

# IDAHO DEPARTMENT OF FISH AND GAME

Jerry Mallet, Acting Director

FEDERAL AID IN FISH RESTORATION  
Job Performance Report  
Program F-71-R-20



## REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS SALMON REGION (Subprojects I, II, III, IV)

<b>PROJECT I.</b>	<b>SURVEYS AND INVENTORIES</b>
Job a.	Salmon Region Mountain Lakes Investigations
Job b	Salmon Region Lowland Lake Investigations
Job c <sup>1</sup>	Salmon Region Rivers and Streams Investigations
Job C <sup>2</sup>	Salmon Region Rivers and Streams Investigations
Job d	Salmon Region Salmon and Steelhead Investigations
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<b>PROJECT III</b>	<b>SALMON REGION HABITAT MANAGEMENT</b>
<b>PROJECT IV</b>	<b>SALMON REGION POPULATION MANAGEMENT</b>

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December 1999  
IDFG 99-35

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## 1995 ANNUAL PERFORMANCE REPORT

State Of: Idaho Program: Fisheries Management F-71-R-20  
Project I: Surveys and Inventories Subproject I-H: Salmon Region  
Job: a Title: Mountain Lakes Investigations  
Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

Thirteen mountain lakes were surveyed in the Salmon Region during July and August 1995. Surveys conducted included six in the Bighorn Crags, five in the White Clouds and two in the Sawtooth National Recreation Area. Each lake was surveyed for use, accessibility, fishery status, fish population, and post stocking strategies.

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## OBJECTIVES

1. To evaluate the Salmon Region mountain lake fish stocking program.
2. To collect data on species composition, access, trail conditions, angler/camper use, and spawning habitat for selected Salmon Region mountain lakes.
3. To collect baseline fisheries data in mountain lakes with stunted brook trout *Salvelinus fontinalis* populations so that future management actions, such as predator introductions, can be evaluated.

## METHODS

Idaho Department of Fish and Game personnel utilized gill nets and/or hook-and-line sampling gear to sample fish communities in 13 mountain lakes. Sinking monofilament gill nets, 45.7m x 1.8m with mesh ranging from 1.9cm to 6.35cm, were set overnight at each lake. In each lake, nets were set perpendicular to shore with the small mesh near shore. A small one-man raft was used to set each net.

## RESULTS & DISCUSSION

Department personnel set gill nets in two Salmon Region mountain lakes, Dome and Upper Champion lakes. Dome Lake, located in the Frank Church River of No Return Wilderness area (FCRNR) contains a stunted population of brook trout. This is thought to be the only population of brook trout in the FCRNR lakes and potential eradication/reduction alternatives are being considered. One 12-hour overnight gill net set in Dome Lake during June 1995 resulted in 44 brook trout 175-200 mm total length. Angling resulted in a catch rate of 16 fish/hr of similar length.

Upper Champion Lake located at the head of Champion Creek in the Sawtooth National Recreation Area (SNRA) contains a small population of rainbow trout *Oncorhynchus Mykiss* and an abundance of brook trout. Gill net efforts in 1992 produced 4.8 fish/hr, 82% of which were brook trout with a mean total length of 257 mm. During July 1993, 108 bull trout *Salvelinus confluentus* (mean length 287 mm) were stocked in Upper Champion Lake in an effort to increase the mean length of brook trout by decreasing numbers through predation. Department personnel set gill nets in upper Champion Lake during August 1995 and found very few fish. Twenty-five hours of gill net effort resulted in eight brook trout captured (0.32 fish/hr.). Winter kill during 1994-95 appears to have temporarily reduced the overabundant brook trout population in upper Champion Lake. No bull trout were sampled.

Results of each lake sampled are documented in tables 1-13.

Table 1. Alpine lake survey data for Dome Lake, 1995.

LAKE LOCATION

Lake name: Dome Survey date: 6-24-95  
 IDFG catalog no.: 07-1180 Primary drainage: Salmon  
 Secondary drainage: Lake Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FQRNR  
 Section: 18 Township: 22N Range: 24W Elevation (ft): 7900

USE

No. Campsites: 1 No. Firepits: 1 Litter: 1  m  h  
 Trail around lake: complete  partial  trampled  yes  no   
 Access: good trail (mi) 6 poor trail (mi)  cross country (mi) 1  
 Trailhead location: Garden Creek Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: .5 No. Fish caught: 16  
 Fish/hour: 16 Fish abundance: 1  m  h

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Brook				10	6				
TOTAL				10	6				

Stocking History

Year	Species	Number of fish	Comments
1949	Brook	1040	3 in. - Mackay Hatchery

COMMENTS:

One 12-hour overnight gill net set caught 44 brook trout 175-200 mm TL.. Two inlet streams provide suitable spawning areas, no above ground outlet.

Table 2. Alpine lake survey data for Lower Champion Lake (#2), 1995.

LAKE LOCATION

Lake name: Lower Champion (#2) Survey date: 8/4-5/95  
 IDFG catalog no.: 07-1730 Primary drainage: Salmon  
 Secondary drainage: Champion Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 22 Township: 8N Range: 15E Elevation (ft): 9500

USE

No. Campsites: 3 No. Firepits: 5 Litter: 1  m \_\_\_\_\_ h \_\_\_\_\_  
 Trail around lake: complete  partial \_\_\_\_\_ trampled: yes  no \_\_\_\_\_  
 Access: good trail (mi) 3.1 poor trail (mi) \_\_\_\_\_ cross country (mi) \_\_\_\_\_  
 Trailhead location: Pole Creek Summit USFS Road #197

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: 2.5 No. Fish caught: 3  
 Fish/hour: .6 Fish abundance: 1 \_\_\_\_\_ m  h \_\_\_\_\_

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Brook						1	2		
TOTAL						1	2		

Stocking History

Year	Species	Number of fish	Comments
1956	Rainbow	700	25-50 mm - Hayspur
1954	Rainbow	2,400	Fry - Hayspur
1949	Rainbow	5,000	Fry - Hayspur
1946	Cutthroat	10,000	Fry - Hayspur

COMMENTS:

According to a local outfitter with a camp on the lake, Lower Champion experienced some winter kill during 94/95. Lake appears to get heavy use judging by trail condition, litter, camp sites, and number of people observed. Lake appears to have fair number of 10-14 in. Brook trout and high number of shiners. Very limited spawning habitat available in small inlet and outlet.

Table 3. Alpine lake survey data for Upper Champion Lake (#3), 1995.

LAKE LOCATION

Lake name: Upper Champion (#3) Survey date: 8/4-5/95  
 IDFG catalog no.: 07-1731 Primary drainage: Salmon  
 Secondary drainage: Champion Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 22\27 Township: 8N Range: 15E Elevation (ft): 9500

USE

No. Campsites: 5 No. Firepits: 6 Litter: 1 \_\_\_\_\_ m  h \_\_\_\_\_  
 Trail around lake: complete  partial \_\_\_\_\_ trampled  yes \_\_\_\_\_ no \_\_\_\_\_  
 Access: good trail (mi) 1.75 poor trail (mi) 2 cross country (mi) \_\_\_\_\_  
 Trailhead location: Pole Creek Summit USFS Road #197

FISHERY AND FISH POPULATIONS

Creel Survey

No. Fishermen: 2 Hours fished: 1.5 No. Fish caught: 0  
 Fish/hour: 0 Fish abundance: 1  m \_\_\_\_\_ h \_\_\_\_\_

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Brook			1	2	3	1	1		
TOTAL			1	2	3	1	1		

Stocking History

Year	Species	Number of fish	Comments
1993	Bull Trout	108	287 mm ave. - Cabinet Gorge
1987	Cutthroat	500	Fry - Mackay

COMMENTS:

Fish collected in 25 hours of gillnet effort. Lake experienced winter kill during winter 1994/1995. Bull trout with mean length 287 mm were stocked in 1993. Bull trout and majority of stunted brook trout appear to be no longer present. Spawning substrate available in inlet and outlet stream.

Table 4. Alpine lake survey data for Walker Lake, 1995.

LAKE LOCATION

Lake name: Walker Survey date: 8-9-95  
 IDFG catalog no.: 07-1355 Primary drainage: EFSR  
 Secondary drainage: Big Boulder Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 17 Township: 9N Range: 16E Elevation (ft): 9239

USE

No. Campsites: 4 No. Firepits: 4 Litter: 1  m \_\_\_\_\_ h \_\_\_\_\_  
 Trail around lake: complete \_\_\_\_\_ partial  trampled: yes  no \_\_\_\_\_  
 Access: good trail (mi) 7 poor trail (mi) \_\_\_\_\_ cross country (mi) \_\_\_\_\_  
 Trailhead location: Big Boulder Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: 2 No. Fish caught: 65  
 Fish/hour: 16.3 Fish abundance: 1 \_\_\_\_\_ m \_\_\_\_\_ h

Length Frequency

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Rbt			20	45					
C <sub>2</sub>				1					
TOTAL			20	46					

Stocking History

Year	Species	Number of fish	Comments
No stocking history			

COMMENTS:

No stocking history. Many fish observed cruising and surfacing. Lake appears to get heavy use. Lake has abundant inlet, outlet, and shoal spawning areas. The fish in Walker Lake appear to be stunted, a result of over-population. A valuable fishery in that anyone can catch trout 6-8 inches.

Table 5. Alpine lake survey data for Cove Lake, 1995.

LAKE LOCATION

Lake name: Cove Survey date: 8-10-95  
 IDFG catalog no.: 07-1364 Primary drainage: EFSR  
 Secondary drainage: Big Boulder Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 20 Township: 9N Range: 16E Elevation (ft): 9842

USE

No. Campsites: 0 No. Firepits: 2 Litter: 1  m  h \_\_\_\_\_  
 Trail around lake: complete \_\_\_\_\_ partial  trampled: yes  no \_\_\_\_\_  
 Access: good trail (mi) 7 poor trail (mi) 1 cross country (mi) \_\_\_\_\_  
 Trailhead location: Big Boulder Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 3 Hours fished: 1.2 No. Fish caught: 3  
 Fish/hour: .86 Fish abundance: 1  m  h \_\_\_\_\_

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Rbt.							1		
Rbt/C <sub>2</sub>									1
C <sub>2</sub>					1				
TOTAL					1		1		1

Stocking History

Year	Species	Number of fish	Comments
1993	Cutthroat	750	SNFH
1984	Cutthroat	1600	Mackay
1977	Cutthroat	2016	Mackay
	Cutthroat	2112	Mackay

COMMENTS:

Main food item in fish sampled were amphipods, several large fish observed in inlet (12-22 in.). Fish density appears low but with great growth potential.

Table 6. Alpine lake survey data for Sapphire Lake, 1995.

LAKE LOCATION

Lake name: Sapphire Survey date: 8-10-95  
 IDFG catalog no.: 07-1367 Primary drainage: EFSR  
 Secondary drainage: Big Boulder Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 18 Township: 9N Range: 16E Elevation (ft): 9888

USE

No. Campsites: 0 No. Firepits: 2 Litter: 1  m \_\_\_\_\_ h \_\_\_\_\_  
 Trail around lake: complete \_\_\_\_\_ partial \_\_\_\_\_ trampled \_\_\_\_\_ yes \_\_\_\_\_ no   
 Access: good trail (mi) 7 poor trail (mi) 1.5 cross country (mi) \_\_\_\_\_  
 Trailhead location: Big Boulder Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 3 Hours fished: 1.8 No. Fish caught: 7  
 Fish/hour: 1.3 Fish abundance: 1 \_\_\_\_\_ m  h \_\_\_\_\_

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
C <sub>2</sub>					7				
TOTAL					7				

Stocking History

Year	Species	Number of fish	Comments
1993	Cutthroat	750	SNFH
1987	Cutthroat	1500	Mackay
1984	Cutthroat	1600	Mackay
1977	Cutthroat	2304	Mackay

COMMENTS:

Fish caught were very robust. Lake should be gill netted to obtain good sample of population.

Table 7. Alpine lake survey data for Tincup Lake, 1995.

LAKE LOCATION

Lake name: Tincup Survey date: 8-10-95  
 IDFG catalog no.: 07-1349 Primary drainage: EFSR  
 Secondary drainage: Big Boulder Creek County: Custer  
 USFS ranger district: SNRA Wilderness area:  
 Section: 8 Township: 9N Range: 16E Elevation (ft): 10,000

USE

No. Campsites: \_\_\_\_\_ No. Firepits: 0 Litter: 1  m \_\_\_\_\_ h \_\_\_\_\_  
 Trail around lake: complete \_\_\_\_\_ partial \_\_\_\_\_ trampled: yes  no \_\_\_\_\_  
 Access: good trail (mi) 5 poor trail (mi) 3 cross country (mi) \_\_\_\_\_  
 Trailhead location: Bighorn Boulder Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No. Fishermen: \_\_\_\_\_ Hours fished: \_\_\_\_\_ No. Fish caught:  
 Fish/hour: \_\_\_\_\_ Fish abundance: 1 \_\_\_\_\_ m \_\_\_\_\_ h

Length Frequency

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1993	Grayling	1000	Mackay
1990	Grayling	500	Mackay
1987	Grayling	1000	Mackay
1984	Cutthroat	1600	Mackay

COMMENTS:

No suitable spawning areas available. Four anglers interviewed said they caught "dollies" before. 6"-12" C<sub>2</sub> cutthroat observed.

Table 8. Alpine lake survey data for Island Lake, 1995.

LAKE LOCATION

Lake name: Island Survey date: 8-10-95  
 IDFG catalog no.: 07-1371 Primary drainage: EFSR  
 Secondary drainage: Big Boulder Creek County: Custer  
 USFS ranger district: SNRA Wilderness area: \_\_\_\_\_  
 Section: 20 Township: 9N Range: 16E Elevation (ft): 9300

USE

No. Campsites: \_\_\_\_\_ No. Firepits: \_\_\_\_\_ Litter: 1  m \_\_\_\_\_ h \_\_\_\_\_  
 Trail around lake: complete \_\_\_\_\_ partial \_\_\_\_\_ trampled  yes  no  
 Access: good trail (mi) 8 poor trail (mi) 1 cross country (mi) \_\_\_\_\_  
 Trailhead location: Big Boulder Trailhead

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 1 Hours fished: \_\_\_\_\_ No. Fish caught: 2  
 Fish/hour: \_\_\_\_\_ Fish abundance: 1 \_\_\_\_\_ m  h \_\_\_\_\_

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Rbt				1	1				
TOTAL				1	1				

Stocking History

Year	Species	Number of fish	Comments
1993	Cutthroat	500	SNFH
1990	Cutthroat	250	Mackay
1987	Cutthroat	750	Mackay
1973	Cutthroat	528	Mackay

COMMENTS:

Fish slender; outlet 100 yds. long with poor spawning habitat (larger rock). Lake appears to get moderate use - trail adequate for horses.

Table 9. Alpine lake survey data for Gooseneck Lake, 1995.

LAKE LOCATION

Lake name: Gooseneck Survey date: 8-18-95  
 IDFG catalog no.: 07-0769 Primary drainage: Salmon  
 Secondary drainage: Clear Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FQRNR  
 Section: 15 Township: 21N Range: 15E Elevation (ft): 9100

USE

No. Campsites: 0 No. Firepits: 1 Litter: 1    m    h     
 Trail around lake: complete    partial    trampled: yes  no     
 Access: good trail (mi) 10 poor trail (mi) 1.5 cross country (mi) 1  
 Trailhead location: Bighorn Crags Campground

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: 1.5 No. Fish caught: 3  
 Fish/hour: 1 Fish abundance: 1  m    h   

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
GN				2			1		
TOTAL				2			1		

Stocking History

Year	Species	Number of fish	Comments
1989	Golden	500	Mackay
1986	Golden	500	Mackay
1977	Golden	500	Mackay
1970	Golden	1000	Mackay

COMMENTS:

Few fish observed, no natural reproduction apparent.

Table 10. Alpine lake survey data for Crater Lake, 1995.

LAKE LOCATION

Lake name: Crater Survey date: 8-17-95  
 IDFG catalog no.: 07-0768 Primary drainage: Salmon  
 Secondary drainage: Clear Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FQRNR  
 Section: 15 Township: 21N Range: 15E Elevation (ft): 8800

USE

No. Campsites: 2 No. Firepits: 2 Litter: 1  m  h   
 Trail around lake: complete  partial  trampled  yes  no   
 Access: good trail (mi) 11 poor trail (mi)  cross country (mi)   
 Trailhead location: Bighorn Crags Campground

FISHERY AND FISH POPULATIONS

Creel Survey

No. Fishermen: 2 Hours fished: 1.25 No. Fish caught: 1  
 Fish/hour: .4 Fish abundance: 1  m  h

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
GN							1		
TOTAL							1		

Stocking History

Year	Species	Number of fish	Comments
1989	Golden	500	Mackay
1986	Golden	1000	Mackay
1977	Golden	1060	Mackay
1970	Golden	1000	Mackay

COMMENTS:

Very few fish seen cruising.

Table 11. Alpine lake survey data for Pothole Lake, 1995.

LAKE LOCATION

Lake name: Pothole Survey date: 8-17-95  
 IDFG catalog no.: 07-0767 Primary drainage: Salmon  
 Secondary drainage: Clear Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FCRNR  
 Section: 15 Township: 21N Range: 15E Elevation (ft): 8620

USE

No. Campsites: 0 No. Firepits: 0 Litter: 1  m  h   
 Trail around lake: complete  partial  trampled  yes  no   
 Access: good trail (mi) 10 poor trail (mi) 1 cross country (mi)   
 Trailhead location: Bighorn Crags Campground

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: 1 No. Fish caught: 5  
 Fish/hour: 2.5 Fish abundance: 1  m  h

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
C <sub>2</sub>				2		1			
C <sub>2</sub> /Rbt				2					
TOTAL				4		1			

Stocking History

Year	Species	Number of fish	Comments
1992	Cutthroat	250	Mackay
1989	Cutthroat	500	
1986	Cutthroat	250	
1970	Cutthroat	500	

COMMENTS:

Very small lake, off the beaten trail, receives very little pressure, no campsites or fire rings around lake.

Table 12. Alpine lake survey data for Glacier Lake, 1995.

LAKE LOCATION

Lake name: Glacier Survey date: 8-18-95  
 IDFG catalog no.: 07-0770 Primary drainage: Salmon  
 Secondary drainage: Clear Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FQRNR  
 Section: 9 Township: 21N Range: 15E Elevation (ft): 8800

USE

No. Campsites: 0 No. Firepits: 0 Litter: 1  m  h   
 Trail around lake: complete  partial  trampled  yes  no   
 Access: good trail (mi) 10 poor trail (mi) 2 cross country (mi) 1.5  
 Trailhead location: Bighorn Crags Campground

FISHERY AND FISH POPULATIONS

Creel Survey

No. Fishermen: 2 Hours fished: 1.25 No. Fish caught: 1  
 Fish/hour: .4 Fish abundance: 1  m  h

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
GN							1		
TOTAL							1		

Stocking History

Year	Species	Number of fish	Comments
1989	Golden	500	Mackay
1986	Golden	1000	Mackay
1977	Golden	1060	Mackay
1970	Golden	1000	Mackay

COMMENTS:

No fish seen rising, few fish observed cruising, no natural reproduction potential. Very scenic, secluded area.

Table 13. Alpine lake survey data for Big Clear Lake, 1995.

LAKE LOCATION

Lake name: Big Clear Survey date: 8-17-95  
 IDFG catalog no.: 07-1183 Primary drainage: Salmon  
 Secondary drainage: Clear Creek County: Lemhi  
 USFS ranger district: Cobalt Wilderness area: FQRNR  
 Section: 15 Township: 21N Range: 15E Elevation (ft): 8562

USE

No. Campsites: 3 No. Firepits: 7 Litter: 1  m  h   
 Trail around lake: complete  partial  trampled  yes  no   
 Access: good trail (mi) 9.3 poor trail (mi)  cross country (mi)   
 Trailhead location: Crags Campground

FISHERY AND FISH POPULATIONS

Creel Survey

No fishermen: 2 Hours fished: 1.75 No. Fish caught: 2  
 Fish/hour: .57 Fish abundance: 1  m  h

Length Frequency

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	> 400
Rbt				2					
TOTAL				2					

Stocking History

Year	Species	Number of fish	Comments
1989	Golden	500	Mackay

COMMENTS:

Spawning habitat available in outlet stream; 2-10 inch fish seen in outlet.

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fishery Management F-71-R-20  
Project I: Surveys and Inventories Subproject I-H: Salmon Region  
Job: b Title: Lowland Lake Investigations  
Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

No specific lowland lake studies were conducted in the Salmon Region during 1995.

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## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fishery Management F-71-R-20  
Project I: Surveys and Inventories Subproject I-H: Salmon Region  
Job: c<sup>1</sup> - Wild Trout Population Surveys Title: Rivers and Streams Investigations  
Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

During summer 1995 six tributaries in the Salmon River Drainage were surveyed in order to assess fish populations and size structure of salmonids. Streams surveyed included Horse and Indian creeks, two tributaries to the mainstem Salmon River near Shoup, Idaho, and four tributaries to these streams.

Two streams were sampled by electrofishing, using multiple-pass removals to derive population estimates. Age 0 fish (<70 mm) were not included in the population estimates due to their reduced capture probability. Streams were sampled at two sites each. Four streams were sampled by snorkeling. Stream transects were sampled using Idaho's standardized snorkeling techniques (Leitzinger et. al. 1993).

Bull trout *Salvelinus confluentus* and cutthroat trout *Oncorhynchus clarki lewisi* were the only salmonids sampled in Indian and McConn creeks electrofishing sites. Steelhead/rainbow trout *O. mykiss* and cutthroat trout were the most abundant fish observed in the four Horse Creek drainage streams.

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## OBJECTIVES

1. Determine species composition, relative abundance, and size structure of fish populations in selected Salmon Region tributaries.

## STUDY AREA AND METHODS

Fish in Indian and McConn creeks were captured by electrofishing, using a Smith-Root SR-15 backpack unit. We attempted to catch all sizes of game and non-game fish. Block nets were set at either end of the transects unless natural barriers were present (i.e., waterfall, beaver dam, or high-gradient riffle). Passes were made going upstream, with each consecutive pass being made immediately after and with equal effort to the previous pass. Two passes were generally made, with a third occasionally being needed to achieve reduction.

Captured fish were measured to total length, placed in holding pens, and monitored for recovery until all passes were completed. Once electrofishing was completed, each fish was returned to the habitat from which it was captured. We estimated relative abundance from all fish captured, and assumed that capture probabilities did not vary with species. No attempt was made to differentiate between rainbow and steelhead trout. We used the maximum likelihood estimator to estimate fish abundance and probability of capture.

Density estimates were reported as fish sampled per 100 m<sup>2</sup> of transect surface area. Because smaller fish were not efficiently sampled, only fish 70 mm and larger were used in the population estimates. All trout species were combined to derive each density estimate.

Two sites were chosen in the upper reaches of Indian Creek, approximately 12 kilometers upstream of its confluence with the Salmon River. McConn Creek, an Indian Creek tributary, was sampled approximately 1.6 and 3.2 kilometers above its confluence with Indian Creek.

Snorkeling was conducted in Horse Creek drainage. One snorkeler was used in each stream due to high visibility and narrow stream widths. Snorkeling was done in daylight hours. Refer to ISS standardized snorkeling techniques for detailed snorkeling technique used (Leitzinger et. al. 1993). One or two transects per stream were snorkeled depending on accessibility and expected variance. Length and width measurements were recorded for each transect to determine fish densities (number/100 m<sup>2</sup>).

## RESULTS AND DISCUSSION

Bull trout *Salvelinus confluentus* were the predominant salmonid collected in the Indian Creek drainage (Table 1, Appendices A & B). Cutthroat trout *Oncorhynchus clarki lewisi* were the only other salmonid collected. Thirty-three juvenile bull trout were collected in two Indian Creek and two McConn Creek sites. Cutthroat were collected in three streams.

Densities of age one and older (>70 mm) bull trout ranged from 2.1 fish/100 m<sup>2</sup> in upper McConn Creek site to 17.9 fish/100 m<sup>2</sup> in lower McConn Creek site (Table 1).

Densities of both species combined ranged from 2.13 fish/100 m<sup>2</sup> in upper McConn Creek site to 22.4 fish/100 m<sup>2</sup> in lower McConn Creek (Table 2).

Mean total length of all trout species captured (N=42) in Indian and McConn creek electrofishing sites ranged from 76-105 mm (Table 3).

The dense forest canopy, stream shading from undercut banks, complex woody debris and abundant cobble/boulder substrate, provide suitable rearing habitat for bull trout in the roadless upper reaches of Indian and McConn creeks.

Steelhead/rainbow *O. mykiss* and cutthroat trout were the only salmonid species collected in the Horse Creek drainage (Appendices C-F). Steelhead/rainbow and cutthroat trout abundance was estimated in four Horse Creek drainage streams (Table 4). Steelhead/rainbow trout densities ranged from .05 fish/100 m<sup>2</sup> in Bronco Creek to .65 fish/100 m<sup>2</sup> in Colt Creek. Cutthroat trout densities ranged from 0-.12 fish/100 m<sup>2</sup>.

Table 1. Estimates of bull trout densities and capture probabilities for McConn and Indian Creeks located near Shoup, Idaho sampled during July 1995. Estimates are for bull trout >7 cm total length only.

Site	Date Surveyed	Density (fish/100m <sup>2</sup> )	Lower 95% CI	Upper 95% CI	Capture Prob (P)	Total Captured
McConn (Lower)	7-16-95	17.9	12.9	23	.55	16
McConn (Upper)	7-16-95	2.1	2	7.3	.66	2
Indian (Lower)	7-19-95	12.7	7.4	18	.58	7
Indian (Upper)	7-19-95	8	9.5	15.1	.67	8

Table 2. Estimates of trout densities (all species) and capture probabilities for McConn and Indian creeks located near Shoup, Idaho sampled during July 1995. Estimates are for trout >7cm total length only.

Site	Date Surveyed	Density (fish/100m <sup>2</sup> )	Lower 95% CI	Upper 95% CI	Capture Prob (P)	Total Captured
McConn (Lower)	7-16-95	22.4	7.3	26.8	.59	20
McConn (Upper)	7-16-95	2.13	2	7.3	.67	2
Indian (Lower)	7-19-95	16.3	12.3	20.3	.64	9
Indian (Upper)	7-19-95	16.9	8.6	25.2	.50	10

Table 3. Minimum, maximum, and mean total length (TL) of trout (all species) captured in Indian and McConn Creeks during July 1995.

Stream	Date Surveyed	Min TL (mm)	Max TL (mm)	Mean TL (mm)	Sample Size
<u>Bull trout</u>					
Indian Cr	7-19-95	25	144	80	15
McConn Cr	7-16-95	62	169	93	19
<u>Cutthroat</u>					
Indian Cr	7-19-95	69	125	105	4
McConn Cr	7-16-95	56	88	76	4

Table 4 Estimates of trout densities (rainbow/steelhead and cutthroat trout) July 1995, for Horse Creek drainage streams.

Site	Date Surveyed	Steelhead/Rainbow Density Fish/100 m <sup>2</sup>	Total Steelhead/Rainbow Observed	Cutthroat Density Fish/100 m <sup>2</sup>	Total Cutthroat Observed
Horse Creek (Lower)	7-28-95	.22	17	.08	6
Horse Creek (Upper)	7-31-95	.35	9	.12	3
Colt Creek	7-28-95	.65	15	--	0
Little Horse Cr	7-30-95	.22	5	.09	2
Bronco Creek	7-29-95	.05	1	.05	1

Appendix A. Length frequency distributions of salmonids observed in Indian Creek, July 1995. Total number of each species captured in parentheses.

TL range (mm)	Cutthroat (6)	Bull trout (13)
<50		5
50-59		
60-69	1	
70-79		3
80-89		
90-99		
100-109		1
110-119	2	4
120-129	1	
130-139		
140-149	2	
150-159		
160-169		
170-179		
180-189		
190-199		
200-209		
210-219		
220-229		
230-239		
240-249		
250-259		
260-269		
270-279		
280-289		
290-299		
300-309		
310-319		
320-329		
330-339		
340-349		
350-359		
360-369		
370-379		
380-389		
390-399		
400-409		
410-419		
420-429		
430-439		
440-449		
450-459		
460-469		
470-479		
480-489		
490-499		
>500		

Appendix B. Length frequency distributions of salmonids observed in McConn Creek, July 1995. Total number of each species captured in parentheses.

TL range (mm)	Cutthroat (4)	Bull trout (19)
<50		
50-59	1	
60-69		9
70-79	1	3
80-89	2	
90-99		
100-109		1
110-119		2
120-129		
130-139		2
140-149		
150-159		1
160-169		1
170-179		
180-189		
190-199		
200-209		
210-219		
220-229		
230-239		
240-249		
250-259		
260-269		
270-279		
280-289		
290-299		
300-309		
310-319		
320-329		
330-339		
340-349		
350-359		
360-369		
370-379		
380-389		
390-399		
400-409		
410-419		
420-429		
430-439		
440-449		
450-459		
460-469		
470-479		
480-489		
490-499		
>500		

Appendix C. Length frequency distributions of salmonids observed in Horse Creek, July 1995.  
 Total number of each species captured in parentheses.

TL range (mm)	Steelhead/Rbt (26)	Cutthroat (9)
<50	1	
50-59	1	
60-69		
70-79	7	1
80-89		
90-99		
100-109	4	2
110-119	2	
120-129	3	4
130-139		
140-149		
150-159	4	1
160-169		
170-179	1	
180-189		
190-199		
200-209	2	1
210-219		
220-229		
230-239		
240-249		
250-259		
260-269		
270-279	1	
280-289		
290-299		
300-309		
310-319		
320-329		
330-339		
340-349		
350-359		
360-369		
370-379		
380-389		
390-399		
400-409		
410-419		
420-429		
430-439		
440-449		
450-459		
460-469		
470-479		
480-489		
490-499		
>500		

Appendix D. Length frequency distribution of salmonids observed in Colt Creek, July 1995. Total number of each species captured in parentheses.

TL range (mm)	Steelhead/Rbt (15)	Cutthroat (0)	Unidentified (9)
<50			8
50-59			
60-69			
70-79	4		
80-89			
90-99			
100-109			
110-119			
120-129	10		
130-139			
140-149			
150-159	1		
160-169			
170-179			
180-189			
190-199			
200-209			
210-219			
220-229			
230-239			
240-249			
250-259			1
260-269			
270-279			
280-289			
290-299			
300-309			
310-319			
320-329			
330-339			
340-349			
350-359			
360-369			
370-379			
380-389			
390-399			
400-409			
410-419			
420-429			
430-439			
440-449			
450-459			
460-469			
470-479			
480-489			
490-499			
>500			

Appendix E. Length frequency distributions of salmonids observed in Little Horse Creek, July 1995. Total number of each species captured in parentheses.

TL range (mm)	Steelhead/Rbt (5)	Cutthroat (2)
<50		
50-59		
60-69		
70-79	1	
80-89		
90-99		
100-109		
110-119		
120-129	2	1
130-139		
140-149		
150-159	1	1
160-169		
170-179		
180-189		
190-199		
200-209	1	
210-219		
220-229		
230-239		
240-249		
250-259		
260-269		
270-279		
280-289		
290-299		
300-309		
310-319		
320-329		
330-339		
340-349		
350-359		
360-369		
370-379		
380-389		
390-399		
400-409		
410-419		
420-429		
430-439		
440-449		
450-459		
460-469		
470-479		
480-489		
490-499		
>500		

Appendix F. Length frequency distribution of salmonids observed in Bronco Creek, July 1995.  
 Total number of each species captured in parentheses.

TL range (mm)	Steelhead/Rbt (1)	Cutthroat (1)	Unidentified (1)
<50			1
50-59			
60-69			
70-79		1	
80-89			
90-99			
100-109			
110-119			
120-129			
130-139			
140-149			
150-159	1		
160-169			
170-179			
180-189			
190-199			
200-209			
210-219			
220-229			
230-239			
240-249			
250-259			
260-269			
270-279			
280-289			
290-299			
300-309			
310-319			
320-329			
330-339			
340-349			
350-359			
360-369			
370-379			
380-389			
390-399			
400-409			
410-419			
420-429			
430-439			
440-449			
450-459			
460-469			
470-479			
480-489			
490-499			
>500			

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fishery Management F-71-R-20

Project I: Surveys and Inventories

Subproject I-H: Salmon Region

Job: c<sup>2</sup> - Idaho Supplementation  
Study & Parr Monitoring

Title: Rivers and Stream Investigations

Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

Five years of Idaho Supplementation Study and Parr Monitoring activities in the Salmon Region have been consolidated. Twenty eight tributaries sampled at varying frequencies, primarily to monitor annual juvenile anadromous fish densities, are summarized. All data compiled is from snorkeling surveys with the exception of 1991-1993 Lemhi River data, which was surveyed via electro-fishing. Densities of fish/100 m<sup>2</sup> are reported for anadromous and resident fish species.

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## INTRODUCTION

In 1993 the majority of the Parr Monitoring and Idaho Supplementation Study activities were transferred to the Salmon Region anadromous personnel. This report is a compilation of most snorkeling data available in the Salmon Region from 1991 to 1995, and incorporates both anadromous and resident fish species. The object of this report is to provide a source of compiled fisheries information that will be useful to succeeding managers and biologists.

## METHODS

For the years 1991-1995, data for 28 streams in the Salmon Region (Appendix A) have been compiled for this report. Some of the streams were snorkeled for five consecutive years and others for only four, three, two or one year, depending upon priority and available funding for each given year. All data compiled is from snorkeling surveys with the exception of the 1991, 1992 and 1993 Lemhi River data, which was surveyed via electro-fishing techniques. All transects snorkeled were sampled in accordance with Idaho's standardized snorkeling techniques (Appendix B).

In an effort to compile a great deal of information into a useful compact document, all the available data has been compiled by individual stream, and includes both anadromous and resident fish species, for the available years of data (Appendix C). In addition, overall density estimates (fish/100m<sup>2</sup>) are provided using the formula:

$$\left( \frac{\text{Sum of all fish, of a given species, (all years)}}{\text{Sum of all area sampled in a given stream, (all years)}} \right) \times 100$$

The resulting density is analogous to a multi-year average, which can be used to identify individual species trends between the 28 streams surveyed, regardless of the number of years of data available for each stream. A summary of the overall density estimates for all streams surveyed is depicted in Table 1. Similarly, an all species density estimate is provided using the following rational:

All species density estimates:

$$\left( \frac{\text{Sum of all fish, of a given stream surveyed, (all years)}}{\text{Sum of all area surveyed in that stream, (all years)}} \right) \times 100$$

The resulting density estimate can be used to identify trends between streams, based on all species present in a given stream.

For the purpose of this report:

1. Big springs creek has been included in all Lemhi river data due to it's heavy influence as an upper tributary to the Lemhi River.
2. All rainbow/steelhead *Oncorhynchus Mykiss* counted in both electrofishing and snorkeling surveys, over the length of 10 inches were assumed to be rainbow trout. All rainbow/steelhead under the length of 10 inches were assumed to be steelhead.
3. All adipose or ventrally fin clipped rainbow trout counted were defined as hatchery rainbows.

## RESULTS

Overall densities of fish (#/100m<sup>2</sup>) counted in Capehorn Creek, Horse Creek, Salmon River, Pahsimeroi River, and Pine Creek were 35.2, 34.5, 28.1, 18.8 and 18.6 fish/100m<sup>2</sup> respectfully and were the 5 streams exhibiting the highest density of fish (all species) in the 28 streams surveyed (Figure 1).

The range and overall densities of cutthroat trout *O. clarki lewisi* from Salmon Region streams exhibiting the highest densities of cutthroat trout indicate that Alpine Creek contains the highest density of cutthroat at 1.8 fish/100m<sup>2</sup>, followed by Yellowbelly Lake Creek at 1.02 fish/100m<sup>2</sup>, Loon creek at 0.48 fish/100m<sup>2</sup>, and the North Fork Salmon River at 0.39 fish/100m<sup>2</sup> (Figure 2).

Observed densities for other species of interest were highest for brook trout *Salvelinus fontinalis* in Yellowbelly Creek (Figure 3), bull trout *S. confluentus* in Bear Valley Creek (Figure 4), and steelhead in Horse Creek (Figure 5).

## DISCUSSION

This information will be updated approximately every three years. It will be an invaluable source to future fisheries managers and/or biologists regarding population trends and will provide a condense summary of activities previously conducted within the region.

Table1. Multi-Year Densities (fish/100m2) of cutthroat trout, rainbow/steelhead, chinook salmon, bull trout, whitefish, and brook trout in Salmon Region tributaries.

Stream	Chinook YOY	Chinook YRL	Chinook Adults	Rbt<10" SH	Rbt>10" Rbt	H. Rbt	BK	WF	BU	C2	AllSpecies
Alpine Creek	0	0	0	0	0	0	2.79	0.26	0.37	1.84	5.27
Alturas Lake Creek	1.58	0.01	0	0.19	0.01	0	1.27	0.7	0.22	0.14	4.12
Bear Valley Creek	0	0	0	0.39	0	0	0.02	0	0.71	0	1.13
Beaver Creek	4.12	0.22	0.03	1.3	0	0	0.15	0.08	0.14	0.2	6.25
Camas Creek	5.53	0.01	0.06	6.46	0.03	0	0	1.14	0.05	0.09	13.37
Capehorn Creek	33.48	0.52	0.09	0.2	0	0	0.53	0.28	0.11	0.02	35.24
East Fork Salmon R.	0.38	0.05	0.02	0.74	0.06	0.93	0	1.52	0.01	0.01	3.73
Hayden Creek	1.35	0	0	0.96	0.04	0	0.02	0.07	0.33	0	2.78
Horse Creek	0.08	0	0	31.82	0.38	0	0	1.79	0.08	0.34	34.48
Knapp Creek	4.6	0.12	0	1.63	0.02	0	2.83	0	0.36	0.16	9.72
Lemhi River	1.47	0.05	0	7.63	0.27	0	0.7	2.91	0	0	13.03
Loon Creek	1.06	0.02	0	2.02	0	0	0.02	2.51	0	0.48	6.1
Marsh Creek	13.34	0.08	0.02	2.17	0	0	3.15	1.87	0.03	0.22	20.9
Morgan Creek	0.4	0	0	9.6	0.48	0	0.4	0.28	0	0.04	11.18
Moyer Creek	0	0	0	4.39	0.14	0.11	0	0.08	0.22	0	4.95
North Fork Salmon	3.73	0.06	0.01	5.33	0.1	0.26	0.01	2.54	0.05	0.39	12.47
Panther Creek	0.03	0	0	1.67	0.05	0.01	0.68	0.89	0.1	0.1	3.52
Pahsimeroi River	7.99	0.24	0	4.53	0.53	0.24	0.57	4.64	0.01	0.07	18.8
Pettit Lake Creek	8.77	0.05	0	1.25	0.05	0.14	2.54	0.1	0	0	12.89
Pine Creek	0.78	0	0	16.01	0.22	0.34	0	0	0.22	1.01	18.58
Redfish Lake Creek	2.46	0.02	0	1.47	0.03	0.18	0	0.65	0.03	0	4.84
Salmon River	13.31	0.62	0.02	9.94	0.02	0.12	0.01	4.01	0	0.02	28.08
Silver Creek	0	0	0	3.32	0	0	0.83	0	0	0	4.15
Thompson Creek	1.24	0.04	0	3.52	0.04	0.15	0	0.52	0.11	0	5.61
Valley Creek	3.66	0	0	0.45	0.12	0.04	0.1	0.35	0	0.04	4.76
Warm Springs Creek	0.9	0.03	0	2.55	0.25	0	0	1.48	0.05	0	5.26
West Fork Yankee Fork	7.98	0.4	0	0.54	0	0	0.03	0.61	0.07	0.07	9.69
Yellowbelly Lake Creek	3.13	0.07	0	0.61	0	0	4.49	0	0	1.02	9.32

YOY = Young of Year Chinook YRL = Yearling Chinook SH = Steelhead Rbt. = Rainbow Trt. H. Rbt. = Hatchery Rainbow Trt. BK = Brook Trt. WF = Whitefish BU = Bull Trt. C2 = Cutthroat Trt.

Appendix A. List of the streams in the Salmon Region and years for which snorkeling data has been compiled, 1991 -- 1995.

Stream	Years of Data
Alpine Creek	1994
Alturas Lake Creek	1993, 1994, 1995
Bear Valley Creek	1992, 1993, 1994
Beaver Creek	1992, 1993, 1994, 1995
Camas Creek	1991, 1992, 1993, 1994
Capehorn Creek	1992, 1993, 1994, 1995
East Fork Salmon River	1991, 1993
Hayden Creek	1992, 1993, 1994
Horse Creek	1993, 1994
Knapp Creek	1992
Lemhi River	1991, 1992, 1993, 1994, 1995
Loon Creek	1992, 1994, 1995
Marsh Creek	1991, 1992, 1993, 1994, 1995
Morgan Creek	1992, 1993, 1994
Moyer Creek	1992, 1993, 1994
North Fork Salmon River	1991, 1992, 1993, 1994, 1995
Pahsimeroi River	1991, 1992, 1993
Panther Creek	1992, 1993, 1994, 1995
Pettit Lake Creek	1993, 1994
Pine Creek	1992, 1993
Redfish Lake Creek	1992, 1993, 1994
Salmon River	1992, 1993, 1994, 1995
Silver Creek	1995
Thompson Creek	1992, 1993, 1994
Valley Creek	1991
Warm Springs Creek	1992, 1993, 1994
West Fork Yankee Fork	1991
Yellowbelly Creek	1993, 1994

Appendix B. Standardized snorkeling techniques to be used in Idaho Supplementation Studies.

Methods:

- The number of snorkelers depends on visibility and width of the stream.
- Snorkelers move slowly but steadily upstream in an assigned lane. The width of the lanes are determined by visibility. The snorkelers are not in a single line perpendicular to the stream. Instead, they are staggered. For example, if there are five snorkelers, one snorkeler will be close to each bank and counting fish between themselves and the banks. The next two divers will be slightly downstream (1-3 m depending on visibility) and closer to the center of the stream. They count the fish that swim between themselves and the diver closest to the bank on their side. The final diver is in the middle of the stream downstream of the other four and counts all the fish that swim between the two divers and swim past them. In essence, the divers form a “V” in the stream. It is important that they maintain accuracy of the counts.
- Field crews are trained prior to each field session in snorkeling techniques, fish identification, and size estimation. Calibrated dowels are carried by novices for more accurate size estimation.
- Visibility is measured prior to snorkeling (with an orange and white nylon measuring tape held underwater) to insure that visibility is sufficient to allow accurate counts. In most streams, visibility is >3 m.
- Snorkeling is done in daylight hours after streams temperatures have risen above 8°C. Juvenile salmonids have shown to conceal themselves when water temperatures drop to or below this level (Hillman et. al. in press, Reihle 1990).
- Chinook salmon are identified and counted as YOY, yearlings, or adults. All other salmonids are identified and lengths are estimated to the nearest inch. After several fish have been counted by an individual, he tells the data recorder walking on the bank behind the snorkelers. The recorder draws detailed sketch maps of the snorkeling reach, noting major habitat types, easily recognizable features of the surrounding land, etc. The person also gives detailed directions to the site, the starting and ending points, presence of flagging, and any other information that may be of value in locating the sites in the future. If a recorder is not available, all is recorded on plexiglas slates carried by the divers.

Appendix C. Summary of observed fish and fish densities (fish/100m<sup>2</sup>) for eight species encountered during snorkeling and electrofishing activities conducted between 1991 and 1995 in 28 of the Salmon Region tributaries and rivers.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 8/4/93 Total Area Sampled (m2): 2243  
 STREAM: East Fork Salmon River

#s	Chinook																							Total					
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.																													
Rbt.							1	2	3	3																			
H. Rbt.																													
B.K.								1					1					2											
W.F.														1					2										
D. V.																						1							
Cl.																													
<b>Total Fish Density of Stream (fish/100m2):</b>				0.98																				<b>Total Numbers of Fish</b>					
																								22					

DATE: 7/25/91 Total Area Sampled (m2): 5965.8  
 STREAM: East Fork Salmon River

#s	Chinook																							Total				
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"
S.H.																												
Rbt.																												
H. Rbt.							3	11	26	15	10	3	6	3	1	1												
B.K.																												
W.F.								1			1	5	8	19	20	27	7											
D. V.																												
Cl.												1																
<b>Total Fish Density of Stream (fish/100m2):</b>				4.76																				<b>Total Numbers of Fish</b>				
																								284				

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	CL	All Species:
0.3776	0.0487	0.0244	0.7431	0.0609	0.9258	0.0000	1.5228	0.0122	0.0122	3.727707

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. CL= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 6/27/94 Total Area Sampled (m2): 1386.6  
STREAM: Hayden Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	Total
S.H.																												39
Rbt.																												0
H. Rbt.																												0
B.K.																												0
W.F.																												1
D. V.																												4
Cl.																												0
Total Fish Density of Stream (fish/100m2):																									3.25	Total Numbers of Fish		45

DATE: 6/29/93 Total Area Sampled (m2): 2173.8  
STREAM: Hayden Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	Total
S.H.																												8
Rbt.																												1
H. Rbt.																												0
B.K.																												0
W.F.																												0
D. V.																												7
Cl.																												0
Total Fish Density of Stream (fish/100m2):																									0.74	Total Numbers of Fish		16

DATE: 6/23/92 to 6/24/92 Total Area Sampled (m2): 1842.4  
STREAM: Hayden Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	Total
S.H.																												5
Rbt.																												1
H. Rbt.																												0
B.K.																												1
W.F.																												3
D. V.																												7
Cl.																												0
Total Fish Density of Stream (fish/100m2):																									4.83	Total Numbers of Fish		89

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	CL	All Species:
1.3512	0.0000	0.0000	0.9525	0.0370	0.0000	0.0185	0.0740	0.3332	0.0000	2.776338

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/1/94      Total Area Sampled (m2): 1455.9  
STREAM: Horse Creek

Length (in.)	Chinook		Chinook Adults	Length (in.)																				Total					
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.				5		20	32	18	10	3	7																	95	
Rbt.																												0	
H. Rbt.																												0	
B.K.																												0	
W.F.			1		13	7				2	1	2	2	2		2												32	
D.V.														1														1	
Cl.						2					1	1	1		1													6	
Total Fish Density of Stream (fish/100m2):			9.20																									Total Numbers of Fish	134

DATE: 7/26/93      Total Area Sampled (m2): 1168.6  
STREAM: Horse Creek

Length (in.)	Chinook		Chinook Adults	Length (in.)																				Total					
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.				2		50	80	180	195	50	150	30	5															740	
Rbt.															5	5												10	
H. Rbt.																												0	
B.K.																												0	
W.F.									2	2	2	1	2	1	1		3		1									15	
D.V.																1												1	
Cl.															1	1		1										3	
Total Fish Density of Stream (fish/100m2):			65.98																									Total Numbers of Fish	771

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0762	0.0000	0.0000	31.8156	0.3810	0.0000	0.0000	1.7908	0.0762	0.3429	34.48276

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.





**Salmon Region Snorkel Surveys**  
All Species

DATE: 8/24/95 Total Area Sampled (m2): 2341.9  
STREAM: Loon Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults																					Total		
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.			10	13	18	14	11	6	7		1															80
Rbt.																										0
H. Rbt.																										0
B.K.							1																			1
W.F.		2	80				3		4	1	8	3	13	1	3											118
D.V.																										6
Cl.							2			5		2	3	1												13
Total Fish Density of Stream (fish/100m2):				9.10																				Total Numbers of Fish	213	

DATE: 8/14/94 Total Area Sampled (m2): 2056.9  
STREAM: Loon Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults																					Total		
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.			13	3	1																					18
Rbt.																										0
H. Rbt.																										0
B.K.																										0
W.F.											1	6	1	7	1	3										19
D.V.																										0
Cl.						1		1				1		1		1										5
Total Fish Density of Stream (fish/100m2):				4.28																				Total Numbers of Fish	88	

DATE: 7/28/92 Total Area Sampled (m2): 1898.8  
STREAM: Loon Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults																					Total		
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	17	1		3	3		2	2		1																29
Rbt.																										0
H. Rbt.																										0
B.K.																										0
W.F.								1					1	1	4	5	4	5								21
D.V.																										0
Cl.							1	1	3			3		3		1										12
Total Fish Density of Stream (fish/100m2):				4.37																				Total Numbers of Fish	83	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
1.0639	0.0159	0.0000	2.0166	0.0000	0.0000	0.0159	2.5089	0.0000	0.4764	6.997561

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.



**Salmon Region Snorkel Surveys**  
All Species

DATE: 8/3/94 Total Area Sampled (m2): 746.3  
STREAM: Morgan Creek

#'s	Chinook YOY	Chinook YRL	Chinook Adults																						Total	
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	17	67	5	24	15	6	3		1																	138
Rbt.											2			2												4
H. Rbt.																										0
B.K.																										0
W.F.												1														1
D.V.																										0
Cl.																										0
Total Fish Density of Stream (fish/100m2):				19.16																					Total Numbers of Fish	143

DATE: 7/15/93 Total Area Sampled (m2): 905.5  
STREAM: Morgan Creek

#'s	Chinook YOY	Chinook YRL	Chinook Adults																						Total	
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.		4	24	15	5	3																				51
Rbt.																										0
H. Rbt.																										0
B.K.	4	5																								10
W.F.										1																1
D.V.																										0
Cl.										1																1
Total Fish Density of Stream (fish/100m2):				6.96																					Total Numbers of Fish	63

DATE: 6/25/92 Total Area Sampled (m2): 869.7  
STREAM: Morgan Creek

#'s	Chinook YOY	Chinook YRL	Chinook Adults																						Total	
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	26	1			2	9	2	8	2	3																53
Rbt.												2		5		1										8
H. Rbt.																										0
B.K.																										0
W.F.						1		1	1	1																5
D.V.																										0
Cl.																										0
Total Fish Density of Stream (fish/100m2):				8.74																					Total Numbers of Fish	76

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.3966	0.0000	0.0000	9.5975	0.4759	0.0000	0.3966	0.2776	0.0000	0.0397	11.18382

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 8/2/94 Total Area Sampled (m2): 770  
STREAM: Moyer Creek

Length (in.)	#s																							Total					
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.																													48
Rbt.		2																											0
H. Rbt.			8																										3
B.K.																													0
W.F.																													1
D.V.																													1
Cl.																													0
Total Fish Density of Stream (fish/100m2):			6.88																				Total Numbers of Fish	53					

DATE: 7/14/93 Total Area Sampled (m2): 1499.6  
STREAM: Moyer Creek

Length (in.)	#s																							Total					
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.																													45
Rbt.																													1
H. Rbt.			4																										1
B.K.																													0
W.F.																													2
D.V.																													4
Cl.																													0
Total Fish Density of Stream (fish/100m2):			3.53																				Total Numbers of Fish	53					

DATE: 8/13/92 Total Area Sampled (m2): 1327.1  
STREAM: Moyer Creek

Length (in.)	#s																							Total					
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.																													65
Rbt.		21																											4
H. Rbt.			1																										0
B.K.																													0
W.F.																													0
D.V.																													3
Cl.																													0
Total Fish Density of Stream (fish/100m2):			5.43																				Total Numbers of Fish	72					

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0000	0.0000	0.0000	4.3929	0.1390	0.1112	0.0000	0.0834	0.2224	0.0000	4.948981

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/19/95 to 7/20/95 Total Area Sampled (m<sup>2</sup>): 4892.8  
STREAM: North Fork Salmon River

Length (in.)	#/s																							Total						
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
S.H.																													152	
Rbt.	13	1	29	53	35	12	3				4			2														3		
H. Rbt.												1		2		1												5		
B.K.				1																								2		
W.F.			27	9	2	6	10			6	7	10			30	3	19		4		4							138		
D.V.							1																					6		
Cl.			5	5	5	7				4	1	1			1													30		
Total Fish Density of Stream (fish/100m <sup>2</sup> ):																														7.05
Total Numbers of Fish																														345

DATE: 7/12/94 to 7/14/94 Total Area Sampled (m<sup>2</sup>): 13706  
STREAM: North Fork Salmon River

Length (in.)	#/s																							Total						
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
S.H.																													96	
Rbt.	275	100	293	169	79	56	26				17	9	9	2	6													6		
H. Rbt.				2	1	2	1				1			12	2	2					1							25		
B.K.				1		2																						6		
W.F.	29	25	236	44	9	5	19			22	4	23			20	4			1		5			2			433			
D.V.				1																								4		
Cl.	18	1	16	15	14	7	6			3	3	3	1	1	2			1		2							32			
Total Fish Density of Stream (fish/100m <sup>2</sup> ):																														22.41
Total Numbers of Fish																														3071

DATE: 7/20/93 to 7/22/93 Total Area Sampled (m<sup>2</sup>): 16024.7  
STREAM: North Fork Salmon River

Length (in.)	#/s																							Total						
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
S.H.																													2	
Rbt.	399	60	64	139	76	64	30				16	7								1								3		
H. Rbt.														1														0		
B.K.																												0		
W.F.	8		9	4	4	9	12			30	9	30	7	29	9	18		7	9	9		4						197		
D.V.																												4		
Cl.				3	2	6	3			3	1	1	1	1	1		2	1						1				25		
Total Fish Density of Stream (fish/100m <sup>2</sup> ):																														7.82
Total Numbers of Fish																														1253

DATE: 6/30/92 to 7/7/92 Total Area Sampled (m<sup>2</sup>): 14917.5  
STREAM: North Fork Salmon River

Length (in.)	#/s																							Total						
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
S.H.																													445	
Rbt.	108	2	48	95	72	63	33				16	5	3	4	23	3	2			1								34		
H. Rbt.												3	3	9	15	3				1								50		
B.K.																												0		
W.F.	1	11	186	167	10	4	12			16	8	25	17	42	21	6	3	2		1				1				533		
D.V.																												5		
Cl.	1		4	7	8	9	3			5	5	2		1	2		3	1		1								52		
Total Fish Density of Stream (fish/100m <sup>2</sup> ):																														10.31
Total Numbers of Fish																														1536

DATE: 7/6/91 to 7/11/91 Total Area Sampled (m<sup>2</sup>): 15444.8  
STREAM: North Fork Salmon River

Length (in.)	#/s																							Total						
	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
S.H.																													1075	
Rbt.	214	24	205	191	159	125	59				59	22	17															19		
H. Rbt.				1			3				5	6	17		8	8	4				1							83		
B.K.																												0		
W.F.	17	1	7		5		11			56	22	53	42	88	17	12	6	6		1		1						348		
D.V.																												6		
Cl.			5	14	7	10	11			1	1	2			1		1											53		
Total Fish Density of Stream (fish/100m <sup>2</sup> ):																														12.26
Total Numbers of Fish																														1894

Overall density estimates (all years) (fish/100m<sup>2</sup>):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
3.7254	0.0554	0.0108	5.3289	0.1016	0.2554	0.0123	2.5380	0.0482	0.3878	12.4658

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt= Rainbow Trl H Rbt= Hatchery Rainbow Trl BK= Brook Trl WF= Whitefish DV= Bull Trl Cl= Cutthroat Trl



**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/20/95 to 7/21/95 Total Area Sampled (m2): 4021.4  
STREAM: Panther Creek

#s	Length (in.)																								Total
	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	
S.H.																									43
Rbt.																									0
H. Rbt.																									7
B.K.																									0
W.F.	3																								7
D.V.	60																								68
Cl.																									1
Total Fish Density of Stream (fish/100m2):																								2.96	
																								Total Numbers of Fish	119

DATE: 8/10/95 Total Area Sampled (m2): 4468.4  
STREAM: Panther Creek

#s	Length (in.)																								Total
	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	
S.H.																									80
Rbt.																									0
H. Rbt.																									0
B.K.																									65
W.F.	1																								28
D.V.																									0
Cl.																									0
Total Fish Density of Stream (fish/100m2):																								4.05	
																								Total Numbers of Fish	181

DATE: 7/14/93 Total Area Sampled (m2): 4335.1  
STREAM: Panther Creek

#s	Length (in.)																								Total
	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	
S.H.																									42
Rbt.																									2
H. Rbt.																									1
B.K.																									28
W.F.	1																								18
D.V.																									0
Cl.																									0
Total Fish Density of Stream (fish/100m2):																								2.17	
																								Total Numbers of Fish	94

DATE: 8/11/92 to 8/14/92 Total Area Sampled (m2): 4458  
STREAM: Panther Creek

#s	Length (in.)																								Total
	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	
S.H.																									123
Rbt.																									6
H. Rbt.																									0
B.K.																									17
W.F.	3																								40
D.V.																									10
Cl.																									16
Total Fish Density of Stream (fish/100m2):																								4.82	
																								Total Numbers of Fish	215

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0347	0.0000	0.0000	1.6664	0.0463	0.0058	0.6770	0.8911	0.1041	0.0984	3.523714

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/21/94 Total Area Sampled (m2): 811  
 STREAM: Petit Lake Creek

#s	Chinook																							Total		
	YOY	YRL	Adults																							
Length (in.)	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'		
S.H.				1	2	3		1																		7
Rbt.																										0
H. Rbt.												1		1												2
B.K.	2			8	1	2	2																			15
W.F.																										0
D.V.																										0
Cl.																										0
																								Total Numbers of Fish	170	
Total Fish Density of Stream (fish/100m2):				20.96																						

DATE: 8/5/93 Total Area Sampled (m2): 1275.7  
 STREAM: Petit Lake Creek

#s	Chinook																							Total		
	YOY	YRL	Adults																							
Length (in.)	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'		
S.H.				1	6	4	4	2	2																	19
Rbt.																										1
H. Rbt.																										1
B.K.	12		1	2	9	4	4	5			1	1														38
W.F.	2																									2
D.V.																										0
Cl.																										0
																								Total Numbers of Fish	99	
Total Fish Density of Stream (fish/100m2):				7.76																						

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
8.7698	0.0479	0.0000	1.2460	0.0479	0.1438	2.5399	0.0958	0.0000	0.0000	12.89117

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt= Rainbow Trt. H. Rbt= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/13/93      Total Area Sampled (      445.7  
STREAM: Pine Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	Total
Length (in.)																												
S.H.																												34
Rbt.																												0
H. Rbt.																												3
B.K.																												0
W.F.																												0
D.V.																												2
Ct.																												4
																												43

Total Fish Density of Stream (fish/100m2):      ERR

DATE: 8/11/92      Total Area Sampled (m2):      447.5  
STREAM: Pine Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	Total
Length (in.)																												
S.H.																												109
Rbt.																												2
H. Rbt.																												0
B.K.																												0
W.F.																												0
D.V.																												0
Ct.																												5
																												123

Total Fish Density of Stream (fish/100m2):      27.49

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Ct.	All Species:
1.5642	0.0000	0.0000	31.9553	0.4469	0.6704	0.0000	0.0000	0.4469	2.0112	37.09497

YOY= Young of the Year Chinook    YRL= Yearling Chinook    SH= Steelhead    Rbt.= Rainbow Trt.    H. Rbt.= Hatchery Rainbow Trt.    BK= Brook Trt.    WF= Whitefish    DV= Bull Trt.    Ct.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/15/94 Total Area Sampled (m2): 3178.1  
 STREAM: Redfish Lake Creek

#s	Chinook	Chinook	Chinook																					Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.			4	8	6	8	1	2		1																30
Rbt.									2																	1
H. Rbt.																										6
B.K.																										0
W.F.		14	5	5						3																29
D. V.												1														1
Cl.																										0
Total Fish Density of Stream (fish/100m2):				6.01																				Total Numbers of Fish	191	

DATE: 8/4/93 Total Area Sampled (m2): 3215.9  
 STREAM: Redfish Lake Creek

#s	Chinook	Chinook	Chinook																					Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	3		3	4	6	9	5	2	3	2																37
Rbt.																										1
H. Rbt.					1	2		1			1															4
B.K.																										0
W.F.	22		4	2				1	1	1																31
D. V.							1								1											2
Cl.																										0
Total Fish Density of Stream (fish/100m2):				2.83																				Total Numbers of Fish	91	

DATE: 7/23/92 Total Area Sampled (m2): 3565  
 STREAM: Redfish Lake Creek

#s	Chinook	Chinook	Chinook																					Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	11	22	15	6	3	7	8	4	1	2																79
Rbt.																										1
H. Rbt.			5			1		1	1																	8
B.K.																										0
W.F.		2	2							1																5
D. V.																										0
Cl.																										0
Total Fish Density of Stream (fish/100m2):				5.61																				Total Numbers of Fish	200	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
2.4601	0.0201	0.0000	1.4660	0.0301	0.1807	0.0000	0.6527	0.0301	0.0000	4.839843

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/31/95 Total Area Sampled (m2): 12767.4  
STREAM: Salmon River

#'s	Chinook		Chinook Adults	Length (in.)																								Total	
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	88		3																										126
Rbt.														1															1
H. Rbt.						2							20																28
B.K.																												5	
W.F.	185		1	9	4		15	15	12	8	16	2	16	1	2	3	3											292	
D.V.																												0	
Cl.							2	1		1			1															6	
Total Fish Density of Stream (fish/100m2):			5.15																								Total Numbers of Fish	656	

DATE: 7/20/94 Total Area Sampled (m2): 14524  
STREAM: Salmon River

#'s	Chinook		Chinook Adults	Length (in.)																								Total	
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	1743	692	4																										2488
Rbt.																													7
H. Rbt.						2								1															9
B.K.																												1	
W.F.	351		127	37	8		20		5	4	25	7	48	2	31	2	1											669	
D.V.																												0	
Cl.																												0	
Total Fish Density of Stream (fish/100m2):			52.99																								Total Numbers of Fish	7696	

DATE: 8/10/93 Total Area Sampled (m2): 19325.6  
STREAM: Salmon River

#'s	Chinook		Chinook Adults	Length (in.)																								Total	
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	417		33																										529
Rbt.																													2
H. Rbt.																													1
B.K.																												0	
W.F.	175		55	39	9		10	14	16	9	21	13	19	7	15	6	8											421	
D.V.																												0	
Cl.																												1	
Total Fish Density of Stream (fish/100m2):			10.88																								Total Numbers of Fish	2102	

DATE: 7/22/92 Total Area Sampled (m2): 15321.4  
STREAM: Salmon River

#'s	Chinook		Chinook Adults	Length (in.)																								Total
	YOY	YRL		1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	
S.H.	1935	792	206				56	7		6	5	1																3012
Rbt.																												3
H. Rbt.									3	4	4	5	3															37
B.K.																												1
W.F.	437	139	146	106	26		22	22	27	16	36	13	40	4	20	5	17	2	3	10	11						1102	
D.V.																												0
Cl.						1																						6
Total Fish Density of Stream (fish/100m2):			45.26																								Total Numbers of Fish	6938

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
13 3148	0.6248	0.0210	9.9373	0.0210	0.1211	0.0113	4.0104	0.0000	0.0210	28.08274

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/21/95  
 STREAM: Silver Creek  
 Total Area Sampled (m2): 120.6

#s	Chinook																							Total					
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
Length (in.)																													
S.H.																													
Rbt																													
H. Rbt.																													
B.K.																													
W.F.																													
D. V.																													
Cl																													
<b>Total Fish Density of Stream (fish/100m2):</b>	4.15																											<b>Total Numbers of Fish</b>	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0000	0.0000	0.0000	3.3167	0.0000	0.0000	0.6292	0.0000	0.0000	0.0000	4.145937

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/19/94 Total Area Sampled (m2): 745.7  
STREAM: Thompson Creek

#s	Chinook																							Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.	25	14	7	11	4	5		1	1																	68
Rbt.																										0
H. Rbt.																										0
B.K.																										0
W.F.									1	1		1														3
D.V.																										0
Ct.																										0
Total Fish Density of Stream (fish/100m2):																								14.08	105	

DATE: 7/16/93 Total Area Sampled (m2): 995.9  
STREAM: Thompson Creek

#s	Chinook																							Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.			1	5	3	5		2	1	3																29
Rbt.																										0
H. Rbt.							1																			1
B.K.																										0
W.F.										1	2	1	1	2	1	4	2									14
D.V.																										0
Ct.																										0
Total Fish Density of Stream (fish/100m2):																								3.51	35	

DATE: 6/25/92 Total Area Sampled (m2): 930.1  
STREAM: Thompson Creek

#s	Chinook																							Total		
	YOY	YRL	Adults																							
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
S.H.						2		3		1																6
Rbt.																										1
H. Rbt.							1		2					1												3
B.K.																										0
W.F.																										0
D.V.																										0
Ct.																										0
Total Fish Density of Stream (fish/100m2):																								1.08	10	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Ct.	All Species:
1.2352	0.0374	0.0000	3.5184	0.0374	0.1497	0.0000	0.5240	0.1123	0.0000	5.614403

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Ct.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/17/91 to 7/18/91      Total Area Sampled (m2): 4894.1  
 STREAM: Valley Creek

#s	Chinook		Chinook Adults																					Total		
	YOY	YRL																								
Length (in.)>	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	22	
S.H.	5		3	2	3	4	3	2				3	1	2												6
Rbt												1														2
H. Rbt				1	1	2	1																			5
B.K.		1				2																				17
W.F.	2					2		4		3		3	1	2												0
D.V.																										2
Cl.							2																			2
																							Total Numbers of Fish	233		
Total Fish Density of Stream (fish/100m2):				4.76																						

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt	H. Rbt	BK	WF	DV	Cl.	All Species:
3.6575	0.0000	0.0000	0.4495	0.1226	0.0409	0.1022	0.3474	0.0000	0.0409	4.760634

YOY= Young of the Year Chinook    YRL= Yearling Chinook    SH= Steelhead    Rbt= Rainbow Trt.    H. Rbt= Hatchery Rainbow Trt.    BK= Brook Trt.    WF= Whitefish    DV= Bull Trt.    Cl= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/18/94 Total Area Sampled (m2): 1138  
STREAM: Warm Springs Creek

#'s	Chinook																							Total						
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"		
Length (in.)																														
S.H.																														32
Rbt.																														4
H. Rbt.																														0
B.K.																														0
W.F.																													17	
D.V.																													0	
Cl.																													0	
																													83	

Total Fish Density of Stream (fish/100m2): 7.29

DATE: 7/16/93 Total Area Sampled (m2): 1281.3  
STREAM: Warm Springs Creek

#'s	Chinook																							Total					
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
Length (in.)																													
S.H.																													8
Rbt.																													0
H. Rbt.																													0
B.K.																													0
W.F.																													15
D.V.																													0
Cl.																													0
																													23

Total Fish Density of Stream (fish/100m2): 1.80

DATE: 6/25/92 Total Area Sampled (m2): 1233.1  
STREAM: Warm Springs Creek

#'s	Chinook																							Total					
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
Length (in.)																													
S.H.																													53
Rbt.																													9
H. Rbt.																													0
B.K.																													0
W.F.																													22
D.V.																													0
Cl.																													0
																													86

Total Fish Density of Stream (fish/100m2): 6.97

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.9035	0.0274	0.0000	2.5463	0.2464	0.0000	0.0000	1.4785	0.0548	0.0000	5.256817

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.



**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/21/94 Total Area Sampled (m2): 316  
 STREAM: Yellowbelly Lake Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	Total
Length (in.)	43																											
S.H.																												0
Rbt.																												0
H. Rbt.																												0
B.K.	6		6	6	3	2	1	1																				25
W.F.																												0
D. V.				10	4	1																						15
Ct.																												0
Total Fish Density of Stream (fish/100m2): 26.27																												
																											Total Numbers of Fish	83

DATE: 8/5/93 Total Area Sampled (m2): 1154.4  
 STREAM: Yellowbelly Lake Creek

#s	Chinook YOY	Chinook YRL	Chinook Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	Total
Length (in.)	3	1																										
S.H.																												9
Rbt.																												0
H. Rbt.																												0
B.K.	13	1	1	2	5	8	3	4	3					1														41
W.F.																												0
D. V.																												0
Ct.																												0
Total Fish Density of Stream (fish/100m2): 4.68																												
																											Total Numbers of Fish	54

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Ct.	All Species:
3.1284	0.0680	0.0000	0.6121	0.0000	0.0000	4.4886	0.0000	0.0000	1.0201	9.317193

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Ct= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/21/94 Total Area Sampled (m2): 1897.5  
 STREAM: Alpine Creek

Length (in.) #s	Chinook																							Total					
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"		21"	22"	23"	24"	
S.H.																													0
Rbt.																													0
H. Rbt.																													0
B.K.	43				5	1	1			3																		53	
WF.	5																											5	
D. V.	6																											7	
Cl.	17	18	1																									35	
<b>Total Fish Density of Stream (fish/100m2):</b>	5.27																											<b>Total Numbers of Fish</b>	100

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.7931	0.2635	0.3689	1.8445	5.270092

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/27/95 to 7/28/95 Total Area Sampled (m2): 19132.6  
 STREAM: Alturas Lake Creek

#s	Chinook																								Total				
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"		22"	23"	24"	
Length (in.)																													
S.H.																													4
Rbt.																													0
H. Rbt.																													0
B.K.	90		8	16	16	5	8	5	1																			150	
W.F.	23		1	4	4																							83	
D.V.	77			1	2	5	5	10	8																			82	
Ct.	3		1		1																							5	
Total Fish Density of Stream (fish/100m2):	1.80																												
																												Total Numbers of Fish	344

DATE: 7/21/94 Total Area Sampled (m2): 12602.9  
 STREAM: Alturas Lake Creek

#s	Chinook																								Total				
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"		22"	23"	24"	
Length (in.)																													
S.H.	37																											53	
Rbt.																												2	
H. Rbt.																												0	
B.K.	94		1	45	19	13	5	5	1																			186	
W.F.	60		2	2	4																							92	
D.V.	14			1	1																							18	
Ct.	58																											59	
Total Fish Density of Stream (fish/100m2):	8.47																												
																												Total Numbers of Fish	1067

DATE: 8/5/93 to 8/9/93 Total Area Sampled (m2): 15033.5  
 STREAM: Alturas Lake Creek

#s	Chinook																								Total				
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"		22"	23"	24"	
Length (in.)																													
S.H.	3		2																									34	
Rbt.																												1	
H. Rbt.																												1	
B.K.	131		3	42	22	22	14	10	7	3																		260	
W.F.	68		1	1	3	6	4	2	7	2																		153	
D.V.																												1	
Ct.						1																						1	
Total Fish Density of Stream (fish/100m2):	3.44																												
																												Total Numbers of Fish	517

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Ct.	All Species:
1.5758	0.0128	0.0000	0.1946	0.0064	0.0021	1.2743	0.7013	0.2160	0.1390	4.12389

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trl. H. Rbt.= Hatchery Rainbow Trl. BK= Brook Trl. WF= Whitefish DV= Bull Trl. Ct.= Cutthroat Trl.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/27/95 Total Area Sampled (m2): 2804.4  
STREAM: Beaver Creek

#s	Chinook																											Total			
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"				
S.H.				1			9	7	10	3	1																		31		
Rbt.																													0		
H. Rbt.																													0		
B.K.																													0		
W.F.							1	1		2	1																	4			
D.V.																												5			
Cl.				1						1																		1			
Total Fish Density of Stream (fish/100m2):			1.71																											Total Numbers of Fish	46

DATE: 7/23/94 Total Area Sampled (m2): 2983.4  
STREAM: Beaver Creek

#s	Chinook																											Total			
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"				
S.H.					4	7	5	1	3																				22		
Rbt.																													0		
H. Rbt.																													0		
B.K.											2	2																	0		
W.F.																													5		
D.V.																													0		
Cl.						1	1		2	1																			5		
Total Fish Density of Stream (fish/100m2):			13.71																											Total Numbers of Fish	409

DATE: 8/3/93 Total Area Sampled (m2): 2691.4  
STREAM: Beaver Creek

#s	Chinook																											Total			
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"				
S.H.				12			16	5	6	2																			62		
Rbt.					2	11																							0		
H. Rbt.																													0		
B.K.							2	2	1	2	1																		0		
W.F.																													2		
D.V.								1	1	1																			3		
Cl.									1																				1		
Total Fish Density of Stream (fish/100m2):			3.64																											Total Numbers of Fish	98

DATE: 7/30/92 Total Area Sampled (m2): 961.1  
STREAM: Beaver Creek

#s	Chinook																											Total			
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"				
S.H.				4			2	2	3																				8		
Rbt.																													0		
H. Rbt.																													0		
B.K.																													0		
W.F.										1																			1		
D.V.																													2		
Cl.							1	4	4	6																			0		
Total Fish Density of Stream (fish/100m2):			3.64																											Total Numbers of Fish	35

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
4.1206	0.2225	0.0316	1.3029	0.0000	0.0000	0.1483	0.0847	0.1377	0.2013	6.249801

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt= Rainbow Trl. H. Rbt.= Hatchery Rainbow Trl. BK= Brook Trl. WF= Whitefish DV= Bull Trl. Cl.= Cutthroat Trl.

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**Salmon Region Snorkel Surveys**  
All Species

DATE: 6/27/94 Total Area Sampled (m2): 1220.6  
STREAM: Bear Valley Creek

#s	Chinook																							Total	
	YOY	YRL	Adults																						
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	12
S.H.			5																						0
Rbt.																									0
H. Rbt.																									0
B.K.																									0
W.F.																									12
D. V.				6	2	2		1		1															0
Cl.																									24
Total Fish Density of Stream (fish/100m2):				1.97																				Total Numbers of Fish	24

DATE: 6/29/93 Total Area Sampled (m2): 1505.9  
STREAM: Bear Valley Creek

#s	Chinook																							Total	
	YOY	YRL	Adults																						
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	1
S.H.			1																						0
Rbt.																									0
H. Rbt.																									1
B.K.								1																	0
W.F.																									1
D. V.								1																	0
Cl.																									3
Total Fish Density of Stream (fish/100m2):				0.20																				Total Numbers of Fish	3

DATE: 6/23/92 Total Area Sampled (m2): 1358.3  
STREAM: Bear Valley Creek

#s	Chinook																							Total	
	YOY	YRL	Adults																						
Length (in.)	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"	3
S.H.	1																								0
Rbt.			2																						0
H. Rbt.																									0
B.K.																									0
W.F.																									16
D. V.				3	2		1	3	2	4			1												9
Cl.																									19
Total Fish Density of Stream (fish/100m2):				1.40																				Total Numbers of Fish	19

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
0.0000	0.0000	0.0000	0.3917	0.0000	0.0000	0.0245	0.0000	0.7099	0.0000	1.126126

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 8/3/94 Total Area Sampled (m2): 4188  
STREAM: Camas Creek

#s	Chinook																											Total		
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"			
S.H.	157																													391
Rbt.																														2
H. Rbt.																														0
B.K.																														0
W.F.		15																												22
D.V.			7																											5
Cl.																														1
Total Fish Density of Stream (fish/100m2):				30.73																								Total Numbers of Fish	1287	

DATE: 7/14/93 to 7/15/93 Total Area Sampled (m2): 6767.4  
STREAM: Camas Creek

#s	Chinook																											Total		
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"			
S.H.																														14
Rbt.																														1
H. Rbt.																														0
B.K.																														0
W.F.																														7
D.V.																														4
Cl.																														0
Total Fish Density of Stream (fish/100m2):				0.81																								Total Numbers of Fish	55	

DATE: 8/12/92 Total Area Sampled (m2): 6577.6  
STREAM: Camas Creek

#s	Chinook																											Total		
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"			
S.H.	521																													1052
Rbt.		388																												0
H. Rbt.																														0
B.K.																														0
W.F.																														126
D.V.																														3
Cl.																														14
Total Fish Density of Stream (fish/100m2):				22.80																								Total Numbers of Fish	1500	

DATE: 8/13/91 Total Area Sampled (m2): 7335.6  
STREAM: Camas Creek

#s	Chinook																											Total		
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"			
S.H.	58																													150
Rbt.																														4
H. Rbt.																														0
B.K.																														0
W.F.																														1
D.V.	41																													129
Cl.																														0
Total Fish Density of Stream (fish/100m2):				6.60																								Total Numbers of Fish	484	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	Cl.	All Species:
5.5331	0.0080	0.0563	6.4620	0.0281	0.0000	0.0040	1.1420	0.0483	0.0925	13.3743

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt. WF= Whitefish DV= Bull Trt. Cl.= Cutthroat Trt.

**Salmon Region Snorkel Surveys**  
All Species

DATE: 7/27/95 Total Area Sampled (m2): 1493.4  
STREAM: Capehorn Creek

#s	Chinook																											Total	
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
Length (in.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
S.H.																													
Rbt.																													
H. Rbt.																													
B.K.																													
W.F.				1	1	2	3	2	1																				
D.V.																													
Cl.																													
Total Fish Density of Stream (fish/100m2):				0.94																								Total Numbers of Fish	
																												141	

DATE: 7/23/94 Total Area Sampled (m2): 1396.3  
STREAM: Capehorn Creek

#s	Chinook																											Total	
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
Length (in.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
S.H.																													
Rbt.																													
H. Rbt.																													
B.K.																													
W.F.			1																										
D.V.																													
Cl.																													
Total Fish Density of Stream (fish/100m2):				98.76																								Total Numbers of Fish	
																												1379	

DATE: 8/23/93 Total Area Sampled (m2): 1299  
STREAM: Capehorn Creek

#s	Chinook																											Total	
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
Length (in.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
S.H.																													
Rbt.																													
H. Rbt.																													
B.K.																													
W.F.																													
D.V.																													
Cl.																													
Total Fish Density of Stream (fish/100m2):				14.16																								Total Numbers of Fish	
																												184	

DATE: 7/29/92 Total Area Sampled (m2): 1234.7  
STREAM: Capehorn Creek

#s	Chinook																											Total	
	YOY	YRL	Adults	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"	12"	13"	14"	15"	16"	17"	18"	19"	20"	21"	22"	23"	24"		
Length (in.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24					
S.H.																													
Rbt.																													
H. Rbt.																													
B.K.																													
W.F.																													
D.V.																													
Cl.																													
Total Fish Density of Stream (fish/100m2):				27.05																								Total Numbers of Fish	
																												334	

Overall density estimates (all years) (fish/100m2):

Chinook YOY	Chinook YRL	Chinook Adults	SH	Rbt.	H. Rbt.	BK	WF	DV	CL	All Species:
33.4845	0.5163	0.0922	0.2028	0.0000	0.0000	0.5347	0.2766	0.1106	0.0184	35.2362

YOY= Young of the Year Chinook YRL= Yearling Chinook SH= Steelhead Rbt.= Rainbow Trt. H. Rbt.= Hatchery Rainbow Trt. BK= Brook Trt WF= Whitefish DV= Bull Trt. CL= Cullfoot Trt.

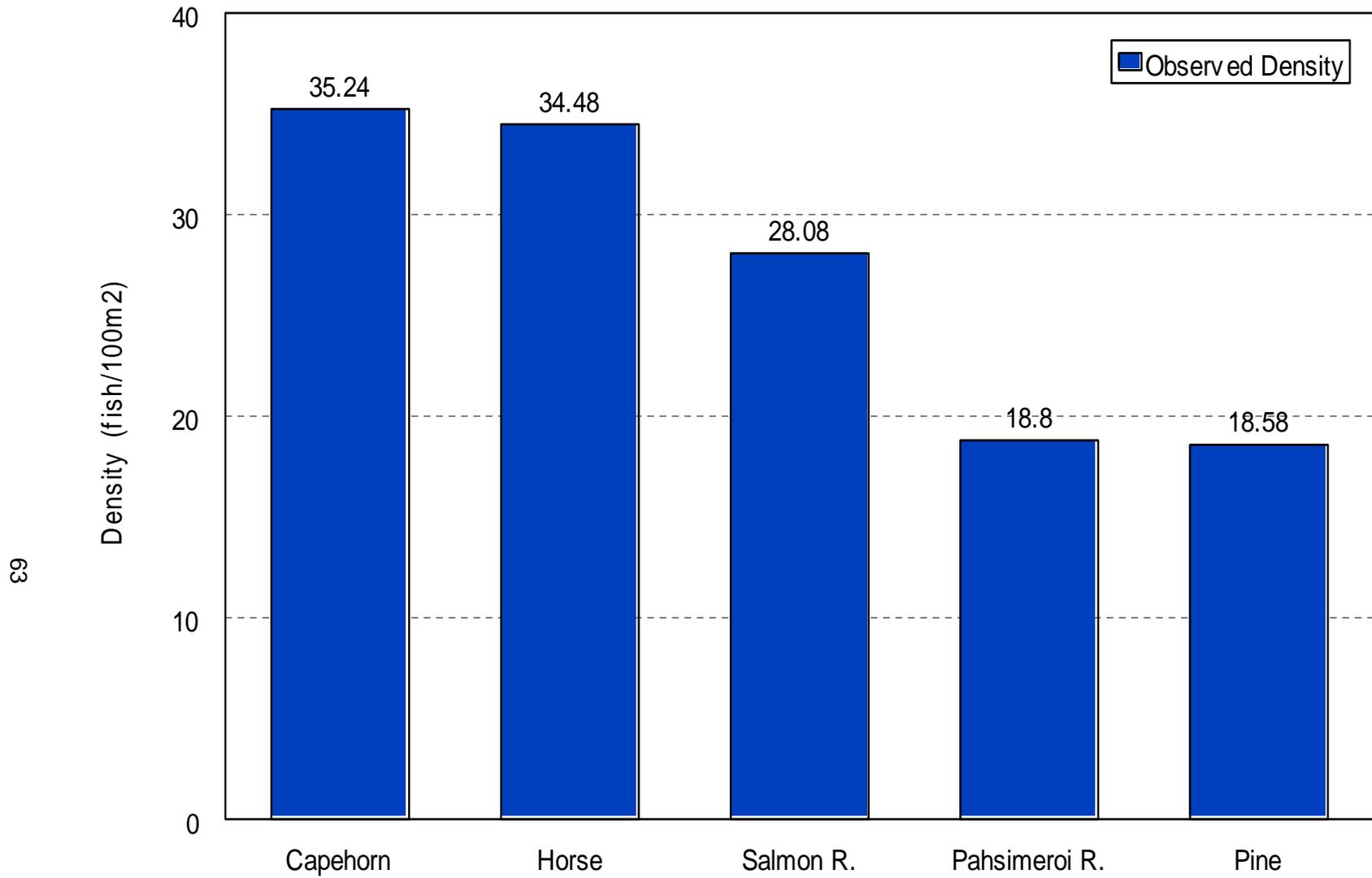
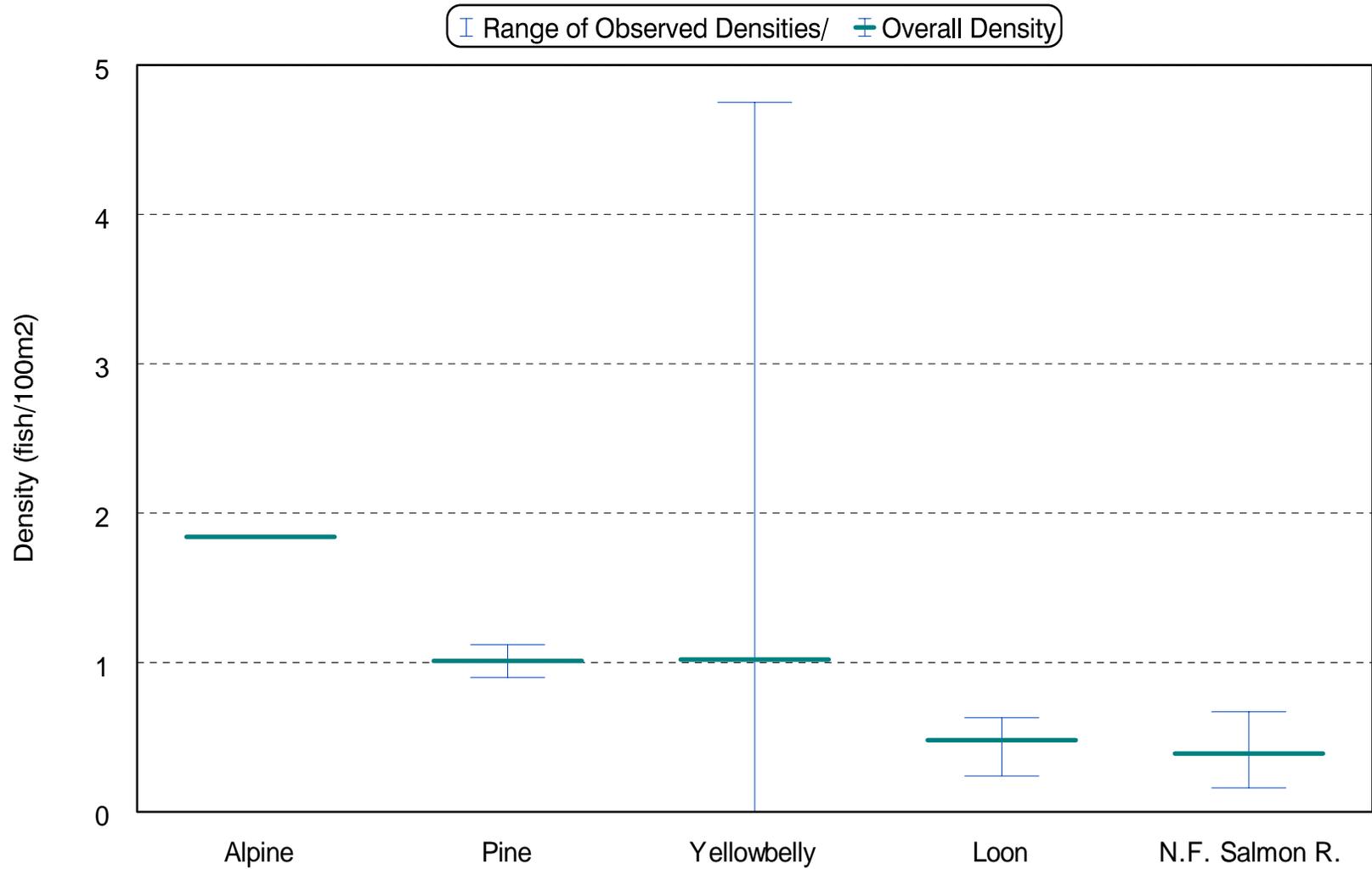
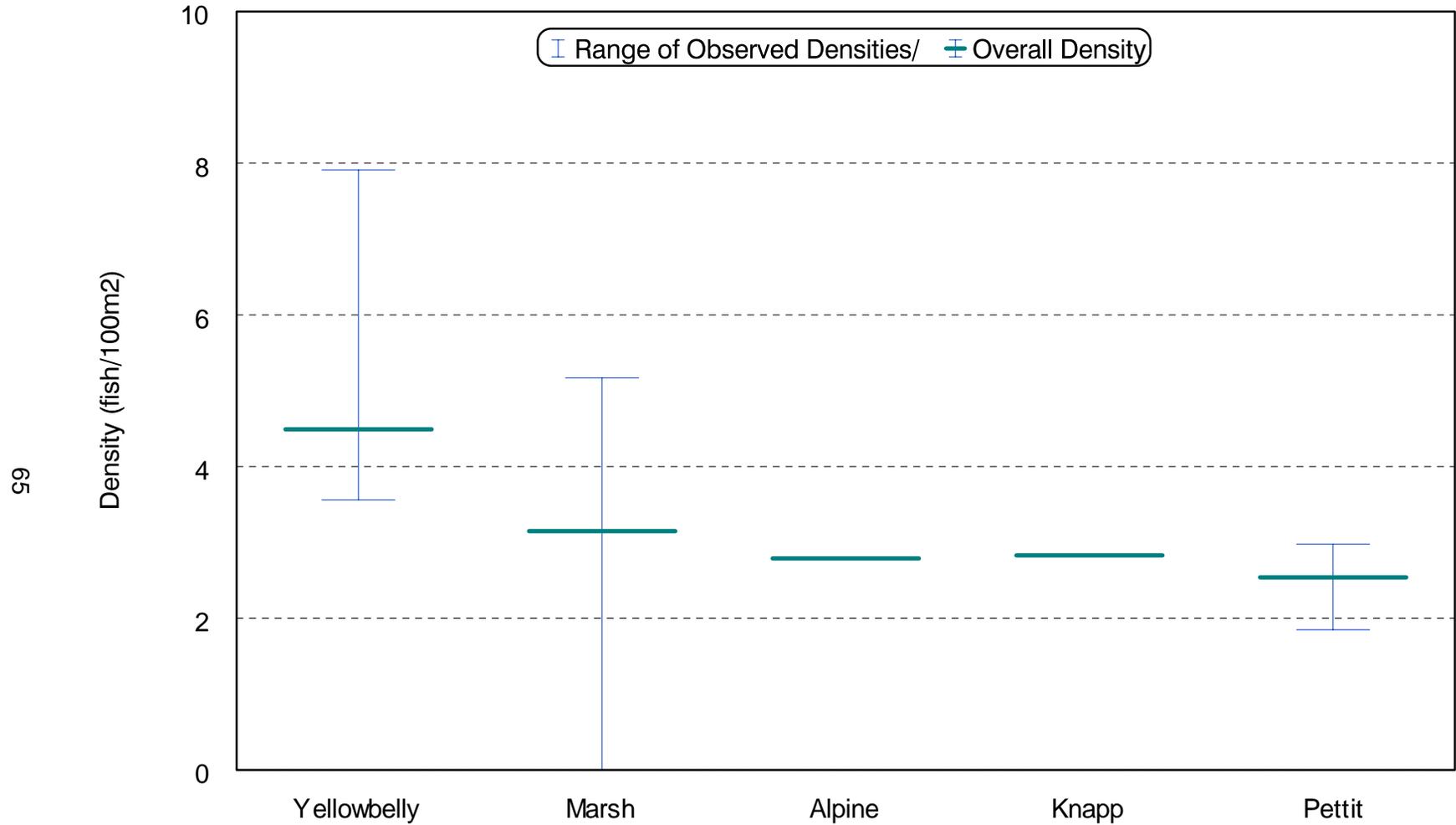


Figure 1. Salmon Region streams exhibiting the highest overall densities of fish (all species), 1991-1995.



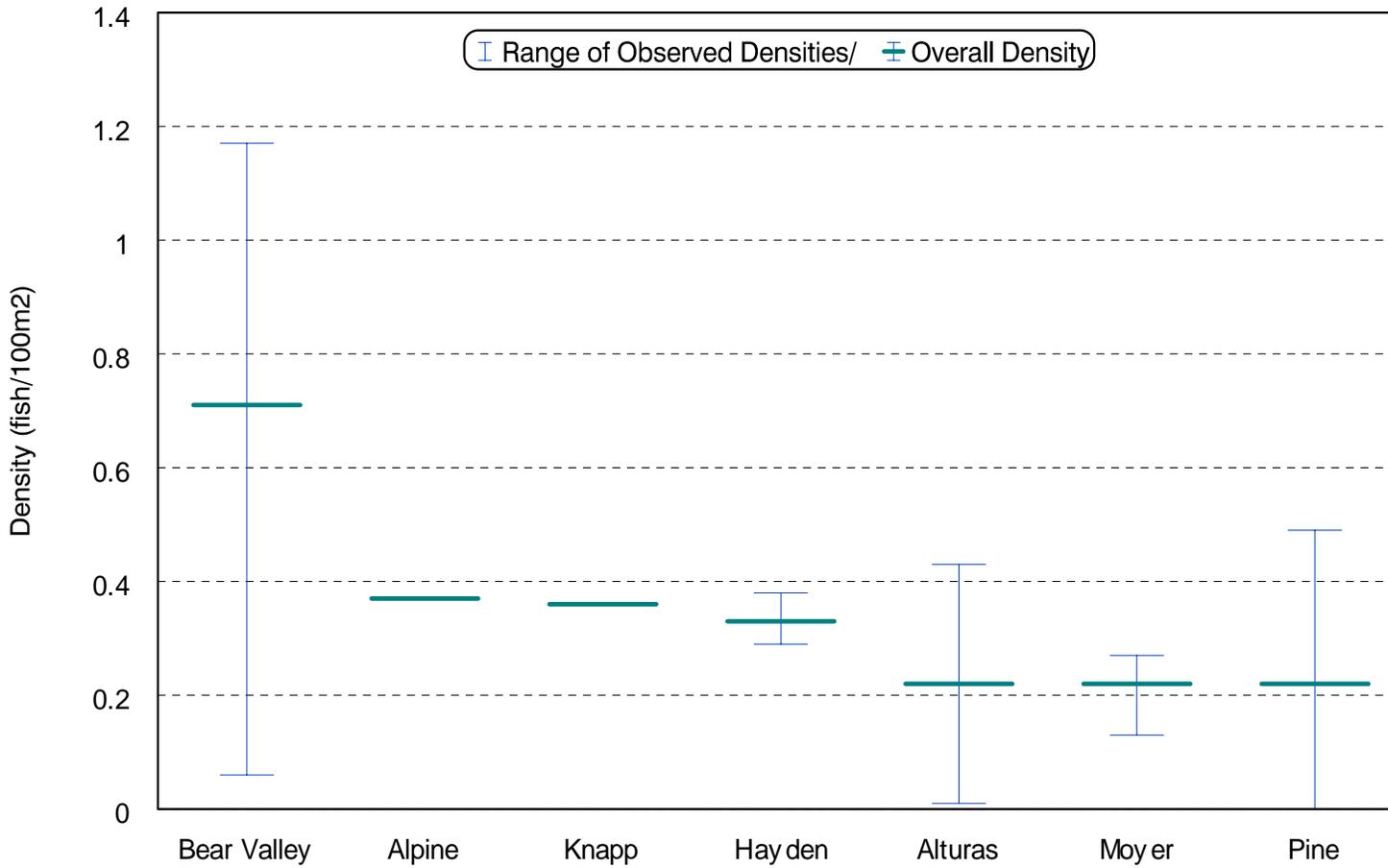
Streams with one year data depict only overall density.

Figure 2. Salmon Region streams exhibiting the highest densities of cutthroat trout (1991-1995).



Streams with one year data depict only overall density.

Figure 3. Salmon Region streams exhibiting the highest densities of brook trout (1991-1995).



Streams with an overall density only, results from 1 yr. of data.

Figure 4. Salmon Region streams exhibiting the highest densities of bull trout (1991-1995).

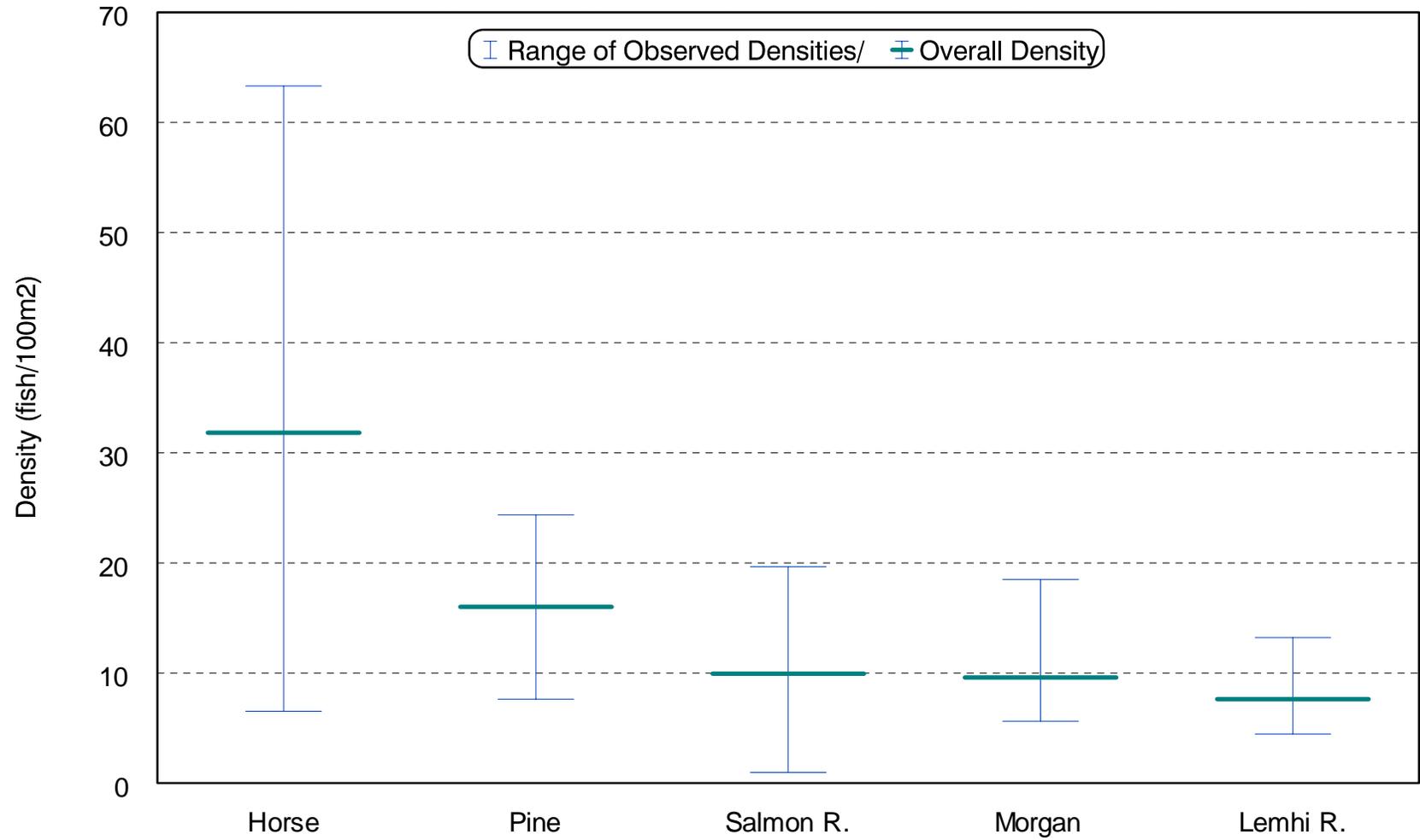


Figure 5. Salmon Region streams exhibiting the highest densities of rainbow trout (1991-1995).

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fishery Management F-71-R-20

Project I: Surveys and Inventories

Subproject I-H: Salmon Region

Job: d

Title: Salmon and Steelhead Investigations

Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

We conducted annual salmon redd counts in the Marsh Creek drainage, Salmon River, Lemhi River, East Fork Salmon River, Pahsimeroi River, and the Yankee Fork Salmon River. This data is included in the annual salmon spawning ground surveys report. Salmon Region's salmon and steelhead investigations are incorporated in a separate, statewide Salmon and Steelhead Investigations report.

#### Authors

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## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fishery Management F-71-R-20

Project II: Technical Guidance

Subproject II-H: Salmon Region

Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

During 1995, technical assistance was provided to all state and federal agencies upon request. Comments were submitted to various agencies and private entities concerning stream alterations, bank stabilization, mining operations and reclamation plans, fish rearing proposals, private ponds, water right applications, grazing allotments, timber sales, highway reconstruction, habitat improvements, bridge construction, and hydropower projects. On-site inspections of proposed, on-going, and completed projects were conducted.

Technical assistance was also provided in the form of angler informational meetings; school presentations and development of the Salmon Region portion of the 1-800-ASK-FISH program. Also, we responded to the general public in person, by telephone, and by mail to inquiries about fishing opportunities, techniques, regulations, and area specifics.

#### Authors

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## OBJECTIVES

1. To assist the Department of Water Resources, the Department of Lands, the U.S. Army Corps of Engineers and other state, federal, local, and private entities in evaluating the effects of habitat manipulation on fish and fish habitat.
2. To recommend procedures that minimize adverse effects of stream course alterations on aquatic habitat and fish.
3. To provide information on all aspects of fisheries and aquatic habitat as requested.

## METHODS

We responded to all requests for data, expertise, and recommendations from individuals, government agencies, and corporations. Meetings were attended, field inspections conducted, and responses generated as appropriate.

## RESULTS

During 1995, we responded in writing to requests for technical assistance or comments on various water and fishery-related matters as follows:

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<u>Agency</u>	<u>Number of Requests</u>
Idaho Outfitters & Guides Licensing Board	6
U.S. Forest Service	7
Idaho Department of Water Resources	15
U.S. Department of Transportation	2
Private and Miscellaneous	7
Corps of Engineers	3
Custer/Lemhi County Commissioners	4
Shoshone-Bannock Tribes	3
Bureau of Reclamation	12

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Telephone communication was the major mode of inter-agency contact. Commonly, we responded to stream alteration proposals by meeting with the applicant on-site, determining the nature of the situation, and sending written comments to the appropriate agency. Due to the remoteness of the Salmon Region, we were often the only agency representatives available to conduct on-site inspections.

We responded to numerous inquiries from the public (by telephone, letter, and in person) about when, where, and how to participate in various fisheries in the region, ranging from steelhead angling to alpine lake fishing.

We reported weekly steelhead fishing results on the local radio station and in area newspapers throughout the season.

Because the Salmon Region has no Information and Education or Regional Conservation Education personnel, we respond to numerous requests from local schools for fish and wildlife related presentations. During 1995, Salmon Region fisheries personnel conducted 15 presentations to approximately 375 students in three different schools.

## **RECOMMENDATIONS**

1. Technical guidance on issues involving fishery resources in the Salmon Region should be continued to assist in maintaining fishery resources in the region.
2. Because of the number of requests for technical guidance and the potential impact of projects to remaining fish resources in the Salmon Region, consideration should be given to adding additional staff in the region to administer habitat issues and information and education needs.

## 1995 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fishery Management F-71-R-20

Project III: Habitat Management

Subproject III-H: Salmon Region

Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

In November 1995, we provided equipment, labor, and funding (through the departments challenge grant program) to construct over 10,000 feet of fence on the upper Lemhi River. The fence created a riparian pasture that will limit livestock use to only short periods during the spring and summer, protecting critical anadromous and resident fishes' spawning and rearing areas. The fence was designed and constructed with the assistance of the landowner, Shoshone-Bannock Tribes, Bureau of Land Management, Trout Unlimited, Model Watershed Project, Natural Resource Conservation Service, and the United States Forest Service.

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## 1995 ANNUAL PERFORMANCE REPORT

State Of: Idaho

Program: Fisheries Management F-71-R-20

Project IV: Population Management

Subproject IV-H: Salmon Region

Contract Period: July 1, 1995 to June 30, 1996

### ABSTRACT

During the summer of 1995, 92 mountain lakes were stocked in the Salmon Region. A total of 35,565 fry were stocked in the Sawtooth Wilderness and Challis National Forest lakes. Species stocked included 7,500 grayling *Thymallus arcticus*, 8,930 rainbow trout *Oncorhynchus mykiss*, and 18,885 cutthroat trout fry *Oncorhynchus clarki lewisi*. A Cessna 185 fixed wing aircraft was used to stock Salmon Region lakes in 1995 at a cost of \$29.11 per lake or \$.042 per fish.

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## OBJECTIVES

To maintain a viable high mountain lake fishery in the Salmon Region.

## METHODS

A Cessna 185 fixed wing aircraft was used to stock Salmon Region high mountain lakes.

Stocking records were summarized for each lake.

## RESULTS

A total of 35,565 fry were stocked in the Sawtooth Wilderness (Table 1) and Challis National Forest (Table 2): 7,500 grayling *Thymallus arcticus*, 18,885 westslope cutthroat trout *Oncorhynchus clarki lewisi*, and 8,930 rainbow trout *Oncorhynchus mykiss*. An additional 22,250 cutthroat fry were requested for 37 lakes. Due to a lack of available cutthroat fry these lakes were not stocked. Golden trout *O. aquabonita* were also requested but not available.

Table 1. Sawtooth mountain lake fry plants, 1995.

Lake name	Number stocked	Species <sup>a</sup>
Alpine Cr #2	250	C2
Alpine Cr #3	250	C2
Alpine Cr #4	1000	GR
W of Alpine #4	250	C2
Alpine Cr #5	250	C2
Alpine Cr #5	250	GR
Alpine Cr #6	250	C2
Alpine Cr #7	250	C2
Alpine Cr #8	150	C2
Alpine Cr #9	150	C2
Alpine Cr #10	250	GR
Alpine Cr #11	250	C2
Alpine Cr #12	250	C2
Alpine Cr #13	400	GR
Alpine Cr #14	400	GR
Alpine Cr #15	400	GR
U. Cramer	250	C2
Decker #1	250	C2
Elizabeth	250	C2
Fishhook Cr #3	250	C2
Goat Cr #1	500	C2
Goat Cr #4	250	C2
Goat Cr #6	250	C2
Hanson #1	250	C2
Hanson #3	250	C2
Hanson #5	250	C2
Hell Roaring Lake	600	GR
Hell Roaring Lake	150	C2
Hell Roaring #1	250	C2
Hell Roaring #2	250	C2
Lucille (HR #14)	250	C2
Profile (HR #15)	250	C2
Hidden	250	C2
Imogene #1	3000	K1
Imogene #2	250	C2
Imogene #3	250	C2
Imogene #4	250	C2
Imogene #5	250	C2
Imogene #6	250	C2
Iron Cr #6	250	C2
Iron Cr #7	500	K1
Marshall #2	250	C2
McGowan #1	500	K1
McGowan #2	500	K1
McGowan #3	500	K1
Parks Peak #1	350	C2

Table 1. (Continued) Sawtooth mountain lake fry plants, 1995.

Lake name	Number stocked	Species <sup>a</sup>
Parks Peak #2	350	C2
U. Redfish #1	750	GR
U. Redfish #2	250	C2
Saddleback L #1	250	C2
Saddleback L #2	250	C2
Stephens	250	C2
Thompson Cirque	250	C2

<sup>a</sup>C2=westslope cutthroat trout.

GR=grayling.

K1=kamloops.

Table 2. Challis National Forest mountain lake fry plants, 1995.

Lake name	Number stocked	Species <sup>a</sup>
Cabin Cr Peak #1	135	C2
Cabin Cr Peak #3	250	C2
Cabin Cr Peak #4	250	C2
Cliff Cr #1	250	C2
Collie	300	C2
Elk Lake	250	C2
F-82	300	C2
S F Fall Cr #3	250	K1
Hindman #1	250	C2
Hindman #3	250	C2
Iris #1	250	C2
Iris #3	500	K1
Island	1000	K1
Kidney	500	K1
Knapp Cr #3	250	C2
Knapp Cr #7	250	C2
Knapp Cr #8	250	C2
Knapp Cr #14	400	GR
Langer	1250	K1
Lola Cr #2	250	C2
Lola Cr #3	250	C2
Lower Valley Cr	500	K1
MacRae (Deer)	1000	GR
Muskeg #1	500	K1
Muskeg #3	500	K1
Rainbow	500	K1
Ruffneck	1130	K1
Seafoam #3	900	GR
Seafoam #4	300	GR
Seafoam #6	500	GR
Soldier #2	250	C2
Soldier #4	250	C2
Soldier #5	250	C2
Soldier #7	250	C2
Soldier #8	250	C2
Soldier #10	150	C2
Valley Cr #1	250	C2
Valley Cr #2	250	C2
Vanity #2	250	C2
Vanity #8	150	C2
Vanity #13	600	GR

<sup>a</sup>C2=westslope cutthroat trout.

RB=rainbow trout.

K1=kamloops.

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