IDAHO DEPARTMENT OF FISH AND GAME

FEDERAL AID IN FISH RESTORATION
2000 JOB PERFORMANCE REPORT
PROGRAM F-21-R-25

Steven M. Huffaker, Director

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS
MAGIC VALLEY REGION (Subprojects I-H, II-H, III-H)

PROJECT I.	**SURVEYS AND INVENTORIES**
Job a.	**Magic Valley Region Mountain Lakes Investigations**
Job b.	**Magic Valley Lowland Lakes Investigations**
Job c.	**Magic Valley Rivers and Stream Investigations**
PROJECT II.	**TECHNICAL GUIDANCE**
PROJECT III.	**HABITAT MANAGEMENT**

By:

Charles D. Warren, Regional Fishery Biologist
Karen A. Frank, Fishery Technician
Fred E. Partridge, Regional Fishery Manager

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2000 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-21-R-25

Project I: Surveys and Inventories

Subproject I-E: Magic Valley Region

Job: a

Title: Mountain Lakes Investigations

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

ABSTRACT

Due to time constraints, no high mountain lakes were surveyed for this contract period.

Author:
Karen A. Frank
Fishery Technician

2000 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-25

Project: Surveys and Inventories

Subproject: Magic Valley Region

Job: b

Title: Lowland Lake Investigations

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

ABSTRACT

Kokanee *Oncorhynchus nerka* numbers in Anderson Ranch Reservoir were estimated with a midwater trawl and with hydroacoustic technology. The total population estimate of young-of-the-year kokanee based on the trawl was 820,000 +/- 1.08 x 10^6 (95cl) fish and was 1,542,000 fish +/- 4.47 x 10^5 (90cl) for the hydroacoustic sample. Approximately 5,000 spawning kokanee were observed at 13 trend monitoring sites on the South Fork Boise River.

A total of 189 largemouth bass *Micropterus salmoides* and 723 bluegill *Lepomis macrochirus* were sampled with a single unit of lowland lakes sampling protocols at the Bruneau Dunes State Park lower north pond in October 2000. The proportional stock density was 63% for largemouth bass and 1% for bluegill.

Brown trout *Salmo trutta* move upstream out of Magic Reservoir to spawn in the Big Wood River each fall. An annual trend monitoring survey of redds made in late November counted a total of 443 redds, which is equal to the highest number ever recorded since counts began in 1986.

Mormon Reservoir was sampled with 14.5 hours of daytime gill netting effort on April 20, 2000 to determine the overwintering survival of fish. A total of 43 rainbow trout *O. mykiss* and three yellow perch *Perca flavescens* were sampled.

Population estimates of rainbow trout were made on the two ponds fed by the Niagara Springs ditch on the Niagara Springs Wildlife Management Area in April and May 2000. Fish were sampled by electrofishing on two nights at each pond for the estimate. The total population of rainbow trout at least 100 mm long was estimated to be 1,418 +/- 914 in the lower pond and 693 +/- 326 in the upper pond.

The fishery at Salmon Falls Creek Reservoir was extensively sampled by numerous methods in 2000. Overall results indicate good numbers of largescale sucker *Catostomus macrochelius,* smallmouth bass *Micropterus dolomieu,* walleye *Stizostedion vitreum* and rainbow trout. Low numbers of yellow perch and spottail shiner *Richardsonius balteatus* in the sample may be an indication of low forage abundance for walleye.

Zooplankton abundance and quality was measured at Anderson Ranch Reservoir, Magic Reservoir and Salmon Falls Creek Reservoir. Results indicate oligotrophic conditions at Anderson Ranch Reservoir but high levels of useable zooplankton at Magic Reservoir and Salmon Falls Creek Reservoir.

Author:

Charles D. Warren
Regional Fishery Biologist

OBJECTIVES

To obtain current information for fishery management decisions on lowland lakes and reservoirs, including angler use, success, harvest and opinions, fish population characteristics, stocking success, return-to-the-creel for hatchery trout, limnology and develop appropriate management recommendations.

METHODS

Kokanee *Oncorhynchus nerka* abundance and age structure were estimated in Anderson Ranch Reservoir using a nighttime midwater trawl. Methods used for the trawling followed those described by Rieman (1992) and population estimates were made by using a computer spreadsheet developed by fishery research (Bill Harryman, Idaho Department of Fish and Game, personal communication). Anderson Ranch Reservoir was arbitrarily partitioned into three strata and trawled for kokanee on the nights of July 31 and August 1, 2000. A total of 14 transects were trawled in three strata. Trawl depths ranged from 11-30 m in depth and were dependent upon reservoir depths at each site. All kokanee sampled were grouped into one of three age class groups: 1) age-0 fish 0-99 mm in total length (TL), 2) age-1 fish 100-259 mm TL, and 3) age-2+ fish $\geq$ 260 mm TL. Additionally, kokanee density and population estimates were made using hydroacoustic equipment by Idaho Department of Fish and Game (Department) Research personnel on May 15 and September 9, 2000 (Teuscher 2001). Kokanee spawn was monitored with counts of adult fish observed at 13 sites on the South Fork Boise River and Trinity Creek between August 18 and September 29, 2000. These same sites have been surveyed since 1989 except for the trap site just downstream of the Pine Bridge that was added in 1990 (Partridge and Corsi 1993).

General fishery data in lakes and reservoirs were collected and analyzed using standardized fish sampling gear and methods. A single unit of standardized lowland lake sampling protocol included one sinking variable mesh gill net, one floating variable mesh gill net, one trap net set overnight, and one hour of nighttime electrofishing. Fish were electrofished using a Smith-Root Model SR-18 electrofishing boat array with a Model 5.0 pulsator and a Coffelt VVP-15 electrofisher. Experimental gill nets (38 m long x 1.8 m wide) had 5 panels with bar mesh sizes that ranged from 19 to 64 mm. Trap nets were designed with a 1.8 x 0.9 m trap-box; five 76-cm diameter hoops, a 23 m lead, and 2 cm bar mesh netting. Other sampling gear included a 15.2 x 1.4 m beach seine with 6.2 mm bar mesh.

Data analysis for standardized lowland lake surveys included total length frequencies of all fish sampled and an estimate of total biomass of all fish sampled broken down by species. Relative weights for walleye *Stizostedion vitreum* were based on standard weight equations developed by Murphy et al. (1990) and relative weights for largemouth bass *Micropterus salmoides* and smallmouth bass *Micropterus dolomieu* were based on standard weight equations developed by Anderson et al. (1983). Growth was estimated by back-calculating total length at annuli on scales. Proportional stock densities (PSD) were based on size designations provided by Anderson et al. (1983).

Population estimates were based on the single mark-recapture model described by Ricker (1975) as the Chapman modification of Petersen's model and is expressed as:

$$\hat{N} = \frac{(M+1)(C+1)}{R+1} - 1$$

And the variance of the estimate is:

$$\hat{V}(\hat{N}) = \frac{(M+1)^2(C+1)(C-R)}{(R+1)^2(R+2)}$$

Where:

$\hat{N}$ = the size of the population at the time of marking

$\hat{V}$ = Variance of $\hat{N}$
M = Number of fish marked
C = Catch or sample taken for census
R = Number of recaptured marks in the sample

Redd counts for brown trout *Salmo trutta* were made by walking upstream through the prescribed reach within a week or two after the end of the spawning season.

Limnological samples were taken by sampling surface water for conductivity, pH, total hardness, and alkalinity. A Hach Kit was used for the total hardness and alkalinity measurements, a Solu Bridge conductivity meter was used for measuring conductivity and an Oakton PhTestr2 was used for measuring pH. Temperature and dissolved oxygen profiles were measured in-situ using a YSI Model 57 temperature/dissolved oxygen meter from a boat. A Secchi disk was used from a boat to measure lake and reservoir water transparency.

Zooplankton was assessed on reservoirs to measure productivity using a zooplankton ratio model described by Teuscher (1999). All reservoirs surveyed were sampled at three general locations: upper-reservoir, mid-reservoir, and near the dam.

RESULTS AND DISCUSSION

Anderson Ranch Reservoir

Abundance estimates, density estimates and spawner counts indicated there was sufficient kokanee recruitment to the reservoir. A total of 695 kokanee were sampled with the nighttime midwater trawl. The trawl abundance estimate of age-0 kokanee (820,000 fish) was one-third of the estimate made in 1999; however, this estimate is well within the range of estimates from the trawl samples taken since 1993 (Table 1). In contrast, the hydroacoustic-generated estimate (1,542,000 fish +/- 4.47×10^5) was twice that generated by the trawl (Table 2) (Teuscher 2001). The trawl density estimates for the whole reservoir were similar to those found in 1997 and were within the middle to upper range of recorded densities (Table 1).

Table 1. Anderson Ranch Reservoir kokanee population and density estimates based on nighttime midwater trawling results from 1993 to 2000. Stratified estimates are reported only for trawl completed on July 31 and August 1, 2000.

Year	Strata (# trawls)	Estimate	Age group			
			Age-0	Age-1	Age-2	Age-3
2000	Strata 1 (5)	Population (95%CI)	582,221 (1.26x10^6)	21,779 (26,267)	0	0
		Density (Fish/ha)	1,004	38	0	0
		SD	1,744	36	-	-
	Strata 2 (5)	Population (95%CI)	133,552 (318,322)	24,783 (41,239)	2,754 (7,641)	0
		Density (Fish/ha)	243	45	5	0
		SD	466	60	11	
	Strata 3 (4)	Population (95%CI)	104,055 (89,304)	7,894 (4,369)	1,435 (2,635)	0
		Density (Fish/ha)	325	25	4	0
		SD	176	8	5	-
	Reservoir	Population (95%CI)	819,828 (1.08x10^6)	54,455 (40,645)	4,189 (6,488)	0
		Density (Fish/ha)	565	38	3	0
1999	Reservoir	Population (95%CI)	1,446,945 (521,699)	12,549 (5,578)	15,210 (8,980)	0
		Density (Fish/ha)	1,201	10	13	0
1998[a]	Reservoir	Population (Var)	117,620 (5x10^8)	32,815 (8x10^8)	10,039 (8.9x10^6)	0
		Density (Fish/ha)	109	29	8	0
1997[a]	Reservoir	Population (Var)	853,932 (7x10^8)	34,582 (5x10^7)	5,831 (2.1x10^6)	0
		Density (Fish/ha)	497	23	4	0
1996[a]	Reservoir	Population (Var)	109,400 (2x10^8)	7,733 (4x10^7)	3,551 (7x10^6)	0
		Density (Fish/ha)	64	6	2	0
1995[a]	Reservoir	Population (Var)	3,134 (3x10^6)	15,995 (3x10^7)	38,364 (5 x 10^7)	0
		Density (Fish/ha)	2	11	25	0
1994[a]	Reservoir	Population (Var)	230,411 (2x10^{10})[b]	444,791 (1x10^{11})[c]	33,709 (5x10^8)	0
		Density (Fish/ha)	191	368	28	0
		Population (Var)	126,916 (6x10^8)[d]			
		Density (Fish/ha)	106			
1993	Reservoir	Population (Var)	212,788 (5x10^9)[b]	2,380 (6x10^6)	1,427 (2x10^6)	660 (4x10^5)
		Density (Fish/ha)	212	2	1	1
		Population (Var)	33,564 (4x10^8)[d]			
		Density (Fish/ha)	26			

[a] Based on model by Rieman (1992)
[b] Wild fish
[c] Estimate of wild and hatchery fish combined for year.
[d] Hatchery fish

Table 2. Kokanee densities by transect and age-class in Anderson Ranch Reservoir. Transects 1-3 were too shallow (<3 m) to safely sample using the hydroacoustic boat.

		Kokanee densities (number/ha)			
Transect	**Transect length (m)**	**YOY**	**Age-1**	**Age-2+**	**Total**
1	NA	NA	NA	NA	NA
2	NA	NA	NA	NA	NA
3	NA	NA	NA	NA	NA
4	1,074	417	88	0	505
5	269	266	124	0	390
6	1,035	7	40	4	52
7	1,626	38	55	1	95
8	1,485	466	631	36	1,133
9	783	352	685	29	1,066
10	766	398	640	23	1,062
11	603	345	711	22	1,078
12	1,061	289	641	40	970
13	807	241	615	41	897
14	1,229	121	344	33	498
15	1,303	343	470	25	838
16	1,487	1,098	605	43	1,746
17	768	1,489	911	18	2,418
18	755	1,924	1,166	52	3,142
19	223	1,629	595	20	2,244
20	1,488	3,327	1,253	43	4,623
21	1,660	1,390	772	35	2,197
22	1,055	988	1,210	26	2,225
23	512	1,401	996	34	2,431
24	852	947	1,095	20	2,062
25	592	955	741	25	1,721
26	1,056	1,297	656	25	1,978
27	779	1,280	1,861	7	3,148
28	1,086	1,616	2,144	73	3,833
	Mean	**905**	**762**	**27**	**1,694**
	Abundance	**1,542,000**	**1,298,000**	**46,000**	**2,887,000**
	90% CI	**29%**	**23%**	**22%**	**24%**

Approximately five thousand pre-spawning and spawning kokanee were counted at the 13 trend monitoring sites on the South Fork Boise River in August and September 2000 (Table 3). The 2000 escapement estimate was similar to those reported in 1995 and 1996 (Figure 1).

Daytime temperature and dissolved oxygen profiles measured at three locations on Anderson Ranch Reservoir on August 1 indicated a strong temperature stratification with the thermocline beginning at about 3 m deep and the top of the hypolimnion at about 15 m deep (Table 4). Dissolved oxygen levels stabilized to about 5 mg/l throughout the hypolimnion.

Bruneau Dunes State Park Ponds

The Bruneau Dunes State Park north pond is the smaller pond of the two located at the base of the large sand dune within Bruneau Dunes State Park. The fishery is managed for largemouth bass *Micropterus salmoides* and bluegill *Lepomis macrochirus* with fishing rules that allow for the harvest of two bass, none less than 20 inches long.

Fish were sampled with a single unit of lowland lakes sampling effort in the north pond in October 2000 to determine the success of restocking the pond after eradicating all of the fish with rotenone in the fall of 1996. Methods used include one sinking gill net, one floating gill net and one trap net set overnight and a total of 48 minutes of nighttime electrofishing effort. A total of 189 largemouth bass and 723 bluegill were sampled (Table 5). The proportional stock density was 63% for largemouth bass and 1% for bluegill. Analysis of scales for back calculated length to annuli formation indicates that by age-3 largemouth bass have exceeded 300 mm in total length and bluegill have exceeded 100 mm (Tables 6 and 7).

Water quality in the north pond was suitable for bluegill and bass. The salinity of a surface water sample from the north pond taken at 1200 hours on June 16 was 0.3 ppt, conductivity was 521µ Seimens/cm, total alkalinity measured 155 mg/l and the Secchi visibility ranged from 150 cm to 210 cm. Water temperatures ranged from 20.5ºC to 19.5ºC and dissolved oxygen ranged from 8.5 to 10.0 mg/l.

The north pond water quality differed slightly from the south pond. The salinity of a surface water sampled from the large south pond at 1000 hours on June 16, 2000 was 0.7 ppt, conductivity was 1,306µ Seimens/cm, total alkalinity measured 250 mg/l and the Secchi visibility ranged from 107 cm to 132 cm. Water temperatures ranged from 20.5ºC to 21.0ºC and dissolved oxygen ranged from 7.6 to 8.6 mg/l. Evaporation has likely increased the level of dissolved ions in the larger south pond.

Magic Reservoir

A spawning ground survey was performed on the Big Wood River upstream of Magic Reservoir to monitor spawning activities of brown trout that had moved upstream from the reservoir to spawn. The survey included the reach from the sheep bridge to the outflow of a private pond on the east side of the Big Wood River approximately 1.5 km upstream of the

Table 3. Number of kokanee observed at selected sites on the South Fork Boise River during spawning ground surveys in 2000.

	Survey date						
Location[a]	8/18	8/25	9/1	9/8	9/15	9/22	9/29
1	45	0	30	25	4	1	0
2	75	25	30	35	25	0	0
3	100	25	12	40	10	3	0
4	40	50	150	100	45	38	0
5	0	2	7	3	2	0	0
6	20	10	50	175	100	60	56
7	12	10	35	20	20	15	0
8	10	14	40	15	20	15	0
9	100	60	50	400	200	60	19
10	30	100	150	400	275	200	0
11	0	35	75	350	100	175	130
12	2	10	10	10	30	8	0
13	0	25	40	150	200	200	60
Total:	434	366	679	1,723	1,031	775	265

[a]Site descriptions:
1 - Trap site: NW1/4, NE1/4, Sec 30, T2N, R10E
2 - Prospect Hole: NW1/4, NE1/4, Sec 18, T2N, R10E
3 - Johnson Hole: SW1/4, NE1/4, Sec 5, T2N, R10E
4 - Paradise Hole: SW1/4, NW1/4, Sec 33, T3N, R10E
5 - Trinity Creek: SE1/4, SW1/4, Sec 9, T3N, R10E
6 - Section 10 Hole: SE1/4, NE1/4, Sec 10, T3N, R10E
7 - Chaparral Campground: NE1/4, NE1/4, Sec 12, T3N, R10E
8 - Ranger station Hole: NE1/4, NE1/4, Sec 8, T3N, R11E
9 - Virginia Gulch Bridge: SE1/4, SE1/4, Sec 9, T3N, R11E
10 - Baumgartner Campground Hole: SE1/4, SE1/4, Sec 7, T3N, R12E
11 - Deadwood confluence: NE1/4, NE1/4, Sec 22, T3N, R12E
12 - Big Hole: SE1/4, SW1/4, Sec 18, T3N, R13E
13 - Smoky Creek confluence: SE1/4, SW1/4, Sec 9, T3N, R13E

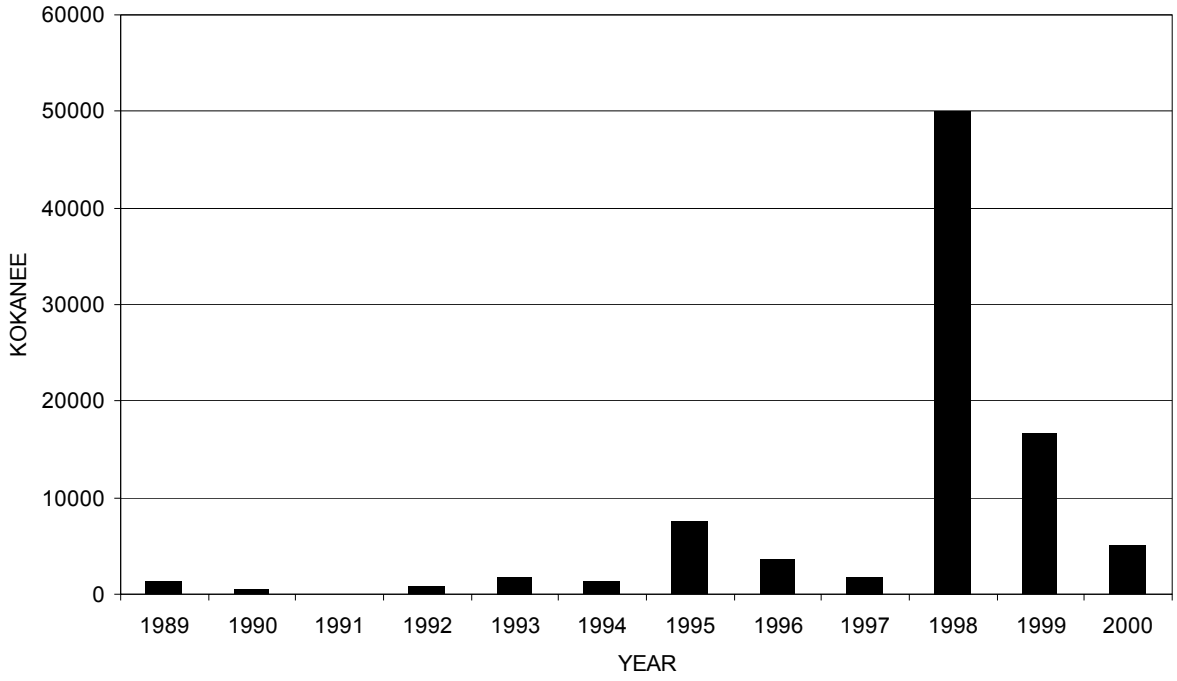

Figure 1. Annual kokanee spawner counts taken from 13 sites on the South Fork Boise River from 1989-2000.

Table 4. Daytime temperature and dissolved oxygen profiles at three sites in Anderson Ranch Reservoir in August 2000.

Date	8/1/2000
Lake	Anderson Ranch Reservoir
Station	North of Lime Creek
Depth	32 m
Time	15:00 hrs

Meters	Dissolved O_2	Temp (C)	Notes
Surface	7.8	25.0	
1	7.6	25.0	
2	8.0	24.0	
3	8.1	24.0	
4	8.2	24.0	
5	8.4	23.0	
6	8.2	22.0	
7	8.2	22.0	
8	7.2	21.0	
9	5.6	20.0	
10	5.3	19.0	
11	4.9	18.0	
12	4.7	18.0	
13	4.7	17.0	
14	4.3	16.0	
15	4.1	16.0	
16	4.2	15.0	
17	4.2	14.0	
18	4.2	14.0	
19	4.2	14.0	
20	4.2	13.0	
21	4.2	13.0	
22	4.3	13.0	
23			
24	4.3	12.0	
25			

Date	8/1/2000
Lake	Anderson Ranch Reservoir
Station	Wood Creek Arm
Depth	> 60 m (cable limit)
Time	15:45 hrs

Meters	Dissolved O_2	Temp (C)	Notes
Surface	7.4	24.0	
1	7.5	24.0	
2	7.5	24.0	
3	7.6	24.0	
4	7.6	23.0	
5	8.0	23.0	
6	8.2	23.0	
7	8.6	23.0	
8	8.6	21.0	
9	8.8	21.0	
10	7.0	20.0	
11	7.1	19.0	
12	7.2	18.0	
13	6.6	17.0	
14	6.4	17.0	
15	6.0	17.0	
16	5.8	15.0	
17	5.3	14.0	
18	5.2	14.0	
19	4.9	13.0	
20	5.0	13.0	
21	5.1	12.0	
22	5.2	12.0	
23	5.1	12.0	
24	5.2	12.0	
25			

Date	8/1/2000
Lake	Anderson Ranch Reservoir
Station	Dam
Depth	> 60 m (cable limit)
Time	16:45 hrs

Meters	Dissolved O_2	Temp (C)	Notes
Surface	7.5	23.0	
1	7.2	23.0	
2	7.6	23.0	
3	7.3	23.0	
4	7.5	22.5	
5	7.6	22.5	
6	7.8	22.5	
7	7.8	22.5	
8	8.0	21.0	
9	8.9	20.0	
10	8.7	19.0	
11	8.5	18.0	
12	8.1	17.0	
13	7.3	16.0	
14	6.7	16.0	
15	6.1	16.0	
16	5.5	15.0	
17	5.4	14.0	
18	4.9	13.0	
19	4.9	13.0	
20	4.9	12.0	
21	5.0	12.0	
22	5.1	12.0	
23	5.2	12.0	
24	5.3	11.0	
25			

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Table 4. Continued

26	4.2	11.0		26	5.6	11.0		26	5.5	11.0	
27	--	--		27	--	--		27	--	--	
28	4.2	11.0		28	5.7	11.0		28	5.8	11.0	
29	--	--		29	--	--		29	--	--	
30	3.8	10.0		30	5.6	11.0		30	5.9	11.0	
31				31	--	--		31	--	--	
32	3.8	10.0	Bottom	32	--	--		32	6.1	11.0	
	--	--		33	--	--		33	--	--	
	--	--		34	5.6	10.0		34	6.2	10.0	
	--	--		35	--	--		35	--	--	
	--	--		36	--	--		36	6.3	10.0	
	--	--		37	--	--		37	--	--	
	--	--		38	5.2	10.0		38	6.5	10.0	
	--	--		39	--	--		39	--	--	
	--	--		40	4.7	10.0		40	6.6	10.0	
	--	--		41	--	--		41	--	--	
	--	--		42	4.2	10.0		42	--	--	
	--	--		43	--	--		43	--	--	
	--	--		44	4.0	9.0		44	--	--	
	--	--		45	--	--		45	6.8	9.0	
	--	--		46	3.3	9.0		46	--	--	
	--	--		47	--	--		47	--	--	
	--	--		48	3.3	9.0		48	--	--	
	--	--		49	--	--		49	--	--	
	--	--		50	3.3	8.0		50	6.1	8.0	
	--	--		51	--	--		51	--	--	
	--	--		52	--	--		52	--	--	
	--	--		53	--	--		53	--	--	
	--	--		54	3.2	7.0		54	--	--	
	--	--		55	--	--		55	5.9	7.0	
	--	--		56	3.2	7.0		56	--	--	
	--	--		57	--	--		57	--	--	
	--	--		58	3.1	6.0		58	--	--	
	--	--		59	--	--		59	--	--	
	--	--		60	2.0	6.0	Cable limit	60	6.2	6.0	Cable limit

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Table 5. Fish sampled (# fish) with 47 minutes of nighttime electrofishing (EF), one sinking gill net (SG), one floating gill net (FG) and one trap net (TN) set overnight on the Bruneau Dunes State Park north pond in October 2000. An asterisk denotes a break in length groups.

	Fish species									
	Bluegill					Largemouth bass				
TL (mm)	EF	FG	SG	TN	Avg. Wt.	EF	FG	SG	TN	Avg. Wt.
70	2	--	--	--	6	1	--	--	--	7
80	1	--	--	--	--	1	--	--	--	--
90	26	1	1	1	13	1	--	--	--	9
100	70	2	1	2	19	7	--	--	--	14
110	83	4	1	25	23	14	--	--	--	17
120	65	--	1	1	32	29	--	--	--	22
130	22	--	--	1	40	14	--	--	--	25
140	7	--	--	--	54	11	--	--	--	33
150	1	--	--	--	55	14	--	2	--	35
160	--	--	--	--	--	12	--	1	--	44
170	--	--	--	--	--	11	--	--	--	62
180	1	--	--	--	127	6	--	--	--	61
190	--	--	--	--	--	2	--	--	--	--
200	1	--	--	--	57	5	--	--	--	93
210 *	--	--	--	--	--	4	--	--	--	104
230	--	--	--	--	--		1	--	--	180
240	--	--	--	--	--	1	--	--	--	--
250	--	--	--	--	--	1	--	--	--	--
260 *	--	--	--	--	--	--	1	--	--	235
340	--	--	--	--	--	1	--	--	--	630
350 *	--	--	--	--	--	1	--	--	--	690
370	--	--	--	--	--	3	--	--	--	882
380	--	--	--	--	--	1	--	--	--	--
390	--	--	--	--	--	4	--	--	--	975
400	--	--	--	--	--	5	--	--	--	1,175
410	--	--	--	--	--	2	--	--	--	1,200
Not meas.	218	3	1	181	--	31	0	0	0	--
Σ	497	10	5	211	--	182	2	3	--	--

13

Table 6. Back-calculated length to annulus from largemouth bass scales taken at the Bruneau Sand Dunes north pond in October 2000. Standard deviation is in parentheses.

Year class	Fish (#s)	Age 1	Age 2	Age 3
1998	25	99 (18.84)	140 (27.46)	
1997	14	174 (12.97)	290 (35.07)	337 (41.18)
Weighted average length		111	194	337

Table 7. Back-calculated length to annulus from bluegill scales taken at the Bruneau Sand Dunes north pond in October 2000. Standard deviation is in parentheses.

Year class	Fish (#s)	Age 1	Age 2	Age 3
1998	8	49 (10.71)	78 (10.59)	
1997	26	40 (9.09)	86 (13.62)	110 (14.31)
Weighted Average Length		42	84	110

Stanton Crossing Bridge on November 17, 2000. A total of 443 redds were counted, which is equal to the number counted in 1999 and is the highest number recorded since counts began in 1986 (Table 8).

Mormon Reservoir

Fish were sampled with 14.5 hours of daytime gillnetting on Mormon Reservoir on April 20, 2000 to determine the overwinter survival of fish. A total of 43 rainbow trout and three yellow perch *Perca flavescens* were sampled, indicating good survival of fish (Table 9).

Niagara Springs Ponds

The two Niagara Springs ponds are located on the Niagara Springs Wildlife Management Area, supported by an artificial diversion from Niagara Springs. See Partridge et al. (1994) for a full description of the ponds and the fishery.

Population estimates of rainbow trout residing in the ponds were based on the Chapman modification of the Petersen mark-recapture population estimate model described by Ricker (1975). Fish were captured in the mark and recapture runs using a Coffelt VVP-15 electrofisher with the drift boat electrofishing array on April 26 and May 2, 2000. The total population of rainbow trout at least 100 mm long was estimated to be 1,418 (+/- 914) in the lower pond and 693 (+/- 326) in the upper pond (Table 10). Size distributions of fish sampled indicate that the upper pond has a wider range of size or year classes of rainbow trout present (Table 11).

Salmon Falls Creek Reservoir

The fishery in Salmon Falls Creek Reservoir was sampled in August 2000 with three units of lowland lakes sampling effort, beach seining six sites, bottom trawling six transects south of Gray's Landing, and with five transects of a midwater kokanee trawl north of Gray's Landing. Fishery research personnel also sampled the fishery with a dual transducer split-beam sonar device (Teuscher 2001). The three units of lowland lakes sampling effort included using three sinking gill nets, three floating gill nets and three trap nets set overnight and 174 minutes of nighttime electrofishing (Figures 2 and 3). Electrofishing output was set to 300 volts, 14 amps, and 120 pulses per second of DC power. Equal effort was made to net all fish stunned while electrofishing, regardless of size or species.

Fish species sampled with the lowland lakes sampling protocols include bridgelip sucker *Catostomus columbianus,* largescale sucker *Catostomus macrochelius,* northern pikeminnow *Ptychocheilus oregonensis,* rainbow trout, smallmouth bass, spottail shiner *Notropis hudsonius,* walleye and yellow perch (Table 12). Additionally, one young-of-the-year black crappie *Pomoxis nigromaculatus* was sampled in a trap net and 506 crayfish *Pacifastacus sp.* were sampled by all methods combined. Largescale sucker made up 61% of the total biomass of fish sampled while smallmouth bass and walleye made up 9% and 13%, respectively (Table 13). Numerically,

Table 8. Brown trout redd counts and spawning activity on the Big Wood River and Rock Creek upstream of Magic Reservoir monitored since 1986.

	Big Wood River[a]					
Date	Reach 1	Reach 2	Reach 3	Reach 4	Total	Rock Creek
Nov. 19, 1986	--[d]	26	--[b]	96	122	--[d]
Nov. 19, 1987	104	62[c]	--[b]	30	196	--[d]
Nov. 15, 1988	13	75	31	39	158	--[d]
Nov. 18, 1989	6	20	33	8	67	1
Nov. 20, 1990	1	25	30	14	70	0
Nov. 15, 1991	3	30	38	15	86	0
Nov. 19, 1992	5	14	9	15	43	0
Nov. 24, 1993	1	28	--[b]	15	43	0
Nov. 16, 1994	9	27	56	5	97	0
Nov. 16, 1995	2	29	54	32	117	0
Nov. 11, 1996	--[d]	8	37	51	96	--[d]
Nov. 25, 1997	--[d]	44	53	23	120	--[d]
Nov. 23, 1998	--[d]	45	139	71	255	--[d]
Nov. 23, 1999	--[d]	104	209	130	443	--[d]
Nov. 17, 2000	--[d]	79	211	153	443	--[d]

[a] Reach 1 - Rock Creek to Sheep Bridge.
Reach 2 - Sheep Bridge to fence at U.S.G.S. station.
Reach 3 - Fence to Stanton Crossing.
Reach 4 - Stanton Crossing to Davis Pond.
Rock Creek - Highway 20 to mouth.
[b] Combined with previous reach.
[c] A total of 42 female brown trout were trapped and spawned from this reach by Hayspur Hatchery in 1987.
[d] Not surveyed.

Table 9. Fish sampled with 14.5 hours of daytime gill netting effort at Mormon Reservoir on April 20, 2000. Length groups are in 10 mm intervals (e.g. 130-139 mm). An asterisk denotes a break in length groups.

	Rainbow trout		Yellow perch
TL (mm)	Number sampled	Avg. wt. (g)	Number sampled
130	--	--	1
150 *	--	--	1
170 *	--	--	1
220 *	1	140	--
250 *	1	280	--
270 *	2	270	--
280	1	230	--
290	4	290	--
300	9	330	--
310	6	373	--
320 *	7	401	--
340 *	2	450	--
360	1	730	--
370 *	1	610	--
390	2	850	--
400	3	885	--
410	1	895	--
420	2	975	--
Total sampled	43		3

Table 10. Population and density estimates of rainbow trout at least 100 mm long sampled from the upper and lower Niagara Springs ponds in 2000.

	M	C	R	Est. N	CI (95%)	Area (ha)	Density (fish/ha)	Sampling Efficiency (R/M)
Lower Pond	91	107	6	1,418	914	1.6	886	0.06
Upper Pond	74	110	11	693	326	2.0	346	0.15

Table 11. Trout sampled during two nights of electrofishing the upper and lower Niagara Springs Wildlife Management Area ponds on April 26 and May 2, 2000. Does not include marked fish that were recaptured. An asterisk denotes a break in length groups.

	Lower Pond		Upper Pond	
TL (mm)	Number sampled	Avg. weight (g)	Number sampled	Avg. weight (g)
60			1	--
70	2		--	--
80	2		--	--
90	7	9	1	--
100	5	12	1	10
110	5	15	1	14
120	6	18	3	19
130	10	26	4	31
140	7	31	5	30
150	8	35	9	39
160	8	45	7	45
170	6	51	7	58
180	9	58	6	76
190	9	66	6	80
200	10	82	4	88
210	6	94	8	105
220	16	103	2	100
230	14	118	6	119
240	8	131	7	155
250	11	148	6	193
260	18	174	7	201
270	14	187	4	237
280	12	203	6	274
290	3	229	8	278
300	6	257	6	266
310	2	269	7	349
320	--	--	3	378
330	--	--	3	398
340	--	--	6	427
350	--	--	8	491
360	--	--	7	532
370	1	425	6	571
380 *	--	--	1	610
400	--	--	2	768
410	--	--	3	847
420	--	--	3	823
430	--	--	2	840
440 *	--	--	3	945
460	--	--	2	1,035
470	--	--	1	1,200
480 *	--	--	2	1,400
530 *	--	--	1	1,450
550	--	--	1	2,000
Total:	205	--	176	

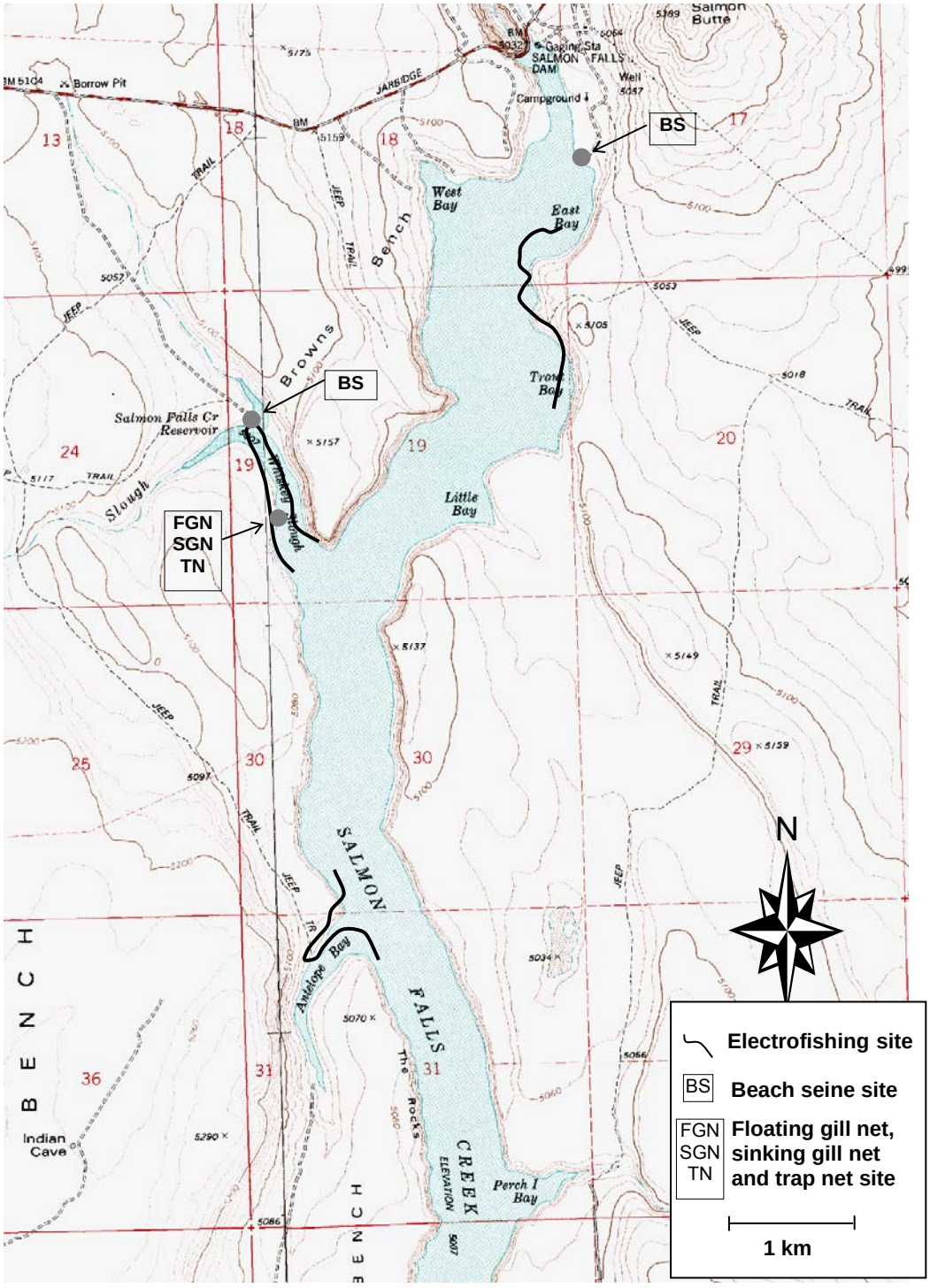

Figure 2. North half of Salmon Falls Creek Reservoir with locations of sites sampled with three units of standardized lowland lakes sampling protocols and with a beach seine in August 2000.

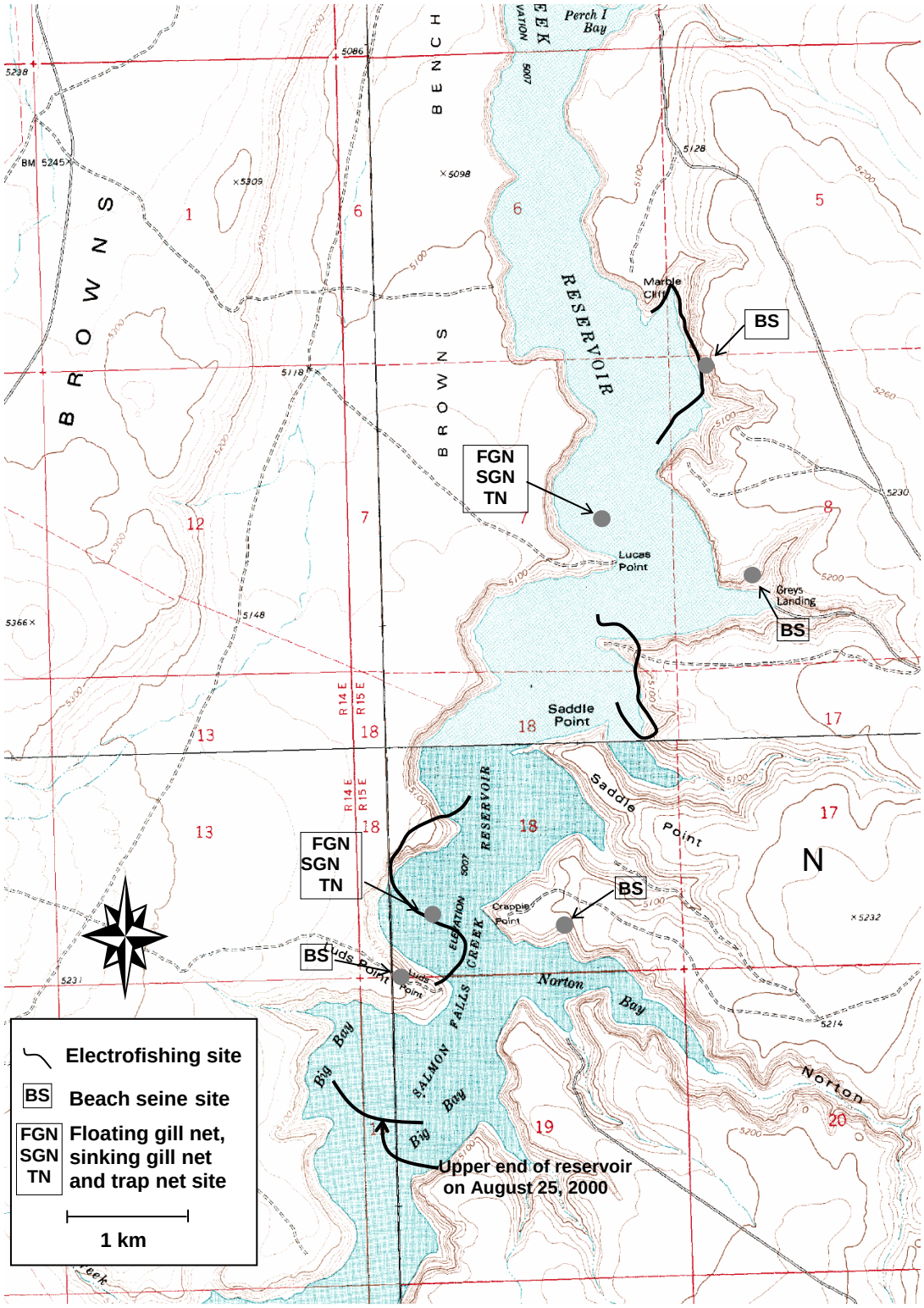

Figure 3. South half of Salmon Falls Creek Reservoir with locations of sites sampled with three units of standardized lowland lakes sampling protocols and with a beach seine in August 2000.

Table 12. Fish sampled with three units of lowland lakes sampling protocols at Salmon Falls Creek Reservoir in August 2000.

Species	TL (mm)	Gill nets		Trap net	Electro	Avg. wt. (g)	Rel. wt
		Floating	Sinking				
Bridgelip sucker	250	1	--	--	1	170	--
	280		--	1		260	--
	290	1	--	--	3	295	--
	300		1	1	2	284	--
	310	1	1	--	1	323	--
	320	1	1	--	2	330	--
	330	1	--	--	1	373	--
	340		--	1	--	410	--
	360	1	1	1	--	537	--
	370	--	--	--	1	500	--
	380	1	--	--	--	510	--
	Total	7	4	6	11	--	--
Largescale sucker	270	--	1	--	--	230	--
	280	--	--	--	1	265	--
	340	1	--	--	2	--	--
	350	-	--	--	2	--	--
	360	--	--	--	2	--	--
	380		--	--	2	--	--
	390	1	--	--	--	--	--
	400	3	1	1	1	810	--
	410	1	2	--	4	832	--
	420	2	--	--	12	--	--
	430	5	3	2	18	933	--
	440	5	5	--	15	984	--
	450	7	5	1	24	1,013	--
	460	6	4	2	20	1,094	--
	470	6	3	1	31	1,242	--
	480	8	1	1	20	1,243	--
	490	--	1	1	10	1,400	--
	500	3	3	1	7	1,430	--
	510	2	2	1	11	1,367	--
	520	5	7	--	6	1,622	--
	530	7	5	1	5	1,638	--
	540	6	4	--	6	1,850	--
	550	7	3	1	6	1,867	
	560	5	1	--	2	1,925	--
	570	4	1	--	2	2,050	--
	580	1	1	--	1	2,175	--
	600	1	1	--	1	2,700	--
	Total	86	54	13	211		
Rainbow trout	155	--	--	--	1	30	
	180	--	--	--	1	--	
	210	1	--	--	--	--	
	240	--	--	--	1	--	
	250	--	--	--	5	--	
	260	--	1	--	7	185	
	270	--	--	--	13	212	

Table 12. Continued

Species	TL (mm)	Gill nets		Trap net	Electro	Avg. wt. (g)	Rel. wt
		Floating	Sinking				
	280	3	--	--	26	260	--
	290	3	--	--	20	244	--
	295		--	--	1	--	--
	300	1	2	--	26	290	--
	310	4	2	--	19	337	--
	320	4	5	--	15	360	--
	330	2	2	--	16	387	--
	340	1	1	--	9	424	--
	350	1	1	--	5	560	--
	360		--	--	8	497	--
	370	1	--	--	10	509	--
	380		1	--	10	541	--
	390	2	--	--	6	554	--
	400		1	--	3	700	--
	405		--	--	1	590	--
	410		--	--	6	733	--
	420		--	--	4	743	--
	430		1	--	3	803	--
	440	1	--	--	3	677	--
	450		--	--	1	960	--
	470		--	--	1	1,100	--
	Total	24	17	--	221	--	--
Smallmouth bass	55	--	--	--	1	--	--
	100	--	--	--	2	18	74
	110	--	--	--	2	--	--
	120	--	--	--	13	25	93
	130	--	--	--	32	29	104
	140	--	--	--	53	36	105
	150	--	--	--	61	46	101
	160	--	--	--	29	56	101
	170	--	--	--	17	72	94
	180	--	1	--	23	83	97
	190	--	1	--	19	99	96
	200	--	1	--	22	116	96
	210	--	--	--	22	118	110
	220	--	3	--	26	153	97
	230	--	1	--	18	173	99
	240	--	--	--	26	193	101
	250	--	--	--	22	198	111
	260	--	3	--	8	247	100
	270	--	--	--	13	262	106
	280	--	--	--	13	317	98
	290	--	1	--	12	335	103
	300	--	--	--	11	373	103
	310	1	1	--	5	438	97
	320	--	--	--	4	455	103
	330	1	--	--	3	514	100
	340	1	--	--	1	650	87
	350	--	--	--	1	710	87
	360	--	--	--	1	--	--
	370	--	--	--	1	770	95
	380	--	--	--	2	838	94
	Total	3	12	--	463		

Table 12. Continued

Species	TL (mm)	Gill nets		Trap net	Electro	Avg. wt. (g)	Rel. wt
		Floating	Sinking				
Spottail shiner	55	--	--	--	1		--
	70	--	--	--	1		--
	80	--	--	--	1		--
	90	--	--	--	1		--
	100	--	--	--	1		--
	Total	--	--	--	5		--
			--				
Northern pikeminnow	300	1	--	--	--	275	--
	310	1	--	--	--	335	--
	320	1	1	--	--	358	--
	330	1	--	--	--	390	--
	340	2	1	--	--	460	--
	350	2	1	--	2	469	--
	360	5	--	--	1	556	--
	370	5	--	--	1	546	--
	380	1	--	--	--	670	--
	400	2	1	--	--	737	--
	410	--	--	--	1	680	--
	430	--	--	--	1	710	--
	460	--	--	--	1	1,050	--
	Total	21	4	--	7	--	--
Walleye	100	--		--	7	8	101
	110	--		--	5	--	--
	120	--		--	8	14	103
	140	--		--	1	20	118
	150	--		--	2	--	--
	180	--		--	1	50	105
	190	--		--	4	57	109
	200	--	2	--	1	65	112
	210	--		--	1	70	122
	240	--		--	1	108	121
	250	1		--	1	130	115
	260	--		--	1	132	128
	280	--	1	--	8	163	131
	290	1	4	2	5	194	123
	300	9	13	--	20	220	121
	310	8	8	--	13	242	122
	320	11	11	--	19	276	118
	330	3	5	1	14	286	126
	340	2	7	2	15	319	124
	350	6		--	14	361	120
	360	2	3	--	6	407	117
	370	2	2	--	3	464	112
	380	--	1	--	2	550	102
	390	3				525	117
	400	1	2	--		582	114
	410	1	2	--	1	623	115
	420	1		--	1	650	119
	430	--	1	--		780	107
	450	--	1	--		840	115
	460		3	--		898	115
	470		1			920	120

Tabl1 12. Continued

Species	TL (mm)	Gill nets		Trap net	Electro	Avg. wt. (g)	Rel. wt
		Floating	Sinking				
	480	--	1	--	--	1,010	117
	490	1	--	--	--	1,100	115
	510	--	--	--	1	1,100	131
	530	--	--	--	2	1,350	120
	550	1	--	--	1	1,600	114
	560	--	1	--	--	1,600	121
	580	--	1	--	--	1,900	114
	690	1	--	--	--	3,500	107
	710	1	--	--	--	3,550	116
	720	1	--	--	--	4,200	102
	Total	56	70	5	158	--	--
Yellow perch	50	--	--	1	--	--	--
	60	--	--	2	--	--	--
	65	--	--	2	--	--	--
	70	--	--	2	--	--	--
	75	--	--	2	--	--	--
	80	--	--	4	--	--	--
	85	--	--	5	--	--	--
	90	--	--	7	--	--	--
	95	--	--	2	--	--	--
	100	--	--	4	--	--	--
	120	--	--	2	--	--	--
	210	--	--	--	2	154	--
	220	--	--	--	4	156	--
	230	--	--	--	2	183	--
	240	--	--	--	2	201	--
	250	1	--	--	4	252	--
	260	1	--	--	5	290	--
	270	--	1	--	2	308	--
	280	--	--	--	2	350	--
	Total	2	1	33	23		

Table 13. Salmon Falls Creek Reservoir standardized lowland lake sampling results, August 2000. Data represent catch data per one standardized lowland lake sampling unit.

		Catch		Biomass	
Species	TL range (mm)	#s	%	Kg	%
Black crappie	50	<1	<0.1	<0.01	<0.1
Bridgelip sucker	250-380	9	1.9	3.16	1.2
Largescale sucker	250-600	122	24.3	154.26	60.8
Rainbow trout (unknown origin)	155-450	6	1.1	2.40	0.9
Rainbow trout (hatchery origin)	210-470	59	11.8	24.70	9.7
Steelhead	180-390	22	4.5	5.77	2.3
Smallmouth bass	55-380	155	31.0	21.77	8.6
Northern pikeminnow	300-460	11	2.1	5.79	2.3
Spottail shiner	55-100	2	0.3	0.01	0.0
Walleye	100-720	96	19.1	33.46	13.2
Yellow perch	50-280	20	3.9	2.20	0.9
	Total	502	100.0	253.52	100.0

[a] One unit of sampling effort is equal to one floating gill net, one sinking gill net, and one trap net set overnight and one hour of night time electrofishing.

smallmouth bass and walleye made up 50% of the sample whereas spottail shiner and yellow perch made up less than five percent of the sample (Table 13). These results suggest the fishery is forage limited.

Analysis of scales for back-calculated length to annuli formation indicates smallmouth bass reach legal harvestable size (305 mm) at age six (Table 14). It takes walleye two years to reach stock length (250 mm) and four years to reach quality length (380 mm) (Table 15).

The annual beach seine forage survey was conducted on August 30, 2000. Numbers of each species sampled include 38 mottled sculpin *Cottus bairdi,* 24 young-of-the-year crappie species, 276 young-of-the-year yellow perch, 6 spottail shiner and 213 crayfish.

The bottom trawl sampled 53 young of the year crappie species, 3 largescale sucker, 2 smallmouth bass, 1 spottail shiner, 15 walleye (one was a young-of-the-year), 26 yellow perch (5 were young-of-the-year), and 76 crayfish.

No kokanee population or density estimate was made. The midwater kokanee trawl sampled no kokanee. Density and population estimates were not generated from the hydroacoustics technique. Fish detected by the equipment were not sampled with gill nets, therefore counted fish could not be partitioned by fish species. However, overall fish densities were estimated to be 446 fish/ha (Teuscher 2001).

A surface water sample was taken on August 24, 2000 for water quality measurements. Total alkalinity measured 72 mg/l, total hardness measured 75 mg/l and pH measured 7.1.

Regional Zooplankton Surveys

Zooplankton was monitored on three reservoirs in 2000 following methods described by Teuscher (1999). These were Anderson Ranch Reservoir, Magic Reservoir, and Salmon Falls Creek Reservoir. Results are provided in Table 16. Stocking recommendations based on the zooplankton quality index (ZQI) are reported in Teuscher 1999.

The ZPR and ZQI for samples taken at Magic Reservoir and Salmon Falls Creek Reservoir indicate that over-winter forage is probably not limited in either of those waters. The ZQI on Anderson Ranch Reservoir indicate that forage resources are limited.

Regional Creel Surveys

Angler contacts were made by conservation officers and regional fishery staff to gather general creel information on waters throughout the region. Results of these angler interviews are provided in Table 17.

Table 14. Back-calculated length (mm) to annulus from smallmouth bass scales taken at Salmon Falls Creek Reservoir in August 2000. Standard deviation is in parentheses.

Year Class	Number of fish	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6
1999	2	62 (1.4)	--	--	--	--	--
1998	26	72 (7.4)	112 (12.7)	--	--	--	--
1997	21	69 (12.0)	129 (28.3)	171 (31.0)	--	--	--
1996	22	73 (12.6)	121 (24.4)	176 (32.5)	219 (36.8)	--	--
1995	19	65 (9.8)	110 (17.8)	159 (29.4)	209 (39.1)	247 (40.0)	--
1994	4	74 (14.3)	129 (13.6)	192 (18.8)	250 (21.2)	287 (23.0)	324 (28.3)
Weighted avg. length:		70	118	171	217	254	325

Table 15. Back-calculated length (mm) to annulus from walleye scales taken at Salmon Falls Creek Reservoir in August 2000. Standard deviation is in parentheses.

Year class	Fish (#'s)	Age 1	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	Age 8	Age 9	Age 10	Age 11
1999	9	104	--	--	--	--	--	--	--	--	--	--
		(8.9)										
1998	11	133	221	--	--	--	--	--	--	--	--	--
		(20.8)	(27.9)									
1997	33	149	241	285	--	--	--	--	--	--	--	--
		(25.3)	(24.4)	(21.6)								
1996	42	145	256	308	341	--	--	--	--	--	--	--
		(23.1)	(34.4)	(37.3)	(42.8)							
1995	6	160	307	377	418	449	--	--	--	--	--	--
		(27.8)	(29.8)	(32.7)	(42.8)	(51.1)						
1994	3	142	284	380	443	473	492	--	--	--	--	--
		(41.1)	(42.6)	(28.5)	(37.8)	(39.1)	(43.1)					
1993	1	154	295	381	461	495	530	547	--	--	--	--
		-	-	-	-	-	-	-				
1992	0	(no scales were sampled from fish of this year class)										
1991	1	159	257	406	501	551	597	625	651	670	--	--
		-	-	-	-	-	-	-	-	-		
1990	2	159	225	376	440	502	547	578	596	608	624	--
		(20.0)	(2.2)	(34.1)	(26.8)	(26.0)	(42.1)	(56.8)	(70.4)	(74.9)	(81.5)	
1989	1	135	170	268	421	534	582	617	655	675	697	705
		--	--	--	--	--	--	--	--	--	--	--
Weighted avg. length		143	250	310	365	478	535	589	625	641	649	705

Table 16. Results of zooplankton sampling and monitoring at three reservoirs in the Magic Valley Region in 2000.

			Biomass (g/m)				
Reservoir	Date	Location	153μ	500μ	750μ	ZPR	ZQI
Anderson Ranch Res.	7/31/00	Dam	0.26	0.03	0.02	0.67	0.04
		Mid Res.	0.38	0.05	0.02	0.40	0.03
		Lime Cr. Arm	0.52	0.17	0.07	0.37	0.09
		Res. Avg.	0.39	0.09	0.04	0.48	0.05
Magic Res.	7/20/00	Dam	1.44	1.45	1.00	0.68	1.68
		Upper Res.	0.12	0.08	0.05	0.71	0.09
		Mid Res.	1.06	0.65	0.47	0.73	0.81
		Res. Avg.	0.87	0.73	0.51	0.71	0.86
Salmon Falls Cr. Res.	8/25/00	Dam	1.63	0.85	0.42	0.46	0.62
		Antelope Bay	1.28	0.78	0.73	0.91	1.42
		Greys Landing	0.87	0.57	0.66	1.15	1.41
		Res. Avg.	1.26	0.73	0.60	0.86	1.15

Table 17. Results of creel checks performed on Magic Valley Region waters in 2000.

Water	Angler (#s)	Effort (hrs) [a]	Species	Catch
Baker Creek	2	1	Hatchery rainbow trout	1
Big Cottonwood Creek	2	6		0
Big Smoky Creek	24	44	Hatchery rainbow trout	38
			Rainbow trout	4
			Bull trout	1
Big Wood River (Dec 1999)	60	102	Rainbow trout	163
			Mountain whitefish	5
Big Wood River	77	158	Hatchery rainbow trout	49
			Rainbow trout	108
			Brown trout	2
			Mountain whitefish	3
Billingsley Creek	15	29	Hatchery rainbow trout	20
			Rainbow trout	8
Billingsley Creek WMA	22	74	Hatchery rainbow trout	55
			Brown trout	1
Camas Pond #2	7	13	Hatchery rainbow trout	6
Carey Lake	13	29	Yellow perch	3
			Largemouth bass	33
Dierkes Lake	4	6	Hatchery rainbow trout	3
Dollar Lake	3	4	Hatchery rainbow trout	14
			Rainbow trout	4
			Brook trout	3
Hagerman WMA March 1	124	271	Hatchery rainbow trout	267
			Largemouth bass	36
Hagerman WMA July 1	23	64	Hatchery rainbow trout	22
			Yellow perch	3
			Bluegill	24
			Largemouth bass	39
Salmon Falls Creek Res.	316	1,118	Hatchery rainbow trout	71
			Yellow perch	20
			Walleye	270
			Kokanee	1
			Smallmouth bass	30
			Rainbow trout	40
Snake River (Bell Rapids)	7	8	Common carp	2
Sublett Creek	6	26	Hatchery rainbow trout	9
Sublett Res.	135	278	Hatchery rainbow trout	159
			Rainbow trout	16
			Brown trout	8
			Cutthroat trout	15
			Kokanee	2
Lake Cleveland	17	37	Hatchery rainbow trout	9
			Cutthroat trout	6

Table 17. Continued

Water	Angler (#s)	Effort (hrs) [a]	Species	Catch
Lake Creek Lake	5	5	Hatchery rainbow trout	10
Lake Walcott	3	2	Hatchery rainbow trout	2
Little Smoky Creek	46	47	Hatchery rainbow trout	16
			Rainbow trout	11
			Bull trout	1
Little Wood Res.	13	45	Hatchery rainbow trout	27
			Rainbow trout	23
Magic Res.	570	2,167	Yellow perch	8,015
			Rainbow trout	1,033
			Sucker	3
			Brown trout	76
Malad River	5	6	Rainbow trout	10
Mormon Res.	76	221	Hatchery rainbow trout	129
			Yellow perch	6
Oakley Res.	163	384	Hatchery rainbow trout	109
			Rainbow trout	28
			Yellow perch	7
Penny Lake	10	5	Hatchery rainbow trout	12
Richfield Canal	11	25	Hatchery rainbow trout	2
			Rainbow trout	5
Rock Creek	26	26	Hatchery rainbow trout	37
			Rainbow trout	6
			Brown trout	2
Roseworth Res.	50	179	Hatchery rainbow trout	92
			Rainbow trout	26
South Fork Boise River	110	172	Hatchery rainbow trout	31
			Rainbow trout	167
			Bull trout	2
Thorn Creek Res.	46	111	Hatchery rainbow trout	86

[a] Effort = all anglers combined for each water for all species

LITERATURE CITED

Anderson, R.O. and S.J. Gutreuter. 1983. Length, weight, and associated structural indices. In: Fisheries Techniques. The American Fisheries Society, Bethesda, Maryland. 468 p.

Mackay, W.C., G.R. Ash, and H.J. Norris (eds.). 1990. Fish ageing methods for Alberta. R.L. & L. Environmental Services Ltd. In assoc. With Alberta Fish and Wildl. Div. And Univ. of Alberta, Edmonton. 113 p.

Murphy, B.R., M.L. Brown, and T.A. Springer. 1990. Evaluation of the Relative Weight (W_r) Index, with New Applications to Walleye. North American Journal of Fisheries Management 10:85-97.

Partridge, F.E. and C.E. Corsi. 1993. Regional Fisheries Management Investigations. 1990 Job Performance Report. Idaho Department of Fish and Game, Project F-71-R-15. Boise.

Partridge, F.E. and C.D. Warren. 1994. Regional Fisheries Management Investigations. Idaho Department of Fish and Game. 1991 Job Performance Report, Project F-71-R-16, Boise.

Ricker, W.E. 1975 Computation and Interpretation of Biological Statistics of Fish Populations. Bulletin 191. Department of the Environment, Fisheries and Marine Service. Ottawa, Canada.

Rieman, B.E. 1992. Subproject II, Study II: Status and Analysis of Salmonid Fisheries, Kokanee Salmon Population Dynamics - Kokanee Salmon Monitoring Guidelines. Idaho Department of Fish and Game, Project F-73-R-14. Boise.

Teuscher, D. 1999. Project 8 - Hatchery Trout Evaluations. Subproject 2: Zooplankton Quality Index. IDFG Report No. 99-23. Idaho Department of Fish and Game, Project F-73-R-21. Boise.

Teuscher D. 2001. Lake and reservoir research. Job performance report. Grant F-73-R-23 Project 5. Idaho Department of Fish and Game, Boise, Idaho.

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

ABSTRACT

Three reaches of the Big Wood River between Hailey and Lake Creek were sampled for a population estimate of rainbow trout *Oncorhynchus mykiss* and mountain whitefish *Prosopium williamsoni* in the fall of 2000. Other species sampled include Wood River sculpin *Cottus lepomus*, bridgelip sucker *Catostomus columbianus* and longnose dace *Rhinichthys cataractae*.

Cassia Creek, Cottonwood Creek (tributary to Clyde Creek), Howell Creek and Stinson Creek are all within the historic range of Yellowstone cutthroat trout *O. clarki*. Fish were sampled from these streams as part of a project to determine the current status of cutthroat trout within their historic range. Results were mixed with cutthroat trout or cutthroat trout X rainbow trout *O. clarki X O. mykiss* hybrids being found in all streams sampled except Howell Creek, where only brook trout *Salvelinus fontinalis* were found. Vineyard Creek was sampled in a continuing trend monitoring project to assess effects of changing the point of return of irrigation water from Vineyard Creek into the Snake River. Results indicate the presence of mottled sculpin *Cottus bairdi*, speckled dace *Rhinichthys osculus*, longnose dace, redside shiner *Richardsonius balteatus*, bridgelip sucker, rainbow trout, cutthroat trout and cutthroat trout x rainbow trout hybrids.

Author:

Chuck Warren
Regional Fishery Biologist

OBJECTIVES

To obtain current information for fishery management decisions on rivers and streams, including angler use, success, harvest and opinions, fish population characteristics, spawning success, habitat characteristics, return-to-the-creel for hatchery trout and develop appropriate management recommendations.

METHODS

Small stream fisheries were sampled by electrofishing with a Smith-Root Model 15-A backpack shocker with one shocker operator and one or two netters. Larger streams were sampled with a 5,000-watt Honda generator providing AC power to a Coffelt VVP-15 electrofishing array. A canoe was used with the array providing pulsed DC power to two hand-held anodes with the canoe serving as the cathode. All fish collected were identified to species, measured (TL), and subsamples were weighed (g).

Stream habitat data were collected using ocular and measurement techniques described by Idaho Department of Fish and Game (Department) (1992). Measurements included instream habitat, substrate composition, stream width, and stream depth across several transects within the sampled area. Stream type classifications were based on Rosgen et al. (1996).

Fish population estimates were made with either a two-step depletion removal method (Seber et al. 1967) or a multiple step removal method using a maximum-likelihood estimate with a computer program developed by Van Deventner and Platts (1989). The two-step removal method was used in most instances on small streams for comparative purposes. In many cases young-of-the-year fish were not included in the population estimates due to low sampling efficiencies.

RESULTS AND DISCUSSION

Big Wood River

The Big Wood River (BWR) provides a popular destination fishery for a significant number of resident and nonresident anglers visiting the Ketchum/Sun Valley area. We estimated fish populations in three reaches of the BWR in order to monitor population trends associated with fishing rule change that occurred in 1990 (Partridge and Warren 1994 and Thurow 1990). Specific reach locations and dimensions are provided in Table 1. Population estimates were made by combining 100 mm size class estimates and by pooling all mark, capture and recapture numbers for all fish $\geq$200 mm.

Species sampled include wild and hatchery rainbow trout *Oncorhynchus mykiss*, brook trout *Salvelinus fontinalis*, mountain whitefish *Prosopium williamsoni*, cutthroat trout *O. clarkii,* Wood River sculpin *Cottus leiopomus*, and bridgelip sucker (Tables 2-4). Population and density estimates for each reach are provided in Table 5. No estimates were made for rainbow trout or mountain whitefish $\leq$100 mm.

Table 1. Big Wood River site descriptions.

Segment	Boundary	UTM Coordinates [a] Easting (m)	Northing (m)	Dimensions Length (m)	Avg. width (m)	Area (m^2)
Hailey	Upper	716,761	4,821,162	1,082	23.4	25,364
	Lower	717,245	4,820,327			
Gimlet	Upper	714,011	4,834,428	744	20.3	15,095
	Lower	713,942	4,833,710			
Hulen Meadows	Upper	710,887	4,844,596	1,274	16.7	21,233
	Lower	709,878	4,845,510			

[a] UTM coordinates all in zone 11

Table 2. Catch data from two passes of electrofishing the Big Wood River at Hailey on September 28 and October 5, 2000. Sample does not include recaptured fish in the second pass.

	Rainbow trout (wild)		Mountain whitefish		Brown trout		Brook trout		BLS[a]	WRS[b]
TL (mm)	# s	Avg. wt (g)	# s	Avg. wt (g)	# s	Avg. wt (g)	# 's	Avg. wt (g)	# s	# s
30	1	--	--	--	--	--	--	--	--	--
40	1	--	--	--	--	--	--	--	--	--
50	22	--	--	--	--	--	--	--	--	--
60	36	--	--	--	--	--	--	--	--	--
70	32	--	--	--	--	--	--	--	--	--
80	12	--	1	--	--	--	2	--	--	--
90	9	--	3	--	--	--	3	8	--	--
100	14	10	7	10	--	--	1	--	--	--
110	29	14	16	13	--	--	--	--	1	--
120	18	17	12	15	--	--	--	--	--	--
130	30	24	10	20	--	--	--	--	1	--
140	24	25	4	17	--	--	--	--	--	--
150	24	41	--	--	--	--	1	25	1	--
160	25	40	1	--	--	--	1	--	1	--
170	15	50	1	--	--	--	3	47	1	--
180	22	58	--	--	--	--	3	--	--	--
190	31	65	1	--	--	--	3	76	--	--
200	34	78	1	--	--	--	4	72	--	--
210	29	98	1	116	--	--	2	88	--	--
220	33	104	5	117	--	--	3	115	--	--
230	37	122	5	145	--	--	2	123	--	--
240	55	128	4	130	--	--	3	130	--	--
250	54	152	8	147	--	--	7	160	--	--
260	50	170	4	147	--	--	6	169	--	--
270	49	201	2	200	--	--	5	250	--	--
280	52	217	2	286	--	--	4	229	--	--
290	34	234	3	298	--	--	--	--	--	--
300	41	263	10	331	--	--	--	--	--	--
310	39	296	17	331	--	--	1	310	--	--
320	43	309	17	391	--	--	2	354	--	--
330	30	351	10	413	--	--	1	351	--	--
340	26	375	1	460	1	396	--	--	--	--
350	25	394	4	501	--	--	--	--	--	--
360	17	473	6	534	--	--	1	475	--	--
370	17	455	1	485	--	--	--	--	--	--
380	13	530	2	630	--	--	--	--	--	--
390	10	479	--	--	--	--	--	--	--	--
400	14	586	3	784	--	--	--	--	--	--
410	3	609	2	745	--	--	--	--	--	--
420	1	468	2	834	--	--	--	--	--	--
430	3	490	2	813	--	--	--	--	--	--
440	3	761	--	--	--	--	--	--	--	--
480*	1	--	--	--	--	--	--	--	--	--
Total[c]	1,058		168		1		58		5	203
	Not measured									203

[a] Bridgelip sucker
[b] Wood River sculpin
[c] Total includes fish not measured
* Indicates a break in length groups

Table 3. Catch data from two passes of electrofishing the Big Wood River at Gimlet on September 27 and October 4, 2000. Sample does not include recaptured fish in the second pass.

	Rainbow trout (wild)		Mountain whitefish		Bridgelip sucker	Brook trout	Wood River sculpin
TL (mm)	# s	Avg. wt (g)	# s	Avg. wt (g)	# s	# s	# s
40	4	--	--	--	--	--	--
50	24	--	--	--	--	--	--
60	56	--	1	--	--	--	--
70	54	--	--	--	--	--	--
80	29	--	--	--	--	--	--
90	12	--	1	--	--	--	--
100	19	10	4	10	--	--	--
110	32	13	7	--	--	--	--
120	41	20	15	18	--	--	--
130	36	22	13	--	--	--	--
140	29	28	2	30	--	--	--
150	32	34	--	--	1	--	--
160	20	45	--	--	--	--	--
170	13	50	--	--	--	1	--
180	16	59	--	--	--	--	--
190	14	72	--	--	--	--	--
200	16	83	--	--	--	--	--
210	25	93	1	--	--	--	--
220	27	137	5	123	--	--	--
230	36	126	--	--	--	--	--
240	29	139	2	--	--	--	--
250	38	149	4	170	--	--	--
260	46	177	3	--	--	--	--
270	36	211	--	--	--	--	--
280	39	227	1	257	--	--	--
290	33	239	1	--	--	--	--
300	37	263	3	315	--	--	--
310	35	309	4	355	--	--	--
320	36	321	9	400	--	--	--
330	37	378	7	--	--	--	--
340	28	387	1	443	--	--	--
350	30	452	3	--	--	--	--
360	30	446	2	--	--	--	--
370	24	481	5	612	--	--	--
380	20	505	5	630	--	--	--
390	20	430	2	699	--	--	--
400	11	715	4	655	--	--	--
410	8	702	2	730	--	--	--
420	4	--	2	944	--	--	--
430	4	--	--	--	--	--	--
440	1	807	--	--	--	--	--
450	5	748	1	1132	--	--	--
470 *	1	960	--	--	--	--	--
480	1	--	--	--	--	--	--
Total [a]	1,088		110		1	1	263
Not Measured							263

[a] Total includes fish counted but not measured

* Indicates a break in length groups

Table 4. Catch data from two passes of electrofishing the Big Wood River at Hulen Meadows on September 26 and October 3, 2000. Sample does not include recaptured fish in the second pass.

	Rainbow trout (hatchery)		Rainbow trout (wild)		Mountain whitefish		Brook trout		CTT[a]	WRS[b]
TL (mm)	# s	Avg. wt (g)	# s	Avg. wt (g)	# s	Avg. wt (g)	# s	Avg. wt (g)	# s	# s
30	--	--	2	--	--	--	--	--	--	--
40	--	--	9	--	--	--	--	--	--	--
50	--	--	50	--	1	--	--	--	--	--
60	--	--	67	--	1	--	1	--	--	--
70	--	--	44	--	2	--	1	--	--	--
80	--	--	15	--	13	--	1	--	--	--
90	--	--	32	8	13	--	1	--	--	--
100	--	--	40	10	1	--	--	--	--	--
110	--	--	37	13	--	--	--	--	--	--
120	--	--	24	17	1	18	2	14	--	--
130	--	--	25	22	1	16	--	--	--	--
140	--	--	19	28	--	--	--	--	--	--
150	--	--	11	34	3	27	2	40	--	--
160	--	--	9	42	1	38	--	--	--	--
170	--	--	6	48	2	39	--	--	--	--
180	--	--	5	58	--	--	--	--	--	--
190	--	--	5	67	1	62	--	--	--	--
200	--	--	4	75	1	68	--	--	--	--
210	1	103	3	92	--	--	--	--	--	--
220	--	--	7	177	--	--	--	--	--	--
230	--	--	1	109	--	--	--	--	--	--
240	2	--	6	145	--	--	--	--	--	--
250	--	--	7	150	--	--	1	158	--	--
260	--	--	7	170	1	185	--	--	--	--
270	1	174	5	201	--	--	1	--	--	--
280	1	212	10	207	1	--	--	--	--	--
290	--	--	2	237	--	--	--	--	--	--
300	1	286	5	263	--	--	--	--	--	--
310	1	278	10	288	2	332	--	--	--	--
320	--	--	6	317	--	--	--	--	1	--
330	--	--	15	353	1	390	--	--	--	--
340	--	--	20	385	3	466	--	--	--	--
350	--	--	15	436	--	--	--	--	--	--
360	1	550	9	453	1	565	--	--	--	--
370	--	--	11	498	1	615	--	--	--	--
380	--	--	6	521	1	645	--	--	--	--
390	--	--	8	497	--	--	--	--	--	--
400	--	--	6	584	--	--	--	--	--	--
410	--	--	6	664	--	--	--	--	--	--
420	--	--	3	512	--	--	--	--	--	--
430	--	--	4	739	--	--	--	--	--	--
Total	8		576		52		10		1	231
Not measured:										231

[a] Cutthroat trout
[b] Wood River sculpin

Table 5. Population and density estimates of rainbow trout and mountain whitefish sampled from three segments of the Big Wood River in September and October 2000.

			Population estimate[a]				
Segment	Species	TL (mm)	M	C	R	Nest 95% (CI)	Density Fish/100m^2)
Hailey	Rainbow trout	100-199	145	100	13	1,053 (495)	4.1±1.9
		200-299	275	223	71	859 (162)	3.4±0.6
		≥300	199	164	77	423 (68)	1.7±0.3
	Mountain whitefish	≥100	114	72	25	330 (101)	1.3±0.4
Gimlet	Rainbow trout	100-199	176	87	15	974 (418)	6.4±2.7
		200-299	212	163	50	685 (154)	4.5±1.0
		≥300	210	213	91	491 (75)	3.2±0.5
	Mountain whitefish	≥100	67	38	5	442 (301)	2.9±2.0
Hulen Meadows	Rainbow trout	100-199 200-299	110 31	83 28	12 7	717 (345) 116 (64)	3.4±1.6 0.5±0.3
		≥300	97	64	37	168 (34)	0.8±0.2
	Mountain whitefish	≥100	18	6	2	44 (33)	0.2±0.2

[a] M = Number marked in initial pass of electrofishing
C = Number caught in second pass of electrofishing
R = Number of marked fish recaptured in the second pass.

Cassia Creek

Cassia Creek is a tributary to the Raft River flowing east from its headwaters in the Albion Mountains east of the town of Oakley, Idaho. Fish were sampled by electrofishing on September 20, 2000 for the purpose of determining the presence and densities of native cutthroat trout and other fish species.

Two upstream passes were made with a backpack electrofishing unit through a 74-m segment of stream. The specific location of the section of stream electrofished was at UTM 4,681,023 m E, 280,343 m N, Z12, which is downstream of the confluence of New Canyon Creek and Flat Canyon Creek. A total of 51 cutthroat trout, 11 brook trout and 58 mottled sculpin *Cottus bairdi* were sampled in both passes combined (Table 6). Sufficient numbers of cutthroat trout and brook trout were sampled in the two consecutive passes for a population estimate of each (Table 7). Cutthroat trout densities were four times those of brook trout.

Cottonwood Creek

Cottonwood Creek is a tributary to Clyde Creek and Cassia Creek originating in the Albion Mountains east of Oakley, Idaho. Fish were sampled there by electrofishing on September 19, 2000 for the purpose of determining the presence and densities of native cutthroat trout and other fish species.

Three upstream passes were made with a backpack electrofishing unit through an 82 m segment of stream. The specific location of the section of stream electrofished was at UTM 284,338 m E, 4,683,140 m N, Z12, which is approximately 2.3 km upstream of its confluence with Clyde Creek. A total of 17 cutthroat trout, 3 rainbow trout, 66 cutthroat trout X rainbow trout hybrids *O. clarki X O. mykiss*, 27 brook trout and 27 mottled sculpin were sampled in the three passes combined (Table 8). Population estimates were made on cutthroat trout separately from the cutthroat trout X rainbow trout hybrids (Table 9).

A stream habitat analysis classifies Cottonwood Creek as a B2a stream type (Rosgen et al. 1996) with a substrate dominated by boulders and a gradient of approximately 4.6% (Table 10).

Howell Creek

Howell Creek is a tributary to Marsh Creek, originating on the east side of Mount Harrison flowing northward out of the foothills of the Albion Mountains into agricultural lands. Some of the water in the lower reaches is diverted into a small stock watering pond at UTM location 290,710 m E, 4,694,050 m N, Zone 12 (owned by Earl Warthen). Regional fishery personnel were interested in finding out if fish become entrained in the pond at Howell Creek water diversion and to determine the relative abundances of brook trout and cutthroat trout.

Table 6. Length frequencies (10 mm bins) and average weights (g) of fish sampled by electrofishing Cassia Creek on September 20, 2000.

TL (mm)	Cutthroat trout		Brook trout		Mottled sculpin
	#s	Avg. wt.	#s	Avg. wt.	#s
40	--	--	--	--	10
50	1	--	--	--	6
60	9	--	--	--	5
70	3	--	3	--	8
80	3	5	1	--	8
90	2	--	1	--	6
100	7	--	1	--	1
110	3	12	--	--	1
120	10	16	--	--	--
130	8	21	--	--	--
140	--	--	2	28	--
150	2	29	1	34	--
160	2	38	1	43	--
170	--	--	1	59	--
190 *	1	75	--	--	--
Total	51		11		45
Measured only					13

* Indicates a break in length groups

Table 7. Population and density estimates of cutthroat and brook trout sampled from Cassia Creek on September 20, 2000.

Species	TL (mm)	Population estimate			Density (fish/100m^2)
		1st pass	2nd pass	Nest (95%CI)	
Cutthroat trout	< 100	14	4	20 (5)	15
Cutthroat trout	≥ 100	31	2	33 (1)	25
Cutthroat trout	all sizes	45	6	52 (3)	39
Brook trout	all sizes	9	2	12 (2)	9

Table 8. Length frequencies (TL) and average weights (g) of fish sampled by electrofishing on Cottonwood Creek on September 19, 2000.

	Cutthroat trout		Rainbow trout		Brook trout		Hybrid[a]	MS[b]
TL (mm)	#s	Avg. wt.	#s	Avg. wt.	#s	Avg. wt.	#s	#s
40	--	--	--	--	--	--	1	1
50	--	--	--	--	--	--	14	--
60	2	--	--	--	--	--	34	1
70	--	--	--	--	3	--	16	13
80	--	--	--	--	6	--	--	3
90	--	--	--	--	1	--	--	1
100	1	11	--	--	2	--	1	--
110	5	--	--	--	--	--	--	--
120	3	16	--	--	--	--	--	--
130	2	20	--	--	--	--	--	--
140	1	28	1	26	3	26	--	--
150	1	32	1	38	5	32	--	--
160	--	--	--	--	2	41	--	--
170	--	--	--	--	2	43	--	--
180	--	--	1	68	--	--	--	--
220 *	2	106	--	--	1	114	--	--
240 *	--	--	--	--	1	140	--	--
250	--	--	--	--	1	130	--	--
Total [c]	17		3		27		66	27
Not measured								8

[a] Cutthroat trout x rainbow trout
[b] Mottled sculpin
[c] Total includes fish counted but not measured
* Indicates a break in length groups

Table 9. Population and density estimates of cutthroat trout and brook trout sampled from Cottonwood Creek on September 19, 2000.

		Population estimate				
Species	TL	1st pass	2nd pass	3rd pass	Nest (95%CI)	Fish/100m^2 (95%CI)
Cutthroat trout	all sizes	10	6	1	17 (2)	8.6 (1.0)
Brook trout	all sizes	18	5	4	28 (4)	14.1 (2.0)
Hybrid [a]	all sizes	27	31	11	100 (44)	50.5 (22.2)

[a] Rainbow x cutthroat trout hybrid

Table 10. Habitat survey results for Cottonwood Creek, September 19, 2000.

Site:	UTM Zone 12, 284,338 E, 4,683,140 N	
Date:	09/19/00	
Channel type:	Confined run dominated	
Avg. width:	2.5	m
Transect interval:	10	m
No. transects:	8	
Length surveyed:	82.4	m
Total surface area:	197.8	m^2
Gradient (clinometer):	4.6	%
Gradient (map):	5.0	%

Habitat type	Percent of total	Average depth (m)
Backwater:		
Pocket:	4.2	0.16
Pool:	16.6	0.08
Riffle:	25.0	0.10
Run:	54.2	0.08

Substrate	Percent of total
Silt/sand:	21.1
Gravel:	27.1
Rubble:	21.5
Boulder:	26.7
Bedrock:	0.0

Percent substrate by habitat type	Backwater	Pocket	Pool	Riffle	Run
% Silt/sand:	0.0	30.0	27.0	11.7	22.9
% Gravel:	0.0	10.0	24.3	18.3	32.9
% Rubble:	0.0	10.0	2.7	28.3	24.3
% Boulder:	0.0	50.0	45.9	41.7	13.6
% Bedrock:	0.0	0.0	0.0	0.0	6.4

Fish were sampled from the pond with a backpack electrofishing unit with only fifteen seconds of electrofishing effort on February 3, 2000. A total of 48 brook trout were sampled ranging in total length from 80 mm to 330 mm (Table 11). No other species were sampled or observed to be present.

South Fork Boise River

Bull trout in the South Fork Boise River system were extensively studied by regional Department personnel under a project that began in the spring of 1998. The objective of the study was to gather information on the life history, timing of migrations, spawning, rearing and wintering habitat of the fish (Partridge et al. 2001). Most information was gathered using radio telemetry tagged bull trout. Bull trout were captured from Anderson Ranch Reservoir or the South Fork Boise River at the Pine Bridge. Fish were tagged in the spring and fall of 1998 and the spring and fall of 1999. Radio tagged fish were subsequently relocated with fixed wing aircraft affixed with a telemetry receiver. After the completion of the previously mentioned report (Partridge et al. 2001), an additional flight was made on May 18, 2000. Bull trout tag locations for that date are provided in Table 12.

Stinson Creek

Stinson Creek is a tributary to Cassia Creek, flowing off of the east side of the Albion Mountains west of the town of Elba, Idaho. The stream was surveyed with two passes of electrofishing with a Coffelt backpack shocker on September 20, 2000. The specific location sampled was a 75 m reach at UTM 279,844 m E, 4,679,662 m N, Z 12. Habitat was measured following methods described by IDFG (1992).

Fish sampled include 160 cutthroat trout and 9 brook trout (Table 13). Estimates were made for cutthroat trout $\geq$90 mm. Cutthroat trout <90 mm appeared to be young-of-the- year fish and they were not efficiently sampled with the backpack shocker. Results of the estimate are provided in Table 14. Results of habitat measurements made across seven transects are provided in Table 15.

Vineyard Creek

Vineyard Creek is a short spring fed stream that flows into the Snake River on the north side of the Twin Falls pool. A project to divert irrigation return water from Vineyard Creek directly into the Snake River was completed by the Natural Resources Conservation Service in the late 1990s. Previous fishery survey results and a description of Vineyard Creek are provided by Partridge and Corsi (1990), Partridge and Warren (1994) and Warren and Partridge (1994). On March 28, 2000 Vineyard Creek was again sampled with a backpack shocker to determine fish species presence. A total of 170 m of stream were sampled in the lower reach and 189 m sampled in the upper. The average stream width was 7.4 m and 8.4 m for the lower and upper reaches, respectively. Species sampled in both reaches combined include mottled sculpin, speckled dace *Rhinichthys osculus*, longnose dace *Rhinichthys cataractae*, redside shiner *Richardsonius balteatus*, bridgelip sucker, rainbow trout, cutthroat trout and cutthroat trout x rainbow trout hybrids (Table 16).

Table 11. Total length frequencies of fish sampled by electrofishing a diversion pond off of Howell Creek on February 3, 2000.

	Brook trout	
TL(mm)	Number sampled	Average weight (g)
80	1	--
90	2	--
100	--	--
110	1	--
130 *	1	20
140	2	27
150	1	28
160	2	--
170	7	46
180	10	54
190	6	61
200	5	71
210	3	87
220	1	100
230	2	118
260 *	1	148
330 *	1	288
Total	48	

* Indicates a break in length groups

Table 12. Locations (from fixed wing aircraft) of radio tagged bull trout in the South Fork Boise River drainage in 2000. .

		Relocation				
Radio frequency	Year tagged [a]	Date	Water	UTM easting[b]	UTM northing	Elev. (m)
150.174	S 1999	5/18/00	S.F. Boise River	639,539	4,825,825	1,347
150.523	S 1999	5/18/00	S.F. Boise River	658,122	4,828,644	1,524
150.564	S 1999	5/18/00	S.F. Boise River	645,698	4,830,511	1,260
150.614	S 1999	5/18/00	S.F. Boise River	639,374	4,824,729	1,341
		8/09/00	Big Smoky Creek	683,466	4,845,017	1,706
151.034[c]	S 1999	5/18/00	S.F. Boise River	649,986	4,829,513	1,463
151.043[d]	S 1999	5/18/00	Anderson Ranch Res.	637,044	4,811,515	1,260
		8/09/00	Anderson Ranch Res.	637,086	4,811,423	1,260
151.084	S 1999	5/18/00	Anderson Ranch Res.	626,952	4,803,633	1,260
151.454[d]	F 1998	5/18/00	S.F. Boise River	641,890	4,829,893	1,378

[a] S 1998 and S 1999 are bull trout caught in springtime gill nets in the reservoir. F 1998 are bull trout trapped in the fall at the weir at Pine.
[b] All UTM coordinates are in Zone 11.
[c] New radio with same frequency as previous year.
[d] Radio not recovered, but presumed unknown mortality or expelled radio due to lack of movement.

Table 13. Length frequencies and average weights (g) of fish sampled by electrofishing on Stinson Creek on September 20, 2000.

	Cutthroat trout		Brook trout	
TL (mm)	#s	Avg. wt. (g)	#s	Avg. wt. (g)
40	8	--	--	--
50	15	--	--	--
60	18	--	--	--
70	--	--	1	--
80	--	--	3	--
90	3	--	--	--
100	5	10	--	--
110	6	11	--	--
120	5	15	--	--
150 *	1	30	2	38
170 *	--	--	1	46
180	--	--	1	71
190	--	--	1	66
Total [a]	160		9	
Not Measured	99 (YOY)		0	

[a] Total includes fish counted but not measured
* Indicates a break in length groups

Table 14. Population and density estimates of cutthroat trout and brook trout sampled from Stinson Creek on September 20, 2000.

		Population estimate			
Species	TL (mm)	1st pass	2nd pass	Nest (95%CI)	Fish/100m^2 (95%CI)
Cutthroat trout	$\geq$ 90 mm	16	4	21 (4)	13.5 (2.6)
Brook trout	all sizes	6	3	12 (11)	7.6 (7.1)

Table 15. Habitat survey results for Stinson Creek, September 20, 2000.

Site:	UTM Zone 12, 279,844 E, 4,679,662 N
Date:	09/20/00
Avg. Width:	2.1m
Transect Interval:	10m
No. Transects:	7
Length Surveyed:	74.8m
Total Surface Area:	155Sq. m
Gradient (clinometer):	6.60%
Gradient (map):	6.20%

Habitat Type	Percent of Total	Average Depth (m)
Backwater:	0.0	-
Pocket:	14.3	0.10
Pool:	33.3	0.12
Riffle:	42.9	0.05
Run:	9.5	0.10

Substrate	Percent of Total
Silt/sand:	19.4
Gravel:	26.5
Rubble:	22.7
Boulder:	26.5
Bedrock:	4.7

Percent Substrate by Habitat Type	Backwater	Pocket	Pool	Riffle	Run
% Silt/sand:	-	21.0	27.9	13.3	15.0
% Gravel:	-	30.6	35.0	15.6	40.0
% Rubble:	-	19.4	17.1	23.3	45.0
% Boulder:	-	29.0	20.0	36.7	0.0
% Bedrock:	-	0.0	0.0	11.1	0.0

Table 16. Fish sampled with a single upstream pass of electrofishing on two sections of Vineyard Creek on March 28, 2000.

		Cutthroat trout		Rainbow trout		Hybrid trout [a]		LND[b]	RSS[b]	SPD[b]	BLS[b]	MTS[b]
Reach	TL (mm)	#'s	Avg. wgt	#'s	Avg. wgt	#'s	Avg. wgt	#'s	#'s	#'s	#'s	
Upper	50	--	--	1	--	--	--	--	--	4	--	--
	60	--	--	--	--	--	--	--	--	--	--	--
	70	--	--	1	--	--	--	--	1	--	--	--
	80	--	--	1	--	--	--	2	1	1	--	--
	90	--	--	--	--	--	--	3	1	1	--	--
	100	--	--	--	--	--	--	3	3	--	--	--
	110	--	--	--	--	--	--	--	2	--	1	--
	120	--	--	--	--	--	--	--	--	--	1	--
	130	--	--	--	--	--	--	--	1	--	--	--
	140	--	--	1	25	--	--	--	--	--	--	--
	170 *	2	40	--	--	--	--	--	--	--	--	--
	200 *	--	--	--	--	1	--	--	--	--	--	--
	220 *	--	--	1	115	--	--	--	--	--	--	--
	250 *	--	--	--	--	--	--	--	--	--	--	--
	260	--	--	--	--	1	160	--	--	--	--	--
	Total	2		5		2		8	9	6	2	--
Upper	50	--	--	--	--	--	--	--	--	1	--	--
	60	--	--	--	--	--	--	--	--	1	--	--
	70	--	--	1	--	--	--	--	--	--	--	--
	80	--	--	1	--	--	--	--	--	--	--	3
	90	--	--	--	--	--	--	--	--	--	--	1
	100	--	--	--	--	--	--	--	--	--	--	1
	110	--	--	--	--	--	--	2	--	--	--	--
	120	--	--	--	--	--	--	--	--	--	--	--
	130	--	--	--	--	--	--	--	--	--	--	--
	140	--	--	--	--	--	--	--	--	--	--	--
	170 *	--	--	--	--	--	--	--	--	--	--	--
	200 *	--	--	--	--	--	--	--	--	--	--	--
	220 *	--	--	--	--	--	--	--	--	--	--	--
	250 *	--	--	--	--	1	160	--	--	--	--	--
	260	--	--	--	--	--	--	--	--	--	--	--
	Total			2		1		2		2		5

[a] Rainbow x cutthroat trout hybrid
[b] LND=longnose dace; RSS=redside shiner; SPD=speckled dace; BLS=bridgelip sucker; MTS=mottled sculpin
* Indicates a break in length groups

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FISH TRANSFER PROJECTS (REGION WIDE)

Little Wood River

The fishery in the Little Wood River was impacted by a toxic ammonia spill from the milk/cheese processing plant in the town of Richfield in September 1998. Fish killed by the toxic spill included, among others, numerous brown trout *Salmo trutta*. In an effort to restore brown trout populations in this segment of the Little Wood River, a total of 134 fish were transferred from Stalker Creek on May 10, 2000 (Table 17).

Table 17. Length frequencies of fish sampled by electrofishing in Stalker Creek on May 10, 2000. Fish were transferred to the Little Wood River.

	Brown trout	
TL (mm)	#'s	Avg. wgt. (g)
160	1	--
170	3	50
180	2	56
190	4	77
210 *	4	110
220	1	--
250 *	1	172
270 *	1	--
280	1	250
290	2	295
310 *	2	350
320	5	385
340	4	475
350	12	468
360	4	--
370	6	575
380	10	593
390	7	655
400	11	600
410	3	770
420	1	770
430	1	720
440	4	--
450	6	880
460	7	1,020
480 *	9	1,073
490	3	--
500	5	1,175
510	1	--
520	3	1,500
540 *	2	--
550	2	--
570 *	2	--
590	2	1,925
600	1	1,800
620*	1	1,900
Total	134	

* Indicates a break in length groups.

LITERATURE CITED

IDFG (Idaho Department of Fish and Game). 1992. Standard Stream Surveys. Standardized methodologies for stream habitat surveys. Unpublished document. Fisheries Bureau, IDFG. Boise.

Partridge, F.E. and C.E. Corsi. 1990. Regional Fisheries Management Investigations. Idaho Department of Fish and Game. Job Performance Report, Project F-71-R-14, Boise.

Partridge, F.E. and C.D. Warren. 1994. Regional Fisheries Management Investigations. Idaho Department of Fish and Game. Job Performance Report, Project F-71-R-16, Boise.

Partridge, F.E., K.A. Frank, and C.D. Warren, 2001. Southeast Idaho Bull Trout Restoration (South Fork Boise River). Idaho Department of Fish and Game, Completion Report. IDFG 01-20, Boise.

Seber, G.A.F. and E.D. LeCren. 1967. Estimating population parameters from catches large relative to the population. Journal of Animal Ecology 36:631-643.

Rosgen, D. and H.L. Silvey. 1996. Applied River Morphology. Wildland Hydrology. Pagosa Springs, Colorado.

Thurow R. 1990. Wood River fisheries investigations. Job Completion Report, Project F-73-R-12. Subproject IV: River and Stream Investigations. Idaho Department of Fish and Game. Boise.

Van Deventner J.S. and W.S. Platts. 1989. Microcomputer software system for generating population statistics from electrofishing data. U.S. Forest Service, Intermountain Research Station. General Technical Report INT-254.

Warren, C.D. and F.E. Partridge. 1994. Regional Fisheries Management Investigations. Idaho Department of Fish and Game. Job Performance Report, Project F-71-R-17, Boise.

2000 ANNUAL PERFORMANCE REPORT

State of: Idaho

Program: Fisheries Management F-71-R-25

Project II: Technical Guidance

Subproject II-E: Magic Valley Region

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

ABSTRACT

Magic Valley Region fishery management personnel furnished verbal and written technical guidance to other agencies, consultants, private individuals and organizations. Fishing information was provided to anglers in the form of brochures, angler guides, public meetings, news releases, telephone calls, e-mail, and in person.

Information was provided to the regional Environmental Staff Biologist, Idaho Department of Water Resources and private landowners on stream alteration projects on the Big Wood River, Silver Creek, Parker Gulch, Wine Creek and Camas Creek.

Regional fishery personnel attended meetings and commented on relicensing for the Idaho Power Projects on the Malad River.

Author:

Fred E. Partridge
Regional Fishery Manager

OBJECTIVES

To communicate current fisheries and habitat information, concerns, and recommendations as needed to Department habitat specialists or directly to state, federal, and private parties contemplating projects with the potential to affect fish.

To provide technical fish and habitat management advice to public and private landowners and other agencies in order to sustain or enhance fish resources.

METHODS

Reviews, field inspections, comments, expertise, and recommendations furnished to governmental agencies, private organizations, consultants and individuals upon request. Personnel participated in meetings, tours, and gave presentations where requested or necessary. Expertise on regional fisheries was provided to the regional environmental coordinator to assist in commenting on the numerous habitat-related projects.

RESULTS AND DISCUSSION

Magic Valley regional fishery management personnel collected data, inspected, commented on and/or provided advice on the following major projects in 2000:

Public Information

Prepared and provided input on regional fishing, recreation and access to the public in various forms including 1-800 ASKFISH service and as requested by public, students, media, organized fishing clubs and at the Twin Falls County Fair. Provided information to local fishing clubs and elementary school classes on regional fisheries and basic habitat needs of fish in the Magic Valley Region.

Threatened and Species of Concern

Collected data, summarized collecting permit reports and provided information to and worked with the US Forest Service, Bureau of Land Management, Bureau of Reclamation, US Fish and Wildlife Service, Idaho Division of Environmental Quality, US Natural Resources Conservation Service and College of Southern Idaho on bull trout *Salvelinus confluentus,* native rainbow (redband) trout *Oncorhynchus mykiss*, Yellowstone cutthroat trout *O. clarkii*, white sturgeon *Acipenser transmontanus,* and Wood River sculpin *Cottus leiopomus* as requested.

Agency Assistance

Regional fishery personnel provided equipment, assistance and information to the regional environmental biologist, US Geological Survey, Idaho Division of Environmental Quality, Idaho Department of Parks and Recreation, Idaho Attorney General, US Forest Service, Bureau of Land Management, The Nature Conservancy, and Wood River Land & Water Trust in the collection of fish to provide long-term monitoring of water quality conditions in rivers and streams and to document the presence of fish species. Comments were provided on stream alterations in the Big Wood River, Silver Creek, Parker Gulch, Wine Creek, Camas Creek and Marsh Creek drainages, water rights issues at Hagerman WMA and stream habitat and wetland improvement projects in the Wood River and Raft River drainages.

Hydropower Relicensing

Regional fishery personnel worked with the Natural Resources Policy Bureau and Idaho Power Company on relicensing issues in the Malad and Snake rivers.

Hazardous Material Spills

Regional fishery and environmental personnel investigated potential damaging impacts from a truck accident adjacent to Bennett Creek and an oil spill at Magic Reservoir. No significant impacts to aquatic resources were observed. Regional personnel completed recovery work on the Little Wood River fish kill below Richfield with a second transplant of brown trout *Salmo trutta* from Silver Creek.

2000 ANNUAL PERFORMANCE REPORT

State of: Idaho | Program: Fisheries Management F-71-R-25

Project III: Habitat Management | Subproject III-E: Magic Valley Region

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

ABSTRACT

Magic Valley Region personnel made slight repairs and improvements to rock drop structures downstream of a culvert barrier on the Feather River to improve migration access for bull trout *Salvelinus confluentus* in the South Fork Boise River drainage. Improvements at this site have the potential of opening up more than 32 km of stream above 1,500 m elevation. .

Magic Valley Region personnel performed habitat surveys on three sites in Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* streams.

Water temperatures checked September 7, 2000 at the outflow of Murphy's Hot Spring discharge into the East Fork Jarbidge River were not warm enough to cause a thermal block for migrating fish.

Plans were developed to begin a long-term forage fish habitat improvement project in Salmon Falls Creek Reservoir using juniper trees and volunteer labor.

Author:

Fred E. Partridge
Regional Fishery Manager

OBJECTIVES

Construct riparian or improved pasture fencing on degraded streams on private property with good potential to enhance wild trout recruitment.

Provide upstream and downstream fish passage in key wild trout spawning and recruitment streams.

Create improved and additional small pond fishing opportunities in areas of easy access.

METHODS

Work with federal, state, and private land management groups to select sites and acquire funds to improve fish habitat and provide additional fishing opportunity.

RESULTS AND DISCUSSION

Feather River

The Feather River is a perennial stream flowing southward towards its confluence with South Fork Boise River (SFBR) at Featherville, Idaho. It is within the range of bull trout *Salvelinus confluentus*, which migrate throughout the SFBR basin from Anderson Ranch Reservoir to upstream tributaries where they are known to spawn. The main SFBR road crosses the Feather River 0.5 km upstream of its confluence with the SFBR. The road crossing has been considered a potential barrier to the upstream migration of bull trout and other species because of the drop of water from the culvert onto a concrete apron and due to velocity of water flowing through the three culverts under the road. This barrier reduces access to more than 32 km of streams above 1,500 m elevation.

In November, 1999 regional and Engineering Bureau personnel constructed three rock drop structures downstream of the culvert to raise water level and flood the culvert apron during high springtime flows (Partridge 2000). Flows were also modified in one of the three culverts with the addition of a detachable fishway. The US Fish & Wildlife Service Section 6 program provided funding for project construction and the Mountain Home and Glenns Ferry Highway districts supplied rocks.

In 2000, following spring runoff, an additional 40 m^3 of rock was added to the barriers to increase stability and some rocks dislodged by high flows were resituated. A wild plant seed mixture was spread over the disturbed soils.

Stream Surveys

Magic Valley Region personnel performed habitat surveys on three sites in Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* streams (see rivers and streams section of this report).

Water temperatures checked September 7, 2000 at the outflow of Murphy's Hot Spring discharge into the East Fork Jarbidge River were not warm enough to cause a thermal block for migrating fish.

Miscellaneous Habitat Projects

Plans were developed to begin a long-term forage fish habitat improvement project in Salmon Falls Creek Reservoir using juniper trees and volunteer labor. We worked with local scout troops in a clean-up effort of the Snake River downstream of Shoshone Falls. We provided information to the public and private land management groups on effects of stream projects on instream and riparian habitat.

LITERATURE CITED

Partridge, Fred. 2000. Bull Trout Habitat Restoration: Feather River Culvert Passage Completion Report. Idaho Department of Fish and Game. Threatened and Endangered Species Report, Project E-17-1, Boise.

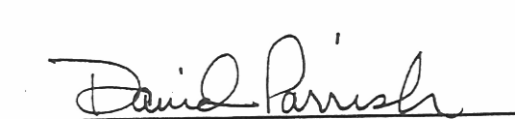
Submitted by:

Fred E. Partridge
Regional Fishery Manager

Charles D. Warren
Regional Fishery Biologist

Karen A. Frank
Fishery Technician

Approved by:



David Parrish
Regional Supervisor