

IDAHO DEPARTMENT OF FISH AND GAME

Jerry M. Conley, Director

FEDERAL AID IN FISH RESTORATION Job Performance Report Project F-71-R-17



REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS

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| Job No. 7-a. | Region 7 Mountain Lakes Investigations |
| Job No. 7-b. | Region 7 Lowland Lakes and Reservoirs Investigations-
Williams Lake and Mosquito Flat Reservoir |
| Job No. 7-c ¹ . | Region 7 Rivers and Streams Investigations-Salmon River
and Middle Fork Salmon River Snorkeling Transacts |
| Job No. 7-c ² . | Region 7 Rivers and Streams Investigations-Salmon River
and East Fork Salmon River Drainage Fishery Surveys |
| Job No. 7-d. | Region 7 Technical Guidance |
| Job No. 7-e. | Region 7 Salmon and Steelhead Investigations |

By

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ABSTRACT 91

JOB PERFORMANCE REPORT

STATE OF: Idaho

NAME: Regional Fishery Management
Investigations

TITLE: Region 7 Mountain Lakes
Investigations

PROJECT NO.: F-71-R-17

JOB NO.: 7-a

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

In 1992, we stocked 67 alpine lakes in the Salmon National Forest. The areas stocked included: Bighorn Crags, Continental Divide, Lemhi Range, and Hat Creek drainage. A Bell Jet Ranger helicopter was used to stock the Lemhi Range, Continental Divide, and Hat Creek drainage, while a Cessna 185 was used to stock the Bighorn Crags for a cost of \$65.02 per lake (\$4,356.80 total).

Idaho Department of Fish and Game (IDFG) personnel and volunteers conducted surveys on 27 alpine lakes, including 6 in the Lemhi Range, 17 in the Bighorn Crags, and 4 in the Sawtooth Wilderness. Survey information included fish species and **SIZE** composition, spawning habitat, access, fish condition, and angler use.

Gill nets were used to assess the fish community in eight alpine lakes. Gill nets were also used to sample four alpine lakes in Region 7 being considered for bull trout Salvelinus confluentus introductions to control stunted brook trout Salvelinus fontinalis populations.

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OBJECTIVES

1. To evaluate the Region 7 mountain lake fish stocking program.
2. To collect data on species composition, access, trail conditions, angler/camper use, and spawning habitat for selected Region 7 mountain lakes.
3. To collect baseline fisheries data in mountain lakes with stunted brook trout populations so that future management actions, such as predator introductions, can be evaluated.

METHODS

Volunteers were utilized to survey 17 Region 7 mountain lakes in 1992. Volunteers were supplied with survey forms, maps, metric rules, and instructions to complete forms. These anglers collected data on species and size composition, catch rates, trail access and condition, relative angler/camper use, and availability of spawning habitat.

Idaho Department of Fish and Game personnel utilized gill nets and hook-and-line sampling gear to sample fish communities in 10 mountain lakes. Sinking monofilament gill nets, 150 feet x 6 feet with mesh ranging from 3/4 inches to 2 1/2 inches, were set overnight at each lake. In each lake, two nets were set perpendicular to shore with the small mesh near shore. A small two-man raft was used to set each net. Gill nets, raft, and camping gear were packed in using horses.

Stocking records were summarized for each lake.

RESULTS

A total of 50,525 fry were stocked in the Salmon National Forest (Table 1): 1,700 grayling Thymallus arcticus and 48,835 westslope cutthroat trout Oncorhynchus clarki lewisi. Golden trout O. aguabonita were also requested but not available.

Department personnel set gill nets in eight Region 7 mountain lakes. A total of 518 fish representing three species were collected. Four lakes are being considered for predator introductions in the spring of 1993 to control brook trout numbers. Brook trout length frequency distributions and gill net catch rates indicated overabundance and stunted condition (Table 2, Figure 1). Brook trout mean length ranged from 209 mm to 258 mm in the four lakes, and gill net catch rates ranged from 1.83 to 7.04 fish/h.

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Table 1. Mountain lakes stocked in the Salmon National Forest, 1992.

Lake name	Loran coordinates	Catalog number	Species ^a	Number of fish
<u>Lemhi and Hat Creek Lakes</u>				
Nez Perce Lake	Lat 44°30' Long 113°23'	07-1273	GR	250
Nez Perce #1	Lat 44°31' Long 113°19'	07-1272	C2	250
MF Little Timber #1 (Lunker)	Lat 44°34' Long 113°31'	07-1271	C2	1,000
Devils Lake	Lat 44°35' Long 113°37'	07-1260	C2	1,000
Big Eight-Mile Lake	Lat 44°35' Long 113°33'	07-1264	C2	500
Dairy Lake	Lat 44°37' Long 113°36'	07-1263	C2	500
Everson Lake	Lat 44°37' Long 113°37'	07-1257	C2	1,500
Patterson Lake	Lat 44°39' Long 113°34'	07-1259	C2	250
Mill Lake	Lat 44°39' Long 113°39'	07-1254	C2	1,500
Bray #2	Lat 44°42' Long 113°44'	07-1247	C2	500
WF Hayden #2	Lat 44°43' Long 113°44'	07-1249	C2	250
Wright Lake		07-1246	C2	250
Wright Lake	Lat 44°44' Long 113°50'	07-1246	GR	200
Buck Lake #4		07-1242	C2	250
Buck Lake #3		07-1241	C2	250
Bear Valley #1		07-1243	C2	1,500
Bear Valley #2	Lat 44°46' Long 113°52'	07-1244	C2	1,000
Bear Valley #3	Lat 44°46' Long 113°52'	07-1245	C2	250
McNutt #4	Lat 44°51' Long 113°46'	07-1235	C2	500
Basin #5	Lat 44°52' Long 113°46'	07-1237	C2	1,000
NF Hat Creek Lake	Lat 45°07' Long 114°04'	07-1285	C2	250
Hat Creek #2	Lat 44°43' Long 114°21'	07-1288	GR	250
Hat Creek #3	Lat 45°05' Long 114°06'	07-1289	C2	1,000
Hat Creek #4	Lat 44°44' Long 114°20'	07-1290	C2	500
Hat Creek #5	Lat 44°43' Long 114°21'	07-1293	C2	1,000
SF Moyer Creek Lake	Lat 44°44' Long 114°22'	07-1205	GR	250
Little Iron Lake	Lat 44°46' Long 114°19'	07-1279	C2	1,000
<u>Continental Divide Lakes</u>				
Bronco Lake	Lat 45°24' Long 114°41'	07-0566	C2	1,000
Hidden Lake	Lat 45°26' Long 114°42'	06-0616	C2	2,000
Helen Lake	Lat 45°31' Long 114°34'	07-0573	C2	1,000
NF EF Reynolds #2	Lat 45°32' Long 114°32'	07-0575	C2	1,000
NF EF Reynolds #4	Lat 45°32' Long 114°31'	07-0578	C2	1,000
Line Lake	Lat 45°33' Long 114°33'	06-0603	C2	500
Allen Lake	Lat 45°31' Long 114°05'	07-1214	C2	1,000
Geertson Lake (Starr)		07-1225	C2	1,000

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Table 1. Continued.

Lake name	Loran coordinates	Catalog number	Species ^a	Number of fish
Geertson Lake (Starr)		07-1225	GR	50
Bohannon Lake		07-1228	C2	500
UP Lake		17-1220	C2	1,000
Pony Lake		07-1204	C2	500
<u>Bighorn Crags Lakes</u>				
Pot Hole Lake		07-1184	C2	250
Gentian Lake		07-1195	C2	500
Birdbill Lake		07-1197	C2	500
Sheepeater Lake		07-0620	C2	1,000
Shoban Lake		07-0619	C2	1,000
Airplane Lake	Lat 45°09' Long 114°33'	07-0618	C2	1,000
Ship Island #2		07-0613	C2	1,000
Ship Island #4		07-0616	GR	250
Harbor Lake		07-0796	C2	3,000
Wilson Lake		07-0794	C2	1,000
Heart Lake	Lat 45°08' Long 114°34'	07-0793	C2	2,000
Welcome Lake		07-0790	C2	2,750
Terrace #4		07-0629	C2	500
Terrace #3	Lat 45°08' Long 114°34'	07-0628	C2	500
Terrace #2		07-0627	C2	500
Terrace #1		07-0626	C2	1,000
Skyhigh Lake		07-0787	C2	1,000
Lost Lake	Lat 45°08' Long 114°35'	07-0740	C2	1,000
Turquoise Lake	Lat 45°07' Long 114°34'	07-0778	C2	1,000
Echo Lake		07-0777	C2	1,000
Reflection Lake		07-0770	C2	1,250
Twin Cove Lake		07-0773	C2	1,000
Doe Lake		07-0766	C2	1,000
Buck Lake		07-0764	C2	1,000
Ramshorn Lake		07-0755	C2	1,000
Paragon Lake	Lat 45°05' Long 114°35'	07-0756	C2	1,000
Plateau Lake		07-0632	C2	500
South Fork Lake		07-0630	C2	500
Golden Trout Lake	Lat 45°07' Long 114°29'	07-1201	C2	1,500
TOTAL		Cutthroat Grayling		48,825 1,700

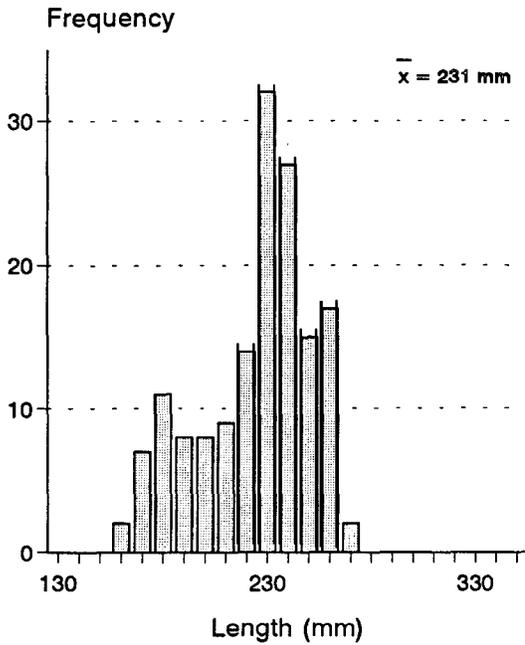
^aC2 = westslope cutthroat trout, GR = grayling

Table 2. Gill net catch rates (brook trout/h) and mean lengths of brook trout sampled in Region 7 mountain lakes, 1992.

Lake	Total brook trout caught	brook trout/h			Mean length (mm)
		Net 1	Net 2	Mean	
Toxaway	150	8	6.1	7.04	231
Upper Champion	94	5.2	3.1	4.13	258
Mable	36	2.46	1.2	1.83	213
Carlson	71	3.08	4.1	3.6	209

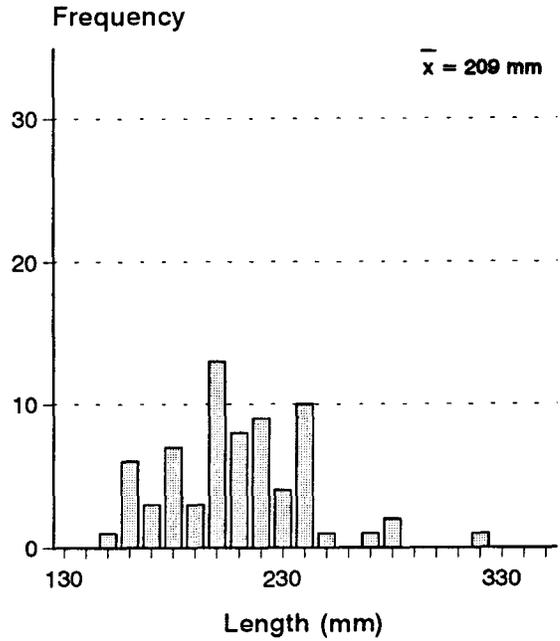
TOXAWAY LAKE

Brook Trout
n = 150



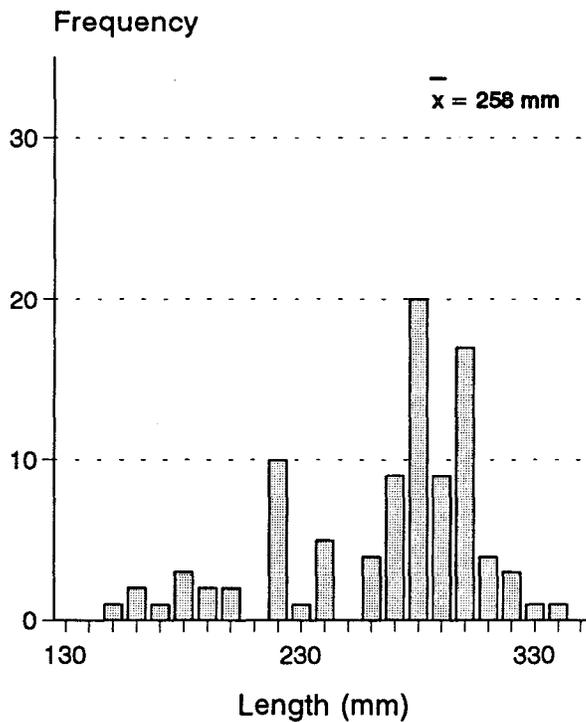
CARLSON LAKE

Brook Trout
n = 71



UPPER CHAMPION LAKE

Brook Trout
n = 94



MABLE LAKE

Brook Trout
n = 36

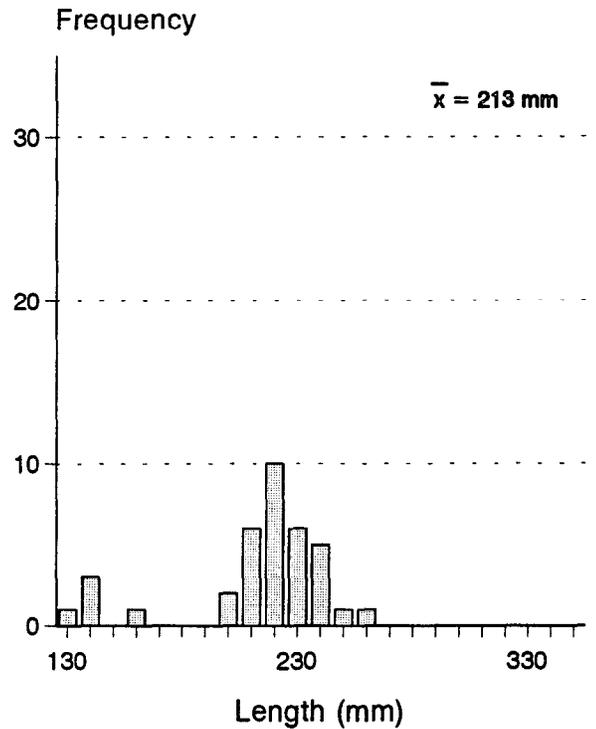


Figure 1. Length frequencies of brook trout sampled with gill nets from four alpine lakes, 1992.

Department personnel and volunteers surveyed a total of 24 mountain lakes (Tables 3-29). Anglers fish 92 hours and caught 306 fish for an overall catch rate of 3.3 fish/h.

RECOMMENDATIONS

1. Continue mountain lake surveys to evaluate fish growth and survival and angler use.
2. Stock predators such as bull trout in lakes overpopulated by brook trout, and monitor fish populations to determine predatory impact.

Table 3. Alpine lake survey data for Airplane Lake 1992.

LAKE LOCATION

Lake name: Airplane Survey date: 7-23-92
 IDFG catalog no.: 07-0618 Primary drainage: Ship Island Creek
 Secondary drainage: Middle Fork Salmon R. County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 16 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 2 No. firepits: 5 Litter: l X m h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 7 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114.

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 50
 Fish/hour: 12.5 Fish abundance: l m h X

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1				20	20				
C2					10				
TOTAL				20	30				

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	1,000 fry	"

COMMENTS

Anglers reported fish easy to catch. Lake has two inlets, one too steep for spawning, the other with 75 yds. of marginal spawning habitat. The outlet flows into Ship Island Creek.

Table 4. Alpine lake survey data for Bear Valley Lake #1, 1992.

LAKE LOCATION

Lake name: Bear Valley #1 Survey date: 7-10-92
 IDFG catalog no.: 07-1243 Primary drainage: Bear Valley Creek
 Secondary drainage: Hayden Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 9 Township: 17 N Range: 22 E Elevation(ft): 9000

USE

No. campsites: 4 No. firepits: 5 Litter: l X m h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 5 poor trail(mi) cross country(mi)
 Trailhead location: Bear Valley Campground, USFS Road #009

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours Fished: 2 No. fish caught: 1
 Fish/hour: 0.5 Fish abundance: l m h X

Length Frequency (Gillnet)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
RC				9	15	12	11		
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	1,500 fry	Mackay
1989	C2	1,000 fry	"
1980	RC	1,500	"
1977	C1	1,700	"

COMMENTS

Rainbow/cutthroat hybrids were the only fish found, with a mean length of 253 mm. Gillnet #1 produced 3 fish/hour; #2 produced 1.2 fish/hour, for a mean of 2.1 fish/hour.

One outlet with approximately .5 miles of fair spawning habitat available.

Table 5. Alpine lake survey data for Bear Valley Lake #2, 1992.

LAKE LOCATION

Lake name: Bear Valley #2 Survey date: 7-11-92
 IDFG catalog no.: 07-1244 Primary drainage: Bear Valley Creek
 Secondary drainage: Hayden Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 9 Township: 17 N Range: 22 E Elevation(ft): 9000

USE

No. campsites: 4 No. firepits: 5 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 5 poor trail(mi) cross country(mi)
 Trailhead location: Bear Valley Campground, USFS Road #009.

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 3 No. fish caught: 10
 Fish/hour: 3.3 Fish abundance: l m h X

Length Frequency (gillnet)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1				3	5	6		1	1
C2			1			4		1	
RC						3	2		
TOTAL			1	3	5	13	2	2	1

Stocking History

Year	Species	Number of fish	Comments
1992	C2	1,000 fry	Mackay
1989	C2	1,000 fry	"

COMMENTS

The mean lengths for gillnetted R1, C2 and RC were 283, 240 and 283 respectively. Gillnet #1 produced 1.7 fish/hour, #2 produced 0.8 fish/hour, for a mean of 1.2 fish/hour.

One inlet and one outlet, each with poor spawning habitat. Most fish collected were in poor condition.

Table 6. Alpine lake survey data for Bear Valley Lake #3, 1992.

LAKE LOCATION

Lake name: Bear Valley #3 Survey date: 7-12-92
 IDFG catalog no.: 07-1245 Primary drainage: Bear Valley Creek
 Secondary drainage: Hayden Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 17 Township: 17 N Range: 22 E Elevation(ft): 9000

USE

No. campsites: 2 No. firepits: 2 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 5 poor trail(mi) cross country(mi)
 Trailhead location: Bear Valley Campground, USFS Road #009

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 0 Hours fished: No. fish caught:
 Fish/hour: Fish abundance: l m X h

Length Frequency (gillnet)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1					1				
C2					2	6	3		
RC						4			
TOTAL					3	10	3		

Stocking History

Year	Species	Number of fish	Comments
1992	C2	250 fry	Mackay
1989	C2	250 fry	"
1983	C2	250 fry	"

COMMENTS

The mean lengths for gillnetted R1, C2, and RC were 220, 274 and 263 mm respectively. Gillnet #1 produced .87 fish/hour and net #2 produced .53 fish/hour, for a mean of .70 fish/hour.

Two inlets and two outlets with poor spawning habitats. Fish caught were in good condition.

Table 7. Alpine lake survey data for Buck Lake #1, 1992.

LAKE LOCATION

Lake name: Buck #1 Survey date: 7-13-92
 IDFG catalog no.: 07-1239 Primary drainage: Buck Creek
 Secondary drainage: Bear Valley Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 21 Township: 17 N Range: 22 E Elevation(ft): 9500

USE

No. campsites: 3 No. firepits: 3 Litter: 1 X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 4.5 poor trail(mi) cross country(mi)
 Trailhead location: Bear Valley Campground, USFS Road #009

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 1 Hours fished: 1 No. fish caught: 2
 Fish/hour: 2 Fish abundance: 1 m h X

Length Frequency (Gillnet)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1			1	7	49	4	1		
TOTAL			1	7	49	4	1		

Stocking History

Year	Species	Number of fish	Comments
			No Stocking History

COMMENTS

Rainbow trout were the only fish found, with mean length of 215 mm.
Gillnet #1 produced 2 fish/hour, #2 produced 3.7 fish/hour, for a
mean of 2.9 fish/hour.

One inlet with approx. 30 m of fair spawning habitat and one outlet
with approximately .25 miles of adequate spawning habitat present.

Table 8. Alpine lake survey data for Buck Lake #3, 1992.

LAKE LOCATION

Lake name: BUCK #3 Survey date: 7-13-92
 IDFG catalog no.: 07-1241 Primary drainage: Buck Creek
 Secondary drainage: Bear Valley Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 21 Township: 17 N Range: 22 E Elevation(ft): 9500

USE

No. campsites: 0 No. firepits: 0 Litter: l X m _____ h _____
 Trail around lake: complete _____ partial X trampled _____ yes _____ no _____
 Access: good trail(mi) 5 poor trail(mi) 1 cross country(mi) .75
 Trailhead location: Bear Valley Campground, USFS Road #009

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 1 No. fish caught: 4
 Fish/hour: 4 Fish abundance: l X m _____ h _____

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1				2		2			
TOTAL				2		2			

Stocking History

Year	Species	Number of fish	Comments
			No Stocking History

COMMENTS

Two inlets with no spawning habitat available. One outlet with approximately 20 m of fair spawning habitat.

Table 9. Alpine lake survey data for Buck Lake #4, 1992.

LAKE LOCATION

Lake name: Buck #4 Survey date: 7-13-92
 IDFG catalog no.: 07-1240 Primary drainage: Buck Creek
 Secondary drainage: Bear Valley Creek County: Lemhi
 USFS ranger district: Leadore Wilderness area: N/A
 Section: 27 Township: 17 N Range: 22 E Elevation(ft): 9800

USE

No. campsites: 1 No. firepits: 1 Litter: 1 X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 5.5 poor trail(mi) 1 cross country(mi) 1
 Trailhead location: Bear Valley Campground, USFS Road # 009

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 11
 Fish/hour: 5.5 Fish abundance: 1 m h X

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					4	3			
RC					1				
GR						1	2		
TOTAL					5	4	2		

Stocking History

Year	Species	Number of fish	Comments
1992	C2	250 fry	Mackay
1989	C2	500 fry	"
1986	C2	500 fry	"
1983	C2	500 fry	"

COMMENTS

No outlets or inlets. Fish in good condition, especially the grayling. Tough climb up to lake; poor or no trail.

Table 10. Alpine lake survey data for Buck Lake, 1992.

LAKE LOCATION

Lake name: Buck Survey date: 7-20-92
 IDFG catalog no.: 07-0764 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 4 Township: 20 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: N/A No. firepits: Litter: l m h
 Trail around lake: complete partial trampled yes no
 Access: good trail(mi) 9 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 3 Hours fished: 9 No. fish caught: 12
 Fish/hour: 1.33 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2						3	7	2	
TOTAL						3	7	2	

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	500 fry	"
1986	C2	500 fry	"
1983	C2	500 fry	"

COMMENTS

Fish in good condition; one inlet from Doe lake and one outlet
observed.

Table 11. Alpine lake survey data for Carlson Lake, 1992.

LAKE LOCATION

Lake name: Carlson Survey date: 7-29-92
 IDFG catalog no.: 07-1303 Primary drainage: Double Spring Creek
 Secondary drainage: Pahsimeroi River County: Custer
 USFS ranger district: Challis Wilderness area: N/A
 Section: 17 Township: 11 N Range: 23 E Elevation(ft):

USE

No. campsites: 3 No. firepits: 4 Litter: l X m h
 Trail around lake: complete X partial trampled yes no
 Access: good trail(mi) X(.5) poor trail(mi) cross country(mi)
 Trailhead location: Spring Hill 4wd trail

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 0 Hours fished: No. fish caught:
 Fish/hour: Fish abundance: l m h X

Length Frequency (Gillnet)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
BK				20	43	5	1		
TOTAL				20	43	5	1		

Stocking History

Year	Species	Number of fish	Comments
1975	R1	160 lbs of 6"+	approx. 500 fish from Mackay
1975	BK	15 lbs of 0-3"	approx. 2685 from Sandpoint
1941, 49 50, 52, 55	BK	5-12 lbs of 2-4"	1,040-2,650 all from Mackay

COMMENTS

Brook trout were the only species captured, 69 fish with mean length of 209 mm. Gillnet #1 produced 3.08 fish/hour; net #2 produced 3.90 fish/hour with mean of 3.5 fish/hour.

Riparian area heavily grazed by cattle. Heavy growth of aquatic macrophytes. Fish captured were in poor condition, with disproportionately large heads.

Table 12. Alpine lake survey data for Upper Champion Lake, 1992.

LAKE LOCATION

Lake name: Upper Champion Survey date: 7-23-92
 IDFG catalog no.: 07-1731 Primary drainage: Champion Creek
 Secondary drainage: Salmon River County: Custer
 USFS ranger district: SNRA Wilderness area: N/A
 Section: 22/27 Township: 8 N Range: 15 E Elevation(ft): 9500

USE

No. campsites: 6 No. firepits: 9 Litter: l X m h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 2 poor trail(mi) 2 cross country(mi)
 Trailhead location: Champion Crk trailhead, USFS Road # 197 (Pole Crk Road)

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 3 Hours fished: 17 No. fish caught: 30
 Fish/hour: 1.7 Fish abundance: l m h X

Length Frequency (Gillnet)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>40
R1				2		7	4	4	
BK			1	8	18	41	26		
TOTAL			1	10	18	48	30	4	

Stocking History

Year	Species	Number of fish	Comments
1987	C2	500 fry	Mackay

COMMENTS

The mean lengths for brook and rainbow trout were 257 mm and 287 mm, respectively. Gillnet #1 produced 5.8 fish/hour and net #2 produced 3.9 fish/hour, with mean of 4.8 fish/hour.
One outlet with 5 m of poor spawning habitat; one inlet with 10 m of poor spawning habitat.
Fish observed were in good condition.

Table 13. Alpine lake survey data for Big Clear Lake, 1992.

LAKE LOCATION

Lake name: Big Clear Lake Survey date: 8-13-92
 IDFG catalog no.: 07-1183 Primary drainage: Clear Creek
 Secondary drainage: Panther Creek County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 10/15 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 3 No. firepits: 3 Litter: l X m h
 Trail around lake: complete X partial trampled yes no
 Access: good trail(mi) 5 poor trail(mi) 5 cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 6
 Fish/hour: 3 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2			1	2	1	2			
TOTAL			1	2	1	2			

Stocking History

Year	Species	Number of fish	Comments
1992	GN	500 fry	Mackey

COMMENTS

Many small fish (.5-5 inches) observed in inlet and outlet of lake.

Table 14. Alpine lake survey data for Crater Lake, 1992.

LAKE LOCATION

Lake name: Crater Lake Survey date: 8-14-92
 IDFG catalog no.: 07-1185 Primary drainage: Clear Creek
 Secondary drainage: Panther Creek County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 15 Township: 21 N Range: 16 E Elevation(ft): 9100

USE

No. campsites: 1 No. firepits: 1 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) poor trail(mi) .5 cross country(mi) .25
 Trailhead location: Crags Campground, USFS Road #114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 7
 Fish/hour: 3.5 Fish abundance: l m X h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
GN			2						
C2			1	1	2	1			
TOTAL			3	1	2	1			

Stocking History

Year	Species	Number of fish	Comments
1989	GN	500 1-3"	Mackay
1986	GN		"
1977	GN	1,060 1-3"	"
1970	GN	1,000 1-3"	"

COMMENTS

Many fish present in the inlet and outlet (1/2 - 1 inch long). Fish also caught in the pond below the lake.

Table 15. Alpine lake survey data for Doe Lake, 1992.

LAKE LOCATION

Lake name: Doe Survey date: 7-20-92
 IDFG catalog no.: 07-0766 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 4 Township: 20 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 1 No. firepits: 1 Litter: l X m h
 Trail around lake: complete X partial trampled X yes no
 Access: good trail(mi) ? poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 1 Hours fished: 3 No. fish caught: 22
 Fish/hour: 7 Fish abundance: l m X h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2						2	10	10	
TOTAL						2	10	10	

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	500 fry	"
1986	C2	500 fry	"
1983	C2	500 fry	"

COMMENTS

Anglers reported good fishing with many fish rising. No small fish sighted. The lake is spring fed with no inlets; one outlet to Buck Lake. Fish captured appeared to be in good condition.

Table 16. Alpine lake survey data for Goat Lake, 1992.

LAKE LOCATION

Lake name: Goat Survey date: 8-11-92
 IDFG catalog no.: 07-0598 Primary drainage: Goat Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 25 Township: 22 N Range: 16 E Elevation(ft): 8900

USE

No. campsites: 3 No. firepits: 3 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) poor trail(mi) 2 cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 4
 Fish/hour: 2 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2						4			
TOTAL						4			

Stocking History

Year	Species	Number of fish	Comments
1980	RC	1,026 1-3"	Mackay
1977	C2	1,152 1-3"	"
1974	C2	1,008 fry	"
1971	C2	1,080 fry	"

COMMENTS

Anglers reported many fish in the 8-15" range cruising near shore.
Small fish present in the outlet.

Table 17. Alpine lake survey data for Gooseneck Lake, 1992.

LAKE LOCATION

Lake name: Gooseneck Survey date: 8-14-92
 IDFG catalog no.: 07-1187 Primary drainage: Clear Creek
 Secondary drainage: Panther Creek County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 9 Township: 21 N Range: 16 E Elevation(ft): 9150

USE

No. campsites: 1 No. firepits: 1 Litter: l X m h
 Trail around lake: complete partial trampled yes X no
 Access: good trail(mi) poor trail(mi) cross country(mi) 1/8
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 1 No. fish caught: 1
 Fish/hour: 1 Fish abundance: l X m h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
<u>C2</u>			<u>1</u>						
<u>TOTAL</u>			<u>1</u>						

Stocking History

Year	Species	Number of fish	Comments
<u>1989</u>	<u>GN</u>	<u>500 1-3"</u>	<u>Mackay</u>
<u>1986</u>	<u>GN</u>	<u>500 1-3"</u>	<u>"</u>
<u>1977</u>	<u>GN</u>	<u>500 1-3"</u>	<u>"</u>
<u>1970</u>	<u>GN</u>	<u>1,000 fry</u>	<u>"</u>

COMMENTS

Anglers reported fish cruising but difficult to catch.

Table 18. Alpine lake survey data for Harbor Lake, 1992.

LAKE LOCATION

Lake name: Harbor Survey date: 7-21-92
 IDFG catalog no.: 07-0796 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 21 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 3 No. firepits: 3 Litter: l X m h
 Trail around lake: complete X partial trampled X yes no
 Access: good trail(mi) 5 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 25
 Fish/hour: 6.25 Fish abundance: l m X h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					20	5			
TOTAL					20	5			

Stocking History

Year	Species	Number of fish	Comments
1992	C2	2,550 fry	Mackay
1989	C2	3,000 fry	"
1986	R1	3,000 fry	"
1983	R1	3,000 1-3"	"

COMMENTS

Anglers reported fish caught were fat and healthy looking.
One inlet with no spawning substrate.

Table 19. Alpine lake survey data for Mable (3) Lake, 1992.

LAKE LOCATION

Lake name : Mable (3) Survey date: 7-28-92
 IDFG catalog no.: 07-1118 Primary drainage: Beaver Creek
 Secondary drainage: Shake Creek County: Custer
 USFS ranger district: Challis Wilderness area: FCRONR
 Section: 14 & 15 Township: 13 N Range: 11 E Elevation(ft): _____

USE

No. campsites: 4 No. firepits: 5 Litter: l X m _____ h _____
 Trail around lake: complete _____ partial X trampled _____ yes _____ no _____
 Access: good trail(mi) 3 poor trail(mi) _____ cross country(mi) _____
 Trailhead location: Beaver Creek Campground, USFS Road # 008

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 0 Hours fished: _____ No. fish caught: _____
 Fish/hour: _____ Fish abundance: l _____ m _____ h _____

Length Frequency (Gillnet)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
BK			4	1	29	2			
TOTAL			4	1	29	2			

Stocking History

Year	Species	Number of fish	Comments
			No Stocking History

COMMENTS

Brook trout were the only species captured; 36 fish with mean length of 213 mm were collected in gillnets. Gillnet #1 produced 2.46 fish/hour; net #2 produced 1.20 fish/hour, with a mean catch of 1.8 fish/hour.

Lake had no inlets and one outlet with 30 m of fair spawning habitat.

Table 20. Alpine lake survey data for Pothole Lake, 1992.

LAKE LOCATION

Lake name: Pothole Survey date: 8-13-92
 IDFG catalog no.: 07-1184 Primary drainage: Clear Creek
 Secondary drainage: Panther Creek County: Lemhi
 USFS ranger district: Cobalt Wilderness area: _____
 Section: 10 Township: 21 N Range: 16 E Elevation(ft): 9100

USE

No. campsites: 0 No. firepits: 0 Litter: l X m _____ h _____
 Trail around lake: complete _____ partial X trampled _____ yes _____ no _____
 Access: good trail(mi) _____ poor trail(mi) .25 cross country(mi) _____
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 3 No. fish caught: 26
 Fish/hour: 8.7 Fish abundance: l _____ m _____ h X

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2		26 caught between 125 mm and 299 mm							
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	250 fry	Mackay
1989	C2	500 fry	"
1986	C2	250 fry	"
1970	GN	500 fry	"

COMMENTS

Anglers reported seeing many fish rising and cruising lake.

Table 21. Alpine lake survey data for Reflection Lake, 1992.

LAKE LOCATION

Lake name: Reflection Survey date: 7-19-92
 IDFG catalog no.: 07-0770 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 4 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 2 No. firepits: 2 Litter: l m X h
 Trail around lake: complete partial X trampled X yes no
 Access: good trail(mi) 8 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 4
 Fish/hour: 1 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2							3		
R1						1			
TOTAL						1	3		

Stocking History

Year	Species	Number of fish	Comments
1992	C2	850 fry	Mackay
1989	C2	1,000 fry	"
1986	C2	1,000 fry	"
1983	C2	1,000 fry	"

COMMENTS

Anglers reported both rainbow and cutthroat appear to be in good condition. Fish were observed rising and cruising along the bank.

Table 22. Alpine lake survey data for Roaring Creek lakes #1 and #2, 1992.

LAKE LOCATION

Lake name: Roaring Creek lakes #1 and #2 Survey date: 8-12-92
 IDFG catalog no.: 07-0600/07-0603 Primary drainage: Roaring Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 35 Township: 22 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 0 No. firepits: 0 Litter: l X m h
 Trail around lake: complete partial trampled yes X no
 Access: good trail(mi) poor trail(mi) cross country(mi) 1
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 8 No. fish caught: 5
 Fish/hour: 0.6 Fish abundance: l m X h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2 Roaring #1								2	
C2 Roaring #2					1	2			
TOTAL					1	2		2	

Stocking History

Year	Species	Number of fish	Comments
1965	C2	1,900 in #1; 3,800 in #2 fry	Mackay
1955	C2	2,000 in #1; 500 in #2 fry	"

COMMENTS

Many fish observed cruising in upper lake. Few fish seen in lower lake. No trail found into the lakes beyond Goat Lake.

Table 23. Alpine lake survey data for Sheepeater Lake, 1992.

LAKE LOCATION

Lake name: Sheepeater Survey date: 7-23-92
 IDFG catalog no.: 07-0620 Primary drainage: Ship Island Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 21 Township: 21 N Range: 16 E Elevation(ft): 9500

USE

No. campsites: 0 No. firepits: 1 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 7 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 6
 Fish/hour: 3 Fish abundance: l X m h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					4	2			
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	1,000 fry	"
1986	C2	1,000 fry	"
1983	C2	1,000 fry	"

COMMENTS

Anglers reported fish difficult to catch. No fish observed rising or cruising. Lake is spring fed with no inlet; the outlet flows into Shoban lake. Appears to be little camper use at lake.

Table 24. Alpine lake survey data for Ship Island Lake, 1992.

LAKE LOCATION

Lake name: Ship Island Survey date: 7-22-92
 IDFG catalog no.: 07-0610 Primary drainage: Ship Island Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 17 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 10 No. firepits: 10 Litter: l X m h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 7.5 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 16
 Fish/hour: 4 Fish abundance: l m X h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
R1			6		4	2			
C2			2		2				
TOTAL			8		6	2			

Stocking History

Year	Species	Number of fish	Comments
1963	C2	23,000 fry	Mackay
1937	R1	12,000 fry	Salmon

COMMENTS

Anglers reported observing few fish in the lake. Small fish (0-49 mm) were seen near the inlet.

Table 25. Alpine lake survey data for Shoban Lake, 1992.

LAKE LOCATION

Lake name: Shoban Survey date: 7-23-92
 IDFG catalog no.: 07-0619 Primary drainage: Ship Island Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 21 Township: 21 N Range: 16 E Elevation(ft): 9500

USE

No. campsites: 1 No. firepits: 3 Litter: l X m h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 7.5 poor trail(mi) cross country(mi) 1/2
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 2 No. fish caught: 9
 Fish/hour: 4.5 Fish abundance: l X m h

Length Frequency (Angling)

Species	Total Length (mm)								
	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					4	5			
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	1,000 fry	"
1986	C2	1,000 fry	"
1983	C2	1,000 fry	"

COMMENTS

Few fish observed rising in lake. Fish in the 0-49 mm range in the spring inlet. The inlet from Sheepeater Lake has potential spawning habitat. One outlet observed.

Table 26. Alpine lake survey data for Skyhigh Lake, 1992.

LAKE LOCATION

Lake name: Skyhigh Survey date: 7-19-92
 IDFG catalog no.: 07-0787 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 32 Township: 21 N Range: 16 E Elevation(ft): 9500

USE

No. campsites: 2 No. firepits: 2 Litter: l m X h
 Trail around lake: complete partial X trampled yes X no
 Access: good trail(mi) 7 poor trail(mi) cross country(mi) 3/4
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 10
 Fish/hour: 2.5 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					5		5		
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1989	C2	1,000 fry	Mackay
1986	C2	1,000 fry	"
1977	C2	1,000 fry	"
1975	GN	1,000 fry	"

COMMENTS

Lake appeared to be 3 feet below normal level. Good numbers of fish were observed rising. No small fish were observed. Fish caught were in good condition.

Table 27. Alpine lake survey data for Toxaway Lake, 1992.

LAKE LOCATION

Lake name: Toxaway Survey date: 7-22-92
 IDFG catalog no.: 07-1749 Primary drainage: _____
 Secondary drainage: Salmon River County: Custer
 USFS ranger district: SNRA Wilderness area: Sawtooth
 Section: 5 Township: 7 N Range: 12 E Elevation(ft): 9000

USE

No. campsites: 15 No. firepits: 15 Litter: l X m _____ h _____
 Trail around lake: complete _____ partial X trampled _____ yes _____ no _____
 Access: good trail(mi) 7.2 poor trail(mi) _____ cross country(mi) _____
 Trailhead location: Tin Cup Horse, USFS Road # 208

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 3 Hours fished: 2.25 No. fish caught: 0
 Fish/hour: _____ Fish abundance: l _____ m _____ h X

Length Frequency (Gillnet)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
BK				28	91	31			
TOTAL				28	91	31			

Stocking History

Year	Species	Number of fish	Comments
1951	BK	1,750 (35 lbs, 3-5")	Hayspur
1949	BK	1,440 (20 lbs, 3-5")	Hayspur
1941	BK	6,000	Hagerman

COMMENTS

Brook trout were the only species captured; 150 fish with a mean length of 229 mm were collected in gillnets. Gillnet #1 captured 10 fish per hour; gillnet #2 captured 6.1 fish/hour, with a mean catch of 7.1 fish/hour.

Lake has numerous spring fed inlets and one outlet. Small brook trout were observed near inlets.

Table 28. Alpine lake survey data for Welcome Lake, 1992.

LAKE LOCATION

Lake name: Welcome Survey date: 7-18-92
 IDFG catalog no.: 07-0790 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 21 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 2 No. firepits: 2 Litter: l X m h
 Trail around lake: complete X partial trampled yes no
 Access: good trail(mi) 5 poor trail(mi) 10 cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 4 No. fish caught: 25
 Fish/hour: 6.3 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				15	10				
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	1,700 fry	Mackay
1989	C2	3,000 fry	"
1986	R1	2,000 fry	"
1983	R1	2,000 fry	"

COMMENTS

Anglers reported many fish rising. Lake appears to receive little angler/camper use. Fish captured and/or observed were all in 170-220 mm range. Two inlets with potential spawning habitat. One outlet with small fish present.

Table 29. Alpine lake survey data for Wilson Lake, 1992.

LAKE LOCATION

Lake name: Wilson Survey date: 7-21-92
 IDFG catalog no.: 07-0794 Primary drainage: Wilson Creek
 Secondary drainage: Middle Fork Salmon River County: Lemhi
 USFS ranger district: Cobalt Wilderness area: FCRONR
 Section: 21 Township: 21 N Range: 16 E Elevation(ft): 9000

USE

No. campsites: 3 No. firepits: 3 Litter: l X m h
 Trail around lake: complete partial X trampled yes no
 Access: good trail(mi) 1/2 poor trail(mi) cross country(mi)
 Trailhead location: Crags Campground, USFS Road # 114

FISHERY AND FISH POPULATIONS

Creel Survey

No. fishermen: 2 Hours fished: 6 No. fish caught: 20
 Fish/hour: 3.3 Fish abundance: l m X h

Length Frequency (Angling)

Total Length (mm)

Species	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2					20				
TOTAL									

Stocking History

Year	Species	Number of fish	Comments
1992	C2	750 fry	Mackay
1989	C2	1,000 fry	"
1986	C2	1,000 fry	"
1983	C2	1,000 fry	"

COMMENTS

Anglers reported large fish seen but not caught. Few fish observed rising. No spawning gravel present in the inlet.

JOB PERFORMANCE REPORT

STATE OF: Idaho

NAME: Regional Fishery Management
Investigations

PROJECT NO.: F-71-R-17

TITLE: Region 7 Lakes and Reservoirs
Investigations - Williams
Lake and Mosquito Flat Reservoir

JOB NO.: 7-b

PERIOD COVERED: July 1. 1992 to June 30. 1993

ABSTRACT

Gill nets, electrofishing, and trap nets were used to survey the fish communities of Williams Lake and Mosquito Flat Reservoir during 1992. Rainbow trout Oncorhynchus mykiss and bull trout Salvelinus confluentus were the only species captured in Williams Lake, with rainbow trout comprising >90% of the catch. Brook trout comprised >70% of the catch in Mosquito Flat Reservoir, and stocked catchable rainbow trout comprised the balance.

Limnological data collected for Williams Lake indicated low oxygen concentrations may limit fish survival during winter months.

Authors:

Mark Liter
Regional Fishery Biologist

James R. Lukens
Regional Fishery Manager

INTRODUCTION

Williams Lake, a mesotrophic lake, is located in north-central Lemhi County at 1,600 m elevation. The surface area is 927 hectares, maximum depth is 56 m, and mean depth is 23 m. The main source of inflow is Lake Creek, with some inflow from springs and intermittent streams. Rainbow trout Oncorhynchus mykiss and bull trout Salvelinus confluentus are the only fish species in the lake.

Water quality degradation, caused by nutrient input from eroded sediments and leaching of septic systems, may be responsible for the reduction in number and size of fish harvested from Williams Lake (Davis and Reingold 1988). Low winter and summer oxygen concentrations probably limit fish survival. Winter dissolved oxygen concentrations fall below 5 mg/l within 2-4 m of the surface. In summer and winter, dissolved oxygen concentrations of 1 mg/l occur as shallow as 8 m. The Idaho Department of Health and Welfare Division of Environmental Quality (DEQ) selected the consulting firm of Kramer, Chin and Mayo, Inc. to conduct limnological and water quality monitoring and provide restoration alternatives.

Mosquito Flat Reservoir, located on Challis Creek, stores 793 acre-feet of water. The reservoir was built in 1954 and is a popular fishery with local residents. Idaho Department of Fish and Game (IDFG) has rights to 28% of the storage, reserved as a minimum pool. This represents a 222 acre-foot pool with a surface area of approximately 21 acres.

METHODS

Standardized lowland lake surveys were conducted on Williams Lake and Mosquito Flat Reservoir during June 1992. Four floating and four sinking monofilament nets, 150 feet x 6 feet, with six panels ranging from 3/4 inch to 2 1/2 inch bar mesh, were fished for two nights in Williams Lake, equaling eight units of sampling effort. One floating and one sinking net were fished overnight in Mosquito Flat Reservoir for one unit of effort. Each net was set perpendicular to shore with the smallest mesh towards shore.

Electrofishing was conducted on Williams Lake at night and along the shoreline for 2.25 hours of time while the current was on. Electrofishing was conducted for one hour in Mosquito Flat Reservoir. An electrofishing boat with boom-mounted electrodes using approximately 500 volts of pulsed DC current and 3 to 4 amps was used.

Two trap nets with 3 feet x 6 feet frames, 75 feet lead, 3/4 inch bar mesh, and crowfoot throats on the first and third of five hoops were set in Williams Lake and Mosquito Flat Reservoir. Trap nets were fished overnight for two nights equaling four units of effort in Williams Lake and one night in Mosquito Flat Reservoir.

R7DJ7-B

Two limnological stations were selected in Williams Lake; one near the inlet and a second stations at the opposite end of the lake near the outlet. Limnological data collected included Secchi depth, temperature, dissolved oxygen, conductivity, pH, and total alkalinity. A YSI Model 51 dissolved oxygen meter with a temperature probe was used to measure dissolved oxygen and temperature at 1-m intervals to a depth of 10 m, and at 5-m intervals to 30 m.

RESULTS

Williams Lake

A total of 193 fish were collected in gill nets in Williams Lake in June 1992 (Appendix A). Rainbow trout and bull trout were the only species captured, with rainbow comprising 93% of the catch. Rainbow trout lengths ranged from 140-470 mm with a mean length of 303 mm. Bull trout lengths ranged from 170-340 mm with a mean of 255 mm. Catch per unit of gill net sampling effort for the four floating and four sinking gill net combinations ranged from 15 to 37 fish with a mean of 24.1.

A total of 114 fish were collected by electrofishing in Williams Lake on June 3, 1992. Rainbow and bull trout were again the only species captured. Rainbow trout were the most abundant, comprising 98% of the catch. Length frequencies for fish captured by electrofishing were generally smaller than those caught in gill nets. Rainbow trout lengths ranged from 70-115 mm with a mean of 153 mm. Two bull trout were captured that were 180 and 209 mm long. Electrofishing was conducted for 2.25 hours and resulted in a catch rate of 50.7 fish/h.

Due to the steep shoreline and limited success, only two trap nets were set in Williams Lake. The trap nets collected five rainbow trout and one bull trout. The rainbow ranged from 180-390 mm long with a mean length of 299 mm. The one bull trout was 155 mm long. The two trap nets in Williams Lake had catch rates of 0.5 and 2.5 fish/unit of effort.

The combined catch per unit of lowland lake survey effort (one hour electrofishing, one floating and sinking gill net night, and one trap net night) was 76.3 fish.

Mosquito Flat Reservoir

Gill nets were set in Mosquito Flat Reservoir in June 1992 (Appendix B). Brook trout and rainbow trout were the only species captured, with brook trout comprising 70% of the catch. Brook trout lengths ranged from 136-292 mm with a mean length of 223 mm. Rainbow trout lengths ranged from 231-320 mm with a mean of 280 mm. Catch per unit of sampling effort for the one floating and one

sinking gill net combination was 81 fish. Mean catch rates were 1.6 and 0.7 fish/h for brook trout and rainbow trout, respectively.

Electrofishing was conducted for one hour on Mosquito Flat Reservoir during June 1992 and resulted in 169 fish sampled. Brook trout and rainbow trout were the only species captured, with brook trout comprising 98% of the catch. Brook trout lengths ranged from 100-329 mm with a mean length of 180 mm. Rainbow trout lengths ranged from 240-330 mm with a mean length of 280 mm.

Rainbow trout captured in Mosquito Flat Reservoir were survivors from catchable-size fish stocked in 1991. Brook trout have never been stocked in the reservoir and probably migrated downstream from the Challis Creek lakes.

One trap net was set overnight in Mosquito Flat Reservoir during June 1992. Brook trout was the only species captured. A total of 18 fish were collected that averaged 205 mm long. The catch rate was 1.3 fish/h, or 18 fish/unit effort.

The combined catch per unit of lowland lake survey effort was 268 fish.

LITERATURE CITED

Davis, J.A., and M. Reingold. 1988. Regional Fishery Management Investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-12, Job 6(SAL), Job Performance Report, Boise.

A P P E N D I C E S

Appendix A. Summary of standardized survey conducted on Williams Lake, 1992.

WILLIAMS LAKE - NARRATIVE

Williams Lake, a mesotrophic lake, is located in north-central Lemhi County at 5,252 feet in elevation. It has a surface area of 180 acres, a maximum depth of 185 feet, and an average depth of 75 feet. Williams Lake was naturally formed (approximately 6,000 years ago) by a major landslide which blocked Lake Creek. Inlet flow to the lake consists of one permanent stream (Lake Creek), one small spring, and several intermittent streams. There is no surface outlet from the lake; however, a continuous seep through the bottom of the barrier and springs form the continuance of Lake Creek.

Numerous land use activities in the drainage have impacted the water quality of Williams Lake. Grazing, logging, and road building have contributed sediment and nutrients. The eastern third of the lake shoreline is privately owned. Numerous homes and a resort have been built adjacent to the lake. A combination of these nutrient sources have increased algae and macrophyte production. In recent years, there has been growing concern about the water quality degradation of Williams Lake and how this might affect the fish population. The major concern is the relatively limited useable habitat available to trout. Winter dissolved oxygen concentrations fall below 5 mg/l within 6-12 feet of the surface. In 1992, the Idaho Department of Health and Welfare Division of Environmental Quality and a private firm (Kramer, Chin and Mayo, Inc.) began a comprehensive investigation of Williams Lake and the entire Lake Creek drainage to identify nutrient sources (primarily phosphorus and nitrogen).

Rainbow trout and bull trout are the only fish species present in Williams Lake. The Idaho Department of Fish and Game stocked the lake from 1941 to 1984. Since 1984, Williams Lake has been managed as a self-sustaining rainbow trout fishery.

Gill nets, electrofishing, and trap nets were utilized to survey Williams Lake in 1992. Rainbow trout and bull trout were the only species captured in the three gear types, with rainbow trout comprising 98% of the catch. A total of 233 rainbow trout were collected ranging from 3 to 16.5 inches. Based on gillnetting and angler creels, the ratio of bull trout to rainbow trout was an estimated 5:95 in 1965.

Fishing pressure, total harvest, and catch rates have declined steadily over the past 15 years (Davis and Reingold 1988). Artificial aeration or destratification may be the only feasible management options to provide more useable fish habitat during critical periods.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

LIMNOLOGICAL CHARACTERISTICS

(To be measured during July 20 - Sept. 10 period. Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: Williams Lake REGION: 7

DATE: 08 13 1992 PERSON COMPLETING FORM: M. Liter

MINIMUM DATA SET:

Ph; 9.3 6.6 Total alkalinity (mg/l): 56.7 65.0
surface bottom surface bottom

Conductivity (umhos): 0.102
surface

Secchi (m): 3.0 , 3.2 3.1
location 1 location 2 location 3 location 4 mean

Temperature and D.O. profile:
(measured at 1 m increments or 10 depth intervals)

Temperature (C): 20.1 20.0 19.9 19.6 18.9 17.8 15.8 12.5 10.1 8.8

D.O. (ppm): 9.28 9.29 9.27 8.95 8.23 7.50 4.75 1.17 0.31 0.29

Depth (m) : 0 , 2 3 4 5 6 7 8 9 10

Volume of trout habitat (<21 C, >5 ppm D.O.): 5.851.807 cu m

Trout habitat as a percent of full pool volume : 27 %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (ug/l): 2.9 TDS (mg/l): 0.63

Total phosphates (ug/l): 18 304
surface bottom

Nitrate nitrogen (ug/l): <10 10
surface bottom

Zooplankton (no./l >):

MEI (mg/1/m): 0.011 = $\frac{\text{TDS (mg/1)}}{\text{mean depth (m)}}$

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: Williams Lake REGION: 7 DATE: 06/09/1992

*
Catch Per Unit of Combined Gear Sampling Effort
Gamefish Species

Species	Length - Range (mm)	No.	%	Wt. (kg)	%
Rainbow trout	70 - 415	72.1	94.5		
Bull trout	150 - 340	4.2	4.5		
	-				
	-				
	-				
	-				
	-				
	-				
	-				
Gamefish Total		76.3	100		

Nongamefish Species

	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
Nongamefish Total		0			
All Fish Total		76.3			

* One hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

Appendix A. Continued.

LOWLAND LAKES AND RESERVOIRS, FISH SURVEY
SPECIES SUMMARY SHEET*

CATCH COMPOSITION OF (species): Bull trout Date: 06/09/1992

LAKE/RESERVOIR: Williams Lake PERIOD: _____

Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity		Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity	
						M I/M	F I/M							M I/M	F I/M
								280-289		11					
50-59								290-299							
60-69								300-309		7					
70-79								310-319		7					
80-89								320-329							
90-99								330-339		7					
100-109								340-349							
110-119								350-359							
120-129								360-369							
130-139								370-379							
140-149		7						380-389							
150-159								390-399							
160-169								400-409							
170-179		7						410-419							
180-189		7						420-429							
190-199								430-439							
200-209		15						440-449							
210-219								450-459							
220-229		7						460-469							
230-239		7						470-479							
240-249		7						480-489							
250-259								490-499							
260-269		7						500-509							
270-279								TOTAL		* Weighted length frequency					

TOTAL CATCH PER EFFORT OF: Gill net 3.0 Electrofishing 0.9 Trap net 0.3

Appendix A. Continued.

LOWLAND LAKES AND RESERVOIRS. FISH SURVEY
SPECIES SUMMARY SHEET *

CATCH COMPOSITION OF (species): Rainbow trout Date: 06/09/1992

LAKE/RESERVOIR: Williams Lake PERIOD: _____

Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity		Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity	
						M I/M	F I/M							M I/M	F I/M
								280-289		2					
50-59								290-299		1					
60-69								300-309		1					
70-79		4						310-319		4					
80-89		2						320-329		4					
90-99		7						330-339		6					
100-109		6						340-349		3					
110-119		8						350-359		3					
120-129		6						360-369		3					
130-139		5						370-379		3					
140-149		1						380-389		3					
150-159		3						390-399		2					
160-169		3						400-409		1					
170-179		<1						410-419		1					
180-189		1						420-429		<1					
190-199		<1						430-439							
200-209		1						440-449		<1					
210-219		<1						450-459							
220-229		3						460-469		<1					
230-239		1						470-479							
240-249		2						480-489							
250-259		1						490-499							
260-269		1						500-509							
270-279		2						TOTAL		* Weighted length frequency					

TOTAL CATCH PER EFFORT OF: Gill net 21.1 Electrofishing 49.8 Trap net 1.3

Appendix B. Summary of standardized survey conducted on Mosquito Flat Reservoir, 1992.

MOSQUITO FLAT RESERVOIR - NARRATIVE

Mosquito Flat Reservoir is an irrigation reservoir located on Challis Creek approximately 10 miles west of Challis. At full pool, the reservoir is approximately 46 acres with a capacity of 793 acre-feet. In 1984, 28% of the reservoir volume was donated to the Department for maintenance of fish populations.

Previous surveys were limited to angler interviews in 1988 and gillnetting in 1979. In July 1988, 27 anglers were interviewed that expended 71.5 hours to catch 44 catchable rainbow trout and 1 brook trout for a catch rate of 0.6 fish/h. In May 1979, two sinking gill nets were fished overnight for 34 hours. The catch included 7 rainbow trout that averaged 13.5 inches and 35 brook trout that averaged 9.2 inches.

The current survey was conducted on June 2 and 3, 1992. A sinking gill net, a floating gill net, and a trap net were fished overnight. We also conducted one hour of nighttime electrofishing. Total sampling effort yielded 244 brook trout which averaged 7.5 inches and 28 rainbow trout which averaged 11.0 inches.

Considering the large number of small brook trout in the reservoir, the fishery may benefit by the introduction of a predator species such as bull trout. Another management option would be an evaluation of put-grow-and-take rainbow releases.

LOWLAND LAKES AND RESERVOIRS
STANDARD DATA BASE

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: Mosquito Flat Res. REGION: 7 DATE: 06/02/1992

*
Catch Per Unit of Combined Gear Sampling Effort

Gamefish Species

Species	Length - Range (mm)	No.	%	Wt. (kg)	%
Rainbow trout	230 - 330	28	10		
Brook trout	100 - 329	240	90		
	-				
	-				
	-				
	-				
	-				
	-				
Gamefish Total		268			

Nongamefish Species

	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
Nongamefish Total		0			
All Fish Total		268			

* One hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

Appendix B. Continued.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF (species): Rainbow trout Date: 06/02/1992

LAKE/RESERVOIR: Mosquito Flat Reservoir PERIOD: _____

Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity		Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity	
						M I/M	F I/M							M I/M	F I/M
								280-289	7	25					
50-59								290-299	3	11					
60-69								300-309	1	4					
70-79								310-319	1	4					
80-89								320-329	2	7					
90-99								330-339							
100-109								340-349							
110-119								350-359							
120-129								360-369							
130-139								370-379							
140-149								380-389							
150-159								390-399							
160-169								400-409							
170-179								410-419							
180-189								420-429							
190-199								430-439							
200-209								440-449							
210-219								450-459							
220-229								460-469							
230-239	1	4						470-479							
240-249	3	11						480-489							
250-259								490-499							
260-269	6	21						500-509							
270-279	4	14						TOTAL	28						

TOTAL CATCH PER EFFORT OF: Gill net 24 Electrofishing 4 Trap net _____

Appendix B. Continued.

LOWLAND LAKES AND RESERVOIRS FISH SURVEY
SPECIES SUMMARY SHEET

CATCH COMPOSITION OF (species): Brook trout Date: 06/02/1992

LAKE/RESERVOIR: Mosquito Flat Reservoir PERIOD: _____

Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity		Length range (mm)	#/unit effort	%	Mean wt (gm)	Wr	Age(s)	Maturity	
						M I/M	F I/M							M I/M	F I/M
								280-289	4	2					
50-59								290-299	3	1					
60-69								300-309							
70-79								310-319							
80-89								320-329	1	<1					
90-99								330-339							
100-109	10	4						340-349							
110-119	7	3						350-359							
120-129	5	2						360-369							
130-139	16	7						370-379							
140-149	18	7						380-389							
150-159	20	8						390-399							
160-169	12	5						400-409							
170-179	15	6						410-419							
180-189	12	5						420-429							
190-199	17	7						430-439							
200-209	14	6						440-449							
210-219	19	8						450-459							
220-229	28	11						460-469							
230-239	18	7						470-479							
240-249	8	3						480-489							
250-259	6	2						490-499							
260-269	9	4						500-509							
270-279	2	1						TOTAL	244						

TOTAL CATCH PER EFFORT OF: Gill net 57 Electrofishing 169 Trap net 18

JOB PERFORMANCE REPORT

STATE OF: Idaho

NAME: Regional Fishery Management
Investigations

PROJECT NO.: F-71-R-17

TITLE: Region 7 Rivers and Streams
Investigations - Salmon River
and Middle Fork Salmon River
Snorkeling Transects

JOB NO.: 7-c¹

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

Mean densities of cutthroat trout Oncorhynchus clarki, rainbow/steelhead trout O. mykiss, and chinook salmon O. tshawytscha counted in the Middle Fork Salmon River (MFSR) transects in 1992 were 0.6, 0.07, and 0.2 fish/100 m², respectively. In MFSR tributary transects, cutthroat trout averaged 0.7/100 m², rainbow/steelhead densities averaged 1.8/100 m², and chinook averaged 0.4/100 m².

In Salmon River *canyon* tributaries (Horse, Bargamin, Chamberlain, and Sheep creeks), fish densities were 0.6 cutthroat trout/100 m², 4.4 rainbow/steelhead trout/100 m², and 0.2 chinook salmon/100 m².

Authors:

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Regional Fishery Manager

Mark Liter
Regional Fishery Biologist

INTRODUCTION

The Middle Fork Salmon River (MFSR), part of the Wild and Scenic Rivers System, flows through a remote area in east-central Idaho. All of the mainstem is within the Frank Church River of No Return Wilderness Area. The Middle Fork originates at the confluence of Bear Valley and Marsh creeks near Cape Horn Mountain. The river flows 171 km to its confluence with the main Salmon River 92 km downstream from Salmon, Idaho (Figure 1).

Road access exists to Dagger Falls and the Salmon River confluence. Headwaters of some tributaries are accessible via primitive roads. The lower 156 km of the Middle Fork is accessible only by aircraft, float boats, or horse/foot trails. The MFSR is a major recreational river that offers a wide variety of outdoor and backcountry opportunities. The number of people floating the river has increased from 625 in 1962 to 9,627 in 1992 (U.S. Forest Service data).

The earliest MFSR fishery study was conducted in 1959 and 1960 and evaluated westslope cutthroat trout Oncorhynchus clarki lewisi life history and seasonal movements (Mallet 1963). In 1971, additional studies were initiated to monitor MFSR cutthroat trout abundance and to evaluate catch-and-release regulations which were established in 1972. Similar regulations were adopted for major tributaries in the early and mid-1980s.

Part of the studies initiated in 1971 included establishment of snorkeling transects which were surveyed periodically (Corley 1972; Jeppson and Ball 1977, 1979). In 1981, a project was initiated on the Middle Fork to evaluate wild steelhead trout O. mykiss (Thurow 1982, 1983, 1985). In 1985, another study was initiated to determine juvenile steelhead, chinook salmon O. tshawytscha, and cutthroat trout densities in the Middle Fork and its tributaries (Reingold and Davis 1987a, 1987b, 1988; Lukens and Davis 1989; Davis et al. 1992; Schrader and Lukens 1992; Liter and Lukens 1992).

This report is a continuation of the 1985 study and presents data collected in July 1992 pertaining to fish densities in the Middle Fork Salmon River drainage and five Salmon River tributaries.

OBJECTIVES

1. To monitor juvenile steelhead trout and chinook salmon densities within the Middle Fork, its tributaries, and Salmon River tributaries.
2. To monitor the effect of catch-and-release regulations on resident fish populations in the MFSR drainage, particularly cutthroat trout.

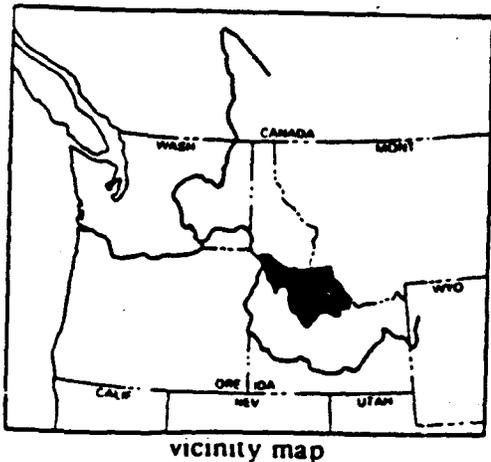
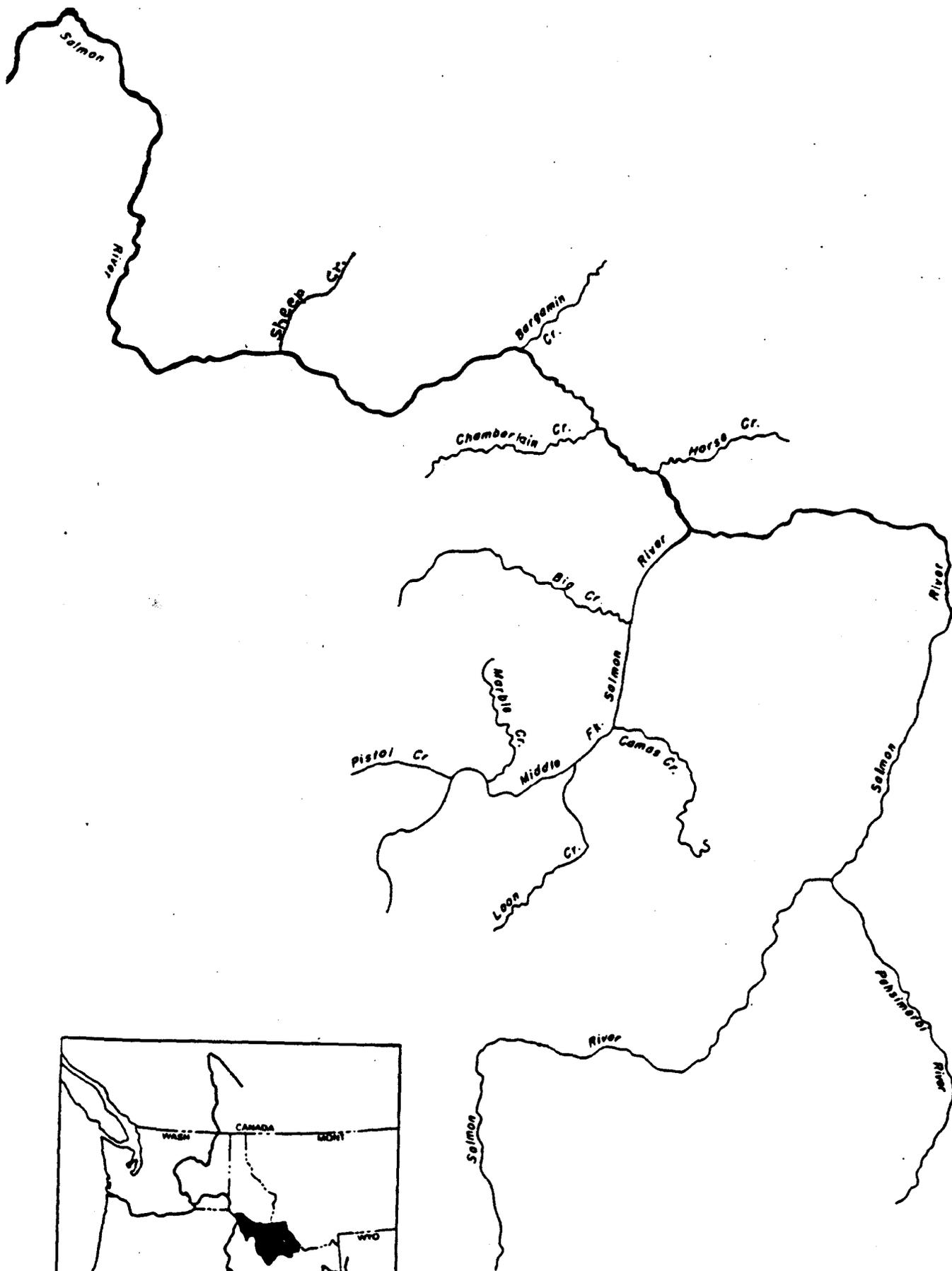


Figure 1. Map of the MFSR, main Salmon River and tributaries where snorkeling surveys are conducted.

METHODS

In 1992, 17 of 29 MFSR transects (Table 1), 5 of 7 MFSR tributary transects (Table 2), and 8 Salmon River tributary transects (Table 3) were surveyed via snorkeling. The upper seven MFSR transects and the two Pistol Creek transects were not snorkeled because low water precluded floating that portion of the river. The lower four MFSR transects were not snorkeled due to severe rainstorms which increased turbidity. The MFSR and tributary transects were snorkeled July 15 to 20, and the Salmon River tributary transects July 6 and 7.

The techniques used to survey these transects are described by Reingold and Davis (1987a, 1987b) and Scully et al. (1990).

Project angling was conducted throughout the mainstem MFSR below Indian Creek utilizing conventional fly fishing gear to further evaluate fish species and length compositions.

All data was compared to previous information to identify trends.

RESULTS

Middle Fork Salmon River Snorkeling Transects

The total number of cutthroat trout, juvenile rainbow/steelhead, and juvenile chinook salmon counted in MFSR transects were 89, 8, and 12, respectively (Table 4). Mean densities were 0.6, 0.07, and 0.2 fish/100 m² for cutthroat trout, rainbow/steelhead, and chinook salmon, respectively (Table 5).

Middle Fork Salmon River Tributary Snorkeling Transects

Juvenile rainbow/steelhead densities ranged from 0-3.5 fish/100 m² and averaged 1.8 (Table 6). Mean juvenile chinook density was 0.4 fish/100 m² and ranged from 0-1.4. Cutthroat trout densities averaged 0.7 fish/100 m² and ranged from 0-1.3.

Salmon River Tributary Transects

The rainbow/steelhead observed in Horse, Chamberlain, Bargamin, and Sheep creeks were predominantly juvenile steelhead. These tributaries may provide spawning and rearing habitat for the only significant population of wild upper Salmon River A-strain steelhead. Rainbow/steelhead densities ranged from 2.0-8.6 fish/100 m² and averaged 4.4 (Table 7).

Table 1. Locations and dimensions of Middle Fork Salmon River snorkeling transects, July 1992.

Fish Type ^a	Location (river km) ^b	Transect name	Length (m)	Visibility (m)	Visible		Area (m ²)	Passes
					corridor	(m)		
Sh	0.3	Boundary	--	--	--	--	--	--
Ct/Ck	4.3	Gardell's Hole	--	--	--	--	--	--
Ct/Ck	8.8	Velvet	--	--	--	--	--	--
Sh	13.6	Elkhorn	--	--	--	--	--	--
Sh	21.3	Sheepeater	--	--	--	--	--	--
Ct/Ck	24.5	Greyhound	--	--	--	--	--	--
Sh	29.6	Rapid River	--	--	--	--	--	--
Sh	40.0	Indian	260	2.3	9.2	2,392	2	
Ct/Ck	44.3	Pungo	86	2.0/2.5	9.0	774	2	
Ct/Ck	51.0	Marble Pool	171	2.7	10.8	1,847	2	
Sh	52.3	Ski-jump	78	2.3	4.6	359	1	
Ct/Ck	60.6	Lower Jackass	266	2.5	5.0	1,330	1	
Sh	64.6	Cougar	110	2.1	8.4	924	2	
Ct/Ck	73.9	Whitey Cox	95	1.7	3.4	323	1	
Sh	74.1	Rock Island	110	1.5	3.0	330	1	
Ct/Ck"	82.9	Hospital Pool	96	1.4	5.6	538	2	
Sh	84.3	Hospital Run	160	1.9	3.8	608	1	
Ct/Ck	92.6	Tappan Pool	103	2.9	11.6	1,195	2	
Sh	92.8	Lower Tappan Run				--	--	
Ct/Ck	106.6	Flying B	110	2.3	9.2	1,012	2	
Sh	108.6	Airstrip	95	2.2	8.8	836	2	
Sh	119.7	Survey	125	2.8	11.2	1,400	2	
Ct/Ck	124.6	Big Creek Bridge	110	2.3	9.2	1,012	2	
Sh	127.8	Love Bar	90	2.4	9.6	864	2	
Ct/Ck	135.8	Ship Island	130	2.0	8.0	1,040	2	
Sh	144.0	Little Ouzel	--	--	--	--	--	
Ct/Ck	144.6	Otter Bar	--	--	--	--	--	
Ct/Ck	151.5	Goat Creek Pool	--	--	--	--	--	
Sh	151.8	Goat Creek Run	--	--	--	--	--	

^a Sh-steelhead, Ct-cutthroat, Ck-chinook salmon.

^b River km starts at Dagger Falls.

Table 2. Middle Fork Salmon River tributary transects.

Transect name	Location
Pistol Creek #1 (lower)	At mile marker 16
Pistol Creek #2 (upper)	Above mile marker 16
Marble Creek	Above pack bridge
Loon Creek #1 (lower)	Below pack bridge
Loon Creek #2 (upper)	400 yards above pack bridge
Camas Creek	From pack bridge downstream
Big Creek	400 yards above mouth

Table 3. Main Salmon River tributary transects.

Transect name	Location
Horse Creek #1 (bridge)	50 yards above bridge
Horse Creek #2	150 yards above bridge
Chamberlain #1 (mouth)	400 yards above mouth
Chamberlain #2 (run)	500 yards above mouth
Bargamin Creek #1	1/4 mile above mouth
Bargamin Creek #2 Sheep	At trail flat above #1
Creek #1 Sheep Creek #2	Below pack bridge
	300 yards above pack bridge

Table 4. Total number of cutthroat trout, rainbow/steelhead, and chinook salmon, by length group (mm), and other fish species counted in the Middle Fork Salmon River transects, July 1992.

Transects	Cutthroat					Rainbow/steelhead				Chinook		Bull trout	White-fish	Other ^a
	<75	75-150	150-230	230-300	>300	75-150	150-230	230-300	>300	Age 0	Age 1			
Boundary	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gardell's Hole	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Velvet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Elkhorn	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sheepsteater	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Greyhound	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rapid River	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indian	0	1	1	12	17	0	1	0	0	0	0	0	49	2
Pungo	0	0	3	5	6	0	1	0	0	0	0	0	6	10
Marble Poole	0	0	1	5	10	0	0	0	0	0	0	0	13	3
Ski-jump	0	0	1	3	1	1	0	0	0	0	0	0	13	0
Lower Jackass	0	0	0	1	0	0	0	0	0	0	0	0	4	0
Cougar	0	0	0	0	0	0	1	0	0	0	0	0	4	0
Whitey Cox	0	0	0	0	0	0	1	0	0	1	0	0	0	0
Rock Island	2	0	0	1	7	0	0	0	0	0	10	0	11	4
Hospital Pool	0	0	0	0	0	0	1	0	0	0	0	0	0	4
Hospital Run	0	0	0	0	0	0	0	0	0	0	0	0	4	0
Tappan Pool	0	0	0	0	1	0	0	0	0	0	0	0	0	0
L. Tappan Run	0	-	-	-	-	-	-	-	-	-	-	-	-	-
Flying B	0	1	0	4	0	0	0	0	0	0	0	0	1	3
Airstrip	0	0	0	0	0	1	0	0	0	0	0	0	3	0
Survey	0	0	1	1	1	0	0	0	0	0	0	0	9	8
Big Cr. Bridge	0	0	0	0	0	0	0	0	0	0	0	0	3	2
Love Bar	0	0	0	0	0	0	0	0	0	1	0	0	4	5
Ship Island	0	0	0	2	1	0	0	0	1	0	0	0	1	2
Little Ouzel	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Otter Bar	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goat Cr. Pool	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goat Cr. Run	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Column Total	2	2	7	34	44	2	5	0	1	2	10	0	125	43
Grand Total			89				8			12				

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Table 5. Densities of cutthroat trout, rainbow/steelhead trout, and chinook salmon (fish/100 m²) in the Middle Fork Salmon River transects, July 1992.

Transect	Cutthroat	Rainbow/ steelhead	Chinook	Total fish ^a
Boundary	--	--	--	--
Gardell's Hole	--	--	--	--
Velvet	--	--	--	--
Elkhorn	--	--	--	--
Sheepeater	--	--	--	--
Greyhound	--	--	--	--
Rapid River	--	--	--	--
Indian	1.3	0.04	0	3.5
Pungo	1.8	0.1	0	4.0
Marble Pool	0.9	0	0	1.7
Ski-jump	1.4	0.3	0	5.3
Lower Jackass	0.08	0	0	0.4
Cougar	0	0.1	0	0.5
Whitey Cox	0	0.3	0.3	0.6
Rock Island	3.0	0	3.0	10.6
Hospital Pool	0	0.2	0	0.9
Hospital Run	0	0	0	0.7
Tappan Pool	0.08	0	0	0.08
L. Tappan Run				
Flying B	0.5	0		0.9
Airstrip	0	0.1	0	0.5
Survey	0.2	0	0	1.4
Big Creek Bridge	0	0	0	0.5
Love Bar	0	0	0.1	1.2
Ship Island	0.3	0.1	0	0.7
Little Ouzel	--	--	--	--
Otter Bar	--	--	--	--
Goat Creek Pool	--	--	--	--
Goat Creek Run	--	--	--	--
Average	0.6	0.07	0.2	2.0

^aTotal fish also includes suckers, squawfish, shiners, whitefish, and bull trout.

Table 6. Number of rainbow/steel head and cutthroat trout by length group (mm), juvenile chinook salmon, and miscellaneous species (Wf=whitefish, Bt=bull trout) counted in the Middle Fork Salmon River tributary transects, July 1992.

Location	Area (m ²)	Rainbow/steel head					Cutthroat				Chinook				
		<75	75-150	150-230	230-300	Rb/100 m ²	75-150	150-230	230-300	>300	Ct/100 m ²	Ave 0	Ck/100 m ²	Wf	Bt
Pistol Creek #1 (lower)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pistol Creek #2 (upper)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Marble Creek	748	0	0	0	0	0	1	0	0	0	0.1	0	0	0	0
Loon Creek #1 (lower)	370	0	6	1	0	1.9	0	2	0	1	0.8	5	1.4	6	0
Loon Creek 02 (upper)	395	3	3	8	0	3.5	0	1	3	1	1.3	1	0.3	1	0
Camas Creek	662	0	6	5	1	1.8	2	2	2	2	1.2	1	0.2	21	0
Big Creek	974	4	5	9	1	2.0	0	0	0	0	0	2	0.1	22	0
Mean						1.8					0.7		0.4		
Weighted Mean						1.7					0.5		0.3		

Table 7. Number of rainbow/steel head and cutthroat trout, by length group (mm), juvenile chinook salmon, and miscellaneous species (Bt=bull trout, Wf=whitfish) counted in Salmon River tributary transects, July 1992.

Location	Area (m ²)	Rainbow/steel head					Cutthroat					Chinook			Wf	Bt	
		<75	75- 150	150- 230	230- 300	>300	Rb/ 100 m ²	75- 150	150- 230	230- 300	>300	Ct/ 100 m ²	Age 0	Age 1			Ck/ 100 m ²
Horse Creek #1 (bridge)	493	0	5	7	3	0	3.0	4	4	1	0	1.8	1	0	0.2	0	24
Horse Creek #2	532	0	6	16	8	1	5.8	0	5	3	2	1.9	3	1	0.8	0	39
Chamberlain Creek #1 (mouth)	395	0	4	4	0	0	2.0	1	1	0	0	0.5	1	0	0.3	0	22
Chamberlain Creek #2 (run)	442	2	1	8	0	0	2.5	0	0	0	0	0	0	0	0	0	19
Bargamin Creek #1	378	0	11	10	0	0	5.6	0	0	0	0	0	0	0	0	0	3
Bargamin Creek #2	557	0	32	16	0	0	8.6	0	2	0	0	0.4	0	0	0	0	3
Sheep Creek #1	308	0	2	9	2	0	4.2	0	1	0	0	0.3	0	0	0	0	10
Sheep Creek #2	183	0	0	7	0	0	3.8	0	0	0	0	0	0	0	0	0	7
Mean							4.4					0.6			0.2		
Weighted Mean							4.7					0.7			0.2		

Chinook densities were low and ranged from 0 to 0.8 fish/100 m². Cutthroat trout densities ranged from 0 to 1.9 fish/100 m².

Protect Analing

Idaho Department of Fish and Game project anglers caught 98 fish which were comprised of rainbow/steelhead (42.9%), cutthroat trout (54.1%), and whitefish and suckers (3.0%) (Figure 2). The cutthroat trout averaged 276 mm and the rainbow/steelhead 173 mm.

DISCUSSION

Middle Fork Salmon River Snorkeling Transects

Steelhead densities were the lowest observed since 1981, when current snorkeling methodologies were first utilized (Figure 3). This downward trend has probably resulted from poor downstream migration conditions for smolts which resulted in reduced adult spawning escapement.

Despite extremely small numbers, 1992 was the first year since 1990 that chinook were observed in mainstem MFSR transects (Figure 4). This was despite a slight decrease in the number of redds counted in index streams the previous year (Figure 5).

The density of cutthroat trout, counted in cutthroat/chinook transects, decreased from 1991 to 1992, while densities for all transects combined increased (Figure 6). The density of cutthroat trout larger than 300 mm has remained fairly stable since 1985.

In 1971, when snorkeling transects were first established, and specifically for cutthroat trout, observed numbers were low (Figure 7). Following establishment of catch-and-release regulations for the mainstem MFSR in 1972, cutthroat trout numbers increased and appeared to peak in the early to mid-1980s. The trend has been a general decline with very low numbers observed the last three years. While fishing pressure and resulting hooking mortality in the MFSR probably are not limiting cutthroat abundance (LITER and LUKENS 1992), other factors may be involved: low levels of precipitation have resulted in approximately seven consecutive years of drought; despite regulation protection, it is possible that cutthroat trout are being lost in the main Salmon River overwintering area due to intense catch-and-release pressure by steelhead anglers, non-compliance, or inadequacy of the protected area; and regulation noncompliance by anglers fishing the MFSR.

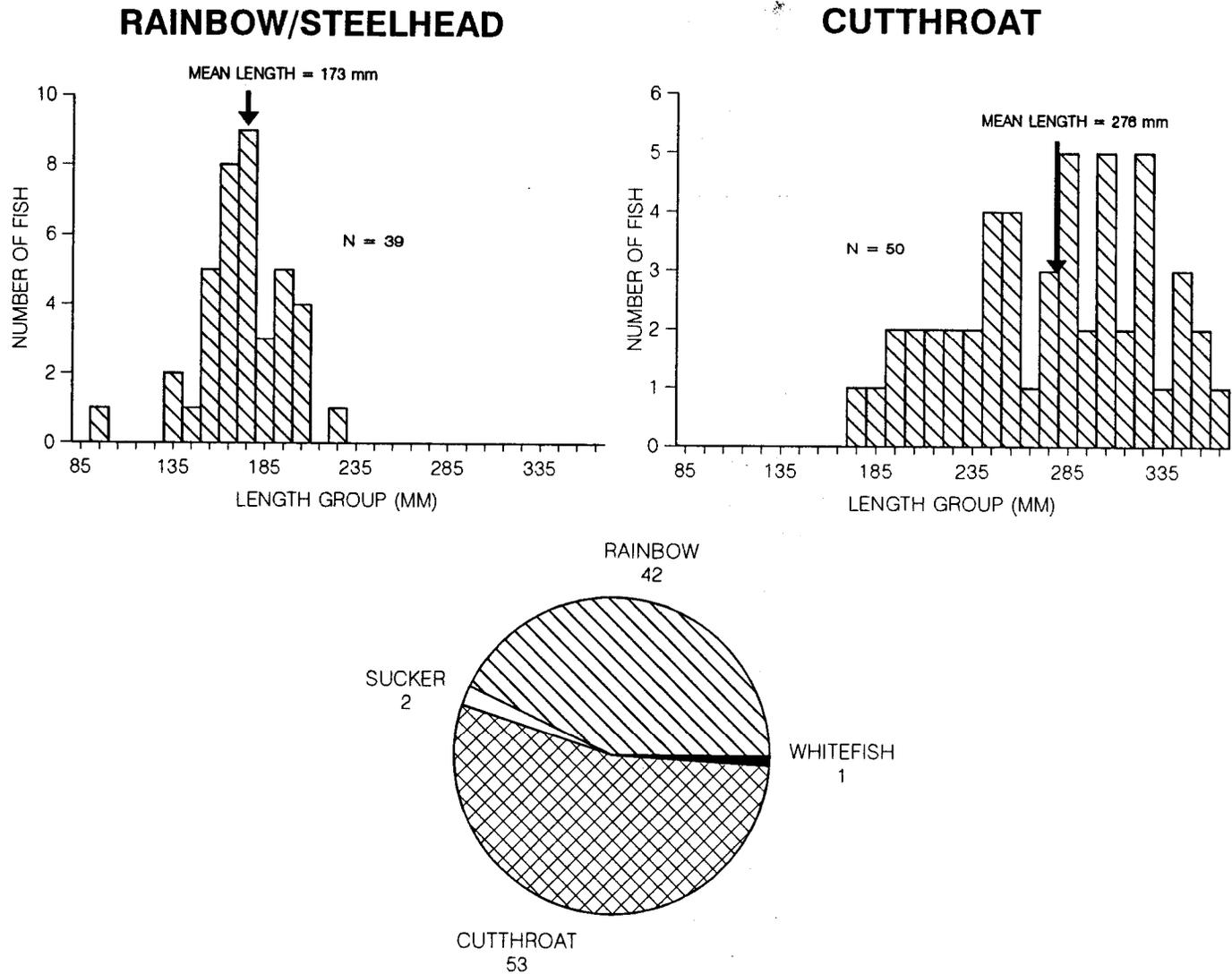


Figure 2. Species composition of fish caught by Department project anglers and length frequency of cutthroat trout and rainbow/steelhead, July 1992.

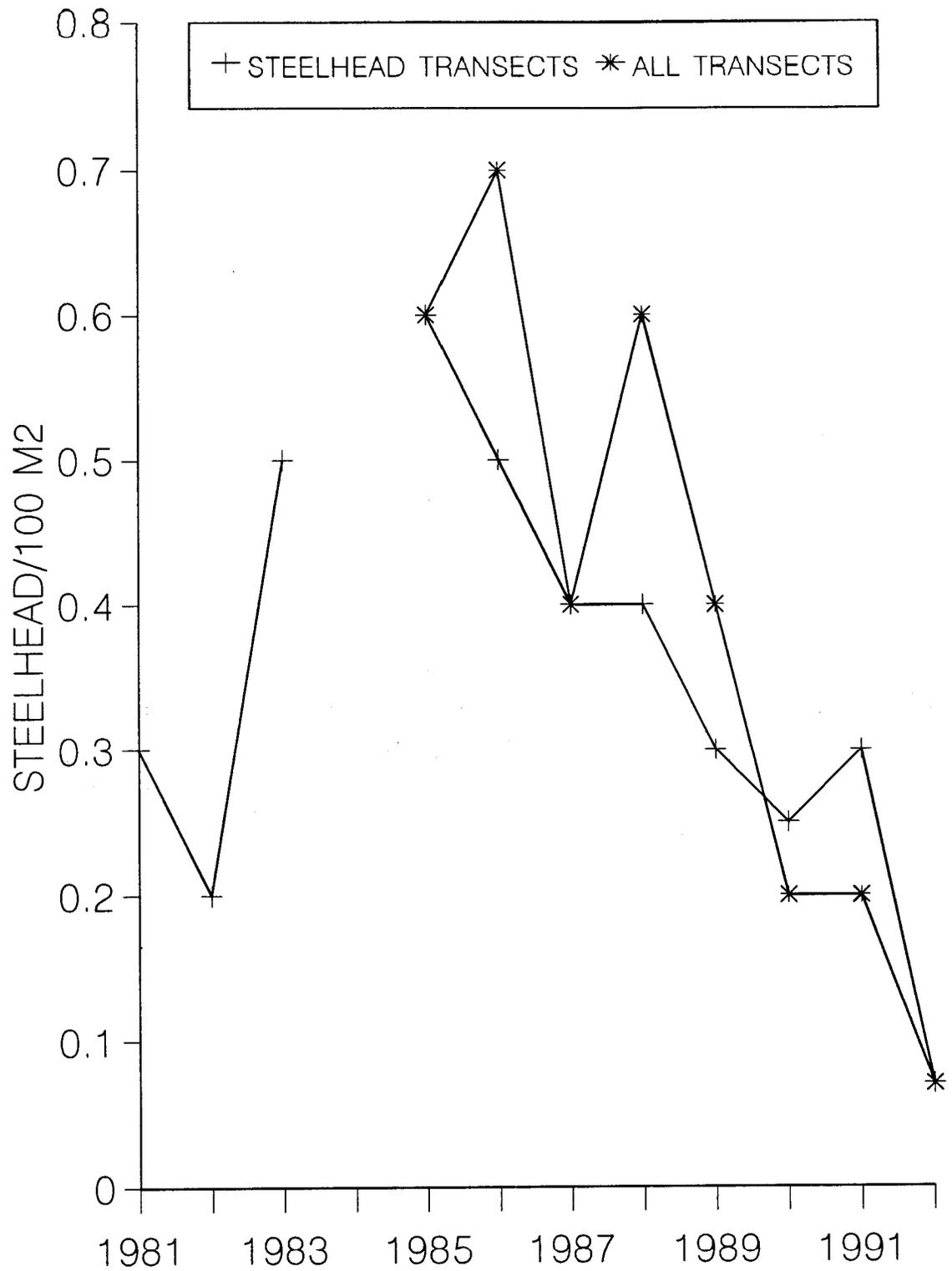


Figure 3. Densities of juvenile steelhead counted in all MFSR snorkeling transects and in steelhead only transects (see Table 1), 1981-92. Data for 1981-83 from Thurow (1982, 1983, 1985).

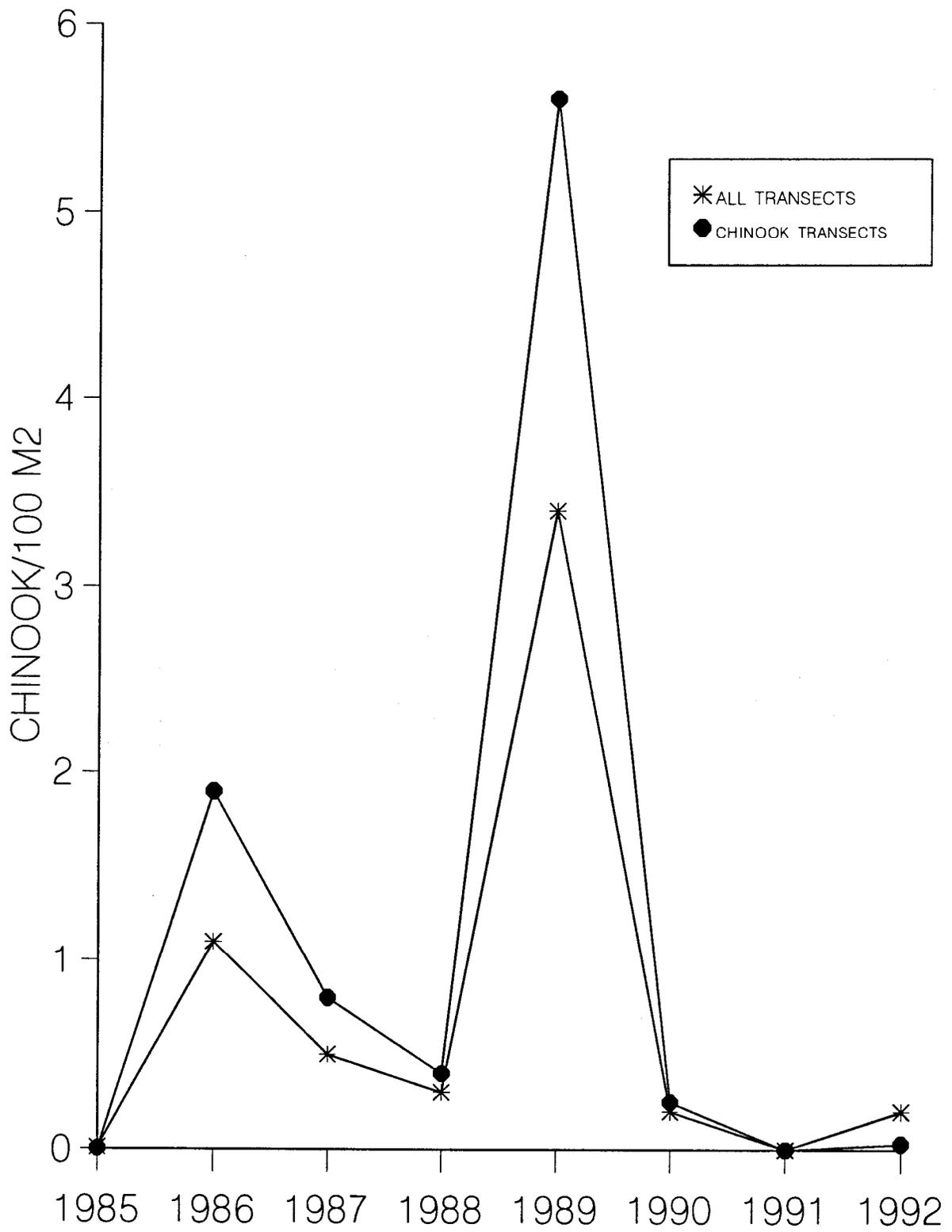


Figure 4. Densities of chinook salmon counted in all MFSR transects and in chinook/cutthroat only transects (see Table 1), 1985-92.

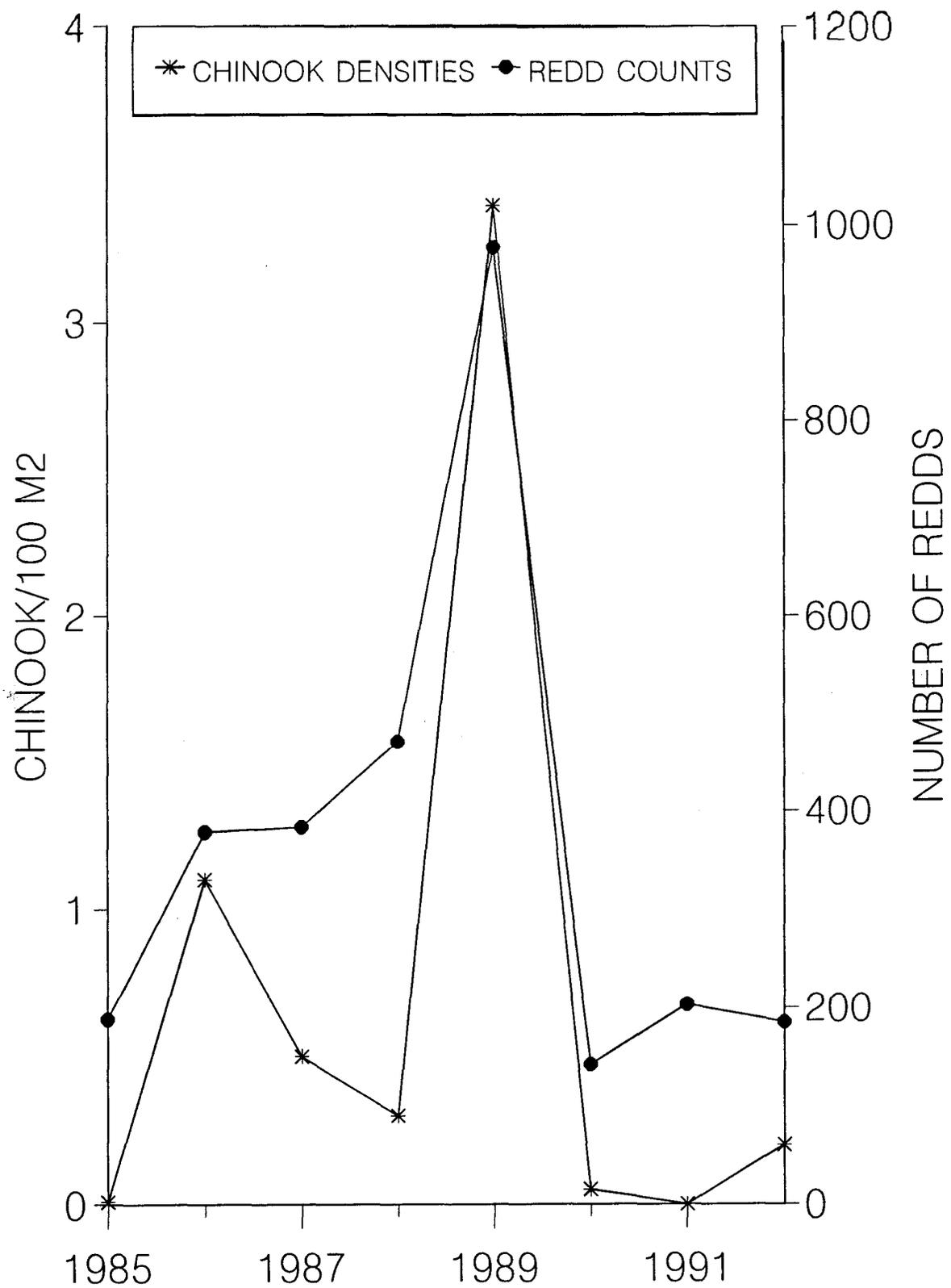


Figure 5. Densities of chinook salmon counted in all MFSR transects, 1985-92 and chinook redd counts in key MFSR tributary index areas for corresponding year classes (White and Cochnauer 1989; Idaho Department of Fish and Game, unpublished data).

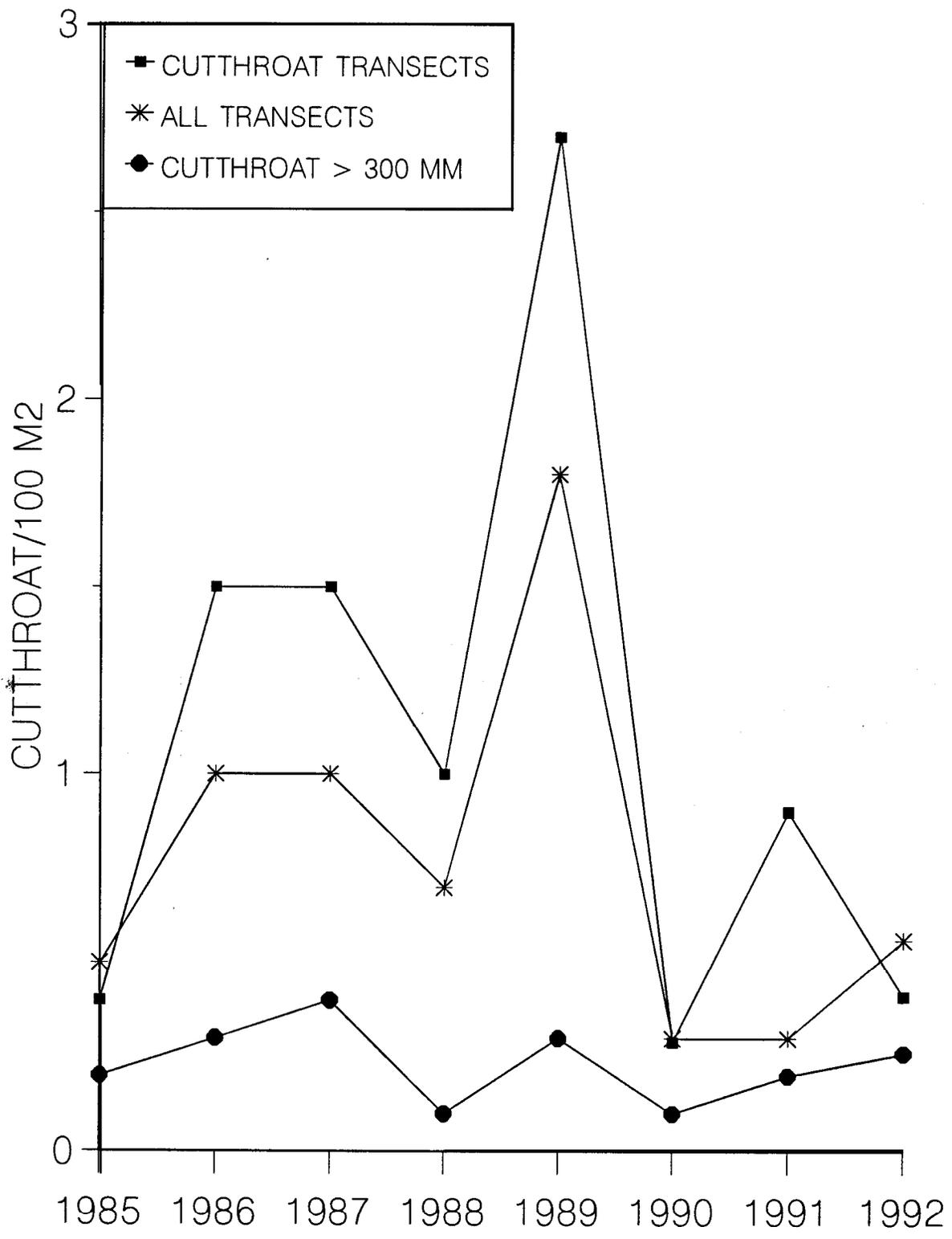


Figure 6. Densities of cutthroat trout counted in all MFSR transects, in cutthroat/chinook only transects (see Table 1) and of cutthroat trout larger than 300 mm in all transects, 1985-92.

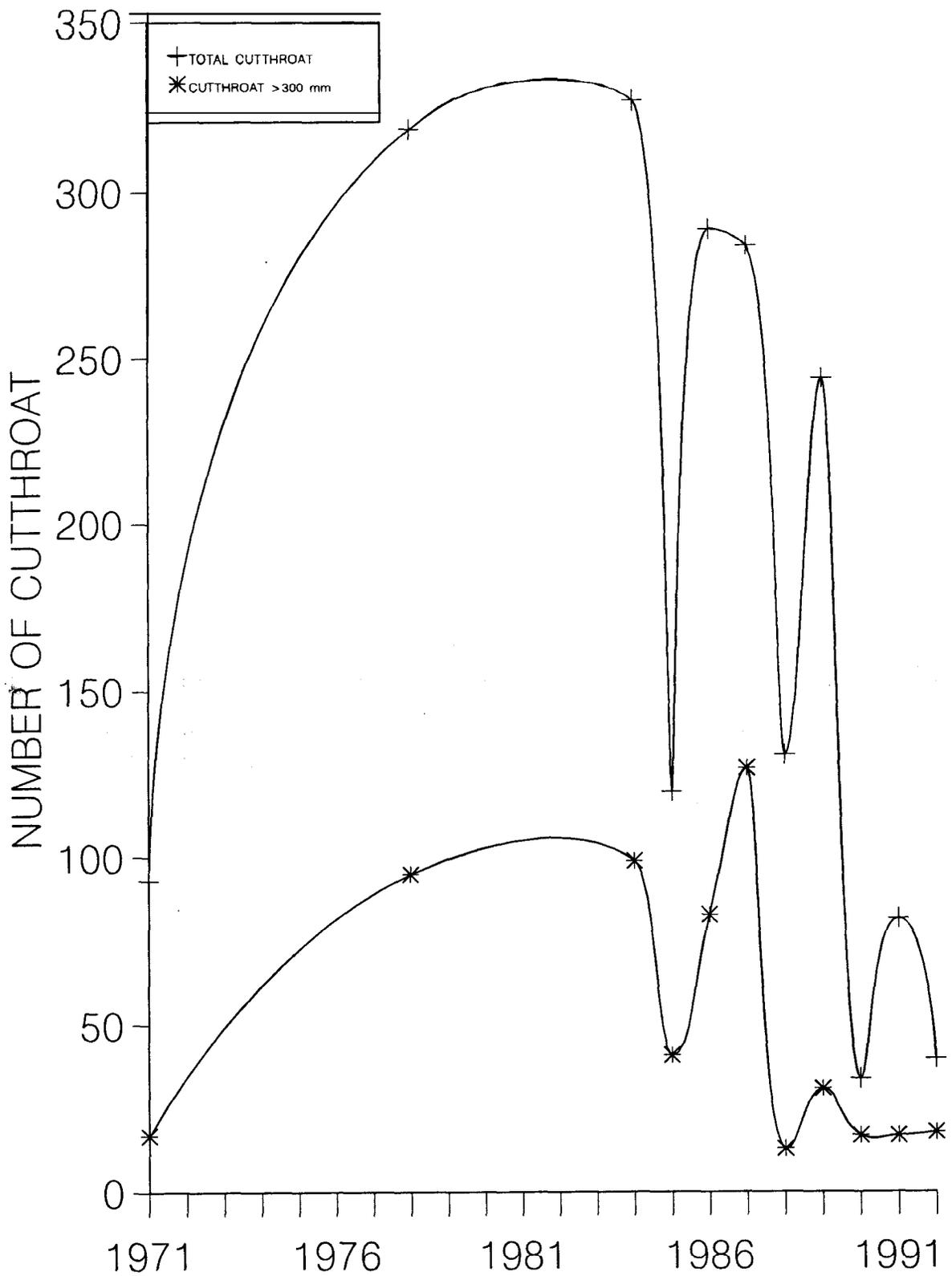


Figure 7. Numbers of cutthroat trout counted in traditional MFSR snorkeling transects (Pungo, Marble Pool, L. Jackass, Whitey Cox, Hospital Pool, Tappan Pool, Flying B, Big Creek Bridge, Ship Island, Otter Bar, and Goat Creek Pool), 1971-92. Otter Bar and Goat Creek Pool not counted in 1992.

Middle Fork Salmon River Tributary Snorkeling Transects

From 1991 to 1992, cutthroat densities decreased in three of the four transects snorkeled (Figure 8). Camas Creek was the exception where densities increased from 0.7 to 1.2 fish/100 m². These changes probably reflect no more than normal yearly fluctuations, particularly those which can be detected by the snorkeling techniques utilized. Densities observed in Camas and Loon creeks were similar to average densities observed since 1981.

Chinook densities increased in three of the four tributaries snorkeled. No chinook were observed in the Marble Creek transect; however, chinook have not been observed in this tributary since the transects were established in 1985. This is probably due to the lack of suitable spawning habitat in this stream. Chinook densities have been low in all the MFSR tributaries snorkeled since 1990.

Steelhead densities decreased in Big and Camas creeks, remained at zero in Marble Creek, and increased in Loon Creek. Densities in all tributaries were low in 1991 and 1992 compared to previous years. Juvenile steelhead densities, like chinook, are heavily influenced by yearly spawner escapement.

Salmon River Tributary Snorkeling Transects

The Salmon River tributary transects were established primarily to monitor juvenile steelhead densities. From 1991 to 1992, steelhead densities declined in three of the four tributaries snorkeled (Figure 9). Bargamin Creek was the exception when densities nearly doubled. Since 1985, steelhead densities in each of the four tributaries have declined gradually but steadily.

The Salmon River tributaries have not traditionally supported the densities of cutthroat trout or chinook like the MFSR tributaries. From 1991 to 1992, chinook densities remained at zero in Bargamin Creek, decreased in Sheep and Chamberlain creeks, and increased approximately two-fold in Horse Creek. Cutthroat trout numbers decreased in each of the four tributaries.

Protect Angling

Prior to the establishment of catch-and-release regulations in 1972, the proportion of cutthroat trout larger than 300 mm caught by project anglers was approximately 20% (Figure 10). This proportion has fluctuated yearly, but has averaged 43% since. The proportion of large cutthroat trout caught in 1992 (38%) was the smallest since 1976. This fluctuation is probably the result of variation in sample timing and fish migration patterns.

Since the regulation change, the average length of creel fish has also increased slightly (17 mm).

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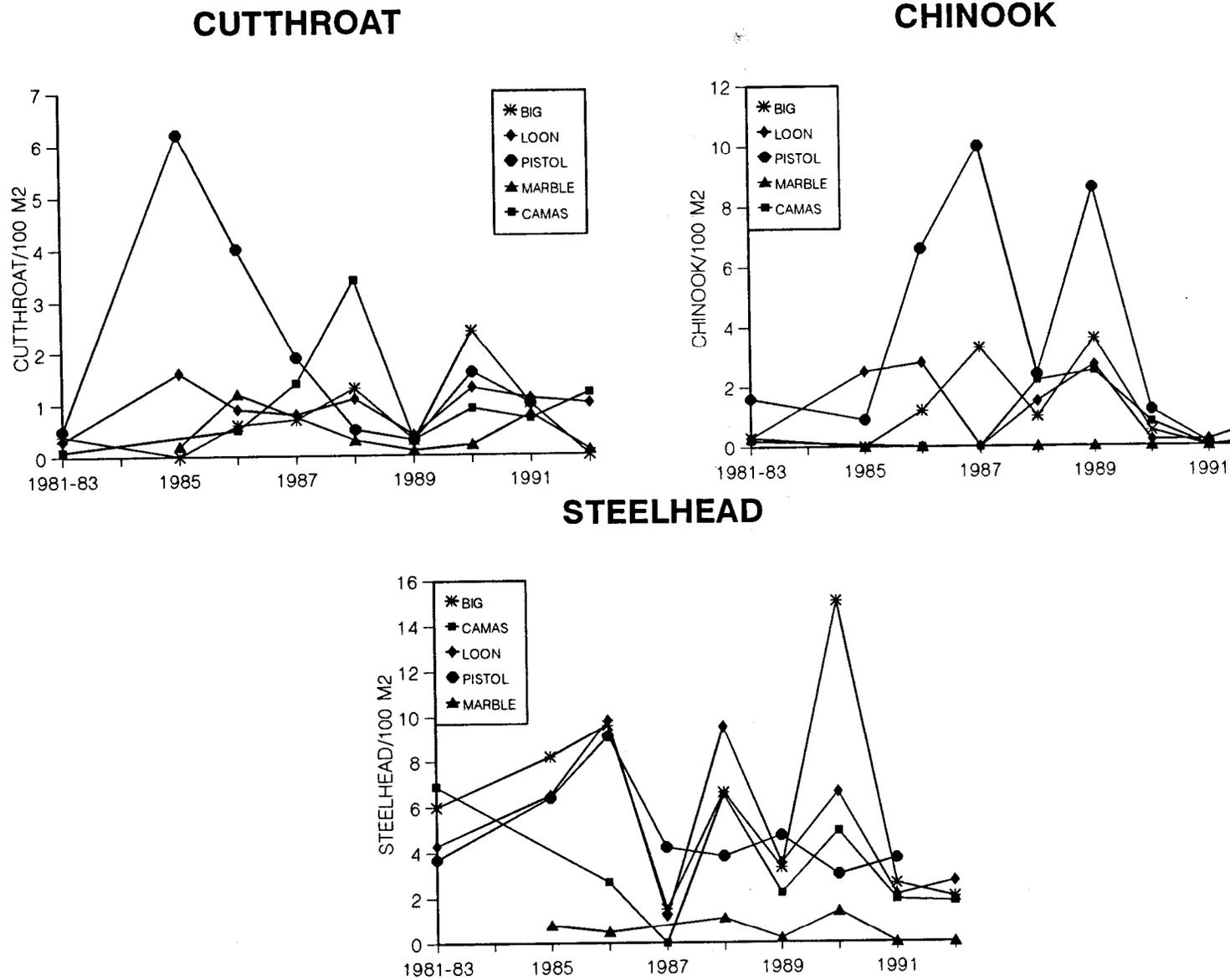


Figure 8. Densities of cutthroat trout, chinook salmon, and steelhead in MFSR tributary snorkeling transects, 1981-92. Data for 1981-83 from Thurow (1982, 1983, 1985).

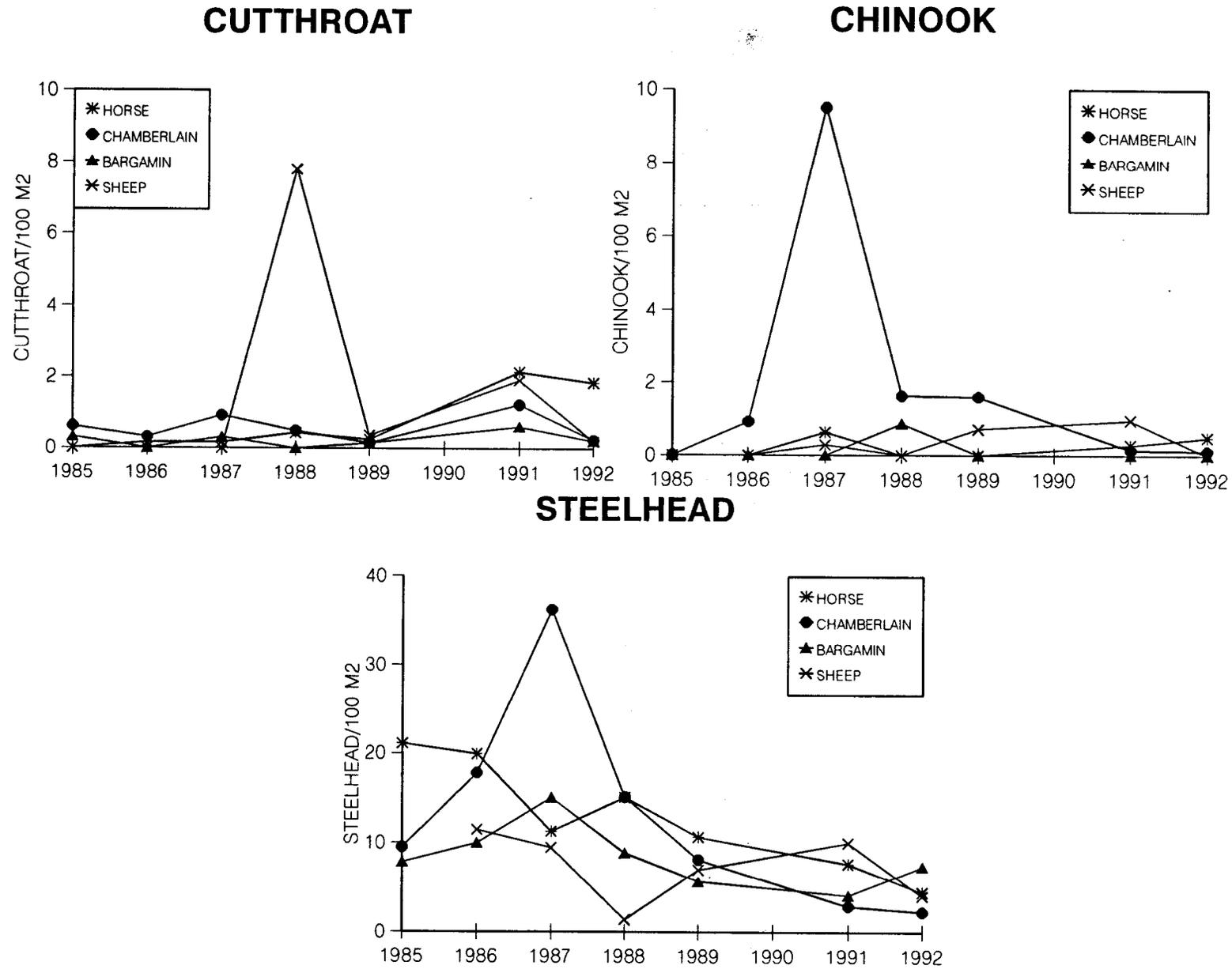


Figure 9. Densities of steelhead, cutthroat trout, and chinook salmon counted in Salmon River tributary snorkeling transects, 1985-92.

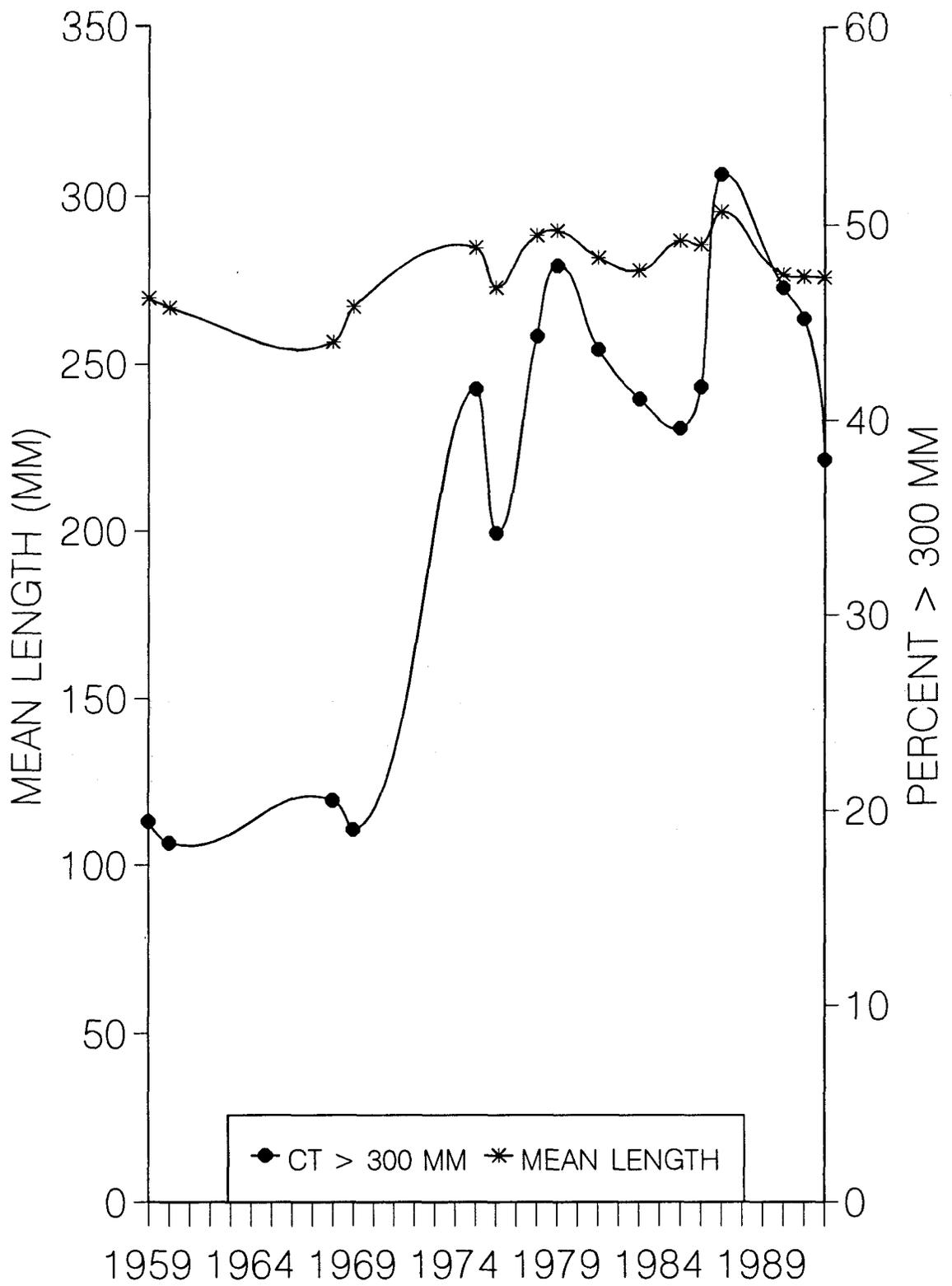


Figure 10. Mean length and proportion of cutthroat trout larger than 300 mm sampled by project angling in the MFSR, 1959-92.

RECOMMENDATIONS

1. Continue monitoring densities of juvenile steelhead, cutthroat trout, and chinook salmon in the MFSR and tributaries via snorkeling between the second week of July and the third week of August.
2. Determine total annual mortality of cutthroat trout and compare to other westslope cutthroat trout populations in similar waters with catch-and-release regulations.
3. Employ techniques to determine level of regulation noncompliance in the MFSR.

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JOB PERFORMANCE REPORT

STATE OF: Idaho NAME: Regional Fishery Management
Investigations

PROJECT NO.: F-71-R-17 TITLE: Region 7 Rivers and Streams
Investigations - Salmon River
and East Fork Salmon River
Drainage Fishery Surveys

JOB NO.: 7-c²

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

We surveyed the mainstem Salmon, East Fork Salmon, and three East Fork Salmon River tributaries during summer 1992 to assess fish populations. In the mainstem Salmon River between Salmon and Challis, mountain whitefish were the predominant species found in electrofishing samples (65-78%). Rainbow/steelhead trout Oncorhynchus mykiss were rare (<1%), and only one marked Kamloops rainbow trout was captured. Suckers Catostomus ER. (16-28%), dace Rhinichthys sp. (2-6%), chinook salmon O. tshawytscha (0-<1%), squawfish Ptychocheilus oregonensis (<1%), and sculpin Cottus sp. (1-4%) were also present.

Rainbow/steelhead, bull trout Salvelinus confluentus, and cutthroat trout O. clarki were collected in the Upper East Fork Salmon River and three tributaries. Few trout >200 mm total length were captured. Estimated trout densities (all species >7 cm) ranged from 3.1-27.2 fish/100 m². In West Pass Creek, only bull trout were sampled, while cutthroat trout was the only species sampled in Bowery Creek.

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STUDY AREA AND METHODS

Salmon River

To determine species composition, relative abundance and size structure, and evaluate Kamloops rainbow trout releases in the Salmon River, we electrofished two transects during July and August 1992. The Shoup Bridge transect began at Shoup Bridge (river mile 265.8) and ended downstream at the U.S. Highway 93 bridge at Salmon City (river mile 259.4). This transect was sampled July 27, 1992. The Bruno Bridge transect began at Bruno Bridge (river mile 311.8) and extended downstream to the Bureau of Land Management Cottonwood Access Site (river mile 307.5). Sampling was conducted on August 3, 1992.

Fish were captured using direct-current (DC) electrofishing equipment (Coffelt VWP-15 powered by a 5,000-watt Honda generator) mounted in an aluminum drift boat. We attempted to capture all sizes of game and nongame fish. We electrofished while floating downstream using approximately 300 volts and 5 amps pulsed DC.

All fish were identified and measured to the nearest millimeter.

East Fork Salmon River and Tributaries

To describe fish species composition, length frequency, and density, we electrofished the East Fork Salmon River above the Bowery Guard Station and three tributaries in August 1992. Fish were captured using backpack DC electrofishing equipment (Smith-Root 15-A powered by a 300-watt Honda generator). We attempted to capture all sizes of game and nongame fish. A two-pass removal methodology was utilized, with both passes made going upstream and the second pass made immediately after and with similar effort to the first. Though electrofishing stations were not blocked at each end, we assumed fish would not move beyond natural habitat boundaries. Station lengths averaged 30 m.

All fish were anesthetized with tricaine methane-sulfonate (MS-222), identified, and measured to the nearest millimeter total length. We assumed capture probabilities did not vary with species, and we estimated relative abundance using all fish captured. We could not distinguish smaller rainbow trout (<225 mm) from wild steelhead trout. Although capture probabilities can vary with fish size, length frequency distributions were developed from all fish captured. We used the maximum likelihood estimator to estimate abundance and probability of capture (Van Deventer and Platts 1983).

Density estimates were reported as fish/100 m² of transect surface area. Because trout <7 cm were not efficiently sampled, only larger fish were used in the calculations. Also, all trout species were combined to make each density estimate.

RESULTS

Salmon River

At least six fish species were captured in the Shoup Bridge transect in July (Table 1). In decreasing order of abundance, they were: mountain whitefish Prosopium williamsoni; suckers Catostomus R., dace Rhinichthys sp., rainbow steelhead Oncorhynchus mykiss, northern squawfish Ptychocheilus oregonensis, and sculpin Cottus sp. The majority of fish captured (65%) were mountain whitefish.

The same species plus juvenile chinook salmon O. tshawytscha were captured in the Bruno Bridge transect in August (Table 1). Relative abundance was similar to that in the Shoup Bridge transect.

Trout species included wild rainbow/steelhead, residualized hatchery steelhead, and one marked Kamloop rainbow trout.

Mountain whitefish ranged in size from 96-395 mm with a mean length of 265 mm (N=361) at Shoup Bridge (Appendix A), and from 82-340 mm with a mean of 235 mm (N=412) in the Bruno Bridge transect (Appendix B). Rainbow/steelhead trout ranged from 80-335 mm at the two sites. Only seven fish in the Shoup Bridge section (1% of all species and sizes captured) and one in the Bruno Bridge transect (<1%) were catchable size (>150 mm) rainbow/steelhead trout.

In September 1989, 1990, and 1991, Kamloop strain rainbow trout fingerlings (75-150 mm total length) were stocked (25,000, 98,000, and 45,500, respectively) between Shoup Bridge and Bruno Bridge. All fish were marked with pelvic fin clips. Hatchery steelhead with coded wire tags are also marked with pelvic fin clips, but also have adipose fin clips. The goal of the program was to establish a summer resident trout fishery using fish that grow well, do not successfully reproduce or hybridize, and do not consume juvenile anadromous salmonids.

Only one Kamloop (231 mm total length) was captured this year, and subsequent releases have been discontinued due to the apparent low survival.

East Fork Salmon River and Tributaries

Densities of age 1 and older (>7 cm) trout ranged from 1.2 fish/100 m² in Germania Creek to 26.2 fish/100 m² in Bowery Creek (Table 2).

Mean total lengths of all trout species captured in the East Fork Salmon River and three tributaries ranged from 71-120 mm (Table 3; Appendices C-F). Rainbow/steelhead were captured in two of four streams sampled. Bull trout was the only species found in West Pass Creek and cutthroat trout the only species captured in Bowery Creek.

Table 1. Fish species composition for mainstem Salmon River transects surveyed during 1992.

	Transect	
	Shoup Bidae	Bruno Bidae
Date surveyed	7/27/92	8/3/92
Water temperature (°C)	18.5	18.0
Total number captured	559	525
Relative abundance (%):		
whitefish	65	78
sucker	28	16
dace	6	2
chinook		<1
rainbow	i	<1
squawfish	<1	<1
sculpin	<1	1

Table 2. Estimates of trout densities (all species) and capture probabilities for the upper East Fork Salmon River and major tributaries sampled during August 1992. Estimates are for trout >7 cm total length only.

Site	Date surveyed	Density (fish /100 m ² t	Lower 95% CI	Upper 95% CI	Capture prob (P1	Total captured
Bowery Creek #1	8/11/92	27.2	26.2	27.2	.96	23
Bowery Creek #2	8/11/92	19.7	16.8	22.7	.81	17
East Fork Salmon River #1	8/10/92	10	--	--	.11	29
East Fork Salmon River #2	8/10/92	16.5	11.9	23.3	.70	14
West Pass Creek #1	8/10/92	4	2.4	5.7	.73	8
West Pass Creek #2	8/10/92	3	2.3	3.8	.80	8
Germania Creek #1	8/11/92	2.2	1.2	3.1	.75	6
Germania Creek #2	8/11/92	3.1	2.2	4	.83	5

Table 3. Minimum, maximum, and mean total length (TL) of trout (all species) captured in East Fork Salmon River and tributaries in August 1992.

Stream	Date surveyed	Min TL (mm)	Max TL (mm)	Mean TL (mm)	Sample size
Bowery Creek	8/11/92	76	210	120	40
West Pass Creek	8/10/92	45	223	108	16
Germania Creek	8/11/92	26	272	96	10
EF Salmon River	8/10/92	32	319	71	43

LITERATURE CITED

Van Deventer, J.S., and W.S. Platts. 1983. Sampling and estimating fish populations from streams. Transactions of the North American Wildlife and Natural Resources Conference. 48:349-54.

A P P E N D I C E S

Appendix A. Length frequency distributions of fish captured at the Shoup Bridge transect, July 27, 1992. Total number of each species captured in parentheses.

TL range (mm)	Whitefish (361)	Sucker (155)	Dace (34)	Sculpin (1)	Rainbow (7)	Squawfish (1)
<50						
50- 59						
60- 69						
70- 79						
80- 89						
90- 99	2					
100-109	6					
110-119	5					
120-129	1	1				
130-139						
140-149						
150-159						
160-169						
170-179						
180-189						
190-199						
200-209						
210-219						
220-229						
230-239	1					
240-249						
250-259						
260-269						
270-279	3					
280-289	1					
290-299	5					
300-309	13					
310-319	13	1				
320-329	8					
330-339	2	2				
340-349	1	1				
350-359						
360-369						
370-379	1	1				
380-389		1				
390-399	1					
400-409		2				
410-419		1				
420-429		1				
430-439						
440-449		3				
450-459		3				
460-469		5				
470-479		3				
480-489		3				
490-499		2				
>500		7				

Appendix B. Length frequency distributions of fish captured at the Salmon River Bruno Bridge transect, August 3, 1992. Total number of each species captured in parentheses.

TL range (mm)	Whitefish (412)	Sucker (85)	Dace (11)	Shiner (2)	Rainbow (4)	Squawfish (2)	Sculpin (7)	Chinook (2)
<50								
50- 59								
60- 69								
70- 79		1	2					
80- 89	3		1		3			
90- 99	15	2						1
100-109	9	1						1
110-119	1					1		
120-129								
130-139								
140-149								
150-159								
160-169								
170-179								
180-189								
190-199	1							
200-209					1			
210-219								
220-249								
230-239								
240-249								
250-259	1							
260-269	2							
270-279	3							
280-289	5							
290-299	7							
300-309	6							
310-319	3							
320-329	1							
330-339	2							
340-349	1							
350-359								
360-369						1		
370-379		2						
380-389								
390-399								
400-409		2						
410-419		1						
420-429		1						
430-439								
440-449		2						
450-459		1						
460-469		2						
470-479		2						
480-489		1						
490-499		2						
>500		4						

Appendix C. Length frequency distributions of fish captured in the East Fork Salmon River (\bar{x} = 71 mm) during August 1992.

TL range (mm)	Rainbow trout
<50	24
50- 59	11
60- 69	
70- 79	
80- 89	1
90- 99	
100-109	2
110-119	
120-129	
130-139	
140-149	
150-159	
160-169	
170-179	
180-189	
190-199	2
200-209	
210-219	
220-229	1
230-239	
240-249	
250-259	
260-269	
270-279	
280-289	
290-299	
300-309	
310-319	1
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 distributions of fish captured in West Pass Creek ($\bar{X} = 71$ mm) during August 1992.

TL range (mm)	Bull trout
<50	2
50- 59	6
60- 69	
70- 79	
80- 89	
90- 99	
100-109	1
110-119	1
120-129	2
130-139	
140-149	
150-159	
160-169	
170-179	
180-189	2
190-199	
200-209	
210-219	
220-229	1
230-239	
240-249	
250-259	
260-269	1
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 fish captured in Germania Creek during August 1992.

TL range (mm)	Rainbow trout
<50	3
50- 59	2
60- 69	2
70- 79	
80- 89	
90- 99	
100-109	
110-119	1
120-129	
130-139	
140-149	
150-159	
160-169	
170-179	
180-189	
190-199	
200-209	
210-219	
220-229	1
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 F. Length frequency distributions of fish captured in Bowery Creek during August 1992.

TL range (mm)	Rainbow trout
<50	
50- 59	
60- 69	
70- 79	2
80- 89	6
90- 99	6
100-109	6
110-119	1
120-129	
130-139	4
140-149	2
150-159	3
160-169	1
170-179	
180-189	3
190-199	2
200-209	
210-219	1
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	

R7DJ7-C2

JOB PERFORMANCE REPORT

STATE OF: Idaho

NAME: Regional Fishery Management
Investigations

PROJECT NO.: F-71-R-17

TITLE: Region 7 Technical Guidance

JOB NO.: 7-d

PERIOD COVERED: July 1, 1992 to June 30, 1993

ABSTRACT

During 1992, 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 stabilizations, mining operations and reclamation plans, fish rearing proposals, private ponds, water right applications, gravel removal projects, 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.

Also, we responded to the general public in person, by telephone, and mail to inquiries about fishing opportunities, techniques, regulations, and area specifics.

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OBJECTIVES

1. To assist the Idaho Department of Water Resources, the Idaho 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 required.

TECHNIQUES

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 1992, we responded in writing to requests for technical assistance or comments on various water and fishery-related matters as follows:

Agency	Number of requests
U.S. Forest Service	6
Idaho Department of Water Resources	17
Idaho Department of Lands	1
Private and Miscellaneous	10
U.S. Army Corps of Engineers	2
Idaho Steelhead and Salmon Unlimited	1
Shoshone-Bannock Tribe	1
City of Salmon	1

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.

R7DJ7-C1

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 the local newspaper throughout the season.

We worked with a local committee to design a wetland interpretive area and urban fishing site near Salmon.

We served on a committee of local irrigators, Soil Conservation Service, Lemhi County Extension Service, and Bureau of Reclamation to develop a cooperative plan to provide flushing flows in the Lemhi River to aid anadromous fish migration as part of the Lemhi River Water Conservation Project.

JOB PERFORMANCE REPORT

STATE OF: Idaho PROJECT

NAME: Regional Fishery Management
Investigations

TITLE: Region 7 Salmon and Steelhead
Investigations

NO.: F-71-R-17

JOB NO.: 7-e

PERIOD COVERED: July 1. 1992 to June 30. 1993

ABSTRACT

Juvenile anadromous fish density counts were conducted in the Middle Fork Salmon River drainage and mainstem Salmon River tributaries in July 1992. This data is included in a previous section of this report (see Job-c').

We also conducted annual salmon redd counts in the Marsh Creek drainage, Salmon River, Lemhi River, East Fork Salmon River, and the Yankee Fork Salmon River. This data is included in the annual salmon spawning ground surveys report.

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