

IDAHO DEPARTMENT OF FISH AND GAME

Rod Sando, Director

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REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS SOUTHWEST REGION (Subprojects I-D, II-D, III-D, IV-D)

PROJECT I.	SURVEYS AND INVENTORIES
Job a.	Southwest Region Mountain Lakes Investigations
Job b.	Southwest Region Lowland Lake Investigations
Job c.	Southwest Region Rivers and Streams Investigations
Job d.	Southwest Region Salmon and Steelhead Investigations
PROJECT II.	TECHNICAL GUIDANCE
PROJECT III.	HABITAT MANAGEMENT
PROJECT IV.	POPULATION MANAGEMENT

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ABSTRACT

Gill nets were set in 11 lakes and visual observations were made in 3 additional lakes in the Goat Creek Drainage to determine the status of fish populations and to monitor the effectiveness of the mountain lakes stocking program. Westslope cutthroat trout *Oncorhynchus clarki lewisi* were found in Upper and Lower Bead, Lone Warbonnet, Warbonnet, Blue Rock, Feather, Cony, McWillards, Little McWillards, Oreamnos, Packrat, Three and Limber lakes. Brook trout *Salvelinus fontinalis* were found in Meadow Lake and Three Lake. Stocking records indicate westslope cutthroat trout are stocked every two years in Upper and Lower Bead, Blue Rock, Feather, Cony, McWillards, Oreamnos, Packrat, Three, and Limber lakes. Based on stocking records and evaluation of length frequencies of gillnetted fish, natural production is likely occurring in most lakes.

Gill net sampling and visual observations were conducted on 13 high mountain lakes near Red Mountain, the Cat Creek lakes chain, and two lakes on Cache Creek, a tributary to Bear Valley Creek Drainage, during September 1994. The sampling was done to document the species composition and the success of the high lake stocking program. All Red Mountain lakes contained westslope cutthroat trout. Westslope cutthroat were present in five of six Cat Creek lakes. Rainbow trout *O. mykiss* were present in Cat Creek Lake #1 (the lowest lake of the chain) and in the two lakes on Cache Creek. Fish length frequencies and scale analysis indicate problems with lake naming or identification from the air while stocking, because few of the lakes' fish populations could be matched with the stocking records. The stocking program has generally created excellent fisheries; adjustments were recommended to better organize and fine-tune stocking rates.

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GOAT CREEK LAKES SURVEY

Methods

Gill nets were set in mountain lakes in the Goat Creek basin (tributary to South Fork Payette River) during the week of August 12-18, 1994. Gill nets were set during the afternoon hours and retrieved the following day. One gill net was set per lake. Gill nets were 30.5 m long with 7.6 m panels of 19, 25, 32, and 38 mm stretch mesh. All fish collected were measured to the nearest mm and weighed to the nearest g. Lake location was determined using a Global Positioning System (GPS). Lake surface area was estimated using an English area grid.

Results

Individual lake summaries are provided in Appendix A.

Lower Bead Lake

This lake is relatively shallow with a mud bottom with submerged logs. It is a cirque lake that is filling with sediment. Eight westslope cutthroat trout *Oncorhynchus clarki lewisi* ranging in size from 155 to 340 mm were collected. Collected fish were likely from the 1991 and 1993 plants of hatchery fish. Limited natural production may occur in the inlet stream that flows from Upper Bead Lake to Lower Bead Lake. Limited evidence of camping and fishing around the lake exists, however, use appears to be light. The stocking recommendation is to change from every other year stocking to every third year.

Upper Bead Lake

Maximum depth is >5 m. Substrate is mostly mud. Fifteen westslope cutthroat trout ranging in size from 163 to 262 mm were collected. No water flowed into the lake, and reproduction is unlikely. Camping and fishing use is light. The stocking recommendation is to change from every other year stocking to every third year. Upper and Lower Bead lakes should be stocked in the same years.

Lone Warbonnet Lake

Maximum depth is >5 m, and the substrate is mostly mud; however, areas of gravel and boulders along the shoreline exist. The lake is mostly deep with little littoral area. Ten westslope cutthroat trout were netted ranging in size from 125 to 255 mm. Trout fry (50 mm) were observed in shallow areas of the lake indicating some natural reproduction is occurring. Camping around the lake occurs, however, use is light. Stocking records indicate this lake has not been stocked recently. Currently the fish population is being sustained by natural production. No stocking is recommended for this lake.

Warbonnet Lake

Maximum depth is >5 m. Most camping occurs around Feather and Lone Warbonnet lakes. Use is light. Eight westslope cutthroat trout were collected ranging in size from 125 to 350 mm. According to stocking records, the lake has not been stocked recently. Natural production is supporting the fish population. No stocking is recommended for this lake.

Blue Rock Lake

This is a deep cirque lake with limited littoral area on the north side. Limited camping occurs in the area, and use is light. Thirteen westslope cutthroat trout were collected, ranging in size from 170 to 283 mm. Trout fry were observed in the inlet stream. Natural production contributes to this trout population. Stocking is recommended every three years.

Feather Lakes

Four lakes make up the Feather Lakes complex. The upper two and lower two lakes are connected. The lakes are generally shallow (<2 m). Gill nets were not set in these lakes. Small numbers of westslope cutthroat up to 250 mm were seen in the lakes. Trout fry were observed in the streams connecting the lakes. Stocking recommendation is to allow natural production to support fish populations. No stocking is recommended.

Cony Lake

This is a relatively deep cirque lake with no inlet or outlet. Camping use around the lake is light. Thirteen westslope cutthroat trout ranging in size from 270 to 342 mm were collected. All fish appeared to be from the same year class. No natural production is evident. Stocking recommendation is to plant the lake every three years.

McWillards Lake

This is a relatively shallow (<2 m) meadow-bog lake. There is no evidence of camping around the lake. There is no inlet and the outlet is not useable for spawning. Fifteen westslope cutthroat trout were collected ranging from 167 to 322 mm. No spawning is thought to occur. Stocking is recommended every three years.

Little McWillards Lake

This is a relatively shallow (<2 m) meadow-bog lake. Gill nets were not set in this lake. Trout fry were observed in the stream between McWillards Lake and Little McWillards Lake. Westslope cutthroat trout 250 mm in length were seen rising in the lake. No stocking is recommended for this lake.

Oreamnos Lake

This lake is relatively deep (>6 m) with some littoral area. Some camping is evident, however, use is light. Twenty-three westslope cutthroat trout were collected ranging from 141 to 355 mm. Trout fry were observed in the inlet stream. Natural production in the inlet stream contributes to this trout population. Stocking is recommended every three years.

Packrat Lake

This is a deep (>6 m) cirque lake. Little human use is evident around this lake. Gill nets were not set, however, three anglers were fishing when we visited the lake. While there, anglers were observed to catch westslope cutthroat trout on nearly every cast. Size ranged from 250 to 450 mm. Trout as small as 75 mm were observed in the lake. Some natural production appears to be occurring. Stocking is recommended every three years.

Meadow Lake

This is a shallow (<2 m) meadow-bog lake. One brook trout *Salvelinus fontinalis* was netted. Several brook trout were observed in the streams above the lake. No stocking is recommended.

Three Lake

This is a relatively large deep lake. Some camping use is evident around the lake, however, use is light. Three anglers were observed fishing while we pulled the net. They caught several trout in the 250 mm size range. Twenty brook trout and 17 westslope cutthroat trout were netted. Brook trout ranged from 117 to 340 mm and westslope cutthroat trout ranged from 110 to 370 mm in length. Stocking is recommended every three years.

Limber Lake

This is a relatively deep cirque lake. Little human use is evident. Sixteen westslope cutthroat trout were netted ranging in size from 175 to 302 mm. No natural production is evident. Stocking is recommended every three years.

RECOMMENDATIONS

1. Identify and record all lakes in the Goat Creek basin on topographic maps. Associate all lakes on topographic maps with a planting number.

2. Make indicated stocking recommendation changes in the mountain lake stocking schedule. In general stocking should be shifted from every other year to every third year. It is recommended to cease stocking in several lakes that appear to have natural reproduction. These lakes should be re-assess in 5-10 years to ascertain success of natural reproduction.

RED MOUNTAIN LAKES SURVEY

Methods

The Red Mountain lakes and the Cat Creek lakes chain were surveyed during the week of September 19 to 22, 1994 by regional fisheries staff. Lakes were surveyed by setting an experimental 30.5-m gill net overnight and retrieving the next day. Most lakes were also angled to calculate a fish caught per hour index. Observations on spawning inlets or outlets were noted. A GPS reading was taken at each lake near the gill net set location. Conductivity and pH measurements were recorded. Fish captured in gill nets were measured for total length to the nearest mm and weighed to the nearest g. Scales were taken from a range of fish sizes at most lakes to allow comparison to stocking records. A length frequency was developed for each lake and minimum and maximum lengths and weights were reported. Individual condition factors (K) were calculated, and a mean condition factor and range of conditions were reported. Lake surface areas were calculated using an English area grid. Lake mean depths were averages of measurements taken with a weighted measuring rope.

Results

Individual lake summaries are provided in Appendix A.

Red Mountain Lake #1

Visual observation identified several sizes of cutthroat trout feeding. Human use is moderate; there was a trail around the lake. Spawning areas were available in the inlet creek which connects to Red Mountain Lake #2 above.

Red Mountain Lake #2

Westslope cutthroat trout were sampled by an overnight gill net set and angling. Cutthroat trout captured in the gill nets ranged from 120 to 330 mm in total length. Average condition factor was low at 0.84. Angling catch rate was 6.3 trout/h. Numerous campsites and trails, and stock areas are around this lake. Some spawning was successful in the outlet area as evidenced by small fish captured in the gill nets. The lake was stocked in 1989 and 1992 which seems to support the length frequency and the group of trout greater than 300 mm.

Red Mountain Lake #3

A high cirque lake above Red Mountain Lake #2 with light human use, light trail, and one campsite. Angling was excellent with a catch rate of 20 trout/h. Length frequency of gillnetted trout was grouped between 190 mm and 265 mm. The lake did not have any obvious spawning stream. Stocking records indicated planting in 1992, but aging also indicated a year class in 1991. It looks like the lake was also planted in 1991 and not recorded in the stocking records.

AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

YEAR CLASS	AGE	n	BACK-CALCULATION AGE			
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
1993	1	0	0.0			
1992	2	4	130.3	160.1		
1991	3	3	144.6	186.2	229.3	
<hr/>						
ALL CLASSES			136.4	171.4	229.3	
		7	7	7	7	

Red Mountain Lake #4

This lake lies above and to the west of Red Mountain Lake #2 and has moderate human use with several campsites present. No angling was done, but gill net catches reveal several year classes of trout present. Spawning gravels were present in the inlet from a small pond above. Condition was poor with an average value of 0.82 and a maximum value of 0.89 K. Stocking records indicate stocking in 1991 and 1992, which does not relate to the calculated age and growth data from scale analysis.

AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

YEAR CLASS	AGE	n	BACK-CALCULATION AGE			
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
1993	1	1	103.9			
1992	2	4	124.1	156.1		
1991	3	0				
1990	4	10	124.5	172.2	214.3	256.0
<hr/>						
ALL CLASSES			123.0	167.6	214.3	256.0
		15	15	14	10	10

Red Mountain Lake #5

Angling was the only sampling conducted on this lake in 1994. Stocking records indicate no stocking of this lake. Westslope cutthroat trout were caught at a catch rate of 11 trout/h. Lengths of trout ranged from 100 to 250 mm; weights were not taken. Excellent spawning areas were present on the outlet channel. This lake lies closest to the main trail and had heavily used trails around the lake. The lake is the shallowest of the Red Mountain Lake group with only one deep area of approximately 3 to 4 m.

Cat Creek Lake #1

Cat Creek #1 is the lowest elevation lake in the Drainage. This lake also receives the highest human use because the main trail system goes to the outlet of the lake. Spawning tributaries with good gravel are numerous. Fishing success was fair at 1.5 trout/h. The lake is stocked with rainbow trout *O. mykiss* fingerlings which have hybridized with the westslope cutthroat trout from the Drainage. Hybrid trout were 2 to 1 ratio versus the "pure" looking rainbow trout captured. Several year classes of trout were present (the last recorded stocking was 1990), and natural recruitment is occurring. Condition of trout in this lake was generally better than in the other lakes surveyed. One spotted frog was observed.

Cat Creek Lake #2

No sampling was conducted other than visual observation. This lake is extremely shallow (<1 m), and no evidence of fish were seen. There were not any fishermen trails around the lake. Stocking records indicate stocking in 1990, 1992, and 1994 with westslope cutthroat trout.

Cat Creek Lake #3

This lake is the third lake up the chain. Overnight gillnetting captured 12 cutthroat trout ranging from 255 to 340 mm in length. No angling was done. Scale analysis classified all these fish as three years old. Stocking records place trout in this lake in 1990, 1992, and 1994, which does not match up with three year old fish. No small fish were captured or seen from the 1994 stocking. Average condition (K) was 0.96, which is higher than most of these lakes.

Cat Creek Lake #4

This lake lies northwest of Cat Creek Lake #3 and is somewhat hard to locate. A gill net was set overnight and no angling was conducted. No spawning areas were identified. Human use of the lake was very light. Fish captured ranged in length from 190 to 260 mm. Scale analysis aged these fish at three years, which does not correspond to the fish stocking in 1992.

Cat Creek Lake #5

This is the uppermost lake in the chain. An overnight gill net set and angling were done. Angling catch rate was 22.4 trout/h. Eighteen gill nets captured fish ranging in length from 220 to 340 mm with an average condition factor of 0.83. There were no obvious spawning inlet or outlet streams. Human use of the lake was light, with a trail but no campsites. Stocking records do not match up with scale ageing or length frequency of the captured fish.

AVERAGE BACK-CALCULATED LENGTHS (mm) FOR EACH AGE CLASS

YEAR CLASS	AGE	BACK-CALCULATION AGE				
		n	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
1993	1	0	0.0			
1992	2	1	82.1	106.1		
1991	3	4	130.0	162.3	200.8	
ALL CLASSES			120.4	151.1	200.8	
n		5	5	5	4	

Cat Creek Lake #6

This lake is the smallest lake in the chain and was about 1.5 m low in 1994. An overnight gill net and angling were used to sample the fish population. Catch rate was 2 trout/h for the angling sampling, and eight cutthroat trout were captured in the gill nets. Trout lengths ranged from 125 to 255 mm in the gill net catch. Spawning area was available in the outlet. These fish were aged at three years old except for the 125 mm fish. Stocking records indicate stocking in 1992. Human use of this lake was a little higher, probably do to its location next to the Red Mountain lakes.

Cache Creek East Lake

This lake lies to the north of the Cat Creek Drainage and is the headwaters of Cache Creek that drains into Bear Valley Creek. Overnight gill net and angling were used to sample this lake. Angling catch rate for wild rainbow/steelhead was 24/h. The length range of gill net captured rainbow was 115 to >500 mm. Average condition was 0.89 and ranged from 0.86 to 1.2. Excellent outlet spawning available. There has been no stocking of this lake.

Cache Creek West Lake

This lake lies west of Cache Creek East Lake and over the pass from Red Mountain. Wild rainbow trout captured in gill nets ranged in length from 115 to 320 mm and were numerous. Angling catch rate was 20 trout/h. Condition of the trout was an average of 0.86. Spawning habitat was available in the outlet and inlet to the lake. This was the only lake with flowing water in this 1994 survey.

Recommendations

1. The regional and hatchery stocking maps need to be verified as to location and naming of these lakes. There is quite a difference in the age and size of fish present and the stocking records.
2. After verification of the lake names and locations, the following adjustments (Table 1) need to be made in the stocking recommendations.

TABLES

Table 1. Recommended stocking plan for Red Mountain and Cat Creek lakes.

Lake	Species	Number	Stocking Rotation	Recommend	
Red Mt. 1	C2	500	odd year	same	
Red Mt. 2	C2	1,500	3rd year	same	
Red Mt. 3	C2	1,500	3rd year	same	
Red Mt. 4	C2	500	odd year	same	
Red Mt. 5	C2	0	0	same	
Cat Cr. 1	R4	1,000	4th year	C2 1,500	odd year
Cat Cr. 2	C2	500	even year	stop stocking	
Cat Cr. 3	C2	500	even year	same	
Cat Cr. 4	C2	1,500	3rd year	same	
Cat Cr. 5	C2	1,500	3rd year	same	
Cat Cr. 6	C2	500	3rd year	same	
Cache E.	none	0	0	none	
Cache W.	none	0	0	none	

C2 – Westslope cutthroat trout
R4 – Hatchery rainbow trout

APPENDIX

Appendix A. Mountain Lakes Survey Summary

Lake Name: Lower Bead
 IDFG Catalog Number: 09-0159
 County: Boise
 Section: 34 Township: 9N
 Quad Map Name: Warbonnet Peak

Date: 8/16/94
 Drainage: South Fork Payette
 GPS Coord: 44 04.27';115 03.13'
 Range: 12E Elevation: 8646 FT

PHYSICAL:

Lake Type: Cirque-scour
 Total Surface Area: 6A
 Comments:

Mean Depth:

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 62 F

SPAWNING POTENTIAL: Some spawning may occur in the stream between Upper and Lower Bead lake. All production would contribute to Lower Bead Lake.

HUMAN USE: Light

Fish Survey

ANGLING: No. Of Fisherman____ Hours of Fishing____
 Fish Caught::_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net x__

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				5	1		2		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
C2	216	155-340	131	34-425	0.96	.86-1.08

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1992	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Upper Bead Date: 08/16/94
 IDFG Catalog Number: 09-0160 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 04.28'; 115 03.15'
 Section: 34 Township: 9N Range: 12E Elevation: 8700 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque-scour Mean Depth:
 Total Surface Area: 6 A
 Comments:

CHEMICAL:

Alkinity: Hardness: pH:
 Conductivity: Surface Temp: 62 F

SPAWNING POTENTIAL: None likely. No inlet and outlet was dry.

HUMAN USE: Light

Fish Survey

ANGLING: No. of Fishermen____ Hours of Fishing____
 Fish Caught::_____ Total Fish/hour____

LENGTH FREQUENCY: Collection Method: Angling____ Gill Net__x__

Total Length in mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				6	4	5			

FISH CONDITION:

Total Length (mm) Weight (g) Condition (K)

Species	Mean	Range	Mean	Range	Mean	Range
C2	220	163-262	101	47-162	.867	.77-1.02

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	500	
1990	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Lone Warbonnet Date: 08/15/94
 IDFG Catalog Number: 09-0161 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.81'; 115 02. 63'
 Section: 34 Township: 9N Range: 12E Elevation: 8910 ft.

Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth:
 Total Surface Area: 15
 COMMENTS: Mostly deep water with little littoral area.

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 60 F

SPAWNING POTENTIAL: None. No inlet or outlet. Outlet water flows through rocks. Based on netting information and stocking records, natural production is occurring.

HUMAN USE: Light. Some camping evident between Lone Warbonnet and Feather lakes.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish / hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net__x__

Total Length In mm

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

FISH CONDITION:

Species	Total Length (mm)			Weight (g)		Condition (K)	
	Mean	Rnge	Man	Range	Mean	Range	
C2	219	125-255	98	42-150	.87	.76-1.02	

STOCKING HISTORY: Non since prior to 1985.

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Warbonnet
 IDFG Catalog Number: 09-0162
 County: Boise
 Section: 34 Township: 9N
 Quad Map Name: Warbonnet Peak

Date: 08/15/94
 Drainage: South Fork Payette
 GPS Coord: 44 03.87'; 115 02.49'
 Range: 12E Elevation: 8916 ft

PHYSICAL:

Lake Type: Cirque
 Total Surface Area: 29 A
 Comments:

Mean Depth:

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 60 F

SPAWNING POTENTIAL: No inlet or outlet. Based on planting records, natural production is occurring.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net x

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2			1			3	4		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
C2	288	125-350	228	103-445	.86	.72-1.038

STOCKING HISTORY: None since prior to 1985.

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Blue Rock Date: 08/15/94
 IDFG Catalog Number: 09-0163 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.87';115 03. 41'
 Section: 33 Township: 9N Range: 12E Elevation: 8205 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth:
 Total Surface Area: 16 A
 Comments: Deep cirque lake. Some littoral area on north side of lake.

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 60 F

SPAWNING POTENTIAL: Fry were observed in the outlet. Successful spawning occurs there. Fry and fingerlings to 150 mm observed in inlet stream.

HUMAN USE: Light. Two campfire rings and camping sites were evident near the lake.

Fish Survey

ANGLING: No. of Fisherman _____ Hours of Fishing _____
 Fish Caught: _____ Total Fish/hour _____

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net x _____

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				3	6	4			

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
C2	223	170-283	95	45-228	.80	.64-1.00

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Feather Date: 08/15/94
 IDFG Catalog Number: 09-0165 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.97'; 115 02. 95'
 Section: 34 Township: 9N Range: 12E Elevation: 8800 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Paternoster Mean Depth: shallow
 Total Surface Area: 11 A
 Comments: Four small lakes. Upper two lakes are connected, and lower two lakes are connected.

CHEMICAL:

Alkalinity : Hardness: PH:
 Conductivity: Surface Temp:

SPAWNING POTENTIAL: Fry were observed swimming in stream between the Feather lakes. Limited natural production is occurring.

HUMAN USE: Light. Some camping occurs around the Feather lakes, and between Feather and Lone Warbonnet Lake.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour_____

A few 250-mm westslope cutthroats were seen swimming in the lakes.

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
19911	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cony Date: 08/12/94
 IDFG Catalog Number: 09-0167 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.68'; 115 04.91'
 Section: 5 Township: 8N Range: 12E Elevation: 8790 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque-scour Mean Depth:
 Total Surface Area: 20 A
 Comments:

CHEMICAL:

Alkalinity: HARDNESS: PH:
 Conductivity: Surface Temp: 64 F

SPAWNING POTENTIAL: None. No inlet or outlet evident.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net x

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2						5	8		

FISH CONDITION:

Total Length (mm) Weight (g) Condition (K)

Species	Mean	Rnge	Mean	Range	Mean	Range
C2	304	270-342	279	200-355	.99	.81-1.16

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: McWillards Date: 08/15/94
 IDFG Catalog Number: 09-0168 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.42';115 03.82'
 Section: 4 Township: 8N Range: 12E Elevation: 8180 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Meadow-bog Mean Depth: Shallow
 Total Surface Area: 8 A
 Comments: Relatively shallow bog lake.

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 65 F

SPAWNING POTENTIAL: None. No inlet or outlet is usable by McWillards Lake fish.

HUMAN USE: Light. No evidence of camping around the lake.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net__x__

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				5	5	4	1		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
C2	227	167-322	100	40-200	.79	.67-.90

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Little McWillards Date: 08/15/94
IDFG Catalog Number: Drainage: South Fork Payette
County: Boise GPS Coord: 44 03.51';115 03.88'
Section: 4 Township: 8N Range: 12E Elevation: 8140 FT
Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Mean Depth:
Total Surface Area: 3 A
Comments: Shallow bog lake.

CHEMICAL:

Alkalinity: Hardness: PH:
Conductivity: Surface Temp:

SPAWNING POTENTIAL: Fry were observed in stream between McWillards and Little McWillards. These fish would have had access to Little McWillards only. Adequate natural production appears to be occurring in the stream to provide fish for the lake.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
Fish Caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Several fish were seen rising in Little McWillards. 250 mm C2 were seen in the lake.

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Oreamnos Date: 08/15/94
 IDFG Catalog Number: 09-0169 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.28'; 115 03.99'
 Section: 4 Township: 8N Range: 12E Elevation: 8140 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth:
 Total Surface Area: 28 A
 Comments: Fair amount of littoral area and fair amount of deep water.

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 62 F

SPAWNING POTENTIAL: Good. Fry observed in inlet. Natural production is probably adequate for this lake.

HUMAN USE: Light. One campfire ring observed.

Fish Survey

ANGLING: No. of Fisherman _____ Hours of Fishing _____
 Fish Caught: _____ Total Fish/hour _____

LENGTH FREQUENCY: COLLECTION METHOD: Angling _____ Gill net_x _____

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2			1	4	8	5	4	1	

FISH CONDITION:

SPECIES	Total Length (mm)		Weight (g)		Condition (K)	
	MEAN	RANGE	MEAN	RANGE	MEAN	RANGE
C2	245	141-355	142	22-435	.84	.70-.97

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Packrat Date: 08/15/94
 IDFG Catalog Number: 09-0170 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 02.61';115 03.30'
 Section: 3 Township: 8N Range: 12E Elevation: 8656 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth: >20'
 Total Surface Area: 31 A
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 61 F

SPAWNING POTENTIAL: Several inlets into lake. Reproduction is likely. 75 mm C2 were observed in the lake.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman 3 Hours of Fishing 1
 Fish Caught: 6 Total Fish/hour 6

LENGTH FREQUENCY: Three anglers were observed fishing at the lake. They caught several fish in the 305 mm range. They reported catching fish up to 500 mm.

FISH CONDITION:

Total Length (mm)		Weight (g)		Condition (K)		
Species	Mean	Range	Mean	Range	Mean	Range
C2	305	75-450				

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Meadow Date: 08/12/94
 IDFG Catalog Number: 09-0171 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.37';115 04.57'
 Section: 5 Township: 8N Range: 12E Elevation: 8460 ft
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Meadow-bog Mean Depth: Shallow
 Total Surface Area: 5 A
 Comments: Shallow bog lake. Likely winter kills frequently.

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp:

SPAWNING POTENTIAL: Brook trout fry observed in inlet stream. Inlet is not connected to the lake except at high water.

HUMAN USE: Light

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net X

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
BK								1	

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
BK	385	385	600	600	1.05	1.05

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Three Date: 08/12/94
 IDFG Catalog Number: 09-0173 Drainage: South Fork Payette
 County: Boise GPS Coord: 44 03.10'; 115 04.51'
 Section: 5 Township: 8N Range: 12E Elevation: 8474 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth:
 Total Surface Area: 49 A
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp: 62 F

SPAWNING POTENTIAL: Lack of Cutthroat planted since 1990 with length frequency of netted fish indicate natural production is adequately supporting this fish population.

HUMAN USE: Light

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net____

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
BK			2		3	5	10		
C2			6	1	1	4	3	2	

FISH CONDITION:

Total Length (mm) Weight (g) Condition (K)

Species	Mean	Range	Mean	Range	Mean	Range
BK	271	117-340	204	16-305	.93	.76-1.14
C2	229	110-370	163	10-459	.88	.68-1.01

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1990	GR	600	
1989	C2	500	
1988	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Limber Date: 08/14/94
 IDFG Catalog Number: 09-0174 Drainage: South Fork Payette
 County: Boise GPS Coord:
 Section: 4 Township: 8N Range: 12E Elevation: 8700 FT
 Quad Map Name: Warbonnet Peak

PHYSICAL:

Lake Type: Cirque Mean Depth:
 Total Surface Area: 9 A
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp:

SPAWNING POTENTIAL: Inlet stream likely supports some natural production.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:_____ Total Fish/hour_____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net X

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
C2				3	8	4	1		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
C2	244	175-302	135	42-262	.86	.72-1.04

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1993	C2	500	
1991	C2	500	
1989	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Red Mnt #2 Date: 09/21/94
 IDFG Catalog Number: 09-0123 Drainage: South Fork Payette
 County: Boise GPS Coord: N44 15.23'W115 23.67'
 Section: 28 Township: 11N Range: 9E Elevation: 7800 FT
 Quad Map Name: Cache Creek

PHYSICAL:

Lake Type: Moraine Mean Depth: >3M
 Total Surface Area: 7.1
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH: 7.3
 Conductivity: 20 uS Surface Temp:

SPAWNING POTENTIAL: Available in outlet to lake below

HUMAN USE: Moderate to heavy this is first bigger lake. Lots of trails and campsites.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 3
 Fish Caught: 19 Total Fish/hour 6.3

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
W CT			2	2		2	5		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
W CUT	248.2	120-330	163.5	19-340	0.84	.74-.95

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	1500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Red Mnt #4
 IDFG Catalog Number: 09-0124
 County: Boise
 Section: 28 Township: 11N
 Quad Map Name: Cache Creek

Date: 09/22/94
 Drainage: South Fork Payette
 GPS Coord: N44 15.12'W115 23.98'
 Range: 9E Elevation: 8106 FT

PHYSICAL:

Lake Type: Cirque Mean Depth: >3M
 Total Surface Area: 4.3
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH: 7.6
 Conductivity: <10 uS Surface Temp:

SPAWNING POTENTIAL: available in inlet from lake above

HUMAN USE: Moderate several campsites

Fish Survey

ANGLING: No. of Fisherman____ Hours of Fishing____
 Fish Caught:____ Total Fish/hour____

LENGTH FREQUENCY: Collection Method: Angling____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
W CT				5		7			

FISH CONDITION:

Total Length (mm) Weight (g) Condition (K)

Species	Mean	Range	Mean	Range	Mean	Range
W CUT	235	170-290	119.5	43-200	0.82	.74-.89

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1991	C2	500	
1993	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Red Mnt #3
 IDFG Catalog Number: 09-0125
 County: Boise
 Section: 28 Township: 11N
 Quad Map Name: Cache Creek

Date: 09/20/94
 Drainage: South Fork Payette
 GPS Coord: N44 15.45'W115 24.03'
 Range: 9E Elevation: 8262 FT

PHYSICAL:

Lake Type: Cirque Mean Depth: >10m
 Total Surface Area: 4.3
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH: 7.1
 Conductivity: <10 uS Surface Temp:

SPAWNING POTENTIAL: No obvious.

HUMAN USE: Light one campsite trail around part of lake.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 1.5
 Fish Caught: 3 Total Fish/hour 20

LENGTH FREQUENCY: Collection Method: Angling Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
W CT				2	10	4			

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
W CUT	231.5	190-265	109	55-212	0.8	.7-.1.4

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	1500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Red Mnt #5 Date: 09/23/94
 IDFG Catalog Number: none Drainage: South Fork Payette
 County: Boise GPS Coord: N44 15.45'W115 24.03'
 Section: 28 Township: 11N Range: 9E Elevation: 7703 FT
 Quad Map Name: Cache Creek

PHYSICAL:

Lake Type: Moraine Mean Depth: <3 m
 Total Surface Area: 5.7
 Comments: Closest red mnt lake to main trail, most of lake extremely shallow

CHEMICAL:

Alkalinity: Hardness: PH:
 Conductivity: Surface Temp:

SPAWNING POTENTIAL: Outlet excellent spawning avail.

HUMAN USE: Heavy trail around lake and camps.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 1
 Fish Caught: 11 Total Fish/hour 11

LENGTH FREQUENCY: Collection Method: Angling X Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
W CT			1	4	7				

FISH CONDITION:

SPECIES	Total Length (mm)		Weight (g)		Condition (K)	
	MEAN	RANGE	MEAN	RANGE	MEAN	RANGE
n/a						

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
none			

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cat Creek # 1
 IDFG Catalog Number: 09-0129
 County: Boise
 Section: 28 Township: 11N
 Quad Map Name: Cache Creek

Date: 09/21/94
 Drainage: South Fork Payette
 GPS Coord: N44 15.72'W115 22.85'
 Range: 9E Elevation: 7678 FT

PHYSICAL:

Lake Type: Moraine Mean Depth: 4.8
 Total Surface Area: 5.7
 Comments: Lowest Cat Creek lake, trail goes to lake. Saw spotted frog

CHEMICAL:

Alkalinity: Hardness: PH: 7.4
 Conductivity: 20 µS Surface Temp:

SPAWNING POTENTIAL: several small gravel inlet and large outlet creek.

HUMAN USE: Heaviest use of all this group of lakes.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 2
 Fish Caught: 3 Total Fish/hour 1.5

LENGTH FREQUENCY: Collection Method: Angling Gill net Overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
RBT			2	1	1	2	1	1	
CT X RBT			4	5	3	4	4		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
RBT	234	125-350	148	14-385	0.88	.72-1.1
HYBRID	217	115-325	130	13-355	.91	.81-1.0

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1990	R4	1000	Increase

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cat Creek # 3
 IDFG Catalog Number : 09-0131
 County: Boise
 Section: 28 Township: 11N
 Quad Map Name: Cache Creek

Date: 09/21/94
 Drainage: South Fork Payette
 GPS Coord: N44 15.67'W115 23.37'
 Range: 9E: Elevation: 7900 ft

PHYSICAL:

Lake Type: Meadow/Beaver Mean Depth: 2
 Total Surface Area: 2.9
 Comments: Third lake up chain, skipped 2nd lake because very shallow

CHEMICAL:

Alkalinity: Hardness: PH: 7.5
 Conductivity: 10 Us Surface Temp:

SPAWNING POTENTIAL: Several small gravel inlet and large outlet creek

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman _____ Hours of Fishing _____
 Fish Caught: _____ Total Fish/hour _____

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
CT						8	4		

FISH CONDITION:

Total Length (mm) Weight (g) Condition (K)

Species	Mean	Range	Mean	Range	Mean	Range
CT	279	255-340	208	139-330	0.96	.82-1.5

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1990	C2	1000	
1992	C2	1000	
1994	C2	500	No evidence

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cat Creek # 6 Date: 09/20/94
 IDFG Catalog Number: 09-0133 Drainage: South Fork Payette
 County: Boise GPS Coord: N44 15.50'W115 23.62'
 Section: 28 Township: 11N Range: 9E Elevation: 7967 FT
 Quad Map Name: Cache Creek

PHYSICAL:

Lake Type: Moraine Mean Depth: 3.5
 Total Surface Area: 1.4
 Comments: Small lake, down about 4 - 5 ft

CHEMICAL:

Alkalinity: Hardness: PH: 7.2
 Conductivity: 10 Us Surface Temp:

SPAWNING POTENTIAL: no inlet some gravels in outlet creek.

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 1
 Fish Caught: 2 Total Fish/hour 2

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
CT			1		5	2			

FISH CONDITION:

Species	Mean	Range	Mean	Range	Mean	Range
C2	230	125-255	134	105-154	0.94	.84-1.0

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cat Creek # 5
 IDFG Catalog Number: 09-0133A
 County: Boise
 Section: 28 Township: 11N
 Quad Map Name Cache Creek

Date: 09/20/94
 Drainage: South Fork Payette
 GPS Coord: N44 15.78'W115 23.82'
 Range: 9E Elevation: 8008 FT

PHYSICAL:

Lake Type: Moraine Mean Depth: 5.0
 Total Surface Area: 2.9
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH: 7.2
 Conductivity: 10 Us Surface Temp:

SPAWNING POTENTIAL: none

HUMAN USE: Light, trail around lake.

Fish Survey

ANGLING: No. of Fisherman _____ Hours of Fishing 1.25
 Fish Caught: 28 Total Fish/hour 22.4

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
CT					16		2		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
CT	248	220-340	131	82-365	0.83	.71-.93

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	1500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cat Creek # 4 Date: 09/21/94
 IDFG Catalog Number: 09-0132 Drainage: South Fork Payette
 County: Boise GPS Coord: N44 15.92'W115 23.52'
 Section: 28 Township: 11N Range: 9E Elevation: 7886 FT
 Quad Map Name: Cache Creek

PHYSICAL:

Lake Type: Moraine Mean Depth: 8.0
 Total Surface Area: 4.3
 Comments:

CHEMICAL:

Alkalinity: Hardness: PH: 7.9
 Conductivity: 10 Us Surface Temp:

SPAWNING POTENTIAL: none

HUMAN USE: Light.

Fish Survey

ANGLING: No. of Fisherman _____ Hours of Fishing _____
 Fish Caught: _____ Total Fish/hour _____

LENGTH FREQUENCY: Collection Method: Angling _____ Gill; net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
CT				1	7	5			

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
CT	124	190-260	138	64-145	0.84	.75-.93

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
1992	C2	1500	

Appendix A. (continued) Mountain Lakes Survey Summary

Lake Name: Cache Creek West
 IDFG Catalog Number: none
 County: Valley
 Section: 20 Township: 11N
 Quad Map Name: Cache Creek

Date: 09/21/94
 Drainage: Bear Valley
 GPS Coord: N44 16.25'W115 24.47'
 Range: 9E Elevation: 7732 FT

PHYSICAL:

Lake Type: Moraine Mean Depth: > 6m
 Total Surface Area: 4.3
 Comments: Well connected to Cache creek

CHEMICAL:

Alkalinity: Hardness: PH: 7.7
 Conductivity: 30 Us Surface Temp:

SPAWNING POTENTIAL: Outlet and inlet spawning avail.

HUMAN USE: Light use.

Fish Survey

ANGLING: No. of Fisherman 2 Hours of Fishing 1.5
 Fish Caught: 30 Total Fish/hour 20

LENGTH FREQUENCY: Collection Method: Angling _____ Gill net overnight

Total Length In mm

SPP	0-49	50-99	100-149	150-199	200-249	250-299	300-349	350-399	>400
RBT			9	6	8	3	4		

FISH CONDITION:

Species	Total Length (mm)		Weight (g)		Condition (K)	
	Mean	Range	Mean	Range	Mean	Range
RBT	200	115-320	91	10-280	0.86	.66-.95

STOCKING HISTORY:

Year	Species	Number of Fish	Comments
none			

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

Job: b

Title: Lowland Lakes Investigations

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Gill nets and trap nets were set in Lucky Peak Reservoir in May, and gill nets were set in June to document species composition and relative abundance of the fish population. In May, game fish species contributed 18.23% of the total weight of netted fish, with bull trout *Salvelinus confluentus*, hatchery rainbow trout *Oncorhynchus mykiss*, smallmouth bass *Micropterus dolomieu*, splake *S. fontinalis* x *S. namaycush*, whitefish *Prosopium williamsoni*, and yellow perch *Perca flavescens* contributing 3.90%, 7.74%, 2.61%, 0.62%, 2.80%, and 0.56%, respectively. In June, game species contributed 6.4% of the total weight of netted fish, with bull trout, hatchery rainbow trout, splake, whitefish, and yellow perch contributing 0.22%, 3.43%, 0.08%, 2.23%, and 0.44%, respectively.

Floating and sinking gill nets, trap nets, and electrofishing were used to monitor fish populations in Lake Lowell in 1994. Electrofishing catch per hour was 5.24, 9.62, 2.62, 8.74, 95.33, and 20.99 fish/h for brown bullheads *Ameiurus nebulosus*, carp *Cyprinus carpio*, channel catfish *Ictalurus punctatus*, largemouth bass *M. salmoides*, largescale suckers *Catostomus macrochilus*, and smallmouth bass, respectively. Catch for trap nets was 0.2, 0.4, 0.2, and 0.2 fish per net night for black crappie *Pomoxis nigromaculatus*, bluegill *Lepomis macrochirus*, carp, and madtom catfish *Noturus gyrinus*, respectively. Catch for sinking gill nets was 6.25, 3.37, .12, 5.87, .25, .5, .12 fish per net night for carp, channel catfish, chiselmouth *Acrocheilus alutaceus*, largescale sucker, rainbow trout, northern pikeminnow *Ptychocheilus oregonensis*, and yellow perch, respectively. Catch for floating gill nets was 4.8, 2.0, 27.4, 0.2, and 0.2 fish per net night for carp, channel catfish, largescale sucker, smallmouth bass, and northern pikeminnow.

One hundred fifty-one largemouth bass and 279 bluegill were salvaged from Beach's Pond and transplanted to Lake Lowell.

Gill and trap nets were set in Shoofly, Little Blue Creek, and Bybee reservoirs to document the success of planting Lahontan cutthroat trout *O. clarki henshawi* in these reservoirs. A total of 102, 22, and 2 Lahontan cutthroat trout were collected from Shoofly, Little Blue Creek, and Bybee reservoirs, respectively. Length of netted Lahontan cutthroat trout ranged from 170 to 480 mm, 80 to 510 mm, and 230 to 510 mm in Shoofly, Little Blue Creek, and Bybee reservoirs, respectively.

Two mountain lake gill nets were set overnight in Bull Trout Lake to monitor the status of the fish population. Six Atlantic salmon *Salmo salar*, 86 brook trout and 2 bull trout were collected. Mean length, weight, and condition factor was 253 mm, 154 g, and 0.95; 190 mm, 68 g, and 0.96; and 344 mm, 404 g, and 0.98, respectively, for Atlantic salmon, brook trout, and bull trout.

An electrofishing survey was done on Paddock Reservoir on October 13, 1994 collecting 280 largemouth bass in 2,644 seconds of energized time for a rate of 381 largemouth bass/h. All largemouth bass captured were left ventral fin-clipped and transported to Lake Lowell.

A creel survey was conducted on Sagehen Reservoir from June 1 through October 2, 1994. Anglers fished 27,876 hours to catch 17,840 and harvest 12,026 rainbow trout. Seasonal catch and harvest rates were 0.64 and 0.43 rainbow trout/h, respectively. At least 55% of the hatchery rainbow trout planted in the lake were harvested.

Gill and trap nets were set overnight in Sagehen Reservoir the night of April 28, 1994. Fifty-eight wild and 26 hatchery rainbow trout were collected. Mean length of wild and hatchery trout collected was 288 and 296 mm, respectively. No other species were collected.

A creel survey was conducted on the Wilson Pond Complex immediately behind the Idaho Department of Fish and Game regional office in Nampa. Anglers fished 64,217 hours to catch 38,273 and harvest 14,357 fish. Annual harvest and catch rates were 0.22 and 0.60 fish/h, respectively. Of the total angling use, 88.2% occurred on waters where anglers were allowed to harvest fish. Of the total number of anglers interviewed, 74.9%, 6.6%, and 18.5% fished with bait, lures, and flies as terminal tackle.

Cove Arm off C.J. Strike Reservoir was gill net sampled on May 11, 1994. A total of 190 fish were collected, lengths and weights were taken, and means and standard error (SE) were calculated.

Mountain Home Reservoir was sampled with two gill nets and two trap nets on May 10, 1994. The reservoir was drained for irrigation water by the summer of 1994, and all fish were lost.

Gill nets and trap nets were set in Caldwell Ponds #1 and #2, Caldwell City Pond, Duff Lane, and Sawyers Pond to monitor fish populations. Catch-per-unit-effort for both numbers of fish collected and weight of fish collected per net night were calculated.

Indian Creek Reservoir was sampled May 10, 1994 to assess the success of restocking after the October 1992 rotenone renovation. Largemouth bass, bluegill, and brown bullhead adults had been stocked in the spring of 1993. Channel catfish were purchased from a commercial source and stocked in the fall of 1993.

Deadwood Reservoir was sampled with gill nets on July 8, 1994 and November 4, 1994. Mean length, weight, and SE were calculated for all species captured.

Crane Falls Lake was sampled with two gill nets on May 11, 1994 and electrofished on June 2, 1994. Mean length, weight, and SE were calculated for fish species captured.

Brownlee Reservoir was sampled with four pairs of experiment gill nets on April 19-21, 1994. Fish tissues were taken for methyl mercury contamination testing from channel catfish, smallmouth bass, large and small crappie, carp, and yellow perch. The State of Idaho Department of Health and Welfare issued a fish consumption guideline as a result of findings of methyl mercury levels greater than 0.5 parts per million in edible fillets of several species from the reservoir. Electrofishing trend surveys were conducted on June 8, 1994.

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LUCKY PEAK RESERVOIR

Methods

Floating and sinking gill nets and trap nets were set in May and floating and sinking gill nets were set in June 1994 to sample fish populations in Lucky Peak Reservoir. Nets were set in the early evening hours and collected the following day, beginning in the morning. In May, trap nets were fished for six net nights, floating gill nets for four net nights and sinking gill nets for four net nights. In June, floating gill nets were fished for two net nights, and sinking gill nets for four net nights. Four trawls were made during the night of June 6, 1994. Trawling was conducted between the dam and Spring Shores.

All fish collected were enumerated by species. Samples of fish collected were measured to the nearest mm and weighed to the nearest g.

Mean length, weight, condition factor (K), and their standard errors (SE) were calculated for all groups of fish for each net type. Catch-per-unit-effort (CPUE) was calculated for each net type for each sample time as the number of fish caught per net per night.

Results

Six hundred fifty-two and 811 fish were collected in May and June nettings, respectively. Mean length, weight, condition factor, SE of netted fish, numbers of fish collected, and CPUE by net type is shown for May and June sampling in Tables 1 and 2, respectively.

Rainbow trout *Oncorhynchus mykiss*, bull trout *Salvelinus confluentus*, and smallmouth bass *Micropterus dolomieu* were in good condition with condition factors greater than 1.00 (Tables 1 and 2). Whitefish *Prosopium williamsoni* and splake *Salvelinus fontinalis* x *S. namaycush* were in poor condition with condition factors generally less than 0.90.

Smallmouth bass were notably absent from the June sample. Kokanee *O. nerka kennerlyi*, also known to be present in the reservoir, were absent from both May and June samples.

Only 18.23% and 6.4% of the weight of netted fish was game species for May and June samples, respectively. Bull trout, hatchery rainbow, smallmouth bass, splake, whitefish, and yellow perch *Perca flavescens* made up 3.90%, 8.74%, 2.61%, 0.62%, 2.8%, and 0.56% by weight (Table 3), respectively, of the May sample, and 0.22%, 3.43%, 0%, 0.8%, 2.23%, and 0.44% by weight (Table 3), respectively, of the June sample. Bridgelip suckers *Catostomus columbianus*, chiselmouth *Acrocheilus alutaceus*, largescale suckers *C. macrocheilus*, and northern pikeminnow *Ptychocheilus oregonensis* made up 80.99% and 92.56% by weight of the fish in the May and June samples, respectively.

Trawling captured a total of two kokanee. Lengths of captured kokanee were 250 and 430 mm.

Numbers of fish planted in Lucky Peak Reservoir from 1991-1994 are given in Table 4. Despite large numbers of trout planted in the reservoir, trout make up a small percentage of the biomass in the reservoir.

Recommendations

1. Investigate introduction of a large coldwater predator into the lake (e.g., lake trout *S. namaycush*). The objective of this introduction would be to reduce the percentage of biomass of nongame species.
2. Conduct a creel survey to estimate angler catch of planted and naturally-produced game species and to estimate angler use.

LAKE LOWELL

Methods

Gill nets, trap nets, and electrofishing were used to monitor fish populations in Lake Lowell during 1994. Standard IDFG experimental floating and sinking gill nets and trap nets were used to monitor fish populations. A boom-mounted electrofishing boat was used for electrofishing. Gill nets and trap nets were set at dusk and retrieved the following morning.

Floating gill nets were fished a total of five net nights (nights of May 30 and 31). Sinking gill nets were fished eight net nights (nights of May 30 and 31). Trap nets were fished a total of five net nights. Four separate stations were electrofished on June 1 beginning at 10:00 p.m. Additional electrofishing occurred on November 11.

Results

Table 5 reports mean length, weight, SE, and number collected for all fish caught by gillnetting, trap netting, and electrofishing in June. (Not all fish collected were weighed and measured.) During electrofishing on November 11, only bass were netted. Electrofishing occurred between 1:30 and 3:00 p.m. During 3,386 seconds of electrofishing, 33 largemouth bass *M. salmoides* were collected. No smallmouth bass were netted. Many of the larger bass were noted to have bird strike wounds. Largemouth bass electrofishing catch/h was 35.1.

Largemouth bass and bluegill *Lepomis macrochirus* were salvaged from Beach's Pond during reconstruction efforts on the pond. One hundred fifty-one largemouth bass and 279 bluegill were transferred to Lake Lowell from Beach's Pond. Mean length (SE), weight (SE), and condition

factor of transferred largemouth bass were 217 mm (6), 170 g (42), and 1.4 (.03), respectively. Mean length (SE), weight (SE), and condition factor (SE) of transferred bluegill were 124 mm (2), 56 g (4), and 2.2 (.03), respectively.

Discussion

Fish population sample information indicates the fish populations in Lake Lowell are maintaining themselves at extremely depressed levels. Crappie, bluegill, and bullhead populations currently are almost non-existent, where prior to 1991 they contributed significantly to angler harvest.

Lack of recruitment seems to be the most important factor limiting fish population size. Spawning is successful, at least for bass, as evidenced by small bass in samples during the summer and fall. These small bass and other fish, however, do not seem to be surviving to older ages.

Recommendations

1. Monitor Lake Lowell water quality parameters to determine if obvious water quality problems exist.
2. Continue to transplant limited numbers of bass, bluegill, white crappie *Pomoxis annularis*, and black crappie *P. nigromaculatus* into Lake Lowell to attempt to reestablish populations of these species.

RIDDLE LAKES

Methods

One floating and one sinking gill net and two trap nets were set overnight in Shoofly, Bybee, and Little Blue Creek reservoirs from May 26 to 28, 1994. Gill nets were standard IDFG experimental nets. Trap nets were standard IDFG design. Nets were set in the late afternoon and retrieved the following morning.

All fish caught were enumerated by sample gear type. All fish caught were measured to the nearest mm. Samples of all fish species collected were weighed to the nearest gram, except that fish smaller than 100 mm were not weighed.

Results

Table 6 shows mean length, weight, condition factors, SE, number collected, and CPUE by gear type and lake for all fish collected.

The difference in mean condition factor of Lahontan cutthroat trout *O. clarki henshawi* between Little Blue Creek Reservoir and Shoofly Reservoir is significant ($\alpha=.05$). This difference is likely due to the absence of suitable forage in Shoofly Reservoir. Lahontan cutthroat trout in Little Blue Creek Reservoir appear to be utilizing mountain suckers *C. platyrhynchus* and reaside shiners *Richardsonius balteatus* for food.

Survival of Lahontan cutthroat trout in Bybee Reservoir is poor.

Discussion

Planting fingerling Lahontan cutthroat trout in reservoirs in the Riddle area has been successful in creating fishable populations of Lahontan cutthroat. Lahontan cutthroat trout have increased angling diversity by adding this species to those previously found in Idaho.

Planting success in the Riddle lakes has been variable. Survival in some lakes has been good and poor in others. Likely success is directly related to irrigation practices. In those lakes where adequate water remains after the irrigation season, Lahontan cutthroat trout are able to successfully overwinter.

Currently, angler use is light in these lakes. Angler harvest does not appear to be limiting size of fish at this time.

Recommendations

1. Sample all reservoirs planted with Lahontan cutthroat in 1995. Continue stocking lakes where survival is demonstrated. Discontinue stocking those lakes where fish do not survive.
2. Advertise the existence of these lakes. Encourage anglers to participate in Lahontan cutthroat fishing.

BULL TROUT LAKE

Methods

Mountain lake gill nets were set overnight in Bull Trout Lake to monitor the status of the trout population. All fish netted were measured to the nearest mm and weighed to the nearest g.

Results

Six Atlantic salmon *Salmo salar*, 86 brook trout *S. fontinalis*, and two bull trout were collected from gill nets. Mean length, weight, and condition factor of Atlantic salmon, brook trout, and bull trout were 253 mm, 154 g, and .95; 190 mm, 68 g, and .96; and 344 mm, 404 g, and .98, respectively.

Planting information for Bull Trout Lake is included in Table 7.

There is no evidence that rainbow trout or Arctic grayling *Thymallus arcticus* have survived or are reproducing.

Both bull trout collected had bent dorsal fin rays, indicating they were from the October 1992 plant. At the time of planting, these fish were approximately 200 mm. In essentially one growing season, the two bull trout collected averaged 343 mm. Growth of bull trout (based on two fish) appears to be excellent.

Atlantic salmon were planted in 1990 and 1994. Origin of the Atlantic salmon collected is unknown. Lengths of collected Atlantic salmon ranged from 187 mm to 309 mm. Hatchery personnel indicate planted fish ranged from 100 to 350 mm. All Atlantic salmon may have been from the 1994 plant. If so, survival of the 1990 plant was poor. If some of the collected fish were from the 1990 plant, growth was poor. In either case, Atlantic salmon do not appear to be growing and feeding on brook trout enough to accomplish their intended objective of reducing the density and increasing the average size of brook trout.

Average size of 86 brook trout collected was less than 190 mm. Generally, brook trout are too small to be desired by anglers.

Recommendations

1. Stock coldwater predator species annually. Investigate the availability of fall chinook salmon *O. tshawytscha* and bull trout for use as predators. Discontinue use of Atlantic salmon.

2. Plant westslope cutthroat trout to provide a desirable size fish in the fishery.
3. Gill net Bull Trout Lake in 1996-1997. If no trout greater than 500 mm can be found, eliminate trophy fish regulations.

PADDOCK VALLEY RESERVOIR

Methods

Paddock Valley Reservoir was electrofished October 13 to determine species composition and relative abundance of fish in the population.

The electrofishing raft with boom-mounted positive electrodes was used for electrofishing. A Coffelt VVP-15 set at 350 volts, 7-9 amps, 30% pulse width, and 40-60 pulses per second was used to convert AC current from a 5,000 watt Honda generator. The raft was powered by an electric trolling motor.

Electrofishing occurred from 7:30 to 11:00 p.m. Electrode activation time was 2,644 seconds. Electrofishing occurred along both sides of the reservoir between the lower boat ramp and the dam. Attempts were made to collect all fish shocked.

Water temperature was 54°F. Weather was clear and calm. Lake level was very low, however water was still on the boat ramp. Algae on the water surface gave the lake a pea green soup appearance. The electrofishing crew consisted of one person operating the raft and one netter.

Scales were collected and weights were taken from the first 23 largemouth bass collected. The first 73 largemouth bass collected were measured to the nearest mm. All largemouth bass collected were left ventral fin-clipped and placed in a live car until the completion of electrofishing when they were transported and released in Lake Lowell.

Results

A total of 280 largemouth bass were collected in 2,644 seconds of electrofishing for a catch rate of 381 largemouth bass/h.

Mean length of 73 largemouth bass collected was 208 mm (SE=2.83).

Mean weight of 23 largemouth bass was 133 g (SE=9.37). Mean condition factor was 1.34 (SE=.015).

Twenty-three scales were examined to determine age. Average length of 11 age 1 and 12 age 2 largemouth bass was 208 and 249 mm, respectively.

The only other species of fish observed during the survey was 1 young-of-the-year (YOY) crappie found floating in the live car after electrofishing. This crappie had obviously been regurgitated by a bass collected during electrofishing.

SAGEHEN RESERVOIR

Methods

Creel Survey

A creel survey was conducted on Sagehen Reservoir (T12N, R2E, S35) from June 1 through October 2, 1994. The majority of angler counts and fishermen interviews were conducted by IDFG reservists.

Angler counts and interviews were made on three randomly-selected weekdays and three randomly-selected weekend days per month from June through September. (For purposes of this survey, October 1 and 2 were considered part of September.) Two angler counts were made on each sample day. Angler count times were determined by randomly selecting a starting time for the first angler count within the first half of the angler day. The second angler count time was made one-half of the angler day after the first count. The length of the angler day was generally defined as from one-half hour before sunrise to one-half hour after sunset. Angler interviews were conducted before, between, and after angler counts.

Netting

One standard experimental floating and one sinking gill net and two trap nets were set overnight in Sagehen Reservoir the night of April 28, 1994. All fish netted were identified as to species and wild or hatchery origin, measured to the nearest mm and weighed to the nearest g.

Water Chemistry

Standard water chemistry parameters were measured on April 19, 1994.

Results

Creel Survey

Anglers fished 27,876 hours (SE=4,004) on Sagehen Reservoir from June 1 through October 2, 1994. Boat, bank, and float tube anglers accounted for 9,218 (SE=2,128), 16,060 (SE=2,347), and 2,598 (SE=486) hours, respectively.

Anglers reported catching an estimated 17,868 rainbow trout and harvesting 12,026 rainbow trout. Estimated season catch and creel rates were .64 and .43 rainbow trout/h, respectively.

Of the estimated 12,026 rainbow trout harvested, 1,774 were estimated to be of wild origin, 6,665 were hatchery catchables planted in 1994 and left-pelvic marked prior to planting, 3,105 were unmarked hatchery rainbow catchables, and 482 were not identified as to origin.

Return of 1994 hatchery catchables was at least 55.5%. Some of the unmarked hatchery catchables and the unidentified rainbows were likely 1994 hatchery catchables. These harvested catchables would have increased the return rate estimate for hatchery catchables had they been identified as left pelvic-clipped fish.

On some sample days, harvested trout were measured. A total of 106 rainbow were measured, of which 43 were marked hatchery trout and 29 were wild rainbow trout. Mean length and SE of marked hatchery, unmarked hatchery, and wild rainbow was 266 and 3.27, 315 and 4.92, and 325, and 6.99 mm, respectively.

Monthly estimates of angler use, catch and creel rates, and harvest are included in Table 8.

Of 627 anglers contacted, 98.1% were residents of Idaho. Anglers fishing with bait, lures, and flies represented 87%, 8%, and 5% of the anglers, respectively. Of the angler parties contacted, 52% reported catching no fish, 10% reported catching one fish, 9% reported catching two fish, 7% reported catching three fish, 5% reported catching four fish, 2% reported catching five fish, and 15% reported catching six or more fish.

Netting

Rainbow trout were the only species of fish sampled in nets. Fifty-eight wild and 26 hatchery rainbow trout were netted. Mean length, weight, condition factor, SE, number collected, and CPUE by net type and origin are given in Table 9.

Water Chemistry

Methyl orange alkalinity was 12 mg/l CaCO₃, hardness was 20 mg/l CaCO₃, pH was 7.5, and water temperature was 7°C at 2:00 p.m.

Discussion

Creel Survey

Harvest of wild rainbow is greatly reduced in July and August presumably due to warm water temperatures. Low lake levels in September due to irrigation withdrawal and cooling water temperatures greatly increases wild trout vulnerability to harvest.

Recommendations

1. Determine hatchery/wild composition of rainbow trout in Sagehen Reservoir tributaries.
2. Monitor hatchery/wild composition of the trout population in the reservoir every three years to ensure wild trout are not overexploited.
3. Explore the need and benefits of establishing a rainbow trout spawn-taking operation at Sagehen Reservoir.

WILSON SPRINGS

Introduction

A creel survey was conducted on the Wilson Pond complex located immediately south of the Idaho Department of Fish and Game regional office in Nampa. The survey was conducted from July 1, 1993 through June 30, 1994. Objectives of the survey were to estimate angler use, catch and harvest rates, and harvest.

The Wilson Pond complex is composed of the North Pond, South Pond, Catch-and-Release Pond, Wilson Drain, and Beach's Pond. The North, South, and Catch-and-Release ponds were opened to fishing beginning June 1992. The North and South ponds are connected by a culvert, and fish move freely between these ponds. Fish movement between other ponds is prevented by screens. Wilson Drain has been open to fishing several years. Beach's Pond was constructed, planted with largemouth bass and bluegill, and opened to fishing in 1993; however,

few anglers used the pond until the spring of 1994. Fishing regulations restrict angler harvest to a total of two trout/day from the North or South ponds or Wilson Drain. Anglers are required to release all fish caught in the Catch-and-Release and Beach's ponds.

Rainbow trout, brown trout, and lake trout have been stocked in the North, South, and Catch-and-Release ponds and Wilson Drain. Largemouth bass and bluegill have been stocked in Beach's Pond.

Methods

Instantaneous angler counts were used to estimate fishing hours. Fishing counts were stratified by month and day type (weekend/holiday and weekday). Three weekend days and three weekdays per month were randomly selected to sample fishing hours. Three fishermen counts were made on sample days. Fisherman count times were determined by dividing the fisherman day length by three. The first fisherman count time was randomly selected from the first one-third of the fisherman day. One hour was allotted for each count. Count times for the second and third fisherman counts were systematically scheduled one-third and two-thirds of the fisherman day after the first count.

Fishing hours estimates (and standard errors) were calculated for weekend and weekdays. Weekend and weekday estimates for each month were summed to estimate monthly fishing hours. Monthly estimates were summed to produce yearly fishing hour estimates. All fishing hour estimates were made using *The Creel Census System* (McArthur 1992).

Following fishermen counts, anglers were interviewed to determine angling characteristics. Information was collected on the length of time spent fishing, fishing method (flies, lures, bait), and number of fish kept and released by species.

Fish kept, fish released, and total fish caught/h estimates were calculated separately for weekend/holidays and weekdays. Fish kept, fish released and total fish caught/h were calculated for all species combined. Kept and release rates were calculated for rainbow trout, brown trout, lake trout, cutthroat trout, largemouth bass, and bluegill. Kept, released, and total caught/h for weekend/holiday and weekdays were calculated using *The Creel Census System* (McArthur 1992).

Harvest estimates were calculated for weekend/holiday and weekday strata by multiplying fishing hours by fish kept/h estimates. Monthly totals were calculated by summing weekend/holiday and weekday estimates. Annual harvest estimates were calculated by summing monthly estimates. *The Creel Census System* (McArthur 1992) performed harvest estimate calculations.

Monthly and annual fish kept and fish caught/h estimates calculated were by dividing monthly or annual harvest by monthly or annual fishing hours, respectively.

Separate fishing hours, catch per effort, and harvest estimates were calculated for each pond and Wilson Drain.

IDFG Reservists conducted a majority of the angler counts and interviews.

Results

Total hours fished for all waters was 64,217 hours (SE=2,868). Total harvest and total catch from the Wilson Pond complex was 14,357 (SE=1,044) and 38,273 (SE=2,657) fish, respectively. Annual harvest/h and catch/h was 0.22 and 0.60 fish/h, respectively.

Angler use on waters where regulations allowed anglers to harvest fish was 87.8% of the total angler use on the Wilson Pond Complex. Angler use on catch-and-release waters was 12.2% of total angler use.

The total number of anglers interviewed during the survey was 2,965. Of the total number contacted, 74.9% fished with bait, 6.6% fished with lures, and 18.5% fished with flies.

The average length of time spent fishing per angler trip was 1.63 hours. Total angler trips were 39,397.

Fishing hours, harvest, and catch per effort on individual waters are discussed below.

North Pond

Anglers fished 29,200 (SE=4,594) hours in the North Pond (Table 10). Total catch and harvest from the North Pond was estimated to be 17,204 (SE=1,546) and 8,397 (SE=817) fish, respectively. Annual fish harvest and catch rates were 0.29 and 0.59 fish/h, respectively. Monthly estimates of fishing hours, harvest, and catch per effort are also given in Table 10. Harvest was composed of 91.4% rainbow trout, 3.6% brown trout, 2.3% lake trout, 0.6% cutthroat trout, and 2.1% unidentified species.

South Pond

Anglers fished 22,599 hours (SE=2,922) in the South Pond (Table 11). Total catch and harvest was estimated to be 10,508 (SE=1,580) and 4,356 (SE=532) fish, respectively. Monthly use, catch and harvest estimates are given in Table 11. Harvest was composed of 89.0% rainbow trout, 4.0% brown trout, 2.8% lake trout, 0.2% cutthroat trout, and 4.0% unidentified species.

Catch-and-Release Pond

Anglers fished a total of 7,056 hours (SE=1,240) in the Catch-and-Release Pond (Table 12). Estimated total catch was 6,189 fish (SE=1,153). Average annual catch per effort was 0.88 fish/h. Catch was reported to be primarily rainbow trout.

Beach's Pond

Anglers fished a total of 747 hours (SE=224) in Beach's Pond (Table 13). Catch was estimated to be 461 fish (Table 15). Average annual catch per hour was 0.62 fish/h. Monthly use, catch rate, and catch estimates are given in Table 13. Catch was primarily bluegill.

Wilson Drain

Anglers fished a total of 4,615 hours (SE=1,235) in Wilson Drain (Table 14). Total catch and harvest was estimated to be 3,911 (SE=889) and 1,566 (SE=370) fish. Average annual harvest and catch rates were estimated to be 0.34 and 0.85 fish/h, respectively. Harvest was 90.5% rainbow trout, 6.9% brown trout, 0.5% lake trout, and 2.1% cutthroat trout.

Exploitation of Planted Trout

A total of 12,747 rainbow trout catchables (4.0 to 0.4 fish/lb) were planted in the North and South ponds. Of these, 11,555 were estimated to have been harvested (Tables 10 and 11) for an exploitation rate of 90.6%.

A total of 4,722 rainbow trout catchables (4.0-2.0 fish/lb) were released in Wilson Drain during this creel survey. Rainbow trout harvest was estimated to be 3,911 for an exploitation rate estimate of 82.8%.

Two plants of brown trout were made in Wilson Drain, 9,800 at 140 fish/lb and 2,256 at 22.6 fish/lb. These fish were small and generally would not be expected to return to the creel during the time this creel survey was conducted. Estimation of exploitation rates of these fish during this survey is not meaningful.

Lake trout were planted in Wilson Ponds in October 1992. Even with high angling pressure, some of these fish survived and returned to the creel long after they were planted.

No cutthroat trout were planted in Wilson Ponds or Wilson Drain during this creel survey. Fish harvested that were identified as cutthroat trout were likely part of the rainbow trout

catchables releases. Adding cutthroat trout to the rainbow trout harvest increases exploitation rates of rainbow catchables to 91.1% in the North and South ponds and 83% in Wilson Drain.

Recommendation

Continue managing ponds with existing harvest regulations.

COVE ARM

Methods

Cove Arm off C.J. Strike Reservoir was sampled on May 11, 1994 with one floating and one sinking 47.5 m experimental gill net set overnight. Fish were collected the following morning, and all individuals measured for total length and weight.

Results

A total of 190 fish were captured with the set of two gill nets. The mean lengths, weights, conditions, SE, and CPUE are shown in Table 15.

MOUNTAIN HOME RESERVOIR

Methods

The reservoir was sampled with one floating and one sinking 47.5 m experimental gill net and two trap nets on May 10, 1994. The reservoir was approximately 50% full.

Results

Two trap nets captured 69 bluegill, with only one bluegill of adult size (198 mm). The combined set of one floating and one sinking gill net captured 33 largemouth bass; 2 fish were adults and the rest were age 1+. Twenty hatchery rainbow trout were captured and were in excellent condition. Mean length, weight, condition, number captured, and CPUE of fish species captured is shown in Tables 16 and 17. The reservoir was completely drained in late summer 1994, and all fish species were destroyed.

Recommendations

1. Stock with fingerling and catchable rainbow trout only; the history of draining does not allow warmwater fish necessary time to establish a fishery.
2. Work with irrigation district on a minimum pool to overwinter fish, then restock with warmwater species.

SMALL POND SURVEYS

Methods

Gill nets and trap nets were set in Caldwell Ponds #1 and #2, Caldwell City Pond, Duff Lane Pond, and Sawyers Pond to monitor fish populations. Table 18 shows the number of nets by type set in each water. All fish collected were measured to the nearest mm. Samples of fish collected were weighed to the nearest g. Catch-per-unit-effort (number or weight of fish collected per net per night) for both numbers of fish collected and weight of fish collected per net per night was calculated.

Results

Table 19 shows mean length, weight, and condition factor, standard errors, catch-per-unit-effort for numbers (CPUE#) and catch-per-unit-effort for weight (CPUEWT) of fish collected by water by net type.

Total numbers and weight of fish collected in all waters was low. Total weight of fish caught per night for floating gill nets was 803 g, 4,684 g, 530 g, 2,134 g, and 4,228 g, respectively, for Caldwell #1, Caldwell #2, Caldwell City, Duff Lane, and Sawyers ponds. For comparison, the total weight of fish caught per night for floating gill nets in Lucky Peak Reservoir in May and June 1994 and Lake Lowell 1994 was 12,618 g, 27,675 g, and 27,115 g, respectively.

Total weight of fish caught per night for sinking gill nets for Caldwell #2, Duff Lane, and Sawyers ponds was 2,533 g, 1,565 g, and 2,144 g, respectively. Again for perspective, Lucky Peak in May and June, and Lake Lowell 1994, total weight caught per night of sinking gill nets was 35,742 g, 43,183 g, and 16,847 g, respectively.

Total weight of fish caught per night for trap nets was also low. Total weight of fish caught per night for trap nets for Caldwell #1, Caldwell #2, Caldwell City, Duff Lane, and Sawyers ponds was 1,421 g, 178 g, 60 g, 453 g, and 969 g, respectively. These catches were similar to Lucky Peak in May and Lake Lowell 1994, which were 559 g and 347 g per trap net night, respectively.

Water chemistry measurements are reported in Table 20.

INDIAN CREEK RESERVOIR

Methods

One sinking and one floating 47.5 m experimental gill nets were set overnight off of the west shore of the reservoir. Two trap nets were also set overnight along the west shore.

Results

Only three fish were captured in the two gill nets; a channel catfish, 340 mm, 450 g; a largemouth bass, 142 mm, 38 g; and a brown bullhead, 295 mm, 640 g. The two traps captured a combined catch of five largemouth bass, one adult largemouth bass, and four age 1+ largemouth bass, ranging in size from 123 to 355 mm (mean length 175.8), and weighing between 30 to 670 g (mean weight of 163.6). Seven adult bluegill were captured with a length range of 190 to 213 mm (mean length of 197.8 mm) and a weight range of 205 to 292 g (mean weight of 246 g).

The reservoir did not fill in 1993 or 1994. Water elevations have steadily declined since summer of 1993. Review of the drainage did not identify any new reservoirs upstream of Indian Creek Reservoir that would explain the poor spring inflows.

Recommendation

1. Survey the reservoir with electrofishing only when water elevations permit.

DEADWOOD RESERVOIR

Methods

Deadwood Reservoir was sampled twice in 1994. On July 8, 1994, two floating and two sinking experimental nets were set. Also, three vertical gill nets were set overnight. The vertical gill nets floated on the surface and went to the bottom, and were of a single mesh diameter of 1-inch (2), or 3/4-inch (1) bar mesh. Early run kokanee were trapped in the late summer for an egg take operation conducted by the IDFG Nampa Fish Hatchery. On November 4, 1994, two sinking and two floating experimental gill nets were set overnight on the reservoir.

Results

Only two kokanee were captured in one of the 1-inch mesh vertical gill nets. The kokanee were 210 mm and 70 g at 17 ft depth and 190 mm and 50 g at 30 ft depth.

Catch statistics of the July 8, 1994 experimental gillnetting are presented in Table 21.

Catch statistics of the November 4, 1994 gill net survey are presented in Table 22.

The egg take weir was closed on the Deadwood River on August 10, 1994 by the Nampa Fish Hatchery crew. No weirs were installed on any other tributaries to the reservoir, as had been the practice the last few years. The first kokanee were trapped on August 12, 1994 and continued until September 10, 1994 when the trap was removed. An egg yield of 1,134,716 eggs was taken from 3,895 females for a fecundity of 291 eggs per female. Female average total length was 249.7 mm and males averaged 256.7 mm. Average spawner length increased approximately 20 mm from 1993; fecundity also increased from 1993. Average size of spawning kokanee in 1995 should be close to 300 mm.

CRANE FALLS LAKE

Methods

Crane Falls was sampled with one sinking and one floating experimental gill net on May 11, 1994. Electrofishing was done on the evening of June 2, 1994. A total energized field time of 2,386 seconds was used to collect fish. All fish were measured and weighed.

Results

Tables 23 and 24 contain statistics on fish species sampled in Crane Falls Lake.

BROWNLEE RESERVOIR

Methods

Brownlee Reservoir was sampled with four sets of one floating and one sinking gill net on April 19-21, 1994. This sampling was done to capture several fish species of differing sizes to be tested for methyl mercury contamination. The Idaho Department of Health and Welfare tested

rainbow trout, channel catfish, smallmouth bass, crappie, and carp for contamination. Total lengths were collected on all fish captured.

Electrofishing trend surveys were done at three locations: Sturgill Creek, Bay across from Powder River mouth, and Robinette Creek on the night of June 8, 1994. This date was one month later than electrofishing surveys were normally conducted.

Results

Fish tissue testing resulted in the State of Idaho releasing a fish consumption guide for people eating fish from Brownlee Reservoir. About 30% of the fish tested had levels greater than 0.5 parts per million, which is the State of Idaho's level of concern for health reasons. No fish tested had levels greater than 1.0 part per million. Consumption guidelines were placed into two risk groups: non-high risk and high risk (pregnant women, women planning a pregnancy and children under age 7), primarily because of the developing nervous system of young children and the fetus. Consumption guidelines are presented in Table 25.

Mean fish lengths, weights, SE, total catch, and CPUE from the April gill net sampling are presented in Table 26. Mean fish lengths, weights, SE, total catch, and CPUE for the electrofishing sampling are presented in Table 27.

LITERATURE CITED

McArthur, T.J. 1992. Statewide Angler Opinion and Harvest Estimates. Creel Census System. Job Completion Report. Project No. F-71-R-14, Subproject 1, Study 1. Idaho Department of Fish and Game, Boise.

TABLES

Table 1. Mean length, weight, condition factor, SE, total catch, and CPUE for fish caught in gill nets and trap nets in Lucky Peak Reservoir, May 4, 1994

Gear type	Species ^a	Mean Length	SE	Number	Mean weight	SE	Number	Condition Factor	SE	Total collected	CPUE ^b
Trap net	BLS									2	.33
	CZM	262		1	160		1	0.89		2	.33
	LSS	264		1	180		1	0.98		1	.33
	RSS	113	1.9	49	18.4	2.8	17	1.02	.06	52	8.67
	NPM									1	.17
	YP	175	14.4	11	105	15.6	6	1.3	.04	11	1.83
Sinking gill nets	BLS	354	12.2	8	455	42.0	8	1.02	.07	8	4.00
	CZM	280	3.0	31	217	7.9	31	0.98	.02	58	14.5
	HRB	276	11.1	17	235	26.0	17	1.06	.02	17	4.25
	LSS	372	8.2	25	516	38.1	25	0.97	.02	103	25.75
	RSS	151	2.2	13	42	3.9	7	1.21	.18	13	3.25
	SMB	332	13.5	13	575	77.0	13	1.46	.04	13	3.25
	SPL	280	9.1	8	166	14	8	0.75	.02	8	2.00
	NPM	322	7.5	77	375	44.7	77	0.93	.01	152	38.00
	WF	280	11.6	28	214	21.4	28	0.87	.01	28	7.00
	WRB	337		1	410		1	1.07		2	0.50
	YP	183		1	73		1	1.19		1	0.25
Floating gill nets	BLS									3	0.75
	BLT	607	10.9	3	2,783	28	3	1.23	.06	3	0.75
	CZM	266	5.1	23	188	10.7	23	1.01	.01		16.75
	HRB	318	7.8	38	340	18.3	37	1.03	.02	37	9.25
	LSS	319	27.8	3	345	84.3	3	1.02	.02	38	9.50
	RSS									3	0.75
	SMB	407	9.2	8	1051	92	7	1.49	.08	8	2.00
	NPM	305	4.5	23	266	12.3	23	0.93	.01	23	0.75

^a Species: BLT=bull trout, BLS=bridgeline sucker, CZM=chiselmouth, HRB=hatchery rainbow trout, LSS=largemouth sucker, RSS=redside shiner, SMB=smallmouth bass, SPL=splake, NPM=northern pikeminnow, WF=whitefish, WRB=wild rainbow trout, YP=yellow perch.

^b CPUE: catch-per-unit-effort=number of fish caught per net per night.

Table 2. Mean length, weight, condition factor, SE, total catch, and CPUE for fish caught in gill nets in Lucky Peak Reservoir, June 13, 1994

Gear type	Species ^a	Mean Length	SE	Number	Mean weight	SE	Number	Condition Factor	SE	Total collected	CPUE ^b
Sinking gill nets	BLS	290	1.9	27	35.8	1.8	21	1.20	.05	36	9.00
	BLT	373		1	528		1	1.02		1	.25
	CZM	225	6.8	64	150	14.3	52	1.12	.04	74	18.50
	HRB	310	15.4	16	329	35.9	13	1.13	.05	16	4.00
	LSS	339	6.0	97	417	33.4	59	1.03	.03	160	40.00
	RSS	144	1.9	27	35.8	1.8	21	1.2	.05	36	9.00
	NPM	300	3.7	185	292	28.9	106	.93	.01	275	68.75
	UTC	345		1	514		1	1.25		1	.25
	WF	301	8.0	19	248	21.1	5	.90	.04	19	4.75
	YP	220	8.4	3	149	26.7	3	1.36	.09	3	.75
Floating gill net	BLS	151								11	5.5
	CZM	288	4.2	14	270	10.4	14	1.12	.03	41	20.5
	HRB	334	12.7	9	300	152	2	.85	.01	9	4.5
	LSS	358	43.1	5	490	153	5	.95	.04	15	7.5
	RSS	143	10.0	2	42	2	2	1.46	.24	4	2.00
	NPM	315	8.8	21	315	28.8	21	.95	.01	104	52.00
	SPL	272		1	180		1	.89		1	.50
	UTC	289		1						1	.50
YP	221	8.7	4						4	2.00	

^a Species: BLT=bull trout, BLS=bridgelip sucker, CZM=chiselmouth, HRB=hatchery rainbow trout, LSS=largescale sucker, RSS=redside shiner, SPL=splake, NPM=northern pikeminnow, UTC=Utah chub:

WF=whitefish, YP=yellow perch.

^b CPUE: Catch-per-unit-effort=number of fish caught per net per night.

Table 3. Species composition percent of total number of weight by species in Lucky Peak Reservoir, May and June 1994.

a Species	May Number Collected	May Number % of total	May Mean Weight	May Weight % of total	June Number Collected	June Number % of total	June Mean Weight	June Weight % of total
BLS	13	1.99	455	8.42	47	5.80	278	5.51
BLT	3	.46	2,783	3.9	1	.12	528	.22
CZM	127	19.48	201	11.92	115	14.18	175	8.49
HRB	54	8.28	307	7.74	25	3.08	325	3.43
LSS	142	21.78	481	31.89	175	21.58	423	31.23
RSS	68	10.43	25	.79	40	4.93	36	.61
SMB	21	3.22	742	2.61	0			
SPL	8	1.23	166	.62	1	.12	180	.08
NPM	176	26.99	350	28.76	379	46.73	296	47.33
UTC	0				2	.25	514	.43
WF	28	4.29	214	2.8	19	2.34	278	2.23
YP	12	1.84	100	.56	7	.86	149	0.44

a Species BLS=bridgripsucker, BLT=bulltrout, CZM=Chiselmouth, HRB=hatchery rainbow trout, LSS=largescale sucker, RSS=redside shiner, SMB=Smallmouth bass, SPL=splake, NPM=northern pikeminnow, UTL=Utah chub, WF=mountain whitefish, YP=yellow perch

Table 4. Stocking Summary for Lucky Peak Reservoir, 1991-1994.

Year	Species	Number Planted	Pounds Planted	Number per pound
1991	Kokanee	211,300	1,130	187
	Rainbow	410,830	25,585	16
1992	Bull trout	5,990	500	12
	Kokanee			
	Rainbow	318,415	27,700	11
1993	Kokanee	15,332	43	356
	Rainbow	220,818	25,515	9
	Splake	5,625	750	8
1994	Kokanee	249,654	390	640
	Rainbow	115,955	17,925	6

Table 5. Mean length, weight, SE, and number collected for all fish caught by gillnetting and electrofishing on Lake Lowell, June 1994.

	Length (mm)	SE	Weight (g)	SE	Number collected	Catch-per-unit-effort ^a
Electrofishing						
Brown bullhead	118	4	19	2	6	5.24
Carp					11	9.62
Channel Catfish	498	152	3,925	194	3	2.62
Largemouth bass	133	22	173	93	10	8.74
Largescale sucker	362	50	750	124	109	95.33
Smallmouth bass	141	18	367	68	24	20.99
Trap nets						
Black Crappie	115		16		1	0.20
Bluegill	115	3	59	6	2	0.40
Carp	537		1,600		1	0.20
Madtom	98				1	0.20
Sinking gill nets						
Carp	461	10	1,264	70	50	6.25
Channel Catfish	433	25	1,095	188	27	3.37
Chiselmouth	270		217		1	.12
Largescale sucker	432	25	840	46	47	5.87
Rainbow trout	305	14	440		2	.25
Northern pikeminnow	324	22	349	78	4	.5
Yellow perch	260		124		1	.12
Floating gill nets						
Carp	473	10	1,071	58	24	4.80
Channel Catfish	568	34	2,237	373	10	2.00
Largescale sucker	375	16	634	61	37	27.40
Smallmouth bass	274		350		1	0.20
Northern pikeminnow	320		290		1	0.20

^a Electrofishing catch-per-unit-effort is number of fish collected per hour of electrofishing; gill and trap net catch-per-effort is fish collected per net per night.

Table 6. Length, weight, condition factor, SE, number collected, and CPUE of fish collected from Shoofly and Little Blue Creek Reservoirs, May 1994.

Lake	Sample Gear	Species	Length (mm)	SE	Weight (g)	SE	Condition Factor	SE	Number sampled	CPUE ^a	
Shoofly Reservoir	Floating gill net										
		Lahontan cutthroat	320	6	306	13	.90	.01	45	45	
			bluegill	135	8	61	11	2.26	.14	8	8
	Sinking gill net										
		Lahontan cutthroat	322	6	318	17	.91	.01	49	49	
			bluegill	162	4	100	7	2.23	.03	30	30
		Trap net								0	0
Little Blue Creek Reservoir	Floating gill net										
		Lahontan cutthroat	346	13	481	52	1.00	.02	40	40	
		mountain sucker	247	7	180	16	1.19	.08	9	9	
			reeside shiner	104		18		1.6		1	1
	Sinking gill net										
		Lahontan cutthroat	270	9	289	25	1.03	.01	89	89	
		mountain sucker	268		210		1.09		1	1	
		reeside shiner	140	3	37	4	1.34	.04	3	3	
	Trap net	Lahontan cutthroat	343	90						2	1
		mountain sucker	86	2						70	35
reeside shiner		95	1						101	51	

^a CPUE-catch-per-unit-effort is equal to catch of fish per net per night.

Table 7. Fish Stocking in Bull Trout Lake, 1985-1994.

Date	Species	Number	Pounds
7/1/85	Unspecified rainbow	2,100	
7/19/85	Mt. Lassen rainbow	1,800	
7/2/85	Mt. Lassen rainbow	2,025	450
8/21/86	Mt. Lassen rainbow	2,590	700
5/15/86	Mt. Lassen rainbow	2,890	850
6/30/87	Mt. Lassen rainbow	2,450	700
6/17/88	Mt. Lassen rainbow	520	200
6/22/88	Mt. Lassen rainbow	1,000	400
7/20/88	Mt. Lassen rainbow	650	250
7/25/88	Mt. Lassen rainbow	690	300
6/27/89	Unspecified rainbow	2,000	625
6/27/90	Atlantic salmon	9,931	1,300
8/31/90	Arctic grayling	1,200	2
10/7/92	Bull trout	2,800	550
6/27/94	Atlantic salmon	500	

Table 8. Angler use, catch, and harvest estimates from Sagehen Reservoir, June 1 through October 2, 1994.

Hours	June	SE	July	SE	August	SE	September	SE	Total	SE
Weekend	5,200	601	5,280	1,733	2,340	246	2,220	421	15,040	1,898
Weekday	6,161	2,178	3,399	1,801	2,616	2,018	660	132	12,836	3,475
Boat	4,495	1,274	2,224	1,363	2,293	1,016	206	129	9,218	2,128
Bank	6,205	1,611	5,446	1,399	2,218	899	2,190	388	16,060	2,347
Tube	661	286	1,010	359	444	153	484	37	2,598	486
Total	11,361	2,260	8,679	2,499	4,956	2,033	2,880	441	27,876	4,004
Catch Rate										
Boat	0.47	0.36	0.82	0.52	0.13	0.11	11.3	6.16	.71	
Bank	0.2	0.06	0.44	0.24	0.86	0.32	0.68	0.36	.44	
Tube	0.76	0.48	2.16	1.41	0.72	0.18	2.62	2.3	1.64	
Total									.64	
Creel Rate										
Boat	0.39	0.29	0.65	0.58	0.11	0.11	8	2.31	.55	
Bank	0.18	0.06	0.43	0.24	0.6	0.23	0.64	0.36	.39	
Tube	0.45	0.37	0.15	0.3	0	0	0.4	0.48	.25	
Total									.43	
Harvest										
Wild rainbow trout	568		237		144		825		1,774	
left ventral marked hatchery rainbow trout	1,276		1,983		1,369		2,037		6,665	
Unmarked hatchery rainbow trout	873		1,763		67		402		3,105	
Unseen rainbow trout	482		0		0		0		482	
Total	3,199	1,549	3,983	2,316	1,580	826	3,264	1,462	12,026	3,253

Table 9. Mean length, weight, condition factor, SE, number collected, and CPUE^a of wild and hatchery rainbow trout collected from Sagehen Reservoir, April 29, 1994.

Gear Type	Species	Length (mm)	SE	Weight (g)	SE	Condition Factor	SE	Number	CPUE ^a
Floating gill net	Hatchery rainbow trout	298	7.31	241	16.5	.89	.02	10	10
	Wild rainbow trout	299	10.6	266	25.4	.93	.02	24	24
Sinking gill net	Hatchery rainbow trout	296	11.3	250	23.2	.94	.03	15	15
	Wild rainbow trout	285	13.8	252	34.4	.93	.01	25	25
Trap net	Hatchery rainbow trout	293		200		.80		1	0.5
	Wild rainbow trout	227	17.1	125	19.7	.94	.02	9	4.5

^a CPUE: Catch-per-unit-effort equals number of fish caught per net per night.

Table 10. Fishing use, harvest, and catch per hour of fish from the Wilson Pond Complex North Pond, July 1, 1993 to June 30, 1994

Month	Fishing hours	Fish kept	Fish caught	Rainbow trout	Brown trout	Lake trout	Cutthroat trout	Fish kept per hour	Fish caught per hour
Jul	1,329	647	2,039	625				0.49	1.53
Aug	2,420	1,340	2,767	1,190	23		11	0.55	1.14
Sep	4,928	1,843	2,603	1,706	36	85	16	0.37	0.53
Oct	3,228	539	835	431		106		0.17	0.26
Nov	3,408	680	980	670				0.20	0.29
Dec	1,553	219	761	202				0.14	0.49
Jan	3,721	797	1,573	771			26	0.21	0.42
Feb	3,504	870	1,322	798	65			0.25	0.38
Mar	1,885	314	1,010	233	82			0.17	0.54
Apr	1,167	342	1,106	245	97			0.29	0.95
May	656	140	383	140				0.21	0.59
Jun	1,401	666	1,825	666				0.48	1.30
Total	29,200	8,397	17,204	7,677	303	191	53	0.29	0.59
SE	4,594	817	1,546	768	120	92	27		

Table 11. Fishing use, harvest, and catch per hour of fish from the Wilson Pond Complex South Pond, July 1, 1993 to June 30, 1994.

Month	Fishing hours	Fish kept	Fish caught	Rainbow trout	Brown trout	Lake trout	Cutthroat trout	Fish kept per hour	Fish caught per hour
Jul	597	231	742	152				0.39	1.24
Aug	1,136	457	904	423		33		0.40	0.80
Sep	3,413	224	389	164				0.07	0.11
Oct	1,448	378	433	378				0.26	0.30
Nov	2,240	140	455	140				0.06	0.20
Dec	3,917	744	2,481	686	17	8		0.19	0.63
Jan	2,529	283	474	283				0.11	0.19
Feb	2,478	673	1,397	588	84			0.27	0.56
Mar	2,452	555	1,077	422	50	82		0.23	0.44
Apr	1,162	317	785	296	22			0.27	0.67
May	633	150	532	142			8	0.24	0.84
Jun	594	204	839	204				0.34	1.41
Total	22,599	4,356	10,508	3,878	173	123	8	0.19	0.46
SE	2,922	532	1,580	492	86	86	7		

Table 12. Fishing hours, catch, and catch per hour of fish from the Wilson Pond Complex Catch and Release Pond, July 1, 1993 to June 30, 1994

Month	Fishing hours	Catch	Fish caught per hour
July	316	596	1.88
August	600	193	0.32
September	886	186	0.20
October	494	124	0.25
November	1,181	2,445	2.07
December	163	164	1.01
January	1,499	923	0.62
February	232	137	0.59
March	336	208	0.62
April	491	549	1.12
May	415	473	1.14
June	443	191	0.43
Total	7,056	6,189	0.88
SE	1,240	1,153	

Table 13. Fishing hours, catch, and catch per hour of fish from the Wilson Pond Complex Beach's Pond, July 1, 1993 to June 30, 1994.

Month	Fishing hours	Catch	Fish caught per hour
July	12		0.00
August			
September	44		0.00
October	115	96	0.83
November	165	97	0.59
December			
January	92	18	.020
February	165	206	1.25
March			
April	126		0.00
May	28	44	1.57
June			
Total	747	461	0.62
SE	224	217	

Table 14. Fishing hours, catch, and harvest and fish kept and caught per hour from the Wilson Pond Complex Wilson Drain, July 1, 1993 to June 30, 1994

Month	Fishing hours	Fish kept	Fish caught	Rainbow trout	Brown trout	Lake trout	Cutthroat trout	Fish kept per hour	Fish caught per hour
July	161	222	544	222				1.38	3.38
August	251	74	220	24	49			0.29	0.88
September	996	286	267	254	32			0.29	0.27
October	515	108	157	69	29			0.21	0.30
November	442	367	436	367				0.83	0.99
December	313	86	444	86				0.27	1.42
January	662	68	203	68			33	0.10	0.31
February	724	170	391	170				0.85	0.54
March	194	166	430	158		8		0.86	2.22
April	120	19	94	19				0.16	0.78
May	191		165					0.00	0.86
June	46		460					0.00	10.0
Total	4,615	1,566	3911	1,437	110	8	33	0.34	0.85
SE	1,235	370	889	360	72	12	42		

Table 15. Mean length, weight, condition factors, total catch, CPUE, and SE for fish captured in Cove Arm, May 11, 1994 by gill nets.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Condition	SE Condition	Total number	CPUE ^a
BLG	208		1	214		1			1	1
BCR	288		1	200		1			1	1
BRBH	210		1	70		1			1	1
HRBT	297.1	15.5	8	308.5	81.3	8	1.05 K	0.03	8	8
SMB	213.5	25.1	6	141.2	41.4	6	87.8 WR	2.6	6	6
WCR	227.2	14.7	4	211	34.4	4	127 WR	5.2	4	4
MWF	402		1	600		1			1	1
MWMOU	134.8	11.1	4	59	12.6	4			4	4
YP	230.5	4.9	77	170.5	9.5	77	88.8 WR	1.16	77	77
LSS									24	24
CZL									8	8
PEAM									55	55

^a CPUE: Catch per unit effort=number of fish caught per set of floating and sinking experimental 47.5 m gill nets.

Species: BLG=bluegill, BCR=black crappie, BRBH = brown bullhead, HRBT=hatchery rainbow trout, SMB=Smallmouth bass, WCR=white crappie, MWF=mountain whitefish, WMOU=warmouth sunfish, YP=yellow perch, LSS=largescale sucker, CZL=chislemouth, PEAM=Peamouth.

Table 16. Mean length, weight, condition factors, SE, total catch, and CPUE for fish captured in trap nets in Mountain Home Reservoir, May 10, 1994.

Species	HRBT	LMB	BLG	BLS	RSS
Mean length			62.4		
SE length			6.5		
Number			69		
Mean weight					
SE weight					
Condition					
SE Condition					
Total collected			69	2	12
CPUE ^a			34.5	1	6

^a CPUE: Catch per unit effort=number of fish captured per trap net per night.

Table 17. Mean length, weight, condition factors, SE, total catch, and CPUE for fish captured in gill nets in Mountain Home Reservoir, May 10, 1994.

Species	HRBT	LMB
Mean length	266.6	166.3
SE length	20.4	6.5
Number	20	33
Mean weight	311.5	86
SE weight	72.4	17.7
Condition	1.13 K	103.3 Wr
SE Condition	0.07	7.5
Total collected	20	33
CPUE ^a	20	33

^a CPUE: Catch per unit effort=number of fish caught per set of floating and sinking experimental gill nets combined.

Table 18. Number of net nights by water and net type for Caldwell #1, Caldwell #2, Caldwell City Pond, Duff Lane Pond, and Sawyers Ponds, April 1994.

Water	Net type	Number of net nights
Caldwell #1	Floating gill net	2
	Sinking gill net	0
	Trap net	2
Caldwell #2	Floating gill net	1
	Sinking gill net	1
	Trap net	2
Caldwell City Pond	Floating gill net	2
	Sinking gill net	0
	Trap net	2
Duff Lane Pond	Floating gill net	1
	Sinking gill net	1
	Trap net	2
Sawyers Ponds	Floating gill net	1
	Sinking gill net	1
	Trap net	2
Water chemistry was measured at some ponds.		

Table 19. Mean length (mm), weight (g), condition factor, SE, numbers collected, catch-per-unit-effort for number (CPUE#), and catch-per-unit-effort for weight (CPUEWT) by water and net type, April 1994.

Water	Species ^a	Net ^b	Mean	SE	Number	Mean	SE	Mean	SE	CPUE#	CPUEWT	
Caldwell #1	BG	FGN	115	13	2	28	8	1.80	.07	1	28	
	BHD		265		1	350		11.88		.5	175	
	CB		156		1	42		1.11		.5	21	
	LMB		276	59	3	339	154	1.24	.06	1.5	509	
	PS		140	5	2	70	6	2.55	.07	1	70	
	BG	TN	140	3	58	49	3	1.72	.04	29	1,421	
Total										33.5	2,224	
Caldwell #2	BG	FGN	110	18	3	36	18	2.24	.06	3	54	
	BHD		264	18	3	327	70	1.73	.06	3	210	
	CC		620		1	4,200		1.76		1	4,200	
	HRB		283		1	220		.97		1	220	
	BG	SGN	139	12	4	65	50	2.13	.18	4	65	
	CC		540		1	2,250		1.43		1	2,250	
	HRB		283	3	4	218	26	.94	.03	4	218	
	BG	TN	91	7	6	14	7	1.80	.01	3	42	
	BHD		149	11	4	47	14	1.31	.01	2	94	
	PS		153		1	85		2.37		.5	42	
	Total										22.5	7,301
	Calwell City	BHD	FGN	225	8	3	169	44	1.46	.06	1.5	254
CZM			310		1	310		1.04		.5	155	
HRB			238		1	124		1.92		.5	62	

Table 19. (continued)

	PS		122		1	38		2.09		.5	19
	SUK		210		1	80		1.86		.5	40
	BG	TN	55	3	5	3	1	1.66	.14	2.5	8
	PS		90	3	8	13	2	1.66	.08	4	52
	Total									10	590
Duff Lane	BG	FGN	133	4	2	46	2	1.77	.09	2	92
	BHD		280		1	380	1	1.73		1	380
	CB		274	52	2	366	198	1.59	.06	2	732
	CC		407		1	520		.77		1	520
	LMB		305		1	410		1.45		1	410
	BHD	SGN	265	15	5	313	119	1.64	.34	5	1,565
	CB		238	13	2	182		1.60		2	364
	CC		520		1	2,000		1.42		1	2,000
	BG	TN	86	11	7	22	6	1.45	.11	3.5	77
	BHD		309	14	2	376		1.29	.25	1	376
	Total									19.5	6,516
Sawyers	HRB	FGN	259	10	22	174	27	.92	.02	22	3,828
	YP		170	3	8	50	3	1.03	.04	8	400
	BG	SGN	99	1	2	23	1	2.40	.01	2	46
	CB		176		1	84		1.54		1	84
	CRP		465	57	2					2	
	CW		204	40	3	146	99	1.21		3	438
	HRB		237	4	2	108	8	.81	.02	2	216

	LMB		258		1	210		1.22		1	210
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Table 19. (continued)

	LSS		450		1	1,150		1.26		1	1,150
	BG	TN	120	4	48	32	3	1.51	.06	24	768
	CB		228		1	140		1.18		.5	70
	HRB		217		1	78		.76		.5	39
	PS		115		1	36		2.37		.5	18
	YP		156	4	4	32	2	.85	.05	2	64
	Total									69.5	7,331

^a Species: BG=bluegill, BHD=bullhead, CB=black crappie, CC=channel catfish, CRP=carp, CW=white crappie, CZM=Chiselmouth, HRB=hatchery rainbow trout, LMB=largemouth bass, LSS=largescale sucker, PS=pumpkinseed, SUK=sucker sp., YP=yellow perch.

^b FGN=floating gill net, TN=trap net, SGN=sinking gill net.

Table 20. Water chemistry for various ponds, April 1994.

	Caldwell #2	Caldwell City	Duff Lane	Sawyers
Parameter				
Date	4/20/94	4/22/94	4/19/94	4/29/94
Time		8 a.m.	7 a.m.	10 a.m.
Water Temp ©	13	15	13	11
Conductivity (Microsemens)			146	
pH	7.5	8.0	7.5	8.0
M.O. Alkalinity (mg/l CaCO ₃)	160	160	90	280
Hardness (mg/l CaCO ₃)	160	120	80	100

Table 21. Mean length, weight, condition factors, total catch, CPUE, and SE for fish captured in two sinking and two floating experimental gill nets in Deadwood Reservoir on July 8, 1994.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Condition	SE Condition	Total number	CPUE ^a
bull trout	236.1	5.7	9	133.9	8.3	9	1.01	0.01	9	4.5
westslope cutthroat	268.1	8.9	16	167.8	13.85	16	0.82	0.01	16	8
rainbow x cutthroat	233.3	21.8	3	125	31.2	3	0.93	0.02	3	1.5
kokanee	215	5.0	3	86.6	3.33	3	0.93	0.07	3	1.5
rainbow	262.7	16.4	13	185	38.91	13	0.9	0.03	13	6.5
rainbow (Gerrard)	315	15.4	4	252.5	27.5	4	0.82	0.65	4	2
whitefish	265.4	5.61	139	221.9	12.42	139	1.01	0.02	139	69.5

^a CPUE: One pair of floating and sinking experimental gill nets.

Table 22. Mean length, weight, condition factors, total catch, CPUE, and SE for fish captured in two sinking and two floating experimental gill nets in Deadwood Reservoir on November 4, 1994.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Condition	SE Condition	Total number	CPUE ^a
Atlantic salmon	258.6	7.48	11						11	5.5
rainbow x cutthroat	286.4	17.4	7						7	3.5
kokanee	253.7	2.24	92	159.5	8.77	20	0.86		92	46
rainbow	239.2	11.9	24						24	12
westslope cutthroat	316.8	16.3	13	332.5	23.1	8	0.93		13	6.5
whitefish	316.7	3.2	208	393.7	22.03	55	0.91		208	104

^a CPUE: One pair of floating and sinking experimental gill nets.

Note: High winds prevented taking weights of most fish in the November 4, 1994 sampling.

Table 23. Mean length, weight, SE, total catch, and CPUE for fish captured by one sinking and one floating gill net in Crane Falls Lake on May 5, 1994.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Total catch	CPUE ^a
black crappie	134		1	40		1	1	1
black bullhead	308	17.36	5	596	74.05	5	5	5
hatchery rainbow	283.3	5.69	45	266.6	18.58	45	45	45
largemouth bass	287.3	35.15	3	403.3	117.59	3	3	3
yellow perch	206.6	7.01	5	123	7.04	5	5	5

^a CPUE: Catch per unit effort = One sinking and one floating experimental gill net.

Table 24. Mean length, weight, SE, total catch, and CPUE for fish captured by electrofishing in Crane Falls Lake on June 2, 1994.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Total catch	CPUE ^a
black crappie	60		1				1	1.5
brown bullhead	298	10.44	5	566.6	14.4	3	5	7.6
bluegill	97.6	6.89	36	134.1	30.14	36	36	54.5
hatchery rainbow	260	4.67	4	193	12.3	4	4	6.1
largemouth bass	266.7	12.4	69	442.3	44.58	61	69	104.5
pumpkinseed	120.4	4.7	36	73.6	10.45	23	36	54.5
yellow perch	97.1	4.78	39	83.7	33.03	4	237	359.1

^a CPUE: Catch per unit effort = Catch adjusted to equal one hour of energized field time.

Table 25. Fish consumption guidelines for Brownlee Reservoir as issued on May 3, 1994 by the State of Idaho Department of Health and Welfare.

People may substitute two meals from Group B for one meal in Group A.

GROUP A:	GUIDELINE:	HIGH-RISK GROUPS
Yellow perch		
Smallmouth Bass		
Large Crappie (over 10 inches)	30, 7 ounce meals/year	12,7 ounce meals/year
-OR-		
GROUP B:		
catfish		
crappie (less than 10 inches)	120, 7 ounce meals/year	24, 7 ounce meals/year

High risk group: pregnant women, women planning a pregnancy, and children under the age of 7 years old.

Table 26. Mean length, weight, SE, number, total number, and CPUE of gill net captured fish from Brownlee Reservoir on April 19-21, 1994.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Total catch	CPUE ^a
black crappie	193	7.88	10				10	2.5
carp	560	5000					1	0.25
channel catfish	295.2	4.32	452	234.6	39.86	55	452	113
chiselmouth	170		1				20	5
hatchery rainbow	303.3	49.68	3				3	0.75
mountain whitefish	210	4.64	3				3	0.75
peamouth	248.5	15.3	7				28	7
smallmouth bass	259.7	3.04	47				47	11.75
northern pikeminnow	265.7	22.4	7				40	10
white crappie	234.9	4.8	78				78	19.5
yellow perch	220	13.8	46				46	11.5
largescale sucker							95	23.75
Bridgelip sucker							6	1.5

^a CPUE: One floating and one sinking experimental gill net pair.

Table 27. Mean length, weight, numbers, SE, total catch, and CPUE for electrofishing sampling on June 8, 1994 on Brownlee Reservoir.

Species	Mean Length	SE Length	Number	Mean Weight	SE Weight	Number	Total catch	CPUE ^a
black crappie	200	9.5	5	148.2	28.2	4	5	8.1
bluegill	157.3	9.8	11	132.7	24.1	11	11	17.1
bridgelip sucker	258.5	25.8	2				2	3.2
channel catfish	455	14.1	2	850	42.4	2	2	3.2
chiselmouth	175	28.8	4				4	6.5
hatchery rainbow	328.9	34.03	9	547.8	160.1	9	9	14.5
smallmouth bass	227.6	3.14	115	152.7	6.12	84	115	185.5
largescale sucker	356.4	40.5	12				12	19.4
white crappie	223.7	7.78	4	182.2	20.16	4	4	6.5
mountain whitefish	268.5	4.59	2	192.5	8.83	2	2	3.2

^a CPUE: one hour of energized electrofishing field time

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

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Title: Rivers and Streams Investigations

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Stream electrofishing surveys were conducted in the Boise River within the Boise metropolitan area. An electrofishing raft was utilized in the fall of 1993 to collect fish in the reach between Barber Park and Municipal Park. In March 1994, a five-probe, hand-held electrofishing method was employed to sample the fishery and obtain population estimates. Results were compared against previous samples, although methods differed significantly. In general, all species densities were reduced in the Boise River. Winter flows were identified as the probably cause of continued fish population declines.

Eight sites on the Middle Fork Boise River inside of the special rule waters were sampled using a three-pass removal electrofishing method. Population estimates for wild rainbow trout *Oncorhynchus mykiss* were calculated for seven reaches and averaged 1.26 trout >100 mm/100 m²; densities ranged from 0.28 to 3.19 trout >100 mm/100 m². A total of six bull trout *Salvelinus confluentus* were captured and ranged in size from 130 to 590 mm. Standard Idaho Department of Fish and Game (IDFG) habitat measurements were collected at each sample site.

Eleven sites in the upper Squaw Creek drainage above Ola were sampled, and population densities of redband trout were calculated. Ten of 11 sites contained redband trout and 3 contained bull trout. Densities of redband trout ranged from 0 to 30.2 trout >100 mm/100 m². Densities of bull trout ranged from 0 to 0.36 bull trout/100 m². These bull trout were considered unique because of their isolation in the upper end of the drainage and no consecutiveness to other populations.

Densities of resident fish were calculated from snorkel observations collected during salmon and steelhead parr monitoring surveys. Five snorkel transects were completed on Bearskin and Elk creeks, respectively. Thirty-three snorkel transects were completed on Sulphur Creek and four on North Fork Sulphur Creek.

Three electrofishing surveys were conducted on Logger's Creek, an irrigation/side channel on the Boise River in Boise. Habitat measurements confirm very degraded habitat exists in this channel, and no adult trout were captured. The area may well serve as a nursery area for natural-spawned trout from the river.

One hundred steelhead trout *O. mykiss* were stocked in the Payette River below Black Canyon Dam on March 10, 1994. All fish were tagged with individually numbered Floy tags prior to release. A creel survey estimated anglers fished 2,104 hours for steelhead between March 10 and April 3, 1994. Baseball caps were given as rewards to all anglers catching tagged steelhead and returning tags to IDFG personnel or the Emmett Sports Emporium. A total of 20 steelhead was accounted for as harvested or caught and released. Twenty percent of the steelhead planted were harvested or caught and released.

The same 9.6 km section of the South Fork Boise River electrofished in 1993 was electrofished in September 1994. Objectives were to estimate trout population size, biomass, and growth rates. Comparison of 1994 estimates with 1993 estimates will document annual variability in population estimates. Work goals are to estimate baseline population parameters and to determine trout population limiting factors.

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BOISE RIVER, CITY OF BOISE SAMPLING SITES

Routine fishery sampling was conducted on the Boise River within the city limits of Boise, Idaho during November and December 1993 and in March 1994. The sampling was conducted to better characterize the trout *Oncorhynchus spp.* and mountain whitefish *Prosopium williamsoni* populations in this section of the river. The Boise River is managed as a basic yield fishery through most of Boise, and a heavy stocking program using hatchery catchable rainbow trout creates a very popular fishery. Limited stream sampling has been conducted in the past in this reach of the river.

Methods

Three floats with an electrofishing raft were done in November and December 1993 to sample the resident fish population. A section from Barber Park to across from Park Center Pond Park was shocked, and a section just above Municipal Park was shocked, as well as a section from 36th Street to Glenwood. A sample of whitefish was collected from each float trip, and all trout individuals encountered were captured. All fish were measured and weighed and scales removed from all naturally-produced trout for age analysis.

Five electrofishing stations were sampled in March 1994; two of these stations had been sampled previously, one was moved slightly upstream from a previous site and two were new sampling stations. Stream flows were approximately 240 cfs during the sampling period, and these flows necessitated the several changes in sample sites.

New electrofishing equipment was used in 1994. A Coffelt VVP-15 electrofishing control box was used with a 5,000-watt shore-based generator and the crew carried five hand-held positive electrodes to shock fish. The hand-held probes were wired about 10 m apart with the first probe in the series controlling the power output with a safety on-off switch. The probe gang was separated from the power source by a 150-m electrical cord that allowed approximately a 300-m stretch of river to be sampled.

Sample sites were placed between a lower and upper riffle to constrict movement of fish. Three passes of the electrode gang were conducted starting from the lower boundary to the upper. All fish encountered were collected and segregated into live pens, and all three passes were kept separate. Fish were measured and weighed and released. Scales were taken from any naturally-produced trout captured. Population estimates were generated and density of species were calculated on a basis of number of fish/100 m². Densities were compared to previous samples taken in 1988 and 1992. Length frequencies of rainbow trout and mountain whitefish were produced. Lengths at age for rainbow trout and brown trout *O. trutta* were also calculated. Standard habitat measurements were taken at each of five sample sites.

Results

1994 Sampling

Electrofishing methods were considerably improved in 1994. In 1988 and 1992, most of the electrofishing was done with one hand-held probe using a drift boat; the 1994 shocking used up to five hand-held probes. Table 1 compares results of electrofishing for three years among three stations. The fish populations continue to decline for all species in all areas (Table 1). The most likely cause of these fish population declines is the low winter flows experienced during the past drought years. Lack of water accrual to the IDFG storage pool in Lucky Peak Reservoir has not allowed winter releases from Lucky Peak Reservoir to maintain necessary winter stream flows.

The differences in population structure may be explained in the differences in electrofishing methods and the habitat types sampled. Raft electrofishing sampled pools much more effectively than the hand-held probes could; conversely, the raft could not sample riffles and shallow runs as well as the hand-held probes. The difference in length frequencies may be that the smaller fish were in different habitat types than the larger whitefish that tend to inhabit bigger pools.

Standard habitat measurements taken were recorded in Table 2.

MIDDLE FORK BOISE RIVER

Methods

Eight sites were electrofished on the upper Middle Fork Boise River above the confluence of the North Fork Boise River. Electrofishing was accomplished with the five-gang probe system previously described. Sampling was conducted in the second week of September 1994. No previous electrofishing had been done in this area.

Results

Electrofishing worked fairly well; site selection was critical to effectively sample. Areas of deeper pools were ineffectively sampled, and high gradient runs at flows encountered were also difficult to capture fish in. All sites had good vehicle access for ease of use and were located from just below Breadwinner Canyon and upstream to Queens River (Table 3).

Population estimates and densities were calculated from seven of the eight sites sampled. Site 6 densities were the lowest recorded at 0.28 trout >100 mm/100 m², but this site had a large pool which created poor sampling conditions. The average density of wild rainbow trout for the seven sites was 1.26 trout >100 mm/100 m² (Table 4). Densities ranged from 0.28 to 3.19 trout

>100 mm/100 m². These compare with previous snorkel estimates from 1993 of 0.19 to 2.38 for all trout/100m² (Allen et al., 1996). The sample sites were not the same in 1993 and 1994.

Mountain whitefish were collected at each sample site.

Bull trout were captured at sites 3, 6, 7, and 8. Total lengths ranged from 130 mm to 590 mm. A total of six bull trout were captured among all sites.

Water quality measurements were taken at all sites. Water temperature ranged from 11°C to 14°C; conductivity from 50 to 80 *Us*; pH from 8.3 to 8.9; and alkalinity from 15 to 40 mg/l as CaCO₃.

Habitat measurements were taken at all sites using standard IDFG methodology (Table 5). Dredge miners were actively mining on claims in 1994. Electrofishing site number 4 was within a 1994 dredge-mined site. This site contained only younger aged fish, mostly age 1+ and 2+ trout, and the largest fish was 227 mm in total length. The stream substrate measurements were within the range observed in the other sample sites. Visual observations of this site indicated much looser gravel than in undredged sites.

SQUAW CREEK DRAINAGE

Methods

Eleven sites in the Squaw Creek drainage were backpack electrofished in 1993 and 1994 to define the resident fish population. Sites were selected for road access ease and dispersal of sites. A three-pass electrofishing removal sample, previously described, was completed at each site along with stream habitat measurements.

Results

Nine of 11 sites contained redband trout, and 3 sites contained bull trout. One site could not be sampled effectively because of higher flows and probably contained redband trout. Densities of redband trout ranged from 0 to 30.2 trout >100 mm/100 m² (Table 6). The densities observed are within ranges observed in the Payette River drainage.

Densities for bull trout ranged from 0.25 to 0.36 bull trout/100 m² (Table 6). The presence of bull trout is unique in that the only other populations are in the upper ends of the Payette River drainage. The Squaw Creek bull trout populations are isolated to the upper end of the drainage and have no consecutiveness to other populations.

Habitat measurements are presented in Table 7. The drainage has a high load of fine particulates evidenced by the higher percentage of sand recorded in some sample sites. Cattle grazing and past and present logging activities contribute to the instream habitat degradation.

MIDDLE FORK SALMON DRAINAGE RESIDENT FISH INVENTORY

Methods

Snorkel counts of resident fish species were conducted concurrently with parr monitoring counts of anadromous chinook (reported in Salmon and Steelhead section). Counts were conducted with two snorkelers moving upstream through the trend section identifying fish species and sizes, and relaying information to a data recorder who was walking the stream bank. The snorkel sections were then measured for the area observed (length and minimum of four stream channel cross-sections) to define the area of stream snorkeled. Some sites only used one snorkeler because of small stream size.

Results

Five snorkel transects were counted for resident fish species in Bearskin and Elk creeks. Thirty-three transects were counted in Sulphur Creek, and four transects were done in the North Fork Sulphur Creek. Habitat measurements were taken at all sites in Bearskin and Elk creeks and only at the three General Parr Monitoring Sites on Sulphur Creek.

Tables 8-11 summarize the density of resident fish species (number/100 m²) by size group. Tables 12-14 summarize the habitat measurements collected.

Recommendations

Conduct resident fish counts annually while conducting parr monitoring trend counts.

LOGGERS CREEK

Methods

Three transects on Loggers Creek were sampled with a backpack electrofishing unit on March 10-11, 1994. All fish encountered were captured, identified, and measured for length.

Habitat measurements were taken at the areas sampled. A three-pass population survey was done in fall 1994 in conjunction with a biology class from Boise State University.

Results

Very few game fish were collected. Rainbow trout and brown trout were generally small; of 7 rainbows collected, their lengths ranged from 112 to 170 mm; of 20 brown trout collected, their lengths ranged from 98 to 208 mm. The species composition of the three March samples are presented in Table 15. The fall population estimate for rainbow trout was 28 (± 3.7); and for brown trout, a population estimate of 47 (± 5.1) was calculated.

Habitat was generally poor with two of the three sites predominately sand (Table 16).

Recommendations

Remove the special regulations from this irrigation channel. The habitat will not support adult trout and all trout present are small. This is one of the "few side channels present" on this section of the Boise River so it will continue to have some importance as a rearing area.

PAYETTE RIVER STEELHEAD ANGLER USE AND HARVEST EVALUATION

Introduction

Some years, steelhead excess to hatchery needs return to Idaho steelhead hatcheries. Steelhead surplus to brood needs is available for collection and transplanting into streams where steelhead have been eliminated due to dam construction. The purpose of these outplants is to provide steelhead angling opportunity outside of the area where steelhead currently return.

The Payette River below Black Canyon Dam is an area that has received surplus steelhead previously when available. However, angler use and harvest was not estimated following these releases. Due to the costs associated with collecting and transporting steelhead for angler use away from hatcheries, it is important to estimate angler use and catch benefits provided by outplants. The purpose of this work was to document angler use and harvest provided by steelhead plants in the Payette River below Black Canyon Dam.

Methods

During the fall 1993 steelhead trapping season, steelhead surplus to hatchery needs returned to Idaho Power Company's Hells Canyon trap. One hundred surplus steelhead were tagged by hatchery personnel with individually numbered yellow Floy tags and transported to the Payette River below Black Canyon Dam for release on March 10, 1994. The fish were released at approximately 2 p.m. Approximately 50% of the fish were released immediately below the Plaza Road Bridge, and approximately 50% were released 400 m below Black Canyon Dam on the south side of the river.

Angler counts were used to estimate angling use from March 10 through April 3. The survey was terminated April 3 at the onset of irrigation flows from Black Canyon Dam. Angler counts were made by driving between the Plaza Road Bridge and Black Canyon Dam and counting all anglers. Counts required approximately 10 minutes to complete.

The angling day was defined to extend from 7 a.m. to 8 p.m. The angling day was stratified by hour. Angler counts were made on as many days in as many hourly strata as possible from March 10 through April 3. Counts were made by volunteers and IDFG personnel as time allowed. Angler count times were not randomly scheduled a priority, and no variance estimates were calculated.

Angler use for each hourly strata was obtained by calculating a mean angler count for that strata and multiplying by the number of days in the strata between 2 p.m. March 10 and 8 p.m. April 3. Total angler use was obtained by summing hourly strata angler use estimates.

Catch of planted steelhead was done by attempting to account for all steelhead caught and released or harvested. To encourage anglers to report all steelhead caught, baseball caps with "I Caught a Payette River Steelhead" printed on the front were given to all anglers turning in a yellow Floy tag. Additionally, signs were posted throughout the area informing anglers that steelhead had been planted and rewards (caps) were being offered for the return of tags. The Emmett Sports Emporium recorded all steelhead caught and delivered hats to anglers returning tags.

Results

Between 7 and 11 angler counts were made for each hourly strata (Table 17). Total estimated angling hours between March 10 and April 3 was 2,104 hours.

A total of 20 steelhead were accounted for as having been caught or harvested. Of these, 14 tags from steelhead were turned into the Emmett Sports Emporium; 1 steelhead was reported caught that had lost its tag; 3 steelhead were reported caught and released without removing the tag; and 2 steelhead from the Payette River were reported in the Idaho Statesman newspaper as having been caught by an angler who did not turn in the tags. It is unknown whether these last two steelhead had lost their tags prior to being caught.

Discussion

Planting steelhead generated 2,104 hours of angling pressure in 25 days. This angling occurred in approximately 1 km of river. Assuming 4 hours per angler trip, 526 angler trips were resulted from planting steelhead in this section of the Payette River. The U.S. Fish and Wildlife Service (USFWS) estimated that anglers spent \$23.50 for each day spent angling in Idaho. Donnelly et al. (1985) estimated steelhead anglers spent between \$36 and \$145 per day to fish for steelhead within their current range in Idaho. Total dollars generated by planting steelhead in the Payette River, using the minimum USFWS figure, would be \$12,361.

Costs associated with planting steelhead in the Payette River include 16 man-hours at \$15/man-hour (including benefits), per diem at \$40, and 250 miles at \$1.00/mile for a total of \$530. The benefit: cost ratio produced by planting steelhead in the Payette River is 23.3:1.

Angler trips per mile during the spring 1991 steelhead fishery ranged from 29 to 144 on various sections of the Salmon River (McArthur 1992). Table 18 is a comparison of angling trips for the spring 1991 Salmon River steelhead fishery, Boise River 1993 steelhead fishery for the month of March (unpublished data), and Payette River 1993 steelhead fishery. Although some of the data may be biased and subject to question, the fact that the Payette River estimate greatly exceeds fishermen density (angler trips per mile) on the other rivers is indicative there is adequate angling pressure to support the steelhead fishery.

Several factors limited exploitation rate of steelhead planted in the Payette River. One of the 14 tags returned was from a steelhead caught in Brownlee Reservoir at Snake River mile 315, 88 miles downstream from the release site. This fish was caught on March 15, five days after release. Obviously, this fish did not remain in the fishery area for very long. It is unknown how many additional steelhead left the planting area immediately after being released. However, any fish migrating out of the fishery area would not be as available to angler catch, and catch rates would be reduced accordingly. A second steelhead (untagged) was reported caught from Brownlee Reservoir. This fish may have been from steelhead releases in the Boise River. This fish also migrated a long distance following release.

A second factor limiting exploitation was related to river flow. Flows below Black Canyon Dam are generally lowest from near November 1 through the end of February. Flows tend to increase sometime after March 1 depending upon snowpack forecasts. Generally, exploitation rates are inversely related to flow, i.e., higher flows result in lower exploitation rates. Steelhead were planted in the Payette River on March 10 with flows of 1,328 cfs. By April 3, flows had increased to 2,040 cfs. Higher flows are thought to have reduced harvest and catch relative to what they would have been at lower flows.

Steelhead migratory urge is affected by temperature and day length. As the temperature approaches 40°F and day length shortens near the end of November, steelhead tend to stop migrating for the winter (Kent Ball, IDFG, personal communication). Conversely, as water begins to warm and day length increases in the spring, steelhead migratory urge increases. Steelhead were planted in the Payette River on March 10. As day length and water temperatures increased, migratory urge was stimulated. To minimize steelhead movement out of the planting area, it is recommended that planting be done in mid to late November as water temperatures approach 40°F.

In summary, the Payette River below Black Canyon Dam is capable of supporting a limited steelhead fishery in years when steelhead are available to plant there. Although the section is

relatively short, angler enthusiasm is high, and use and catch are adequate to justify costs associated with transporting fish from the hatchery to the stream. Economic benefits are adequate to justify the program.

Recommendations

1. Plant steelhead in the fall as soon as water temperatures are 45°F or less and irrigation flows below Black Canyon Dam have been reduced.
2. Plant 25% of the steelhead available for outplanting in the Payette River and 75% in the Boise River.

CANYON CREEK

Methods

Canyon Creek, a tributary to the South Fork Payette River, was sampled near Highway 21 milepost 98.2 near (T11N, R10E, S2, GPS Coord. 44⁰, 12.73'N, 115⁰, 14.39') on September 30, 1994. A three-pass electrofishing removal was done along with collection of standard IDFG habitat measurements and water quality data.

Results

Redband rainbow trout and bull trout were the only species collected. Density of redband trout was 2.7/100 m², with a population estimate of 13 ± 1.07. Redband trout average lengths were 157 mm, and ranged from 89 to 250 mm; average weights were 51 g, and ranged from 6 to 172 g. Bull trout densities were 3.5/100 m², with a population estimate of 17 ± 2.57. Bull trout average length in this stream section was 108.6 and ranged from 66 to 202 mm. Average weight of bull trout was 24.7, and ranged from 7 to 68 g.

Habitat measurements recorded a quality habitat in this high gradient stream (Table 19). Water quality measurements taken are presented in Table 20.

SOUTH FORK BOISE RIVER

Introduction

The same 9.6 km section of the South Fork Boise River electrofished in 1993 was electrofished in September 1994. Objectives were to estimate trout population size, biomass and growth rates. Comparison of 1994 estimates with 1993 estimates will document annual variability in population estimates. Work goals are to estimate baseline population parameters and to determine trout population limiting factors.

Methods

The section of river electrofished extended from the Village access area (T1S, R8E, S15), 4 km below Anderson Ranch Dam, downstream 9.6 km (T1N, R8E, S31). The lower boundary was approximately 1.6 km below the mouth of Cow Creek.

Electrofishing methods and equipment were similar to 1993 (Allen et al., 1995), except that in 1994, a Coffelt VVP-15 was used on all electrofishing runs.

River flows in 1994 were ($600 \text{ ft}^3\text{sec}^{-1}$) for the mark runs and ($300 \text{ ft}^3\text{sec}^{-1}$) for the recapture runs.

All trout were measured to the nearest mm. Samples of trout were weighed to the nearest g. Scales were collected from up to 10 trout per cm size group.

Population estimates and standard errors were made using the modified Petersen population and variance estimators (Seber 1973). Estimates were made by pooling all fish from size group estimates from mark runs, recapture runs, and recaptures. Size group population estimates were made for rainbow trout greater than 129 mm and for rainbow trout greater than 239 mm.

Scales were magnified using a standard microfiche reader. Annuli were identified and distance from the focus marked on a slip of paper. Slips of paper with distance marks were later digitized, and back-calculated length at age estimates were made using DisBCal 89 V1.0 program in the Fishery Analysis Tools software developed by the Missouri Department of Conservation.

Results and Discussion

Species Collected

Bull trout, rainbow trout, and rainbow x cutthroat hybrids were the only trout collected during this survey. In addition to trout, kokanee, mountain whitefish, bridgelip sucker, largescale sucker, northern pikeminnow, redbelt shiners, dace, and sculpin were collected or observed.

Mean number of rainbow trout greater than 129 mm collected per day of electrofishing was 199 during the mark runs and 291 during the recapture runs. Increased catch during recapture runs is due to lowering water levels from 600 cfs to 300 cfs for the recapture runs.

Length, Weight, and Condition Factor

Rainbow trout collected September 7, 8, 9, 20, and 23, 1994 were measured to the nearest mm. Mean length of 1,221 trout measured was 290 mm (SE=2.93).

Rainbow trout greater than 99 mm collected on September 7 and 20 were weighed to the nearest g. Mean weight of 383 rainbow trout collected was 325 g (SE=13.0).

The length-weight relationship for rainbow collected in September 1994 is described by $\log(\text{wt}) = -4.81 + 2.91 \cdot \log(L)$.

Mean length and weight of rainbow trout collected in September 1993, 341 mm and 468 g, were greater than those collected in 1994. These differences in size of rainbows collected are statistically significant at the .05 level. However, this difference is due to differences in sampling gear efficiency (VVP-2E versus VVP15) rather than differences in mean size of the rainbow trout in the population (Allen et al., 1996).

Mean condition factor for 380 rainbow trout weighed and measured was 0.97 (SE=.0054). The regression equation describing the relationship between length and condition factor (CF) was $CF = 1.057 - .00029 \cdot L$. The correlation coefficient (r) was significant ($P < .01$), indicating as rainbow trout grow longer, body condition tends to decrease.

Six bull trout were collected during five days of electrofishing, representing 0.52% of the trout population in the section. Size of bull trout ranged from 243 to 514 mm. Mean length of bull trout collected was 388 mm (SE=38.2).

Eleven kokanee were collected during electrofishing. Size ranged from 207 to 420 mm. Mean length of kokanee was 297 mm (SE=25.6). Two age groups appeared to be represented in the kokanee sample. One size group ranged from 207 to 270 mm and one group ranged from 330 to 420 mm.

Age and Growth

Scales were read and age determined for 282 rainbow trout. Mean back-calculated length at age for all age classes from 1 to 8 was 96, 180, 288, 344, 384, 401, 418, and 397 mm, respectively. Age classes 7 and 8 are each represented by one fish. Back-calculated length at age for each year class is given in Table 21.

At the time of sampling, age 0 to age 8 rainbow trout averaged 89, 169, 250, 359, 429, 429, 480, and 424 mm, respectively. Average, minimum, and maximum length at capture are given in Table 22.

The age distribution (percent by age) of rainbow trout by cm size group is shown in Table 23. Rainbow trout exhibit large variation in growth. The best guess explaining the large variation in growth is either age estimates are inaccurate, hatchery fish from Anderson Ranch Reservoir exhibiting different annuli and growth patterns from resident trout are migrating into the section, or perhaps the riverine population is a mixture of rainbow trout spawned in the river and tributaries that exhibit greatly different growth patterns.

Scales from bull trout collected in 1993 and 1994 were read by IDFG Fisheries Research personnel. Bull trout length and estimated age are shown in Table 24. Scales were read by two independent readers. Estimated age was agreed upon for 60% of the fish.

Population and Biomass Estimates

Numbers of rainbow trout in the marked sample, recapture sample, and number of recaptures by cm size group are shown in Table 25. A total of 42 recaptures ranging from 160 to 470 mm were collected.

The smallest age 1 rainbow trout collected was 130 mm (Table 22). The pooled population estimate for rainbow trout greater than 130 mm was 8,093 (SE=1132). The pooled population estimate for rainbow trout greater than 239 mm was 4898 (SE=811). Allen et al. (1995) estimated 4,540 (SE=861) rainbow trout greater than 239 mm in 1993.

River width was measured in 12 separate locations during electrofishing. Mean river width was 37.0 m (SE=2.4).

The mean weight of rainbow greater than 130 mm in the sample was 324 g. Biomass of rainbow trout in the 9.6 km section was estimated to be 2,622 kg or 273 kg/km. There were 355.2 ha within the section. Estimated biomass was 7.38 kg/ha.

Recommendations

1. Electrofishing catch was greatly enhanced by electrofishing at reduced flows. Future electrofishing should be done after river flows are reduced to 300 cfs.
2. Determine if electrofishing can be done at night to minimize angler conflict.
3. Mark hatchery fingerling rainbow trout planted in Anderson Ranch Reservoir to determine their contribution to the South Fork fishery below Anderson Ranch Reservoir.
4. Conduct annual population estimates in this river section for two more years to determine annual variability in trout populations.

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TABLES

Table 1. Fish densities collected by electrofishing on the Boise River in the City of Boise, Idaho, comparison of 1988, 1992, and 1994 sampling.

**Station No. 0
Municipal Park**

SPECIES	DENSITY No./100m ²		
	1988	1992	1994
NATURAL RAINBOW	0.27	1.2	0.47
NATURAL BROWN	0.08	0.2	0.09
HATCHERY RAINBOW	0.11	0.0	0.02
MOUNTAIN WHITEFISH	4.08	11.3	0.8
LARGEMOUTH BASS	0.0	0.0	0.0
NONGAME SPECIES	0.54	15.9	0.0

**Station No. 2
Les Bois Park**

SPECIES	DENSITY No./100m ²		
	1988	1992	1994*
NATURAL RAINBOW	0.01	0.0	0.0
NATURAL BROWN	0.0	0.0	0.0
HATCHERY RAINBOW	0.06	0.02	0.0
MOUNTAIN WHITEFISH	5.64	4.2	0.52
LARGEMOUTH BASS	0.03	0.0	0.0
NONGAME SPECIES	72.4	23.3	0.52

*Station was moved approximately 100 m upstream in 1994 due to higher river flows.

**Station No. 3
Upper Eagle Island South Channel; Williamson's Horse Ranch**

SPECIES	DENSITY No./100m ²		
	1988	1992	1994
NATURAL RAINBOW	0.67	0.2	0.0
NATURAL BROWN	0.2	0.0	0.0
HATCHERY RAINBOW	0.1	0.07	0.0
MOUNTAIN WHITEFISH	14.3	2.2	0.3
LARGEMOUTH BASS	0.0	0.0	0.0
NONGAME SPECIES	5.93	3.5	4.9

Table 1. (continued)

Station No. 5
Eagle Island South Channel; Channel Road

SPECIES	DENSITY No./100m ²	
	1988	1992
NATURAL RAINBOW	0.67	0.2
NATURAL BROWN	0.12	0.0
HATCHERY RAINBOW	0.87	0.08
MOUNTAIN WHITEFISH	10.49	1.5
LARGEMOUTH BASS	0.07	0.06
NONGAME SPECIES	19.24	16.6

Station No. 6
Eagle Island North Channel; Monrock Property
Inside Special Regulation Section

SPECIES	DENSITY No./100m ²	
	1994	
NATURAL RAINBOW	0.09	
NATURAL BROWN	0.0	
HATCHERY RAINBOW	0.24	
MOUNTAIN WHITEFISH	9.4	
LARGEMOUTH BASS	0.0	
NONGAME SPECIES	4.46	

Station No. 7
Eagle Island South Channel; Eagle Hatchery Access
Below Special Regulation Section

SPECIES	DENSITY No./100m ²	
	1994	
NATURAL RAINBOW	0.09	
NATURAL BROWN	0.0	
HATCHERY RAINBOW	0.9	
MOUNTAIN WHITEFISH	0.82	
LARGEMOUTH BASS	0.0	
NONGAME SPECIES	0.82	

****Electrofishing methods differed considerably in 1994 from past years.

Table 2. Habitat variables of stream length, average width, average depth, percent composition of stream substrate, collected on the Boise River in the City of Boise in March 1994

Site	Length (m)	Width (m)	Depth (m)	% sand	% gravel	% rubble	% boulder	% bedrock
STATION #0	160.1	35.7		20.7	11.8	48.6	18.9	0.0
STATION #2	143.5	22.9	0.42	25.3	13.3	57.2	4.2	0.0
STATION #3	144.4	23.1	0.46	41.2	36.3	21.7	0.8	0.0
STATION #6	114.5	18.2	0.69	31.7	11.2	52.5	4.6	0.0
STATION #7	147.0	22.4	0.61	60.0	21.6	16.5	1.9	0.0

Table 3. Location of electrofishing sample sites on the Middle Fork Boise River collected in September 1994.

Site number	Description	Location
1	HOTSPRINGS WATER-FALL MILEPOST 35.5	43 ⁰ 44.34' 115 ⁰ 35.04'
2	BELOW NINEMEYER MILEPOST 37.6	43 ⁰ 45.38' 115 ⁰ 34.57'
3	GRANITE CR MOUTH MILEPOST 49.1	43 ⁰ 47.87' 115 ⁰ 24.43'
4	BELOW DUTCH CR DREDGING SITE MILEPOST 51.2	
5	SWANHOLM CREEK	43 ⁰ 49.07' 115 ⁰ 21.60'
6	HOT CREEK MOUTH	43 ⁰ 49.98' 115 ⁰ 19.93'
7	BELOW BALD MNT CR MILEPOST 58.8	43 ⁰ 48.86' 115 ⁰ 16.00'
8	QUEENS RIVER MOUTH	43 ⁰ 49.07' 115 ⁰ 12.55'

Table 4. Wild rainbow trout population density estimates for eight sample stations collected on the Middle Fork Boise River in September 1994

SITE NUMBER	DENSITY # OF TROUT >100mm/100 m²
1	0.91
2	1.10
3	1.42
4	0.45
5	1.50
6	0.28
7	3.19
8	N/A

MEAN DENSITY = 1.26 TROUT > 100 mm/100 m².

Table 5 Habitat variables of stream length, average width, average depth, percent composition of stream substrate, collected on the Middle Fork Boise River, in September 1994

Site	Length (m)	Width (m)	Depth (m)	% sand	% gravel	% rubble	% boulder	% bedrock
STATION #1	66.0	23.2	0.54	5.4	10.0	34.2	50.4	0.0
STATION #2	84.0	17.3	0.54	0.0	8.7	46.7	36.3	8.3
STATION #3	70.0	17.1	0.60	37.1	27.6	10.0	25.2	0.0
STATION #4	99.6	22.4	0.41	6.5	24.1	32.9	32.8	3.7
STATION #5	66.6	18.0	0.42	0.8	11.7	25.9	61.7	0.0
STATION #6	86.6	20.5	0.80	31.1	29.4	20.6	18.9	0.0
STATION #7	87.0	19.1	0.50	11.1	16.7	25.0	47.2	0.0
STATION #8	62.0	14.8	0.70	6.7	18.3	17.8	58.3	0.0

Table 6. Squaw Creek drainage sample locations and densities of redband trout collected in 1993 and 1994.

SITE	LOCATION	DENSITY FISH/100 m ²	DENSITY FISH/100 m ²
		ALL SIZES	>100 mm
MAIN SQUAW CK #1 (EXCLOSURE)	R1ET13N SECTION 25 N44' 25.50 W116' 17.12	4.8	3.1
MAIN SQUAW CK #2	R2ET13N SECTION 11 N44' 28.69 W116' 11.26	26.8	23.2
THIRD FK SQUAW CK #3	R3ET13N SECTION 34	*	*
THIRD FK SQUAW CK TRIB #5	R2ET13N SECTION 27	24.1	18.6
THIRD FK SQUAW CK TRIB #6	R2ET13N SECTION 26	21.9	16.4
THIRD FK SQUAW CK TRIB #7	R2ET13N SECTION 35	22.6	19.6
RENEWYCK CK #8	R2ET12N SECTION 14	8.1	4.2
SECOND FK SQUAW CK #9	R1ET12N SECTION 31 N44' 21.02 W116' 14.02	21.0	13.5
PINE CK TRIB #10	R2ET15S SECTION 15 N44' 16.23 W116' 12.68	**	**
MAIN SQUAW CK #11	R2ET13N SECTION 10	34.9	30.2

*SECTION NEEDS TO BE RESAMPLED DURING LOW FLOW PERIOD.

**NO FISH WERE SAMPLED IN TRANSECT-REDBAND TROUT WERE SAMPLED IN A POOL 25 METERS UPSTREAM.

SECTIONS IN WHICH BULL TROUT WERE SAMPLED	DENSITY FISH/100 m ²
#2	0.36
#5	0.25
#11	0.26

Table 7. Habitat measurements taken in 1993 and 1994 in Squaw Creek drainage sample sites.

AVERAGED CROSS-SECTIONAL VALUES FROM WITHIN EACH SECTION									
Section	Grad (%)	Width (m)	Depth (m)	Sand (%)	Gravel (%)	Rubble (%)	Boulder (%)	Bed (%)	OM (%)
#1	1.3	9.05	0.16	21.7	25.4	42.1	10.8		
#2	5.0	5.0	0.27	13.9	18.3	18.9	48.9		
#3	1.1	4.9	0.31	30	13.3	25	31.7		
#5	3.3	6.5	0.27	23.3	17.8	22.2	36.7		
#6	6.1	2.4	0.11	52.2	15.5	16.7	15.5		
#7	1.4	6.5	0.15	46.7	26.1	20.5	3.3		3.3
#8	1.3	4.5	0.27	20.3	21.7	39.7	18.3		
#9	1	4.9	0.21	20	11.2	42.5	25.4	0.8	
#10	1	1.7	0.04	74.7	6.7				19
#11	5.9	5.3	0.33	16.1	6.1	1.1	25	52	

SECTIONS

- #1 - Main Squaw Creek (exclosure)
- #2 - Main Squaw Creek
- #3 - Third Fork Squaw Creek
- #5 - Third Fork Squaw Creek trib
- #6 - Third Fork Squaw Creek trib
- #7 - Third Fork Squaw Creek trib
- #8 - Renwyck Creek
- #9 - Second Fork Squaw Creek
- #10 - Pine Creek trib
- #11 - Main Squaw Creek

Table 8. Densities of resident game fish (number/100 m²) observed while snorkeling Bearskin Creek in July 1994.

Species	<100 mm	100-199 mm	200-299 mm	300-399 mm	>400 mm
brook trout	2.22	1.19	1.12	0.33	0.0

Total of 5 transects observed; 4,280.4 m² area observed

Table 9. Densities of resident game fish (number/100 m²) observed while snorkeling Elk Creek in July 1994.

Species	<100 mm	100-199 mm	200-299 mm	300-399 mm	>400 mm
mountain whitefish	1.67	0.0	0.01	0.19	0.03
brook trout	0.03	0.03	0.01	0.0	0.0
steelhead	0.13	0.0	0.0	0.0	0.0

Total of 5 transects observed; 7,949 m² area observed.

Table 10. Densities of resident game fish (number/100 m²) observed while snorkeling Sulphur Creek in August 1994.

Species	<100 mm	100-199 mm	200-299 mm	300-399 mm	>400 mm
mountain whitefish	0.78	0.006	0.08	0.32	0.006
westslope cutthroat	0.46	0.35	0.05	0.03	0.01
steelhead	0.19	0.22	0.03	0.006	0.0

Total of 33 transects observed; 15,548 m² area observed.

Table 11. Densities of resident game fish (number/100 m²) observed while snorkeling North Fork Sulphur Creek in August 1994.

Species	<100 mm	100-199 mm	200-299 mm	300-399 mm	>400 mm
westslope cutthroat	3.5	2.1	0.0	0.0	0.0
bull trout	0.7	0.0	0.0	0.0	0.0

Total of 43 transects observed; 142.4m² area observed.

Table 12. Summary of habitat measurements collected on snorkel sites in Bearskin Creek during July 1994.

Site	Length (m)	Width (m)	Depth (m)	% Silt	% Sand	% Gravel	% Pebble	% Cobble	% Boulder
1A	126	8.0	1.0	43.3	56.7	0.0	0.0	0.0	0.0
2A	121	7.7	0.6	55.6	29.4	13.9	1.1	0.0	0.0
3A	63.5	4.5	0.15	0.0	43.3	55.8	0.8	0.0	0.0
3B	92	7.5	0.5	15.8	47.5	36.7	0.0	0.0	0.0
Oxbow	134	8.7	0.36	42.9	36.2	9.5	0.9	0.9	9.5

Table 13. Summary of habitat measurements collected on snorkel sites in Elk Creek during July 1994.

Site	Length (m)	Width (m)	Depth (m)	% Silt	% Sand	% Gravel	% Pebble	% Cobble	% Boulder
S1 A	123	14.6	0.49	5.8	35.0	45.8	3.3	14.2	0.0
S1 B	92.8	14.2	0.36	0.0	38.3	49.2	4.2	0.0	0.0
S2 A	215	9.9	0.36	6.3	22.3	23.0	27.3	21.0	0.0
S2 B	212	10.3	0.68	0.7	49.3	29.0	11.7	4.7	4.6
S2 C	80	6.5	0.46	9.2	55.0	11.7	12.5	11.6	0.0

Table 14. Summary of habitat measurements collected on snorkel sites in Sulphur Creek during August 1994.

Site	Length (m)	Width (m)	Depth (m)	% Silt	% Sand	% Gravel	% Pebble	% Cobble	% Boulder
S1 A	123	14.6	0.49	5.8	35.0	45.8	3.3	14.2	0.0
S1 B	92.8	14.2	0.36	0.0	38.3	49.2	4.2	0.0	0.0
S2 A	215	9.9	0.36	6.3	22.3	23.0	27.3	21.0	0.0
S2 B	212	10.3	0.68	0.7	49.3	29.0	11.7	4.7	4.6
S2 C	80	6.5	0.46	9.2	55.0	11.7	12.5	11.6	0.0

Table 15. Species composition by percentage of three sample sites on Loggers Creek an irrigation channel in the City of Boise, Idaho.

NO. 1 UPPER END JUST BELOW DIVERSION

<u>SPECIES</u>	<u>PERCENTAGE</u>
RAINBOW TRT	5.3
REDSIDE SHINER	62.5
SUCKER	1.8
SCULPIN	26.8
N PIKEMINNOW	3.6

NO. 2 ABOVE PARK CENTER BRIDGE

<u>SPECIES</u>	<u>PERCENTAGE</u>
SPECKLED DACE	10.6
N PIKEMINNOW	19.1
SUCKER	21.3
CHISLEMOUTH	19.1
RAINBOW TROUT	10.6
LARGEMOUTH BASS	2.1
BROWN TROUT	12.7
REDSIDE SHINER	4.2

NO. 3 BELOW PARK CENTER BRIDGE

<u>SPECIES</u>	<u>PERCENTAGE</u>
LARGEMOUTH BASS	6.2
REDSIDE SHINER	12.5
SCULPIN	3.1
BROWN TROUT	50.0
WHITEFISH	3.1
BLUEGILL	3.1
RAINBOW TROUT	12.5

Table 16. Summary of habitat measurements taken at three sample sites on Loggers Creek an irrigation channel of the Boise River in the City of Boise, Idaho.

Site	Length (m)	Width (m)	Depth (m)	% Sand	% Gravel	% Cobble	% Boulder
NO. 1	80.0	6.7	0.73	66.9	6.1	21.7	5.3
NO. 2	49.0	6.6	0.25	21.3	52.7	19.3	6.7
NO. 3	80.0	11.7	0.25	80.9	1.8	12.7	4.6

NO. 1. At end of Park Center Blvd., downstream of culvert.

NO. 2. Just above Park Center Blvd bridge.

NO. 3. Below Park Center Blvd. bridge by Doubletree Hotel.

Table 17. Payette River steelhead angler counts by hourly strata and date, mean angler count per strata, number of days per strata and estimated angler hours per strata.

Date	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm
3/10	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	28	23	14		
3/11													
3/12	29	23	15	19	21				20	27			
3/13													
3/14													
3/15													
3/16									9	7	7	5	
3/17	7	8	9	13	14	11	12	10	11	9	10	5	0
3/18	3	1	1	5	3	3	5	5					
3/19			22	25	28			16					
3/20	5	9	12	11	14	17	18	17	23	13	7	3	0
3/21	0	0	2	3	6	2	1	3	2	0	2	1	
3/22	0	0	0	1	2	2	2						
3/23	0	2	2	3	1	0	0	2	4	7	3	1	0
3/24	0	1	1	4	4	4	5	8	6	4	4	3	3
3/25							9	7	9	13	6	5	5
3/26													
3/27													
3/28													
3/29													
3/30													
3/31													
4/1	1	4	0	5	2	4	7	6	7	10	11	7	2
4/2													
4/3	0	0	0	0	1	5	7	6	3	11	8	2	0
Mean cnt	4.5	4.8	5.8	8.1	8.7	5.3	6.6	8.0	11.0	11.0	7.1	3.5	1.4
No of days	24	24	24	24	24	24	24	24	25	25	25	25	25
Est. Hour	108	115	140	194	209	128	158	192	277	282	177	88	36

Table 18. Comparison of angler trips per mile for various Idaho waters with steelhead.

River Section	Number of days in period	Angler trips	River miles in section	Angler trips per mile
Salmon River				
Salmon River mouth-Whitebird Creek	90	1,507	52	29
Whitebird-Little Salmon River	90	1,585	31	51
Little Salmon River-Vinegar Creek	90	1,031	24	43
Vinegar Creek-South Fork Salmon River	90	778	22	35
South Fork Salmon River-Middle Fork Salmon River	90	1,780	61	29
Middle Fork Salmon River-North Fork Salmon River	120	5,476	38	144
North Fork Salmon River-Lemhi River	120	2,402	21	52
Lemhi River-Pahsimeroi River	120	1,887	46	41
Pahsimeroi River-East Fork Salmon River	120	1,770	39	45
East Fork Salmon River-Sawtooth	120	2,441	44	55
Boise River-Barber Park-Glenwood Bridge	31	2,177	11	198
Payette River-Plaza Road Bridge-Black Canyon Dam	25	526	1	526

Table 19. Habitat measurements taken on Canyon Creek on September 30, 1994.

Average Width (m)	% Gradient	Average depth (m)	% Sand	% Gravel	% Rubble
6.7	2.8	0.29	14.2	32.5	51.7

Table 20. Water quality measurements taken on Canyon Creek on September 30, 1994.

pH	- 8.4
Conductivity	- 70 Umhos/cm
Alkalinity	- 15 mg/l as CaCo3
Hardness	- 40 mg/l as CaCo3
Water Temperature	- 44°F at 1030 Hrs
Water Temperature	- 48°F at 1448 Hrs

Table 21. Average back-calculated length-at-age for rainbow trout in the South Fork Boise River below Anderson Ranch Dam, September 1994.

Year Class	Age	N	1	2	3	4	5	6	7	8
1993	1	50	95							
1992	2	101	97	179						
1991	3	69	97	191	306					
1990	4	33	95	171	268	351				
1989	5	16	100	173	276	344	396			
1988	6	11	90	161	254	329	375	405		
1987	7	1	125	216	290	343	398	430	465	
1986	8	1	80	136	214	266	298	328	371	397
All			96	180	287	343	384	401	418	397
N			282	232	131	62	29	13	2	1

Table 22. Minimum, maximum, and average length-at-capture by age for rainbow trout in the South Fork Boise River below Anderson Ranch Dam, September 1994.

Year Class	Age	N	Minimum Length	Average Length	Maximum Length	Standard Error
1994	0	11	49	65	84	2.97
1993	1	50	130	169	375	5.82
1992	2	101	175	250	430	5.55
1991	3	69	266	359	465	5.14
1990	4	33	280	393	470	8.48
1989	5	16	364	429	475	7.74
1988	6	11	196	452	507	9.34
1987	7	1	480	480	480	0
1986	8	1	424	424	424	0

Table 23. Age distribution (percent) of rainbow trout by size group.

Size Group (cm)	Sample Size	Age 1 %	Age 2 %	Age 3 %	Age 4 %	Age 5 %	Age 6 %	Age 7 %	Age 8 %
13	7	100							
14	9	100							
15	8	100							
16	9	100							
17	10	70	30						
18	9	44	56						
19	8	12	88						
20	9	11	89						
21	10	10	90						
22	11	9	91						
23	9		100						
24	11		100						
25	5		100						
26	8		88	12					
27			78	22					
28	2		100						
29	6	17	50	33					
30	4		75	25					
31	8		75	12	12				
32	9			22	56	22			
33	5		40	60					
34	10			100					
35	11		9	55	36				
36	10		10	70	10	10			
37	9		11	78	11				

Table 23. (continued)

38	6				67	16	16		
39	8		12	38	38	12			
40	9		22	33	44				
41	10		10	20	40	30			
42	11			27	36	18	9		9
43	7		14	29	29	14	14		
44	5					60	40		
45	4			25	50		25		
46	7			14	14	43	28		
47	2				50	50			
48	2						50	50	
49	0								
50	1						100		

Table 24. Length and estimated age of bull trout collected from the South Fork Boise River below Anderson Ranch Reservoir, September 1993 and 1994.

Length	243	327	375	397	405	428	429	430	433	450	460	488	490	514
Age	3	3	4	4	4	5	5	4	5	5	6	4	5	5

Table 25. Numbers of rainbow trout collected by cm group during mark and recapture runs, and number of recaptures in the South Fork Boise River below Anderson Ranch Dam, September 1994.

Length (cm)	Mark Run	Recap Run	Recaps	Length (cm)	Mark Run	Recap Run	Recaps
13	14	6		32	22	15	1
14	25	18		33	31	29	3
15	19	26		34	18	29	3
16	22	26	2	35	41	32	3
17	18	27	3	36	24	30	1
18	16	33	3	37	23	29	
19	20	10		37	22	23	1
20	23	23	1	39	27	26	2
21	14	17	2	40	26	21	2
22	20	23	2	41	20	13	2
23	14	11		42	12	15	3
24	8	17		43	9	10	1
25	8	12		44	7	10	
26	12	11		45	10	6	1
27	10	12		46	6	6	1
28	5	5		47	3	3	1
29	14	8		48	2	1	
30	11	16	2	49	1		
31	19	14	2	50	1		

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project I: Surveys and Inventories

Subproject I-D: Southwest Region

Job: d

Title: Salmon and Steelhead Investigations

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Regional fisheries staff conducted snorkel surveys for chinook salmon *Oncorhynchus tshawytscha* parr monitoring in Bearskin, Elk, and Sulphur creeks in 1994. Snorkeling was also conducted for chinook supplementation sites in Sulphur and the North Fork Sulphur Creeks. A total of 25, 117, and 124 chinook parr were observed in the parr monitoring sites of Bearskin, Elk and Sulphur creeks, respectively. Sulphur Creek supplementation monitoring sites contained 719 chinook juveniles. The North Fork Sulphur Creek supplementation sites contained no juvenile chinook.

Salmon spawning ground surveys were conducted in Bear Valley, Elk, and Sulphur creek trend areas on August 22-25, 1994. Redds numbered 10, 8, and 0 in Bear Valley, Elk, and Sulphur creek trend areas, respectively. Redd count trend areas in 1994 were 6.7%, 1.9%, and 0% of trend data area counts in 1993.

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METHODS

Snorkel Counts

Parr monitoring snorkel counts were conducted with two snorkelers moving upstream through the trend section identifying fish species and sizes (resident species counts in Rivers and Streams section), and relaying information to a data recorder walking the stream bank. Snorkel sections were then measured for area, (length and minimum of four widths), of the area snorkeled. Chinook supplementation sites were divided into distinct habitat types with each habitat type recorded as a unit and each habitat unit area measured separately. Some supplementation sites only used one diver because of small stream widths.

Redd Counts

Redds were enumerated according criteria described in the draft Idaho Redd Counting Manual. Carcasses encountered were identified as to sex, and measured (fork length) where possible. Live fish observed were visually classified as to sex and ocean age (jacks, 2, 3, or 4).

RESULTS

Snorkel Counts

Five snorkel transects were completed in Bearskin and Elk Creeks, respectively, and three in Sulphur Creek. Thirty transects were completed in Sulphur and four transects were done in North Fork Sulphur Creek for chinook supplementation. Numbers of chinook juveniles counted and areas measured are provided in Table 1.

Redd Counts

Salmon redds were counted in trend areas in Bear Valley, Elk, and Sulphur creeks on August 22-25, 1994. Redds were also counted in Sulphur Creek's "other" area. Redds counted, dates of counts, live fish observed, and carcasses encountered by area are reported in Table 2.

Counts in 1993 in Bear Valley, Elk, and Sulphur creek trend areas were 10, 8, and 0, respectively (Table 2). Counts in 1994 in all streams were much less than in 1993.

TABLES

Table 1. Summary of snorkeling activities in Bearskin, Elk, and Sulphur Creeks for 1994.

Stream	Length snorkeled(cm)	Area snorkeled (m ²)	Juvenile Sp/Su chinook	Adults observed	Redds observed
Bearskin ^a	535	4,072	25	0	0
Elk	778	7,949	117	0	0
Sulphur North Fork ^b	118	346	0	0	0
Mainstem ^a	395	3,902	124	0	0
Mainstem ^b	1,634	11,645	719	0	0
^a parr monitoring ^b supplementation					

Table 2. Salmon spawning ground counts for Bear Valley, Elk, and Sulphur Creeks. Counts completed August 22-25, 1994

Section	Section	Date	Redds	Live Fish	Carcasses
BVC-mine enclosure	Ws-9a	8/22	0	1-2oc m 1-3oc m 3-3oc f 1-unk	
BVC-mine-Cub Creek	Ws-9b	8/22	0		
BVC-Cub-Sack Ck	Ws-9c	8/22	0		
BVC-Sack-Elk Ck	Ws-9d	8/22	2	1-3oc m 1-3oc f	
BVC-Elk-Poker Br	Ws-10a	8/25	8	1-2oc m 1-3oc m 1-unk 3-3oc f	1 decomposed carcass
BVC-Poker Br-Fir Ck	Ws-10b	8/25	0		
Elk-WF-Twin Br	Ws-11a	8/24	5		
Elk-Twin Br-Guard Station	Ws-11b	8/25	3	1-2oc-f	92cm f
Elk-Guard Station-BVC	Ws-11c	8/25	0		
Sulphur-below ranch	Ws-12	8/24	0		
Sulphur-Above ranch	OS-4	8/24	0		

1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project II: Technical Guidance

Subproject II-D: Southwest Region

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Regional fisheries staff continues to provide a large amount of information about regional and statewide fisheries to the general public. Staff coordinated with the Natural Resources Policy Bureau staff biologists on comment letters on various topics. Several publications were developed during the year by regional fisheries staff, including:

Allen, D.B., B.J. Flatter, and K. Fite. 1995. Redband Trout (*Oncorhynchus mykiss gairdneri*) Population and Habitat Surveys in Jump, Reynolds, and Sheep Creeks, and Sections of the Owyhee River, Owyhee County, Idaho. Idaho Bureau of Land Management, Technical Bulletin No. 95-6. March 1995.

Allen, D.B., S.P. Yundt, and B.J. Flatter. 1995. Populations of Bull Trout (*Salvelinus confluentus*) in the Payette River Drainage in the Cascade Resource Area of the Boise District of the Bureau of Land Management. Idaho Bureau of Land Management, Technical Bulletin No. 95-10. April 1995.

State of Idaho. 1994. Pre-decisional Draft Working Document, Bull Trout Conservation Strategy, Boise, Idaho.

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1994 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-19

Project IV: Population Management

Subproject IV-D: Southwest Region

Contract Period: July 1, 1994 to June 30, 1995

ABSTRACT

Warmwater fish species were captured and transferred to eight small drought-affected lakes or reservoirs to rebuild fish populations. A total of 1,388 largemouth bass *Micropterus salmoides*, 4,235 bluegill *Lepomis macrochirus*, 3,000 channel catfish *Ictalurus punctatus*, 2,812 crappie *Pomoxis sp.*, and 5,000 yellow perch *Perca flavescens* were stocked.

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