Creek Reservoir.

Effort

Total angling effort on Moose Creek Reservoir during 1999 was estimated at 11,821 hours, 16% less than the 1993 creel census estimate. The effort consisted of 86.5% bank, 13% boat, and 0.5% ice anglers. Moose Creek Reservoir supported 145 hours of angling effort per hectare (358 hours per acre) in 1999. Effort was reported highest during interval 13 (June 25 – July 8) at 2,048 hours.

Catch Rate

Anglers caught an estimated 11,323 fish from Moose Creek during 1999, resulting in a catch rate of 0.96 fish per hour. Catch rate during 1993 was estimated at 1.28 fish per hour (Schriever 1993). Highest catch rates were reported during interval 12 (June 11–June 24) at 1.42 fish per hour and interval 22 (October 29–November 11) at 3.75 fish per hour. Catch rates of zero were documented during intervals 2, 4, and 6 due to lack of angler effort and intervals 3-7 and 17 due to lack of harvest. Harvest rate was estimated to be 0.77 fish per hour during 1999 (Figure 20).

Harvest

Anglers harvested 9,057 fish from Moose Creek during 1999, 80% of the total 11,323 fish caught. Harvest of hatchery rainbow trout dropped from 14,187 in 1993 to 7,961 in 1999. Bluegill harvest also dropped from 2,803 in 1993 to 1,096 in 1999. There was no reported harvest for largemouth bass in 1999.

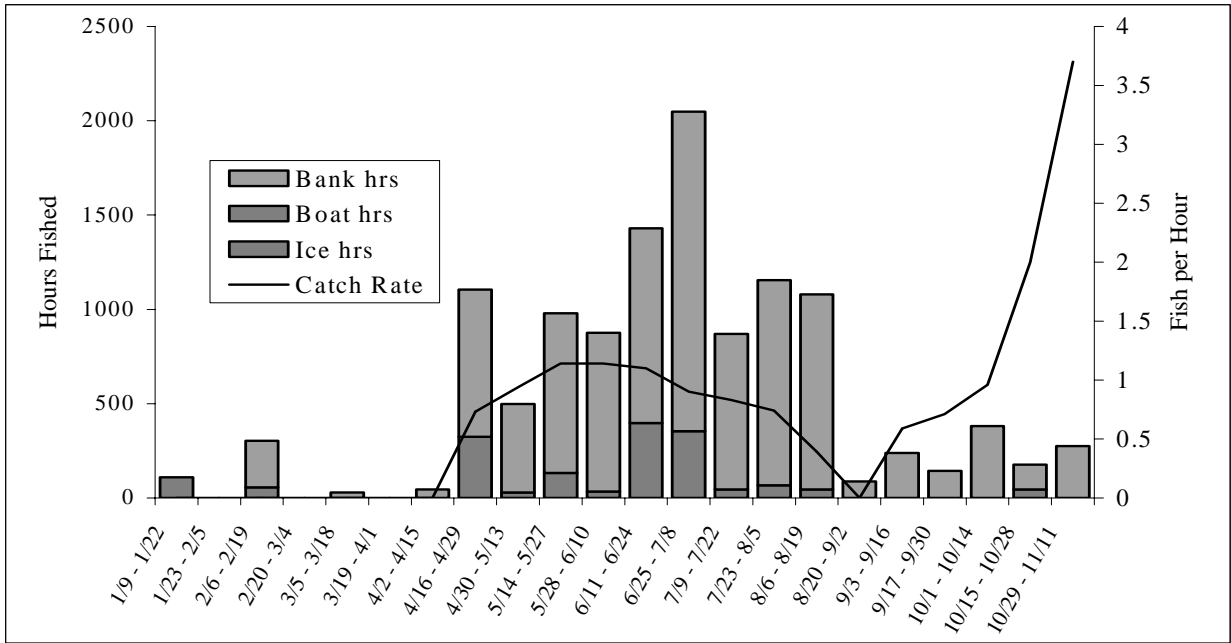


Figure 20. Estimated angler effort hours and catch rate per interval on Moose Creek Reservoir, 1999.

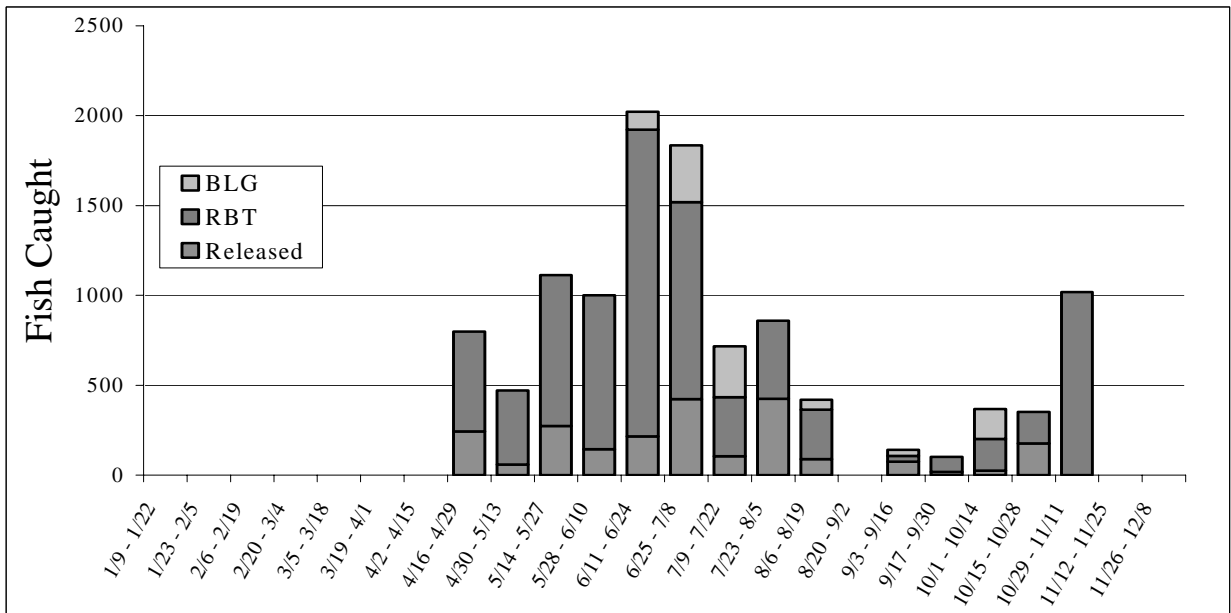
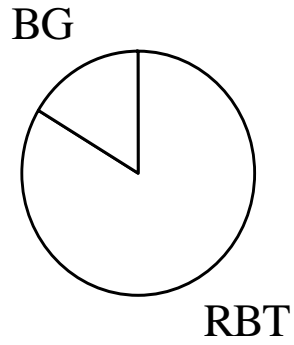


Figure 21. Estimated fish caught by species and fish released per interval on Moose Creek Reservoir, 1999.

1993



1999

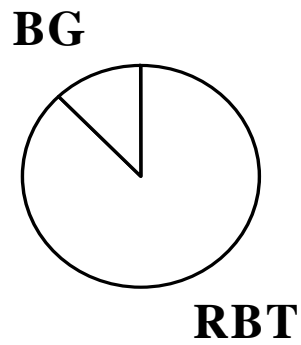


Figure 22. Comparison of harvest composition between 1999 and 1993 creel census estimates on Moose Creek Reservoir.

Catch Composition

Hatchery trout made up 87.9% of the harvest, the remaining 12.1% resulted from bluegill. Creel census in 1993 estimated a harvest composition of 83.5% trout and the remaining 16.5% panfish (Schriever 1993) (Figures 21 and 22).

Discussion

Moose Creek Reservoir has had over a 37% decrease in fish caught in 1999 when compared to 1993 creel estimates. This is likely due to a decrease of angler effort because no trout were stocked until April 1999.

Waha Lake

Waha Lake is a 262 ha reservoir located in Nez Perce County, two miles east of Waha, Idaho. The reservoir provides recreational activities such as fishing and overnight camping. Easy bank access is limited to only a small portion of the reservoir. Fish species present include hatchery rainbow trout, smallmouth bass, and splake. Statewide general fishing regulations apply to Waha Lake.

Effort

Total angling effort on Waha Lake during 1999 was estimated to be 4,103 hours. The effort consisted of 51.8% boat and 48.2% bank anglers. Waha Lake supported 16 hours of angler effort per hectare (39 hours per acre) in 1999. Effort was reported highest during interval 11 (May 28 – June 10) at 616 hours. No effort was reported for intervals 1- 4, 18, 20, 21, and 24 (Figure 23). No effort estimates from Waha Lake were generated in 1993.

Catch Rate

Anglers caught an estimated 2,409 fish from Waha Lake during 1999, resulting in a catch rate of 0.59 fish per hour. The highest catch rates were seen during interval 13 (June 25 – July 8) at 2.1 fish per hour and interval 23 (Nov. 12 – Nov. 25) at 1.84 fish per hour. Catch rates of zero were reported for intervals 1 – 4, 18, 20, 21, and 24 due to lack of angler effort and intervals 5, 7, 12, 17, and 22 due to zero fish being caught. Harvest rate was estimated to be 0.47 fish per hour during 1999 (Figure 23). No catch rate estimates from Waha Lake were generated in 1993.

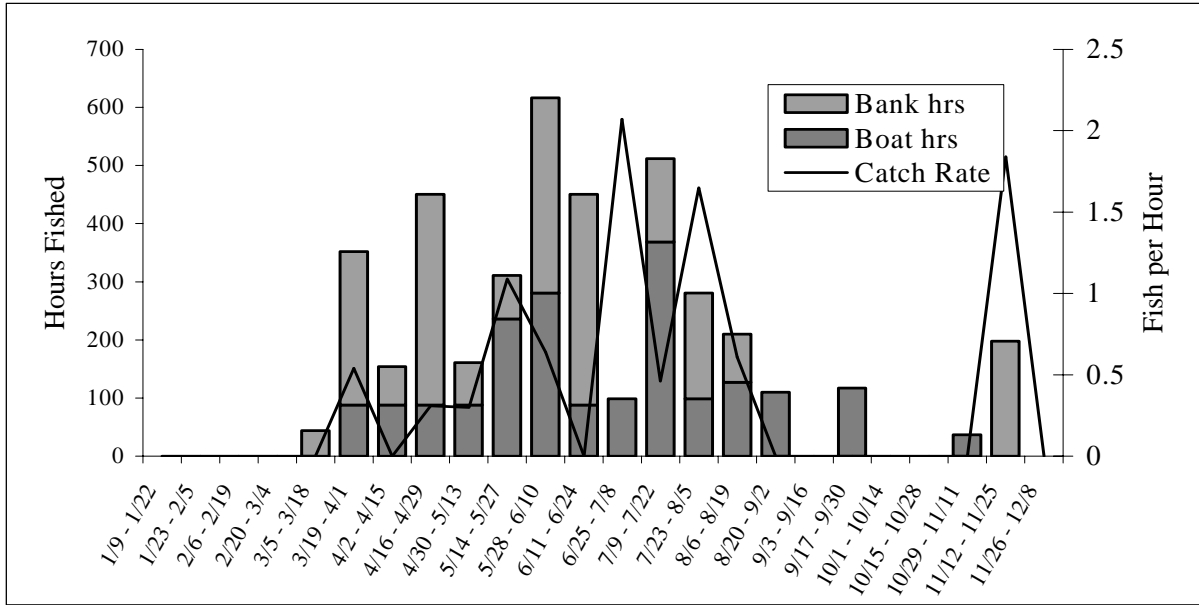


Figure 23. Estimated angler effort hours and catch rate per interval on Waha Lake, 1999.

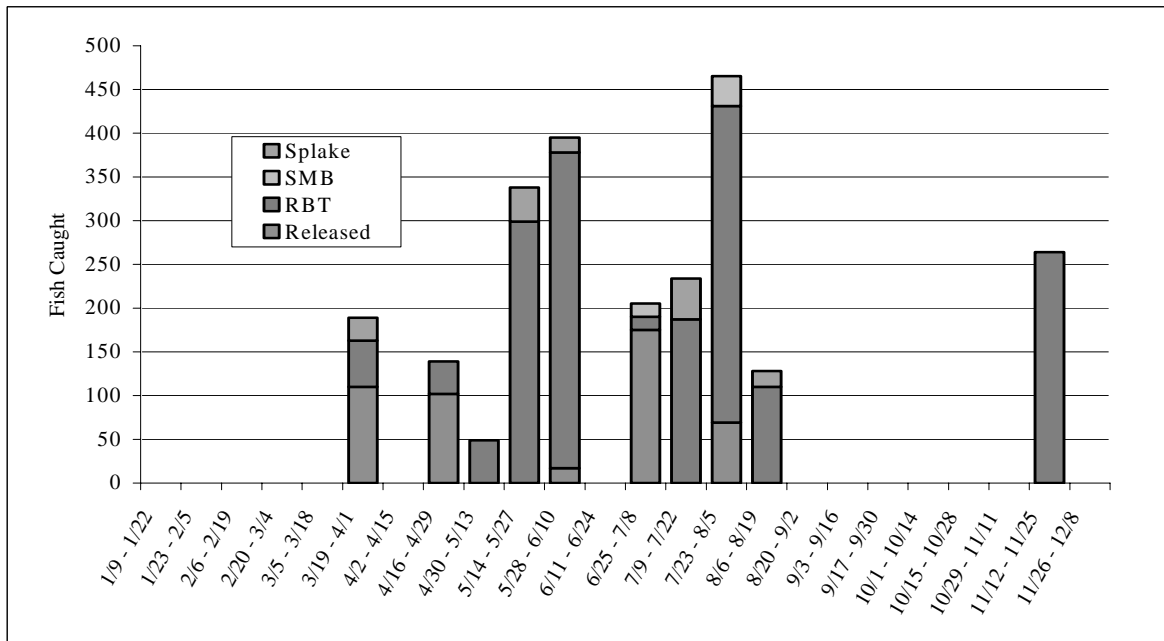


Figure 24. Estimated fish caught by species and fish released on Waha Lake, 1999.

Harvest and Catch Composition

Anglers harvested 1,934 fish from Waha Lake during 1999, 80.3% of the total 2,409 fish caught. The harvest composition consisted of 81.8% hatchery trout, 12.1% splake, and 6.1% smallmouth bass (Figure 24). Splake length ranged from 29 to 34 cm with an average length of 30 cm. No harvest estimates were generated from Waha Lake in 1993.

Discussion

Waha Lake received the lowest amount of angler effort, fish caught, and the lowest catch rate of the seven lowland lakes. The low angler effort and number of fish caught may be due to the minimal amount of shoreline access.

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1999 ANNUAL PERFORMANCE REPORT

State of: Idaho

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Subproject I-B: Clearwater Region

Job: c

Title: Rivers and Streams Investigations

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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 lower than in previous years. Twenty-three adult chinook salmon redds were counted in traditional aerial spawning ground counts in the Lochsa and Selway rivers, and five were counted in the South Fork Clearwater River drainage. We sampled one Kamloops rainbow trout *O. mykiss* from the lower Clearwater River and found no fish in diet analysis. No fish or fish parts were identified in the contents of X hatchery origin trout stomachs. We collected 56 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 counted 660 kokanee *O. nerka* spawners in three index tributaries of the North Fork Clearwater River.

Creel census surveys were conducted on the South Fork Clearwater River in 1999. Anglers spent an estimated 14,856 hours fishing during the steelhead season (January 1–April 30) to catch 2,628 steelhead *O. mykiss gairdneri*. Anglers spent an estimated 5,099 hours fishing during the general season (May 27–November 30) to catch 5,898 resident fish. These fish species include wild and hatchery rainbow trout *O. mykiss*, cutthroat trout, bulltrout *Salvelinus confluentus*, mountain whitefish *Prosopium williamsoni*, juvenile chinook salmon *O. tshawytscha*, and brook trout *S. fontinalis*.

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OBJECTIVES

1. Develop long-term fish population database on selected streams throughout the Clearwater Region.
2. 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 m². In streams that research or other agency personnel regularly snorkel, we coordinated data collection and have summarized the information on 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 18 to August 21 and occurred during daylight hours to avoid safety hazards.

Results

Selway River

Juvenile chinook salmon *O. tshawytscha* numbers remain low in the tributaries (Table 1) and in the mainstem river (Table 2). A total of 29 chinook salmon juveniles were observed in 14 tributary transects above Selway Falls, and 22 juvenile chinook salmon were counted in 4 tributary transects below Selway Falls. In five mainstem transect 190 juvenile chinook salmon were observed. Aerial chinook salmon spawning ground counts in September revealed 12 redds, 7 in tributaries and the rest in the mainstem (Table 3).

Table 1. Summary of fish densities (per 100 m²) as determined by snorkeling the Selway River drainage, 1999.

Stream	Date	Total	Steelhead trout				Total	Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout	Coho salmon
			Age 0	Age 1	Age 2	Age >2		<305 mm	>305 mm				
Bear Creek #1 at bridge	8/2	0.59	0	0	0.44	0.15	1.53	1.24	0.29	0.44	1.46	0	0
Bear Creek #2 upper	8/2	0.41	0	0.41	0	0	0.51	0.51	0	0.51	0.10	0	0
Deep Creek Cactus	7/30	4.29	0.41	2.86	1.02	0	3.27	3.27	0	0	0	0	0
Deep Creek Scimitar	7/30	3.14	0.55	1.23	0.68	0.68	3.01	3.01	0	0.55	0	0	0
E.F. Moose Creek #3	8/4	2.05	0	1.08	0.86	0.11	1.60	1.49	0.11	0.06	0.40	0	0
Gedney Creek # 1	8/9	11.87	7.21	2.33	2.33	0	0	0	0	2.76	0.42	0	0
Gedney Creek # 2	8/9	18.65	8.91	4.45	4.18	1.11	0	0	0	0.28	0.28	0	0
Little Clearwater R. #1 lower	7/31	1.80	0	0.90	0.90	0	2.70	2.70	0	0	0	0	0
Little Clearwater R. #2 upper	7/31	1.08	0	0.86	0.22	0	0.80	0.80	0.80	0	0.43	0	0
Marten Creek	8/6	7.66	0	0	3.24	3.54	0.88	2.95	2.95	0	0	0	0
Meadow Creek # 1 Slims Camp	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meadow Creek # 2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Moose Creek #1 at mouth	8/4	0.78	0	0.28	0.35	0.14	0.99	0.92	0.07	0	4.54	0	0
Moose Creek #2 at E.F. confluence	8/4	0.13	0	0.13	0	0	0.04	0.04	0	0.13	0.04	0	0
N.F. Moose Creek #4	8/4	0.42	0	0.08	0.36	0.69	0.69	0	0.08	1.31	0.27	0	0
O'Hara Creek #1 meadow	7/26	4.60	2.93	1.67	0	0	0.42	0.42	0	6.28	0.21	0	0
O'Hara Creek #2 canyon	7/26	4.44	0	3.17	1.06	0.21	4.02	4.02	0	3.59	0.21	0	0
Otter Creek	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Running Creek #1 lower	ND ¹		ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹	ND ¹
Running Creek #2 upper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Selway R. at Magruder	7/30	0.55	0.18	0.27	0.06	0.03	0.91	0.88	0.03	0.21	0.36	0.03	0
Selway R. at Hell's-Half	7/31	0.98	0.35	0.35	0.14	0.14	1.91	1.94	0.07	0.07	0.71	0.07	0
Selway R. at Little Clearwater R.	7/31	0.92	0.23	0.38	0.15	0.15	2.23	2.23	0	0.08	0.69	0	0
Selway R. at Beaver Point	7/30	1.47	0.77	0.47	0.13	0.10	1.20	1.10	0.10	5.08	0.94	0.13	0
Three Links Creek	8/6	7.06	0	2.02	2.52	1.26	3.53	3.28	0.25	0	0	0	0
White Cap Creek #1 lower	7/31	0.88	0.22	0.52	0	0.15	1.40	1.40	0	0	0.52	0	0
White Cap Creek #2 middle	7/31	0.44	0.06	0.31	0	0.06	0.31	0.31	0	0	0.81	0	0
White Cap Creek #3 upper	8/1	1.29	0.32	0.52	0.45	0	0.65	0.58	0.06	0.58	0.26	0	0

¹ Running Creek transects were snorkeled, but no measurements were taken.

Table 2. Number of fish counted in snorkel transects (5 snorkelers) in the unroaded mainstem Selway River, 1992-1999.

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
	1999	49	2	0	0	7	2	1	146	0
at North Star Creek										
	1992	22	2	0	0	0	0	0	56	0
	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
	1999	46	9	1	0	0	0	4	189	0
at Osprey Island										
	1992	8	8	0	2	0	0	0	32	0
	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
	1999	58	4	0	0	0	0	0	50	0
at Big Bend										
	1993	13	7	0	0	0	0	0	32	0
	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
	1999	32	7	0	0	1	0	4	81	0
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
	1999	28	3	0	1	10	2	0	92	1

Table 3. Chinook salmon spawning ground survey summary in the Selway River drainage, 1999.

Drainage	Reach	Type	Description	Date	Method	Redds	Fish	
							Live	Dead
White Cap Creek	WC-1	T	Mouth to Coopers Flat	9/15	Aerial	0	0	0
		ISS&C	Coopers Flat to Barrier	Not flown	Aerial	ND	ND	ND
Bear Creek	WC-2	T	Mouth to Cub Creek	9/15	Aerial	7	0	0
Moose Creek	WC-3	T	Mouth to Cedar Creek	9/15	Aerial	0	0	0
Running Creek	WC-4	T	Mouth to two miles above Eagle Creek and lower one mile of Eagle Creek	9/15	Aerial	0	0	0
Selway	WC-5	T	Thompson Flat to Magruder RS	9/15	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	9/3	Ground	4	3	0
				9/15	Aerial	4	0	0
Selway	WC-8	T	Little Clearwater River to White Cap Creek	9/15	Aerial	0	0	0
Selway	WC-9	T	White Cap Creek to Bear Creek	9/15	Aerial	0	0	0
			Selway drainage ground count total:			4	3	0
			Selway drainage aerial count total:			12	0	0

¹T = traditional transect

A total of seven bull trout *Salvelinus confluentus* were observed in the North Fork Moose Creek and seven in the mainstem river above Selway Falls (Table 1).

Historic snorkel comparisons for all subbasins were summarized in Cochnauer et al. (1996). Due to their large volume, we will no longer publish them each year.

Size classes of cutthroat trout 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 through Table 9 depict historic relative numbers and sizes of cutthroat trout *O. clarki*, steelhead trout, and mountain whitefish observed by snorkeling in mainstem transects.

Lochsa River

Fish densities (per 100 m²) as determined by snorkeling 21 transects in the Lochsa River drainage are shown in Table 10. A total of 96 chinook salmon juveniles were observed in the tributaries surveyed. A total of three bull trout were observed, with one each in Fish, Split, and Warm Springs creeks (Table 10).

Chinook salmon aerial spawning ground counts revealed a total of five redds in Crooked Fork and Brushy Fork (Table 11).

Snake River

No bull trout were observed while snorkeling two Snake River tributaries (Table 12).

Salmon River

Ten tributaries of the lower Salmon River were surveyed by snorkeling in 1999 (Table 13). A total of 149 juvenile chinook salmon were found in Crooked, Sheep, Skookumchuck and Slate creeks. Bull trout were observed in Crooked, Sheep and Slate creeks.

North Fork Clearwater River

Clearwater Region Fisheries personnel and volunteers collected 156 westslope cutthroat trout 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 recorded date, tag number, tagging location (rkm) and total length of fish (Figure 1). We snorkeled 41 sites in the North Fork Clearwater River to monitor fish populations (Table 14).

Table 4. Percent of cutthroat trout by 50.8 mm (2 in) size groups sampled in the Selway River by angling, 1975-1999.

Length (mm)	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1993	1994	1995	1996	1997	1998	1999
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	2.1
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	16.2
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	25.9
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	30.6
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	20.6
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	4.0
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	0.6
Number of cutthroat measured	233	238	229	470	352	549	429	322	506	816	301	377	215	283	242	268	504	679

Table 5. Comparison of cutthroat trout counted in snorkel transects (1 snorkeler) and cutthroat trout caught by angling in the Selway River between White Cap Creek and Race Creek, 1975-1999.

Year	Counted in snorkel transects		Total no cutthroat measured	Caught by angling	
	Average no. of CT counted/ transect	Percent CT >305 mm in transects		Average CT total length (mm)	Percent CT caught >305 mm
1999	10.71	1.95	679	258	25.0
1998 ²	4.60	8.10	504	241	16.7
1997	13.60	14.00	268	257	29.0
1996	14.20	3.00	242	252	21.5
1995	11.20	3.20	28	254	28.0
1994	5.90	11.00	215	272	29.0
1992	5.40	28.00	301	251	18.0
1990	10.50	19.00	816	259	31.0
1988	17.10	22.00	506	249	24.0
1986	21.50	20.00	322	264	32.0
1984	18.30	23.00	429	249	21.0
1982	16.10	16.00	549	254	22.0
1980	17.00	14.00	352	264	29.0
1978	13.00	19.00	470	262	27.0
1977	15.40	20.00	229	241	19.0
1976	7.10	21.00	238	259	22.0
1975	5.70	13.00	233	239	12.0
1974	5.50	10.00	--	--	--
1973	4.40	18.00	--	--	--

¹ Extremely low flows

² 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 inches) counted in snorkel transects (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1999.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998	1999
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	5.9
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	ND	2.0
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	16.9
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	10.6
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	32.0
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	22.2	25	ND
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	10.0	40	27.8
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	50.0
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	32.4

Table 7. Average number of cutthroat trout counted/snorkel transect (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1999.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998	1999
White Cap Cr. to Running Cr.	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	17.0
Running Cr. to Bear Cr.	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	12.6
Bear Cr. to Moose Cr.	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	16.6
<u>Weighted means:</u>																			
White Cap Cr. to Moose Cr.	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	15.1
Moose Cr. to Halfway Cr.	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	10.6
Halfway Cr. to Three Links Cr.	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	ND
Three Links Cr. to Jim's Cr.	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	4.5
Jim's Cr. to Race Cr.	--	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	3.0
<u>Weighted means:</u>																			
Moose Cr. to Race Cr.	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	7.0

Table 8. Average number of juvenile steelhead (<8 inches) counted/snorkel transect (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1999.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998	1999
White Cap Cr. to Running Cr	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 ¹	3.00
Running Cr. to Bear Cr.	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	0.25
Bear Cr. to Moose Cr.	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	0.80
<u>Weighted means:</u>																			
White Cap Cr. to Moose Cr.	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	0.80
Moose Cr. to Halfway Cr.	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	5.80
Halfway Cr. to Three Links Cr.	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	ND
Three Links Cr. To Jim's Cr.	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	0.50
Jim's Cr. to Race Cr.	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	1.00
<u>Weighted means:</u>																			
Moose Cr. to Race Cr.	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	3.00

¹ Water too turbid to get accurate count

Table 9. Average number of whitefish counted/snorkel transect (1 snorkeler) in the Selway River (unroaded portion) from White Cap Creek to Race Creek, 1973-1999.

Stream section	1973	1974	1975	1976	1977	1978	1980	1982	1984	1986	1988	1990	1992	1994	1995	1996	1997	1998	1999
White Cap Cr. to Running Cr	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 ¹	39.0
Running Cr. to Bear Cr.	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 ¹	54.8
Bear Cr. to Moose Cr.	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	17.2
<u>Weighted means:</u> White Cap Cr.to Moose Cr.	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	15.2	13.8	17.0	34.4
Moose Cr. to Halfway Cr.	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	13.8
Halfway Cr. to Three Links Cr	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	ND
Three Links Cr. To Jim's Cr.	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	17.3
Jim's Cr. to Race Cr.	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	14.4
<u>Weighted means:</u> Moose Cr. to Race Cr.	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	23.9

¹ Water too turbid to get accurate count

Table 10. Summary of fish densities (per 100 m²) as determined by snorkeling in the Lochsa River drainage, 1998.

Stream	Date	Total	Steelhead trout				Total	Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout	Brook trout
			Age 0	Age 1	Age 2	Age >2		<305 mm	>305 mm				
Brushy Fork Cr. # 1	7/25	3.34	0	2.50	0.83	0	0.83	0.83	0	0	0	0	0
Brushy Fork Cr. #2	7/25	2.13	0	1.28	0.57	0.28	0.28	0.28	0	0	0	0	0
Colt Cr.	7/25	0.96	0	0.48	0.48	0	3.85	3.85	0	0	0	0	0
Crooked Fork Cr. #1B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Crooked Fork Cr. #2B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0
Fire Cr. #1 lower	7/23	7.09	4.95	1.48	0.66	0	1.32	1.32	0	0	0.49	0	0.16
Fire Cr. #2 upper	7/23	1.94	0	1.36	0.58	0	0.58	0.58	0	0	0.19	0	0.29
Fish Cr. #1 lower	7/26	15.89	6.43	5.14	3.51	0.82	0	0	0	0	0	0.12	0
Fish Cr. #2 upper	7/26	16.28	1.78	6.43	7.52	0.68	0.14	0.14	0	0.14	0	0	0
Hopeful Cr.	7/24	5.32	1.43	3.48	0.41	0	6.14	6.14	0	0	0	0	0
Lochsa River #4 at Papoose Cr.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lochsa River #3 at Warm Springs Cr.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lochsa River #1 at Fish Cr.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Lochsa River #2 at Pete King Cr.	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Old Man Cr.	7/23	5.18	0.52	4.14	0.52	0	1.21	1.21	0	0	1.04	0	0
Post Office Cr. #1 lower	7/24	12.10	10.59	1.51	0	0	0.60	0.60	0	0	0	0	0
Post Office Cr. #2 upper	7/25	12.61	7.68	4.93	0	0	1.92	1.92	0	0	0	0	0
Split Cr. #1 lower	7/23	6.96	0	2.92	3.59	0.45	0.45	0.45	0	0	0.22	0	0
Split Cr. #2 upper	7/23	6.67	0	3.89	2.78	0	0	0	0	0	0.37	0.19	0
Warm Springs Cr.	7/25	0.77	0	0.51	0.26	0	0.68	0.60	0.09	0.34	0	0.09	0
White Sands Cr. aka Colt Killed Cr	7/25	0.40	0.12	0.23	0.02	0.02	0.12	0.12	0	0.16	0.09	0	0

Table 11. Chinook salmon redd counts on three tributaries of the upper Lochsa River, 1999.

Drainage	Reach	Type ¹	Description	Date	Method	Redds	Fish	
							Live	Dead
Crooked Fork	NC -9	NT	Mouth to Hopeful Creek	9/7	Aerial	2	0	0
	NC-10	T	Rock Creek to Cliff Hole	9/3	Ground	6	0	3
Brushy Fork	NC -11	T	Low Gap Bridge to one mile downstream	9/2	Ground	0	0	0
	NC-12	T	Mouth to Spruce Creek	9/7	Aerial	3	0	0
White Sands	NC-13	NT	Mouth to Big Flat Creek	9/7	Aerial	0	0	0
Big Sand Creek		NT/ISS	Mouth to Hidden Creek	9/7	Aerial	0	0	0
Storm Creek		NT/ISS	Mouth to North Fork	9/7	Aerial	0	0	0
			Lochsa Drainage Ground Total			6	0	3
			Lochsa Drainage Aerial Total			5	0	0

¹ NT = nontraditional transect; T = traditional transect.

Table 12. Summary of fish densities (per 100 m²) as determined by snorkeling in the Snake River drainage, 1999.

Stream	Date	Total	Steelhead trout					Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout	
			Age 0	Age 1	Age 2	Age >2	Hatchery	Total	<305 mm				>305 mm
Granite Creek, #1, lower	8/18	14.46	2.54	8.37	2.79	0.76	0	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	17.54	0.63	10.02	5.64	1.25	0.31	0	0	0	0	0	0
Sheep Creek, #1, lower	8/17	30.56	9.91	9.50	6.61	4.54	0.83	0	0	0	0	0	0
Sheep Creek, #2, upper	8/17	32.50	9.16	15.56	5.49	1.37	0.46	0	0	0	0	0	0

Table 13. Summary of fish densities (per 100 m²) as determined by snorkeling in the Lower Salmon River drainage, 1999.

Stream	Date	Total	Steelhead trout				Age >2	Total	Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout
			Age 0	Age 1	Age 2	<305 mm			>305 mm				
Bargamin Creek #1, lower	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bargamin Creek #2, upper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Big Mallard Creek #1, lower	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Big Mallard Creek #2, upper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Crooked Creek #1, lower	8/5	15.22	8.28	5.07	1.60	0.27	0.40	0.40	0	1.21	1.33	0	0
Crooked Creek #2, upper	8/5	14.51	11.24	2.66	0.61	0	0	0	0	0.10	0.51	0.01	0.01
Jersey Creek	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
John Day Creek #1, lower	7/21	2.52	0	1.89	0.63	0	0.63	0.63	0	0	0	0	0
John Day Creek #2, upper	7/21	9.45	0.38	8.31	0.76	0	0	0	0	0	0	0	0
Race Creek	7/21	1.76	0.22	0.44	1.10	0	0	0	0	0	0	0	0
Sheep Creek #1, lower	8/4	7.11	0.24	5.30	1.33	0.24	0.84	0.84	0	3.13	0.84	0.24	0.24
Sheep Creek #2, upper	8/4	6.78	0.59	4.81	1.18	0.20	0.59	0.59	0	0.10	0.39	0	0
Skookumchuck Cr. #1, lower	7/21	3.85	0.43	0.43	2.56	0.43	0	0	0	0	0	0	0
Skookumchuck Cr. #2, upper	7/21	3.56	0	1.02	2.03	0.51	0	0	0	0	0	0	0
Slate Cr #1	7/22	12.63	4.49	7.30	0.56	0.28	0	0	0	3.09	0.28	0	0
Slate Cr #2	7/22	10.59	0.20	8.36	1.83	0.20	0	0	0	10.19	0	0	0
Slate Cr #3	7/22	9.17	1.47	6.39	1.31	0	0.98	0.98	0	3.77	0	0	0
Slate Cr #4	7/22	4.82	0	2.97	1.85	0	0.74	0.74	0	0.37	0	0.37	0.37
Slate Cr #5	7/22	2.80	0.29	2.22	0.29	0	0.07	0.07	0	1.21	0	0.07	0.07
Slate Cr #6	7/22	5.66	0.40	2.43	2.29	0.54	0.67	0.67	0	1.48	0.40	0.13	0.13
Slate Cr #7 (Little Slate Cr)	7/22	4.62	0	1.68	2.94	0	0	0	0	0.84	0	0.42	0.42
S.F. White Bird Creek #2	7/22	39.51	28.57	9.88	0.35	0.71	0	0	0	0	0	0	0
S.F. White Bird Creek #3	7/22	23.74	13.30	7.12	2.85	0.47	0	0	0	0	0	0	0
White Bird Creek #1	7/22	15.77	10.16	5.26	0	0.35	0.70	0.70	0	0	0	0	0

Table 14. Summary of snorkeling observations (fish/100 m²) in North Fork Clearwater River drainage, 1999.

Stream	Area (m ²)	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	1.21	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

Table 14. Continued.

Stream	Area (m ²)	Rainbow trout				Cutthroat trout		Bull trout	Mountain whitefish	Brook trout
		Age 0	Age 1	Age 2	Age >2	<305 mm	>305 mm			
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
Quartz Creek #2	286	2.45	5.25	0	0	0	0	0	0	0
Ruby Creek	95	3.17	6.35	0	0	1.06	0	0	0	0
Skull Creek #1	261	5.74	6.51	0	0	0.38	0	0	0	0
Skull Creek #2	360	6.39	2.22	1.11	0	1.11	0.28	0	6.94	0
Skull Creek #3	1,756	0.63	0.68	0.97	0	0	0	0	1.03	0
Skull Creek #4	657	0.30	0.46	0	0	0.30	0	0	1.98	0
Weitas Creek - lower	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Weitas - upper	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

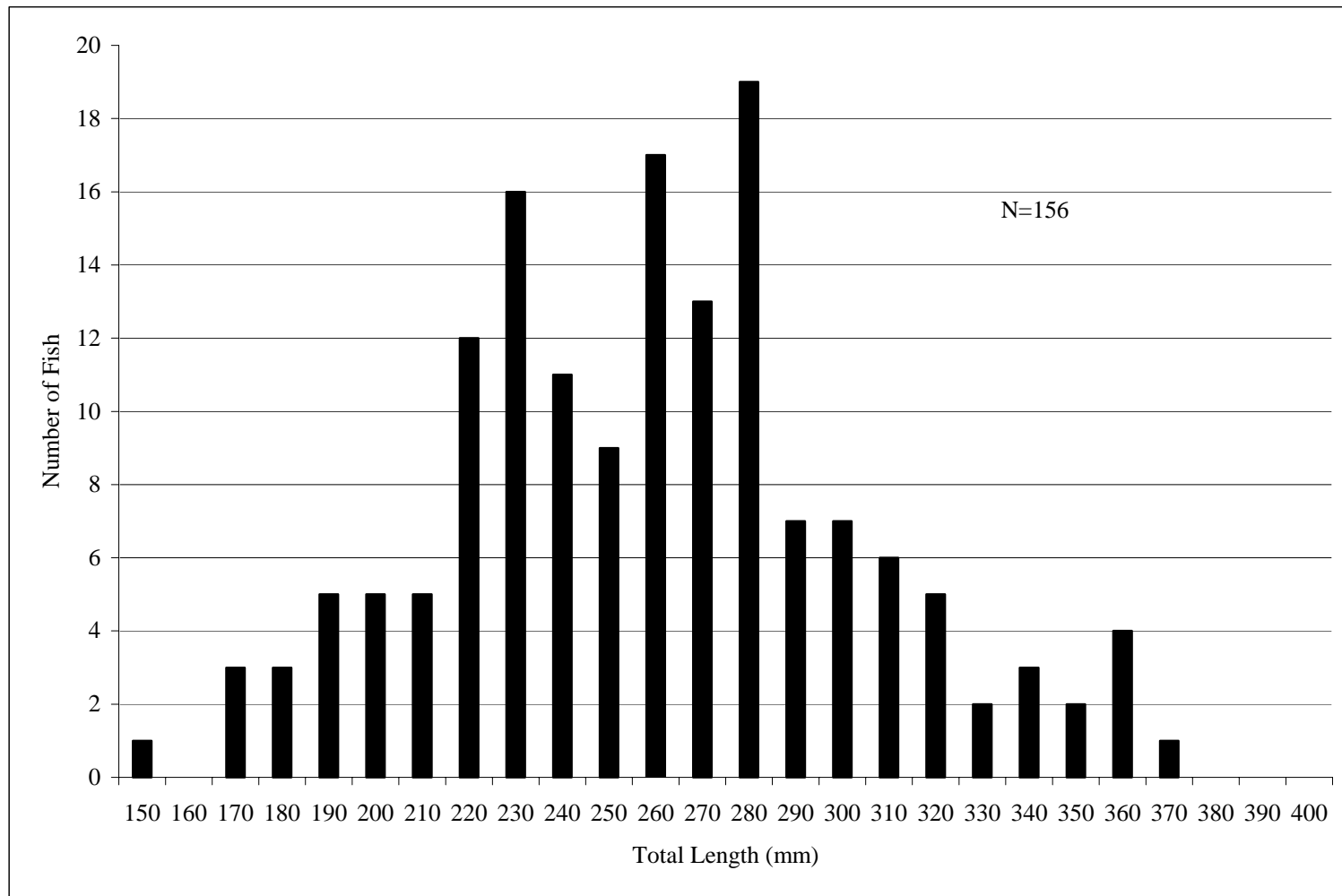


Figure 1. Length frequency of cutthroat trout sampled in North Fork Clearwater River above Dworshak Reservoir, 1999.

Clearwater River

Three tributaries were snorkeled in the drainage. Steelhead trout were the most abundant species observed (Table 15).

Twenty-four 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 (Schriever et al. 1999). Over 900 mountain whitefish were sampled (Figure 2). Length frequencies of the three sport fish species are shown in Figures 3-5. Four bull trout were sampled. Two hundred twenty-two smallmouth bass were sampled (Figure 3). Two hundred and ten wild steelhead trout juveniles were sampled (Figure 4).

South Fork Clearwater River

A total of 527 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 Moore and Johns creeks. Additional transects were snorkeled as part of Idaho Supplementation Studies (ISS), but the data is not presented here. A total of 5 chinook salmon redds were counted in traditional aerial surveys in the South Fork Clearwater drainage (Table 17).

Twenty-one transects were snorkeled as part of (ISS) field data collection in the Crooked River drainage. A total of 563 juvenile chinook salmon were observed (Table 18). In addition, seven bull trout were observed, three in the mainstem, the West Fork, and the East Fork (Table 18).

Creel Census

The South Fork Clearwater River is 103 km long, beginning at the mouth of the American and Red rivers. It is located in Idaho County and runs between Elk City and Kooskia, Idaho. For the purpose of this project, the river was divided into four semi-equal sections: Section 1, mouth of the South Fork Clearwater River – Harpster, Idaho; Section 2, Harpster – Castle Creek; Section 3, Castle Cr. – Golden, Idaho; Section 4, Golden – mouth of American and Red rivers.

Table 15. Summary of fish densities (per 100 m²) as determined by snorkeling in the Lower Clearwater River drainage, 1999.

Stream	Date	Total	Steelhead trout				Cutthroat trout		Chinook salmon	Mountain whitefish	Bull trout	Coho salmon
			Age 0	Age 1	Age 2	Age >2	Total	<305 mm				
Big Canyon Creek, #1, bridge	6/25	8.63	5.12	3.51	0	0	0	0	0	0	0	0
E.F. Potlatch River, #1, lower	6/23	0	0	0	0	0	0	0	0	0	0	0
E.F. Potlatch River, #2, middle	6/24	7.25	4.43	2.15	0.54	0.13	0	0	0	0	0	0
E.F. Potlatch River, #3, upper	6/26	6.69	1.91	4.78	3.87	0	0	0	0	0	2.87	0
Potlatch River, Kendrick	6/23	0.25	0.25	0	0	0	0	0	0	0	0	0
Potlatch River, #1, upper	6/24	4.61	3.44	0.76	0.41	0	0	0	0	0	0	0
Mission Creek, #1	6/25	24.59	23.65	0.47	0.47	0	0	0	0	0	0	0
Mission Creek, #2	6/25	12.39	10.76	1.63	0	0	0	0	0	0	0	0

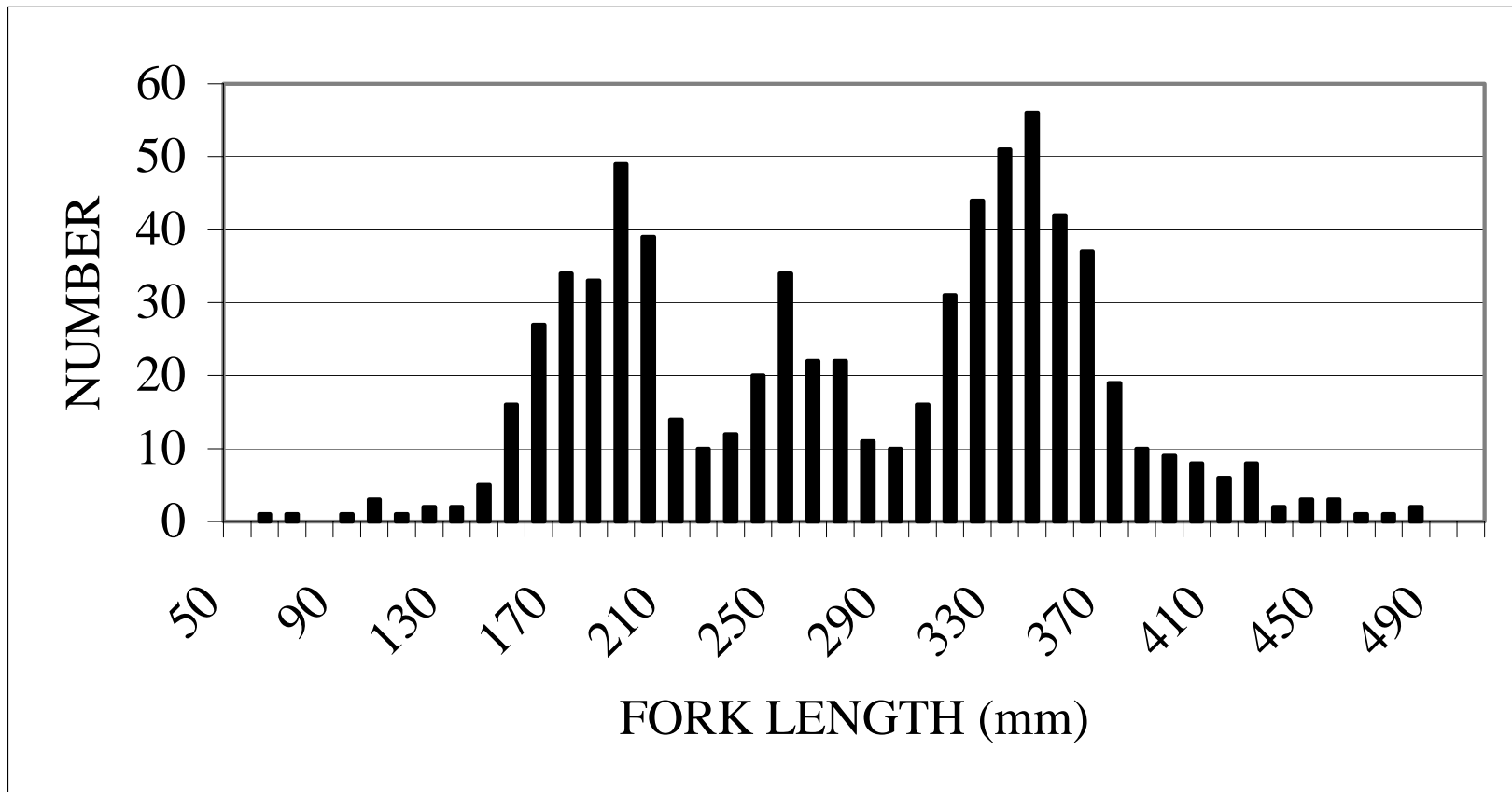


Figure 2. Length frequency for mountain whitefish sampled in Clearwater and North Fork Clearwater rivers (below Dworshak Dam), 1999.

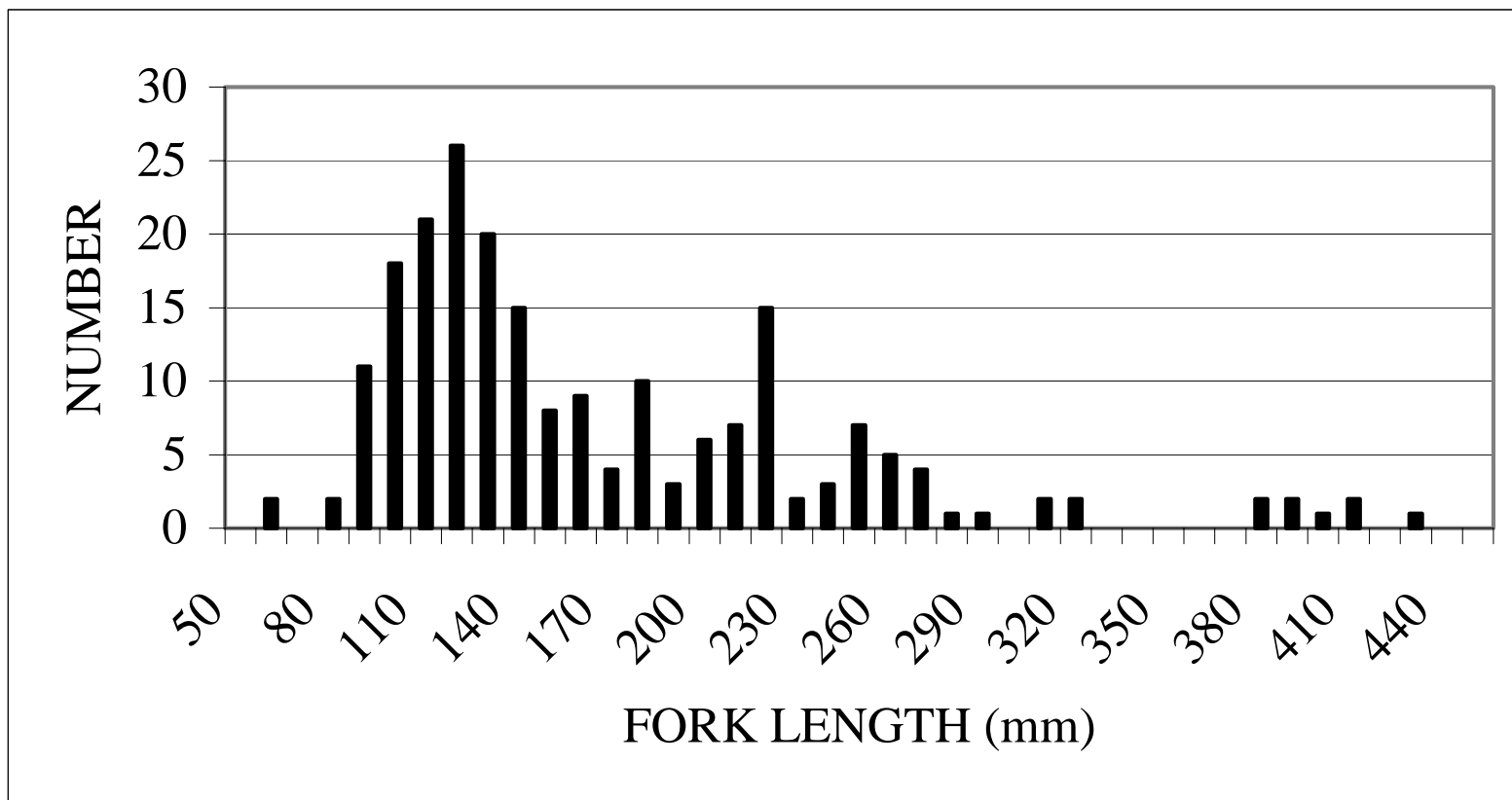


Figure 3. Length frequency for smallmouth bass sampled in Clearwater and North Fork Clearwater rivers (below Dworshak Dam), 1999.

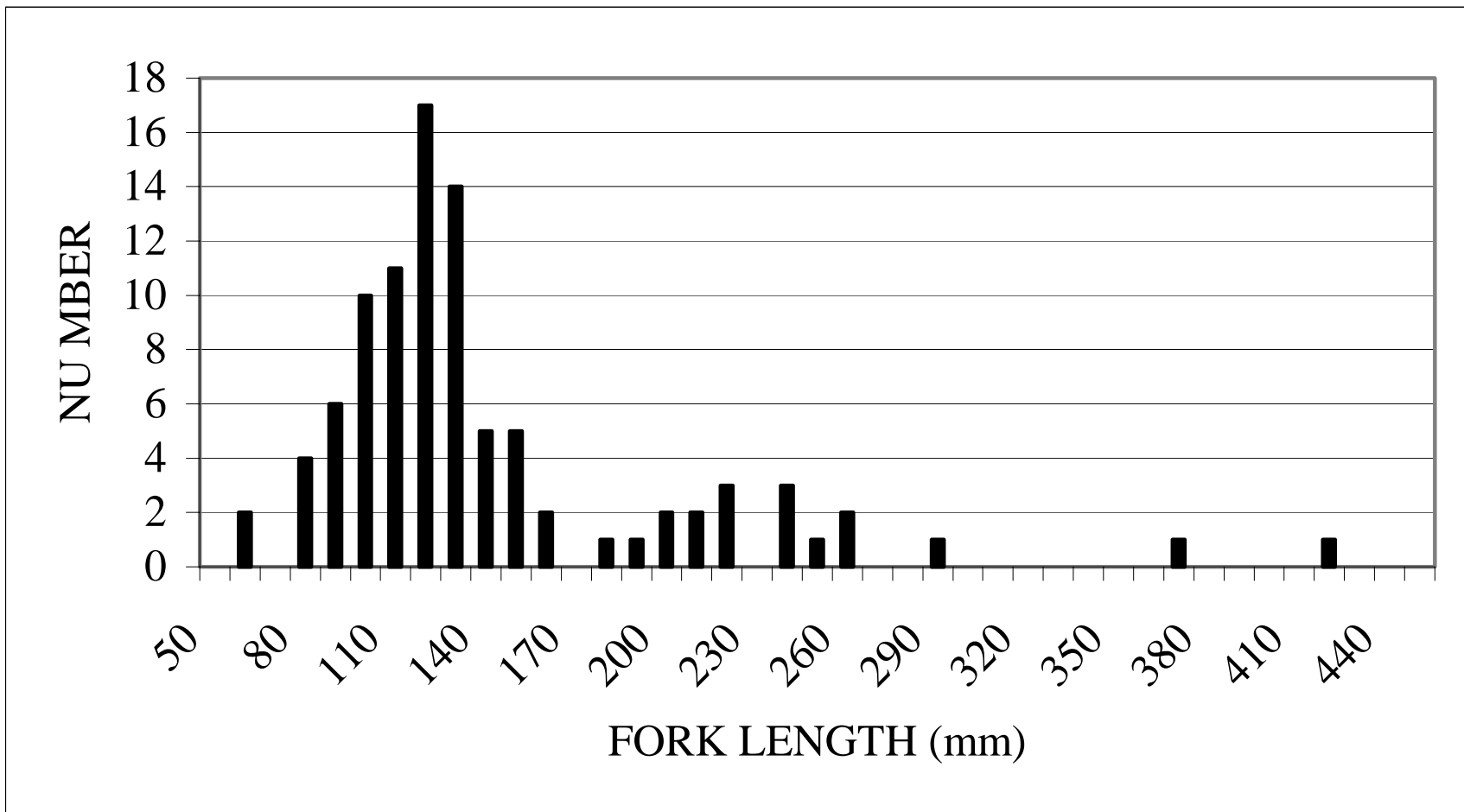


Figure 4. Length frequency for wild rainbow/steelhead trout sampled in Clearwater and North Fork Clearwater rivers (below Dworshak Dam) rivers, 1999.

Table 16. Summary of fish densities (per 100 m²) as determined by snorkeling parr monitoring sites in the South Fork Clearwater River drainage, 1999.

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	7/12	2.32	2.32	0	0	0	0.29	0.29	0	11.58	0	0	0
American River, Strata 3, #2	7/12	48.79	47.33	0.40	0.93	0.13	0	0	0	20.53	0.27	0	0
Meadow Creek, #1, MP2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Meadow Creek, #2, meadow	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Red River, Strata1 control 1	7/7	0	0	0	0	0	0.38	0.38	0	6.65	0.38	0	2.09
Red River, Strata1 control 2	7/7	3.00	2.65	0.35	0	0	0	0	0	4.59	0.88	0	6.01
Red River, Strata 2 control 2	7/10	0	0	0	0	0	0.11	0.11	0	0.67	0.11	0	0
Red River, Strata 2 treat 2	7/9	0.37	0	0.28	0.09	0	1.89	1.89	0	5.78	0.28	0	0.57
Red River, Strata 4 control 2	7/9	0	0	0	0	0	0.07	0.07	0	6.99	0.41	0	0
Red River, Strata 4 treat 2	7/9	0	0	0	0	0	0	0	0	2.71	0.47	0	0.12
Red River, Strata 5 control 2	7/9	0	0	0	0	0	0.19	0.19	0	0.75	0.62	0	0.06
Red River, Strata 5 treat 2	7/9	0	0	0	0	0	0.12	0.12	0	0.06	0.37	0	0
Johns Creek, #1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Johns Creek, #2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Johns Creek, #3	8/19	2.49	0.31	1.71	0.47	0	0.16	0.16	0	0	0	0	0
Johns Creek, #4	8/19	8.0	0.36	5.82	1.82	0	0	0	0	0	0	0	0
Moore Creek, #1, lower	8/19	2.39	0	2.39	0	0	1.02	1.02	0	0	0	0.68	0
Moore Creek, #2, upper	8/19	7.84	0.56	7.28	0	0	0	0	0	0	0	0.56	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 River drainage, 1999.

Drainage	Reach	Type ¹	Description	Date	Method	Redds	Fish	
							Live	Dead
American River	NC-4	T	Lick Creek to Kirks Fork	8/31	Aerial	0	0	0
		ISS	Mouth to Limber Luke	8/31	Aerial	0	0	0
Crooked River	NC -6	T	Mouth to Forks above Old Orogrande	8/31	Aerial	0	0	1
Newsome Creek	NC -8	T	Mouth to Radcliffe Creek	8/31	Aerial	1		
Red River	NC -1	T	Weir to Cole 66 Bridge	8/31	Aerial	4	1	0
South Fork Clearwater River Drainage Aerial Total						5	1	1

T = traditional transect

Table 18. Summary of fish densities (per 100 m²) as determined by snorkeling in the Crooked River drainage, 1998.

Stream	Date	Steelhead/rainbow 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
Strata 1, Sill Log B	7/11	1.43	0.95	0.24	0.12	0.12	0.95	0.95	0	11.51	0	0	0.12
Strata 1, Boulder A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 1, Control B	7/11	0	0	0	0	0	0	0	0	5.04	0	0.13	0.13
Strata 1, Control A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 1, Pond A	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 2, Control 1	7/12	0	0	0	0	0	0.51	0.51	0	3.17	0.25	0	0
Strata 2, Treat 1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 2, Control 2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 2, Treat 2	7/12	0.11	0.11	0	0	0	0.22	0.22	0	1.78	0.45	0	0
Strata 2, Pond U	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Strata 3, Natural 1	7/12	0.07	0	0.07	0	0	0.22	0.22	0	10.53	0.67	0	0.07
Strata 3, Natural 3	7/12	0	0	0	0	0	0.26	0.26	0	0.64	0.64	0	0
Strata 4, B-Ponds S-2	7/11	0	0	0	0	0	0.35	0.35	0	0.53	0.35	0	0
Strata 4, Meander 1	7/12	1.71	1.71	0	0	0	0	0	0	5.13	5.24	0.11	0.22
Strata C, Canyon 2	7/11	0	0	0	0	0	1.14	1.14	0	8.39	0.14	0.14	0
Strata C, Canyon 3	7/11	0	0	0	0	0	0.56	0.56	0	4.38	0.47	0.09	0
Orogrande 1	7/11	0.37	0	0.37	0	0	0.18	0.18	0	9.93	0	0	0
West Fork, WF1	7/11	0.29	0	0	0.29	0	4.08	4.08	0	1.46	0	0.29	0
West Fork, WF2	7/11	0.21	0	0.21	0	0	0.85	0.85	0	0.21	0.21	0.21	0.21
East Fork, EF1	7/11	0	0	0	0	0	2.87	2.87	0	0.14	0	0.43	0
East Fork, EF2	7/11	0	0	0	0	0	1.54	1.54	0	0	0	0.34	0.34
Five Mile Cr, Strata 1, 1-A	7/14	0	0	0	0	0	3.53	3.53	0	0	0	0	0
Five Mile Cr, Strata 1, 1-B	7/14	0	0	0	0	0	9.66	9.66	0	0	0	0	0
Relief Creek, Strata 1, 1-A	7/14	0.81	0	0.81	0	0	0	0	0	23.56	1.35	0	0
Relief Creek, Strata 1, 1-B	7/14	0	0	0	0	0	0.51	0.51	0	0	0	0	0
Relief Creek, Strata 2, 2-A	7/14	0	0	0	0	0	3.57	3.57	0	0	0.45	0	0
Relief Creek, Strata 2, 2-B	7/14	1.39	0	0	1.39	0	4.18	4.18	0	0	0.93	0	0

SOUTH FORK CLEARWATER RIVER

Methods

Creel census surveys were conducted on the South Fork Clearwater River by regional fishery management staff and conservation officers in 1999. We recorded instantaneous counts of anglers, total hours fished, number of fish caught, fish species, and fish lengths. We used creel census program developed by the Idaho Department of Fish and Game (IDFG) to calculate estimates and confidence intervals (Boydston and McArthur 1993). Creel survey counts were done a minimum of two weekdays and two weekend days per interval. Intervals are two weeks long beginning on February 14, 1999 and ending November 30, 1999 with the exception of section 4, which has four-week intervals.

Results

We estimated total angling effort on the South Fork Clearwater River at 19,955 hours in 1999. Steelhead fishing efforts accounted for 74% (14,856 hours) of the total hours fished (Figure 5). Angler effort consisted of 33% bait, 66% lure, and 1% fly-fishing.

Anglers caught an estimated 2,628 steelhead from the South Fork Clearwater River during 1999, generating a steelhead catch rate of 0.18 steelhead per hour. The highest steelhead catch rate was reported on section 3 (Castle Creek – Golden) at 0.21 steelhead per hour. Zero catch rates were reported on section 4 (Golden – Red River) (Figure 1). Anglers harvested a total of 1,110 steelhead from the South Fork Clearwater River during 1999, 42% of the total steelhead caught. Harvest was reported highest on Section 2 at 661 steelhead and reported lowest on section 4 at zero steelhead (Figure 6).

Anglers caught an estimated 5,898 resident fish from the South Fork Clearwater River during 1999, generating a catch rate of 0.35 fish per hour. The highest catch rate was reported on section 2 (Harpster – Castle Cr.) at 0.75 fish per hour and the lowest on section 1 (Mouth – Harpster) at zero fish per hour (Figure 1). Anglers harvested a total of 2,646 resident fish from the South Fork Clearwater River during 1999, 45% of the total resident fish caught. The harvest composition consisted of 56% hatchery rainbow trout, 39% wild rainbow trout, 2% brook trout *Salvelinus fontinalis*, 1.5% cutthroat trout *Oncorhynchus clarki*, 1% mountain whitefish. The remaining 0.5% harvested were due to the illegal harvest of juvenile chinook and bull trout (Figure 7).

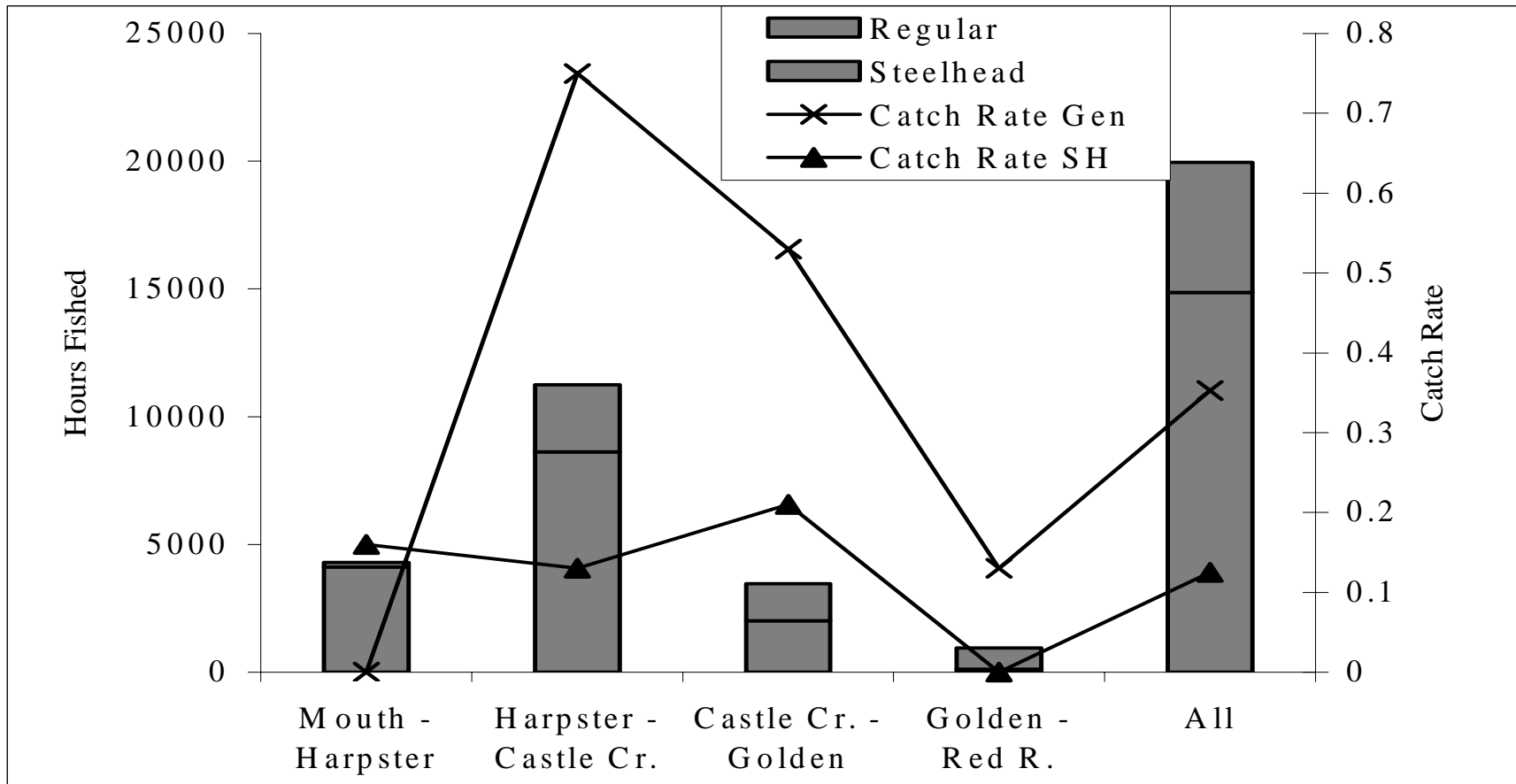


Figure 5. Summary of estimated angler effort by season and catch rate per section on the South Fork Clearwater River, 1999.

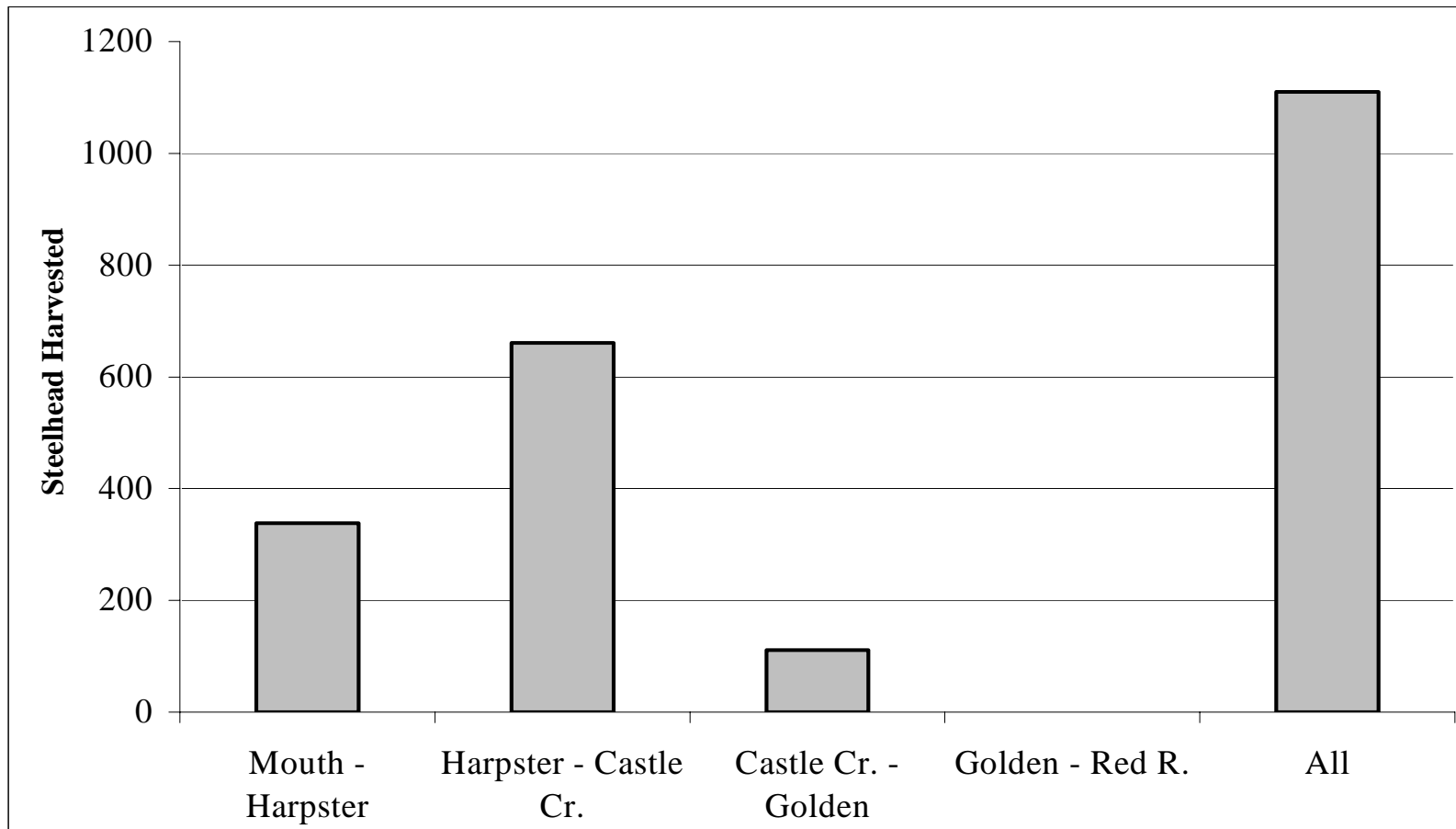


Figure 6. Summary of estimated steelhead harvested per section on the South Fork Clearwater River, 1999.

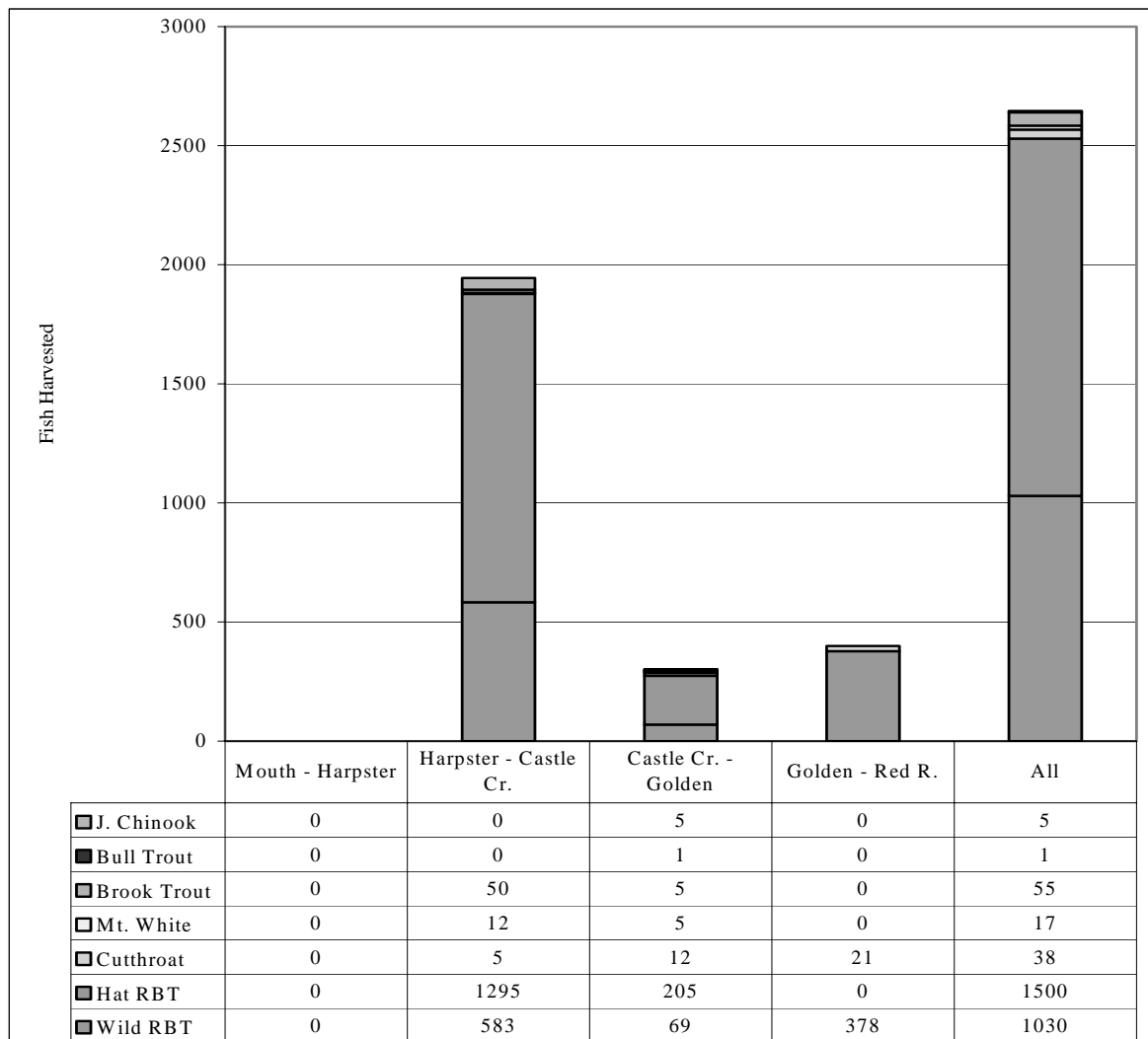


Figure 7. Summary of estimated harvest for resident species per section from the South Fork Clearwater River, 1999.

Section 1: Mouth – Harpster, Idaho

We estimated total angling effort for the steelhead season in section 1 to be 4,110 hours during 1999. Effort was reported highest during interval 3 (March 14–March 27) at 1,525 hours (Figure 8). Anglers caught an estimated 338 steelhead from section one during 1999, resulting in a catch rate of 0.16 steelhead per hour. Highest catch rates were reported in interval 4 (March 28–April 10) at 0.5 steelhead per hour. Anglers harvested an estimated 338 steelhead from section 1 during 1999, 52% of the total 654 steelhead caught. Harvest was reported highest in interval 2 (February 28–March 13) at 196 steelhead. No steelhead catch or harvest was reported during intervals 5 and 6 (Figure 9).

We estimated total angling effort for the general season in section 1 to be 178 hours during 1999. Effort was reported highest during interval 14 (August 1–August 14) at 83 hours. No resident fish were reported caught in section 1 (Figure 10).

Section 2: Harpster – Castle Creek

We estimated total angling effort for the steelhead season in section 2 at 8,628 hours during 1999. Effort was reported highest during interval 3 (March 14 – March 27) at 3,696 hours (Figure 11). Anglers caught an estimated 1,451 steelhead from section 2 during 1999, resulting in a catch rate of 0.13 steelhead per hour. Highest catch rates were reported during interval 4 (March 28–April 10) at 0.32 steelhead per hour. No steelhead were reported caught for intervals 1, 5, and 6 (Figure 11). Anglers harvested an estimated 661 steelhead from section 2 during 1999, 46% of the total 1,451 steelhead caught. Harvest was reported highest during interval 4 (March 28–April 10) at 362 steelhead. No harvest was reported during intervals 1 and 6 (Figure 12).

We estimated total angling effort for the general season on section 2 at 2,623 hours during 1999. Effort was reported highest during interval 11 (July 4–July 17) at 619 hours. No effort was reported from intervals 18 - 23 (October 10–November 30) (Figure 13). Anglers caught an estimated 4,033 resident fish from section 2 during 1999, resulting in a catch rate of 0.75 fish per hour. Highest catch rates were reported during intervals 9, 11, 13, and 16, all above 3 fish per hour. No catches were reported during intervals 8, 9, 13, 14, and 15 (Figure 13). Anglers harvested a total of 1,945 resident fish from section 2 during 1999, 48% of the total resident fish caught. Hatchery rainbow trout made up the majority of the harvest at 67%. Of the total harvest, wild trout accounted for 30% and brook trout 2.5% (Figure 14). Anglers harvested an estimated five cutthroat trout in section 2 during 1999. The cutthroat trout were harvested during interval 12 from July 18–July 31 (Figure 15).

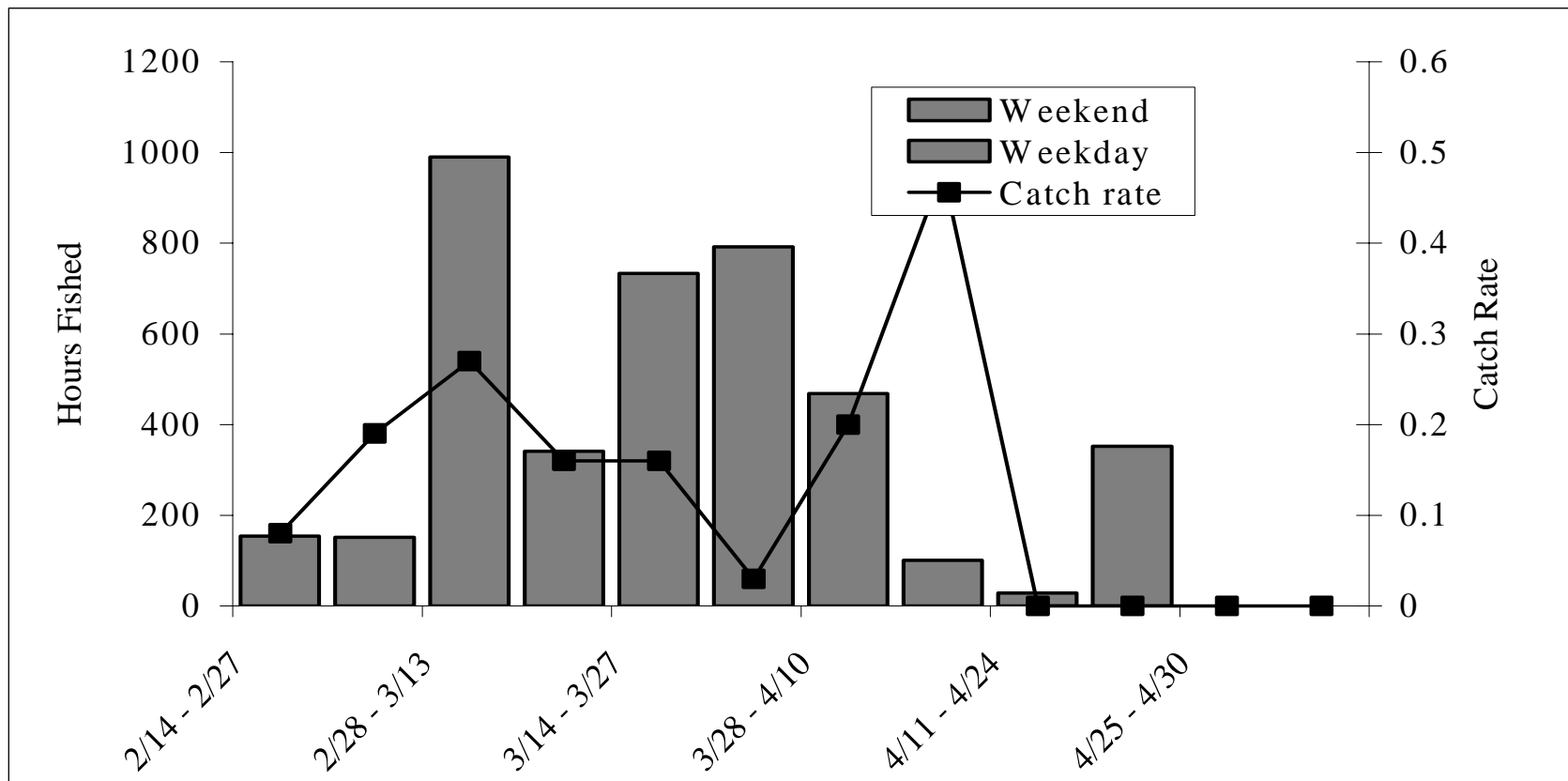


Figure 8. Estimated angler effort and catch rate per interval for the steelhead season on the South Fork Clearwater River, mouth - Harpster, 1999.

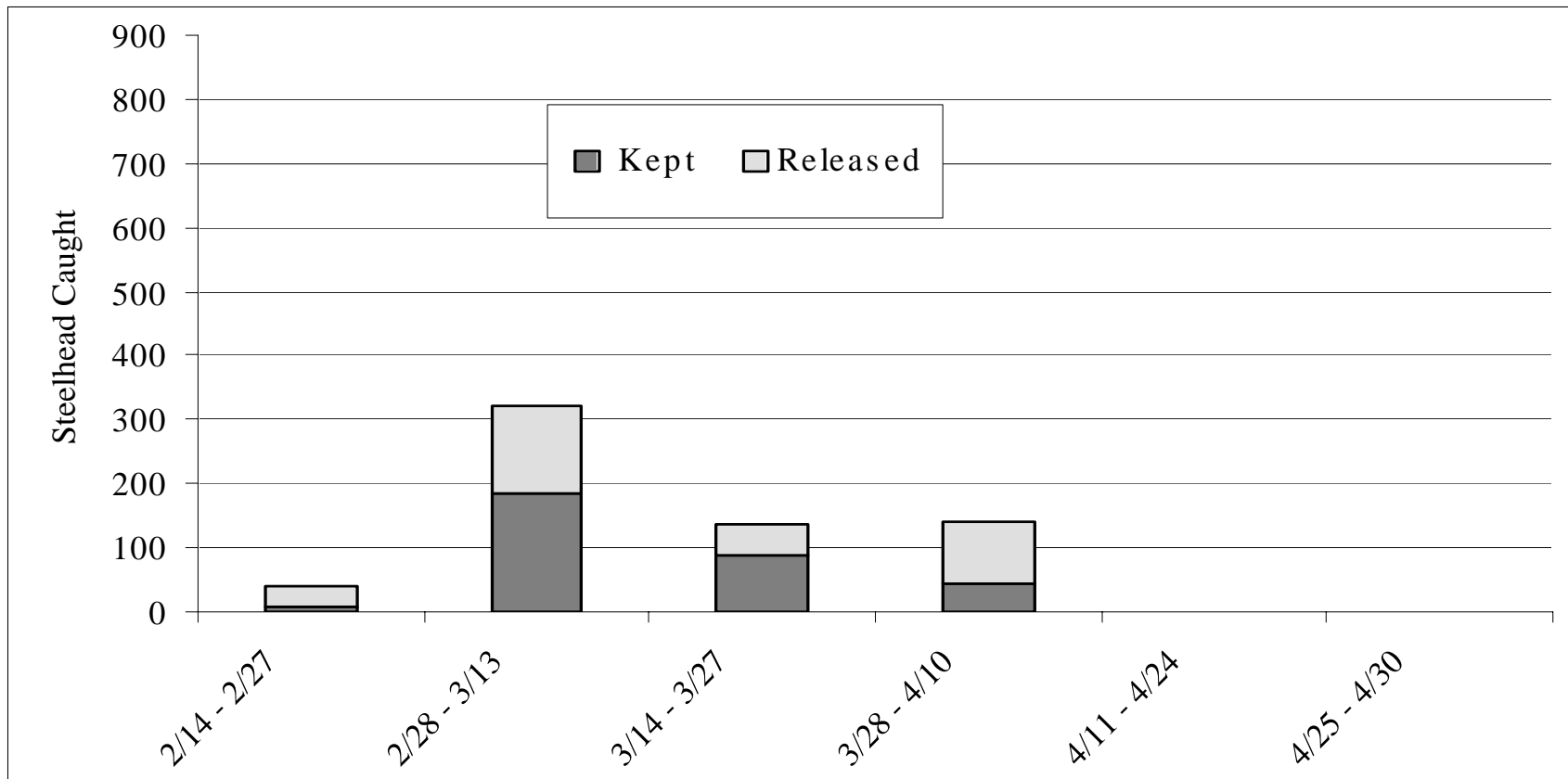


Figure 9. Estimated steelhead caught per interval on the South Fork Clearwater River, mouth – Harpster, 1999.

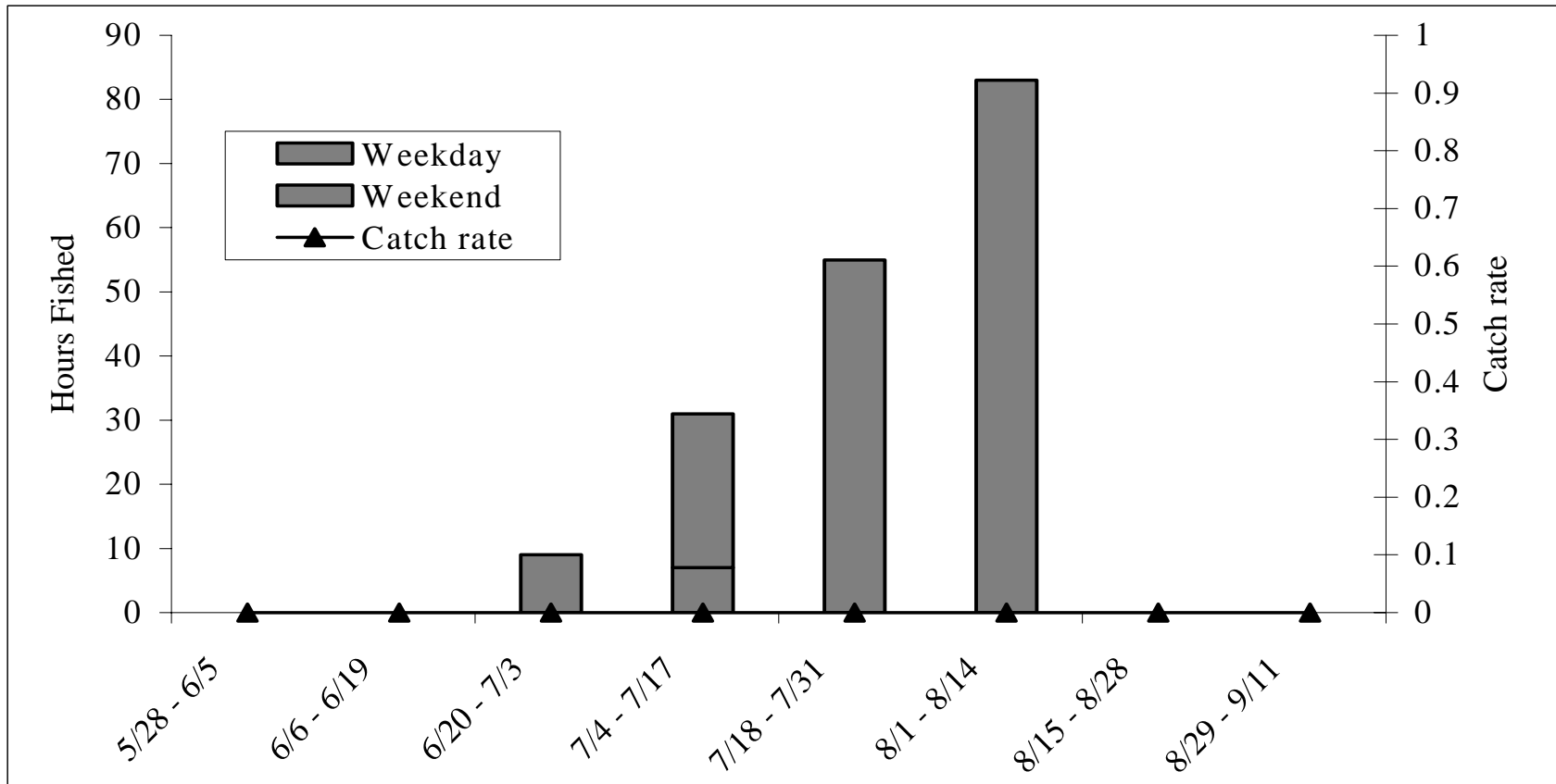


Figure 10. Estimated angler effort and catch rate per interval for the general season on the South Fork Clearwater River, mouth – Harpster, 1999.

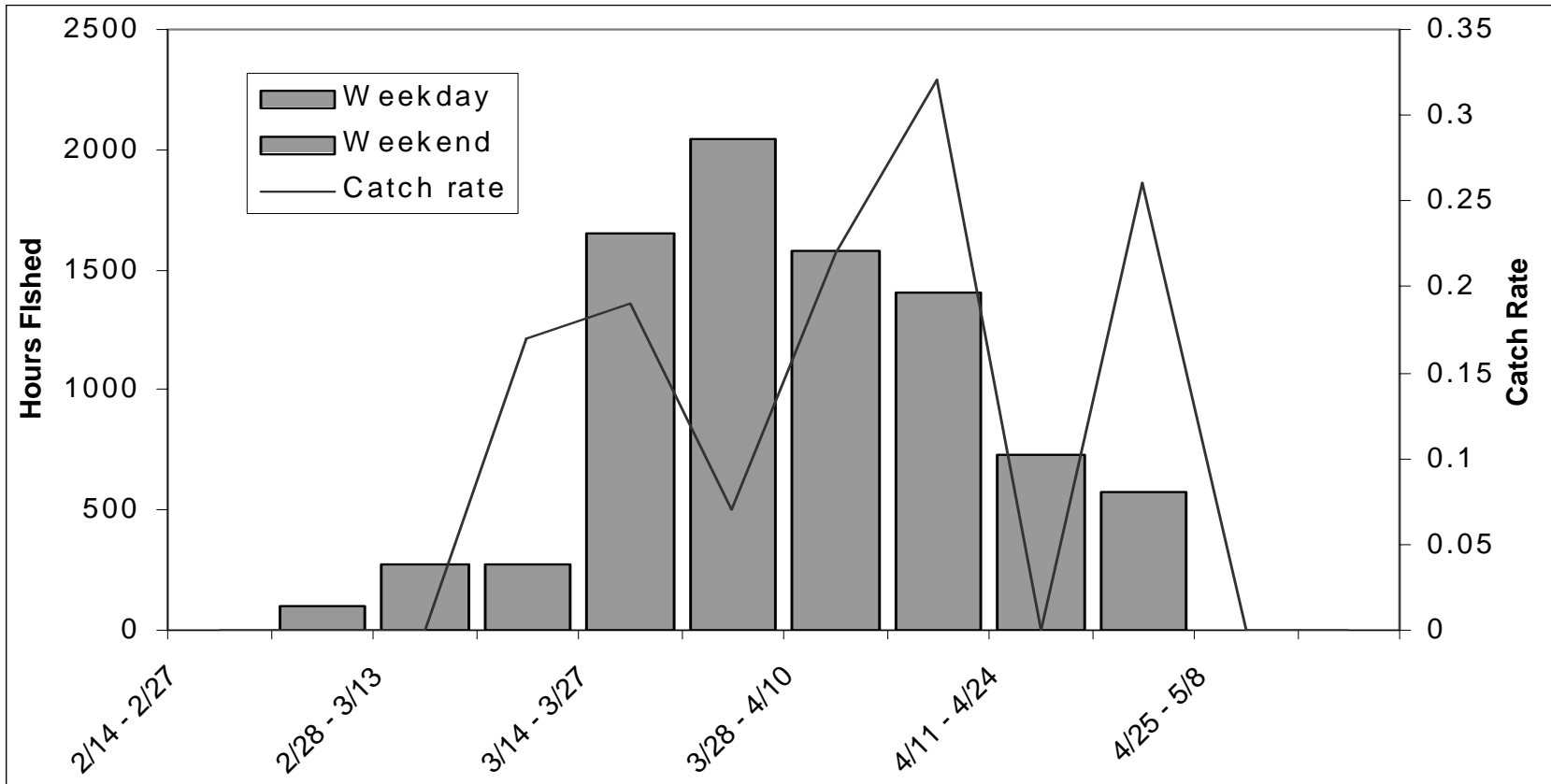


Figure 11. Estimated angler effort and catch rate per interval for the steelhead season on the South Fork Clearwater River, Harpster – Castle Creek, 1999.

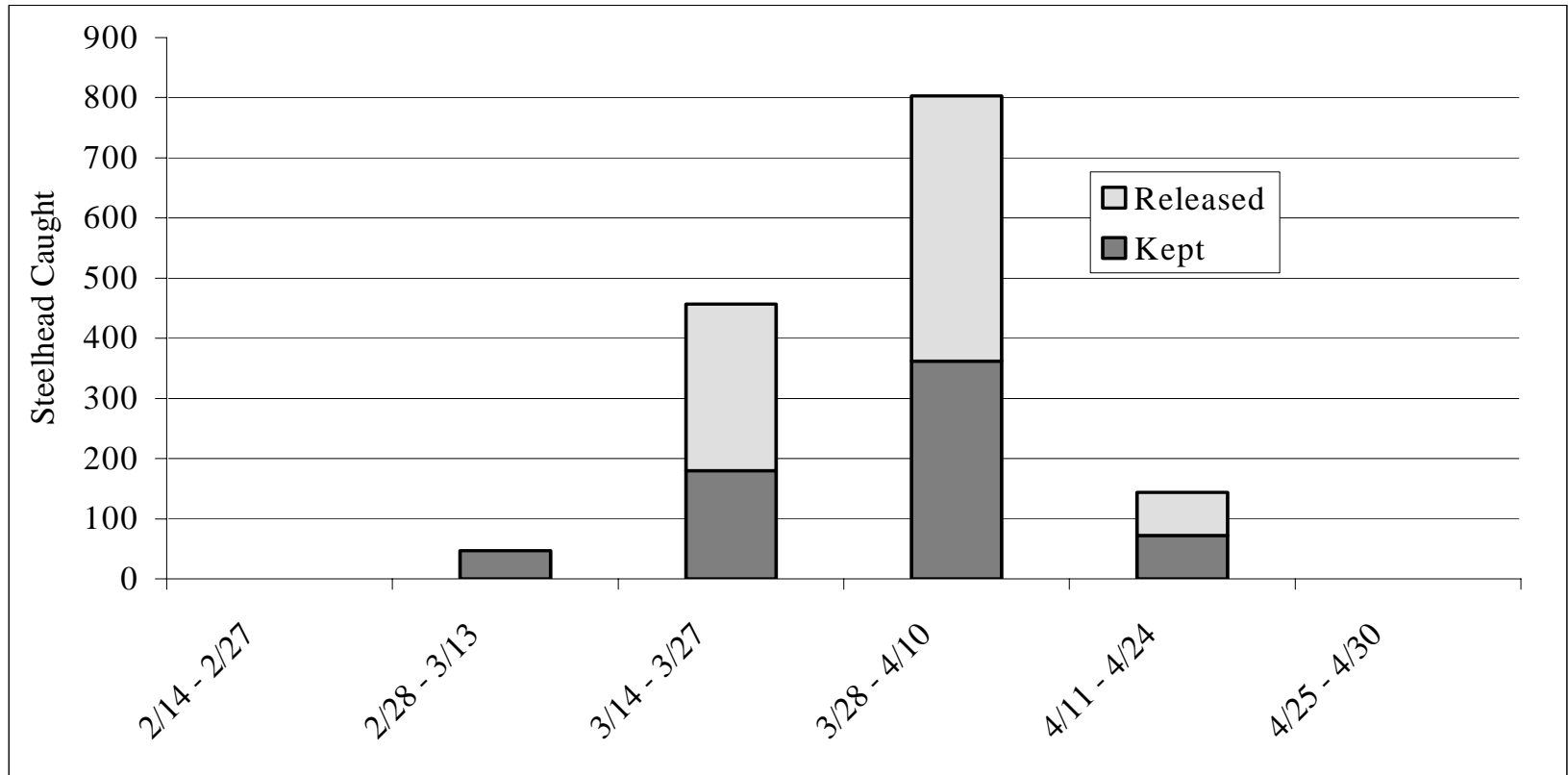


Figure 12. Estimated steelhead caught per interval on the South Fork Clearwater River, Harpster – Castle Creek, 1999.

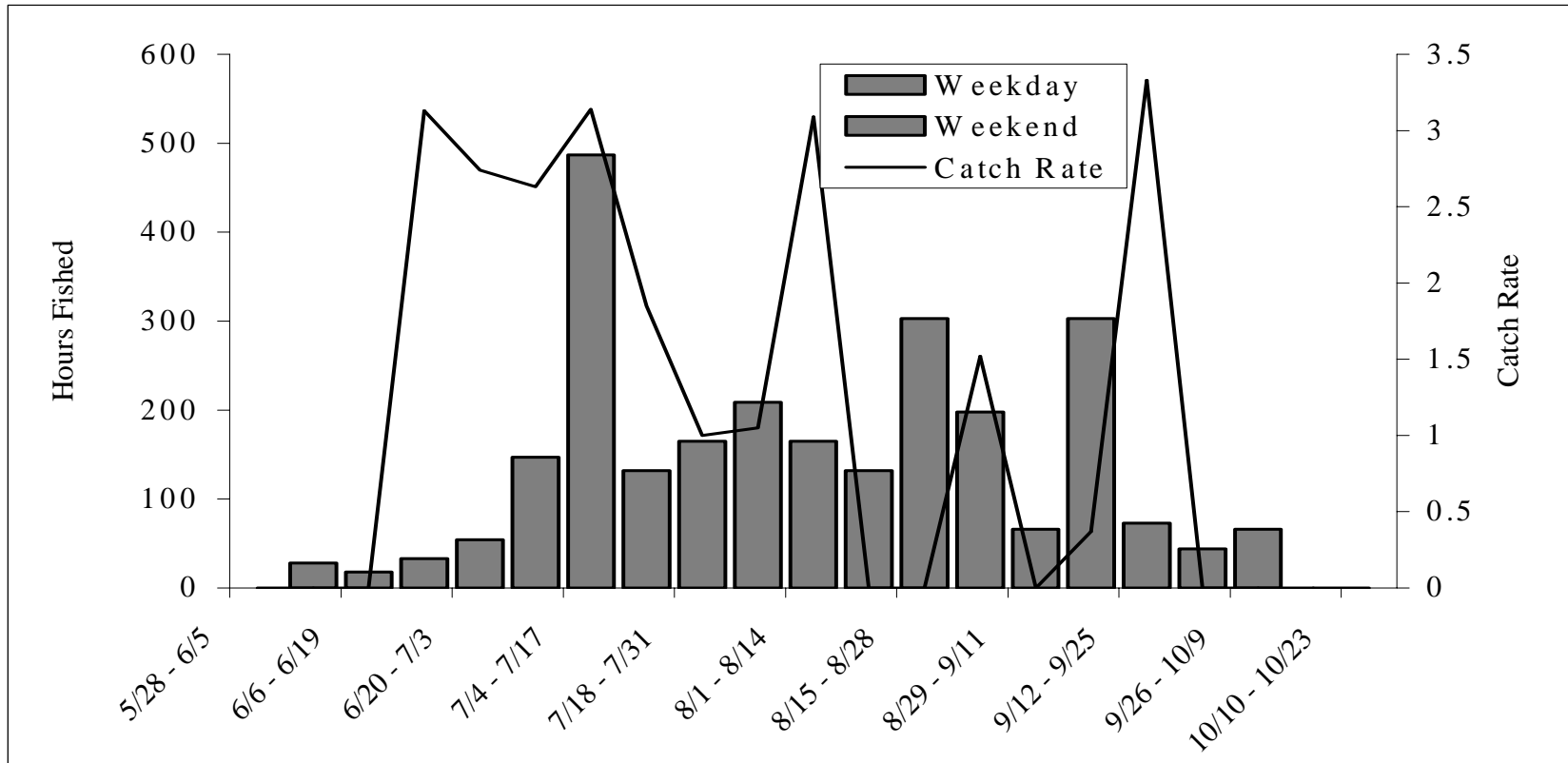


Figure 13. Estimated angler effort and catch rate per interval for the general season on the South Fork Clearwater River, Harpster – Castle Creek, 1999.

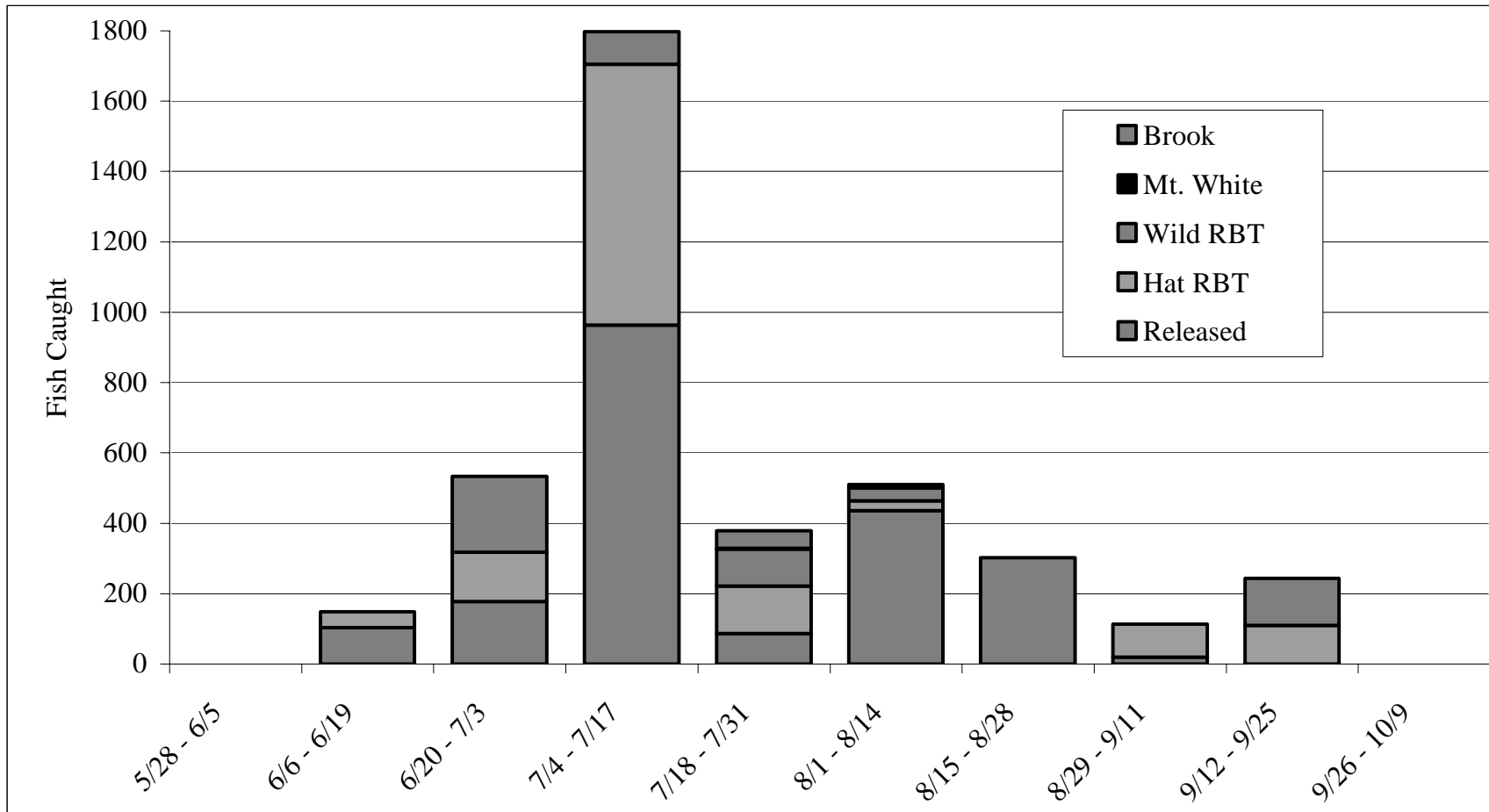


Figure 14. Estimated fish caught by species per interval for the general season on the South Fork Clearwater River, Harpster – Castle Creek, 1999.

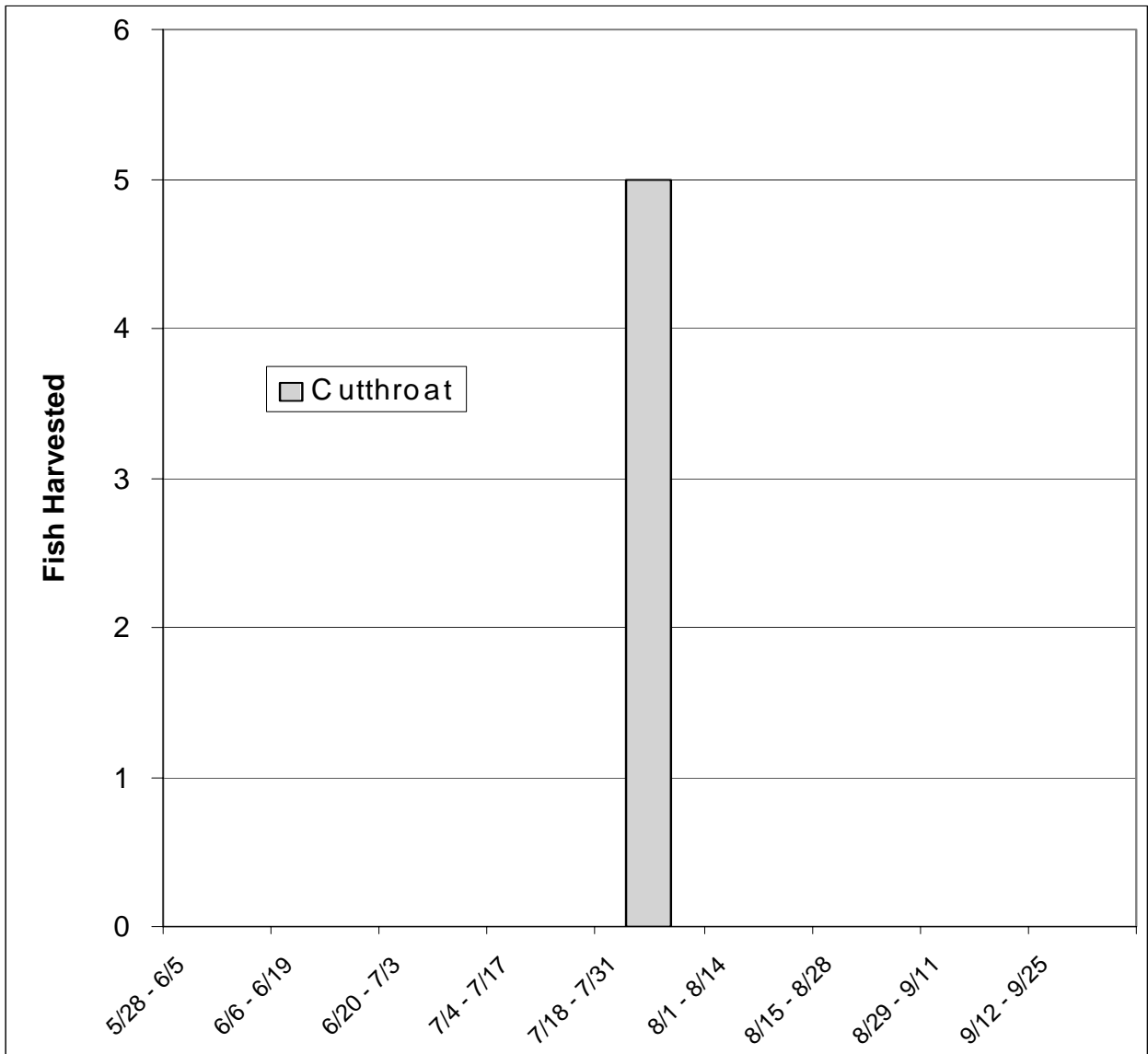


Figure 15. Estimated species of special concern harvested per interval on the S.F. Clearwater, Harpster - Castle Creek, 1999.

Section 3: Castle Creek – Golden, Idaho

We estimated total angling effort for the steelhead season in section 3 at 2,008 hours during 1999. Effort was reported highest during interval 5 (April 11 – April 24) at 1,161 hours. No effort was reported during intervals 1 and 2 (Figure 16). Anglers caught an estimated 523 steelhead from section 3 during 1999, resulting in a catch rate of 0.21 steelhead per hour. Highest catch rates were reported during interval 4 (March 28–April 10) at 1.07 steelhead per hour. No catches were reported during intervals 1, 2, 3, and 6. Anglers harvested an estimated 111 steelhead from section 3 during 1999, 21% of the total 523 steelhead caught. Harvest was reported highest during interval 5 (April 11–April 24) at 88 steelhead. No harvest was reported during intervals 1, 2, 4, and 6 (Figure 17).

We estimated total angling effort for the general season in section 3 at 1,458 hours during 1999. Effort was reported highest during interval 11 (July 4–July 17) at 365 hours. No effort was reported during intervals 8 and 20 (Figure 18). Anglers caught an estimated 1,356 resident fish from section 3 during 1999, resulting in a catch rate of 0.53 fish per hour. Highest catch rates were reported during interval 16 (September 12–September 25) at 6 fish per hour. No catch rates were reported during intervals 8, 9, 10, 12, 18, 19, and 20 (Figure 18). Anglers harvested a total of 302 resident fish from section three during 1999, 22% of the total 1,356 fish caught. Hatchery rainbow trout made up the majority of the harvest at 68%. Wild trout made up 23%, mountain whitefish 1.5%, and brook trout 1.5% of the harvest (Figure 19). Anglers harvested an estimated 12 cutthroat trout, 5 juvenile chinook, and 1 bull trout from section 3 during 1999. The juvenile chinook salmon and bull trout were illegally harvested during interval 11 (July 4–July 17) and interval 13 (August 1–August 14) (Figure 20).

Section 4: Golden – Red River

We estimated total angling effort for the steelhead season in section 4 at 110 hours during 1999. Effort was reported only in interval 3 (April 11–April 30) at 110 hours. No steelhead catches were reported in section 4 for the entire season (Figure 21).

We estimated total angling effort for the general season in section 4 at 840 hours during 1999. Effort was reported highest during interval 7 (July 18 – August 14) at 337 hours fished. No effort was reported for intervals 5 and 11 (Figure 22). Anglers caught an estimated 509 resident fish from section 4 during 1999, resulting in a catch rate of 0.13 fish per hour. Catch rates were reported highest during interval 7 (July 18–August 14) at 1.5 fish per hour. No catches were reported during intervals 5, 6, 9, 10, and 11 (Figure 22).

Anglers harvested a total of 399 fish from section 4 during 1999, 78% of the total 509 fish caught. Wild rainbow trout accounted for 95% of the harvest, and cutthroat trout the remaining 5%. An estimated 21 cutthroat were harvested from section four, all caught during interval 8 (August 15–September 11) (Figure 23).

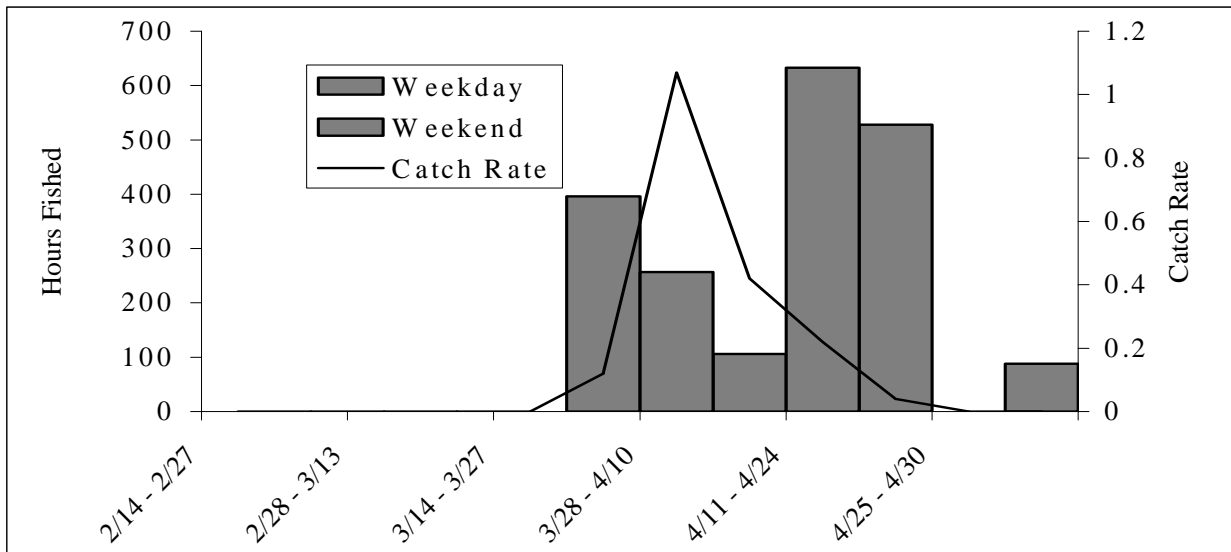


Figure 16. Estimated angler effort and catch rate per interval for the steelhead season on the South Fork Clearwater River, Castle Creek – Golden, 1999.

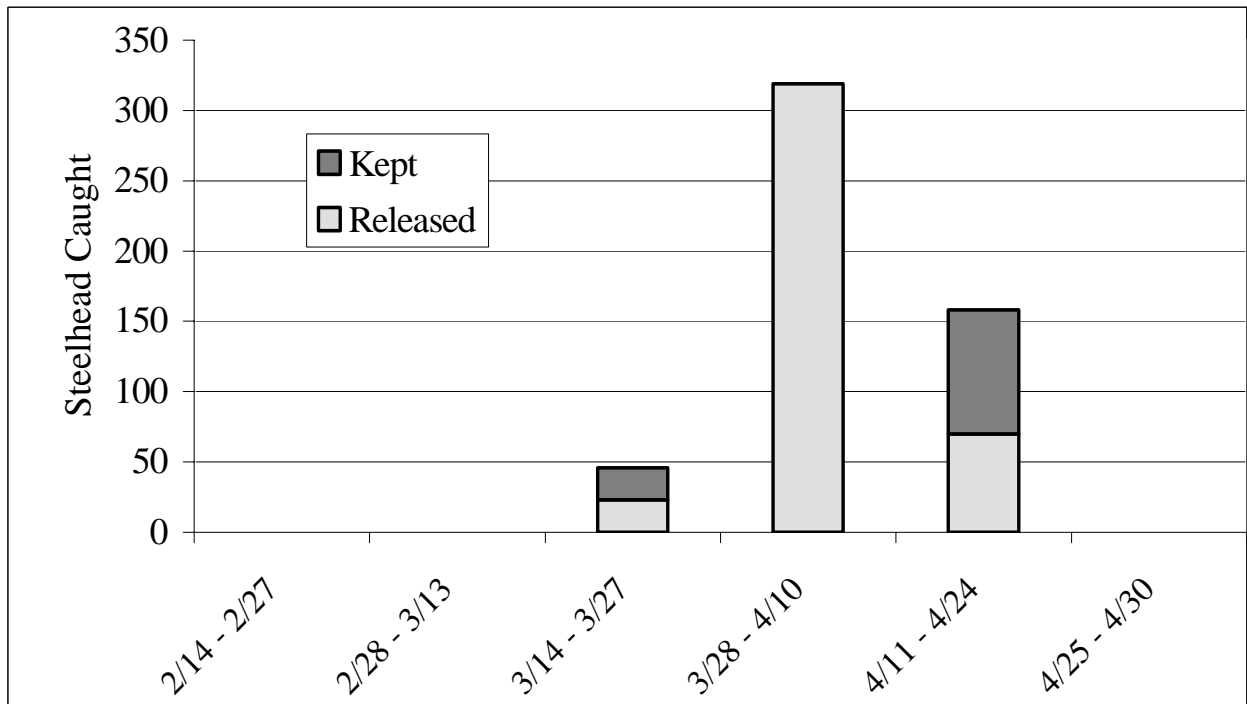


Figure 17. Estimated steelhead caught per interval on the South Fork Clearwater River, Castle Creek – Golden, 1999.

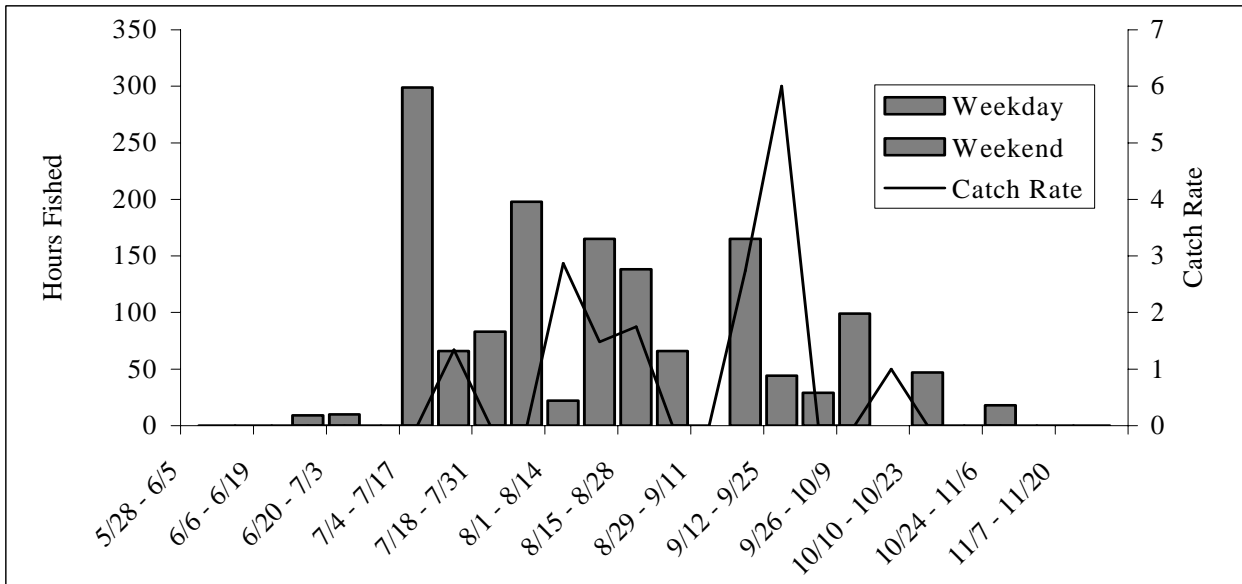


Figure 18. Estimated angler effort and catch rate per interval for the general season on the South Fork Clearwater River, Castle Creek – Golden, 1999.

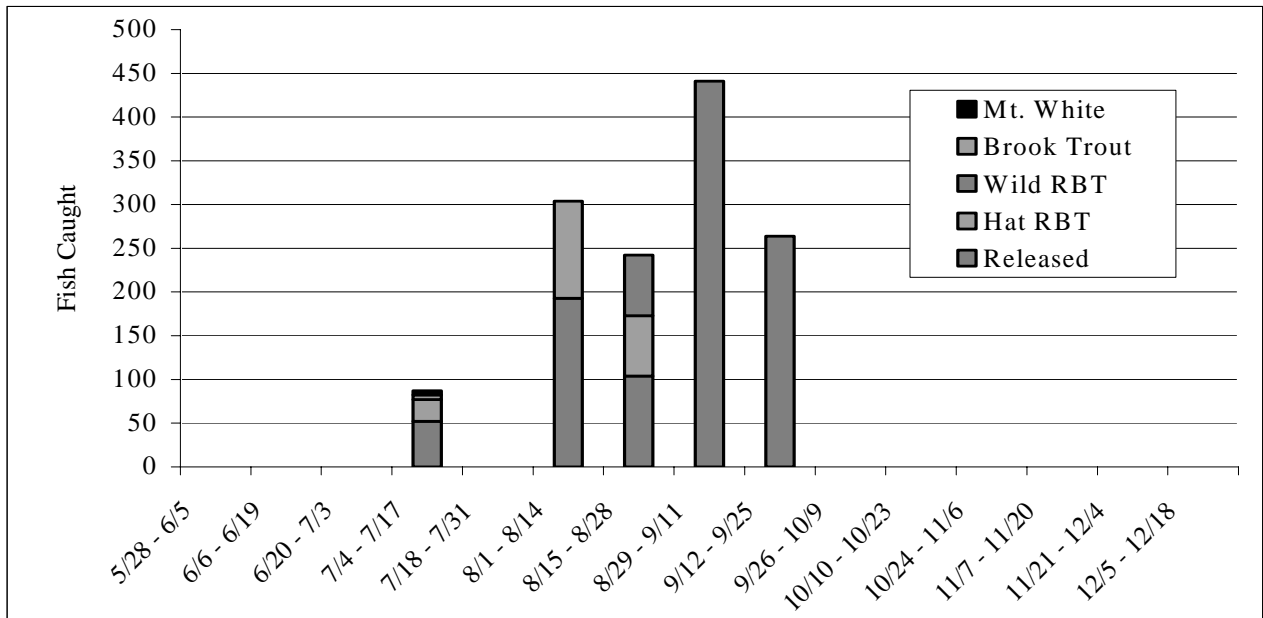


Figure 19. Estimated fish caught by species per interval for the general season on the South Fork Clearwater River, Castle Creek – Golden, 1999.

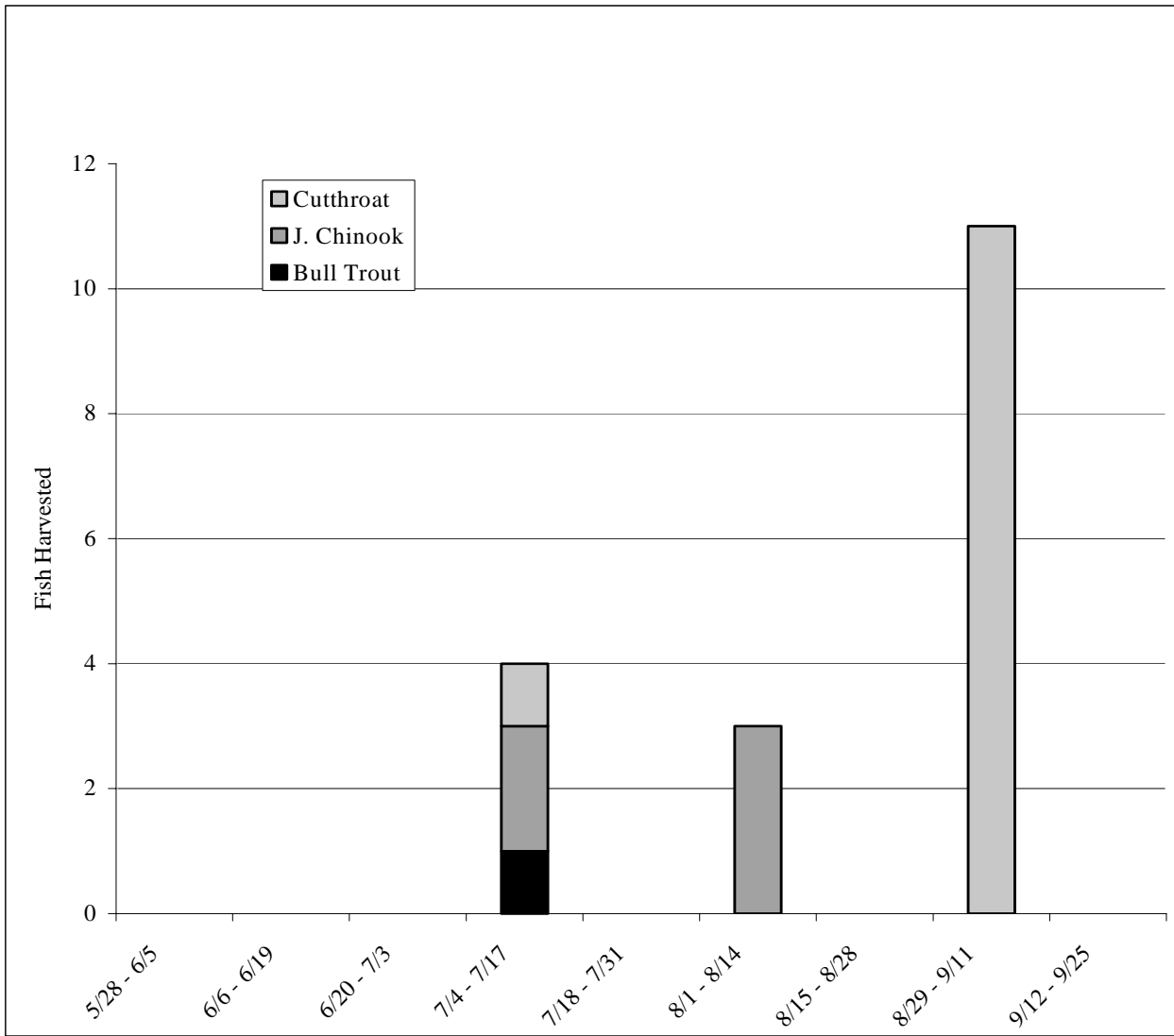


Figure 20. Estimated species of special concern caught per interval on the South Fork Clearwater River, Castle Creek – Golden, 1999.

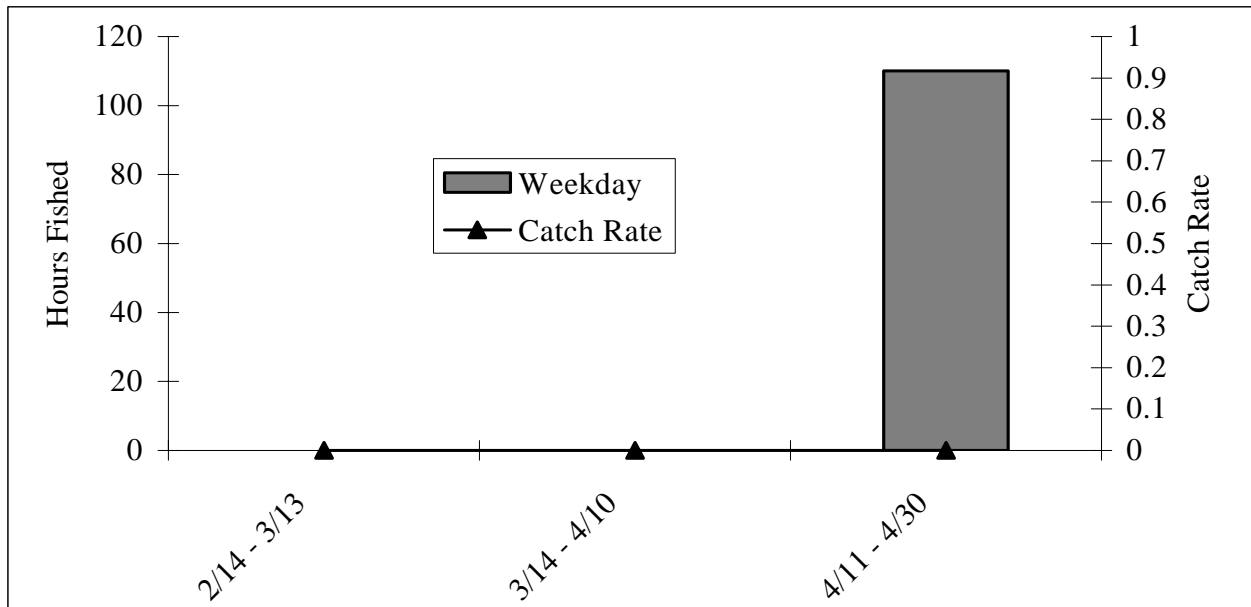


Figure 21. Estimated angler effort and catch rate per interval for the steelhead season on the South Fork Clearwater River, Golden – Red River, 1999.

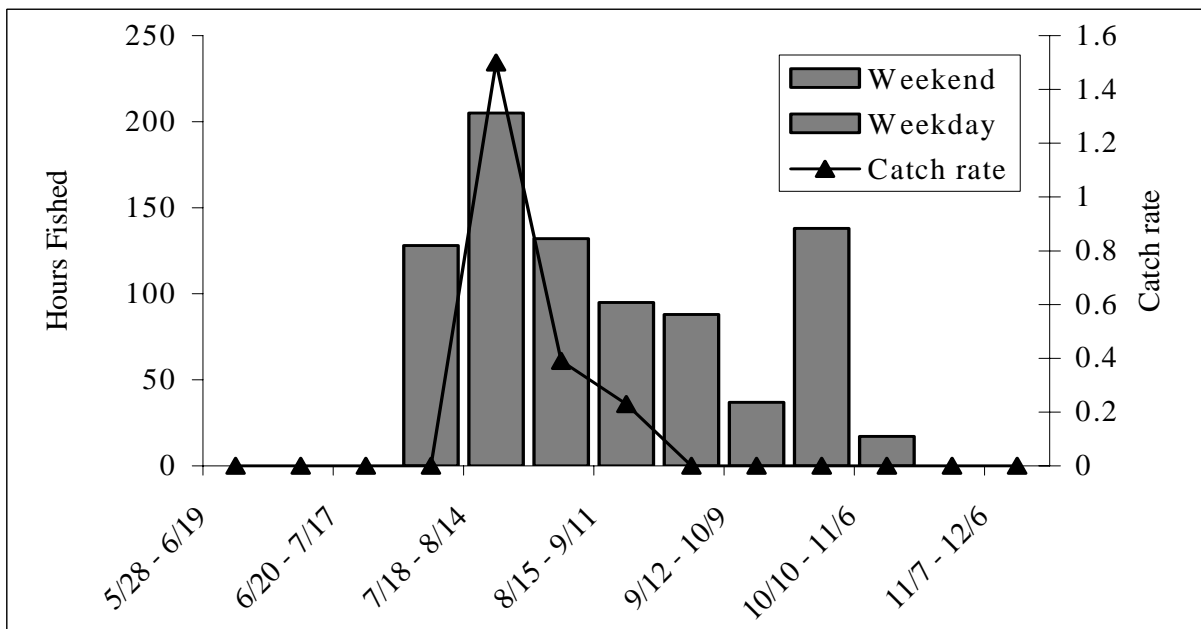


Figure 22. Estimated angler effort and catch rate per interval for the general season on the South Fork Clearwater River, Golden – Red River, 1999.

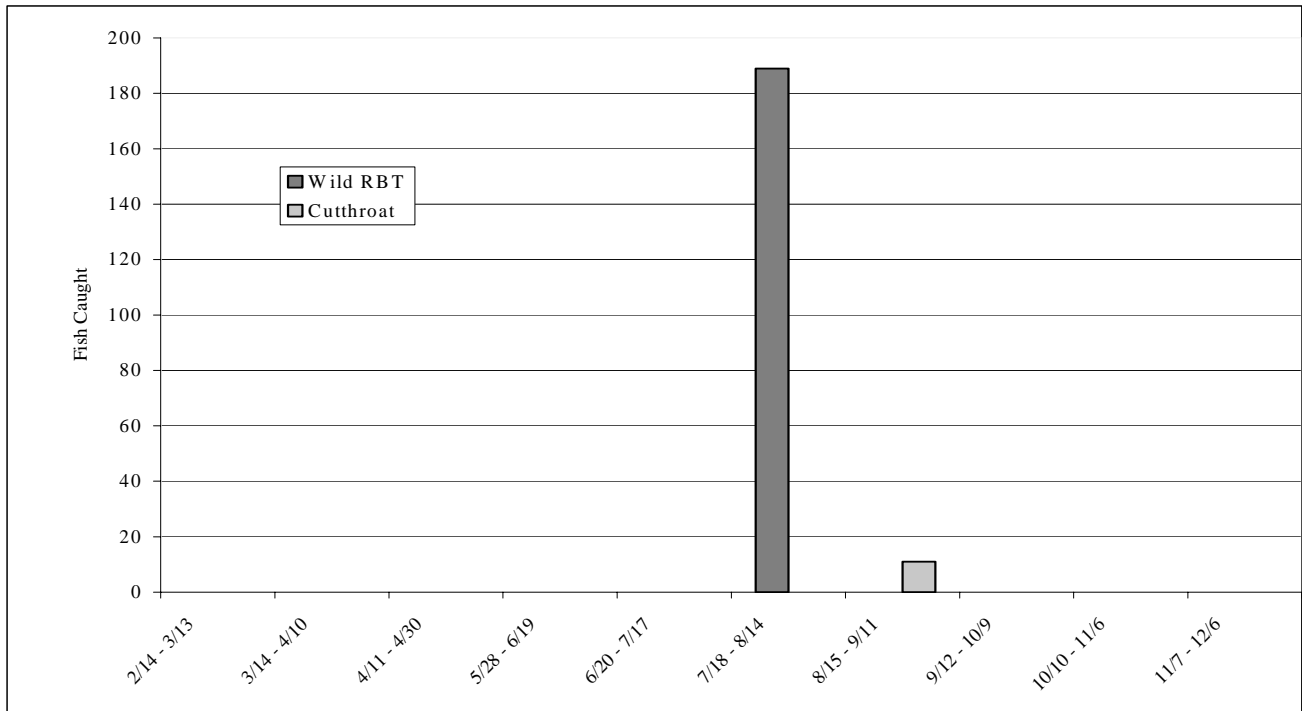


Figure 23. Estimated fish caught by species for the general season on the South Fork Clearwater River, Golden – Red River, 1999.

SALMONID SAMPLING AND DIET ANALYSIS

Methods

As in 1992 to 1998, 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.

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. Hatchery steelhead trout juveniles were identified by a missing adipose fin. Domestic Kamloops were identified by a left ventral clip and Spokane rainbows by a right ventral clip. We classified rainbow trout with general fin deformity and/or erosion but no clips as unspecified hatchery trout, and classified trout with no deformities as wild/natural.

Results

Clearwater River

We sampled sections within the lower 70 kilometers of the Clearwater River with electrofishing gear weekly from April 18 to August 21, 1999. In approximately 1,607 minutes of electrode on time, we collected 763 hatchery steelhead smolts, 29 unmarked hatchery rainbow trout, 5 Spokane strain rainbows, 3 Colorado strain rainbows, and 1 domestic Kamloops rainbow (Table 19). The unmarked hatchery rainbows were most likely catchable rainbow trout that emigrated from Dworshak Reservoir. We dissected the stomachs of all Spokane strain, Colorado strain, and domestic Kamloops rainbow for diet analysis. Diet consisted primarily of aquatic and terrestrial insects, snails and green algae. No fish or fish parts were found.

Salmon River

We sampled the lower 80 km of the Salmon River with hook and line gear August 15-August 19, 1999. In approximately 250 hours of effort with hook and line gear, we captured 49 wild rainbow trout, 38 residualized hatchery steelhead smolts, 9 domestic Kamloops rainbow trout, and 2 Spokane rainbow trout. Three year classes of hatchery rainbow were represented in the sample.

Table 19. Length frequency of hatchery rainbow trout (LV clip) collected by electrofishing in the Clearwater River, 1999.

Fork length (mm)	Domestic Kamloops (LV clip)	Colorado strain rainbow (RV clip)	Spokane strain rainbow (RV clip)
150			
160			
170			
180		1	
190			
200		2	
210			
220			
230	1		
240			
250			
260			
270			
280			
290			1
300			
310			
320			
330			1
340			
350			
360			
370			
380			2
390			
400			
410			
420			
430			
440			
450			
460			
470			
480			
490			
500			
510			1
Total	1	3	5

We dissected the stomachs of all 49 hatchery origin trout collected from the Salmon River and examined the content. Diet generally consisted of aquatic and terrestrial insects, aquatic snails, and green algae. Six young-of-the-year northern pikeminnow *Ptychocheilus oregonensis* were found in the stomach of a 309 mm residualized hatchery steelhead.

KOKANEE SALMON SPAWNING GROUND COUNTS

Methods

Since 1981, four to six tributaries to Dworshak Reservoir have been surveyed in late September to estimate the size of the kokanee salmon *Oncorhynchus 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, 1999 we counted 11,320 kokanee spawners in three index tributaries of the North Fork Clearwater River (Table 20). This count was higher than that of 1998.

CREEL CENSUS

Methods

Clearwater Region fish management personnel and conservation officers performed spot check creel census surveys throughout the region in 1999.

Results

Nine rivers and streams were censused on a random basis in 1999 (Table 21). Regional personnel checked 138 anglers who fished 193 hours. Anglers reported catching 259 game fish, averaging 1.34 fish per hour.

Table 20. Number of spawning kokanee observed in selected tributaries to Dworshak Reservoir, Idaho, 1981-1999.

Year	Trend count area			Total	Dog Creek	Breakfast Creek
	Isabella Creek	Skull Creek	Quartz 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	21,820	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	
1999	10,132	361	827	11,320	2,207	

Table 21. Impromptu creel census findings from various Clearwater region streams, 1999.

Water/ date	Anglers	Hours fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
American River										
3-Jul	3	3	0	3	0	0	0	0	3	1.00
Clearwater River										
9-Jul	1	1	0	0	0	0	0	1	1	1.00
27-Jul	2	2	0	0	0	0	0	0	0	0.00
Subtotal	3	3	0	0	0	0	0	1	1	0.33
Gedney Creek										
3-Jul	2	2	0	1	0	0	0	0	1	0.50
Kelly Creek										
17-Jul	8	10	26	3	0	0	0	0	29	2.90
Little Salmon River										
13-Jun	4	2	0	2	0	0	0	0	2	1.00
25-Jun	9	5	0	16	0	0	0	0	16	3.20
27-Jun	5	5	0	2	0	0	0	0	2	0.40
9-Jul	3	2	0	3	0	0	0	0	3	1.50
28-Aug	7	12	0	17	0	0	0	0	17	1.42
5-Sep	6	3	0	0	0	0	0	0	0	0.00
Subtotal	34	29	0	40	0	0	0	0	40	1.38
Middle Fork Clearwater River										
17-Jan	2	2	0	0	0	0	0	0	0	0.00
10-Jul	2	4	2	32	0	0	0	0	34	8.50
11-Jul	1	2	0	0	0	0	0	0	0	0.00
Subtotal	5	8	2	32	0	0	0	0	34	4.25

Table 26. Continued.

Water/ Date	Anglers	Hours fished	Cutthroat trout	Rainbow trout	Mountain whitefish	Brook trout	Steelhead trout	Smallmouth bass	Total	CPUE
Lochsa River (below Wilderness Gateway)										
26-Jun	2	2	0	0	0	0	0	0	0	0.00
3-Jul	16	28	16	0	0	0	0	0	16	0.57
4-Jul	1	1	0	0	0	0	0	0	0	0.00
10-Jul	3	3	0	0	0	0	0	0	0	0.00
11-Jul	6	5	3	0	0	0	0	0	3	0.60
24-Jul	2	4	3	0	0	0	0	0	3	0.75
25-Jul	3	3	0	0	0	0	0	0	0	0.00
27-Jul	2	2	0	3	0	0	0	0	3	1.50
1-Aug	8	11	11	0	0	0	0	0	11	1.00
4-Sep	9	14	22	0	0	0	0	0	22	1.57
Subtotal	52	73	55	3	0	0	0	0	58	0.79
Lochsa River (above Wilderness Gateway)										
1-Aug	6	16	32	0	0	0	0	0	32	2.00
Red River										
1-Aug	2	2	0	0	0	0	0	0	0	0.00
Selway River (below Selway Falls)										
26-Jun	2	2	2	0	0	0	0	0	2	1.00
3-Jul	8	10	1	0	0	0	0	0	1	0.10
10-Jul	6	4	4	1	0	0	0	0	5	1.25
11-Jul	2	4	0	0	0	0	0	0	0	0.00
24-Jul	2	1	0	0	0	0	0	0	0	0.00
Subtotal	20	21	7	1	0	0	0	0	8	0.38
Selway River (above Selway Falls)										
1-Jul	2	4	0	0	0	0	0	0	0	0.00
16-Jul	1	16	59	1	0	0	0	0	60	3.75
24-Jul	1	1	0	0	0	0	0	0	0	0.00
31-Jul	7	15	22	0	0	0	0	0	22	1.47
Subtotal	11	36	81	1	0	0	0	0	82	2.28
1999 Totals	138	193	177	81	0	0	0	1	259	1.34

INCIDENTAL TRAP CATCHES

Rotary traps have been installed in selected streams in the Clearwater River 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 where data was available. Pacific lamprey *Lampetra tridentata* have only been captured at the Red River trap. Bull trout captured at all traps since 1996 have received Passive Integrated Transponder (PIT) tags to monitor movement and growth.

LITERATURE CITED

Boydston, Reece, and McArthur, Tom. Creel Census System. Lewiston, ID: Idaho Department of Fish & Game. 1993; 97 p. Statewide Angler Opinion and Harvest Surveys Study: I, Job No.: 2. April 1, 1991 to March 31, 1993. Available from: Idaho Dept. of Fish & Game, Region 2: Lewiston, ID.

Cochnauer, T. C., E. Schriever, J. Brostrom, and S. Dove. 1996. Regional Fisheries Management Investigations. Idaho Department of Fish & Game. Federal Aid in Fish and Wildlife Restoration, F-71-R-19, Job Performance Report, Boise.

JOB PERFORMANCE REPORT

State of: Idaho

Name: Fisheries Management

Project II: Technical Guidance

Subproject: I-B Clearwater Region

Contract Period: July 1, 1999 to June 30, 2000

ABSTRACT

Clearwater Region fish management personnel offered technical assistance and guidance to 21 state, federal, and tribal agencies, and 111 private entities on timber sales, mining, stream channel alteration permitting, hydropower development, farm pond permits, and other proposed activities concerning bodies of water. Regional staff sponsored or co-sponsored 11 youth fishing clinics on Free Fishing Day. We also sponsored youth educational clinics for fly fishing and steelhead fishing throughout the year.

The Clearwater Region produced and printed informational brochures on fishing the Lochsa and Selway rivers.

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JOB PERFORMANCE REPORT

State of: Idaho

Name: Fisheries Management

Project II: Population Management

Subproject IV-B: Clearwater Region

Contract Period: July 1, 1999 to June 30, 2000

ABSTRACT

Fish populations and fishing in the Clearwater Region were enhanced by stocking approximately 929,627 fingerling kokanee *Oncorhynchus nerka*, 150,810 fingerling rainbow trout *O. mykiss*, and 339,603 catchable sized rainbow trout.

The Clearwater Region distributed 333 bluegill sunfish *Lepomis macrochirus*, 32 black crappie *Pomoxis nigromaculatus*, and 705 largemouth bass *Micropterus salmoides* to local farm pond owners for private pond stocking.

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DISCUSSION

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 150,810 fingerling size rainbow trout *Oncorhynchus mykiss* and 929,672 fingerling size kokanee salmon *O. nerka* in 1999 (Table 1). Lakes, ponds and reservoirs were stocked with 245,808 catchable size rainbow trout in 1999 (Table 2).

Table 1. Fingerling size rainbow trout and kokanee stocked in the lowland lakes and reservoirs of the Clearwater Region, 1999.

Water	Month	Rainbow trout	Kokanee	Total
Dworshak Reservoir	June		904,672	904,672
Mann Lake	May	54,970	10,000	64,970
Soldiers Meadow Reservoir	May	15,820	5,000	20,820
Spring Valley Reservoir	May	29,970		29,970
Waha Lake	May	15,020	5,000	20,020
Winchester Lake	May	35,030	5,000	40,030
Total		150,810	929,672	1,080,482

Table 2. Catchable size trout stocked in lakes, ponds, and reservoirs of the Clearwater Region, 1999.

Water	March	April	May	June	July	August	September	October	Total
Camp Grizzly Pond				500					500
Campbells Pond		880	3,110	1,500	517				6,007
Dworshak Reservoir		66,175	47,680	36,300					150,155
Elk Creek Reservoir			7,500	10,000	10,000				27,500
Fenn Pond		500	500	1,250	500		225		2,975
Five Mile Pond				500	1,000		275		1,775
Henrys Gulch Pond									
Hordeman Pond		250			500				750
Karolyns Pond			1,000		500		800		2,300
Levee Pond	400	400	400	600	200				2,000
Mann Lake	7,500	9,160	3,340	7,500				7,500	35,000
Moose Creek Reservoir		5,000	5,000	2,500				4,950	17,450
Powell Pond			500	1,000	500		500		2,500
Robinson Pond		1,000	1,020	2,000					4,020
Soldiers Meadow Reservoir		5,000		7,500	891				13,391
Spring Valley Reservoir		17,530		7,500				7,500	32,530
Waha Lake		2,500	3,000						5,500
Wilkins Pond				250					250
Winchester Lake		10,000	10,000	7,500				7,500	35,000
Total	7,900	118,395	83,050	86,400	14,608		1,800	27,450	339,603

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