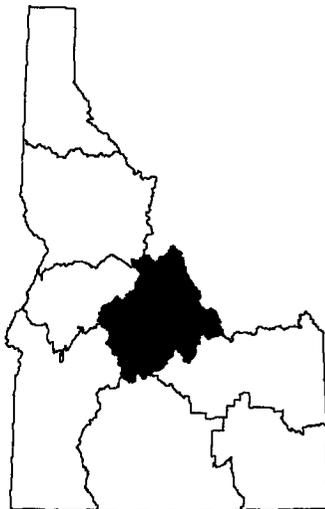




**IDAHO DEPARTMENT OF FISH AND GAME
FISHERY MANAGEMENT ANNUAL REPORT**

Cal Groen, Director



SALMON REGION

2004

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SALMON REGION 2004 FISHERY MANAGEMENT ANNUAL REPORT

MOUNTAIN LAKE INVESTIGATIONS

ABSTRACT

The Idaho Department of Fish and Game (Department) stocked 45 alpine mountain lakes in Salmon-Challis National Forest, Sawtooth Wilderness Area, and the Sawtooth National Recreation Area via airplane during the summer of 2004. Sawtooth Fish Hatchery personnel stocked 32 lakes with 30,765 westslope cutthroat trout *Oncorhynchus clarkii lewisi*. McCall Fish Hatchery personnel stocked six lakes with 3,075 golden trout *O. aguabonita* and seven lakes with 5,300 triploid (3N) Hayspur rainbow trout *O. mykiss*.

Department personnel surveyed a total of 22 mountain lakes in the Sawtooth Wilderness Area, Sawtooth National Recreation Area and Salmon-Challis National Forest during June and July of 2004. We assessed fishery status visually, by angling and/or by gillnetting. We also assessed lake use, natural recruitment potential, presence of amphibians by species, and reviewed past stocking efforts. Nine of the 22 (41%) lakes surveyed were previously stocked, but only six of the nine (67%) had fish in them at the time of the survey. One out of the six (17%) lakes with fish had naturally reproducing fish populations. We determined that fish stocking should be discontinued in two of the nine (22%) lakes previously stocked due to a lack of appropriate habitat or because naturally reproducing fish populations were present. Sixteen of the 22 (73%) lakes surveyed were fishless and should remain so to provide refugia for native fauna. Seven of the 22 (32%) lakes had amphibians present. Three of the seven (43%) lakes with amphibians also had fish present. Ten of the 22 lakes surveyed (45%) showed campsite impact rates of low to moderate use. The remaining twelve of the 22 (55%) lakes showed no sign of campsite impacts.

On July 6, 2004 the fish community in Valley Creek Lake # 1 and Valley Creek Lake # 2 were surveyed with specialized, lightweight, backpacking gillnets. Cutthroat trout made up 100% of the catch. The net at Valley Creek Lake #1 was fished a total of 13.8 diel hours and had a capture rate of 0.1 fish/gillnet hour. The net at Valley Creek Lake #2 was fished a total of 13.2 diel hours and had a capture rate of 0.1 fish/gillnet hour.

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INTRODUCTION

The Salmon Region has approximately one thousand lakes. Many of these lakes have never been inventoried and some have not been surveyed in decades. High levels of angler satisfaction, coupled with increased requests for information on alpine angling opportunities, led the Salmon Region to increase the priority of mountain surveys. In recent years, the Salmon Region began conducting cursory mountain lake surveys on an annual basis. The information collected from these surveys is stored in a regional database. The database is used to provide information for the angling public and government agencies.

OBJECTIVES

Mountain Lake Stocking

Maintain a viable and diverse high mountain lake fishery in the Salmon Region.

Mountain Lake Surveys

Conduct rapid cursory surveys of all stocked and unstocked mountain lakes within the Salmon Region. Surveys document amphibian and fish populations, determine spawning potential of inlets and outlets, and status of angler/camper use. Information collected during this multi-year effort will be used to assist in the development of a statewide high lake management plan.

METHODS

Mountain Lake Stocking

We used a Cessna – 185 fixed-wing airplane to stock Salmon Region high mountain lakes during the summer of 2004.

Mountain Lake Surveys

Department personnel conducted cursory surveys by backpacking into 22 mountain lakes in the Sawtooth Wilderness Area, Sawtooth National Recreation Area and Salmon-Challis National Forests during June and July of 2004. We documented fish communities by visual observation, angling and/or gillnetting. Fish caught from the lakes were identified, measured (total length) to the nearest millimeter and released. We used hook and line information to estimate fish relative abundance using rating methods developed by Bahls (1992; Table 3). Visual observation was also used to determine fish presence and species. These techniques were used separately or in concert to determine stocking success and to determine whether or

not there was a need to adjust stocking rates. Species presence or absence of amphibians was determined by a modification of the timed visual encounter survey (VES) methodology, of the shoreline perimeter, reported by Crump and Scott (1994). The main deviation from the VES methodology was that we performed a full perimeter search without accounting for various habitat types.

Each lake was surveyed to document campsite impacts. Lakes were visually surveyed for campsites and signs of human use and notes recorded about the difficulty of access. We used Bahls (1992) campsite impact rating to assess the condition of areas surrounding each lake (Table 4).

In addition to our cursory surveys this year, we conducted gillnet surveys on Valley Creek Lake # 1 and Valley Creek Lake # 2. One specialized backpacking gill net was deployed at each lake the evening of July 6, 2004 and removed the next morning. The gill nets were made of lightweight monofilament nylon, with six panels of webbing (10, 12.5, 18.5, 25, 33, 38 mm). Each panel is 6 meters long and 1.8 meters deep. The gill nets were set perpendicular to the shore for approximately 13 hours. Fish captured were identified and measured to the nearest mm (total length; TL) and weighed to the nearest gram.

All data collected was entered into the Salmon Region alpine lake Access database for future analysis. Data sheets are archived at the Salmon Region office.

RESULTS AND DISCUSSION

Mountain Lake Stocking

In 2004, Sawtooth Fish Hatchery personnel conducted high mountain lake stocking of westslope cutthroat trout *Oncorhynchus clarkii lewisi* by fixed wing aircraft in the Salmon Region. Two flights flown by McCall Air Taxi occurred on August 28 and on August 31. A total of 30,765 Westslope cutthroat trout were stocked into 32 different lakes. Westslope cutthroat trout averaged between 2,500 and 3,000 fish per 0.45 kilogram (2.54 cm or less TL). Flight time was 11 hours at a cost of \$1,831.00 or an average of \$57.22 per lake.

McCall Fish Hatchery personnel stocked triploid Hayspur rainbow trout *O. mykiss* and golden trout *O. aguabonita* by fixed wing aircraft into the Salmon Region. A total of 5,300 triploid Hayspur rainbow trout were stocked into seven lakes and 3,075 golden trout were stocked into six lakes. Triploid Hayspur rainbow trout averaged 773.0 fish per 0.45 kilogram (4.14 cm TL) and the golden trout were 1,873.0 fish per 0.45 kilogram (3.07 cm TL). Three flights were flown by McCall Air Taxi on August 21, 2004 at a total cost of \$722.50 or \$55.58 per lake.

The 2004 stocking records for the Salmon Region are presented in Tables 1 and 2.

Mountain Lake Surveys

Twenty-two mountain lakes were surveyed. Nine of the 22 (41%) lakes surveyed were previously stocked. Fish were documented in six of the nine lakes (67%) at the time of the

Table 1. Salmon Region high mountain (alpine) lakes stocked during the summer of 2004 by McCall Fish Hatchery personnel.

Lake Name	Catalog No.	Land Area ^a .	Species ^b .	No. Stocked
Alpine	07-1540	SWA	GN	750
China #03	07-0885	SCNF	GN	200
Crater	07-1185	SCNF	GN	700
Glacier	07-1189	SCNF	GN	275
Golden Trout	07-1201	SCNF	GN	950
Gooseneck	07-1187	SCNF	GN	200
Lost Packer	07-0564	SCNF	T9	1,000
MF Hat Creek #03	07-1289	SCNF	T9	1,000
MF Hat Creek #04	07-1290	SCNF	T9	300
Puddin Mtn #01	07-0764	SCNF	T9	500
Puddin Mtn #02	07-0766	SCNF	T9	500
Puddin Mtn #05	07-0770	SCNF	T9	1,000
Puddin Mtn #06	07-0773	SCNF	T9	1,000

^a SCNF = Salmon-Challis National Forest, SWA = Sawtooth Wilderness Area

^b T9 = triploid Hayspur rainbow trout, GN = golden trout

Table 2. Salmon Region high mountain (alpine) lakes stocked during the summer of 2004 by Sawtooth Fish Hatchery personnel (30,765 fish).

Lake Name	Catalog No.	Land Area ^a	Species ^b	No. stocked
Basin Creek #05	07-1237	SNRA	C2	1,000
Bear Valley #03	07-1245	SCNF	C2	150
Birdbill	07-1197	SCNF	C2	500
Broncho	07-0566	SCNF	C2	725
Devils	07-1260	SCNF	C2	350
Everson	07-1257	SCNF	C2	1,500
Harbor	07-0796	SCNF	C2	3,000
Heart	07-0793	SCNF	C2	1,675
Hidden #01	07-1573	SNRA	C2	1,125
Hidden	06-0616	SCNF	C2	1,000
Hindman #01	07-1495	SCNF	C2	500
Iron #01	07-1279	SCNF	C2	1,000
Line	06-0603	NPNF	C2	350
Lower Valley Creek	07-1584	SCNF	C2	750
MF Hat Creek #05	07-1293	SCNF	C2	1,075
McNutt (Basin Creek #04)	07-1235	SNRA	C2	350
Paragon (Wilson Creek #03)	07-0756	SCNF	C2	275
Park Fork Creek	07-1261	SCNF	C2	150
Patterson Creek #01	07-1258	SCNF	C2	125
Patterson Creek #02	07-1259	SCNF	C2	200
Puddin Mtn. #10 (Turquoise Lake)	07-0778	SCNF	C2	275
Puddin Mtn. #15 (Sky High Lake)	07-0787	SCNF	C2	675
Ramshorn (Wilson Creek Lake #02)	07-0755	SCNF	C2	350
NFEF Reynolds #02	07-0575	SCNF	C2	1,325
NFEF Reynolds #04	07-0578	SCNF	C2	1,000
RF Big Eight Mile	07-1264	SCNF	C2	150
Ship Island #05 (Airplane Lake)	07-0618	SCNF	C2	1,000
Ship Island #07 (Sheepeater Lake)	07-0620	SCNF	C2	325
U.P. Lake	07-1220	SCNF	C2	1,000
Welcome	07-0790	SCNF	C2	1,225
Wilson	07-0794	SCNF	C2	1,000
Yellowbelly	07-1734	SNRA	C2	6,640

^a SCNF = Salmon-Challis National Forest, SNRA = Sawtooth National Recreation Area, NPNF = Nez Perce National Forest

^b C2 = westslope cutthroat trout

survey. In five lakes catch rates ranged from 0.1 to 3.0 fish/hour, which is considered very low to moderate fish abundance by Bahls (1992;Table 3). In one lake, catch rates were ≥ 3.1 fish/hour, which was considered to be high to very high fish abundance. Of the nine previously stocked lakes, we determined that stocking should be discontinued in two (22%) lakes because one had natural reproduction and one lacked appropriate habitat. Seven of the 22 (32%) lakes had amphibians present. Three of the seven (43%) lakes with amphibians also had fish present. Cutthroat trout was the only species present in the three lakes supporting both amphibians and trout. This trend is consistent with results seen in 2002 and 2003 (Esselman R. et al, 2003). Sixteen of the 22 (73%) lakes surveyed were fishless and should remain so to provide refugia for native fauna. Results of each survey are listed in Tables 5 – 26.

Using Bahls (1992) campsite impact rating ten of the 22 lakes surveyed (45%) showed campsite impact rates of low to moderate use. Of the 10 lakes, 7 (70%) were previously stocked. The remaining twelve of the 22 (54%) lakes showed no signs of campsite impacts (Table 4).

Gillnet surveys in Valley Creek Lake # 1 and Valley Creek Lake # 2 resulted in cutthroat trout *O. clarkii lewisi* making up 100% of the catch. The net at Valley Creek Lake # 1 was fished a total of 13.75 diel hours and had a capture rate of 0.14 fish/gillnet hour. Total lengths of the two sampled cutthroat trout were 152 and 292 mm. Weights ranged from 35 to 340 g with an average of 187.5 g. The net at Valley Creek Lake # 2 was fished a total of 13.17 diel hours and had a capture rate of 0.07 fish/gillnet hour. The total length of the cutthroat trout caught was 356 mm with a weight of 450 g.

RECOMMENDATIONS

Continue cursory surveys of high mountain lakes to determine the current status of fish and amphibian populations, human use, and the success of current stocking strategies. Standard mountain lake surveys will be performed on selected lakes based on cursory surveys and historical stocking information to measure the response of fish and amphibian populations due to changes in management strategies. A collection of amphibian samples has been initiated for future genetic evaluation.

Table 3. - Bahls Trout Relative Abundance

Population Size	Angling catch/hour	Gillnet catch/12 hour set
Very low	<.4	<4
Low	.4-1.0	5-8
Moderate	1.1-3.0	9-17
High	3.1-6.0	18-30
Very High	>6.0	>31-70

Table 4. - Bahls Total Impact Rating for Lakes

None	No campsites found
Low	1 - 4
Moderate	5 - 7
High	> 7

Table 5. Alpine lake survey of Bear Valley #1.

LAKE LOCATION

Lake Bear Valley #1 Survey Date: 7/26/2004
 IDFG Catalog 71243 Primary Bear Valley Cr
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 9135
 Section: 9 Township: 17N Range: 22E Acres: 120
 UTM East: 273025 UTM North: 4964787

LAKE USE

Campsites: 5 Campsite Impact Rating: moderate Trail around Lake: Intermittent
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time <u>1</u>	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 1 Hrs 0.75 # Fish Caught: 10 Fish/Hr: 13
 Fish Abundance: Moderate Fish Gear Angling
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RBT</u>						
	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>CU</u>	<u>GR</u>	<u>EB</u>
0-49mm:	1	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	4	0	0	0	0	0	0
150-199mm:	2	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	4	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Large cutthroat and 3year classes of RBT.

Table 6. Alpine lake survey of Bear Valley #2.

LAKE LOCATION

Lake Bear Valley #2 Survey Date: 7/26/2004
 IDFG Catalog 71244 Primary Lemhi River
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 8968
 Section: 9 Township: 17N Range: 22E Acres: 30
 UTM East: 274129 UTM North: 4965720

LAKE USE

Campsites: 2 Campsite Impact Rating: low Trail around Lake: Partial
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.33</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 1 Hrs 0.167 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Angling
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

It was difficult to see any fish due to rain. We know lake has been stocked with cutthroat in the past.

Table 7. Alpine lake survey of Bear Valley #2A.

LAKE LOCATION

Lake Bear Valley #2A Survey Date: 7/26/2004
 IDFG Catalog 71244 Primary Lemhi River
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 9119
 Section: Township: Range: Acres: .2
 UTM East: 274422 UTM North: 4965998

LAKE USE

Campsites: 1 Campsite Impact Rating: low Trail around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.25</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	3	Spotted Frog	200
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Frog pond with a high density of spotted frog juveniles present.

Table 8. Alpine lake survey of Bear Valley #3.

LAKE LOCATION

Lake Bear Valley #3 Survey Date: 7/26/2004
 IDFG Catalog 71245 Primary Lemhi River
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 9160
 Section: 17 Township: 17N Range: 22E Acres:
 UTM East: 274109 UTM North: 4966491

LAKE USE

Campsites: 1 Campsite Impact Rating: low Trail Around Lake: Partial
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.5</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	4	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: Moderate Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	3	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	10	0	0	0	0	0
250-299mm:	0	5	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

20 fish observed in less than 5 minutes. Lots of fish feeding on surface of water, saw 3 fry in outlet. Two spotted frog genetic samples taken. Reproductive success appears limited. Elk camp near lake.

Table 9. Alpine lake survey of Bear Valley #3A.

LAKE LOCATION

Lake Bear Valley #3A Survey Date: 7/26/2004
 IDFG Catalog 71245 Primary Lemhi River
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 9183
 Section: Township: Range: Acres:
 UTM East: 274327 UTM North: 4966268

LAKE USE

Campsites: 1 Campsite Impact Rating: low Trail around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time <u>0.33</u>	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	3	Spotted Frog	200
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
<u>LENGTH</u>							
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

FROG POND!! Spotted Frog (2) genetic samples taken. Elk camp near by counted as one camp and one firepit. Lots of juvenile spotted frogs.

Table 10. Alpine lake survey of Bear Valley #3B.

LAKE LOCATION

Lake Bear Valley #3B Survey Date: 7/26/2004
 IDFG Catalog 71245 Primary Lemhi River
 Secondary Hayden Cr. County: Lemhi
 Land Area: Lemhi USFS Ranger Leadore Elevation (ft): 9238
 Section: Township: Range: Acres: 1
 UTM East: 273975 UTM North: 4966116

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Bear Valley

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time <u>0.25</u>	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	2	Spotted Frog	350
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Marsh with network of frog ponds covering about 4 acres. Lots and lots of juvenile spotted frogs.

Table 11. Alpine lake survey of Edith Lake.

LAKE LOCATION

Lake Edith Lake Survey Date: 6/30/2004
 IDFG Catalog 71740 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SNRA Elevation (ft): 8666
 Section: 32 Township: 7N Range: 13E Acres:
 UTM East: 663729 UTM North: 4871120

LAKE USE

Campsites: 4 Campsite Impact Rating: low Trail Around Lake: Partial
 Trampled Yes Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time		<u>0.33</u>		
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: Moderate Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>		
					<u>CU</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	2
150-199mm:	0	0	0	0	0	0	3
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Five EBT seen in less than 15 minutes, ranging in size from 7 to 11 inches. It was raining hard so it was difficult to see fry, amphibians, etc.

Table 12. Alpine lake survey of Farley #1.

LAKE LOCATION

Lake Farley #1 Survey Date: 7/1/2004
 IDFG Catalog 71739 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SNRA Elevation (ft): 7754
 Section: 34 Township: 7N Range: 13E Acres:
 UTM East: 665956 UTM North: 4871398

LAKE USE

Campsites: 2 Campsite Impact Rating: low Trail around Lake: Intermittent
 Trampled No Access Good 4 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

		<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.67</u>	Western Chorus Frog	0	Western Chorus Frog	0
		Spotted Frog	0	Spotted Frog	0
		Pacific Chorus Frog	0	Pacific Chorus Frog	0
		Tailed Frog	0	Tailed	0
		Western Toad	0	Western	0
		Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 1 Hrs 0.67 # Fish Caught: 1 Fish/Hr: 1.49
 Fish Abundance: Moderate Fish Gear Angling
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u> <u>CU</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	20
100-149mm:	0	0	0	0	0	0	3
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	1
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Saw one larger fish jump in the middle of the lake. Three springs in addition to the two inlets.

Table 13. Alpine lake survey of Farley Lake #1A.

LAKE LOCATION

Lake Farley Lake #1A Survey Date: 7/1/2004
 IDFG Catalog 71739 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Ck County: Custer
 Land Area: SNRA USFS Ranger SNRA Elevation (ft): 7806
 Section: 34 Township: 7N Range: 13E Acres: .25
 UTM East: 665818 UTM North: 4871622

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 4 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake Creek

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.08</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	5

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Located directly next to Farley Lake and close proximity to main trail.

Table 14. Alpine lake survey of Parks Peak #1.

LAKE LOCATION

Lake Parks Peak #1 Survey Date: 6/30/2004
 IDFG Catalog 71745 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SWA Elevation (ft): 8723
 Section: 4 Township: 8N Range: 13E Acres: 20
 UTM East: 665154 UTM North: 4869186

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 5 Access Poor 2
 Access X-Country 2 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.167</u>			
	Western Chorus Frog	<u>0</u>	Western Chorus Frog	<u>0</u>
	Spotted Frog	<u>0</u>	Spotted Frog	<u>0</u>
	Pacific Chorus Frog	<u>0</u>	Pacific Chorus Frog	<u>0</u>
	Tailed Frog	<u>0</u>	Tailed	<u>0</u>
	Western Toad	<u>0</u>	Western	<u>0</u>
	Long Toed	<u>0</u>	Long Toed	<u>0</u>

FISHERY AND FISH POPULATIONS

Anglers: 1 Hrs 0.25 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Angling
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
50-99mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
100-149mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
150-199mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
200-249mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
250-299mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
300-349mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
350-399mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
>399mm:	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

Comments:

Arrived at 18:30 cold, rainy, hail, overcast

Table 15. Alpine lake survey of Parks Peak #1A.

LAKE LOCATION

Lake Parks Peak #1A Survey Date: 6/30/2004
 IDFG Catalog 71745 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SWA Elevation (ft): 8800
 Section: 4 Township: 8N Range: 13E Acres: 1
 UTM East: 664961 UTM North: 4869124

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 5 Access Poor 2
 Access X-Country 2 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.083</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Looked like ephemeral pond with upland vegetation growing on pond bottom.

Table 16. Alpine lake survey of Parks Peak #1B.

LAKE LOCATION

Lake Parks Peak #1B Survey Date: 6/30/2004
 IDFG Catalog 71745 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SWA Elevation (ft):
 Section: 4 Township: 8N Range: 13E Acres: 0.8
 UTM East: 665093 UTM North: 4869623

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 5 Access Poor 2
 Access X-Country 2 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time		<u>0.083</u>		
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Arrived at 20:00. Overcast, rainy, cold.

Table 17. Alpine lake survey of Parks Peak #2.

LAKE LOCATION

Lake Parks Peak #2 Survey Date: 6/30/2004
 IDFG Catalog 71746 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Cr. County: Custer
 Land Area: SNRA USFS Ranger SWA Elevation (ft): 8900
 Section: 9 Township: 8N Range: 13E Acres: 4
 UTM East: 664718 UTM North: 4868968

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 5 Access Poor 2
 Access X-Country 2 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.083</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Arrived at 19:00. Cold, rainy, overcast.

Table 18. Alpine lake survey of Parks Peak #2A.

LAKE LOCATION

Lake Parks Peak #2A Survey Date: 6/30/2004
 IDFG Catalog 71746 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Creek County: Custer
 Land Area: SNRA USFS Ranger SWA Elevation (ft): 9260
 Section: 9 Township: 8N Range: 13E Acres: 1
 UTM East: 664514 UTM North: 4868458

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 5 Access Poor 2
 Access X-Country 2 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.083</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Arrived at 19:20. Cold, rainy, overcast.

Table 19. Alpine lake survey of Toxaway #1A.

LAKE LOCATION

Lake Toxaway #1A Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Cr County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft): 8658
 Section: 8 Township: 8N Range: 12E Acres:
 UTM East: 662780 UTM North: 4868293

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.13</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Too shallow to support fish. No real amphib habitat.

Table 20. Alpine lake survey of Toxaway #1B.

LAKE LOCATION

Lake Toxaway #1B Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Cr County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft): 8748
 Section: 8 Township: 8N Range: 12E Acres:
 UTM East: 662946 UTM North: 4868138

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.33</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Very small amount of amphibian habitat. Snow on west side of lake.

Table 21. Alpine lake survey of Toxaway #1C.

LAKE LOCATION

Lake Toxaway #1C Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Creek County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft): 8779
 Section: 8 Township: 8N Range: 12E Acres:
 UTM East: 663162 UTM North: 4867937

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.08</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u> <u>CU</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

No fish observed, however lake is suitable for stocking-plenty deep. Unless previously stocked, do not stock. Complete snow on west side.

Table 22. Alpine lake survey of Toxaway #1D.

LAKE LOCATION

Lake Toxaway #1D Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Cr County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft):
 Section: 6 Township: 8N Range: 12E Acres:
 UTM East: 662370 UTM North: 4868745

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.167</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: Fish Gear
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Wetland complex - may dry later in summer. Okay amphib habitat.

Table 23. Alpine lake survey of Toxaway #1E.

LAKE LOCATION

Lake Toxaway #1E Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Cr County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft): 8350
 Section: 6 Township: 8N Range: 12E Acres:
 UTM East: 662288 UTM North: 4868810

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.25</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Likely amphibian location.

Table 24. Alpine lake survey of Toxaway #1F.

LAKE LOCATION

Lake Toxaway #1F Survey Date: 7/1/2004
 IDFG Catalog 71749 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Yellowbelly Lake Cr County: Custer
 Land Area: SWA USFS Ranger Sawtooth Elevation (ft): 8350
 Section: 6 Township: 8N Range: 12E Acres:
 UTM East: 662224 UTM North: 4868872

LAKE USE

Campsites: 0 Campsite Impact Rating: none Trail Around Lake: None
 Trampled No Access Good 6 Access Poor 0
 Access X-Country 0 Trailhead Loc: Yellowbelly Lake

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>0.167</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	0	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 0 Fish/Hr: 0
 Fish Abundance: None Fish Gear Visual
 Hrs Set (gn): 0

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Likely spot for amphibians.

Table 25. Alpine lake survey of Valley Creek #1.

LAKE LOCATION

Lake Valley Creek #1 Survey Date: 6/6/2004
 IDFG Catalog 71585 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Valley Cr County: Custer
 Land Area: Capehorn USFS Ranger Yankee Fork Elevation (ft): 7912
 Section: 17 Township: 12N Range: 13E Acres: 10.5
 UTM East: 662632 UTM North: 4915429

LAKE USE

Campsites: 2 Campsite Impact Rating: low Trail around Lake: Intermittent
 Trampled No Access Good 0 Access Poor 1
 Access X-Country 0 Trailhead Loc: Basin Butte Rd 32

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time <u>2</u>	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	3	Spotted Frog	1
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	8	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 2 Fish/Hr: 0.15
 Fish Abundance: Very low Fish Gear Gillnet
 Hrs Set (gn): 14

(Length)

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	1	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	1	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	0	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Outlet has adequate spawning area, but a log jam may act as a complete barrier. Four adult cutthroat 10-12 inches in size were seen in outlet, but it's likely they could not access lake. No fry observed. Fish look healthy, but low in density.

Table 26. Alpine lake survey of Valley Creek #2.

LAKE LOCATION

Lake Valley Creek #2 Survey Date: 6/6/2004
 IDFG Catalog 71587 Primary Main Salmon (Yankee Fk - Headwaters)
 Secondary Valley Cr County: Custer
 Land Area: Capehorn USFS Ranger Yankee Fork Elevation (ft): 8163
 Section: 16 Township: 12N Range: 13E Acres: 18.5
 UTM East: 663174 UTM North: 4915004

LAKE USE

Campsites: 5 Campsite Impact Rating: moderate Trail around Lake: Intermittent
 Trampled No Access Good 0 Access Poor 2
 Access X-Country 0 Trailhead Loc: Basin Butte Rd 32

AMPHIBIAN SURVEY DATA

	<u>Adults</u>	<u>#</u>	<u>Juveniles</u>	<u>#</u>
Search Time	<u>1.5</u>			
	Western Chorus Frog	0	Western Chorus Frog	0
	Spotted Frog	0	Spotted Frog	0
	Pacific Chorus Frog	0	Pacific Chorus Frog	0
	Tailed Frog	0	Tailed	0
	Western Toad	0	Western	0
	Long Toed	11	Long Toed	0

FISHERY AND FISH POPULATIONS

Anglers: 0 Hrs 0 # Fish Caught: 1 Fish/Hr: 0.08
 Fish Abundance: Very low Fish Gear Gillnet
 Hrs Set (gn): 13

(Length

<u>LENGTH</u>	<u>RB</u>	<u>CU</u>	<u>GN</u>	<u>BL</u>	<u>RBT</u>	<u>GR</u>	<u>EB</u>
0-49mm:	0	0	0	0	0	0	0
50-99mm:	0	0	0	0	0	0	0
100-149mm:	0	0	0	0	0	0	0
150-199mm:	0	0	0	0	0	0	0
200-249mm:	0	0	0	0	0	0	0
250-299mm:	0	0	0	0	0	0	0
300-349mm:	0	0	0	0	0	0	0
350-399mm:	0	1	0	0	0	0	0
>399mm:	0	0	0	0	0	0	0

Comments:

Less habitat for frogs in littoral and shoreline areas than Valley Ck Lake #1. Eight long toed salamanders observed under one log!!!!!!

LITERATURE CITED

- Bahls, Peter. 1992. Report of the High Lake Fisheries Project 1991. Clearwater National Forest.
- Crump, M.L. and N.J. Scott, Jr. 1994. Visual encounter surveys. In *Measuring and monitoring biological diversity: Standard methods for amphibians*. Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster (Eds.), Smithsonian Institution Press, Washington, D.C., pp. 84-92.
- Esselman R. ; Andrews, K. and Curet, T 2003. Regional Fisheries Management Investigations. Project 1. Surveys and Inventories. Job A. Salmon Region Mountain Lake Investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-28, Annual Progress Report, Boise.

SALMON REGION 2004 FISHERY MANAGEMENT ANNUAL REPORT

LOWLAND LAKE INVESTIGATIONS

ABSTRACT

On August 9, 2004, the zooplankton community in Jimmy Smith Lake was sampled to determine zooplankton ratios (ZPR) and zooplankton quality index (ZQI) at the outlet and mid-lake. Due to limited numbers of large zooplankton, results for the averaged ZPR and ZQI values were 0.026 and 0.03, respectively. This data suggests that zooplankton resources in Jimmy Smith Lake are limited as a forage resource for trout production.

On August 9, 2004, Herd Lake was sampled to assess zooplankton resources available for fish forage. The average values for zooplankton ratio (ZPR) and zooplankton quality index (ZQI) were 0.2 and 0.35, respectively. These values indicate that zooplankton resources are limited as a forage resource for trout production in the lake.

Hydroacoustics were used to determine the winter spatial distribution of fish in Williams Lake on February 6, 2004. The fish were found to be concentrated in the upper 10 meters of the lake.

On April 28 and 30, with the assistance of volunteers, Department staff collected and spawned 23 pairs of adult rainbow trout *Oncorhynchus mykiss* from Williams Lake. Resultant progeny, estimated to number 40,000 were released into Lake Creek, the inlet of Williams Lake, at the early fry stage.

On June 17 and 18, department personnel utilized backpack electrofishing methodologies to sample Lake Creek, the inlet to Williams Lake, for the purpose of documenting bull trout *Salvelinus confluentus* presence and the collection of genetic samples. Eight sites were sampled, four bull trout were observed and two genetic samples were collected.

On July 1, 2004, the fish community in Yellowbelly Lake was surveyed via eight gillnets. Brook trout *S. fontinalis*, cutthroat trout *O. clarki lewisii*, rainbow trout *O. mykiss*, northern pikeminnow *Ptychocheilus oregonensis* and suckers *Catostomus* sp (bridgelip and large scale) were encountered during the survey. A total of 376 fish were netted. Game species comprised 14% of the catch and non-game species 86%. Sucker species comprised 79% of the catch; brook trout comprised 10%, northern pikeminnow 7%, rainbow trout 2%, cutthroat trout 1% and hybrid rainbow/cutthroat trout 1% of the total catch, respectively. The suckers had a mean total length of 261.8 mm; brook trout 305.9 mm, cutthroat 378 mm, rainbow trout 357.44 mm, and rainbow/cutthroat trout hybrids 464.7 mm.

Trout species were weighed to the nearest gram. Brook trout ranged from 46 to 500 g with a mean weight of 270.6g. Rainbow trout ranged in weight from 167 g to 472 g with a mean weight of 481.6 g. Cutthroat trout ranged in weight from 285 g to 720 g with a mean weight of 506.2 g. Apparent rainbow/cutthroat hybrid ranged in weight from 448 g to 1,340 g with a mean weight of 962.

In 2002, forty-one tiger muskellunge *Esox lucius* x *E. masquinongy* were introduced into Carlson Lake in an effort to shift the size structure of the brook trout *S. fontinalis* population from a high density, small average fish size structure to one consisting of fewer, larger fish. In 2003, post introduction studies indicated a decrease (8.5%) in the brook trout population and no significant change in relative weights. During the 2003 sampling efforts tiger muskellunge were incidentally netted and mortalities occurred. Due to the tiger muskellunge mortalities in 2003 a hoop net was deployed to evaluate the brook trout population and to minimize tiger muskellunge mortalities. The hoop net was deemed to be ineffective in sampling brook trout in low water years in Carlson Lake.

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INTRODUCTION

Jimmy Smith Lake

Jimmy Smith Lake is a landslide lake, located in north central Custer County at 1,948 meters elevation with a surface area of 26 hectares (UTM coordinates 11T 707474mE, 4894112mN NAD 27). The lake has one outlet and two inlet streams. The outlet stream is located at the north end of the lake and two inlet streams are located at the west and south ends of the lake. These tributaries provide adequate spawning habitat.

Jimmy Smith Lake is a eutrophic body of water dominated by an abundance of aquatic macrophytes. It supports a naturally reproducing population of rainbow trout *O. mykiss*. The lake was stocked with 184,600 rainbow trout from Mackay Hatchery between 1927 and 1938 and has not been stocked since.

Herd Lake

Herd Lake, a landslide lake, is located in Custer County at 2,187 m elevation (UTM coordinates 11T 726324mE, 4885654mN, NAD 27). The surface area is 6.9 hectares. It is a coldwater rainbow trout fishery under general management regulations. The inlet of Herd Lake is Lake Creek a tributary to Herd Creek, in the East Fork Salmon River drainage.

Williams Lake

Williams Lake, an early eutrophic lake, is located in north central Lemhi County (UTM coordinates 12T 265427mE, 4989077mN NAD 27) at 1,600 m elevation. The lake has a surface area of 73 hectares, maximum depth of 58 m, and mean depth of 23 m. The principle inflow is provided by Lake Creek, with some inflow originating from springs and intermittent streams. Rainbow trout and bull trout *S. confluentus* are the only fish species recorded from the lake.

Winter dissolved oxygen concentrations fall below 5.0 ppm within 2-4m of the surface. In summer and winter, dissolved oxygen concentrations of 1.0 ppm occur as shallow as 8 m. These low dissolved oxygen levels are limiting the available fish habitat and therefore, are limiting the fish production potential of the lake. Furthermore, these low oxygen levels have been responsible for past fish kills in the lake. Poor water quality in the lake is caused by nutrient input in the form of phosphorous, eroded sediments from the watershed and the leaching of human waste from private septic systems around the lake. During 2000 and 2001 private landowners renovated their septic systems to reduce septic inputs.

Yellowbelly Lake

Yellowbelly Lake, an oligotrophic lake, is located in southern Custer County (UTM coordinates 11T 670342mE, 4873950mN NAD 27) at 690 meters elevation. It is 82 hectares with a maximum depth of 24.5 meters. The lake also has 8.42 kilometers of shoreline. Yellowbelly is managed as a westslope cutthroat trout fishery. Fish species currently found in the lake are brook trout *S. fontinalis*, cutthroat trout *O. lewisi*, rainbow trout, northern pikeminnow *Ptychocheilus oregonensis* and suckers *Catostomus sp.*

Carlson Lake

Carlson Lake is a two hectare, sub-alpine lake located in the Pahsimeroi River drainage (UTM Coordinates: 12T 280334mE, 4906829mN, NAD 27), and is situated about 2,438 meters (m) in elevation. Subterranean flow from the lake drains into Double Springs Creek, a tributary of the Pahsimeroi River. There appears to be a historical surface outlet; however, there has been no indication of surface flow in the channel for 30 years (personnel communication, Mark Armbruster). Historically, Idaho Department of Fish and Game (Department) stocked brook trout *S. fontinalis* in Carlson Lake. Additionally, lake stocking records indicate rainbow trout *O. mykiss* was stocked in 1975 and 1993. Brook trout is the only naturally reproducing fish species currently found in Carlson Lake.

OBJECTIVES

Jimmy Smith and Herd Lakes

1. Monitor the lake's zooplankton community to determine the availability of zooplankton forage resources.

Williams Lake

1. Conduct winter hydroacoustic survey to determine spatial distribution of fish population during likely oxygen deficits.
2. Collect bull trout genetic samples from Lake Creek for future analysis.
3. Engage private interests with a goal of addressing fisheries and water quality issues.
4. Spawn rainbow trout from Lake Creek (a tributary to Williams Lake) and release progeny back into Lake Creek.

Yellowbelly Lake

1. Monitor the fishery's species composition and size structure.
2. Determine success of introductions of Westslope cutthroat trout.

Carlson Lake

The objective was to evaluate hoop nets as a substitute for gillnets to estimate the brook trout population and minimize the impacts to the tiger muskellunge *Esox lucius* x *E. masquinongy* population.

METHODS

Jimmy Smith and Herd Lakes

Zooplankton samples were collected on August 9, 2004 using methods outlined by Teuscher, 1999. In the laboratory procedures, zooplankton abundance and quality were analyzed using ZPR and ZQI methods developed by the Wyoming Game and Fish (Dan Yule, Wyoming Game and Fish, unpublished data) and Teuscher, 1999.

Williams Lake

Hydroacoustic Survey

A hydroacoustic survey was conducted on February 6, 2004 using a simplified version of the methods outlined by Butts, 2004. Temperature and dissolved oxygen data was collected concurrently with the hydroacoustic sampling. Due to the time of year and the objectives of the survey we modified the methodology. Modifications included the use of a snowmobile and sled instead of a boat. Data collection looked only at the distribution of fish.

Bull trout Genetic Sampling

On June 17 and 18, Department personnel used a Smith Root SR-15 backpack shocking unit to sample Lake Creek, the inlet to Williams Lake, for the purpose of documenting bull trout presence and the collection of genetic samples. Site locations were selected to encompass a complete sampling coverage of fish communities within the Lake Creek system. Genetic samples were taken from bull trout and stored at the Regional office for future analysis.

Spawning Project

A target goal of twenty pairs of adult rainbow trout migrating upstream of the lake are electrofished and spawned. Ten pairs are spawned during each of two spawning sessions. The embryos are incubated and the resultant fry released in Lake Creek, the inlet to Williams Lake.

Yellowbelly Lake

On July 1, 2004 eight experimental gill nets, four sinking and four floating, were used to sample the fish community in Yellowbelly Lake. Project personnel set gill nets perpendicular to the shoreline with the large mesh end positioned towards the pelagic zone of the lake. They were set in the afternoon and pulled the next morning. The nets were checked on July 2, 2004 and fish were measured to the nearest millimeter (mm) in total length and released. Trout species were measured to the nearest gram (g). Some fish were retained and donated to the local food bank.

Carlson Lake

On the afternoon of June 15, 2004, two hoop nets were set in the north and northwest littoral areas of Carlson Lake. Nets were checked and fish removed periodically throughout the sample effort. The nets were removed on June 16, 2004. Captured brook trout total lengths (TL) were measured to the nearest millimeter (mm) and weighed to the nearest gram. Length and weight data were used to calculate relative weights for brook trout.

Additionally, brook trout were also sampled by angling and incorporated into the sample. Brook trout fin-clips from previous years marking efforts were noted.

RESULTS AND DISCUSSION

Jimmy Smith Lake

Jimmy Smith Lake is a highly productive body of water. Results from the averaged zooplankton ZPR and ZQI indices for the lake were 0.026 and 0.03, respectively (Table 1). The ZQI results suggest that even though there is substantial productivity there are few large zooplankters for fish to consume. Large zooplankton was present in 2004 and 2003 samples at low abundance. In 2002, samples were devoid of large zooplankton. The difference in numbers of the larger sized zooplankton in the 2003 and 2004 tows compared to 2002 tows can be due to a variety of factors such as time of year sampled and lake productivity. The slight increasing trend in the ZPR and ZQI indices may mean an increase in larger, more forageable zooplankton. One sampling effort each year may not represent zooplankton population fluctuations. We think the fish population is cropping off the larger sized zooplankton susceptible to trout predation.

Overall, Jimmy Smith Lake is meeting the direction of the Five Year Management Plan, to provide a fishery of larger sized fish supported by natural production. Of note, the region has had reports of high angler satisfaction for the last three years.

Table 1. Zooplankton ratio (ZPR), and zooplankton quality index (ZQI) from Teuscher, 1999.

ZQI > 0.60	Competition for food unlikely stock fingerlings from 150 to 300 per acre
0.60 > ZQI > 0.10	Competition for food may be occurring stock fingerlings from 75 to 150 per acre
	Forage resources are limiting stock less than 75 fingerlings per acre or catchables

Herd Lake

Results of the zooplankton tows provided ZPR and ZQI values of 0.04 and 0.07 at mid-lake and 0.00 and 0.00 at the outlet, respectively. These values suggest that zooplankton forage resources are severely limited and the fish population is cropping off almost the entire preferred zooplankton size.

The five-year management plan objective is to maintain a fishery with natural reproduction and to increase the average length of fish. Fish size in Herd Lake is believed to be density dependent and available forage limited. ZQI results given above coupled with fish length frequency data collected in 2003 leads us to consider that a management effort to increase fish size may be worthwhile.

Williams Lake

Hydroacoustic Survey

We used hydroacoustics to determine the spatial distribution of fish in Williams Lake when the lake was iced over. In more complex surveys, hydroacoustics with intensive fish collection can be used to determine not only distribution of fish, but pelagic fish abundance and size structure. We found that fish were concentrated in the upper 10 meters of the lake where the highest concentration of dissolved oxygen was recorded (Figures 1-4). Similar results were documented in a hydroacoustic survey conducted in September, 2003. The 2003 survey showed the majority of the fish were concentrated in the upper 15 meters of the water column (Butts, 2004).

Bull trout Genetic Sampling

A total of eight sites were sampled utilizing backpack electrofishing methodologies. Department personnel observed four bull trout and collected two genetic samples. A low density population resulted in low numbers of sampled fish relative to effort.

Figure 1. Sampling locations and lake sections for the winter hydroacoustics survey at Williams Lake on February 4, 2004. Sampling was conducted by drilling holes through the ice and lowering the transducers approximately 0.1 m below the bottom of the ice layer.

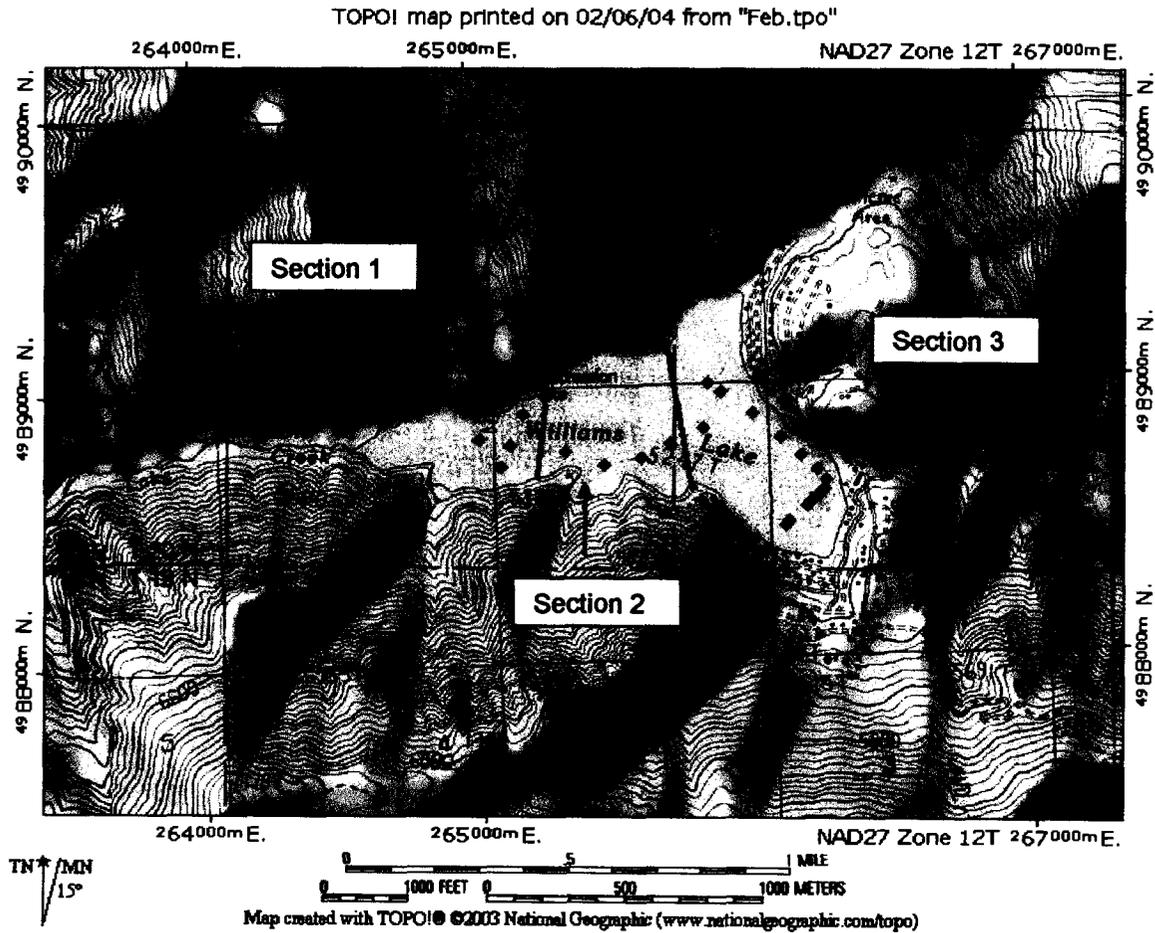


Figure 2. Depth distribution of tracked fish in relation to vertical temperature and dissolved oxygen profiles in section 1.

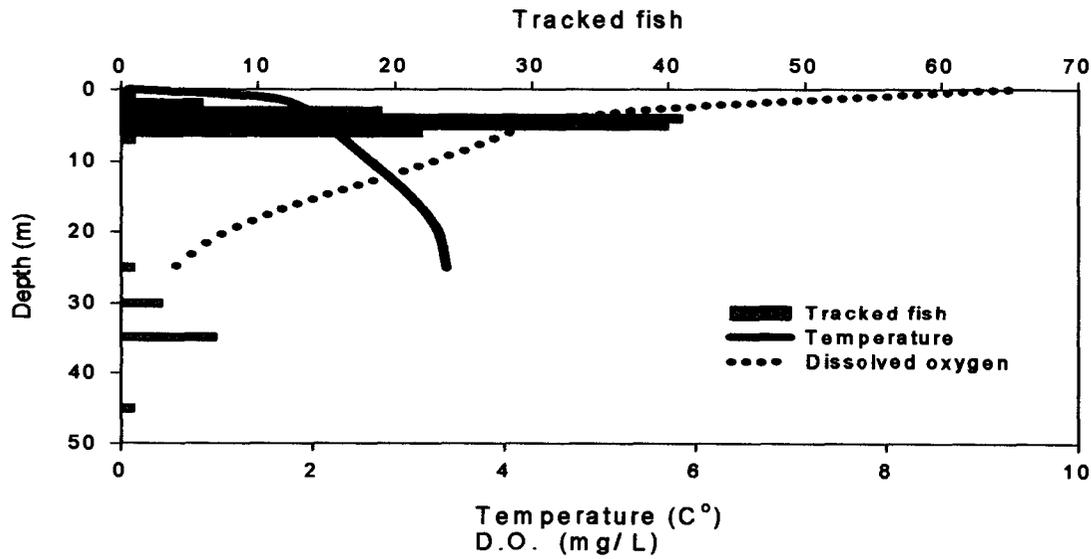


Figure 3. Depth distribution of tracked fish in relation to vertical temperature and dissolved oxygen profiles in section 2.

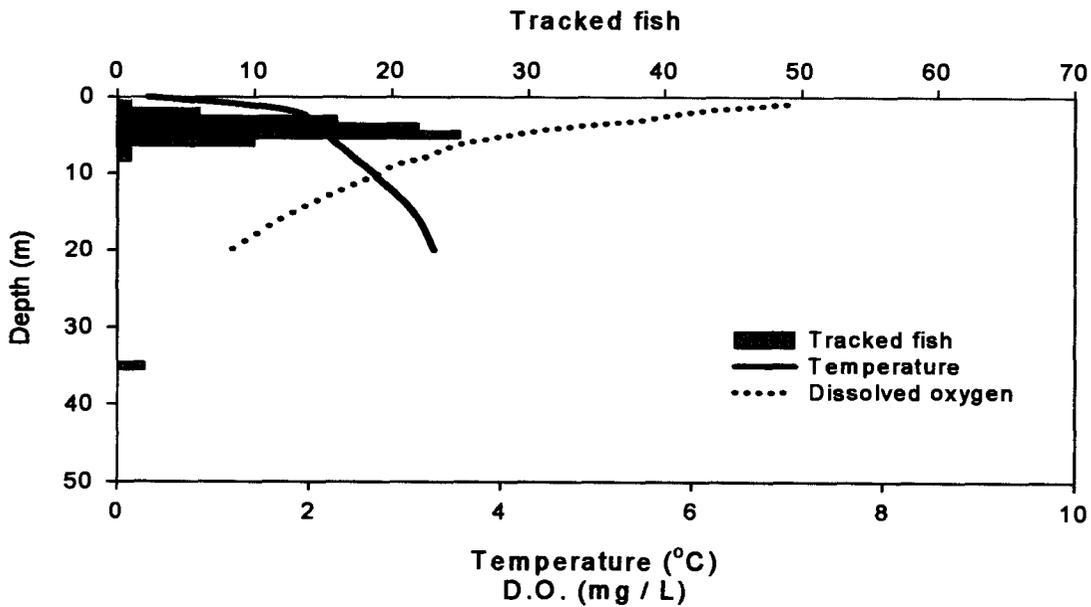
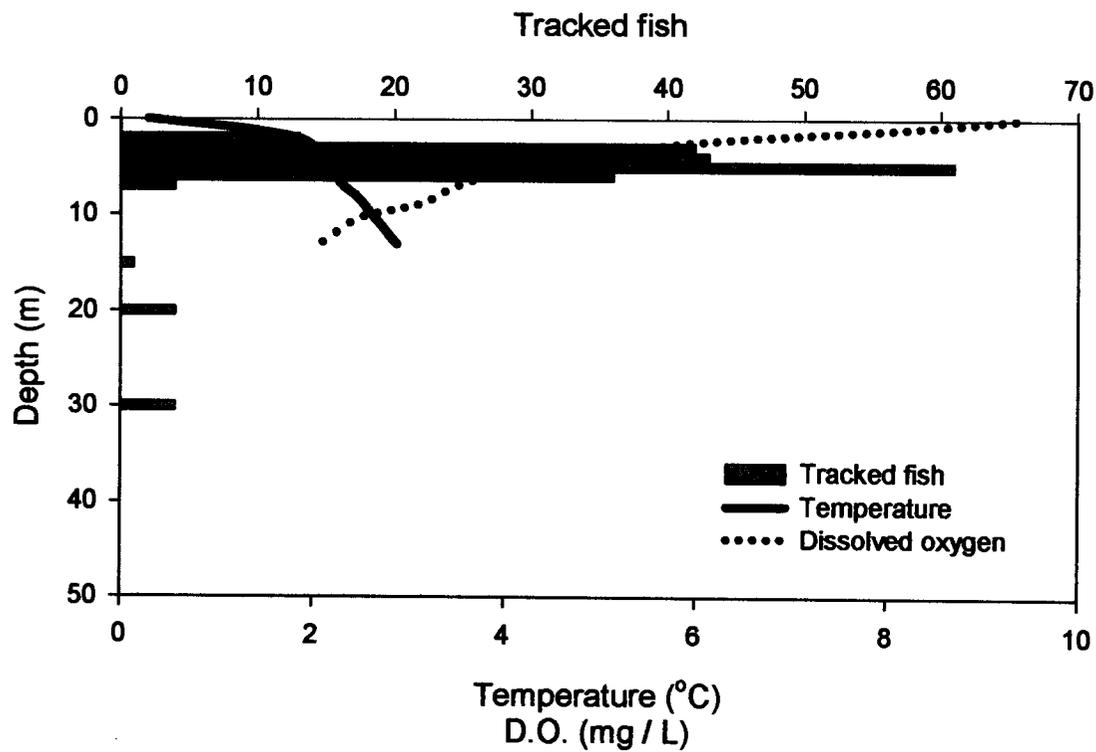


Figure 4. Depth distribution of tracked fish in relation to vertical temperature and dissolved oxygen profiles in section 3.



Spawning Project

On April 28 and 30, ten female rainbows and thirteen female rainbows, respectively, were collected with electrofishing gear and spawned with more than 25 male rainbow trout. Fertilized eggs were incubated at a facility downstream of the lake. A cooperater (Ken John) tended the eggs until "button up". The fry were then released in the inlet to the lake. Approximately 40,000 fry were released on June 17, 2004.

Yellowbelly Lake

We caught a total of 376 fish in the gill net survey on Yellowbelly Lake. Game species comprised 14% of the catch and non-game species 86%. Brook trout comprised 10% of the catch, suckers 79%, northern pikeminnow 7%, rainbow trout 2%, cutthroat trout 1%, and apparent hybrid rainbow/cutthroat trout 1% of the total catch for all nets combined. The largest trout encountered was an apparent rainbow/cutthroat hybrid at 513 mm. The suckers had a mean total length of 261.8 mm; brook trout 305.9 mm, cutthroat 378 mm, rainbow trout 357.44 mm, and rainbow/cutthroat trout hybrids 464.7 mm. Raw data from the gill net surveys can be found in the appendix.

Trout species were weighed to the nearest gram (g). Brook trout ranged from 46 to 500 g, with a mean weight of 270.6 g. Rainbow trout ranged in weight from 167 g to 472 g, with a mean weight of 481.6 g. Cutthroat trout ranged in weight from 285 g to 720 g, with a mean weight of 506.2 g. Apparent rainbow/cutthroat hybrid ranged in weight from 448 g to 1340 g, with a mean weight of 962.

The four experimental floating gill nets captured 28 brook trout, 11 northern pikeminnow, 149 largescale suckers, two bridgelip suckers, six rainbow trout, three cutthroat trout, and two apparent rainbow/cutthroat hybrids. The nets were fished a total of 62.58 diel hours and had a capture rate of 3.21 fish/hour.

The four experimental sinking gill nets captured eight brook trout, 16 northern pikeminnow, 144 largescale suckers, one bridgelip sucker, three rainbow trout, one cutthroat trout, and two apparent rainbow/cutthroat hybrids. The nets were fished a total of 60.9 diel hours and had a capture rate of 2.87 fish/hour.

For comparison, on June 12, 2001, the fish community in Yellowbelly Lake was surveyed using four experimental gillnets, two sinking and two floating. The experimental floating gill nets were fished a total of 17.6 diel hours and had a capture rate of 1.1 fish/hour. The experimental sinking gill nets were fished a total of 17.6 diel hours and had a capture rate of 4.4 fish/hour.

Three species of fish were encountered during the 2001 survey: Brook trout, cutthroat trout, and suckers. A total of 96 fish were caught. Brook trout comprised 57%, suckers 41%, and cutthroat trout 2% of the total catch, respectively.

The data suggests a decrease in number of salmonids (59% to 12%) and an increase in sucker numbers (41% to 79%) when comparing 2001 to 2004 results. This may indicate a shift in species composition. However, the difference in species composition seen is likely due to increased gillnet efforts, higher numbers of fish caught and site specific sample locations in the

lake. Another explanation may be a response by the non-game population to the removal of the migration barrier at the outlet of the lake. The sampling of the northern pikeminnow may be indicative of species colonization from the mainstem Salmon River. Duplication of the 2004 survey efforts will be necessary to determine any shifts in species composition over time.

In 1961, Yellowbelly Lake was chemically renovated with toxaphene to eradicate non-game species and to facilitate the management of the lake as a cutthroat trout fishery. The lake remained uninhabitable to fish life for approximately three years after the treatment. A migration barrier was also installed on the lake outlet the same year and remained in place until 2000.

In 1990, the lake was chemically renovated again; this time with rotenone. Similar results occurred, with the lake remaining uninhabitable to fish for a number of months after treatment. Both chemical treatments were partially successful at removing non-game fish, but the desired long-term results of managing the lake as a cutthroat trout fishery was short-lived.

Archived data from gillnet surveys conducted in 1961, 1978, 2001 and 2004 pre-treatments and post-treatments have yielded similar results, with non-game species dominating the numbers and biomass of every catch (Table 2). The consistency of the gillnet survey results, before and after two chemical renovations, a migration barrier and the stocking of 259,256 westslope cutthroat trout (Table 3) help to highlight the challenges of trying to manipulate the species composition of Yellowbelly Lake.

Recent angler comments for the Yellowbelly Lake trout fishery are positive. Angler catch rates of salmonids relative to non-game species are disproportionate to what is being observed in gillnet catches. Anglers are catching higher numbers of salmonids and few non-game species.

Carlson Lake

Twenty-three brook trout were caught during hoop net capture efforts. The nets were fished a total of 60.5 diel hours. Nine of the fish were recaptured from previous years marking efforts. There were four adipose-clipped fish caught that originated from a group marked for a population estimate in 2002. There were five left ventral fin-clipped fish marked in 2003 (Curet et al 2003). Tiger muskellunge were not encountered or represented in the hoop net catch. Therefore, the hoop net evaluation was successful and did not cause incidental mortalities as occurred with gillnets in 2003 (Table 4).

Twenty-five brook trout were captured by angling. Five of these fish were recaptures from previous year's marking efforts. Two of the captured fish had left ventral clips, two had adipose fin clips and one had both adipose and left ventral fin clips.

In 2004, catch-per-unit effort (CPUE) for brook trout was 0.38 fish/hoop net hour. Staff feels the lack of catch in the hoop nets could be due to the following three reasons: 1) In Carlson Lake, the tiger muskellunge likely operate close to the shoreline where most structure is present. This may have led to the change in spatial distribution of brook trout from shoreline regions to pelagic areas. Staff also noted a decrease of brook trout fry in littoral areas. 2) The resulting change in distribution of brook trout would render the brook trout less likely to be captured in the shoreline-oriented hoop nets. 3) Furthermore, the decrease in CPUE may be explained by a reduction in the brook trout population.

Table 2. Summary of gillnet data from Yellowbelly Lake 1961 to 2004.

Date	Nets	Total Catch	RBT	CT	RBTxCT	EBT	BLT	Total Trout	Percent Trout	RSS	SUC	NPM	MWF	Percent Non-game
July-04	8	376	9	4	4	36	0	53	14	0	303	27	0	86
June-01	4	96	0	1	0	56	0	57	59	0	39	0	0	41
October-78	2	58	0	1	0	4	0	5	9	2	50	1	0	91
1961	1	57	0	0	0	0	2	2	3	0	43	9	3	97

RBT = rainbow trout, CT = cutthroat trout, RBTxCTT = hybrid, EBT = brook trout, BLT = bull trout, RSS = reidside shiner, SUC = sucker sp., NPM = Northern pikeminnow, MWF = mountain whitefish

Table 3. Yellowbelly Lake Stocking History, 1968-2004.

Date Stocked	Species Type	Size	Number Stocked
9/06/2004	westslope cutthroat	Fry (0-3 Inches)	6,640
9/02/2003	westslope cutthroat	Fry (0-3 Inches)	2,500
7/15/2003	Cutthroat	Fry (0-3 Inches)	1,256
8/10/2002	westslope cutthroat	Fry (0-3 Inches)	384
6/25/2002	westslope cutthroat	Fry (0-3 Inches)	1,084
9/03/1999	westslope cutthroat	Fry (0-3 Inches)	5,000
7/26/1995	westslope cutthroat	Fry (0-3 Inches)	3,000
7/20/1993	westslope cutthroat	Catchable (6 Inches+)(Is)	2,025
7/01/1992	westslope cutthroat	Fingerling (3-6 Inches)	5,015
8/30/1987	Golden Trout	Fingerling (3-6 Inches)	2,750
8/27/1986	Henrys Lake Cutthroat	Fry (0-3 Inches)	9,959
9/18/1976	Cutthroat	Fry (0-3 Inches)	16,848
8/29/1972	Cutthroat	Fry (0-3 Inches)	73,899
9/13/1971	Cutthroat	Fry (0-3 Inches)	52,896
9/04/1969	Cutthroat	Fry (0-3 Inches)	76,000
8/14/1968	Cutthroat	Fry (0-3 Inches)	79,640

Table 4. Comparison of brook trout sampling efforts in Carlson Lake, Idaho 2002-2004.

	2002*	2003*	2004**
Date	6/13-14	6/13-14	6/15-6/16
Numbers Removed	546	562	48
Size Range (mm)	102-266	96-270	156-251
Mean Total Length (mm)	191.8***	209	223.9
Mean Weight (g)	77.3	78.12	96.1
Total Gill Net Hours	147.8	416.86	60.5
Fish / net hour (CPUE)	3.69	1.38	0.38
Relative Weight	89.58	89.8	n/a

*2002-2003 Gillnet survey data

**2004 Hoop net survey data

***Mean total fork length was recorded in 2002(mm)

Of note, the littoral area was almost non-existent due to low water levels related to snow pack. The lack of littoral area impacted the trapping efficiency of the hoop nets. The lead of the hoop net set-up could not be placed in a conventional manner so as to cause fish to travel the lead and then enter the trap net.

In 2004, total lengths of brook trout ranged from 156 to 255 mm (Figure 5). The mean total length of brook trout sampled was 223.9 mm (Table 1). Although, sample size was small mean length increased 14.9 mm. In 2005, sample size will be increased to determine if this trend continues.

Fisheries staff requested an additional 100 tiger muskellunge for introduction in 2004. Unfortunately, the tiger muskellunge destined for Carlson Lake contracted furunculosis prior to the hauling date, and the transport was cancelled.

RECOMMENDATIONS

Jimmy Smith Lake

1. Sample Jimmy Smith Lake to monitor the size structure, relative weight and food habits of resident rainbow trout with gill net sampling in 2005.
2. Investigate the use of a predator type biological control, such as tiger muskellunge (*Esox lucius x E. masquinongy*).
3. Monitor the zooplankton population in 2005 or in future only if snow pack exceeds average or above average percent.

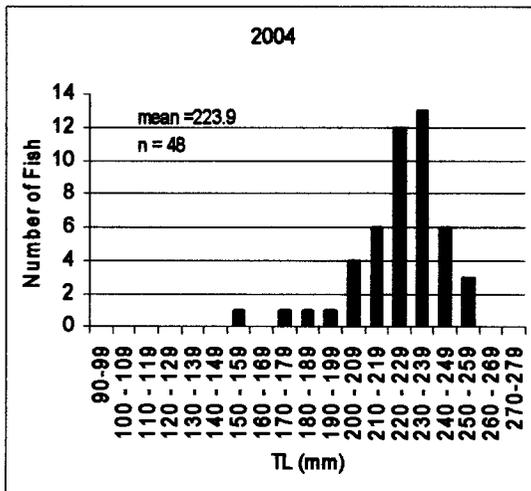
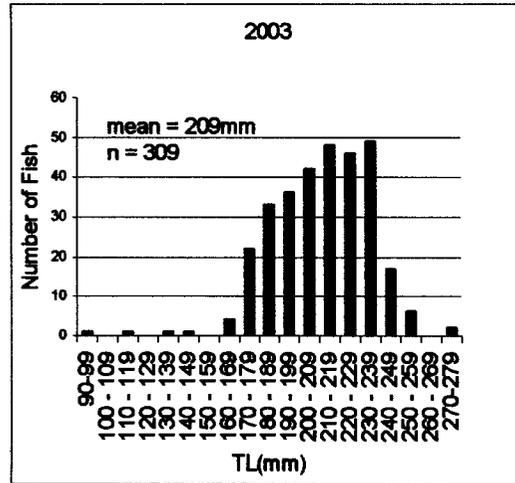
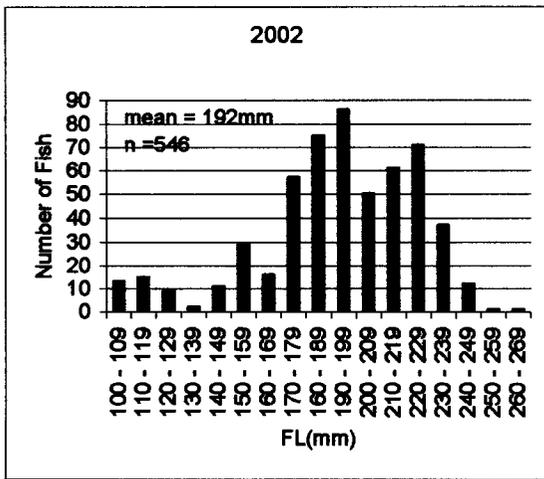
Herd Lake

1. Explore opportunities, such as tiger muskellunge *Esox lucius x E. masquinongy* introductions, for population control in Herd Lake to improve the average size of fish.
2. Monitor the zooplankton population in 2005 if snow pack exceeds average or above average percent.

Williams Lake

1. Continue collaboration with interested parties to develop a long term strategy for improving water quality in Williams Lake.

Figure 5. Length frequency histograms for brook trout in Carlson Lake during specified years, 2002-2004.



2. Consultation with a limnological specialist to review methods to increase habitable space.
3. Continue trapping, spawning and stocking fry. The positive public relations are resulting in support for the Department.

Yellowbelly Lake

The goal of a natural, quality westslope cutthroat trout fishery is difficult to achieve because: Yellowbelly Lake is in a drainage dominated by brook trout, the lake is populated with non-game species and the lake trends toward this biological state over time despite various control measures. Future management direction will be focused on the cost/benefit of stocking marked, six-inch westslope cutthroat trout for greater survival, introduction of a biological predator to reduce non-game fish biomass or to maintain status quo.

Carlson Lake

The region has requested an introduction of 100 tiger muskellunge in 2005. Subsequent to this stocking, Carlson Lake will be sampled in the 2007 field season to track changes in the size structure of the brook trout population. It has been determined that from our experiences on Carlson Lake, that two field seasons of predation prior to sampling will provide a better characterization of the effects of tiger muskellunge introduction on the brook trout population. In the event that lake levels reach bank full condition, hoop nets will be utilized to determine the effects of tiger muskellunge on brook trout populations in the 2007 field season.

LITERATURE CITED

- Butts, A. E. 2004. Lake and reservoir research. Job performance report. Grant F-73-R-26. Project 5. Idaho Department of Fish and Game, Boise.
- Curet, T., B. Esselman, and K. Andrews. 2003. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-25, Job Performance Report, Boise.
- Teuscher, M. D. 1999. Hatchery trout evaluations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-73-R-21, Annual Progress Report, Boise.
- Yule, D. Unpublished Data on Zooplankton Sampling. Wyoming Game & Fish. Cheyenne.

APPENDIX

Appendix A. Yellowbelly Lake 2004 gillnet data.

Yellowbelly Lake 2004 Raw Data

Gillnet Evaluation

Gillnet #7

sinking (38m)

set: 7/1/04 start 17:14

pulled: 7/2/04 end: 09:07

hrs MIN 15hr53m 0.883

CPUE(fish/hr): 5.982

notes:

Rainbow trout = rainbow trout, CT = cutthroat trout, RBTxCTT = hybrid,
BRK = brook trout, BLT = bull trout, RSS = redbside shiner, SUC = sucker
NPM = Northern pikeminnow, MWF = mountain whitefish, and CMA =
large scale suckers

Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)
BKT	357	390	CMA	166		CMA	96	
CMA	467		CMA	166		CMA	113	
CMA	322		CMA	180		CMA	112	
CMA	320		CMA	157		CMA	110	
CMA	465		CMA	209		CMA	177	
CMA	250		CMA	212		CMA	170	
CMA	300		CMA	170		CMA	104	
CMA	460		CMA	216		NPM	110	
CMA	305		CMA	167		CMA	110	
CMA	195		CMA	187		CMA	105	
CMA	465		CMA	170		NPM	106	
CMA	420		CMA	168		CMA	98	
CMA	220		CMA	180		CMA	167	
NPM	235		CMA	195		CMA	110	
CMA	310		CMA	196		CMA	102	
CMA	210		CMA	203		CMA	175	
CMA	175		CMA	236		CMA	100	
NPM	233		CMA	204		CMA	106	
CMA	184		BKT	233	122	CMA	178	
BKT	336	340	CMA	185				
CMA	311		CMA	173				
CMA	200		CMA	164				
CMA	196		CMA	183				
CMA	166		CMA	176				
CMA	184		CMA	160				
CMA	197		CMA	174				
CMA	241		CMA	177				
CMA	201		CMA	161				
CMA	213		CMA	184				
CMA	197		CMA	161				
CMA	165		CMA	168				
CMA	228		CMA	160				
CMA	189		CMA	165				
CMA	182		CMA	164				
CMA	178		CMA	160				
CMA	172		CMA	161				
CMA	193		CMA	103				
CMA	108		CMA	110				

Yellowbelly Lake 2004 Raw Data Gillnet Evaluation Gillnet #14 sinking (58m) set: 7/1/04 start: 17:08 pulled: 7/2/04 end: 09:22 hrs MIN 16hr14m 0.2333 CPUE(fish/hr): 0.3697 notes:			Yellowbelly Lake 2004 Gillnet Evaluation Gillnet #10 floating (45m) set: 7/1/04 start: 17:18 pulled: 7/2/04 end: 08:45 hrs MIN 15hr27m 0.45 CPUE(fish/hr): 0.6472 notes:			Yellowbelly Lake 2004 Gillnet Evaluation Gillnet #15 sinking (58m) 1345 set: 7/1/04 start: 17:36 pulled: 7/2/04 end: 07:21 hrs MIN 13hr45m 0.75 CPUE(fish/hr): 0.5818 notes: not speciated		
Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)
CMA	118		RBT	467	900	SUC	107	
CMA	115		NPM	252		SUC	112	
CMA	111		CMA	238		SUC	110	
plus additional 3 CMA not measured			NPM	249		SUC	115	
			NPM	263		SUC	111	
			NPM	245		SUC	108	
			NPM	221		SUC	109	
			NPM	276		SUC	112	
			NPM	296				
			NPM	226				

Yellowbelly Lake 2004 Raw Data

Gillnet Evaluation

Gillnet #8 14hr

floating (45m)

set: 7/1/04 start: 17:30

pulled: 7/2/04 end: 07:56

hrs MIN 14hr26m 0.8667

CPUE(fish/hr): 5.0471

notes:

Yellowbelly Lake 2004

Gillnet Evaluation

New Gillnet #1

floating (45m) 59m

set: 7/1/04 start: 16:55

pulled: 7/2/04 end: 09:54

hrs MIN 15hr59m 0.9833

CPUE(fish/hr): 1.4393

notes:

Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)
BKT	304	250	BKT	351		CMA	415	
RBT	461	800	CMA	437		CMA	507	
RBT	195	66	CMA	406		CMA	453	
CTT	303	285	CMA	411		CMA	400	
RBT	335	325	CMA	355		CMA	455	
CMA	462		CMA	435		CMA	444	
CMA	437		CCO	348		CMA	337	
CMA	410		CMA	412		CMA	413	
CMA	387		CMA	292		CMA	320	
BKT	348	355	CMA	384		CMA	413	
BKT	379	500	CMA	277		CMA	313	
BKT	306	290	CMA	282		CMA	296	
RBT	344	340	CMA	286		CMA	321	
BKT	350	380	CMA	253		BKT	312	270
CTT	371	495	CMA	230		CMA	243	
BKT	351	380	CMA	254		CMA	224	
BKT	383	500	CMA	232		CMA	225	
BKT	325	320	CMA	262		CMA	216	
CTT	396	525	NPM	208		CMA	218	
RBTXCTT	368	448	CMA	166		BKT	169	46
BKT	308	320	CMA	217		BKT	283	200
BKT	328	298	CMA	171		CMA	243	
BKT	338	420	CMA	155		RBTXCTT	513	1340
CMA	445		CMA	155				
CMA	440		BKT	174	51			
CMA	425		CMA	223				
CMA	446		CMA	185				
CMA	415		CMA	168				
CMA	445		CMA	162				
CMA	438		CMA	163				
CMA	381		CMA	221				
CMA	428		CMA	165				
CMA	416		CMA	164				
CMA	542		CMA	165				
CMA	414		BKT	190	70			
CMA	361		NPM	238				
CMA	419							
CMA	424							
NPM	280							

Yellowbelly Lake 2004 Raw Data

Gillnet Evaluation

Gillnet #6

sinking (37m)

set: 7/1/04 start: 17:24

pulled: 7/2/04 end: 08:25

hrs MIN 15hr01m 0.0167

CPUE(fish/hr): 4.9281

notes:

Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)
RBTXCTT	473	1000	NPM	246	
RBT	428	660	NPM	211	
CMA	420		NPM	203	
CMA	463		CMA	184	
CMA	467		CMA	175	
CMA	459		CMA	187	
CTT	442	720	CMA	165	
CMA	475		CCO	163	
CMA	452		NPM	199	
CMA	422		BKT	258	150
CMA	476		NPM	244	
RBTXCTT	505	1060	NPM	220	
CMA	415		NPM	201	
CMA	420		CMA	237	
CMA	435		CMA	217	
CMA	468		NPM	245	
CMA	465		CMA	205	
CMA	350		CMA	190	
BKT	314	280	CMA	230	
RBT	472	860	CMA	178	
BKT	305	240	CMA	175	
CMA	444		RBT	167	44
CMA	455		NPM	175	
CMA	475		CMA	173	
CMA	468		CMA	158	
CMA	435		CMA	174	
CMA	440		CMA	175	
CMA	426		CMA	166	
CMA	522		CMA	171	
CMA	440		NPM	235	
CMA	441		CMA	156	
CMA	362		CMA	164	
CMA	312		CMA	183	
CMA	411		CMA	130	
BKT	452	425	BKT	230	120
CMA	289				
CMA	242				
NPM	215				
NPM	260				

Yellowbelly Lake 2004 Raw Data

Gillnet Evaluation

New Gillnet #2

floating (45m) 103

set: 7/1/04 start 17:04

pulled: 7/2/04 end: 9:47

hrs MIN 16hrs 43m 0.716667

CPUE(fish/hr): 5.5635

notes: * = estimated due to decap

Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)	Species	Total Length (mm)	Weight (g)
BKT	291	220	CMA	282		CMA	170	
BKT	240	120	CMA	224		CCO	169	
CMA	300		CMA	334		CMA	186	
CMA	294		CMA	341		CMA	156	
CMA	450		CMA	284		CMA	157	
CMA	377		CMA	381		CMA	163	
CMA	287		CMA	360		CMA	169	
CMA	335		CMA	465		CMA	172	
CMA	268		CMA	329		CMA	161	
CMA	224		CMA	340		CMA	158	
CMA	287		CMA	330		CMA*	193	
CMA	245		CMA	281		CMA*	174	
CMA	354		CMA	281		CMA*	178	
CMA	276		CMA	248		CMA	318	
BKT	312	280	CMA	252		CMA	177	
CMA	367		CMA	217				
BKT	300	250	CMA	218				
CMA	352		CMA	249				
CMA	245		CMA	232				
CMA	243		CMA	228				
CMA	300		CMA	225				
BKT	230	120	CMA	190				
BKT	294	245	CMA	177				
BKT	380	350	CMA	205				
CMA	251		CMA	206				
CMA	232		CMA	206				
CMA	232		CMA	254				
CMA	296		CMA	424				
CMA	294		CMA	314				
CMA	296		CMA	284				
CMA	318		CMA	293				
BKT	302	260	CMA	275				
BKT	343	300	CMA	348				
BKT	305	250	CMA	290				
BKT	330	360	CMA	185				
RBT	348	340	CMA	221				
CMA	294		CMA	184				
CMA	267		CMA	172				
CMA	303		CMA	190				

SALMON REGION 2004 FISHERY MANAGEMENT ANNUAL REPORT

RIVERS AND STREAM INVESTIGATIONS

ABSTRACT

During the summer of 2004, Idaho Department of Fish Game (Department), US Forest Service (USFS), and Department of Environmental Quality (DEQ) sampled 102 tributary streams of the upper Salmon River basin to determine fish species composition, relative abundance and size distribution. Ninety-eight of the 104 tributary streams had fish present. Rainbow trout/Steelhead *Oncorhynchus mykiss* were found in 62% of the 98 fish-bearing tributary streams surveyed and had total lengths ranging from 24 to 270 mm. Westslope cutthroat trout *O. clarkii lewisi* were found in 65% of the fish-bearing tributary streams surveyed and had total lengths ranging from 22 to 375 mm. Bull trout *Salvelinus confluentus* were found in 40% of the fish-bearing streams and had total lengths ranging from 32 to 600 mm. Phenotypically appearing hybrid rainbow/cutthroat trout were found in 14% of the 988 fish-bearing tributary streams surveyed with fish. Hybrid rainbow/cutthroat trout total lengths ranged from 60 to 335 mm. Brook trout *S. fontinalis* were found in 14 % of the streams with fish (total lengths ranging from 33 to 243 mm) and juvenile Chinook salmon *O. tshawytscha* were found in 12%. Non-game fish were found in 23% of the fish-bearing streams.

Project personnel conducted rainbow trout spawning ground surveys on Big Springs Creek (tributary to the Lemhi River) and the Upper Lemhi River to monitor trends in numbers of redds which may reflect benefits of fishing regulation changes and habitat improvement projects sponsored by the Upper Salmon Basin Watershed Project. We counted a total of 121 redds on April 26, 2005, a decrease from previous years (234 in 2004, 287 in 2003, 556 in 2002, 283 in 2001 and 306 in 2000).

On September 9, 2004 regional department staff surveyed a reach of Fourth of July Creek and counted 33 bull trout redds with three possible redds.

On September 8, 2004 regional department staff surveyed a meadow reach of Bear Valley Creek to determine the number of bull trout redds. Forty-four bull trout redds were observed.

On September 8, 2004 department staff surveyed a meadow reach of the East Fork of Hayden Creek and counted 26 bull trout redds.

Between August 30 and September 9, 2004 Department research staff counted a total of eleven completed bull trout redds in Fishhook Creek and nine in Alpine Creek in the Stanley Basin.

On April 25th 2005, Carmen Creek irrigators shut off their irrigation water for a 24 hour period to increase in-stream flows. Regional fisheries biologists monitored activities during the irrigator initiated, flushing flow.

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INTRODUCTION

Wild Trout Population Surveys

During the summer of 2004, the Idaho Department of Fish and Game (Department), US Forest Service (USFS), and the Idaho Department of Environmental Quality (IDEQ) cooperatively inventoried fish communities in tributary streams of the upper Salmon River basin. Accurate and current information is needed to effectively manage fish stocks, particularly since several endangered fish species (bull trout *Salvelinus confluentus*, Chinook salmon *Oncorhynchus tshawytscha*, sockeye salmon *O. nerka*, and steelhead trout *O. mykiss*) are known to inhabit the upper Salmon River basin.

Big Springs Creek

In 1994, the Department initiated informal resident rainbow trout redd count surveys on Big Springs Creek (BSC), a tributary to the Upper Lemhi River near Leadore, Idaho. We established three transect areas in 1997 to monitor long-term resident rainbow trout population trends; two on BSC and one on the Upper Lemhi River. These efforts are performed to track trends in numbers of redds observed. Theoretically, regulation changes implemented in 1994 (only rainbow trout over 14 inches may be kept), habitat projects and tributary reconnects should be reflected with increased spawning activity.

Bear Valley Creek

2004 marked the third year for conducting bull trout redd counts in Bear Valley Creek. Bear Valley Creek is a tributary of Hayden Creek which is a high quality bull trout rearing and spawning tributary to the Lemhi River. Bear Valley Creek is located within a relatively low gradient meadow formed by a landslide. This meadow is located about 3.2 km upstream from the confluence of Bear Valley Creek with Hayden Creek. Bear Valley Creek is likely the most important tributary for spawning fluvial bull trout in the Lemhi River drainage.

East Fork Hayden Creek

The monitoring of resident bull trout redds in the East Fork Hayden Creek was conducted for the third year in 2004. East Fork Hayden Creek is a tributary to Hayden Creek in the Lemhi River drainage. East Fork of Hayden Creek has bull trout spawning in a meadow five km upstream from the confluence with Hayden Creek.

Alpine and Fishhook Creeks

In 1995, the Department initiated informal bull trout redd count surveys on Alpine (tributary to Alturas Lake) and Fishhook (inlet to Redfish Lake) creeks. In 1998, standardized transects were established in order to monitor long term bull trout spawning trends.

Fourth of July Creek

The monitoring of bull trout redds in Fourth of July Creek was conducted for the second year in 2004. Fourth of July Creek is a tributary to the mainstem Salmon River. The survey was started approximately 6.8 km upstream from the confluence of the mainstem Salmon River and ends approximately 4 km upstream. Bull trout counts in Fourth of July Creek were initiated after flow alterations and stream improvements were performed by the IDFG Screen Program.

Carmen Creek

In low water years, irrigation withdrawals from Carmen Creek and its tributaries have resulted in periodic flow impairment of the mid and lower reaches of the mainstem Carmen Creek. Since 2004, concerned landowners/irrigators have met with state and federal fish biologists to discuss ideas for developing fisheries related restoration projects in the Carmen Creek watershed. Conservation easements, seasonal water leases, ditch screening, fisheries habitat improvement projects and improving fish migration conditions highlight some of the ideas discussed during these meetings.

In April 2005, Carmen Creek irrigators observed and reported juvenile fish concentrating at the head end of ditches throughout the watershed. Simultaneously the watershed was experiencing pronounced low flows due to low snow pack, cool temperatures, irrigation, and a lack of precipitation. From past experience the irrigators recognized that the behavior of these fish suggested that they were likely trying to migrate out of the watershed. However, there were not sufficient flows to support unobstructed passage to the main stem Salmon River. On April 25, 2005, state and federal fish biologists were contacted by irrigators concerned about flow conditions and the possible consequences for fish. Alternative options to temporarily increase flows to facilitate fish movement were discussed.

At 1800 hours that same day all main stem Carmen Creek irrigators shut off their irrigation water to increase in-stream flows. The irrigation water remained turned off for a 24 hour period. This report summarizes the monitoring activities conducted during the irrigator initiated, flushing flow of Carmen Creek.

OBJECTIVES

1. Monitor fish populations in streams to determine species, size, and density information.
2. Evaluate the effects of harvest restrictions and habitat improvement efforts on resident rainbow trout populations in the Upper Lemhi River and Big Springs Creek.
3. Monitor the number of bull trout redds in Bear Valley, East Fork Hayden, Alpine, Fishhook and Fourth of July creeks to provide baseline information relative to bull trout recovery.
4. Monitor water temperature response throughout duration of flushing flows on Carmen Creek relative to baseline temperatures collected subsequent to the flush.
5. Monitor stream flows before and during flushing flows at two locations on Carmen Creek to determine the magnitude and duration of the released water.
6. Establish photo point monitoring sites at multiple locations on main stem Carmen Creek To document visual changes in water levels before and during flushing flows.

STUDY AREA AND METHODS

Wild Trout Population Studies

Between June 10 and October 13, 2004, 102 tributary streams of the upper Salmon River basin were surveyed for fish composition, relative abundance, and size distribution. Stream characteristics (temperature, gradient, altitude, and area sampled) were also typically recorded (Appendix A). Drainage information and map coordinates are found in Appendix B.

In the summer of 2004, fish presence and abundance was documented by utilization of backpack electrofishing methodologies. Site locations were selected to encompass a complete sampling coverage of fish communities within a drainage. Some site locations had to be based on adequate access and permission from landowners.

Streams were sampled by electrofishing with use of a Smith Root SR-15 backpack shocking unit. Samplers attempted to catch all sizes of fish in transects ranging in size from 50 to 500 meters in length while moving upstream. Two different types of stream surveys were conducted. Most common was a standardized stream survey. The second type of survey was presence or absence sampling. For standard stream surveys a given transect was sampled one or two times or until a 50% reduction in fish numbers was realized. Captured fish were measured (total length; TL) to the nearest millimeter, placed in holding pens, and monitored for recovery until all passes were completed. Genetic samples were taken on some of the game fish for analysis at a later date. Non-target fish were enumerated only. Once electrofishing was completed, fish were released back into the surveyed reach.

Density estimates (fish sampled per 100m²) were calculated by use of Microfish population software (Van Deventer & Platts, 1989). When consecutive passes did not achieve the appropriate reduction (50%), no population estimate for that stream was calculated. Young of the year (YOY) fish were included in density estimate calculations.

Big Springs Creek

Since 1994 the Department has performed resident rainbow trout redd count surveys on Big Springs Creek (BSC), a tributary to the upper Lemhi River near Leadore, Idaho (Table 1). We established three transect areas in 1997 to monitor long-term resident rainbow trout population trends; two on BSC and one on the upper Lemhi River. The two sites on BSC include the portion of the creek that flows through what is locally known as the Karl Tyler Ranch (NAD27 start: 12 310017 Easting, 4953211 Northing and end: 12 307299 Easting, 4955469 Northing) and the Darwin Neibaur Ranch (NAD27 start: 12 311162 Easting, 4952233 Northing and end: 12 310017 Easting, 4953211 Northing). The upper Lemhi River site includes the section that flows through the Merrill Beyeler Ranch (NAD27 start: 12 312832 Easting, 4950675 Northing and end: 12 312238 Easting, 4952088 Northing). The redd counts are usually conducted during the last week of April or the first week of May using visual, on the ground, count methods. We conducted resident rainbow trout redd counts on April 22, 2004.

Bear Valley Creek

Area reconnaissance indicated bull trout spawning during the first full week of September. Redd counts were conducted during the first week of September using visual, on the ground, count methods. We conducted fluvial bull trout redd counts on September 8, 2004.

NAD27 UTM coordinates for the start and end of the redd count transect on Bear Valley Creek are: 12 0282998 Easting, 4961730 Northing and 12 0282169 Easting, 4962479 Northing respectively. The transect for Bear Valley Creek consists of c-channel habitat.

East Fork Hayden Creek

East Fork Hayden Creek redd counts were conducted during the first full week of September using visual, on the ground, count methods. We conducted fluvial bull trout redd counts on September 8, 2004.

The starting and ending NAD27 UTM coordinates for the 2004 survey are as follows for East Fork of Hayden Creek Start: 12 288683 Easting, 4955925 Northing End: 12 289197 Easting, 4955050 Northing. The transect for the East Fork consists of c-channel type.

Table 1. Number of resident rainbow trout redds counted in Big Springs Creek (BSC) and Lemhi River, 1994 through 2004.

Date	Lemhi River Beyeler Ranch ^a	BSC Neibaur Ranch	BSC Tyler Ranch ^b	Total
4/26/94	-	-	-	40 ^c
5/3/95	-	57	-	57
5/3/96	7	32	-	39
4/21-5/3/97	8	44	45	97
5/3/98	18	93	124	235
4/29/99	29	39	71	139
4/20/00	23	160	123	306
4/5/01	2	95	186	283
4/25/02	3	360	193	556
4/22/03	56	128	103	287
4/22/04	15	174	45	234
4/26/05	3	75	43	121

^a Habitat improvement project implemented spring 1995.

^b Habitat improvement project implemented spring 1998.

^c Incidental count taken during a Lemhi Model Watershed Project habitat survey includes all of Big Spring Creek.

Alpine and Fishhook Creeks

Two bull trout redd counts were conducted by Department research personnel on Fishhook and Alpine creeks (August 30, 31 and September 9, 2004). All redds were flagged during the first survey. On the second survey any additional redds were counted, including the flagged redds to provide a total number of redds counted for each standardized section of Fishhook and Alpine creeks. The starting and ending NAD27 UTM coordinates for the 2004 surveys are as follows: Fishhook Creek Start; 11 662601 Easting, 4888913 Northing End; 11 661966 Easting, 4888623 Northing and for Alpine Creek Start; 11 666223 Easting, 4863395 Northing End; 11 665350 Easting, 4863075 Northing.

Fourth of July Creek

Fourth of July Creek redd counts were conducted during the first full week of September using visual, on the ground, count methods. The counts were conducted on September 9, 2004.

The starting and ending NAD27 UTM coordinates for the 2004 survey are as follows for Fourth of July Creek: Start; 11 679680 Easting, 4878679 Northing End; 11 684992 Easting, 4879856 Northing.

Upper Lemhi River Resident Rainbow Trout Spawning Ground Surveys 1994-2005

61

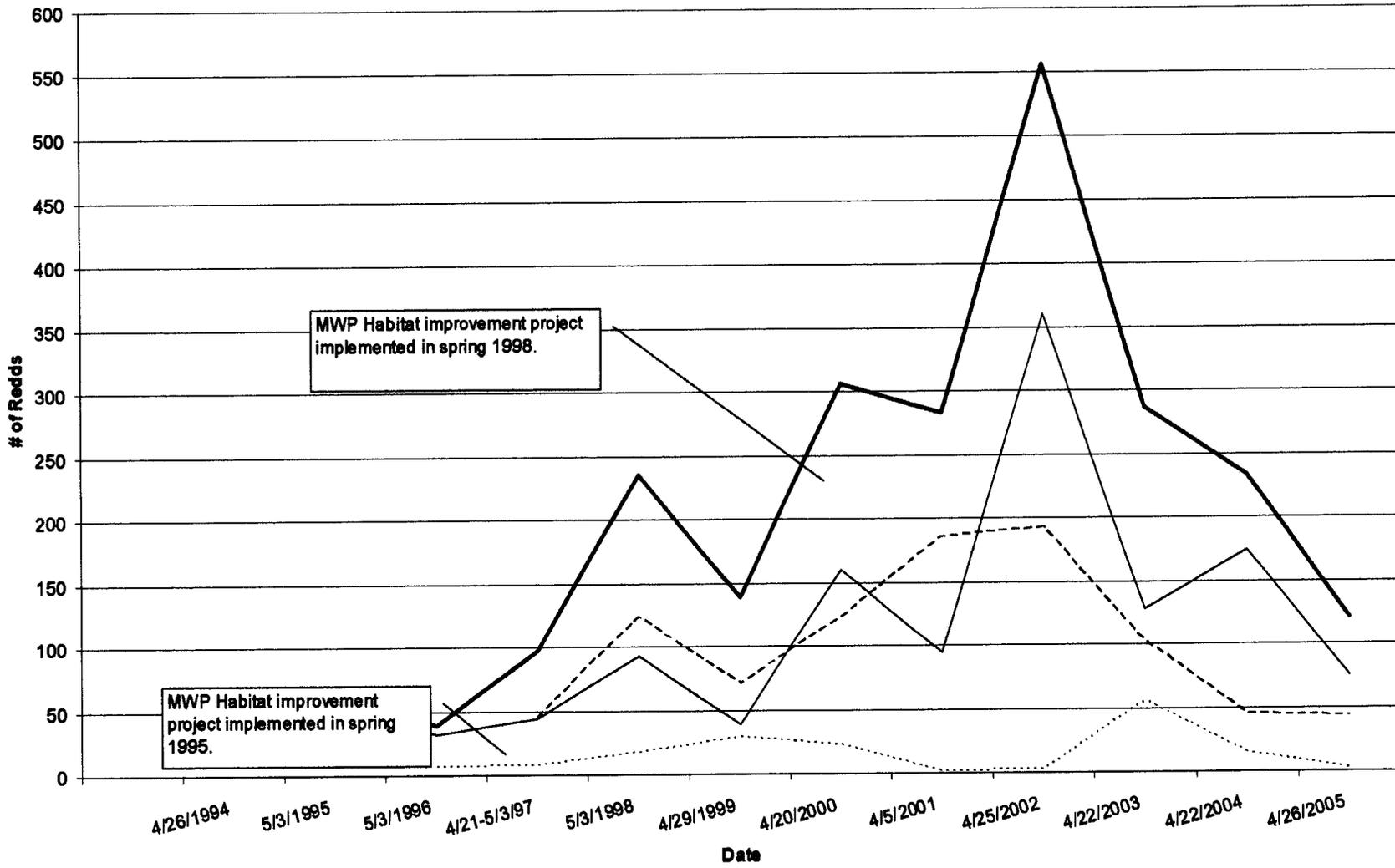


Figure 1. Upper Lemhi Resident Rainbow Trout Spawning Ground Surveys 1994 – 2005.

Carmen Creek

Carmen Creek is located in one of 23 subwatersheds in the Middle Salmon-Panther Subbasin (HUC 17060203). The Middle Salmon-Panther Subbasin is a fifth-field HUC located in east-central Idaho spanning approximately 1,810 square miles (IDEQ, 2001).

The Carmen Creek subwatershed includes Carmen Creek and its tributaries. The subwatershed is 35,089 acres (54.8 miles²) in size. The major tributary to Carmen Creek is Freeman Creek. Carmen Creek has a mean annual flow of 17.5 cfs and a mean monthly flow range of 70 cfs in June to 6 cfs in December through March (SCNF, 1993). Of 35.1 miles of stream, 50% is high gradient (>10%), and the remaining 50% is evenly divided between low (<4%) and moderate gradient (4-10%). Roughly half of the total stream miles are below the National Forest boundary and are privately owned. All of the low to moderate gradient stream miles below the Forest boundary (12.4 miles) were historically accessible to Chinook salmon (SCNF, 1993). Historic Chinook spawning and rearing habitat includes eight miles of Carmen Creek and three miles of Freeman Creek. The lowest reaches of Carmen Creek are periodically de-watered for irrigation (SBTA, 1998). In years of above average precipitation there may be sufficient flow for anadromous fish.

The Carmen Creek watershed supports anadromous and resident cold water fish (e.g. juvenile Chinook salmon, rainbow trout/steelhead, bull trout, and sculpin *Cottus sp.*).

An automatic electronic temperature recording device (HOBO®) was deployed to record water temperatures in lower Carmen Creek (Figure 2). For the purpose of this study temperatures were recorded from April 25 to April 30, 2005 (Figure 3). The unit recorded temperature data at two-hour intervals. Temperature recording accuracy as per specifications from the manufacturer was $\pm 0.2^{\circ}\text{C}$ within an external range of 10°C to 40°C .

The HOBO® temperature data was downloaded using BOXCAR® and saved in a text file. The data was transferred to Microsoft Excel® where irregular raw data from transport to and from the sampling site was deleted to avoid skewing results. Microsoft Excel® was then used to summarize and evaluate the data.

Three different flow measurements were taken at two different locations during the course of monitoring. Flows were measured just prior to the flush, one midway through the flush and one just prior to the end of the flush. A Swoffer Model 3000 propeller driven flow meter, mounted on a top-set wading rod, was used to collect stream flow information for the first and last sample times on April 25 and 26. A Swoffer Model 2100 propeller driven flow meter, mounted on a top-set wading rod, was used to collect stream flow information during the midway flush on the morning of April 26, 2005 (Figures 4 and 5). Stream flow sampling techniques are outlined by Gallagher et.al. 1999.

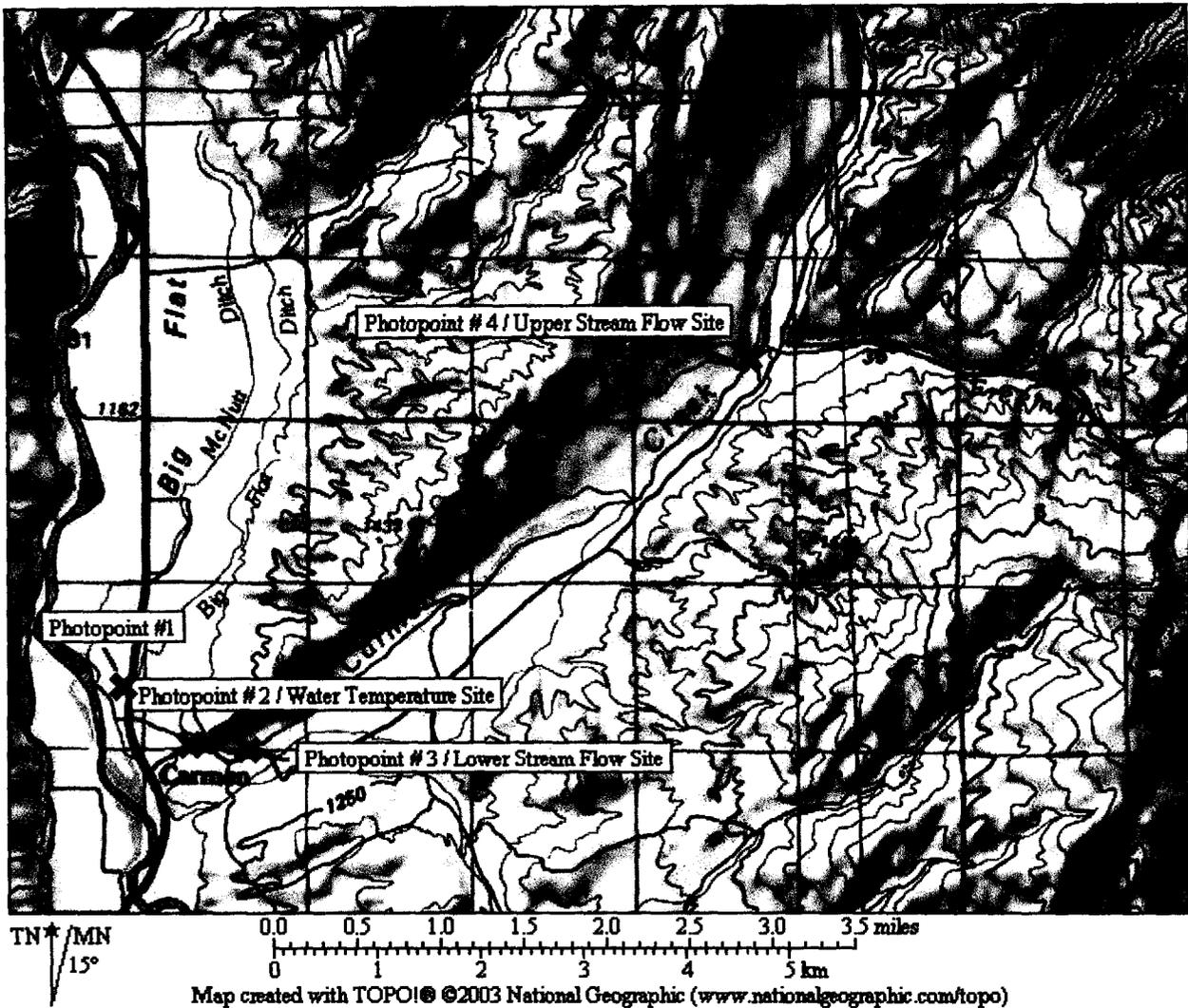


Figure 2. Locations of photo points, stream flow, and water temperature sites on Carmen Creek.

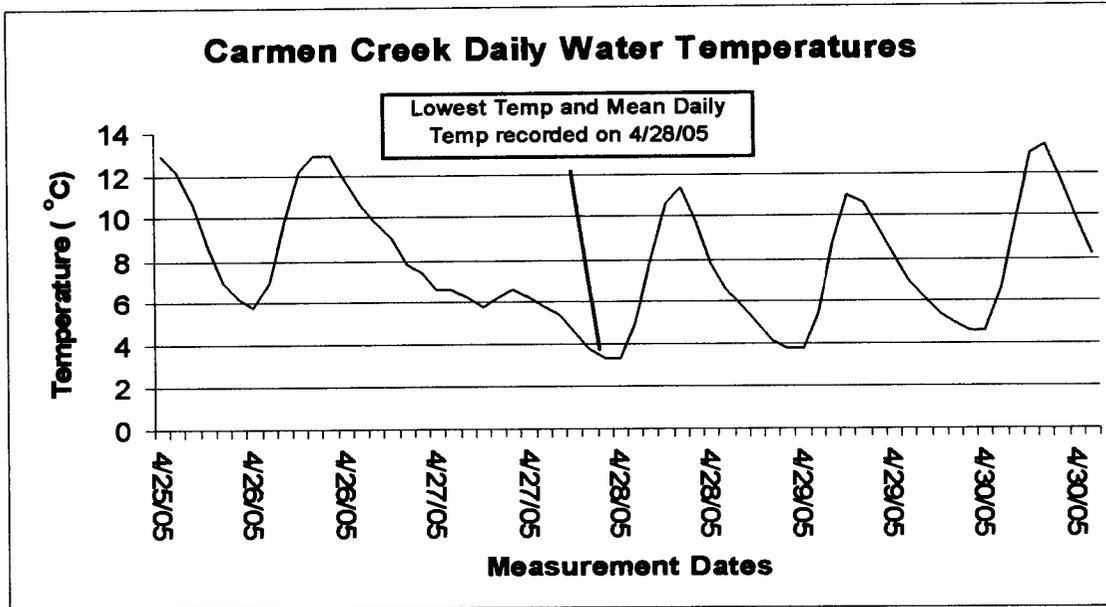


Figure 3. Daily water temperatures recorded at the Grange Bridge during the period April 25 – April 30, 2005.

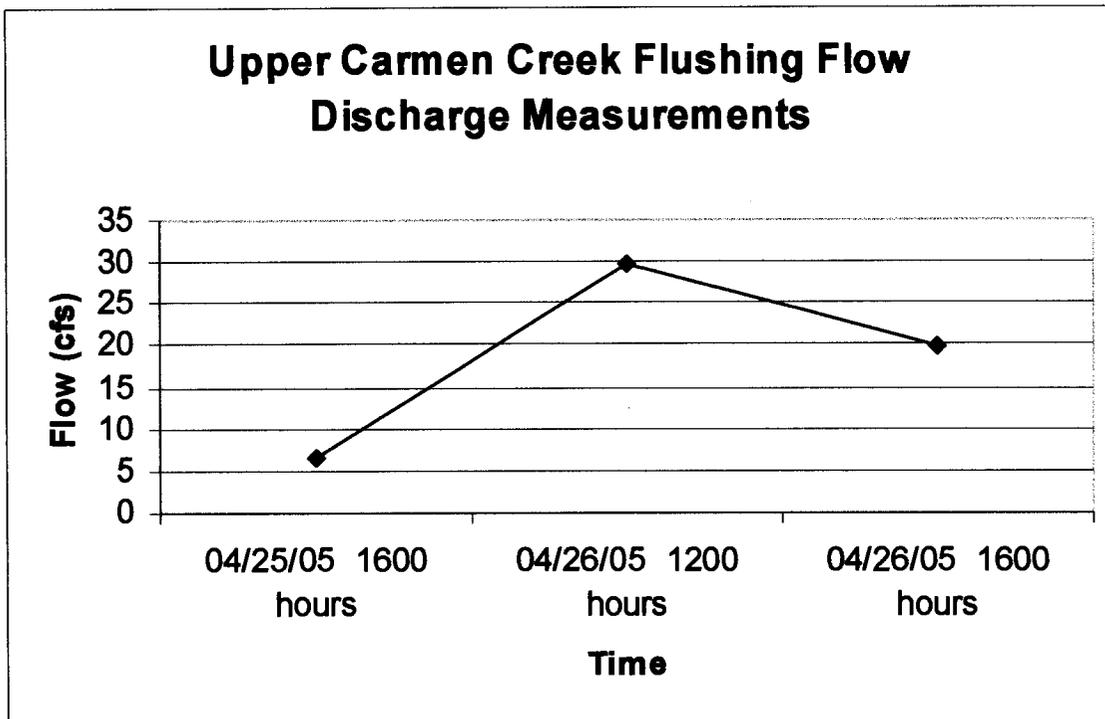


Figure 4. Upper Carmen Creek discharge measurements during the twenty-four hour period of April 25 – April 26, 2005.

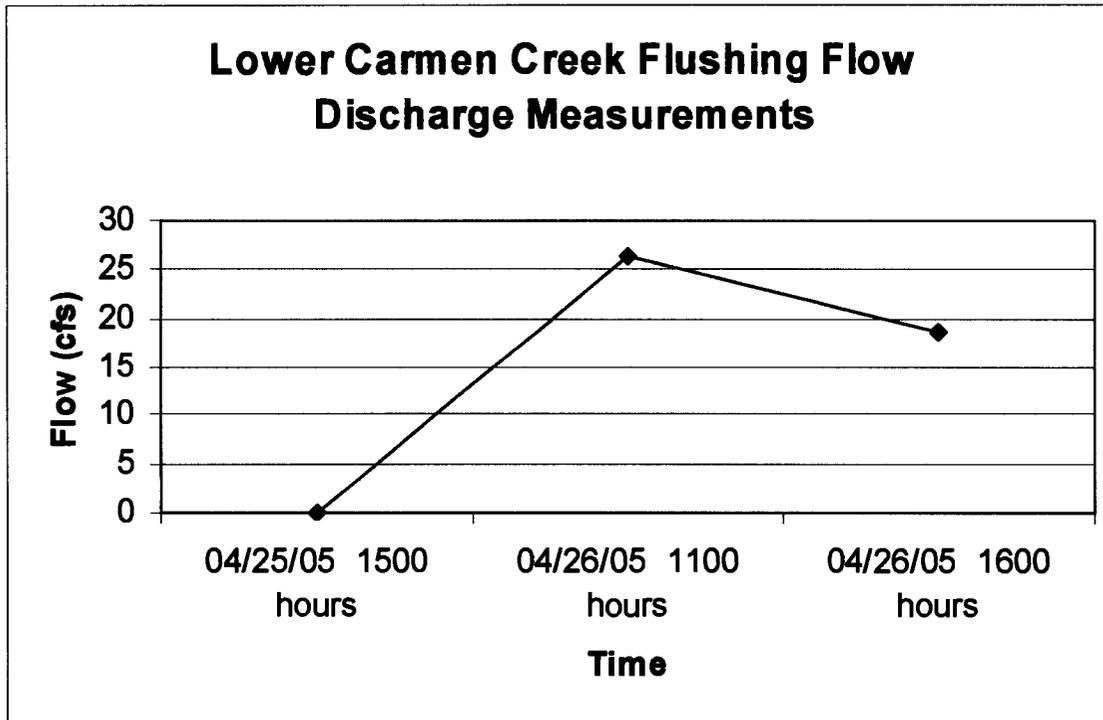


Figure 5. Lower Carmen Creek discharge measurements during the twenty-four hour period of April 25 – April 26, 2005.

Photo point monitoring was conducted at seven sites on Carmen Creek before and during the flushing flows. Photo point monitoring is a qualitative monitoring tool that was used to provide detailed visual documentation of changes during the flush (Figure 2, Photo Points 1a-7b).

A Canon® PowerShot A70 camera was used for each photo point. Two pictures were taken at each site except at the Carmen Grange Bridge. At each photo point a picture was taken facing downstream and the second picture taken facing upstream.

RESULTS AND DISCUSSION

Wild Trout Population Studies

Population estimates for all species of salmonids were calculated for three-pass electrofishing transect sites. Population estimates were based on total sample size (n) of all salmonids sampled during each electrofishing pass (Table 2). Salmonids were found in 92 out of 96 streams surveyed with fish present (Table 2). Westslope cutthroat trout was the predominant species encountered during our investigations and was found in 65% of the tributary streams surveyed. Westslope cutthroat trout had total lengths ranging from 22 to 375 mm. The highest densities of westslope cutthroat trout occurred in Bayhorse and Twelvemile creeks (Table 2). Rainbow trout were found in 62% of the tributary streams surveyed and had total lengths ranging from 24 to 270mm. Ron and Thompson creeks had the highest densities of rainbow trout (Table 2). Bull trout were found in 40% of the streams surveyed and had total lengths ranging from 32 to 600 mm. East Fork Hayden and Fourth of July creeks had the highest densities of bull trout (Table 2). Apparent hybrid rainbow/cutthroat trout were found in 14% of the 98 surveyed tributary streams with fish. Apparent hybrid rainbow/cutthroat trout total lengths ranged from 60 to 335 mm. Brook trout were found in 14% of the streams surveyed with fish and had total lengths ranging from 33 to 243 mm. Juvenile Chinook salmon *O. tshawytscha* were found in 12% of the streams.

Highest densities of brook trout were found in Champion Creek and Smiley Creek. Bernard and Pole creeks had the highest densities of juvenile Chinook salmon (Table 2). Fish were not found in the following six tributaries: Eighteenmile, Grand Prize Gulch, Salzer, Short, Tenmile, and Wheetip.

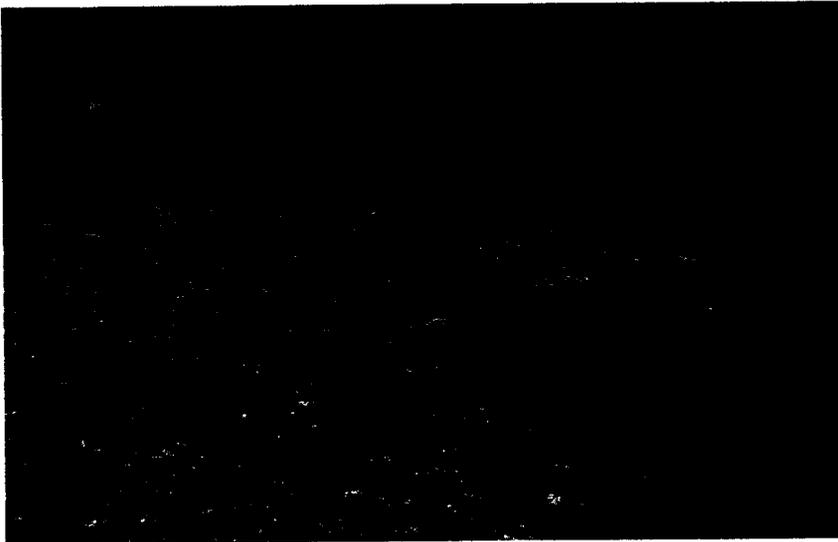
Non-target species found included: dace *Rhinichthys sp.*, sculpin, mottled sculpin *Cottus bairdi*, and mountain whitefish *Prosopium williamsoni* (Table 3). Non-target species were found in 23% of tributaries surveyed that had fish present. This percentage is likely to be low because non-game species were not targeted during surveys by all agencies and may not have been enumerated even though present. Sculpin species were sampled in 23 of the 98 tributaries with fish present. The highest abundance of sculpin was found in Pole Creek and Thompson Creek. Other non-target species found in less than 13% of the 23 tributaries with non-game species present are: mountain whitefish (13%), and sucker species (4%).



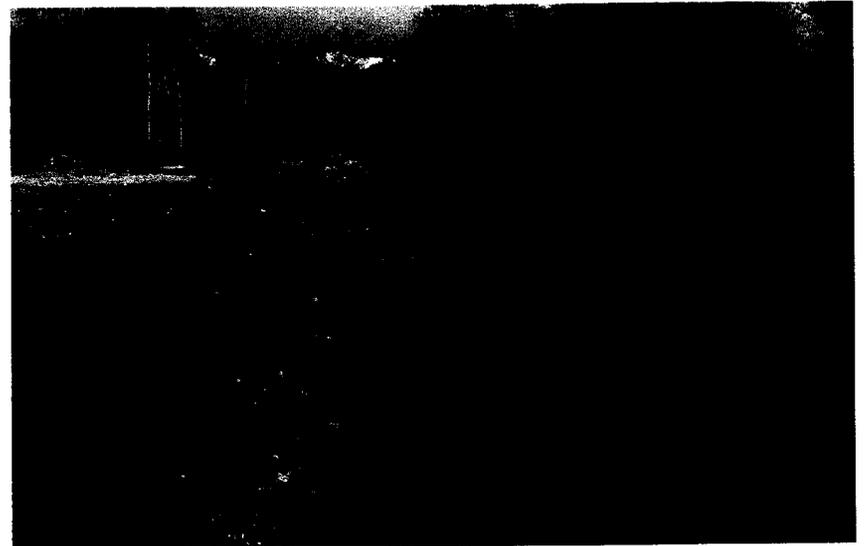
Photopoint 1a. April 25, 2005 Carmen Creek at lower pond bridge looking downstream.



Photopoint 2a. April 25, 2005 - Carmen Creek at lower pond bridge looking upstream.



Photopoint 1b. April 26, 2005 Carmen Creek at lower pond bridge looking downstream.



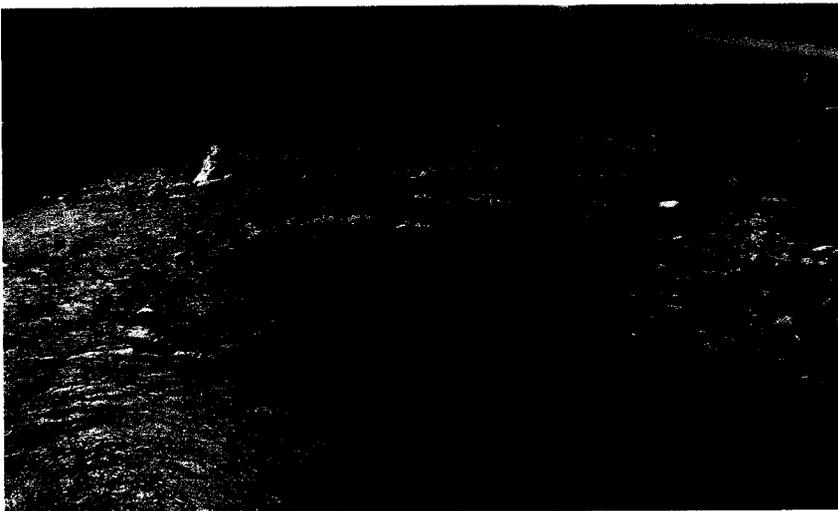
Photopoint 2b. April 26, 2005 - Carmen Creek at lower pond bridge looking upstream.



88 Photopoint 3.a. April 25, 2005 Carmen Creek—Below Freeman Junction looking downstream from private bridge.



Photopoint 4a. April 25, 2005 Carmen Creek—McFarland Property looking downstream at culvert.



Photopoint 3b. April 26, 2005 Carmen Creek—McFarland Property looking downstream from private bridge.



Photopoint 4b. April 26, 2005 Carmen Creek—McFarland Property looking downstream at culvert.



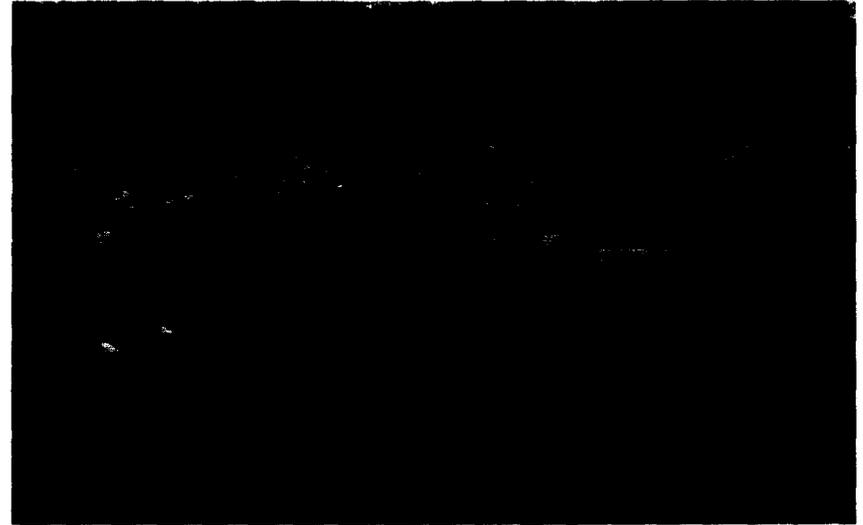
Photopoint 5a. April 25, 2005 - Carmen Creek at Big Flat Siphon looking downstream.



Photopoint 6a. April 25, 2005—Carmen Creek at Big Flat Siphon looking



Photopoint 5b. April 26, 2005 - Carmen Creek at Big Flat Siphon looking downstream.



Photopoint 6b. April 26, 2005 - Carmen Creek at Big Flat Siphon looking upstream.



Photopoint 7a. April 25, 2005 – Carmen Creek at Grange Bridge looking upstream.



Photopoint 7b. April 26, 2005 – Carmen Creek at Grange Bridge looking up stream.

Table 2. Combined salmonids population estimates including fry, 95% confidence intervals (CI), and species composition for selected streams of the Upper Salmon River Basin in 2004 (L= lower reach, M= M reach, and U= upper reach).

Stream	Transect	Sample date	Transect area	Fish Sampled (n)	Population Estimate (95% CI)	Fish/100m2	Species Composition							
							CT	RB	BLT	RBXCT	EBT	CK	GT	
Agency	L	9/27/2004	484.0	29	30(29,33)	6.0		100						
Agency	L	9/29/2004	308.0	26	**	8.4		96					4	
Agency	M	9/20/2004	332.0	38	**	11.4		100						
Agency	M	10/13/2004	350.0	34	**	9.7		100						
Agency	U	9/10/2004	222.0	190	267(251,282)	78.4	32	68						
Agency	U	9/10/2004	154.0	140	**	90.9		100						
Agency	U	9/10/2004	124.0	33	**	26.6	48	52						
Alder	L	7/11/2004	160.0	58	**	36.3	100							
Alder	U	7/28/2004	96.4	5	n/a	5.2	100							
Allan	L	7/27/2004	78.0	4	**	5.1	100							
Anderson	M	7/21/2004	91.0	23	**	25.3	96						4	
Aparejo	L	7/18/2004	0.0	29	**	n/a	100							
Bayhorse	L	8/4/2004	400.0	49	**	12.3	12	88						
Bayhorse	L	8/6/2004	326.0	262	**	80.4	1	96						3
Bayhorse	L	8/7/2004	342.0	529	549(536,561)	154.7	98							2
Bayhorse	M	8/6/2004	470.0	65	69(65,76)	13.8	100							
Bayhorse	M	8/6/2004	308.0	53	**	17.2	45	55						
Bayhorse	U	7/1/2004	278.0	8	**	2.9	100							
Bayhorse	U	7/13/2004	196.0	40	**	20.4	100							
Bayhorse	U	7/13/2004	214.0	20	**	9.3	100							
Bayhorse	U	7/14/2004	260.0	56	**	21.5	100							
Bear Valley	M	8/28/2004	318.0	19	19(19,20)	6.0		47	53					
Bernard	L	7/18/2004	0.0	127	**	n/a		20	1					79
Big Bear	L	7/15/2004	172.0	22	22(22,23)	12.8	55	23	9	13				
Big Bear	L	8/24/2004	172.0	15	**	8.7	87	13						
Big Bear	L	7/18/2004	0.0	31	**	n/a	100							
Big Bear	L	7/19/2004	0.0	8	**	n/a		100						
Big Bear	M	8/24/2004	0.0	15	**	n/a	73	20		7				
Big Bear	M	7/1/2004	91.0	18	**	19.8	100							
Big Bear	U	7/1/2004	0.0	13	**	n/a	80	20						
Big Eightmile	U	9/13/2004	528.0	23	**	4.4		9	91					
Big Timber	M	9/14/2004	520.0	33	**	6.3		100						
Bog	L	7/7/2004	0.0	2	**	n/a	50				50			
Boulder	M	9/2/2004	292.0	15	**	5.1			100					
Brush	L	7/17/2004	0.0	13	**	n/a	8	84		8				
Camas	L	7/17/2004	0.0	36	**	n/a	70	28	2					
Canyon	M	9/15/2004	0.0	2	**	n/a		100						
Canyon	M	6/15/2004	318.3	24	**	7.5		100						
Canyon	U	9/15/2004	0.0	6	**	n/a		100						
Canyon	U	6/15/2004	374.0	22	**	5.9		100						
Cape Horn	L	9/9/2004	200.0	3	**	1.5			33					67
Carmen	M	8/9/2004	512.0	130	**	25.4		86						14
Carmen	U	8/30/2004	478.0	33	**	6.9			100					
Champion	L	8/16/2004	432.0	113	**	26.2	2	3				35	60	
Champion	M	8/17/2004	334.0	96	106(96,118)	28.7		5	3			56	36	
Champion	M	8/16/2004	358.0	102	**	28.5						100		
Champion	M	8/17/2004	348.0	36	**	10.3			3			97		
Champion	M	8/17/2004	300.0	20	**	6.7	70					30		
Champion	U	8/18/2004	148.0	58	58(58,59)	39.2	100							
Clear	M	9/13/2004	150.0	20	**	13.3		100						

Table 2. continued

Stream4	Transect	Sample date	Transect area	Fish Sampled (n)	Population Estimate (95% CI)	Fish/100m2	Species Composition							
							CT	RB	BLT	RBXCT	EBT	CK	G1	
Corn	L	9/16/2004	310.0	34	**	11.0	3	97						
Cougar	L	7/16/2004	0.0	41	**	n/a	100							
Cow	L	9/29/2004	158.0	11	**	7.0	36	64						
Cow	M	9/20/2004	146.0	12	**	8.2	8	92						
Cub	L	7/17/2004	0.0	30	**	n/a	20	47			33			
Dairy	L	7/22/2004	170.0	5	**	2.9		20	80					
Deep	L	9/7/2004	244.0	1	**	0.4	100							
Deer	L	8/5/2004	98.0	3	3(3,6)	3.1				100				
Ditch	L	7/27/2004	286.0	23	**	8.0	9	91						
Ditch	L	7/26/2004	284.0	19	**	6.7	53	47						
East Fork Hayden	M	8/23/2004	298.0	39	35(31,44)	13.1				100				
E. Fork Pahsimeroi	L	9/8/2004	300.0	10	**	3.3				100				
Eighteenmile Creek	L	9/13/2004	100.0	0		0.0								
Elk	L	9/9/2004	200.0	29	**	14.5		55				14	31	
Elkhorn	L	7/14/2004	0.0	74	**	n/a	4	81	9	6				
Everson	M	7/21/2004	194.0	6	6(6,8)	3.1				100				
Flume	L	9/20/2004	252.0	34	**	13.5	76	24						
Ford	L	8/4/2004	152.0	33	34(33,37)	21.7	27	67			6			
Fourth of July	L	7/24/2004	504.0	18	**	3.6	11			61		28		
Fourth of July	L	7/25/2004	458.0	22	22(22,24)	4.8	27			73				
Fourth of July	L	7/25/2004	436.0	53	**	12.2	2	6	9				83	
Fourth of July	M	7/24/2004	538.0	8	**	1.5	25			75				
Fourth of July	M	7/23/2004	554.0	20	**	3.6	15			85				
Fourth of July	M	7/24/2004	412.0	11	**	2.7	45			45		10		
Fourth of July	M	8/25/2004	442.0	30	**	6.8	47			53				
Fourth of July	U	7/22/2004	222.0	37	**	16.7	100							
Fourth of July	U	7/22/2004	174.0	14	**	8.0	100							
Fourth of July	U	7/22/2004	0.0	68	**	n/a	85			15				
Fourth of July	U	7/22/2004	0.0	54	**	n/a	100							
Fourth of July	U	7/23/2004	484.0	73	80(74,89)	15.1	44			56				
Fourth of July	U	8/25/2004	402.0	15	**	3.7				100				
Freeman	L	8/30/2004	462.2	74	**	16.0			100					
Garden	L	7/15/2004	0.0	44	**	n/a	100							
Goat	M	8/28/2004	366.0	23	**	6.3	9					91		
Goat	M	8/28/2004	326.0	23	23(23,25)	7.1		4				96		
Goat	U	8/28/2004	360.0	28	**	7.8	18					82		
Golden	L	7/19/2004	0.0	3	**	n/a			100					
Haynes	M	9/13/2004	200.0	63	**	31.5			100					
Horse	U	8/31/2004	378.0	26	**	6.9				100				
Hughes	L	6/24/2004	540.0	8	**	1.5			100					
Hughes	M	8/10/2004	444.0	20	**	4.5	65	20	15					
Hull	L	7/12/2004	300.0	5	**	1.7		20				80		
Hull	M	7/12/2004	195.0	1	**	0.5	100							
Iron	L	8/26/2004	484.0	35	41(35,53)	7.5	3	46				2.5	49	
Iron	L	8/8/2004	482.0	113	**	23.4		95					5	
Iron	L	8/8/2004	460.0	594	n/a	129.1		91					9	
Iron	L	6/29/2004	274.0	18	**	6.6				100				
Iron	M	6/29/2004	416.0	1	**	0.2	100							
Iron	M	8/26/2004	462.0	13	**	2.8	8	31				61		
Iron	M	8/26/2004	430.0	9	**	2.1	11	11				67		11
Iron	M	8/9/2004	594.0	113	**	19.0		95					5	
Iron	M	8/9/2004	494.0	41	**	8.3		100						
Iron	M	9/21/2004	512.0	64	**	12.5		97	3					
Iron	U	8/27/2004	494.0	21	**	4.3	71					29		

Table 2. continued

Stream	Transect	Sample date	Transect area	Fish Sampled (n)	Population Estimate (95% CI)	Fish/100m2	Species Composition						
							CT	RB	BLT	RBXCT	EBT	CK	G1
Iron	U	8/27/2004	364.0	48	**	13.2	46	6				38	1C
Iron	U	6/21/2004	0.0	14	**	n/a		43	57				
Iron	U	8/9/2004	520.0	84	**	16.2		85	15				
Iron	U	9/9/2004	506.0	176	180(176-185)	34.8		74	26				
Juliette	L	7/1/2004	399.0	36	**	9.0	100						
Kadletz	L	8/4/2004	224.0	18	19(18,24)	8.0	5	78	17				
Lee	U	7/22/2004	0.0	72	75(72,80)	n/a	58				42		
Little Loon	L	7/16/2004	0.0	38	**	n/a	18	82					
Loon	L	7/22/2004	0.0	20	**	n/a	25	65	5		5		
Marble	L	7/16/2004	0.0	41	**	n/a	3	95	3				
Meadow	L	7/1/2004	150.0	11	**	7.3	100						
Moose	L	8/2/2004	232.0	21	**	9.1	85		15				
Nez Perce	L	7/20/2004	180.0	6	**	3.3	100						
North Fork Iron	L	6/28/2004	368.2	51	**	13.9		78	22				
North Fork Iron	M	6/22/2004	408.0	1	**	0.2			100				
North Fork Iron	M	6/23/2004	388.0	24	24(24,25)	6.2			100				
North Fork Iron	U	6/22/2004	358.0	22	22(22,23)	6.1			100				
North Fork Iron	U	6/22/2004	318.0	15	**	4.7			100				
North Fork Salmon	U	9/20/2004	328.0	9	**	2.7	100						
Norton	L	7/17/2004	0.0	39	**	n/a	2	98					
Otter	L	9/8/2004	194.0	22	**	11.3	18			82			
Otter	U	9/8/2004	170.0	9	**	5.3				100			
Papoose	L	7/19/2004	0.0	46	**	n/a	2	98					
Pattee	L	9/13/2004	100.0	42	**	42.0		100					
Pine	L	9/8/2004	340.0	46	**	13.5	52	48					
Pine	L	7/17/2004	0.0	40	**	n/a	100						
Poison	L	7/7/2004	0.0	3	**	n/a		100					
Pole Creek	L	9/16/2004	376.20	14	**	3.7		7			7	1	
Pole	L	9/16/2004	568.00	232	254(237,270)	40.8		2			10	88	
Pole	M	9/15/2004	482.00	17	**	3.5					100		
Pole	M	9/15/2004	338.00	11	**	3.3					100		
Pole	M	8/25/2004	336.00	6	n/a	1.8					100		
Pole	U	8/29/2004	580.00	22	**	3.8	27				73		
Pole	U	8/29/2004	246.00	14	**	5.7					100		
Pungo	L	7/15/2004	0.0	42	**	n/a	69	19			12		
Quaking Asp	L	7/7/2004	0.0	8	**	n/a	13		13	75			
Rainbow	L	9/16/2004	264.00	17	**	6.4					100		
Reservoir	L	7/14/2004	160.00	27	27(27,28)	16.9	19	44			37		
Reservoir	L	8/24/2004	160.0	17	17(17,18)	10.6	65	29			6		
Reservoir	M	7/14/2004	0.0	18	**	n/a	22	22			56		
Roaring	L	7/20/2004	0.0	35	**	n/a	23	66	11				
Salmon	U	8/13/2004	466.0	125	**	n/a					95	5	
Salmon	U	8/13/2004	286.00	210	**	73.4					97	3	
Salzer Creek	M	7/27/2004	94.0	0		0.0							
Sawmill	L	8/12/2004	146.00	13	13(13,14)	8.9					100		
Sheep	L	9/9/2004	540.00	41	**	7.6	12	41	10				37
Sheep	L	7/18/2004	0.0	16	**	n/a		100					
Ship Island Creek	L	7/19/2004	0.0	40		n/a	10	88			2		
Short Creek	L	8/5/2004	94.0	0		0.0							
Slide	M	6/30/2004	120.60	22	22(22,23)	18.2	100						
Smiley	L	8/12/2004	476.00	36	43(36,56)	7.6		3				97	
Smiley	M	7/27/2004	914.00	132	**	14.4						100	
Smiley	M	7/27/2004	568.00	51	**	9.0						100	

Table. 2 continued

Smiley	M	8/12/2004	838.00	61	**	7.3	2	98					
				Fish	Population			Species Composition					
Stream	Transect	Sample date	Transect area	Sampled (n)	Estimate (95% CI)	Fish/100m2	CT	RB	BLT	RBXCT	EBT	CK	GI
Smiley	U	7/26/2004	286.00	23	23(23,24)	8.0	30						70
Smiley	U	7/26/2004	476.00	28	**	5.9							100
Smiley	U	7/26/2004	554.00	91	**	16.4		1					99
Smithy	L	7/20/2004	236.00	9	**	3.8	89	11					
South Fork Iron	L	6/19/2004	295.32	33	33(33,35)	11.2		67	33				
South Fork Iron	L	6/19/2004	294.00	39	**	13.3		90	10				
South Fork Iron	M	6/18/2004	234.00	13	**	5.6				100			
South Fork Iron	M	6/18/2004	218.00	20	**	9.2		5	95				
South Fork Iron	U	6/20/2004	210.00	21	**	10.0				100			
South Fork Iron	U	6/20/2004	218.00	11	**	5.0				100			
Spring	L	9/8/2004	410.00	60	**	14.6	3	97					
Squaw	L	9/27/2004	280.00	29	**	10.4		76	24				
Squaw	L	6/10/2004	0.0	57	**	n/a		46	54				
Stoddard	L	7/20/2004	0.0	116	**	n/a		34	1				65
Stroud	M	7/21/2004	274.00	15	17(15,24)	5.5				100			
Tenmile Creek	L	9/13/2004	50.0	0		n/a							
Thomas	L	7/16/2004	0.0	40	**	n/a	100						
Thompson	L	7/12/2004	565.80	16	**	2.8			100				
Thompson	L	8/5/2004	428.00	542	675(614,735)	126.6		97					3
Thompson	L	7/12/2004	486.00	10	**	2.1			100				
Thompson	M	7/11/2004	376.00	54	56(54,60)	14.4	98	2					
Thompson	M	7/12/2004	550.00	21	**	3.8	76	24					
Thompson	M	7/12/2004	396.00	10	**	2.5	90	10					
Thompson	M	7/12/2004	504.00	5	**	1.0	40	60					
Thompson	U	7/8/2004	216.00	70	**	32.4	100						
Thompson	U	7/8/2004	302.00	80	**	26.5	94		6				
Thompson	U	7/9/2004	366.00	35	37(35,42)	9.6	100						
Thompson	U	7/10/2004	500.00	27	**	5.4	100						
Thompson	U	7/7/2004	136.00	3	**	2.2	100						
Tobias	L	7/28/2004	218.00	7	**	3.2	100						
Tumble	L	7/20/2004	0.0	7	**	n/a			100				
Twelvemile	L	6/16/2004	232.00	19	**	8.2			100				
Twelvemile	L	6/16/2004	348.00	23	**	6.6	4	96					
Twelvemile	M	6/16/2004	0.00	16	**	n/a				100			
Twelvemile	M	6/8/2004	403.20	14	**	3.5	64			36			
Twelvemile	M	6/8/2004	444.00	45	49(45,56)	10.1	64			36			
Twelvemile	U	6/7/2004	418.00	45	**	10.8	100						
Twelvemile	U	6/7/2004	326.56	36	**	11.0	100						
Twelvemile	U	6/4/2004	334.40	84	103(84,125)	25.1	100						
Twelvemile	U	6/3/2004	198.00	21	**	10.6	100						
Twin	L	9/7/2004	434.00	10	**	2.3	10			90			
Twin	L	6/9/2004	594.00	12	**	2.0				100			
Twin	L	9/16/2004	168.00	3	**	1.8	33						67
Twin	L	6/9/2004	0.0	8	**	n/a				100			
Twin	L	6/10/2004	0.0	10	**	n/a				100			
Wagonhammer	L	8/3/2004	126.00	10	**	7.9	100						
Wagonhammer	M	8/3/2004	126.00	18	**	14.3	100						
Wagonhammer	M	8/3/2004	196.00	26	**	13.3	100						
Wagonhammer	M	8/10/2004	142.0	22	**	15.5	100						
Wagonhammer	M	8/10/2004	176.00	19	**	10.8	100						
Warm Spring	L	7/16/2004	0.0	30	**	n/a	7	83			10		
West Fork Iron	L	6/21/2004	384.00	14	**	3.6		7	93				
W.F. Nez Perce	L	7/20/2004	97.00	9	**	9.3	100						

Table 2. continued

Stream	Transect	Sample date	Transect area	Fish Sampled (n)	Population Estimate (95% CI)	Fish/100m2	Species Composition						
							CT	RB	BLT	RBXCT	EBT	CK	GI
W.Fork N.Fork Salmon	L	8/2/2004	224.00	15	**	6.7	53		47				
Wilson	L	7/18/2004	0.00	41	**	n/a	7	93					
Withington	U	9/13/2004	150.00	21	**	14.0	71	19		10			
Wright	L	9/13/2004	50.00	20	**	40.0			100				
Wright	L	8/26/2004	290.00	29	32(29,39)	10.0	10	62	28				
Yearian	M	9/13/2004	100.00	13	**	13.0		100					

^a L = lower reach, M = middle reach, and U = upper reach.

^b CT = westslope cutthroat trout, RB = rainbow trout/steelhead, BLT = bull trout, RBXCT = rainbow trout/steelhead X westslope cutthroat trout hybrid, EBT=eastern brook trout, Ck=Chinook salmon.

Table 3. Combined non-game fish population densities, and species composition for selected streams of the Upper Salmon River Basin in 2004 (L= lower reach, M= M reach, and U= upper reach).

Stream	Transect ^a	Sample date	Transect area	Fish Sampled (n)	Fish/100m ²	Species Composition ^b					
						SCU	DAC	SUC	MTW	MSC	F
Agency	L	9/27/2004	484.0	39	8.1	100					
Agency	L	9/29/2004	308.0	8	2.6	100					
Agency	M	9/20/2004	332.0	57	17.2	100					
Agency	M	10/13/2004	350.0	36	10.3	100					
Agency	U	9/10/2004	222.0	254	114.4	100					
Agency	U	9/10/2005	154.0	8	5.2	100					
Big Bear Canyon	M	7/1/2004	91.0	1	1.1	100					
Canyon	M	6/15/2004	318.3	203	63.8	100					
Canyon	U	6/15/2004	374.0	269	71.9	100					
Cape Horn	L	9/9/2004	200.0	13	6.5	100					
Champion	L	8/16/2004	432.0	47	10.9	98				2	
Champion	M	8/17/2004	334.0	37	11.1	100					
Clear	M	9/13/2004	150.0	51	34.0	100					
Cow	L	9/29/2004	158.0	5	3.2	100					
E. Fork Pahsimeroi	L	9/8/2004	300.0	30	10.0	100					
Elk	L	9/9/2004	200.0	20	10.0	65		30		5	
Flume	L	9/20/2004	252.0	82	32.5	100					
Fourth of July	L	7/24/2004	504.0	9	1.8	100					
Fourth of July	L	7/25/2004	458.0	20	4.4	100					
Fourth of July	L	7/25/2004	436.0	30	6.9	100					
Fourth of July	M	7/24/2004	538.0	34	6.3	100					
Fourth of July	M	7/24/2004	412.0	6	1.5	100					
Goat	M	8/28/2004	366.0	88	24.0	100					
Goat	M	8/28/2004	326.0	41	12.6	100					
Goat	U	8/28/2005	360.0	20	5.6	100					
Haynes	M	9/13/2004	200.0	18	9.0	100					
Iron	L	8/26/2004	464.0	215	46.3	100					
Iron	L	8/8/2004	482.0	122	25.3	100					
Iron	L	8/8/2004	460.0	67	14.6	100					
Iron	M	8/26/2004	462.0	73	15.8	100					
Iron	M	8/26/2004	430.0	141	32.8	100					
Iron	M	8/9/2004	594.0	46	7.7	100					
Iron	M	8/9/2004	494.0	173	35.0	100					
Iron	M	9/21/2004	512.0	18	3.5	100					
Iron	U	8/27/2004	494.0	12	2.4	100					
Meadow	L	7/1/2004	150.0	1	0.6	100					
Pattee	L	9/13/2004	100.0	27	27.0	100					
Pole	L	9/16/2004	376.2	54	14.4	100					
Pole	L	9/16/2004	568.0	548	96.5	100				1	
Pole	M	9/15/2004	482.0	38	7.9	100					
Pole	M	9/15/2004	338.0	21	6.2	100					
Salmon River	U	8/13/2004	286.0	91	31.8	100					
Salmon River	U	8/13/2004	466.0	67	143.8	100					

Table 3. continued

Stream	Transect ^a	Sample date	Transect area	Fish Sampled (n)	Fish/100m ²	Species Composition ^b					
						SCU	DAC	SUC	MTW	MSC	F
Smiley	L	8/12/2004	476.0	126	26.5	100					
Smiley	M	7/27/2004	914.0	44	4.8	100			1		
Smiley	M	7/27/2004	568.0	1	0.2	100					
Smiley	M	8/12/2004	838.0	41	4.9	100					
Smiley	U	7/26/2004	476.0	49	10.3	100					
Smiley	U	7/26/2004	554.0	31	5.6	100					
Thompson	L	7/12/2004	565.8	58	10.3	100					
Thompson	L	8/5/2004	428.00	204	11.4	100					
Thompson	L	7/12/2004	486.0	17	3.5	100					
Thompson	M	7/11/2004	376.0	451	119.9	100					
Thompson	M	7/12/2004	550.0	146	26.5	100					
Thompson	M	7/12/2004	396.0	75	18.9	100					
Thompson	M	7/12/2004	504.0	155	30.8	100					
Thompson	U	7/9/2004	366.0	82	22.4	100					
Thompson	U	7/10/2004	500.0	107	21.4	100					
Twin	L	6/9/2004	594.0	13	2.2	100					
W. Fork Anderson	L	6/28/2004	180.0	1	0.6	100					
Yearian	M	9/13/2004	100.0	22	22.0	100					

^a L= lower reach, M= middle reach, and U= upper reach.

^b SCU=sculpin, DAC=dace, SUC=suckers, MTW=mountain whitefish, RSS=red-sided shiner.

More detailed information on stream sites is located in Appendix A. and Appendix B. Appendix A. lists stream sites surveyed, dates of sampling, and transect measurements. Appendix B. lists streams surveyed, primary drainage, secondary drainage, UTM zone, and UTM coordinates.

Big Springs Creek

We observed a total of 121 redds on Big Springs Creek (BSC) and the upper Lemhi River. Seventy-five redds were counted on the Neibaur Ranch, while 45 were observed on the Tyler Ranch. Three redds were counted on the Beyeler Ranch (upper Lemhi River) (Figure 1).

The Neibaur Ranch reach had a fencing project of 2.5 km completed during February and March of 2003. Variable numbers of redds on the Neibaur Ranch may be a ramification of lack of stability in part due to habitat degradation. This should improve over time as the effects of the new fencing project are realized. The BSC transect within Tyler Ranch boundaries, with an exclusionary fencing project completed in 1998, contained fewer redds in 2004 than the previous year. We believe the general increase over time and improving stability of the habitat will result in continued upward trends in redd numbers in the future.

Reviewing redd counts from the three reaches over time suggests there may be alternate year spawning occurring. Should alternate year spawning be occurring, this year would be the expected lesser year. Of note, this year the steelhead run was earlier than normal to area hatcheries and we suspect the peak for rainbow trout redds was missed and some amount of redd degradation may have resulted in lower counts for the Beyeler and Tyler reaches. These sites will continue to be monitored and trends evaluated in the rainbow trout population in future years. Habitat changes will be monitored over the next 10 years to document improvements in the riparian areas.

Bear Valley Creek

On September 8, 2004 forty-four bull trout redds were observed. The majority of the redds were still in progress having both the females and males present on the redds. The population of bull trout, which uses Bear Valley Creek for spawning, appears to be a fluvial population in that relatively large adults are observed. The estimated size of the bull trout ranged from 25 to 635 millimeters. Results from the fluvial trout study indicate these fish may be spending part of their lives in the main stem Salmon and Lemhi Rivers, then, migrate into Hayden Creek up to the meadow on Bear Valley Creek to spawn.

East Fork Hayden Creek

On September 8, 2004 we observed 26 bull trout redds in East Fork Hayden Creek. In 2003, 25 bull trout redds were observed. This population appears to be a resident population with individuals being significantly smaller than the Bear Valley Creek population. The bull trout observed were estimated to be eight to fourteen inches in length.

Alpine and Fishhook Creeks Bull Trout Counts

Final counts were conducted on September 9, 2004. Eleven completed bull trout redds were observed in Fishhook Creek and nine in Alpine Creek. In 2003, a total of 15 redds were counted in Fishhook Creek and 12 redds were counted in Alpine Creek.

Fourth of July Creek

On September 9, 2004 Department staff surveyed a reach of Fourth of July Creek and counted 33 bull trout redds with three possible redds. In 2003, 14 complete and three possible redds were counted.

Carmen Creek

An electronic temperature recording device was launched at the Grange Bridge on Carmen Creek on April 25, 2005 and was withdrawn on April 30, 2005. Data was recorded for five full days and one partial day.

No apparent changes in temperature occurred during the flush however, for two days immediately following the flush, temperatures moderated substantially in lower Carmen Creek (Figure 3). These reductions in temperatures are likely due in part to the flush however, significant decreases in ambient temperatures observed immediately after the flush are likely responsible for the noted changes.

Flows recorded at 1600 hours at the upper Carmen Creek site on April 25, prior to the flush, were 6.63 cubic feet per second (cfs) (Table 4). At 1200 hours on April 26, midway through the flush, the recorded flow was 29.86 cfs and at 1600 hours the flow had receded to 19.97 cfs (Table 5-6).

Flows at the lower Carmen Creek site on April 25, prior to the flush, were not recorded because there was an inadequate amount of water (<1cfs) to take measurements. The channel was almost completely dewatered. At 1100 hours on April 26, the recorded flow was 26.36 cfs and at 1500 hours the flow had receded to 18.5 cfs (Table 7-8).

Figures 4 and 5 graphically depict the changes in discharge during the flushing flows. Apparent in both graphs is the maximum flows being documented during the morning measurements 12 hours into the 24 hour flush.

An explanation for these observations is that pulsed flows from the previous day's snowmelt arrive in lower Canyon Creek approximately 12 to 14 hours after the maximum temperatures from the prior day (Bruce McFarland, Carmen Creek watermaster, personal communication). Arrival of this pulsed flow combined with the flushing flows the morning of the 26th when maximum flows were observed.

Table 4. Upper Carmen Creek Flow Computation Table April 25, 2005, 1600 hours.

Distance from initial point (ft)	width (ft)	depth (ft)	velocity (fps)			discharge (cfs)	remarks
			at point	mean by vertical	area (sf)		
1							LEW
2.0	1	0	0.0		0.0	0.00	
3.0	1	0	0.0		0.0	0.00	
4.0	1	0.2	0.4		0.2	0.08	
5.0	1	0.4	0.4		0.4	0.16	
6.0	1	0.4	0.8		0.4	0.32	
7.0	1	0.6	0.6		0.6	0.36	
8.0	1	0.7	0.7		0.7	0.49	
9.0	1	0.6	0.7		0.6	0.42	
10.0	1	0.7	0.8		0.7	0.56	
11.0	1	0.8	0.7		0.8	0.56	
12.0	1	0.6	0.9		0.6	0.54	
13.0	1	0.7	0.7		0.7	0.49	
14.0	1	0.5	1.0		0.5	0.5	
15.0	1	0.5	1.1		0.5	0.55	
16.0	1	0.4	0.7		0.4	0.28	
17.0	1	0.5	0.5		0.5	0.25	
18.0	1	0.4	0.9		0.4	0.36	
19.0	1	0.4	0.6		0.4	0.24	
20.0	1	0.4	0.5		0.4	0.20	
21.0	1	0.3	0.4		0.3	0.12	
22.0	1	0.3	0.5		0.3	0.15	
23.0	1	0.3	0.0		0.3	0.00	
24.0							REW
Total						6.63	

Table 5. Upper Carmen Creek Flow Computation Table (from McFarland Property), April 26, 2005, 1200 hours.

Distance from initial point (ft)	width (ft)	depth (ft)	velocity (fps)			discharge (cfs)	remarks
			at point	mean by vertical	area (sf)		
1							LEW
2	1	0.50	0.36		0.50	0.18	
3	1	0.70	0.30		0.70	0.21	
4	1	0.90	0.89		0.90	0.80	
5	1	1.00	1.41		1.00	1.41	
6	1	1.10	1.64		1.10	1.80	
7	1	1.40	1.44		1.40	2.02	
8	1	1.40	1.15		1.40	1.61	
9	1	1.30	1.58		1.30	2.05	
10	1	1.30	1.67		1.30	2.17	
11	1	1.15	1.63		1.15	1.87	
12	1	1.20	1.58		1.20	1.90	
13	1	1.20	1.66		1.20	1.99	
14	1	1.95	1.68		1.95	3.28	
15	1	0.80	1.66		0.80	1.33	
16	1	0.95	1.44		0.95	1.37	
17	1	0.80	1.02		0.80	0.82	
18	1	0.90	1.47		0.90	1.32	
19	1	0.80	0.89		0.80	0.71	
20	1	0.80	1.26		0.80	1.01	
21	1	0.70	1.29		0.70	0.90	
22	1	0.70	1.09		0.70	0.76	
23	1	0.50	0.69		0.50	0.35	
24							REW
Total						29.86	

Table 6. Upper Carmen Creek Flow Computation Table (from McFarland Property), April 26, 2005, 1600 hours.

Distance from initial point (ft)	width (ft)	depth (ft)	velocity (fps)			discharge (cfs)	remarks
			at point	mean by vertical	area (sf)		
1							LEW
2	1	0	0.0		0.0	0.00	
3	1	0	0.0		0.0	0.00	
4	1	0.6	0.8		0.6	0.48	
5	1	0.7	1.1		0.7	0.77	
6	1	0.7	1.5		0.7	1.05	
7	1	0.9	1.4		0.9	1.26	
8	1	0.9	1.4		0.9	1.26	
9	1	1.0	1.3		1.0	1.30	
10	1	1.0	1.7		1.0	1.70	
11	1	1.0	1.6		1.0	1.60	
12	1	0.9	1.5		0.9	1.35	
13	1	0.8	1.6		0.8	1.28	
14	1	0.7	1.7		0.7	1.19	
15	1	0.7	1.6		0.7	1.12	
16	1	0.7	1.5		0.7	1.05	
17	1	0.7	1.3		0.7	0.91	
18	1	0.6	1.2		0.6	0.72	
19	1	0.6	1.2		0.6	0.72	
20	1	0.6	1.1		0.6	0.66	
21	1	0.5	1.2		0.5	0.60	
22	1	0.5	1.7		0.5	0.85	
23	1	0.5	0.2		0.5	0.10	
24							REW
Total						19.97	

Table 7. Lower Carmen Creek Flow Computation Table (from Eberhard Property), April 26, 2005, 1100 hours.

Distance from initial point (ft)	width (ft)	depth (ft)	velocity (fps)		area (sf)	discharge (cfs)	remarks
			at point	mean by vertical			
1							LEW
2	1	0.50	0.79		0.50	0.40	
3	1	0.70	1.33		0.70	0.93	
4	1	0.95	1.11		0.95	1.05	
5	1	0.80	1.38		0.80	1.10	
6	1	0.55	1.22		0.55	0.67	
7	1	0.70	2.35		0.70	1.65	
8	1	0.90	1.43		0.90	1.29	
9	1	0.80	2.35		0.80	1.88	
10	1	1.00	2.10		1.00	2.10	
11	1	0.95	2.11		0.95	2.00	
12	1	0.90	2.10		0.90	1.89	
13	1	0.90	2.30		0.90	2.07	
14	1	0.95	2.09		0.95	1.99	
15	1	1.00	1.96		1.00	1.96	
16	1	0.75	1.49		0.75	1.12	
17	1	0.90	0.95		0.90	0.86	
18	1	0.95	1.71		0.95	1.62	
19	1	0.90	1.57		0.90	1.41	
20	1	0.80	0.10		0.80	0.08	
21	1	0.50	0.59		0.50	0.30	
22	1	0.50	0.79				REW
Total						26.36	

Table 8. Lower Carmen Creek Flow Computation Table (from Eberhard Property), April 26, 2005, 1500 hours.

Distance from initial point (ft)	width (ft)	depth (ft)	velocity (fps)		area (sf)	discharge (cfs)	remarks
			at point	mean by vertical			
1							LEW
2	1	0.2	0.3		0.2	0.06	
3	1	0.4	0.15		0.4	0.06	
4	1	0.7	0.2		0.7	0.14	
5	1	0.7	2.1		0.7	1.47	
6	1	0.8	1.5		0.8	1.20	
7	1	0.6	0.3		0.6	0.18	
8	1	0.6	2.0		0.6	1.20	
9	1	0.8	1.9		0.8	1.52	
10	1	0.6	1.5		0.6	0.90	
11	1	0.7	2.3		0.7	1.61	
12	1	0.7	1.7		0.7	1.19	
13	1	0.7	1.9		0.7	1.33	
14	1	0.7	1.8		0.7	1.26	
15	1	0.6	1.5		0.6	0.90	
16	1	0.7	1.5		0.7	1.05	
17	1	0.7	1.8		0.7	1.26	
18	1	0.7	0.9		0.7	0.63	
19	1	0.6	1.6		0.6	0.96	
20	1	0.6	1.8		0.6	1.08	
21	1	0.5	1.0		0.5	0.50	
22	1	0.2	0.1				REW
Total						18.5	

A review of photo points 1a-7b provides visual documentation that wetted width increased dramatically between April 25 and April 26. This is a visual representation of the changes in water levels during the flushing flow event. These photo points also support recorded flow measurements.

In summary, irrigators of Carmen Creek recognizing potential stranding conditions contacted area fish biologists. Under similar conditions in previous years, irrigators have noticed that when fish begin to accumulate at the head end of ditches and the first signs of natural pulse flows, fish begin to rapidly move downstream (Dave McFarland, personal communication). Together the group decided flushing flows was the most logical and immediate tool available to provide adequate migrating conditions.

The urgency and short timeframe at which the use of flushing flows were decided upon made it impossible to establish and implement a set of fish monitoring protocols. Although the flushing flows were directed to benefit migratory fish, no direct fish monitoring occurred. Based on the temporarily improved migration conditions, it is likely that fish did benefit from the irrigators action. Also important is the cooperative working relationship being developed between Carmen Creek water users and agency representatives.

APPENDIX

Appendix A. Site characteristics of streams surveyed in the Upper Salmon River Basin during the summer of 2004.

Stream	Transect	Sample date	Channel type	Water	Transect	Transect	Transect
				temperature (°C)	length (m)	mean width (m)	area (m)
Agency	L	9/27/2004		11.7	100	4.84	484.0
Agency	L	9/29/2004		10.6	100	3.08	308.0
Agency	M	9/20/2004		8.9	100	3.32	332.0
Agency	M	10/13/2004		6.7	100	3.50	350.0
Agency	U	9/10/2004		14.4	100	2.22	222.0
Agency	U	9/10/2004		11.1	100	1.54	154.0
Agency	U	9/10/2004		13.9	100	1.24	124.0
Alder	L	7/11/2004		11.1	100	1.60	160.0
Alder	U	7/28/2004		8.9	100	0.96	96.4
Allan	L	7/27/2004	B	11.7	100	0.78	78.0
Anderson	M	7/21/2004	B	8.9	100	0.91	91.0
Aparejo	L	7/18/2004			500	0.00	0.0
Bayhorse	L	8/7/2004		11.7	100	3.42	342.0
Bayhorse	L	8/6/2004		17.2	100	3.26	326.0
Bayhorse	L	8/4/2004		15.6	100	4.00	400.0
Bayhorse	M	8/6/2004		9.4	100	4.70	470.0
Bayhorse	M	8/6/2004		15	100	3.08	308.0
Bayhorse	U	7/13/2004		14.4	100	1.96	196.0
Bayhorse	U	7/1/2004		10.6	100	2.78	278.0
Bayhorse	U	7/13/2004		16.1	100	2.14	214.0
Bayhorse	U	7/14/2004		12.2	100	2.60	260.0
Bear Valley	M	8/28/2004	C		100	3.18	318.0
Bernard	L	7/18/2004			0	0.00	0.00
Big Bear	L	8/24/2004	E	8.9	100	1.72	172.0
Big Bear	L	7/15/2004	E	15.6	100	1.72	172.0
Big Bear	L	7/18/2004			350	0.00	0.0
Big Bear	L	7/19/2004			0	0.00	0.0
Big Bear	M	7/1/2004	E	13.9	100	0.91	91.0
Big Bear	M	8/24/2004		6.7	0	0.00	0.0
Big Bear	U	7/1/2004	B	10	0	0.76	0.0
Big Eightmile	U	9/13/2004		7.8	100	5.28	528.0
Big Timber	M	9/14/2004		5.6	100	5.20	520.0
Bog	L	7/7/2004	E	10.6	0	1.50	0.0
Boulder	M	9/2/2004		6.7	100	2.92	292.0
Brush	L	7/17/2004			0	0.00	0.0
Camas	L	7/17/2004			0	0.00	0.0
Canyon	L	6/15/2004		18	61	1.80	109.8

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water temperature (°C)	Transect length (m)	Transect mean width (m)	Transect area (m)
Canyon	M	9/15/2004			0	0.00	0.0
Canyon	M	6/15/2004		15	92	3.46	318.3
Canyon	U	6/15/2004		14	110	3.40	374.0
Canyon	U	9/15/2004		8.9	50	0.00	0.0
Cape Horn	L	9/9/2004		11.1	100	2.00	200.0
Carmen	M	8/9/2004		17.2	100	5.12	512.0
Carmen	U	8/30/2004		8.3	100	4.78	478.0
Champion	L	8/16/2004		15	100	4.32	432.0
Champion	M	8/17/2004		8.9	100	3.48	348.0
Champion	M	8/16/2004		10.6	100	3.58	358.0
Champion	M	8/17/2004		8.9	100	3.34	334.0
Champion	M	8/17/2004		10	100	3.00	300.0
Champion	U	8/18/2004			100	1.42	142.0
Champion	U	8/18/2004		8.9	100	1.48	148.0
Clear	M	9/13/2004		11.3	100	1.50	150.0
Corn	L	9/16/2004		10	100	3.10	310.0
Cougar	L	7/16/2004			0	0.00	0.0
Cow	L	9/29/2004		9.4	100	1.58	158.0
Cow	M	9/20/2004		7.8	100	1.46	146.0
Cub	L	7/17/2004			0	0.00	0.0
Dairy	L	7/22/2004	B	11.7	100	1.70	170.0
Deep	L	9/7/2004	B	6.1	100	2.44	244.0
Deer	L	8/5/2004	B	8.9	100	0.98	98.0
Ditch	L	7/26/2004	B	15	100	2.84	284.0
Ditch	L	7/27/2004	B	16.1	100	2.86	286.0
East Fork Hayden	M	8/23/2004	E	6.1	100	2.98	298.0
East Fork Pahsimeroi	L	9/8/2004		7.1	100	3.00	300.0
Eighteenmile	L	9/13/2004		13.6	100	1.00	100.0
Elk	L	9/13/2004		13.6	100	1.00	100.0
Elk	L	9/9/2004		11.1	100	2.00	200.0
Elkhorn	L	7/14/2004			0	0.00	0.0
Everson	M	7/21/2004	B	11.1	100	1.94	194.0
Flume	L	9/20/2004		6.7	100	2.52	252.0
Ford	L	8/4/2004	B	12.8	100	1.52	152.0
Fourth of July	L	7/24/2004			100	5.04	504.0
Fourth of July	L	7/25/2004		9.4	100	4.58	458.0
Fourth of July	L	7/25/2004		12.2	100	4.36	436.0
Fourth of July	M	7/24/2004		14.4	100	5.38	538.0

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water	Transect	Transect	Transect
				temperature (°C)	length (m)	mean width (m)	area (m)
Fourth of July	M	7/24/2004		11.1	100	4.12	412.0
Fourth of July	M	8/25/2004		7.8	100	4.42	442.0
Fourth of July	M	7/23/2004		12.2	100	5.54	554.0
Fourth of July	U	7/22/2004		14.4	100	1.74	174.0
Fourth of July	U	8/25/2004		6.1	100	4.02	402.0
Fourth of July	U	7/22/2004		7.2	100	2.22	222.0
Fourth of July	U	7/23/2004		11.1	100	2.48	248.0
Fourth of July	U	7/23/2004		10	100	4.84	484.0
Fourth of July	U	7/22/2004		11.7	100	2.04	204.0
Fourth of July	U	7/22/2004		12.2	100	3.96	396.0
Freeman	L	8/30/2004		14.4	100	4.62	462.2
Garden	L	7/15/2004			0	0.00	0.0
Goat	M	8/28/2004		5.6	100	3.66	366.0
Goat	M	8/28/2004		11.1	100	3.26	326.0
Goat	U	8/28/2004		7.5	100	3.60	360.0
Golden	L	7/19/2004			0	0.00	0.0
Grand Prize Gulch	L	8/29/2004		7.8	100	3.22	322.0
Haynes	M	9/13/2004		14.8	100	2.00	200.0
Horse	U	8/31/2004	B	8.9	100	3.78	378.0
Hughes	L	6/24/2004	B	11.1	100	5.40	540.0
Hughes	M	7/12/2004		14.4	100	3.60	360.0
Hughes	M	8/10/2004	B	10	100	4.44	444.0
Hull	L	7/12/2004		11.1	100	3.00	300.0
Hull	M	7/12/2004		11.1	100	1.95	195.0
Hull	U	7/12/2004		10	100	1.75	175.0
Iron	L	8/8/2004		15.6	100	4.60	460.0
Iron	L	8/8/2004		17.8	100	4.82	482.0
Iron	L	8/26/2004		7.8	100	4.64	464.0
Iron	M	8/9/2004		11.7	100	5.94	594.0
Iron	M	9/21/2004		6.1	100	5.12	512.0
Iron	M	8/26/2004		9.4	100	4.30	430.0
Iron	M	8/26/2004		10.6	100	4.62	462.0
Iron	M	8/9/2004		14.4	100	4.94	494.0
Iron	U	8/27/2004		10	100	3.64	364.0
Iron	U	6/21/2004		8.9	100	4.30	430.0
Iron	U	8/9/2004		14.4	100	5.20	520.0
Iron	U	9/9/2004		9.4	100	5.06	506.0
Iron	U	8/27/2004		11.1	100	4.94	494.0
Juliette	L	7/1/2004			105	3.80	399.0

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water	Transect	Transect	Transect
				temperature (°C)	length (m)	mean width (m)	area (m)
Kadletz	L	8/4/2004	B	10.6	100	2.24	224.0
Lee	U	7/22/2004		11.7	100	0.00	0.0
Lemhi River	L	7/21/2004	B	19	100	14.54	1454.0
Lemhi River	M	7/21/2004	B	19	100	14.06	1406.0
Lemhi River	U	7/21/2004	B	19	100	13.96	1396.0
Little Loon	L	7/16/2004			0	0.00	0.0
Loon	L	7/22/2004			0	0.00	0.0
Marble	L	7/16/2004			0	0.00	0.0
Meadow	L	7/1/2004	B	11.1	100	1.50	150.0
Moose	L	8/2/2004	B	10.6	100	2.32	232.0
Nez Perce	L	7/20/2004		8.9	100	1.80	180.0
North Fork Iron	L	6/28/2004		11.7	104	3.54	368.2
North Fork Iron	M	6/22/2004		8.9	100	4.08	408.0
North Fork Iron	M	6/23/2004		8.9	100	3.88	388.0
North Fork Iron	U	6/22/2004		7.2	100	3.58	358.0
North Fork Iron	U	6/22/2004		7.8	100	3.18	318.0
North Fork Salmon	U	9/20/2004		3.3	100	3.28	328.0
Norton	L	7/17/2004			175	0.00	0.0
Otter	L	9/8/2004		8.3	100	1.94	194.0
Otter	U	9/8/2004		7.2	100	1.70	170.0
Papoose	L	7/19/2004			0	0.00	0.0
Pattee	L	9/13/2004		15.9	100	1.00	100.0
Pine	L	7/17/2004			0	0.00	0.0
Pine	L	9/8/2004	B	5	100	3.40	340.0
Poison	L	7/7/2004	E	12.2	0	0.00	0.0
Pole	L	9/16/2004		13.3	110	3.42	376.2
Pole	L	9/16/2004		6.1	100	5.68	568.0
Pole	M	9/15/2004		6.1	100	4.82	482.0
Pole	M	9/15/2004		6.7	100	3.38	338.0
Pole	M	8/25/2004		6.7	100	3.36	336.0
Pole	U	8/30/2004		5.6	100	1.70	170.0
Pole	U	8/29/2004		6.1	100	5.80	580.0
Pole	U	8/29/2004		7.8	100	2.46	246.0
Pungo	L	7/15/2004			0	0.00	0.0
Quaking Asp	L	7/7/2004	E	12.2	0	0.61	0.0
Rainbow	L	9/16/2004		6.7	100	2.64	264.0
Reservoir	L	7/14/2004	E	16.1	100	1.60	160.0
Reservoir	L	8/24/2004	E	9.4	100	1.60	160.0

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water	Transect	Transect	Transect
				temperature (°C)	length (m)	mean width (m)	area (m)
Reservoir	M	7/14/2004		13.3	0	0.00	0.0
Roaring	L	7/20/2004			0	0.00	0.0
Salmon River	U	8/13/2004		12.2	100	4.66	466.0
Salmon River	U	8/13/2004		10	100	2.86	286.0
Salzer	M	7/27/2004	B	10.3	100	0.94	94.0
Sawmill	L	8/12/2004		10.5	100	1.46	146.0
Sheep	L	7/18/2004			0	0.00	0.0
Sheep	L	9/9/2004	B	10	100	5.40	540.0
Ship Island	L	7/19/2004			0	0.00	0.0
Short	L	8/5/2004	B	11.1	100	0.94	94.0
Slate	L	7/25/2004	B	10.5	51.5	4.20	216.3
Slate	L	7/25/2004	B	11	70	4.34	303.8
Slide	M	6/30/2004			90	1.34	120.6
Smiley	L	8/12/2004		20	100	4.76	476.0
Smiley	M	7/27/2004		16.7	100	5.68	568.0
Smiley	M	7/27/2004		15.6	100	9.14	914.0
Smiley	M	8/12/2004		18.3	100	8.38	838.0
Smiley	U	7/26/2004		13.3	100	5.54	554.0
Smiley	U	7/26/2004		12.8	100	4.76	476.0
Smiley	U	7/26/2004		15	100	2.86	286.0
Smiley	U	8/12/2004		3.7	100	2.51	251.0
Smithy	L	7/20/2004	B	12.5	100	2.36	236.0
South Fork Iron	L	6/19/2004		10	100	2.94	294.0
South Fork Iron	L	6/19/2004		10	107	2.76	295.3
South Fork Iron	M	6/18/2004		6.7	100	2.34	234.0
South Fork Iron	M	6/18/2004		8.9	100	2.18	218.0
South Fork Iron	U	6/20/2004		7.2	100	2.10	210.0
South Fork Iron	U	6/20/2004		7.8	100	2.18	218.0
Spring	L	9/8/2004	B	13.3	100	4.10	410.0
Squaw	L	9/27/2004	B	6.7	100	2.80	280.0
Squaw	L	6/10/2004		5.6	100	0.00	0.0
Squaw	L	6/10/2004			0	0.00	0.0
Stoddard	L	7/20/2004			350	0.00	0.0
Stroud	M	7/21/2004		9.4	100	2.74	274.0
Tenmile	L	9/13/2004		20	100	0.50	50.0
Thomas	L	7/16/2004			0	0.00	0.0
Thompson	L	8/5/2004		10.6	100	4.28	428.0
Thompson	L	7/12/2004		18.9	100	4.86	486.0
Thompson	L	7/12/2004		18.9	115	4.92	565.8

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water	Transect	Transect	Transect
				temperature (°C)	length (m)	mean width (m)	area (m)
Thompson	M	7/11/2004		15.6	100	3.76	376.0
Thompson	M	7/12/2004		15.6	100	5.04	504.0
Thompson	M	7/12/2004		12.8	100	3.96	396.0
Thompson	M	7/12/2004		12.2	100	5.50	550.0
Thompson	U	7/8/2004		10	100	3.02	302.0
Thompson	U	7/8/2004		9.4	100	2.16	216.0
Thompson	U	7/7/2004		11.7	100	1.36	136.0
Thompson	U	7/9/2004		10	100	3.66	366.0
Thompson	U	7/10/2004		12.8	100	5.00	500.0
Tobias	L	7/28/2004		11.1	100	2.18	218.0
Tumble	L	7/20/2004			0	0.00	0.0
Twelvemile	L	6/16/2004		7.2	100	3.48	348.0
Twelvemile	L	6/16/2004		10	100	2.32	232.0
Twelvemile	M	6/8/2004		7.2	105	3.84	403.2
Twelvemile	M	6/16/2004			0	0.00	0.0
Twelvemile	M	6/8/2004		10.6	100	4.44	444.0
Twelvemile	U	6/7/2004		6.7	104	3.14	326.6
Twelvemile	U	6/7/2004		7.8	100	4.18	418.0
Twelvemile	U	6/3/2004		8.9	100	1.98	198.0
Twelvemile	U	6/4/2004		7.8	110	3.04	334.4
Twin	L	6/10/2004			0	0.00	0.0
Twin	L	6/9/2004			0	0.00	0.0
Twin	L	6/9/2004		6.7	100	5.94	594.0
Twin	L	9/7/2004		7.8	100	4.34	434.0
Twin	L	9/16/2004		5.6	100	1.68	168.0
Twin	L	9/16/2004		5.6	100	1.68	168.0
Wagonhammer	L	8/3/2004	C	10.6	100	1.26	126.0
Wagonhammer	M	8/10/2004		10.3	100	1.76	176.0
Wagonhammer	M	8/3/2004		12.2	100	1.26	126.0
Wagonhammer	M	8/3/2004		12.8	100	1.96	196.0
Wagonhammer	M	8/10/2004		12.2	100	1.42	142.0
Warm Spring	L	7/18/2004			0	0.00	0.0
West Fork Anderson	L	6/28/2004	B		100	1.80	180.0
West Fork Anderson	L	6/28/2004			100	1.80	180.0
West Fork Iron	L	6/21/2004		7.8	100	3.84	384.0
West Fork Iron	M	6/21/2004		6.7	100	0.00	0.0
West Fork Iron	U	6/21/2004		5	100	0.00	0.0

Appendix A. Continued.

Stream	Transect	Sample date	Channel type	Water temperature (°C)	Transect length (m)	Transect mean width (m)	Transect area (m)
West Fork Nez Perce	L	7/20/2004		11.1	100	0.97	97.0
West Fork North Fork Salmon	L	8/2/2004	B	11.1	100	2.24	224.0
Wheetip	L	7/1/2004	C	11.1	100	0.00	0.0
Wilson	L	7/18/2004			0	0.00	0.0
Withington	U	9/13/2004		10.6	100	1.50	150.0
Wright	L	8/26/2004	A		100	2.90	290.0
Wright	L	9/13/2004		18.9	100	0.50	50.0
Yearian	M	9/13/2004		17.6	100	1.00	100.0

Appendix B. Upper Salmon River Basin (Idaho) tributary streams surveyed during the summer of 2004.

Stream	Transect	Sample date	SUBBASIN	UTM		
				Zone	Easting	Northing
Agency	L	9/27/2004	LEMHI RIVER	11	295057	4980321
Agency	L	9/29/2004	LEMHI RIVER	11	292509	4981095
Agency	M	9/20/2004	LEMHI RIVER	11	298282	4980391
Agency	M	10/13/2004	LEMHI RIVER	11	299640	4981722
Agency	U	9/10/2004	LEMHI RIVER	11	302028	4983168
Agency	U	9/10/2004	LEMHI RIVER	11	303594	4983000
Agency	U	9/10/2004	LEMHI RIVER	11	305246	4983357
Alder	L	7/11/2004	SALMON-NORTH FORK TO HEADWATERS	11	692754	4908698
Alder	U	7/28/2004	LEMHI RIVER	12	291628	4955884
Allan	L	7/27/2004	NORTH FORK SALMON	11	731843	5044811
Anderson	M	7/21/2004	NORTH FORK SALMON	12	271935	5050190
Aparejo	L	7/18/2004	M FORK SALMON	11	679230	4976386
Bayhorse	L	8/7/2004	SALMON-NORTH FORK TO HEADWATERS	11	718105	4917627
Bayhorse	L	8/6/2004	SALMON-NORTH FORK TO HEADWATERS	11	717275	4917744
Bayhorse	L	8/4/2004	SALMON-NORTH FORK TO HEADWATERS	11	715460	4918700
Bayhorse	M	8/6/2004	SALMON-NORTH FORK TO HEADWATERS	11	712312	4919628
Bayhorse	M	8/6/2004	SALMON-NORTH FORK TO HEADWATERS	11	714332	4919121
Bayhorse	U	7/13/2004	SALMON-NORTH FORK TO HEADWATERS	11	708595	4919894
Bayhorse	U	7/11/2004	SALMON-NORTH FORK TO HEADWATERS	11	709348	4920508
Bayhorse	U	7/13/2004	SALMON-NORTH FORK TO HEADWATERS	11	707813	4919935
Bayhorse	U	7/14/2004	SALMON-NORTH FORK TO HEADWATERS	11	710879	4920006
Bear Valley	M	8/28/2004	LEMHI RIVER	12	282683	4961918
Bernard	L	7/18/2004	M FORK SALMON	11	678574	4982482
Big Bear	L	8/24/2004	LEMHI RIVER	12	330353	4948411
Big Bear	L	7/15/2004	LEMHI RIVER	12	330353	4948411
Big Bear	L	7/18/2004	M FORK SALMON	11	679101	4974936
Big Bear	L	7/19/2004	M FORK SALMON	11	679101	4974936
Big Bear	M	7/1/2004	LEMHI RIVER	12	333220	4947475
Big Bear	M	8/24/2004	LEMHI RIVER	12	331955	4948785
Big Bear	U	7/1/2004	LEMHI RIVER	12	333276	4946807
Big Eightmile	U	9/13/2004	LEMHI RIVER	12	296748	4944349
Big Timber	M	9/14/2004	LEMHI RIVER	12	310139	4942012
Bog	L	7/7/2004	LEMHI RIVER	12	332777	4948321
Boulder	M	9/2/2004	SALMON-HORSE CK TO NORTH FORK	11	707640	5032456

Appendix B. Continued.

Stream	Transect	Sample date	SUBBASIN	UTM		
				Zone	Easting	Northing
Brush	L	7/17/2004	M FORK SALMON	11	678703	4980323
Camas	L	7/17/2004	M FORK SALMON	11	679758	4973220
Canyon	L	6/15/2004	LEMHI RIVER	12	312909	4951114
Canyon	M	9/15/2004	LEMHI RIVER	12	319344	4954111
Canyon	M	6/15/2004	LEMHI RIVER	12	319986	4956170
Canyon	U	6/15/2004	LEMHI RIVER	12	321103	4958336
Canyon	U	9/15/2004	LEMHI RIVER	12	320963	4958279
Cape Horn	L	9/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	640950	4912954
Carmen	M	8/9/2004	SALMON-NORTH FORK TO HEADWATERS	12	277679	5016174
Carmen	U	8/30/2004	SALMON-NORTH FORK TO HEADWATERS	11	282353	5025997
Champion	L	8/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	674613	4875901
Champion	M	8/17/2004	SALMON-NORTH FORK TO HEADWATERS	11	679236	4875861
Champion	M	8/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	677570	4875598
Champion	M	8/17/2004	SALMON-NORTH FORK TO HEADWATERS	11	676341	4875548
Champion	M	8/17/2004	SALMON-NORTH FORK TO HEADWATERS	11	680809	4875253
Champion	U	8/18/2004	SALMON-NORTH FORK TO HEADWATERS	11	684245	4876046
Champion	U	8/18/2004	SALMON-NORTH FORK TO HEADWATERS	11	682489	4875567
Clear	M	9/13/2004	LEMHI RIVER	11	331694	4934604
Corn	L	9/16/2004	SALMON-HORSE CREEK TO NORTH FORK	11	681554	5026273
Cougar	L	7/16/2004	M FORK SALMON	11	664595	4955861
Cow	L	9/29/2004	LEMHI RIVER	11	298074	4979484
Cow	M	9/20/2004	LEMHI RIVER	11	298824	4978129
Cub	L	7/17/2004	M FORK SALMON	11	675895	4967522
Dairy	L	7/22/2004	LEMHI RIVER	12	297436	4945591
Deep	L	9/7/2004	NORTH FORK SALMON	12	267906	5053880
Deer	L	8/5/2004	LEMHI RIVER	12	280324	4963374
Ditch	L	7/26/2004	NORTH FORK SALMON	11	266124	5044962
Ditch	L	7/27/2004	NORTH FORK SALMON	12	266056	5043945
East Fork Hayden	M	8/23/2004	LEMHI RIVER	12	288533	4956149
E. Fork Pahsimeroi	L	9/8/2004	PAHSIMEROI RIVER	12	284714	4889873
Eighteenmile	L	9/13/2004	LEMHI RIVER	12	318486	4944805
Elk	L	9/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	653309	4905427
Elk	L	9/13/2004	SALMON-NORTH FORK TO HEADWATERS	11	653309	4905427
Elk	L	9/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	653309	4905427
Elkhorn	L	7/14/2004	M FORK SALMON	11	638321	4941537
Everson	M	7/21/2004	LEMHI RIVER	12	297000	4946915

Appendix B. Continued.

Stream	Transect	Sample	SUBBASIN	Zone	UTM	
		date			Easting	Northing
Flume	L	9/20/2004	LEMHI RIVER	11	303473	4984502
Ford	L	8/4/2004	LEMHI RIVER	12	284499	4961033
Fourth of July	L	7/24/2004	SALMON-NORTH FORK TO HEADWATERS	11	679383	4878527
Fourth of July	L	7/25/2004	SALMON-NORTH FORK TO HEADWATERS	11	677910	4878177
Fourth of July	L	7/25/2004	SALMON-NORTH FORK TO HEADWATERS	11	675167	4877032
Fourth of July	M	7/24/2004	SALMON-NORTH FORK TO HEADWATERS	11	681584	4879114
Fourth of July	M	7/24/2004	SALMON-NORTH FORK TO HEADWATERS	11	680898	4878943
Fourth of July	M	7/24/2004	SALMON-NORTH FORK TO HEADWATERS	11	682222	4879665
Fourth of July	M	8/25/2004	SALMON-NORTH FORK TO HEADWATERS	12	276343	5032477
Fourth of July	M	7/23/2004	SALMON-NORTH FORK TO HEADWATERS	11	683770	4880074
Fourth of July	U	7/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	687886	4877683
Fourth of July	U	8/25/2004	SALMON-NORTH FORK TO HEADWATERS	12	278312	5034213
Fourth of July	U	7/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	688812	4879660
Fourth of July	U	7/23/2004	SALMON-NORTH FORK TO HEADWATERS	11	685458	4879840
Fourth of July	U	7/23/2004	SALMON-NORTH FORK TO HEADWATERS	11	685287	4879700
Fourth of July	U	7/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	686997	4878920
Fourth of July	U	7/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	687084	4879080
Freeman	L	8/30/2004	HEADWATERS	12	279623	5017536
Garden	L	7/15/2004	M FORK SALMON	11	647519	4955849
Goat	M	8/28/2004	SALMON-NORTH FORK TO HEADWATERS	11	661979	4895800
Goat	M	8/28/2004	SALMON-NORTH FORK TO HEADWATERS	11	660765	4894892
Goat	U	8/28/2004	SALMON-NORTH FORK TO HEADWATERS	11	659762	4893495
Golden	L	7/19/2004	M FORK SALMON	11	678356	5002086
Grand Prize Gulch	L	8/29/2004	SALMON-NORTH FORK TO HEADWATERS	11	686674	4867274
Haynes	M	9/13/2004	LEMHI RIVER	12	287895	4987554
Horse	U	8/31/2004	SALMON-MOUTH TO HORSE CREEK	11	704431	5040833
Hughes	L	6/24/2004	NORTH FORK SALMON	11	733719	5044118
Hughes	M	7/12/2004	NORTH FORK SALMON	11	731719	5044769
Hughes	M	8/10/2004	NORTH FORK SALMON	11	729879	5046385
Hull	L	7/12/2004	NORTH FORK SALMON	12	265738	5039234
Hull	M	7/12/2004	NORTH FORK SALMON	11	729781	5040890
Hull	U	7/12/2004	NORTH FORK SALMON	11	728475	5040807
Iron	L	8/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	265397	4974701

Appendix B. Continued.

Stream	Transect	Sample	SUBBASIN	Zone	UTM	
		date			Easting	Northing
Iron	L	8/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	263353	4975824
Iron	L	8/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	661514	4897305
Iron	M	8/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	735710	4976628
Iron	M	9/21/2004	SALMON-NORTH FORK TO HEADWATERS	11	732388	4977519
Iron	M	8/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	658740	4895425
Iron	M	8/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	660454	4895971
Iron	M	8/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	732388	4977519
Iron	U	8/27/2004	SALMON-NORTH FORK TO HEADWATERS	11	656268	4894472
Iron	U	6/21/2004	SALMON-NORTH FORK TO HEADWATERS	11	727532	4977783
Iron	U	8/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	729152	4977907
Iron	U	9/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	731025	4977990
Iron	U	8/27/2004	SALMON-NORTH FORK TO HEADWATERS	11	657493	4894612
Juliette	L	7/1/2004	SALMON-NORTH FORK TO HEADWATERS	11	710932	4919512
Kadletz	L	8/4/2004	LEMHI RIVER	12	283061	4961313
Lee	U	7/22/2004	LEMHI RIVER	12	295421	4949887
Lemhi River	L	7/21/2004	LEMHI RIVER	12	290570	4987436
Lemhi River	M	7/21/2004	LEMHI RIVER	12	290666	4986988
Lemhi River	U	7/21/2004	LEMHI RIVER	12	290681	4936849
Little Loon	L	7/16/2004	M FORK SALMON	11	663122	4954928
Loon	L	7/22/2004	M FORK SALMON	11	673077	4963775
Marble	L	7/16/2004	M FORK SALMON	11	657061	4956198
Meadow	L	7/1/2004	LEMHI RIVER	12	333435	4947492
Moose	L	8/2/2004	NORTH FORK SALMON	12	268617	5059696
Nez Perce	L	7/20/2004	NORTH FORK SALMON	12	277817	5049885
North Fork Iron	L	6/28/2004	SALMON-NORTH FORK TO HEADWATERS	11	727693	4978874
North Fork Iron	M	6/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	727332	4981963
North Fork Iron	M	6/23/2004	SALMON-NORTH FORK TO HEADWATERS	11	727164	4980421
North Fork Iron	U	6/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	727312	4985127
North Fork Iron	U	6/22/2004	SALMON-NORTH FORK TO HEADWATERS	11	727258	4983771
North Fork Salmon	U	9/20/2004	NORTH FORK SALMON	12	268142	5060432
Norton	L	7/17/2004	M FORK SALMON	11	674381	4965876
Otter	L	9/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	714433	4970976
Otter	U	9/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	717175	4970525

Appendix B. Continued.

Stream	Transect	Sample date	SUBBASIN	UTM		
				Zone	Easting	Northing
Papoose	L	7/19/2004	M FORK SALMON	11	679136	5004640
Pattee	L	9/13/2004	LEMHI RIVER	12	296049	4984022
Pine	L	7/17/2004	M FORK SALMON	11	666566	4958814
Pine	L	9/8/2004	SALMON-HORSE CREEK TO NORTH FORK	11	713464	5025107
Poison	L	7/7/2004	LEMHI RIVER	12	331987	4948812
Pole	L	9/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	676175	4865745
Pole	L	9/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	677389	4865499
Pole	M	9/15/2004	SALMON-NORTH FORK TO HEADWATERS	11	680910	4864269
Pole	M	9/15/2004	SALMON-NORTH FORK TO HEADWATERS	11	682269	4864895
Pole	M	8/25/2004	SALMON-NORTH FORK TO HEADWATERS	11	683473	4866125
Pole	U	8/30/2004	SALMON-NORTH FORK TO HEADWATERS	11	686168	4869097
Pole	U	8/29/2004	SALMON-NORTH FORK TO HEADWATERS	11	684957	4866462
Pole	U	8/29/2004	SALMON-NORTH FORK TO HEADWATERS	11	685794	4867841
Pungo	L	7/15/2004	M FORK SALMON	11	652497	4958435
Quaking Asp	L	7/7/2004	LEMHI RIVER	12	329738	4951023
Rainbow	L	9/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	682804	4864669
Reservoir	L	7/14/2004	LEMHI RIVER	12	329071	4949330
Reservoir	L	8/24/2004	LEMHI RIVER	12	329071	4949330
Reservoir	M	7/14/2004	LEMHI RIVER	12	329832	4950893
Roaring	L	7/20/2004	M FORK SALMON	11	684842	5014224
Salmon River	U	8/13/2004	SALMON-NORTH FORK TO HEADWATERS	11	680726	4858009
Salmon River	U	8/13/2004	SALMON-NORTH FORK TO HEADWATERS	11	680619	4857014
Salzer	M	7/27/2004	NORTH FORK SALMON	11	729973	5048364
Sawmill Creek	L	8/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	676090	4858860
Sheep	L	7/18/2004	M FORK SALMON	11	699260	4960299
Sheep	L	9/9/2004	NORTH FORK SALMON	12	271554	5042293
Ship Island	L	7/19/2004	M FORK SALMON	11	679197	5004796
Short	L	8/5/2004	LEMHI RIVER	12	281033	4962885
Slate	L	7/25/2004	SALMON-NORTH FORK TO HEADWATERS	11	693084	4900416
Slate	L	7/25/2004	SALMON-NORTH FORK TO HEADWATERS	11	694246	4902151
Slide	M	6/30/2004	SALMON-NORTH FORK TO HEADWATERS	11	732352	4975342
Smiley	L	8/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	676483	4861373
Smiley	M	7/27/2004	SALMON-NORTH FORK TO HEADWATERS	11	676323	4859585
Smiley	M	7/27/2004	SALMON-NORTH FORK TO HEADWATERS	11	676479	4858050

Appendix B. Continued.

Stream	Transect	Sample date	SUBBASIN	UTM		
				Zone	Easting	Northing
Smiley	M	8/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	676309	4859769
Smiley	U	7/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	676077	4856438
Smiley	U	7/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	675193	4855343
Smiley	U	7/26/2004	SALMON-NORTH FORK TO HEADWATERS	11	674673	4853287
Smiley	U	8/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	674397	4852317
Smithy	L	7/20/2004	NORTH FORK SALMON	12	274085	5048718
South Fork Iron	L	6/19/2004	SALMON-NORTH FORK TO HEADWATERS	11	727890	4977768
South Fork Iron	L	6/19/2004	SALMON-NORTH FORK TO HEADWATERS	11	727571	4976161
South Fork Iron	M	6/18/2004	SALMON-NORTH FORK TO HEADWATERS	11	727859	4974082
South Fork Iron	M	6/18/2004	SALMON-NORTH FORK TO HEADWATERS	11	728061	4975311
South Fork Iron	U	6/20/2004	SALMON-NORTH FORK TO HEADWATERS	11	726016	4975066
South Fork Iron	U	6/20/2004	SALMON-NORTH FORK TO HEADWATERS	11	727302	4974675
Spring	L	9/8/2004	SALMON-HORSE CREEK TO NORTH FORK	11	714583	5031147
Squaw	L	9/27/2004	SALMON-HORSE CREEK TO NORTH FORK	11	718066	5034641
Squaw	L	6/10/2004	SALMON-HORSE CREEK TO NORTH FORK	11	718306	5034144
Squaw	L	6/10/2004	SALMON-NORTH FORK TO HEADWATERS	11	718232	5034408
Stoddard	L	7/20/2004	M FORK SALMON	11	683130	5011579
Stroud	M	7/21/2004	LEMHI RIVER	12	296346	4947636
Tenmile	L	9/13/2004	LEMHI RIVER	12	324837	4938854
Thomas	L	7/16/2004	M FORK SALMON	11	657558	4952968
Thompson	L	8/5/2004	SALMON-NORTH FORK TO HEADWATERS	11	698392	4903324
Thompson	L	7/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	697806	4906364
Thompson	L	7/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	698215	4905033
Thompson	M	7/11/2004	SALMON-NORTH FORK TO HEADWATERS	11	692765	4909156
Thompson	M	7/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	695945	4906527
Thompson	M	7/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	694607	4907094
Thompson	M	7/12/2004	SALMON-NORTH FORK TO HEADWATERS	11	693260	4907586
Thompson	U	7/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	692800	4912899
Thompson	U	7/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	693037	4914531
Thompson	U	7/7/2004	SALMON-NORTH FORK TO HEADWATERS	11	692673	4914586
Thompson	U	7/9/2004	SALMON-NORTH FORK TO HEADWATERS	11	692514	4911668

Appendix B. Continued.

Stream	Transect	Sample	SUBBASIN	Zone	UTM	
		date			Easting	Northing
Thompson	U	7/10/2004	SALMON-NORTH FORK TO HEADWATERS	11	692194	4910230
Tobias	L	7/28/2004	LEMHI RIVER	12	285645	4957803
Tumble	L	7/20/2004	M FORK SALMON	11	682149	5010007
Twelvemile	L	6/16/2004	SALMON-NORTH FORK TO HEADWATERS	12	270784	4988232
Twelvemile	L	6/16/2004	SALMON-NORTH FORK TO HEADWATERS	12	269258	4988079
Twelvemile	M	6/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	273791	4986009
Twelvemile	M	6/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	273402	4986907
Twelvemile	M	6/8/2004	SALMON-NORTH FORK TO HEADWATERS	11	273402	4986907
Twelvemile	U	6/7/2004	SALMON-NORTH FORK TO HEADWATERS	11	274727	4983393
Twelvemile	U	6/7/2004	SALMON-NORTH FORK TO HEADWATERS	11	274236	4984516
Twelvemile	U	6/3/2004	SALMON-NORTH FORK TO HEADWATERS	11	275547	4980036
Twelvemile	U	6/4/2004	SALMON-NORTH FORK TO HEADWATERS	11	275040	4981636
Twin	L	6/10/2004	NORTH FORK SALMON	12	268251	5054602
Twin	L	6/9/2004	NORTH FORK SALMON	12	268251	5054602
Twin	L	6/9/2004	NORTH FORK SALMON	12	267450	5054940
Twin	L	9/7/2004	NORTH FORK SALMON	12	267495	5054918
Twin	L	9/16/2004	NORTH FORK SALMON	12	267450	5054940
Twin	L	9/16/2004	SALMON-NORTH FORK TO HEADWATERS	11	682922	4866375
Wagonhammer	L	8/3/2004	NORTH FORK SALMON	12	269778	5030995
Wagonhammer	M	8/10/2004	NORTH FORK SALMON	12	270764	5032513
Wagonhammer	M	8/3/2004	SALMON-NORTH FORK TO HEADWATERS	12	269966	5031228
Wagonhammer	M	8/3/2004	SALMON-NORTH FORK TO HEADWATERS	12	270335	5031867
Wagonhammer	M	8/10/2004	SALMON-NORTH FORK TO HEADWATERS	12	270565	5032134
Warm Spring	L	7/18/2004	M FORK SALMON	11	679187	4979503
West Fork	L	6/28/2004	NORTH FORK SALMON	12	272241	5050958
West Fork	L	6/28/2004	NORTH FORK SALMON	11	272241	5050958
West Fork Iron	L	6/21/2004	SALMON-NORTH FORK TO HEADWATERS	11	726636	4978527
West Fork Iron	M	6/21/2004	SALMON-NORTH FORK TO HEADWATERS	11	725573	4978687
West Fork Iron	U	6/21/2004	SALMON-NORTH FORK TO HEADWATERS	11	724293	4980101
West Fork Nez	L	7/20/2004	Perce	12	277791	5049927
West Fork North	L	8/2/2004	Fork Salmon	12	268431	5059766
Wheetip	L	7/1/2004	LEMHI RIVER	12	333102	4946906
Wilson	L	7/18/2004	M FORK SALMON	11	679338	4988957

Appendix B. Continued.

Stream	Transect	Sample date	SUBBASIN	UTM		
				Zone	Easting	Northing
Withington	U	9/13/2004	LEMHI RIVER	12	280434	4991411
Wright	L	8/26/2004	LEMHI RIVER	12	281939	4962234
Wright	L	9/13/2004	LEMHI RIVER	12	281652	4962033
Yearian	M	9/13/2004	LEMHI RIVER	12	298320	4969423

LITERATURE CITED

- Curet, T., B. Esselman, and K. Andrews 2001 Regional Fishery Investigations, Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-25 Job Performance Report, Boise.
- Gallagher, A.S., and Stevenson N.J. 1999. Stream flow. Pages 149-155 in M.B. Bain and N.J. Stevenson, editors. Aquatic habitat assessment: common methods. American Fisheries Society, Bethesda.
- SCNF. 1993. Watershed Characteristics Within Middle Salmon-Panther Subbasin. Salmon-Challis National Forest, Idaho.
- SBTA. 1998. Salmon Basin Bull Trout Problem Assessment.
- VanDeventer, J.S. and W.S. Platts. 1989. Microcomputer software system for generating population statistics from electrofishing data – users guide for Microfish 3.0. General Technical Report INT 254. USDA Forest Service, Intermountain Research Station, Boise.

SALMON REGION 2004 FISHERY MANAGEMENT ANNUAL REPORT

RIVERS AND STREAMS INVESTIGATIONS

ABSTRACT

In July 2004, Idaho Fish and Game Department (Department) personnel used snorkeling to sample 10 of the 29 mainstem Middle Fork Salmon River transects, and six of 10 tributary sites, for fish presence and density. Due to poor visibility, numerous transects were not surveyed. Mean snorkel densities of age one and older westslope cutthroat trout *Oncorhynchus clarkii lewisi*, rainbow trout/steelhead *O. mykiss*, and juvenile Chinook salmon *O. tshawytscha* counted in Middle Fork Salmon River mainstem transects were 1.7, 1.1, and 25.3 fish/100 m², respectively. In Middle Fork Salmon River tributary transects, mean westslope cutthroat trout snorkel densities averaged 2.2/100 m², rainbow trout/steelhead averaged 1.9/100 m², and Chinook salmon averaged 23.1/100 m². The species composition of fish caught by Department anglers was 57% cutthroat trout and 43% rainbow trout.

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INTRODUCTION

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

Primitive roads access Dagger Falls and the headwaters of some tributaries. Access to the lower 156 km of the MFSR is limited to aircraft, float boats, or horse/foot trails.

The MFSR is a major recreational river that offers a wide variety of outdoor and backcountry experiences. The number of people floating the river during the permit season has increased substantially in the past 30 years from 625 in 1962 to 11,050 in 2004. The US Forest Service estimates total use days to be 67,000 days (U.S. Forest Service, Salmon-Challis National Forest, Middle Fork Ranger District, 2004).

The earliest MFSR fishery studies conducted in 1959 and 1960 evaluated the life history and seasonal movements of westslope cutthroat trout *Oncorhynchus clarkii lewisi* (Mallet 1963). In 1971 the Department initiated studies to monitor MFSR westslope cutthroat trout abundance and to evaluate catch-and-release regulations established by the Idaho Fish and Game Commission in 1972. The Commission adopted similar regulations for major MFSR tributaries in the early and mid-1980s.

The 1971 study included establishment of snorkeling transects to be surveyed periodically (Corley 1972; Jeppson and Ball 1977, 1979). Since then the Department has begun additional studies within the MFSR drainage. In 1981, using only traditional steelhead transects established in that year, we began to evaluate wild steelhead trout populations *O. mykiss* on the MFSR (Thurow 1982, 1983, 1985). In 1985, the Department added additional sites to enumerate cutthroat trout and Chinook salmon. In that same year, the Department started measuring juvenile steelhead, Chinook salmon *O. tshawytscha* and westslope cutthroat trout densities in the MFSR 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, a continuation of the 1985 study, presents data collected in July 2004 on fish densities in the Middle Fork Salmon River drainage.

OBJECTIVES

1. Monitor juvenile steelhead trout and Chinook salmon densities within the Middle Fork Salmon River and its tributaries.
2. Monitor the effects of catch-and-release regulations on resident fish populations in the MFSF drainage, particularly on westslope cutthroat trout.
3. Collect fish genetic samples in select tributaries for analysis and reporting by Eagle Genetics Lab.

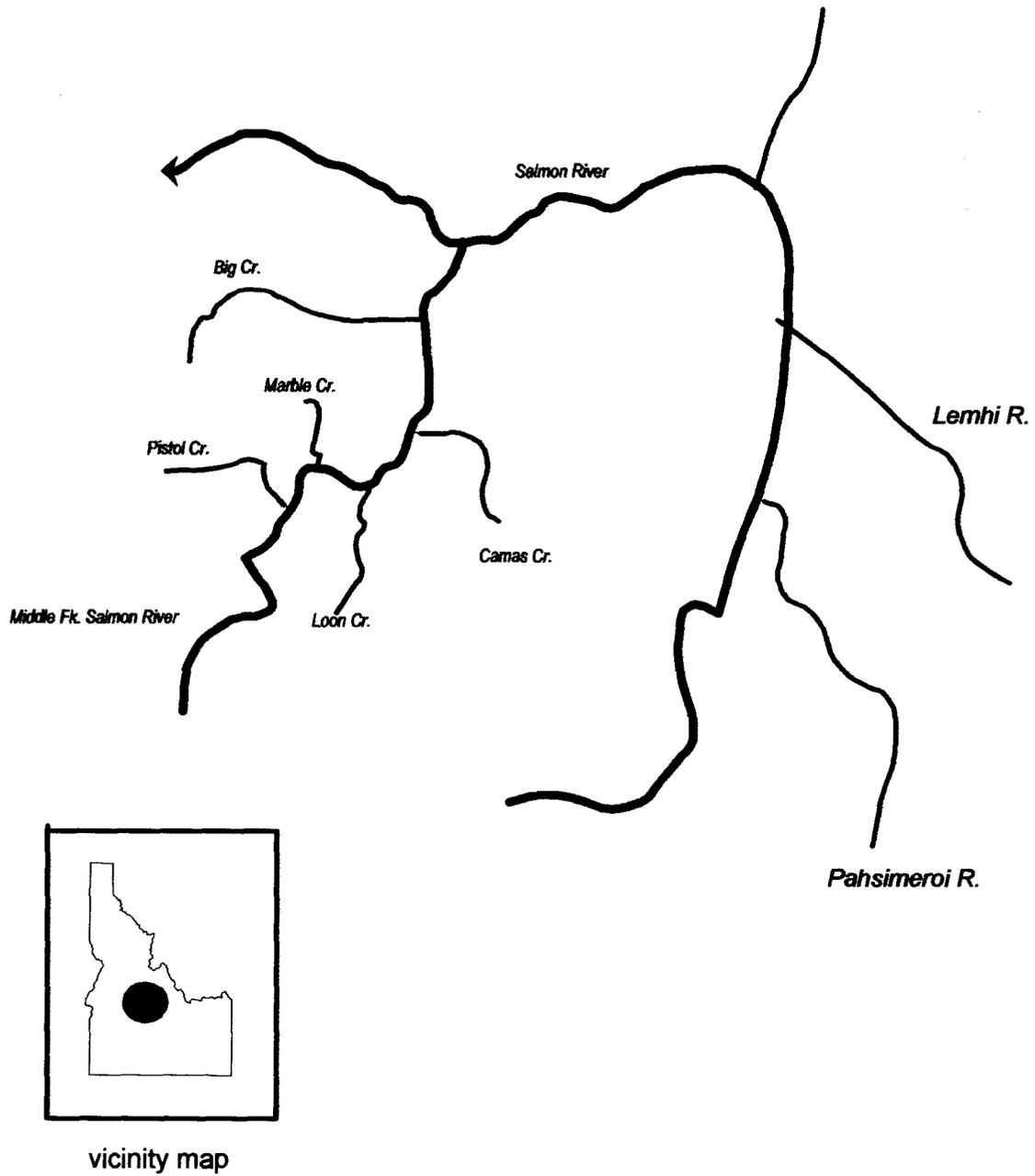


Figure 1. Map of Middle Fork Salmon River and tributaries, Idaho.

METHODS

Between July 13 and July 20, 2004, Department personnel snorkeled 10 of 29 mainstem MFSR transects and six of 10 MFSR tributary transects (Table 1-3). All MFSR transects below Marble Pool including the six historical (Corley) transects were not surveyed (Table 1-3).

The snorkeling techniques are described by Thurow (1994). We used conventional fly-fishing and spin cast gear to evaluate fish species and length frequencies on the MFSR below the confluence of Boundary Creek.

RESULTS

Middle Fork Salmon River Snorkeling Transects

In mainstem snorkeling transects we counted 150 westslope cutthroat trout, 88 rainbow trout/steelhead, and 2,095 juvenile Chinook salmon in mainstem MFSR transects (Table 4). Mean densities were 1.7, 1.1, and 25.3 fish/100 m² for westslope cutthroat trout, rainbow trout/steelhead and juvenile Chinook salmon, respectively (Table 5).

Middle Fork Salmon River Tributary Snorkeling Transects

In tributary snorkeling transects we counted 68 westslope cutthroat trout, 69 rainbow trout/steelhead, and 673 juvenile Chinook salmon in mainstem MFSR transects (Table 6). Mean densities were 2.2, 1.9, and 23.1 fish/100 m² for westslope cutthroat trout, rainbow trout/steelhead and juvenile Chinook salmon, respectively (Table 6).

Middle Fork Salmon River Historical Snorkeling Transects

No MFSR snorkeling transects were surveyed during the 2004 field season (Table 7).

Project Angling

Department anglers caught 427 fish: 243 westslope cutthroat trout (57%) and 184 rainbow trout/steelhead (43%) (Figure 2). Mean total lengths were 263.2 mm for westslope cutthroat trout and 182.4 mm for rainbow trout/steelhead.

Table 1. Locations and dimensions of sample transects on Middle Fork Salmon River, July 2004.

Location River km ^a	Transect Name	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Area (m ²)	Traditional Transects ^b
0.3	Boundary	61	3.2	12.8	780.8	SB
4.3	Gardells Hole	126	3.3	13.2	1663.2	C2, ck
8.8	Velvet	37	2.5	10	370	C2, ck
13.6	Elkhorn	68	2.5	10	680	SB
21.3	Sheepwater	104	2.2	8.8	915.2	SB
24.5	Greyhound	100	2.9	11.6	1160	C2, ck
29.6	Rapid River	74	2.7	10.8	799.2	SB
40	Indian	137	1.5	6	822	SB
44.3	Pungo	77	2.7	10.8	831.6	C2, ck
51	Marble Pool	142	2.6	10.4	1476.8	C2, ck
52.3	Skijump*	155	n/a	n/a	n/a	SB
60.6	Lower Jackass*	111	n/a	n/a	n/a	C2, ck
64.6	Cougar*	50	n/a	n/a	n/a	SB
73.9	Whitey Cox*	102	n/a	n/a	n/a	C2, ck
74.1	Rock Island*	122	n/a	n/a	n/a	SB
82.9	Hospital Pool*	80	n/a	n/a	n/a	C2, ck
84.3	Hospital Run*	66	n/a	n/a	n/a	SB
92.6	Tappan Pool*	137	n/a	n/a	n/a	C2, ck
92.8	Tappan Run*	n/a	n/a	n/a	n/a	SB
106.6	Flying B*	75	n/a	n/a	n/a	C2, ck
108.6	Airstrip*	110	n/a	n/a	n/a	SB
119.7	Survey*	n/a	n/a	n/a	n/a	SB
124.6	Big Creek Bridge*	185	n/a	n/a	n/a	C2, ck
127.8	Love Bar*	100	n/a	n/a	n/a	SB
135.8	Ship Island*	126	n/a	n/a	n/a	C2, ck
144	Little Ouzel*	87	n/a	n/a	n/a	SB
144.6	Otter Bar*	143	n/a	n/a	n/a	C2, ck
151.5	Goat Creek Pool*	134	n/a	n/a	n/a	C2, ck
151.8	Goat Creek Run*	122	n/a	n/a	n/a	SB

^a River km start at Dagger Falls.

^b Traditional steelhead transects established in 1981; SB = Steelhead; traditional cutthroat trout and Chinook transects established in 1985; C2 = westslope cutthroat trout and ck = Chinook salmon.

* All sites below Marble Pool were not surveyed in 2004 due to Marble Creek blow out.

Table 2. Middle Fork Salmon River tributary snorkeling transects, July 2004.

Transect Name*	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Area (m ²)	Species Present**	Location River km ^a
Loon Creek Lower	n/a	n/a	n/a	n/a	SB,C2, ck	Below pack bridge
Loon Creek Upper	n/a	n/a	n/a	n/a	SB,C2, ck	360 m above pack bridge
Big Creek	n/a	n/a	n/a	n/a	SB,C2	360 m above mouth
Pistol Creek Lower	40	2.2	13.2	528	SB,C2, ck	At mile marker 16
Pistol Creek Upper	28	2.2	13.2	369.6	SB,C2, ck	Above mile marker 16
Indian Creek Lower	57.3	3.2	10.34	592.5	SB,C2, ck	75 m above mouth
Indian Creek Upper	50	3.2	12.8	640	SB,C2, ck	300 m above mouth
Marble Creek	n/a	n/a	n/a	n/a	SB,C2, ck	Above pack bridge
Camas Creek Lower	75	2.4	14.4	1080	SB,C2	From pack bridge downstream
Camas Creek Upper	37	2.4	14.4	532.8	SB,C2, ck	Above pack bridge

** SB = steelhead; C2 = westslope cutthroat trout; ck = Chinook salmon.

* Marble, Loon, and Big Creek sites were not snorkeled in 2004.

Table 3. Middle Fork Salmon River historical snorkeling transects (Corley sites), July 2004.

Transect Name	Transect Length (m)	Visibility (m)	Visibility Corridor (m)	Area (m ²)	Species Present**	Location River km ^a
Hancock Rapids Hole	n/a	n/a	n/a	n/a	C2	Directly below Hancock Rapids
Cliffside Rapids Hole	n/a	n/a	n/a	n/a	SB,C2	Directly below Cliffside Rapids
Bernard Airstrip	n/a	n/a	n/a	n/a	SB,C2	Site below airstrip site
Mahoney Camp	n/a	n/a	n/a	n/a	SB,C2, ck	
White Creek Pack Bridge	n/a	n/a	n/a	n/a	SB,C2, ck	Above Loon Creek sites
Little Ck Guard Station	n/a	n/a	n/a	n/a	C2, ck	Above pack bridge

** SB = steelhead; C2 = westslope cutthroat trout; ck = Chinook salmon.

Table 4. Numbers of westslope cutthroat trout and rainbow trout/steelhead by length group (mm), Chinook salmon by age group, and other fish, Middle Fork Salmon River snorkel counts, July 2004. (BU = bull trout, WF = mountain whitefish, FNP = N. Pikeminnow, SUC = all sucker species, RSS = reddsides)

Transect Name	River km	Westslope Cutthroat Trout (C2)					Total C2	Rainbow Trout/ Steelhead (R1)				Total R1	Chinook		Total Ck	BU	WF	FNP	SUC	RSS	Total Fish
		<75	75-150	150-230	230-300	>300		75-150	150-230	230-300	>300		Age 0	Age 1							
Boundary	0.3	15	0	1	2	1	19	2	0	0	0	2	58	0	58	1	3	0	0	0	85
Gardells Hole	4.3	0	0	0	7	4	11	1	6	0	0	7	178	0	178	0	8	0	0	0	200
Velvet	8.8	0	1	3	6	2	12	9	0	0	0	9	335	0	335	0	5	0	0	0	360
Elkhorn	13.6	0	0	2	6	1	9	14	5	1	0	20	105	0	105	1	2	0	0	0	130
Sheepeater	21.3	0	0	0	1	2	3	3	2	0	0	5	0	0	0	0	4	0	0	0	10
Greyhound	24.5	0	0	8	19	0	27	3	5	0	0	8	261	0	261	0	8	0	0	0	300
Rapid River	29.6	0	0	0	14	4	18	6	4	3	0	13	340	0	340	1	5	0	0	0	370
Indian	40	0	0	5	5	1	11	1	3	0	0	4	50	0	50	0	3	4	5	0	70
Pungo	44.3	0	0	4	6	2	12	0	0	0	0	0	88	0	88	3	10	1	0	0	110
Marble Pool	51	0	0	7	14	7	28	0	20	0	0	20	680	0	680	0	17	5	18	0	760
Skijump	52.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lower Jackass	60.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cougar	64.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Whitey Cox	73.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Rock Island	74.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hospital Pool	82.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hospital Run	84.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tappan Pool	92.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tappan Run	92.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Flying B	106.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Airstrip	108.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Survey	119.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Creek Bridge	124.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Love Bar	127.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ship Island	135.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Little Ouzel	144	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Otter Bar	144.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goat Creek Pool	151.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Goat Creek Run	151.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		15	1	30	80	24	150	39	45	4	0	88	2095	0	2095	6	65	10	23	0	2440

Table 5. Densities (fish/100 m²) of westslope cutthroat trout, rainbow trout/steelhead, and Chinook salmon, Middle Fork Salmon River snorkel transects, July 2004.

Transect Name	River km	Area (m ²)	Densities (fish/100m ²)			Total Fish*
			Westslope Cutthroat Trout	Rainbow Trout	Chinook Salmon	
Boundary	0.3	780.8	2.4	0.3	7.4	10.1
Gardells Hole	4.3	1663.2	0.7	0.4	10.7	11.8
Velvet	8.8	370	3.2	2.4	90.5	96.2
Elkhorn	13.6	680	1.3	2.9	15.4	19.7
Sheepeater	21.3	915.2	0.3	0.5	0.0	0.9
Greyhound	24.5	1160	2.3	0.7	22.5	25.5
Rapid River	29.6	799.2	2.3	1.6	42.5	46.4
Indian	40.0	822	1.3	0.5	6.1	7.9
Pungo	44.3	831.6	1.4	0.0	10.6	12.0
Marble Pool	51.0	1476.8	1.9	1.4	46.0	49.3
Skijump	52.3	n/a	n/a	n/a	n/a	n/a
Lower Jackass	60.6	n/a	n/a	n/a	n/a	n/a
Cougar	64.6	n/a	n/a	n/a	n/a	n/a
Whitey Cox	73.9	n/a	n/a	n/a	n/a	n/a
Rock Island	74.1	n/a	n/a	n/a	n/a	n/a
Hospital Pool	82.9	n/a	n/a	n/a	n/a	n/a
Hospital Run	84.3	n/a	n/a	n/a	n/a	n/a
Tappan Pool	92.6	n/a	n/a	n/a	n/a	n/a
Tappan Run	92.8	n/a	n/a	n/a	n/a	n/a
Flying B	106.6	n/a	n/a	n/a	n/a	n/a
Airstrip	108.6	n/a	n/a	n/a	n/a	n/a
Survey	119.7	n/a	n/a	n/a	n/a	n/a
Big Creek Bridge	124.6	n/a	n/a	n/a	n/a	n/a
Love Bar	127.8	n/a	n/a	n/a	n/a	n/a
Ship Island	135.8	n/a	n/a	n/a	n/a	n/a
Little Ouzel	144.0	n/a	n/a	n/a	n/a	n/a
Otter Bar	144.6	n/a	n/a	n/a	n/a	n/a
Goat Creek Pool	151.5	n/a	n/a	n/a	n/a	n/a
Goat Creek Run	151.8	n/a	n/a	n/a	n/a	n/a

*Total fish includes suckers, northern pikeminnow, shiners, whitefish, and bull trout.

Table 6. Numbers of westslope cutthroat trout and rainbow trout/steelhead by length group (mm), Chinook salmon by age group, and other fish species counted in Middle Fork Salmon River tributaries, July 2004.

Transect Name	Area (m2)	Westslope Cutthroat Trout (C2)						Rainbow Trout/ Steelhead (R1)					Chinook Total				BU	WF	FNP	SUC	RSS	Total Fish
		<75	75-150	150- 230-		>300	Density	75-150	150- 230-		>300	Density	Age									
				230	300				Age 0	1			Ck	Density								
Loon Creek Lower*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Loon Creek Upper*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Big Creek*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pistol Creek Lower	369.6	0	0	8	14	2	6.49	0	0	3	2	1.35	271	0	271	73.32	0	12	0	0	0	312
Pistol Creek Upper	528	0	0	4	1	0	0.95	0	3	0	1	0.76	98	0	98	18.56	0	9	0	0	0	116
Indian Creek Lower	592.5	0	0	4	3	1	1.35	1	3	1	0	0.84	133	0	133	22.45	0	6	0	0	0	152
Indian Creek Upper	640	0	2	1	5	3	1.72	2	19	11	2	5.31	116	0	116	18.13	1	13	0	0	0	175
Marble Creek*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Camas Creek Lower	1080	0	0	3	6	0	0.83	9	0	0	0	0.83	44	0	44	4.07	0	37	1	2	0	102
Camas Creek Upper	532.8	0	2	3	6	0	2.06	7	3	2	0	2.25	11	0	11	2.06	3	10	0	2	0	49

* Transect not sampled in 2004.

Table 7. Numbers of westslope cutthroat trout and rainbow trout/steelhead by length group (mm), Chinook salmon by age group, and other fish species counted in Middle Fork Salmon River historical (Corley) transects, July 2004.

Transect Name	Area (m2)	Westslope Cutthroat Trout (C2)						Rainbow Trout/ Steelhead (R1)					Chinook Total				BU	WF	FNP	SUC	RSS	Total Fish
		<75	75-150	150-230		>300	Density	75-150	150-230		>300	Density	Age									
				230-300	>300				Age 0	1			Ck	Density								
Cliffside Rapids Hole*	2760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hancock Rapids Hole*	1159.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mahoney Camp*	540	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WhiteCreekPack Bridge*	3840	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bernard Airstrip*	920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Little Ck Guard Station*	850	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

* Transect not sampled in 2004.

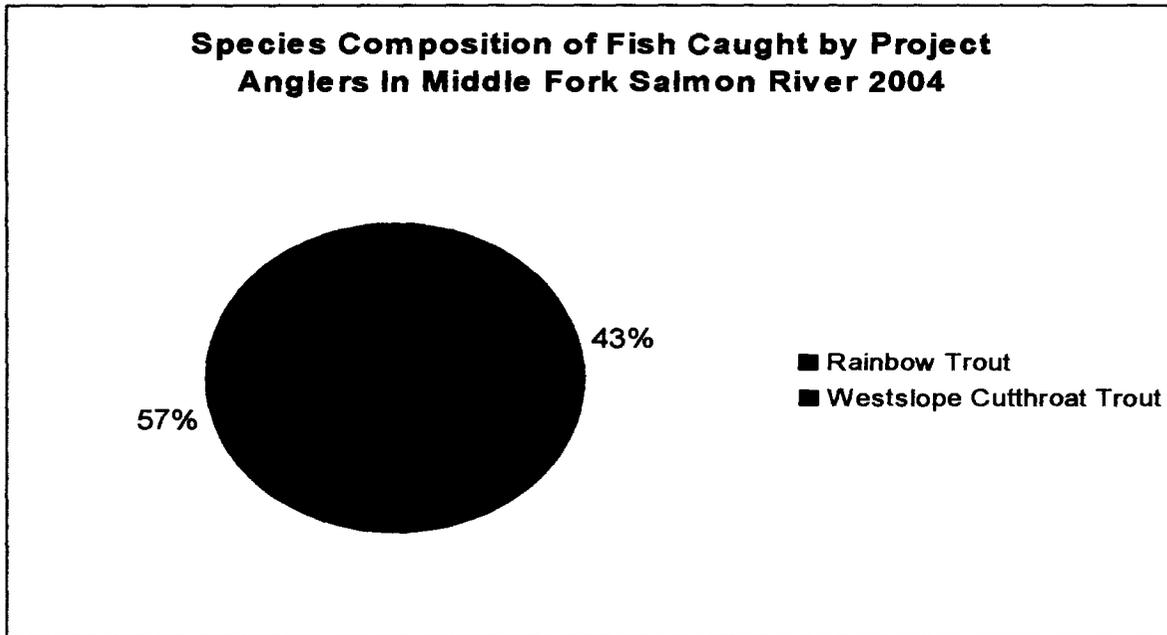


Figure 2. Species composition of fish caught by Department project anglers In Middle Fork Salmon River Project Angling, July 2004.

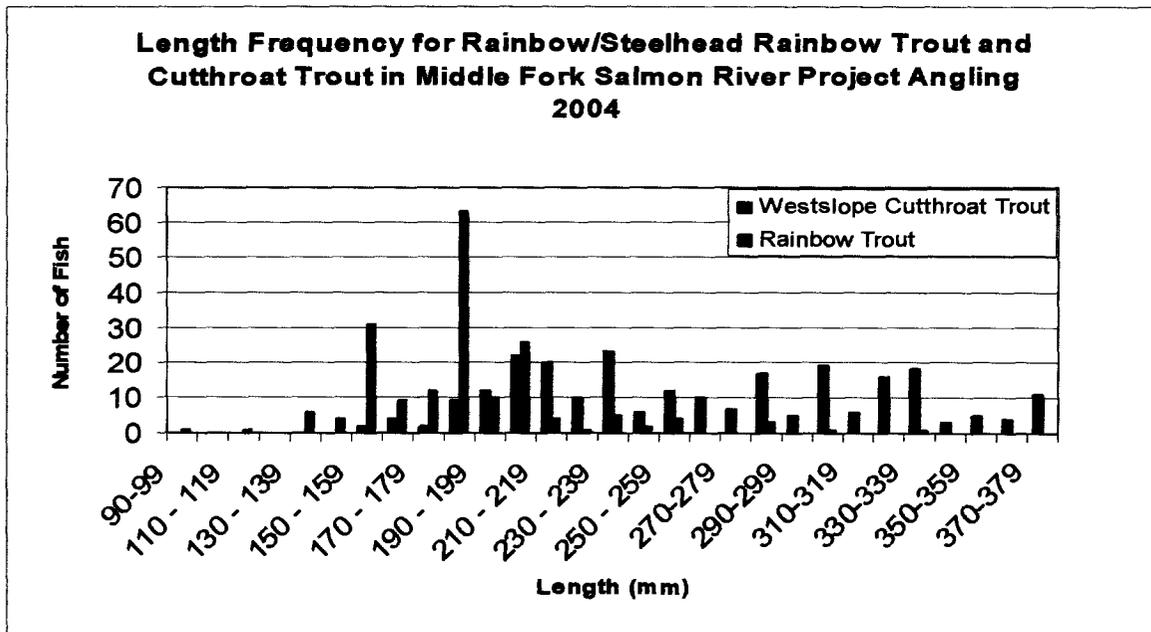


Figure 3. Length frequency of rainbow trout/steelhead and westslope cutthroat trout caught by Project Anglers in Middle Fork Salmon River Project Angling, July 2004.

DISCUSSION

Middle Fork Salmon River Snorkeling Transects

We counted 88 rainbow trout/steelhead, 150 westslope cutthroat trout, and 2,095 juvenile Chinook salmon in mainstem MFSR transects (Table 4) in 2004. Mean densities were 1.1, 1.7 and 25.27 fish/100 m² for rainbow trout/steelhead, westslope cutthroat trout and juvenile Chinook salmon, respectively (Table 5).

In 2003, we counted 87 rainbow trout/steelhead, 302 westslope cutthroat trout and 1,659 juvenile Chinook salmon in mainstem MFSR transects. Mean densities were 0.5, 1.2, and 8.2 fish/100 m² for rainbow trout/steelhead, Westslope cutthroat trout, and juvenile Chinook salmon, respectively (Curet et. al. 2003).

The 2004 rainbow trout/steelhead, westslope cutthroat trout, and Chinook salmon mean densities appear higher than the 2003 densities however, only 10 of the 29 transects were surveyed. Not all transects were surveyed because Marble Creek was flowing sediment and debris causing little to no visibility in snorkel sites downstream. It is likely the reason the mean densities appear higher in 2004 than 2003 is because only upper river transects were surveyed, similar total numbers of fish observed, and the total transect area sampled in 2004 was smaller than 2003.

The upper river transects historically have higher densities of salmonids. Comparing upstream to downstream in the MFSR, the densities of salmonids decrease due to environmental factors such as temperature, elevation, and gradient. Since the upper ten transects were surveyed, we were able to collect data from the areas known to have the highest fish densities. Surveying only the upper 10 transects, the transect area was reduced from 29,874.8 m² in 2003 to 9,448.8 m² in 2004. Because not all of the sites were surveyed we opted to remove numerous historical graphs that we have used to compare annual data from each field season because it's not comparable and if used it would be misleading.

The 2004 and 2003 rainbow trout/steelhead numbers appear similar. It is important to note, as stated earlier, that not all transects were surveyed in 2004 due to Marble Creek effecting visibility in snorkel sites down stream. The number of fish observed in the ten sites surveyed in 2004 (N=88) compared to the 27 sites observed in 2003 (N=87) indicate the possibility that higher numbers of rainbow trout/steelhead may have been counted in 2004 if all sites were surveyed.

In 1971, when project personnel first established snorkeling transects specifically for westslope cutthroat trout, observed numbers of fish were low. The Idaho Fish and Game Commission established catch-and-release regulations for the Middle Fork Salmon River in 1972. After this, westslope cutthroat trout numbers increased and appeared to peak in the early to mid-1980s. The trend during the early 1990s had been a general decline with lower numbers observed. However, westslope cutthroat trout are now slowly increasing in numbers and size (Curet et al. 2003). This increase was observed in 2004 and 2003.

Dramatic declines in juvenile Chinook salmon densities were observed from 1989 to 1996. Since 1996 an upward trend in juvenile Chinook salmon has been noted (Curet et. al 2003).

The highest juvenile Chinook salmon numbers in traditional MFSR transects since 1971 were recorded in 2004 (N=2095) (Figure 5) and 2003 (N=1659).

Middle Fork Salmon River Tributary Snorkeling Transects

In 2004, juvenile rainbow trout/steelhead densities ranged from 0.8 to 5.3 fish/100 m² with a mean of 1.9 fish/100 m² (Table 6). The mean juvenile Chinook salmon density was 23.1 fish/100 m² and ranged from 2.1 to 73.32 fish/100 m². Mean westslope cutthroat trout density was 2.23 fish/100 m² and ranged from 0.8 to 6.5 fish/100 m².

In 2003, juvenile rainbow trout/steelhead densities ranged from 0.3 to 5.2 fish/100 m² with a mean of 2.2 fish/100 m² (Table 6). The mean juvenile Chinook salmon densities were 8.8 fish/100 m² and ranged from 0 to 35.3 fish/100 m². Mean westslope cutthroat trout densities were 1.8 fish/100 m² and ranged from 0.2 to 6.3 fish/100 m².

In 2004, only six of the ten tributary sites were surveyed. This affected numbers of fish observed, which in turn lowered/increased and biased mean densities when graphing long-term density trend information. Due to this potential bias, trend graphs were not compiled for 2004.

Rainbow trout/steelhead densities have decreased slightly since 1999. Yearly spawner escapement can heavily influence juvenile steelhead densities. The relationship between resident rainbow trout, residual steelhead, and migratory steelhead can make this data difficult to interpret. In addition, the time of year counts are conducted, visibility and other environmental factors also affect the number of fish species observed and counted.

From 1989 to 1996 there had been a dramatic decline in juvenile Chinook salmon densities for reasons similar to those for the decrease in steelhead. Since 1996 an upward trend in juvenile Chinook salmon has been seen in tributary snorkel counts (Curet et. al 2003). In 2004, the highest juvenile Chinook salmon numbers in MFSR tributary transects were recorded since the Department began collecting Chinook data in 1981. It is important to note that only six of the ten transects were surveyed in 2004. This change in juvenile Chinook salmon densities can be traced to increased adult escapement into the MFSR tributaries for spawning and thermal refuge.

Between 1993 and 1999, westslope cutthroat trout densities varied little in tributary transects snorkeled. Although there was some slight variation in densities among tributaries, no major changes occurred. In 2004, westslope cutthroat densities were the highest recorded since 1983.

Middle Fork Salmon River Historical Snorkeling Transects

In 2003, the six historical Corley sites were snorkeled for the first time since the early 1970s (Table 3). In 2004, these sites were not surveyed due to water conditions. In the future, we will compare these additional historical snorkeling sites once multiple years of data are available.

Project Angling

The Idaho Fish and Game Commission established catch-and-release regulations in MFSR in 1972. Before this, approximately 20% of the westslope cutthroat trout caught by project anglers were larger than 300 mm (Figure 9). Since the regulation change, this proportion has fluctuated yearly ranging from 33% to 53% and averaged 43%. The proportion of large westslope cutthroat trout caught in 2003 was 32% and in 2004, 33%. This slight fluctuation is probably because of variation in sample timing, gear type, angler skill, number of anglers and fish migration patterns. The mean length of creeled Westslope cutthroat trout is currently 263.2 mm.

RECOMMENDATIONS

Continue monitoring densities of westslope cutthroat trout, juvenile rainbow trout/steelhead, and juvenile Chinook salmon in the 29 mainstem MFSR sites, 10 tributary sites and 6 historical sites (Corley) by snorkeling annually between the second week of July and the third week of August. This information is important because it demonstrates population trends over time. In addition, the mainstem westslope cutthroat trout snorkel counts on the Middle Fork of the Salmon, St. Joe, Coeur d'Alene, and Selway rivers, along with the General Parr Monitoring snorkel counts for westslope cutthroat trout likely comprise the best trend dataset for a salmonid subspecies in America (Dan Schill, personal communication, 2005).

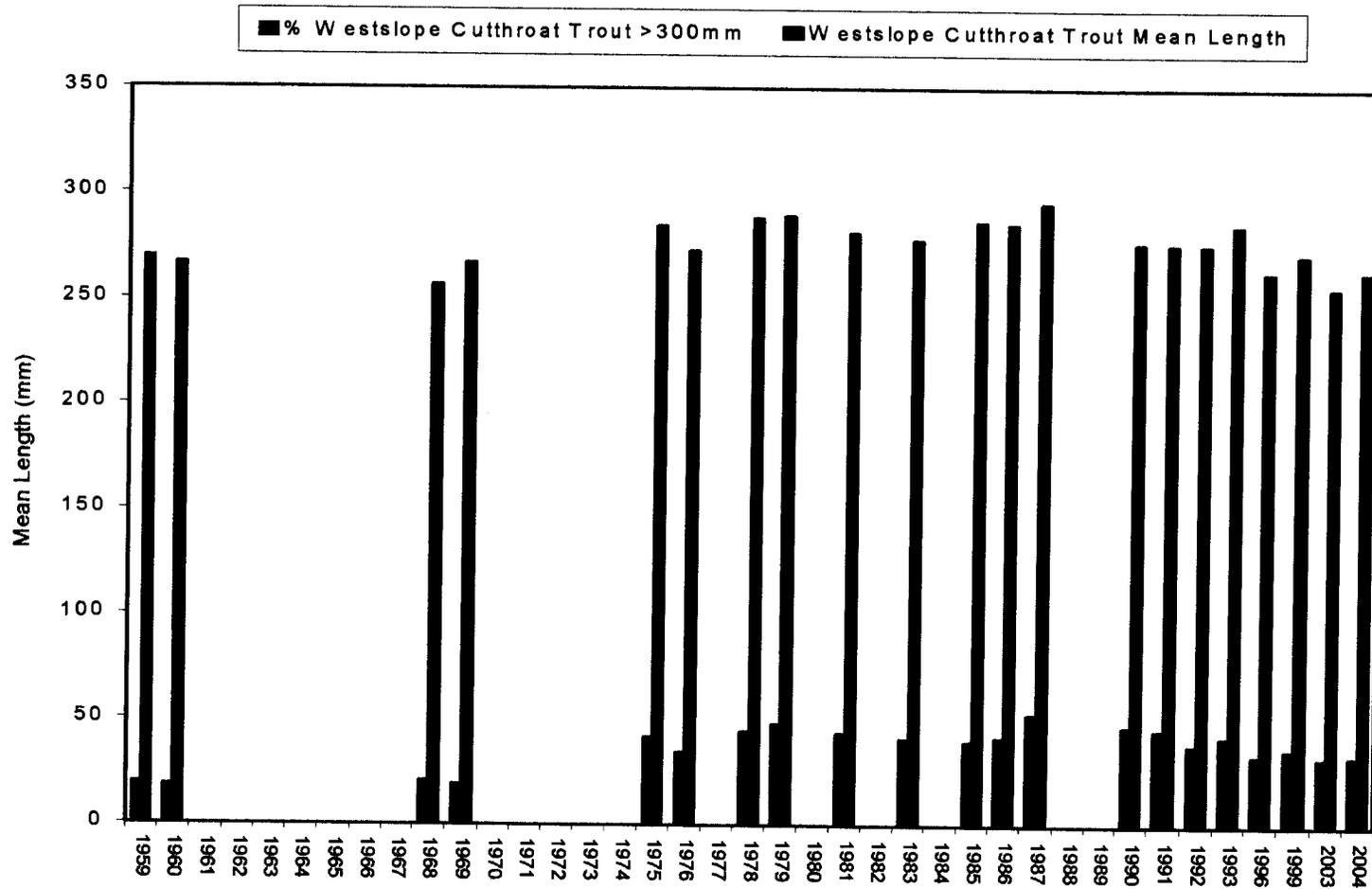


Figure 4. Mean length and proportion of westslope cutthroat trout larger than 300 mm sampled by project angling in the Middle Fork Salmon River, 1959-2004.

LITERATURE CITED

- Corley, D.R. 1972. Snorkel trend counts of fish in the Middle Fork - 1971. Idaho Department of Fish and Game, Completion Report, Boise.
- Curet, T., R. Esselman, K. Andrews, and A. Brimmer. 2003. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-28, Job Performance Report, Boise.
- Davis, J.A., J.R. Lukens, and W.C. Schrader. 1992. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-14, Job Performance Report, Boise.
- Jeppson, P., and K. Ball. 1977. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-1, Job 6, Job Performance Report, Boise.
- Jeppson, P., and K. Ball. 1979. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-3, Job 6, Job Performance Report, Boise.
- Liter, M., and J.R. Lukens. 1992. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-16, Job Performance Report, Boise.
- Lukens, J.R., and J.A. Davis. 1989. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-13, Job 6(SAL), Job Performance Report, Boise.
- Mallet, J.L. 1963. The life history and seasonal movements of cutthroat trout in the Salmon River, Idaho. Master's thesis. University of Idaho, Moscow.
- Reingold, M., and J.A. Davis. 1987a. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-10, Job 6(SAL), Job Performance Report, Boise.
- Reingold, M., and J.A. Davis. 1987b. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-11, Job 6(SAL), Job Performance Report, Boise.
- Reingold, M., and J.A. Davis. 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.
- Schrader, W.C., and J.R. Lukens. 1992. Regional fishery management investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-71-R-15, Job 6(SAL), Job Performance Report, Boise.

- Thurrow, R. 1982. Middle Fork Salmon River fisheries investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-73-R-4, Job Performance Report, Boise.
- Thurrow, R. 1983. Middle Fork Salmon River fisheries investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-73-R-5, Job Performance Report, Boise.
- Thurrow, R. 1985. Middle Fork Salmon River fisheries investigations. Idaho Department of Fish and Game, Federal Aid in Fish Restoration, F-73-R-6, Job Performance Report, Boise.
- Thurrow, R.F. 1994. Underwater methods for study of salmonids in the intermountain west. General Technical Report INT-GTR-307. Ogden, Utah: U.S. Department of Agriculture, Forest Service, Intermountain Research Station.

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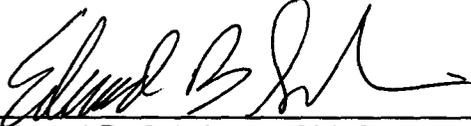
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