ERY MANAGEMENT INVESTIGATIONS

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Cal Groen, Director

REGIONAL FISHERIES MANAGEMENT INVESTIGATIONS
SOUTHEAST REGION (Subproject I-F, II-F, III-F)

PROJECT I. SURVEYS AND INVENTORIES
Job b. Lake and Reservoir Investigations
Job c. River and Stream Investigations
PROJECT II. TECHNICAL GUIDANCE
PROJECT III. HABITAT MANAGEMENT

By

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SOUTHEAST REGION 2000 FISHERY MANAGEMENT ANNUAL REPORT

LAKE AND RESERVOIR INVESTIGATIONS

State of:	Idaho	Program:	F-71-R-25
Project I:	Surveys and Inventories	Subproject I-F:	Southeast Region
Job:	b	Title:	Lake and reservoir investigations

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

ABSTRACT

We conducted a creel survey on American Falls Reservoir during the months of March through November 2000. Clerks contacted 1,099 anglers during the survey, producing estimates of 125,435 hours of effort from an estimated 24,544 anglers (5.1 h/angler). Angling effort peaked during the month of July with an estimated 25,306 hours of effort. Anglers caught an estimated 21,086 fish (0.17 fish/h) of which 65.8% were rainbow trout *Oncorhynchus mykiss,* 28.2% smallmouth bass *Micropterus dolomieu,* and 6% other species (brown trout *Salmo trutta,* cutthroat trout O. *clarki bouvieri,* hybrid trout O. *mykiss x O. c/arki,* and kokanee *O. nerka kennerlyr).* Anglers harvested 91% of all rainbow trout caught while only 15% of smallmouth bass caught were harvested.

In conjunction with Fisheries Research personnel, we attempted to determine the number of game fish lost (through mortality or entrainment) from American Falls Reservoir during a period of severe drawdown. As part of the investigation, regional personnel conducted gillnet surveys (both vertical and horizontal) during day and night sets. A total of 15 vertical gillnet sets resulted in the capture of 62 Utah chubs *Gila atraria, 22* Utah suckers *Catostomus ardens,* and a single brown trout. With five sets of three horizontal gillnets, we captured 204 Utah chubs, one common carp *Cyprinus carpio,* 221 Utah suckers, four rainbow trout, two brown trout, and seven yellow perch *Perca flavescens*.

We monitored two bass tournaments, on American Falls Reservoir and Glendale Reservoir, during the year 2000. During the American Falls Reservoir tournament on June 24, 36 anglers fished a total of 360 hours to catch and keep (later released) 90 smallmouth bass for a keep rate of 0.25 fish kept/h. Mean length of fish kept (tournament minimum equaled 305 mm) was 369 mm with a standard deviation of 30 mm. Mean weight of fish kept was 894 g with a standard deviation of 233 g. The mean relative weight (Rw) of smallmouth bass kept during the tournament was 121%.

During the Glendale Reservoir bass tournament on June 15, 16 anglers fished a total of 164 hours to catch and keep (later released) 75 largemouth bass *M. salmoides* for a keep rate of .46 fish kept/h. Mean length of fish kept (tournament minimum equaled 305 mm) was 371 mm with a standard deviation of 22 mm. Mean weight of fish kept was 704 g with a standard deviation of 108 g. The mean Rw of largemouth bass kept during the tournament was 94%.

We conducted a lowland lake survey on Foster Reservoir March 6. Relative species composition was 54.7% yellow perch, 28.2% rainbow trout, 11.1% bluegill *Lepomis macrochirus,* and 6.0% crappie *Pomoxis sp.* Rainbow trout averaged 341 mm in length and weighed an average of 495 g. Mean Rw for all rainbow trout was 94%. A significant difference (at a = 0.05) was detected in the mean Rw for spring-stocked (100%) versus fall-stocked (91%) rainbow trout.

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OBJECTIVES

1. Determine the angling effort, catch rate, harvest rate, and other creel survey statistics of American Falls Reservoir during the open-water fishing season.

2. Determine what percentage of the rainbow trout harvested from American Falls Reservoir had been stocked into the Snake River upriver from the reservoir.

3. Determine the impact to the American Falls Reservoir fishery due to entrainment losses during a late summer drawdown event.

4. Monitor the status of the smallmouth bass fishery in American Falls Reservoir using data collected during a fishing tournament.

5. Monitor the status of the largemouth bass fishery in Glendale Reservoir using data collected during a fishing tournament.

6. Determine current status of the Foster Reservoir fishery with a lowland lake survey.

INTRODUCTION AND METHODS American Falls Reservoir

When full (at 1,327 m in elevation), American Falls Reservoir covers 22,360 ha and contains 210,000 ha-m of water. It covers portions of Bannock, Bingham and Power counties. The reservoir is used primarily for irrigation storage, flood control, and hydropower production. Irrigation use begins in April with drawdown beginning as irrigation demand exceeds inflow, usually in mid-June. Secondarily, the reservoir provides opportunities for sportfishing, waterfowl hunting, power boating, sailing, and other water oriented sports. Completed in 1927 and modified in 1979, the dam and reservoir are managed by the U.S. Bureau of Reclamation (USBR) while Idaho Power Company manages the powerhouse.

The Department stocks an annual average of 82,000 catchable (> 6 inches) and 299,000 fingerling (3 - 6 inches) trout in American Falls Reservoir, based on stocking records for 1995 through 2000. Species stocked include several races of rainbow trout *Oncorhynchus mykiss,* rainbow/cutthroat trout hybrids O. *mykiss x O. clarki* (no hybrids stocked after 1998), and Chinook salmon O. *tshaywytscha.* Other fish species present in the reservoir include: brown trout *Salmo trutta,* cutthroat trout O. *clarki,* smallmouth bass *Micropterus dolomieu,* yellow perch *Perca flavescens,* carp *Cyprinus carpio,* Utah suckers *Catostomus ardens,* Utah chub *Gila atraria,* redside shiner *Richardsonius balteatus,* and mottled sculpin *Cottus bairdi.* Other fish species that might occasionally be encountered in the reservoir include kokanee salmon O. *nerka kennerlyi* or lake trout *Salvelinus namaycush* that would have washed down from upriver reservoirs. There was also an attempt by the Department to establish a reproductive population of crappie *Pomoxis sp.* through the use of adult crappie transferred from Crane Creek Reservoir in the Southwest Region in 1999 (Scully unpublished). The success of the crappie transfer remains undetermined at this time.

Creel Survey

We conducted a creel survey on American Falls Reservoir during the months of March through November (open-water fishing season) of 2000. Surveys were conducted twice a week with one day each week falling on a randomly selected weekday and the other on a randomly selected weekend day. Each survey was further randomized into either an AM or PM survey. AM surveys were conducted from 08:00 to 13:00. PM surveys covered the day from 13:00 until typically 19:00. The creel survey data were analyzed using the C-SAP (Creel — Survey Analysis Program) software developed by Weber et al. (1989) for the Colorado Division of Wildlife.

During each survey period, clerks left from the state boat ramp at the dam (Figure 1) and proceeded either clockwise or counterclockwise (randomly chosen) around the reservoir. Clerks attempted to count every angler and interview as many as possible within the time frame available. However, clerks did not cross into the area of the reservoir claimed by the Shoshone-Bannock Tribe. Counts of boats and estimated anglers were done using binoculars from the edge of the reservation boundary. In addition, little effort was made to search the very northern corner of the reservoir due to its historical lack of angler use and the presence of extensive and hazardous shallows (Figure 1). The truncated search pattern effectively surveyed 9,250 ha of the reservoir (41.4% of surface area at full pool). During individual angler interviews, clerks attempted to determine angler residencies, total hours fished, method of fishing (bait or artificial lure/fly), and numbers of fish kept and released per species. Kept fish were identified and measured for length (mm). The creel survey form used is presented in Appendix A.

Upriver Contribution to Fishery — Previous research (Heimer 1978) determined that fish stocked at the upper end of the reservoir contributed more to the overall reservoir fishery than those fish stocked nearer to the dam. We wanted to determine what contribution fish stocked *above* American Falls Reservoir provided to the reservoir's fishery. Nielson (1990) demonstrated that fluorescent grit-marks were an efficient and reliable (90% retention up to 12 years) method for identifying stocked cohorts of fish. Three yearly cohorts of grit-marked rainbow trout (525,650 total fish) were stocked into the Snake River upriver from the reservoir and downriver of Gem State Dam. The fish were marked using the methods described by Jackson (1959) and modified by Phinney et al. (1967).

During the reservoir creel survey, harvested rainbow trout were examined under ultraviolet light to determine the presence/absence of a fluorescent grit mark. To eliminate ambient light, examinations were conducted inside a box constructed for this task (Figure 2). The ultraviolet light source operated on a frequency of 365 nanometers. Since not every fish was examined, creel clerks kept written records of whether an individual fish was checked or not.

Drawdown

Because of drought conditions, American Falls Reservoir suffered a large drawdown event during the late summer of 2000 (Figure 3). We attempted to determine what impact, if any, the drawdown had on the American Falls Reservoir fishery (specifically trout). Regional personnel, in conjunction with research personnel from the Magic Valley Region, conducted a hydro-acoustic survey of the reservoir both prior to the drawdown (July) and after the drawdown

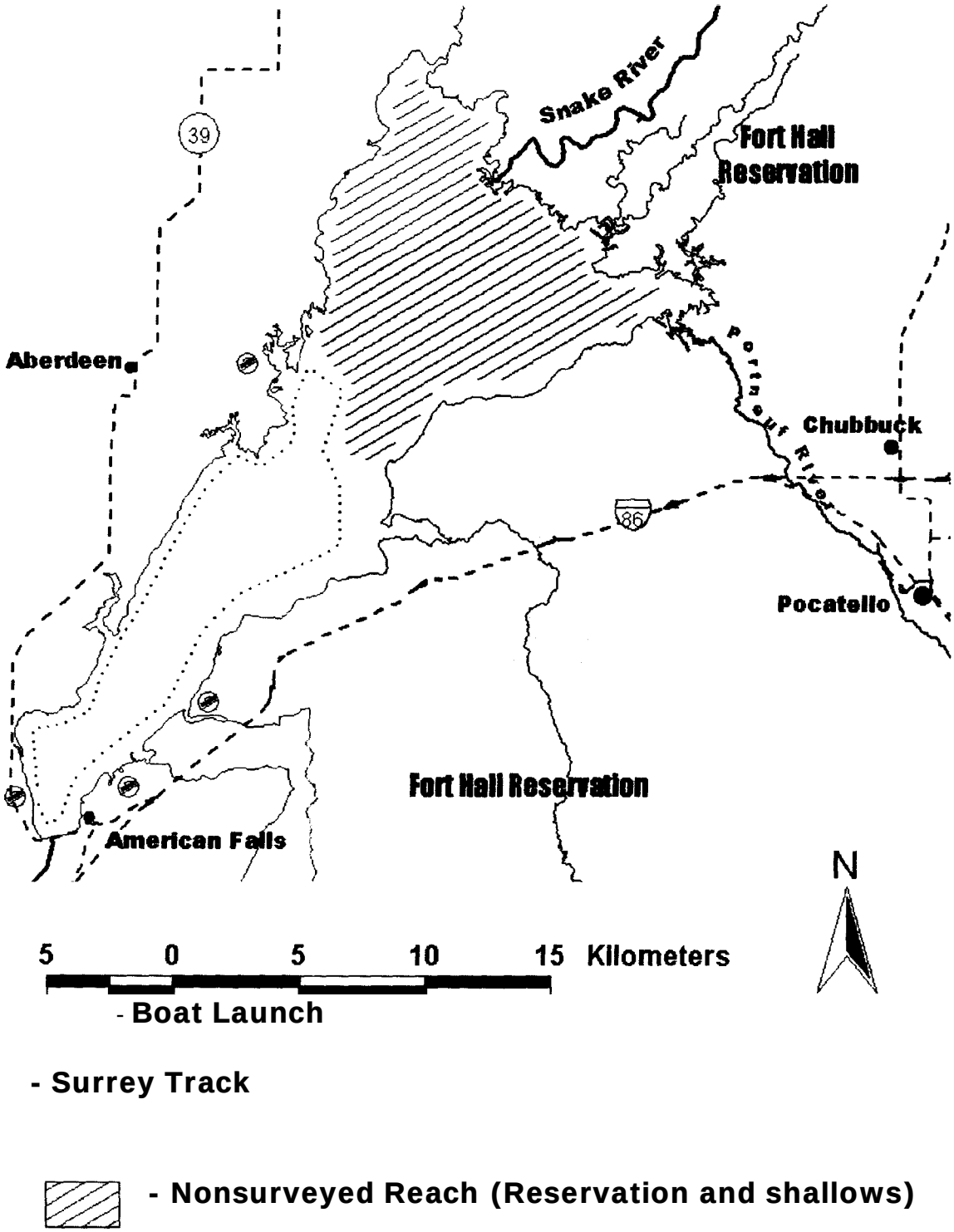


Figure 1. Creel survey track for American Falls Reservoir in 2000.

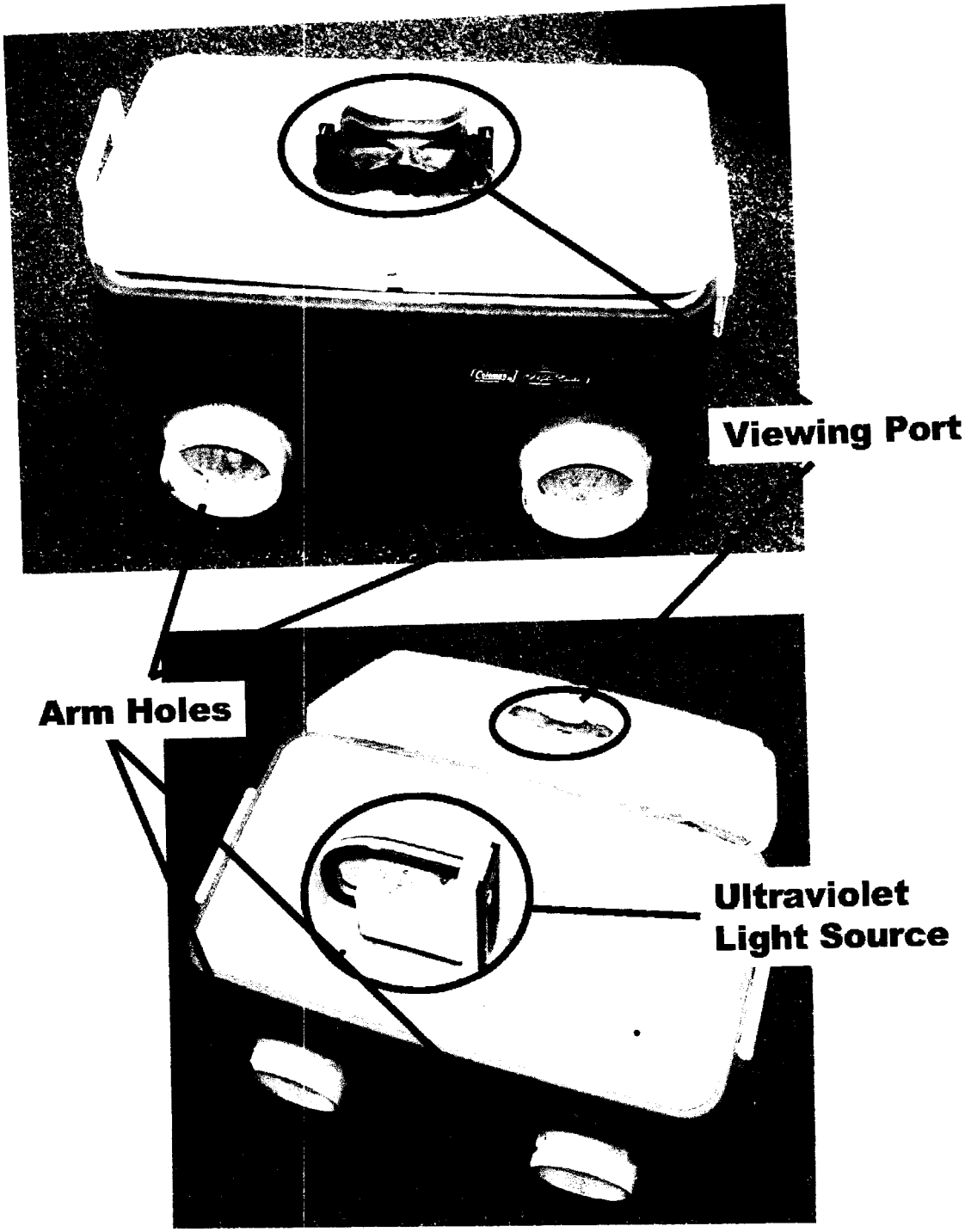


Figure 2. Apparatus used to check florescent-grit marked fish during the 2000 American Falls Reservoir, Idaho, creel survey.

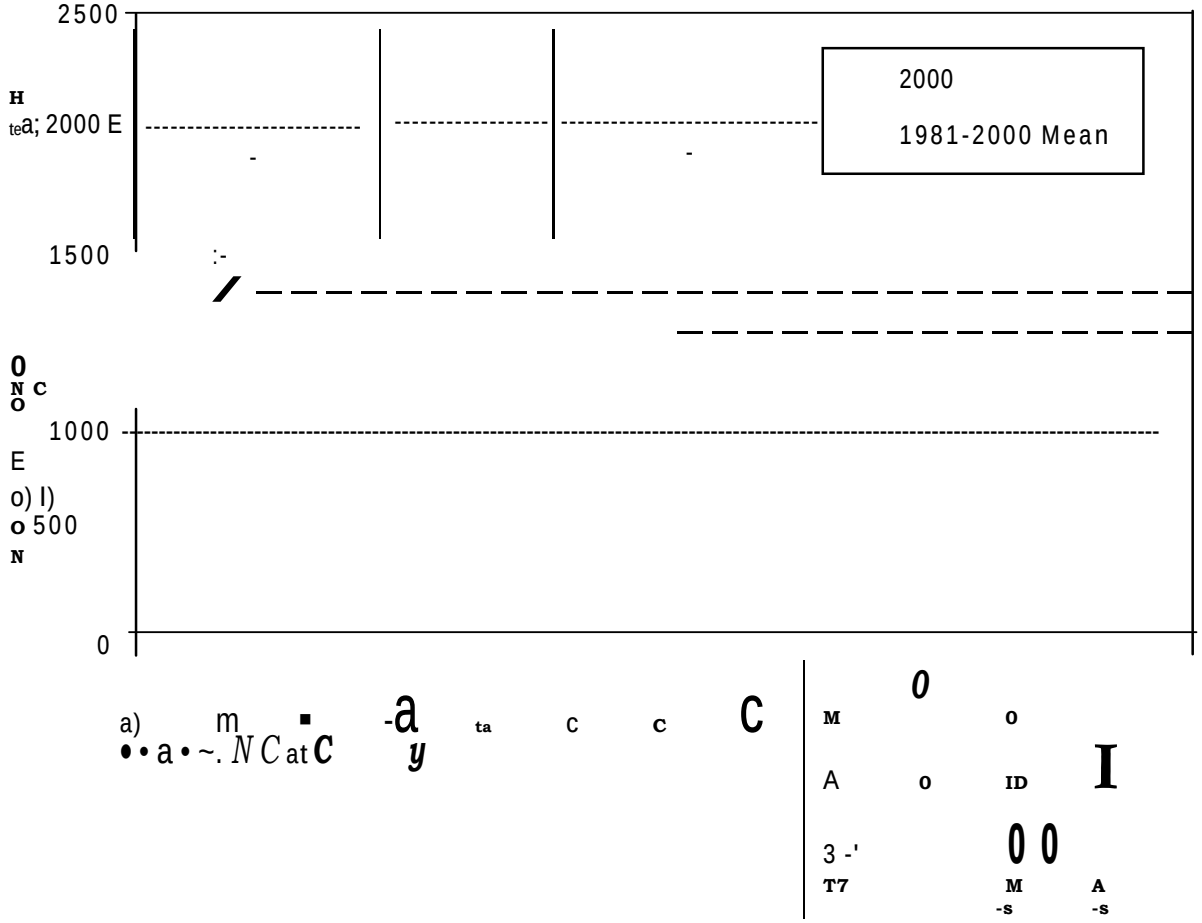


Figure 3. Comparing of water storage level of American Falls Reservoir, Idaho, during the year 2000 versus the previous 20-year average (data courtesy of the USBR

Hydromet Data System).

(November). Hydro-acoustic sampling methods are described in Yule (2000). In order to determine what species of fish were being counted during survey periods, we conducted a series of gillnet trials.

Along the sonar survey path, we sampled the fish community using both horizontal-experimental and vertical gillnets. The horizontal nets were used to sample communities found in shallower water, typically near shore (Figure 4). Each horizontal sample station used three individual nets with one suspended from the surface, one at mid-depth, and one set along the bottom. The vertical gillnet stations were used in more open/deeper water locations and each was composed of four nets (two 1-inch bar mesh and two ^{3}A-inch bar mesh nets). Depth of capture was recorded for all fish sampled with the vertical gillnets. Both types of gillnet counts were used to estimate percent of total sonar counts that were trout vs. non-trout. Gillnet sampling was not repeated during the November sonar survey.

Bass Tournament

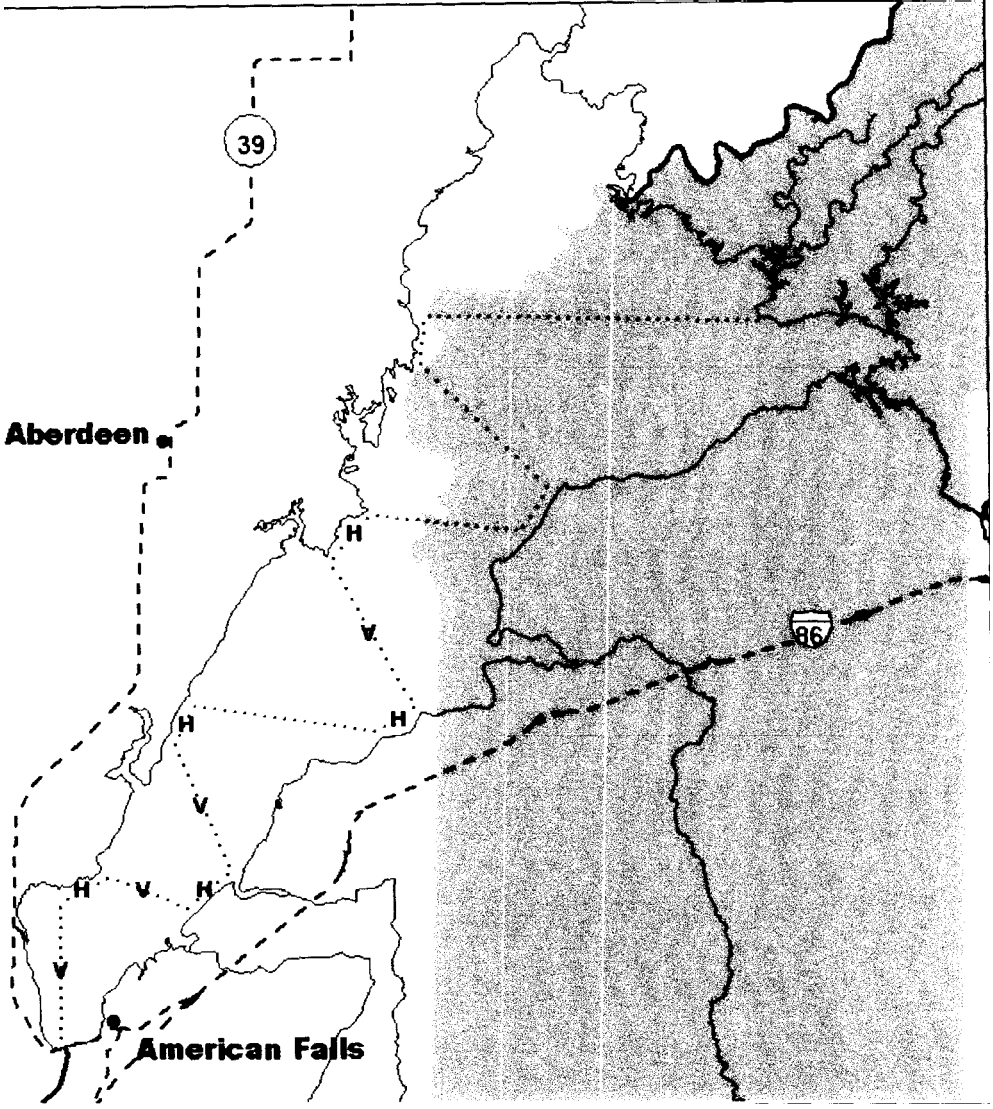
In 1997, Department personnel verified the presence of a smallmouth bass population in American Falls Reservoir (Mende et at. 2000). One year later, the first ever bass tournament was held on the reservoir. During the 1999 tournament, regional personnel collected various types of information regarding the health of the smallmouth bass population in the reservoir (yet to be published). On June 24, 2000, the Snake River Bass Club held another bass fishing tournament. Regional personnel measured and weighed all bass weighed-in by the 36 anglers during the one-day, catch-and-release event. Fish were held in a makeshift livewell (complete with oxygen cylinder and airstone) after being weighed in the tournament. After department personnel finished with the fish, they were returned to tournament officials for release into the reservoir.

Glendale Reservoir

Bass Tournament

Glendale Reservoir is located in Franklin County, northeast of Preston. It is owned by the Twin Lakes Canal Company and at full capacity sits at 1,509 m elevation and covers 92.9 ha. Its primary functions are irrigation storage and flood control. Secondarily, the reservoir provides sport-fishing opportunities as well as camping and watercraft recreation. Fish species present include rainbow trout, largemouth bass *Micropterus* salmoides, bluegill *Lepomis macrochirus,* and crappie Pomoxis *spp."* (Scully, Mende, Rawlins and Burnett 2000)

On June 15, 2000, 16 members of the Cache Valley Bassmasters club conducted a one-day, catch-and-release bass tournament on Glendale Reservoir. Regional personnel and reservists monitored the tournament and recorded length and weight of all largemouth bass weighed-in during the event. Department operations were similar to those performed at the American Falls Reservoir tournament described above. Previous tournaments on Glendale Reservoir have been similarly monitored in 1995, 1997, and 1999. Comparisons among the different tournaments are used as a general indicator of the quality of largemouth bass fisheries.



Sonar Survey Path

2 0 2 4 6 8 Kilometers

H Horizontal Glllnets v

Vertical Gillnets

Fort Hall Reservation I

Figure 4. Sonar survey path and gillnet sample stations used during the 2000 American Falls Reservoir survey.

Foster Reservoir

Lowland Lake Survey

Foster Reservoir is located in Franklin County, northeast of Preston and is owned by the Preston-Whitney Canal Company. At full capacity, Foster Reservoir sits at 1,480 m elevation and covers 53.4 ha. While its primary function is irrigation storage, it also provides sport-fishing opportunities. Fish species present in the reservoir include rainbow trout, largemouth bass, crappie, yellow perch and bluegill. However, the current irrigation practice of annually drawing down Foster Reservoir to extreme minimum levels (Appendix B), likely limit the number of fish that carry over from one year to the next. The continued presence of warmwater species is most likely due to annual immigration of fish from Glendale Reservoir by way of a canal. The Fish and Game Department has not restocked Foster Reservoir with warmwater species. Since no streams capable of supporting salmonid spawning enter the reservoir, the rainbow trout population is completely dependant on regular stocking.

By the end of summer 1998, Foster Reservoir was drained and the fishery placed under salvage regulations. During 1999, the reservoir was restocked with a total of 5,500 catchablesize rainbow trout on two separate dates. On April 28, 2,800 marked (adipose-clipped) fish were stocked into the reservoir. That fall, on September 28, 2,700 unmarked rainbow trout were stocked (IDFG Stocking Database).

On April 4, 2000, we conducted a lowland lake survey on Foster Reservoir. Methods used are detailed in Mende et al. 2000. Particular emphasis was placed on identifying captured trout as either marked (spring-stocked) or unmarked (fall-stocked).

RESULTS AND DISCUSSION

American Falls Reservoir Creel Survey

Statistics from the 2000 (March-November) American Falls Reservoir creel survey are presented in Table 1. During the survey, anglers fished an estimated 125,436 hours (95% CI 102,134; 148,738). This is 5.6 h/ha for the entire reservoir or approximately 13.6 h/ha for that portion of the reservoir sampled in the survey (Figure 1). Anglers caught 21,086 fish (95% CI 15,525; 26,647) for a catch rate of 0.17 fish/h. While this catch rate would likely be considered low, it is higher than the 0.12-fish/h rate documented during the 1993 creel survey (Scully, Mende and Arms 2000). It also falls within the range of historical catch rate values (based upon spot creel check data) from American Falls Reservoir (Table 2).

The catch estimate in the 2000 survey was 65.8% rainbow trout, 28.2% smallmouth bass, and 6% other species (brown trout, cutthroat trout, hybrid trout, and kokanee). However, creel clerks often encountered anglers who had misidentified harvested brown and cutthroat

Table 1. Creel survey statistics from the 2000 American Falls Reservoir, Idaho, creel survey.

		March	April	May	June	July	August	September	October	November	Total
Anglers	Shore	2099	1903	1080	1776	1815	1814	2067	1014	366	13.935
	Boat	384	1403	4032	1911	2130	618	133	0	0	10.610
	Total	2483	3306	5112	3687	3945	2432	2200	1014	366	24.544
Effort (hours)	Shore	6074	11743	4795	5088	9293	10673	12285	4351	1386	65.687
	Boat	1853	8535	13085	16064	16013	3184	910	106	0	59.748
	Total	7927	20278	17879	21152	25306	13856	13195	4457	1386	125.436
Catch	Shore	484	794	508	179	1182	1875	1777	335	42	7.176
	Boat	80	624	3476	3608	3394	2443	285	0	0	13.910
	Total	564	1418	3984	3787	4576	4318	2063	335	42	21.086
Catch Rate (fish/h)	Shore	0.08	0.07	0.11	0.04	0.13	0.18	0.14	0.08	0.03	0.11
	Boat	0.04	0.07	0.27	0.22	0.21	0.77	0.31	0.00	0.00	0.23
	Total	0.07	0.07	0.22	0.18	0.18	0.31	0.16	0.08	0.03	0.17
Harvest	**Shore**	**435 (89.9%)**	715 (90.1%)	**350 (68.9%)**	110 (61.5%)	1121 **(94.8%)**	1817 **(96.9%)**	**1636** (92.1%)	**314** (93.7%)	42 (100.0%)	**6.539** (91.1%)
	Boat	73 (91.3%)	**624** (100.0%)	**2675** (77.0%)	**2445** (67.8%)	**1684 (49.6%)**	**600** (24.6%)	**69** (24.2%)	0 (0.0%)	0 (0.0%)	8.170 (58.7%)
	Total	507 **(89.9%)**	**1339 (94.4%)**	**3025** (75.9%)	**2555** (67.5%)	**2805** (61.3%)	**2416** (56.0%)	1705 (82.6%)	**314** (93.7%)	42 (100.0%)	**14.708 (69.8%)**
Rainbow Trout (caught / **%harvested)**	Shore	**48.4**	**766** (89.7%)	**188** (100.0%)	179 (61.5%)	1175 **(94.8%)**	**1657** (100.0%)	**1694** (92.7%)	**284** (93.0%)	42 (100.0%)	**6.467** (93.8%)
	Boat	**65** (100.0%)	**463** (100.0%)	**2188** (91.6%)	**2246** (91.8%)	**1975** (78.4%)	**436 (85.3%)**	28 (100.0%)	0	0	7.401 **(88.4%)**
	Total	**549** (91.1%)	1228 **(93.6%)**	2377 (92.2%)	**2425 (89.6%)**	**3150 (84.5%)**	2092 **(96.9%)**	1721 **(92.9%)**	**284** (93.0%)	42 (100.0%)	**13.869** (90.9%)
Smallmouth Bass (aught / %harvested)	Shore	0	0	**182** (13.2%)	0	7 (100.0%)	219 (73.1%)	73 (72.6%)	0	0	**481** (50.7%)
	Boat	0	0	**576** (0.0%)	1206 (18.9%)	**1408 (8.8%)**	2007 (11.4%)	**258** (16.3%)	0	0	**5.455** (11.4%)
	Total	0	0	**758** (3.2%)	**1206** (18.9%)	**1415** (9.3%)	2226 (17.4%)	330 (28.8%)	0	0	**5.936** (14.6%)
Other Species[1] (caught / %harvested)	Shore	0	28 (100.0%)	**138** (100.0%)	0	0	0	11 (100.0%)	50 (100.0%)	0	227 (100.00%)
	Boat	**15 (53.3%)**	161 (100.0%)	712 (94.2%)	**155** (100.0%)	11 (100.0%)	0	0	0	0	**1.054 (95.5%)**
	Total	**15 (53.3%)**	**189** (100.0%)	**850** (78.9%)	**155** (100.0%)	11 (100.0%)	0	11 (100.0%)	50 (100.0%)	0	1.281 **(96.3%)**

[1] Includes brown trout, cutthroat trout, hybrid trout, and kokanee.

Table 2. Catch rate information for American Falls Reservoir, Idaho, from 1976 to 2000 (March — November). Data gathered from both spot creels and formal creel surveys.

Year	Anglers Interviewed	Hours Fished	Fish Caught			Catch Rate (fish/h)
			Trout	Non-trout	Total	
1971	350	1,120	181	6	187	0.17
1975	61	125	42	6	48	0.38
1979	280	732	311	2	313	0.43
1980	187	522	146	0	146	0.28
1983	170	594	101	0	101	0.17
1984	55	192	21	0	21	0.11
1985	467	1,787	270	0	270	0.15
1986	132	277	70	0	70	0.25
1987	43	130	10	0	10	0.08
1993 a						0.12
2000 a						0.17

[a] Catch rate determined through use of Creel Survey Analysis Program.

trout as rainbow trout (personal communication and observation). The brown trout displayed typical lentic brown trout colors, silver with irregular black spots. Therefore, estimates of rainbow trout numbers released are likely higher than actual, while brown trout numbers released are likely underestimated. Anglers harvested only 69.8% of the fish they caught. The relatively low harvest rate (compared to historical rates) is due to the influence of catch-and-release bass fisherman. All trout were harvested at a 97% rate while only 15% of smallmouth bass caught were harvested.

In 1993, a creel survey similar to the one in 2000 was conducted on American Falls Reservoir (Scully, Mende and Arms 2000) during the months of May-September. Creel clerks in 1993 followed a similar protocol and survey path. A comparison for the months of May-September between the two surveys is provided in Table 3. In general, the 2000 survey documents increases in all aspects of the reservoir fishery (i.e. hours of effort, catch rates, yields). While the number of harvested fish increased by 33.4%, total weight of harvested fish only increased by 20.3% (Table 3). The smaller increase in total harvest weight and in harvest rate reflect the influence of the growing smallmouth bass fishery. While some smallmouth bass were harvested during the survey, their mean length (318 mm), and ultimately their weight, were significantly less than that of harvested trout which had a mean length of 471 mm. This influence may decrease in future years as the smallmouth bass population matures and mean length increases.

Upriver Contribution to the Reservoir Fishery — During the 2000 creel survey, creel clerks encountered several logistical difficulties when trying to examine harvested rainbow trout for fluorescent grit-marks. The difficulties were ones not encountered by Nielson (1990) because of his greater control on examination methods. The difficulties fell into two general categories: equipment and experience. Primary among the equipment difficulties was our inability to effectively eliminate ambient light during the examinations. Regional personnel's previous field experiences with the grit-mark detection process occurred only at night. During

Table 3. Comparison of creel survey statistics between the 1993 and 2000 American Falls Reservoir, Idaho, surveys.

	Year	May	June	July	August	September	Total
Effort (hours)	1993	11,883	16,025	12,345	13,965	11,716	65,934
	2000	17,879	21,152	25,306	13,856	13,195	91,388
Effort/ha	1993	0.53	0.72	0.55	0.62	0.52	2.95
(total reservoir)	2000	0.80	0.95	1.13	0.62	0.59	4.09
Effort/ha	1993	1.28	1.73	1.33	1.51	1.27	7.13
(survey region)	2000	1.93	2.29	2.74	1.50	1.43	9.89
Catch	1993	1,403	2,237	1,697	1,822	763	7,922
	2000	3,984	3,787	4,576	4,318	2,063	18,728
Catch Rate	1993	0.12	0.14	0.14	0.13	0.07	0.12
(fish/h)	2000	0.22	0.18	0.18	0.31	0.16	0.20
Harvest	1993	1,403	2,221	1,678	1,822	763	7,887
(number of fish)	2000	2,216	2,400	1,794	2,416	1,694	10,520
Harvest a	1993	1,744	2,761	2,086	2,265	948	9,804
(kg)	2000	2,736	2,809	1,508	2,706	2,033	11,792
Yield kg/ha	1993	0.08	0.12	0.09	0.10	0.04	0.44
(total reservoir)b	2000	0.12	0.13	0.07	0.12	0.09	0.53
Yield kg/ha	1993	0.19	0.30	0.23	0.24	0.10	1.06
(survey region)	2000	0.30	0.30	0.16	0.29	0.22	1.27

[a] Harvested weight based upon mean length of harvested fish. Mean lengths were used in standard weight formulas for lentic rainbow trout and smallmouth bass. Calculated mean standard weights for American Falls Reservoir are historically greater than 100% but sample sizes are small. Additionally, harvest results of other species are not included (<6% of harvest). Estimates here most likely underestimate total harvest of all fish by weight.

[b] Yield based upon surface area of reservoir at the beginning of the season.

night operations, steps still had to be taken to isolate the specimen and ultraviolet light source (i.e. put fish in box), but stray ambient light was minimal so we were still successful in identifying marked fish. Daylight operations were much more difficult. The greatest source of stray light was the armholes in the box and therefore we modified them. First, long opaque gloves were attached inside the box; but they proved to be too clumsy in handling slippery trout. A better solution was to attach neoprene wader gravel-guards to the holes. The guards sealed tight enough around a forearm to limit light penetration while also allowing the greatest freedom of movement for the hands.

The second equipment difficulty concerned situations when creel clerks operated on shore. During the interview phase of each daily survey, clerks usually had to disembark from the boat and proceed along the shore on foot in order to contact as many anglers as possible. Often, clerks had to clamber over large boulders, navigate through thick vegetation, and/or walk long distances during shore-bound activities. The examination box proved to be too cumbersome and heavy for most of those interviews. For this reason we examined very few harvested trout for grit marks during the initial months of the survey, before grit-mark examinations were dropped entirely from the protocol.

The experience-related difficulties with the grit-mark assessment centered on the lack of experience examining fish by individual clerks. Opportunities for clerks to examine recently marked fish were provided (hatchery personnel provided frozen specimens). However, the

frozen specimens were younger/smaller fish. Individual grit-marks were concentrated and more numerous on the recently marked fish (personal observation). Fish that had been present in the reservoir for more than a year usually had fewer grit-marks and subsequent growth had spread the previously concentrated marks.

Difficulty in identifying marked fish likely led to many false positives. When opportunities for comparing identification skills between an inexperienced and experienced clerk occurred, often the inexperienced clerk reported a positive mark when none was there (personal observation). Positive identifications made by experienced clerks were so uncommon that little opportunity existed to train others.

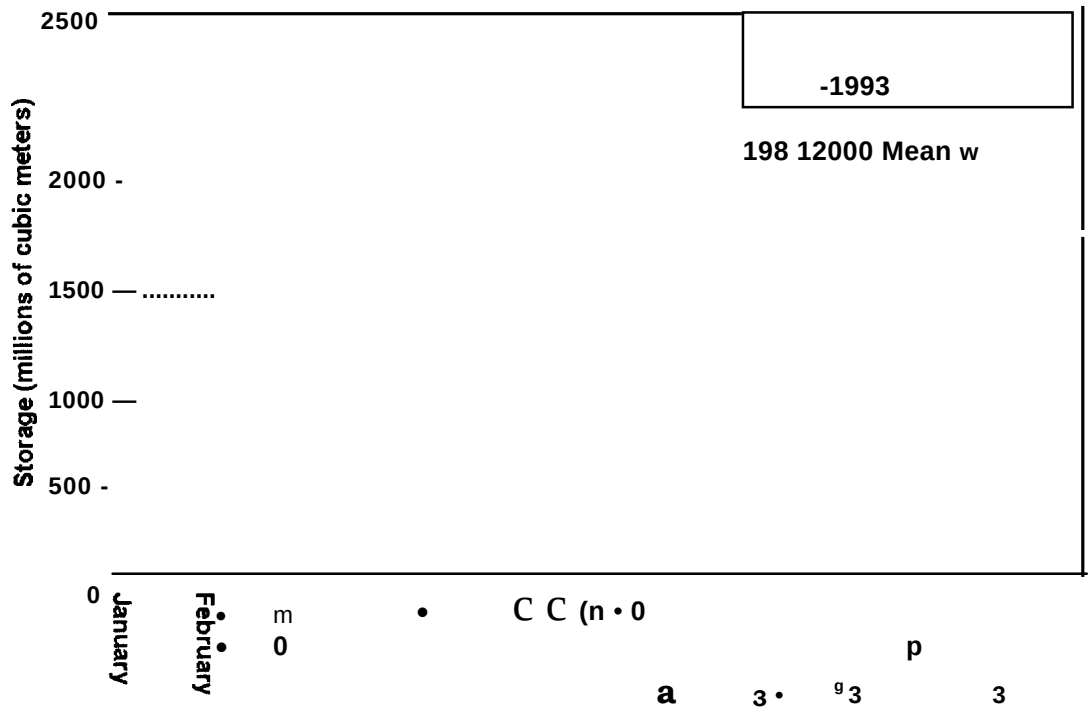
The lack of experience and equipment difficulties combined to present another problem. It was difficult to process an individual boat's catch in an efficient and timely manner. Clerks often had to forego grit-mark examinations in order to complete the survey on time and/or prevent irritation to anglers during their activities. Because of the unexamined shore catch and the unexamined boat catch, we decided to discontinue the grit-mark examinations. Thus we were unable to determine the contribution of river stocked rainbow trout to the American Falls Reservoir fishery.

Recommendation – Develop an efficient and reliable method to examine grit-marked trout during daylight operations (both in a boat and walking along shore).

Drawdown

During 2000, American Falls Reservoir's water storage decreased from a high of 100.3% of capacity on April 17, to a low of 5.6% capacity on October 10. This drawdown was extreme when compared to the twenty-year average (Figure 3), and adversely affected the fishery on American Falls Reservoir. A more typical drawdown during the 1993 creel survey resulted in little change in fishing effort (Figure 5). However, the 2000 creel survey saw a large drop in fishing effort as the reservoir was drawn down (Figure 6). The 45% drop in effort between July and August of 2000 is due to the loss of boat anglers as bank effort increased by 15% (Table 1).

A possible benefit to anglers due to the drawdown was the upward spike in catch rates during the month of August, 0.31 fish/h, versus the monthly mean, 0.17 fish/h (Table 1). A similar spike was not observed during the 1993 survey. Closer analysis of the 2000 data reveals that smallmouth bass fishing was responsible for the increased catch rate. Estimates of the number of rainbow trout caught decreased between July and August. Meanwhile, smallmouth bass numbers increased and coupling that with an overall decrease in effort produced a large jump in the overall catch rate. It appears that the recently established smallmouth bass fishery may provide a late-season opportunity for anglers during a time period (typically August) when water temperatures have increased and dissolved oxygen decreased enough to depress salmonid activity (Scully, Mende, Rawlins and Burnett 2000). However as the drawdown continued throughout the 2000 season, overall catch rates dropped back to normal and then plummeted in October (0.08 fish/h) and November (0.03 fish/h), along with fishing effort.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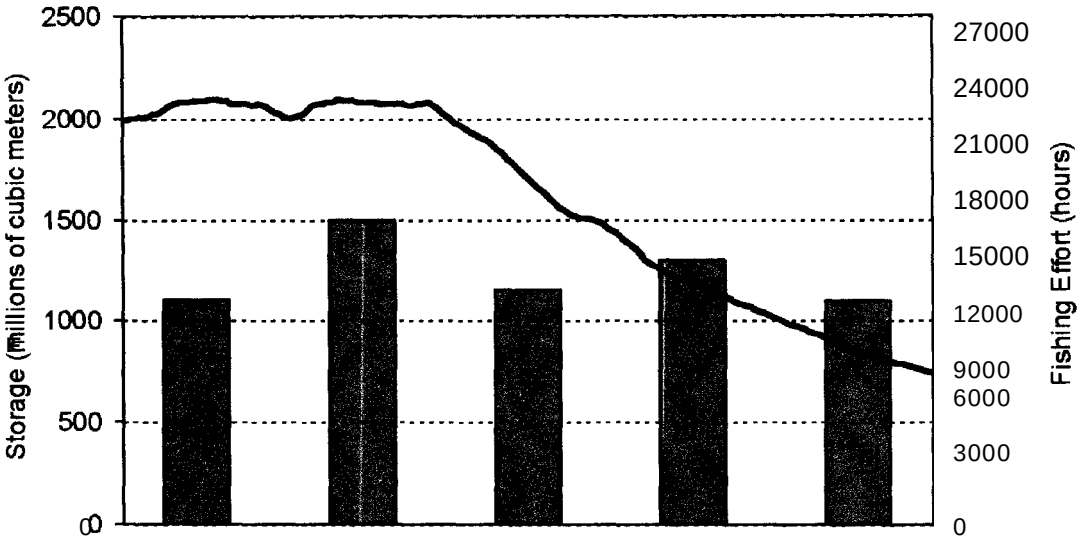
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Storage (millions of cubic meters)
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Fishing Effort (hours)

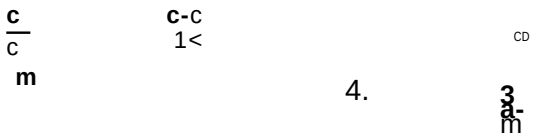
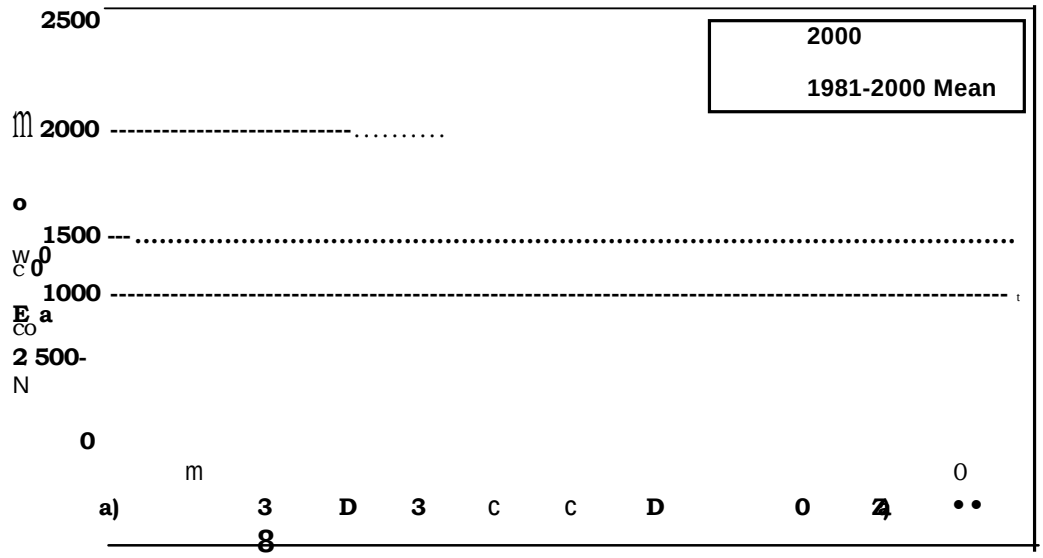


Figure 5. Storage volume of American Falls Reservoir and fishing effort during the 1993 creel survey.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2000
1500
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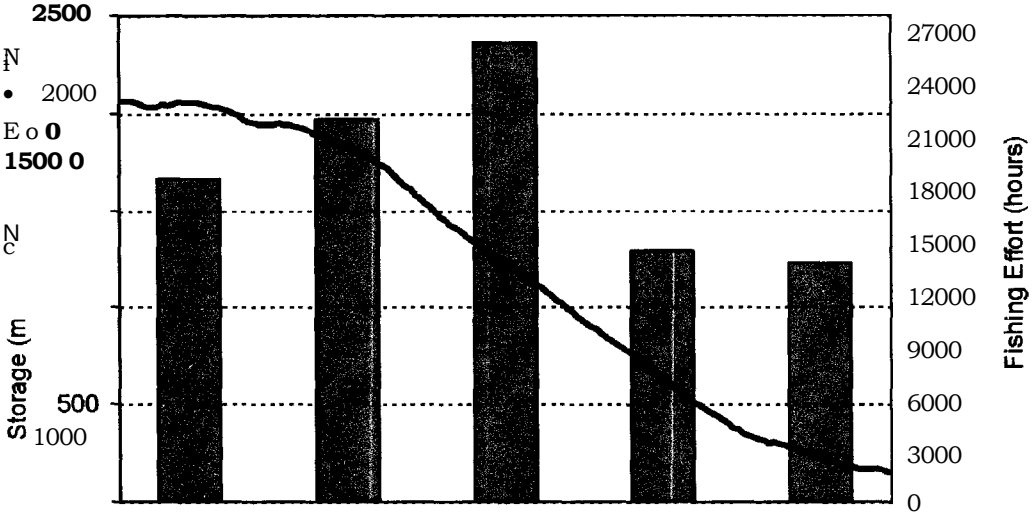
2000
1981-2000 Mean


2500
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9000
6000
3000
0
Fishing Effort (hours)

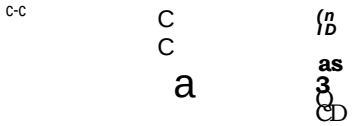


Figure 6. Storage capacity of American Falls Reservoir and fishing effort during the 2000 creel survey.

Recommendation

Conduct a creel survey that specifically aims to differentiate effort and catch rates between anglers targeting salmonids versus those targeting bass. Attempt to verify increased angling opportunities (temporally and spatially) created by the establishment of a smallmouth bass fishery in American Falls Reservoir.

Hydro-acoustic Survey

Detailed analysis of the 2000 American Falls Reservoir hydro-acoustic survey are provided by Teuscher 2001. Appendix B presents the general conclusions drawn by Teuscher concerning the survey. In summary, the hydro-acoustic survey documented a large decrease in fish abundance between July and November of 2000. Pelagic fish numbers dropped from 230,000 (± 71%) in July to 46,000 (± 53%) in November. Smaller fish (<250 mm) made up the greatest portion of the loss. Daytime estimates most likely represent trout, based on surveys done on other waters. However, American Falls Reservoir gillnet catches were too low in numbers to provide a reliable estimate of percent trout within the pelagic fish population. Therefore, an estimate of the number of trout lost to the fishery during the drawdown could not be reliably calculated.

Bass Tournament

During the June **24,** 2000 bass tournament on American Falls Reservoir, 36 anglers fished 360 hours and weighed in 90 smallmouth bass for an overall keep rate of 0.25 fish/h. The number of fish released by each angler during the day was not recorded. A length frequency distribution and relative weight (Wr) analysis for those fish kept and then released during the tournament is presented in Figure 7 and 8, respectively. Relative weight analysis of smallmouth **bass** use the formula developed by Kolander et al. 1993. The mean Wr of 121% indicates that forage is abundant relative to the number of smallmouth bass in the population.

Comparisons between the 2000 tournament and a June 19, 1999 tournament indicate the possibility that the smallmouth bass fishery is still growing in American Falls Reservoir. The modal length of weighed-in smallmouth bass during the two tournaments increased from 370 mm in 1999 to 390 mm in 2000 (Figure 7). Modal comparison is more appropriate for comparison than mean length because both tournaments' results demonstrated a strongly left skewed length frequency distribution. Comparison of the mean Wr between 1999 and 2000 also indicates that the fishery as a whole is still growing. The 121% mean Wr in 2000 is significantly less than the 130% found in 1999 (at a = 0.05). Smallmouth bass competition may have increased from 1999 to 2000 as bass numbers likely increased during this interval. However, 2000's 121% mean Wr is high enough to indicate that the increased competition is still not negatively impacting smallmouth bass growth. Dillon (1992) concluded that thermal regime and not forage is the primary limiting factor on smallmouth bass growth in Idaho.

Recommendations

Continue monitoring mid-June bass tournaments as a possible indicator of smallmouth bass fishery health in American Falls Reservoir. During the tournaments, have anglers measure (to the nearest inch) every fish they catch to determine both total catch rates and relative year-class strengths.

Glendale Reservoir

Bass Tournament

During the June 15, 2000 bass tournament on Glendale Reservoir, 16 anglers fished 160 hours and weighed in 75 largemouth bass for an overall keep rate of **0.47** fish/h. Number and size of fish released (not weighed-in) during the tournament were not recorded. Length frequency distribution and relative weight analysis of largemouth bass weighed-in and subsequently released during the 2000 tournament are provided in Figure 9. Relative weight was calculated using the equation of Wege and Anderson (1978). Only a single fish exceeded the **406** mm minimum harvest length regulation for Glendale Reservoir. Additionally, the mean Wr for fish weighed in at the tournament **(94%)** was significantly less than the standard (at **a** = 0.05).

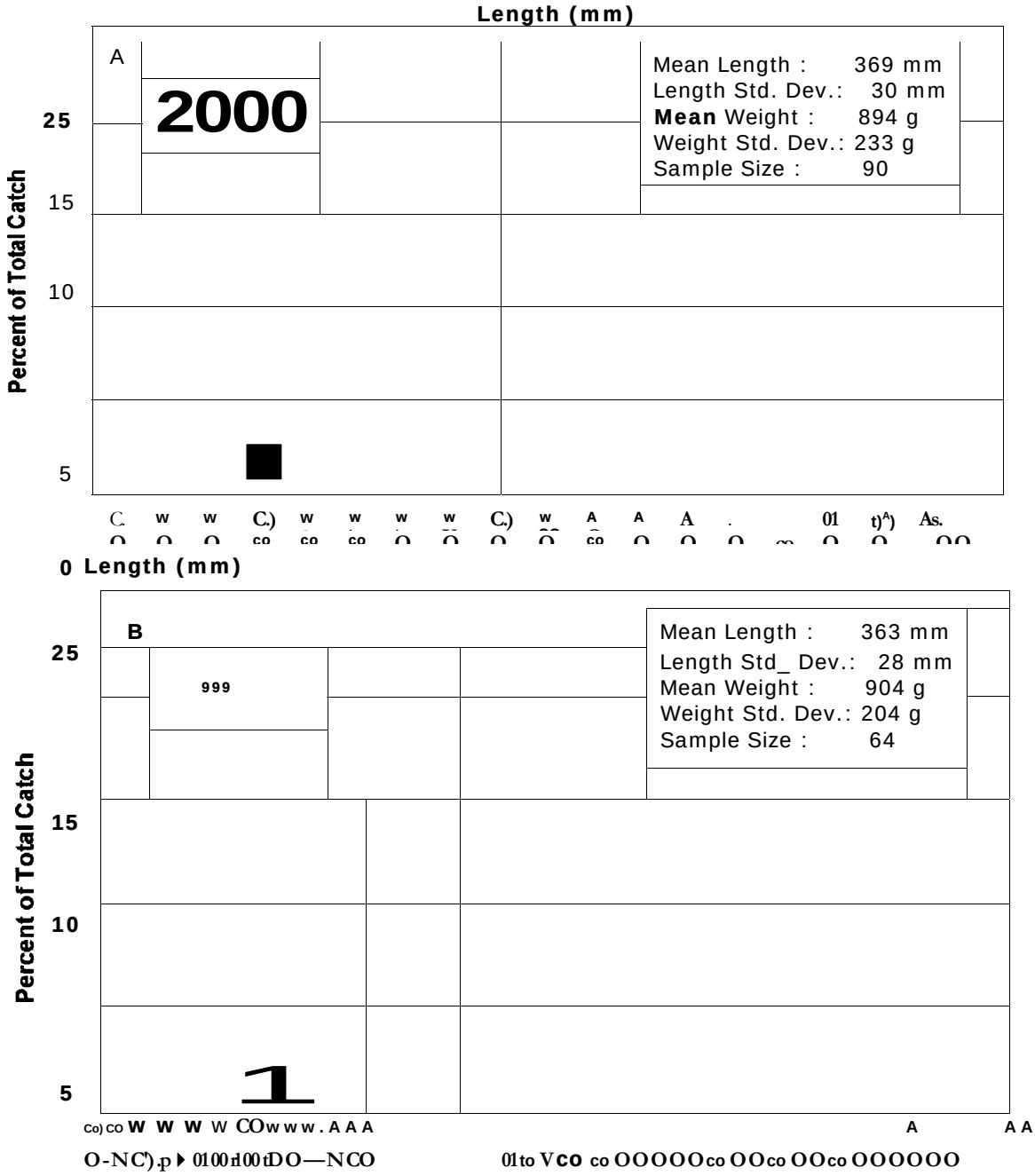
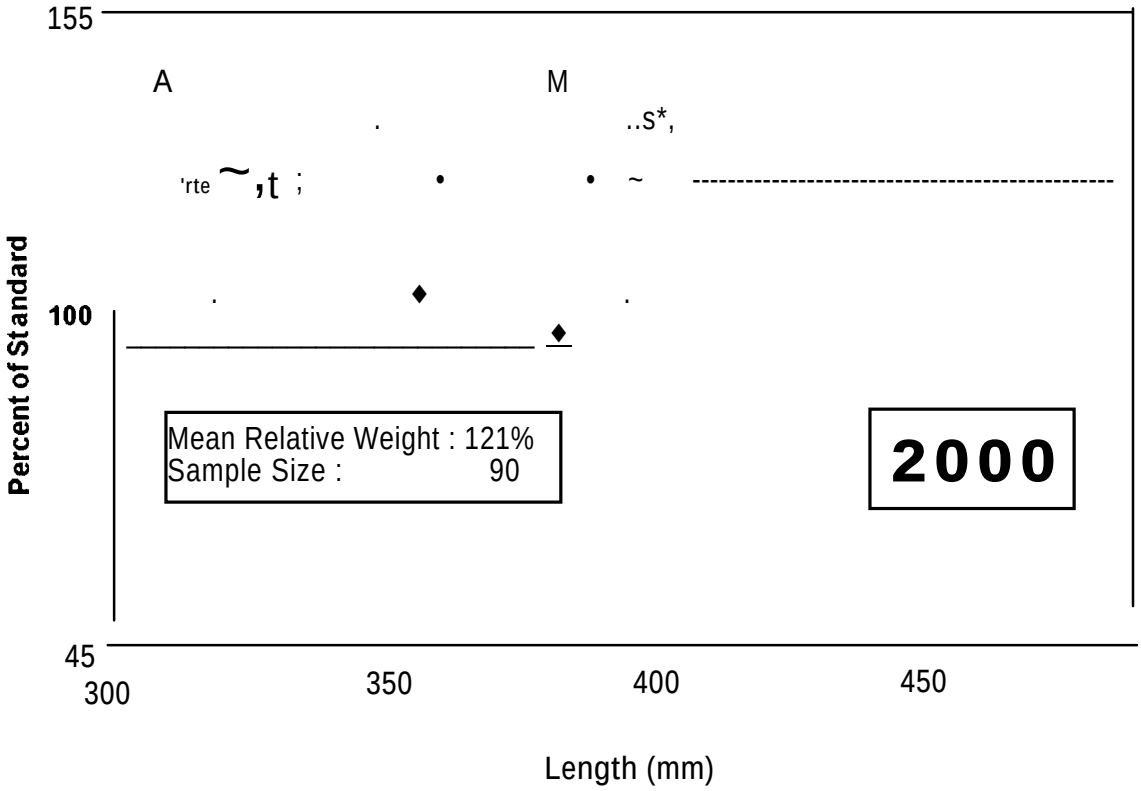


Figure 7. Length frequency distribution of smallmouth bass caught and released during a 1999 (B) and 2000 (A) fishing tournament on American Falls Reservoir.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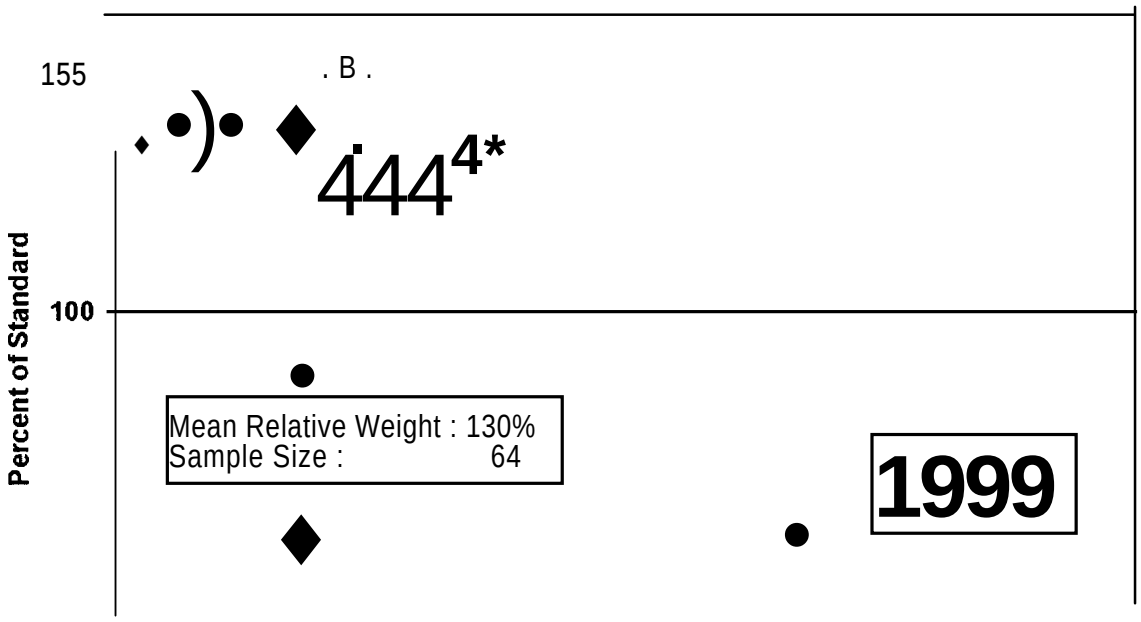
A
M
100
45
Percent of Standard
Mean Relative Weight : 121%
Sample Size : 90
2000
300
350
400
450
Length (mm)


155
100
Percent of Standard
Mean Relative Weight : 130%
Sample Size : 64
1999

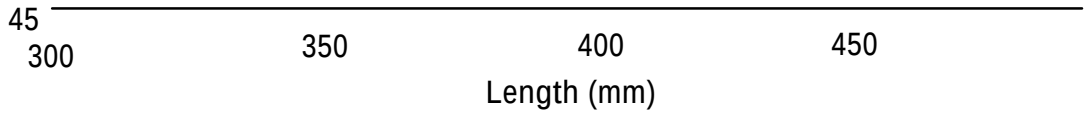


Figure 8. Comparison between relative weight analysis of smallmouth bass weighed in during June 19, 1999 (B) and June 24, 2000 (A) tournaments on American Falls Reservoir.

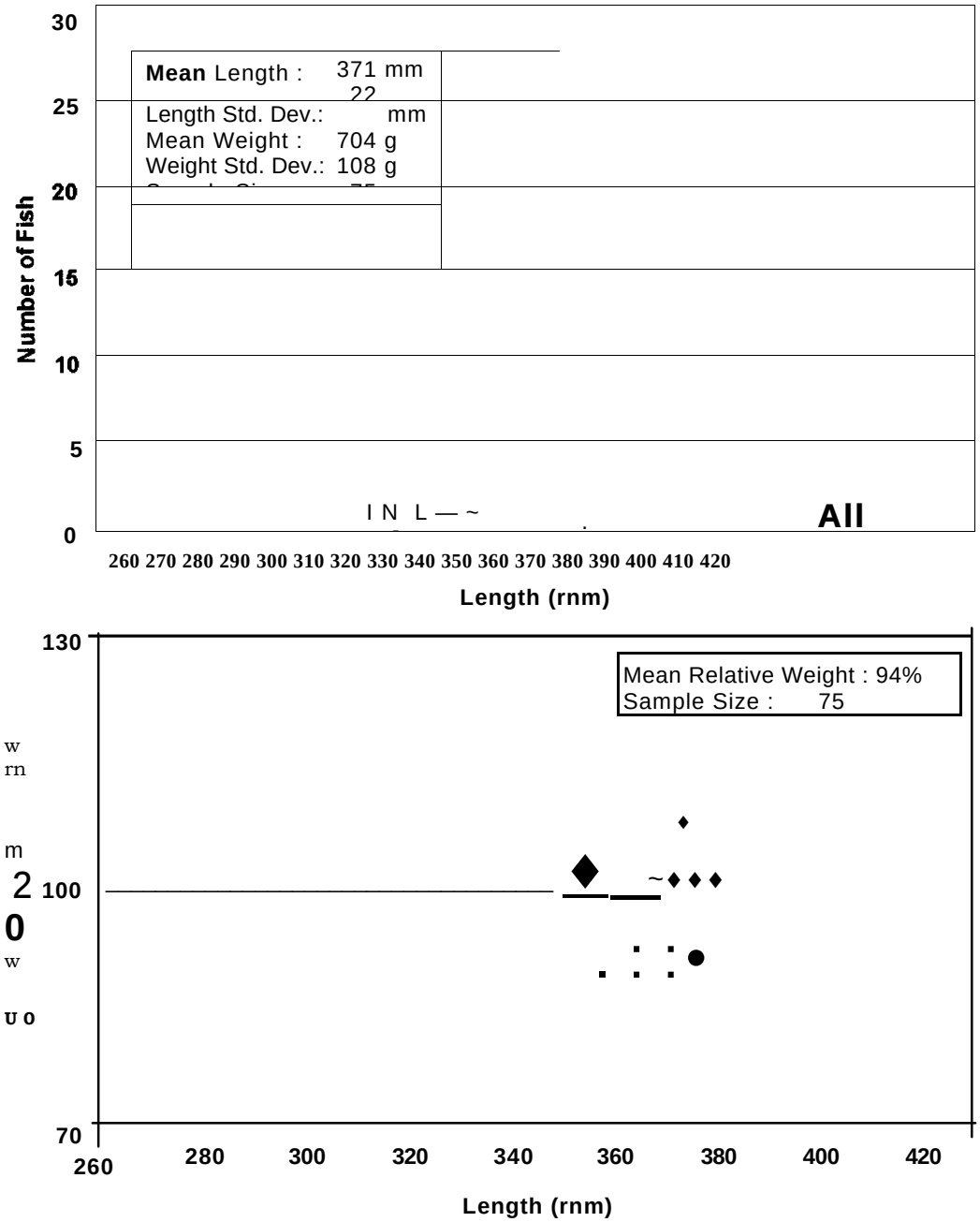
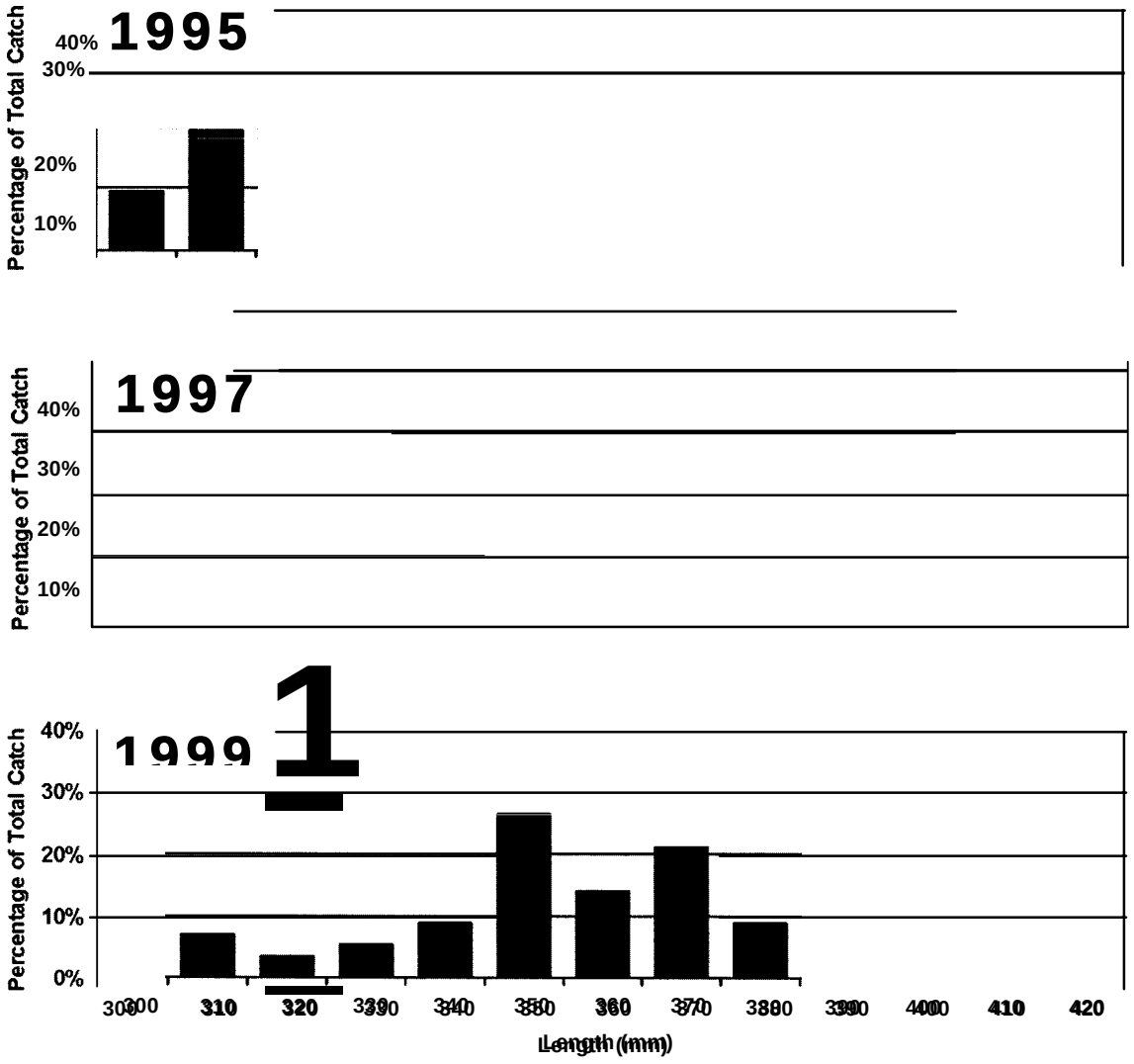


Figure 9. Length frequency distribution and relative weight analysis of largemouth bass caught and released during a June 15, 2000 fishing tournament on Glendale Reservoir.

Figure 10 shows largemouth bass length frequency distributions from previous mid-June tournaments held on Glendale Reservoir. Since data collection methods and numbers of anglers varied between years, values in Figure 10 are given in percent of total catch >300 mm. The mean and modal lengths of fish weighed in show an increase through time. However, the rate of mean length increase is a great deal smaller than the mean annual growth rate calculated by Heimer et al. (1987) for Glendale and nearby (<10 km) Lamont and Condie reservoirs. At this time, we do not have a satisfactory explanation for the length frequency distribution patterns observed in Figure 10. Subsequent investigations based on otolith analyses will likely be required to explain the observations.



300 310 320 330 340 350 360 370 380 390 400 410 420
Length (mm)

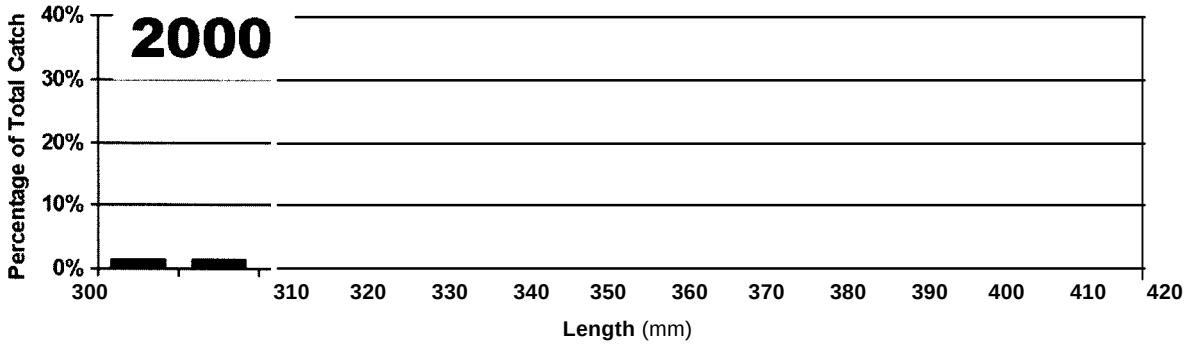


Figure 10. Length frequency distribution of largemouth bass >300 mm caught during tournaments in 1995, 1997, 1999 and 2000 on Glendale Reservoir, Idaho.

Recommendations

Continue monitoring mid-June bass tournaments as a possible indicator of largemouth bass fishery health in Glendale Reservoir. During the tournaments, have anglers measure (to the nearest inch) every fish they catch to determine both total catch rate and relative year-class strength. Collect otoliths from bass that die from handling stress to back calculate age-at-length to determine a cause for the unusual length frequency distribution patterns observed through time on the reservoir. If additional otoliths are needed, collect them during a standard Lowland Lake Survey.

Foster Reservoir

Lowland Lake Survey

During the April 6 lowland lake survey at Foster Reservoir we captured 34 rainbow trout, 7 crappie, 64 yellow perch, and 13 bluegill. Relative species composition of the survey was: yellow perch, 54.7%; rainbow trout, 28.2%; bluegill, 11.1%; and crappie, 6.0%. There are two likely explanations for the absence of largemouth bass in the sample. 1) The water temperature was so low **4** to 10 C) that largemouth bass were still inactive and in deeper water where sampling effort was minimal (gillnets only). 2) The severe drawdown at the end of summer caused the largemouth bass to emigrate downstream.

With one exception, the length frequency distribution of marked and unmarked trout demonstrates a clear separation of stocked cohorts (Figure 11). A single 449-mm, unmarked rainbow trout was captured during the survey. It is impossible to determine if the 449-mm unmarked fish was a carry-over from the previous year or if it was a recent immigrant from Glendale Reservoir. The length frequency distribution provides no evidence that rainbow trout survive for two or more years in the reservoir after stocking. The potential for Foster Reservoir to support a quality or trophy fishery is minimal because of high annual mortality or emigration.

Relative weight values for captured rainbow trout were calculated using the formula developed by Simpkins and Hubert (1996) and are presented in Figure 11. While the absolute number of spring-stocked trout captured was lower than number of fall-stocked trout (11 vs. 23), spring-stocked fish emerged from winter in better condition. Mean Wr for spring-stocked trout (100%) was significantly greater than for fall-stocked fish (91%) at a = 0.05.

Recommendations

Maintain the current strategy of stocking catchable trout split evenly between spring and fall at Foster Reservoir. The fall-stocked fish provide larger numbers of fish for ice-fishermen to catch. While the spring-stocked trout provide opportunities for summer anglers to catch trout, they also provide ice-fishermen with chances to catch larger fish during the winter.

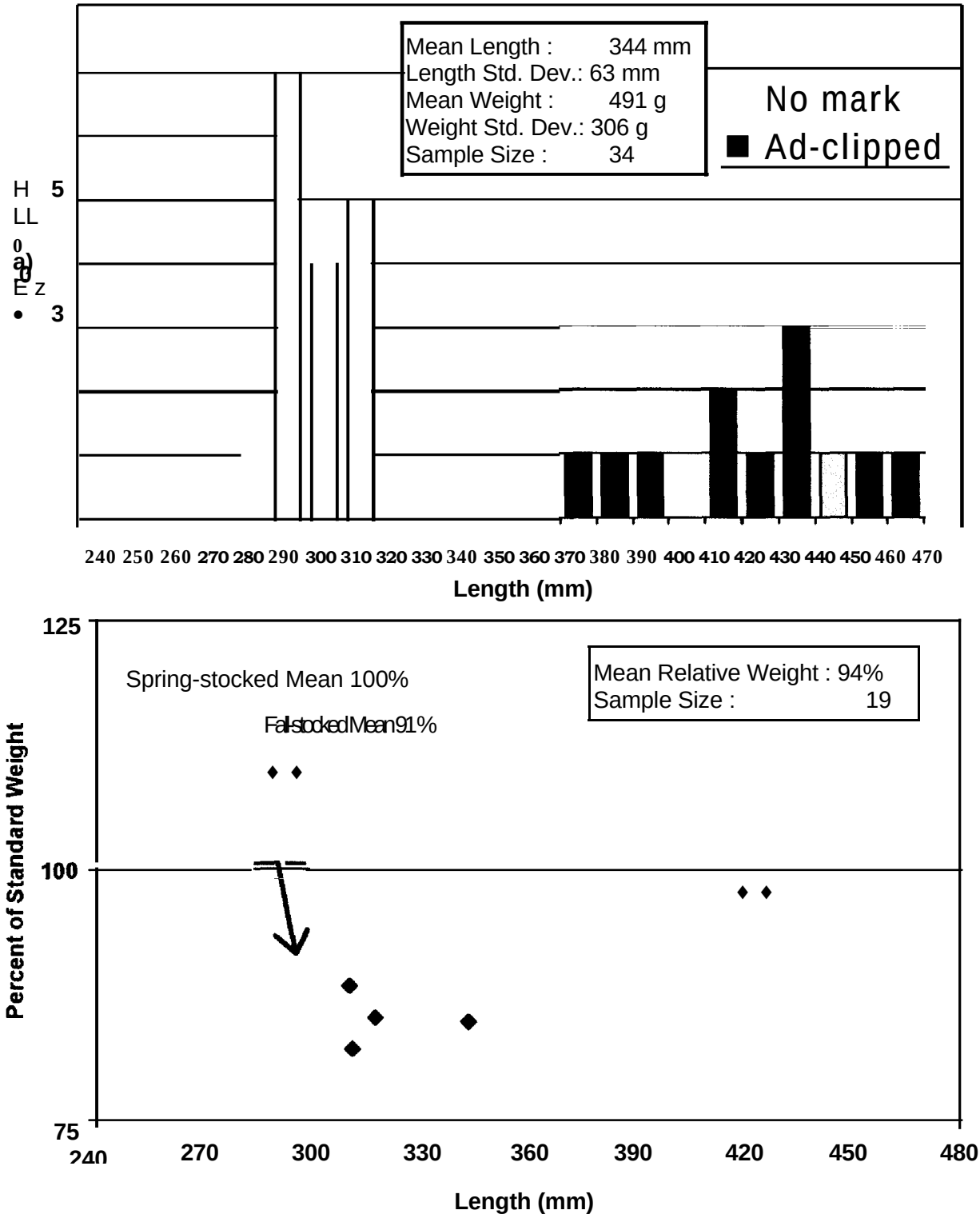


Figure 11. Length frequency distribution and relative weight analysis of rainbow trout captured April 6, 2000 on Foster Reservoir

Conduct **a study to determine the amount of impact that immigrating** largemouth **bass from Glendale Reservoir have on the Foster Reservoir population. The study could be conducted concurrently with** annual monitoring **of bass** tournaments **on Glendale Reservoir. First, mark weighed-in fish during the tournaments as a first step in a mark-recapture population estimate for Glendale Reservoir. Use either another tournament or an electrofishing survey to complete the recapture portion of the estimate. Second, conduct an electrofishing survey on Foster Reservoir during late summer/early fall. Note any marked fish coming from the Glendale Reservoir population estimate. Use the Glendale marked: total sample ratio to determine the percent of Foster Reservoir** largemouth **bass that are annual immigrants from Glendale Reservoir.**

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APPENDICES

Date: _____ y wa x e r Section: _____

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		NUMBER ANGLER	TYPE	COMP TRIP	HOURS	FISHED	Tamot Spades	RBT		B		SMB		LMB'					
	RES	NONRES	boat/shore	Y/N	Bait	Lure/fly		kept	rel	kept	rel	kept	rel	kept	rel	! kept	rel	kept	ret
A																			
B																			
C																			
D																			
E																			
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ANGLER COUNT

- . TIME

SHORE _____

BOAT _____

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Appendix B. Selected passages and figures from Teuscher (2001).

The objective of the American Falls Reservoir (AFR) survey was to estimate the change in fish abundance in the reservoir between July and November 2000. During that time, the reservoir volume decreased from approximately 1,062,289 acre feet to 353,717 acre feet (67% reduction). Reservoir storage dropped below 353,717 acre-feet, but began refilling prior to our November sample. During the same period, surface area declined from 18,000 ha to about 9,500 ha. Survey effort was four days in July and one day in November. Day and night transects were completed during the July survey. The diet work provided an evaluation for determining the best time to sample rainbow trout. Because changes in the rainbow trout fishery were the focus of the July-November comparison and trout monitoring in other waters showed greater measurable densities during the day, we chose to replicate only the daytime portion of the June survey when we returned in November. Gillnet catches during daytime sampling failed to produce enough fish to partition hydro-acoustic targets. Therefore, population estimates were not partitioned by species.

Daytime estimates of pelagic fish abundance dedined from 230,000 (± 71%) in July to 46,000 (± 53%) in November (Figure 12). Most of the difference resulted from a reduction in fish below 8 m. Mean densities of fish below 8 m declined from 49 fish/ha in July to about 3 fish/ha in November. The decline was largely due to a lack of small fish. Figure 13 shows that very few targets in the November survey were less than 250 mm in length. Conversely, the densities of fish tracked near the surface were very similar between the July (11.2 fish/ha) and November (12.4 fish/ha) surveys (Table 4). Due to the lack of catch in vertical gill nets, we could not determine the relative contribution that rainbow trout made to either population estimate.

The day versus night comparison showed significant differences in densities and vertical distribution of fish. Densities near the surface (<8 m deep) were greater during the day. The mean density near the surface was 11 fish/ha during the day and 4.1 fish/ha at night. That trend was similar to results found in waters with predominantly trout species (see Williams and Fish lakes results). Fish density below 8 m, however, was greater at night. The mean density below 8 m was 205 fish/ha at night and only 49 fish/ha during the day (Table 4).

The limitations of the July survey were significant. Some of the limitations included a small sample size (number of transects) and inadequate netting data to determine species composition. The limitations may be remedied by prioritizing daytime transects, using a purse seine to partition pelagic fish species, and increasing the number of transects by standardizing transect length.

Table 4. Fish densities (number/ha) in American Falls Reservoir for the July and November 2000 surveys. Densities for sidelooking (<8 m) and downlooking (>8 m) transducers are shown.

July				November			
Transect	<8 m	>8 m	Total	Transect	<8 m	>8 m	Total
1-day	7.3	36.5	43.8	1-day	53.8	0.0	50.4
3-day	2.9	51.2	54.1	2-day	13.8	0.0	13.8
5-day	31.6	80.1	111.6	3-day	17.6	22.4	40.0
lb-day	2.9	27.1	30.0	4-day	19.8	8.2	27.9
Mean	11.2	48.7	59.9	5-day	3.3	0.0	3.3
				6-day	5.0	0.0	5.0
1-night	1	86.1	87.1	7-day	7.2	0.0	7.2
3-night	2.2	40.8	43	8-day	4.5	0.0	4.5
5-night	2.6	57.5	60.1	9-day	0.0	0.0	0.0
7-night	6.6	656.7	663.3	10-day	4.8	0.0	4.8
9-night	8.3	181.9	190.2	11-day	5.5	0.0	5.5
Mean	4.1	204.6	208.7	12-day	6.0	2.7	8.7
				13-day	19.3	4.6	24.0
				Mean	12.4	2.9	15.0

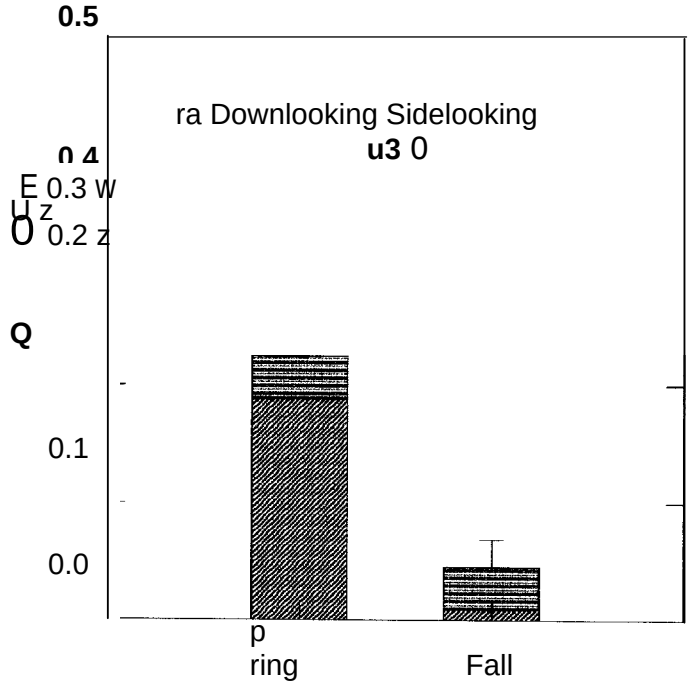

Figure 12. Daytime estimates of pelagic fish abundance in American Falls Reservoir. The legend refers to the proportion of fish tracked by the sidelooking (<8 m) and downlooking (>8 m) transducers. The abundance results are from an incomplete survey of American Falls Reservoir.

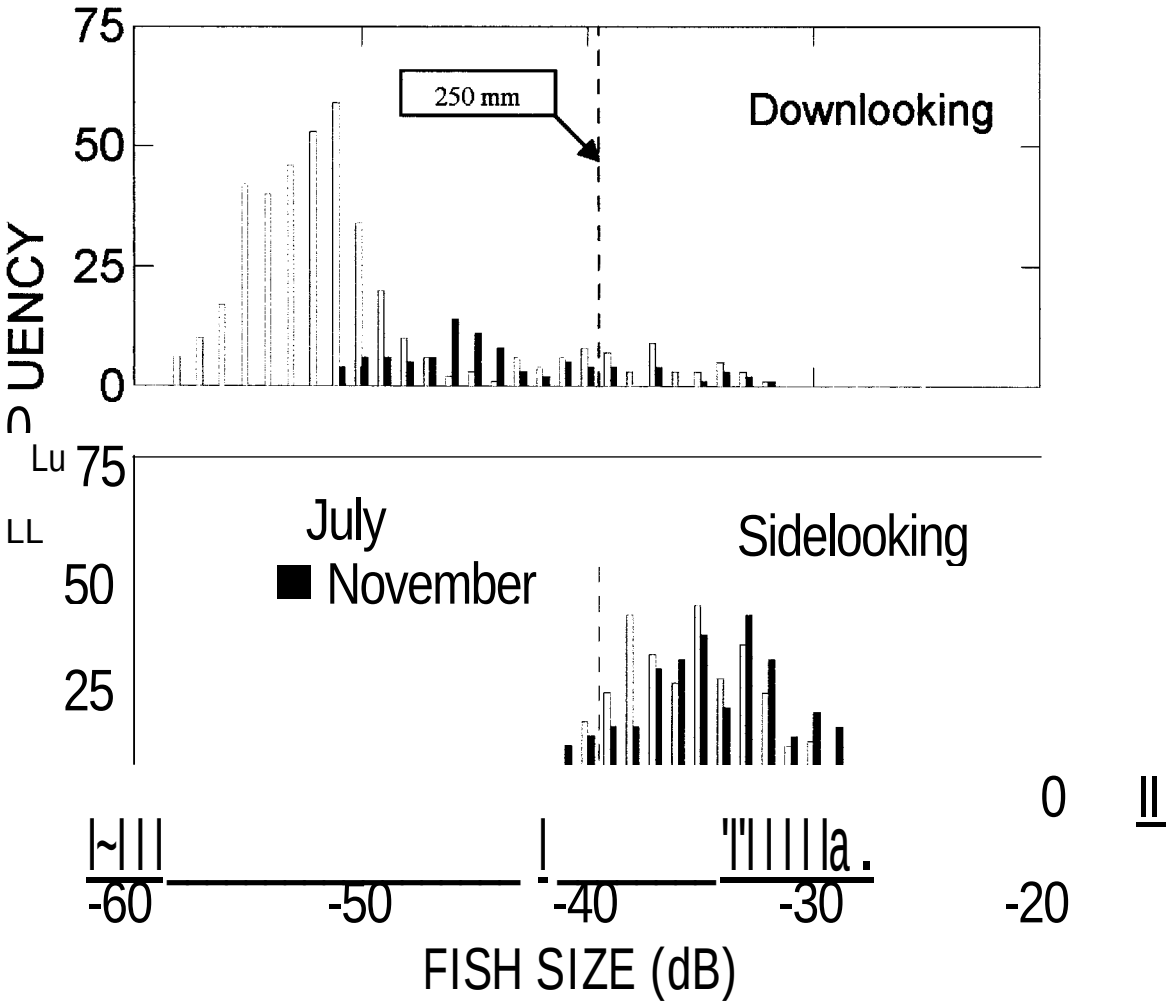

Figure 13. Length frequency distributions in decibels (dB) for fish targets tracked by the sidelooking (<8 m) and downlooking (>8 m) transducers in American Falls

Reservoir, Idaho.

SOUTHEAST REGION 2000 FISHERY MANAGEMENT ANNUAL REPORT

RIVER AND STREAM INVESTIGATIONS

State of:	Idaho	Program:	F-71-R-25
Project I:	Surveys and Inventories	Subproject I-F:	Southeast Region
Job:	c	Title:	River and Stream Investigations

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

ABSTRACT

We conducted a creel survey on the Snake River from McTucker Creek launch to the base of Gem State Dam during the months of March through August 2000. Creel clerks contacted 307 anglers and analysis of those contacts provides an estimate of 26,091 anglers fishing for 69,935 hours to catch 15,041 fish (0.22 fish/h). Boat anglers accounted for 36.6% of the effort. Peak total effort was during the month of March with 15,147 hours; while, May and August had the lowest effort at 9,150 and 9,648 hours respectively. Rainbow trout *Oncorhynchus mykiss* made up 89.2% of the catch with brown trout *Sa/mo trutta,* cutthroat trout 0. *clarki,* and rainbow x cutthroat hybrids O. *mykiss x O. clarki* making up the rest. Anglers harvested 44.9% of the fish they caught.

We operated annual opening-day check stations at two boat launches on the Snake River below American Falls Dam. We checked 580 anglers (85.5% boat anglers) and measured **449** fish. Interviewed anglers fished for a total of 2,842 hours and caught 1,010 fish (0.36 fish/h). Anglers harvested **44.0%** of the fish they caught with rainbow trout making up 88.9% of the harvest. Other species harvested include: brown trout, cutthroat trout, rainbow x cutthroat hybrids, smallmouth bass *Micropterus dolomieu* and a single largemouth bass *M. salmoides.* Combining check station data with aerial survey counts, we estimated that anglers caught a total of 1,611 fish and harvested 695 fish on opening day.

We conducted Yellowstone cutthroat trout O. *clarki bouvieri* spawning ground surveys during the days of June 22 and 23 on six sites along tributaries to the upper Blackfoot River. The number of observed redds per km increased at all sites when compared to the most recent survey. Redd densities ranged from 1.4 redds/km on Timothy Creek to 13.0 redds/km on Spring Creek. The Timothy Creek data compares with 0.0 observed redds/km in 1996 while Spring Creek had only 4.8 redds/km in 1995. Along with Timothy Creek, three other sites had indications of redd presence that were absent during the last survey.

We conducted population estimates on two sections of the Portneuf River above Lava Hot Springs. Trout densities were 618 fish/km for the upper site and 406 fish/km for the lower one. The upper site catch was 61.0% rainbow trout, 19.4% cutthroat trout, and 19.6% rainbow x cutthroat hybrids. The lower site catch was 55.3% rainbow trout, 21.8% cutthroat trout, and 22.9% rainbow x cutthroat hybrids.

We used backpack-electrofishing gear to sample 39 individual sites on 13 streams within the Southeast Region. In the Bear River drainage we sampled 29 sites on First, Second, Third, Preuss, Dry, Giraffe, and Dairy creeks. Bonneville cutthroat trout O. *c/arki utah* densities ranged from 0.0 fish/100 m^2 at two sites on Dairy Creek to 38.6 fish/100 m^2 at one site on Giraffe Creek. In the Snake River drainage, we sampled 10 sites along Rapid, Mink, and Rawlins creeks. Yellowstone cutthroat trout densities ranged from 0.3 fish/100 m^2 at one site on Mink Creek to 42.1 fish/100 m^2 at a site on Rapid Creek.

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OBJECTIVES

1. Determine the angling effort, catch rate, harvest rate, and other creel statistics for the Snake River stretching from American Falls Reservoir upstream to Gem State Dam.

2. Document opening day creel statistics for a stretch of the Snake River below American Falls Dam through the use of annual, boat-launch check stations and aerial angler counts.

3. Continue monitoring the status of upper Blackfoot River cutthroat trout through the use of redd surveys.

4. Continue monitoring the status of upper Blackfoot River fishery through the use of an annual opening day check station.

5. Document the population densities for game species on two sections of the upper Portneuf River.

6. Continue monitoring of Thomas Fork tributary populations of Bonneville cutthroat trout as part of the 1994 Conservation Agreement.

7. Document the status of Yellowstone and Bonneville cutthroat trout throughout the region by conducting population estimates with backpack electrofishing methods.

INTRODUCTION AND METHODS

Snake River Creel Survey above American Falls

Reservoir

We conducted a season-long (March – August) creel survey on the Snake River from the upper boundary of American Falls Reservoir to the base of Gem State Dam (104 river km). This is identical to the reach surveyed by Lukens (1988) in 1987 and is slightly longer than the one conducted by Scully et al. (1995) in 1992. In order for creel clerks to complete a survey in a single day, the survey reach was subdivided into 4 sections (Figure 14). Boundaries between sections 2, 3, and 4 were located at diversion dams that were impassable by jet boat. The boundary between sections 1 and 2 was located at the Ferry Butte boat ramp. Surveys were conducted twice a week with one day each week falling on a randomly selected weekday and the other on a randomly selected weekend day. Each survey day was further randomized into either an AM or PM survey. AM surveys were conducted from 08:00 to 13:00. PM surveys covered the day from 13:00 until typically 19:00. Each section was sampled at least twice a month (one weekday and one weekend day).

During a typical survey period for sections 1 or 2, clerks left from the Ferry Butte boat ramp near Tilden Bridge (Figure 14) and proceeded either downstream (Section 1) or upstream (Section 2). For Section 3, clerks used the boat ramp at Rose Pond. Section 4 surveys were launched from the boat ramp in Firth. Clerks counted anglers during either the outbound or return portions of each survey as determined by coin toss. Clerks then interviewed as many anglers as possible during the non-count leg of the survey trip. During individual angler interviews, clerks recorded angler residencies, total hours fished, method of fishing (bait or artificial lure/fly), and numbers of fish kept and released per species. Kept fish were identified and measured for length (mm). Creel survey data were then analyzed using the C-SAP (Creel – Survey Analysis Program) software developed by Weber et al. (1989) for the Colorado Division of Wildlife. Angler counts for a single Section were used to estimate the total count for all sections based on the percentage of total anglers counted for that section during the entire survey.

A hypothetical example for the angler count method follows: 400 total bank anglers were counted throughout the survey and Section 1's total bank angler count was 50. Therefore Section 1 had 12.5% of the total bank angler count. On an individual day 6 bank anglers were counted in Section 1. From those 6, an estimate of 48 (6/0.125 = 48) bank anglers would be entered into the C-SAP software. Catch rates and species compositions were assumed to be homogenous throughout all survey sections and thus no modifications were made to angler interview data (similar to Lukens 1988 and Scully et al. 1995).

Upstream Contribution to American Falls Reservoir Fishery – Clerks attempted to identify which harvested fish were stocked into the river versus those that were feral. Methods of stocked-fish identification are described in the American Falls Reservoir section of this report.

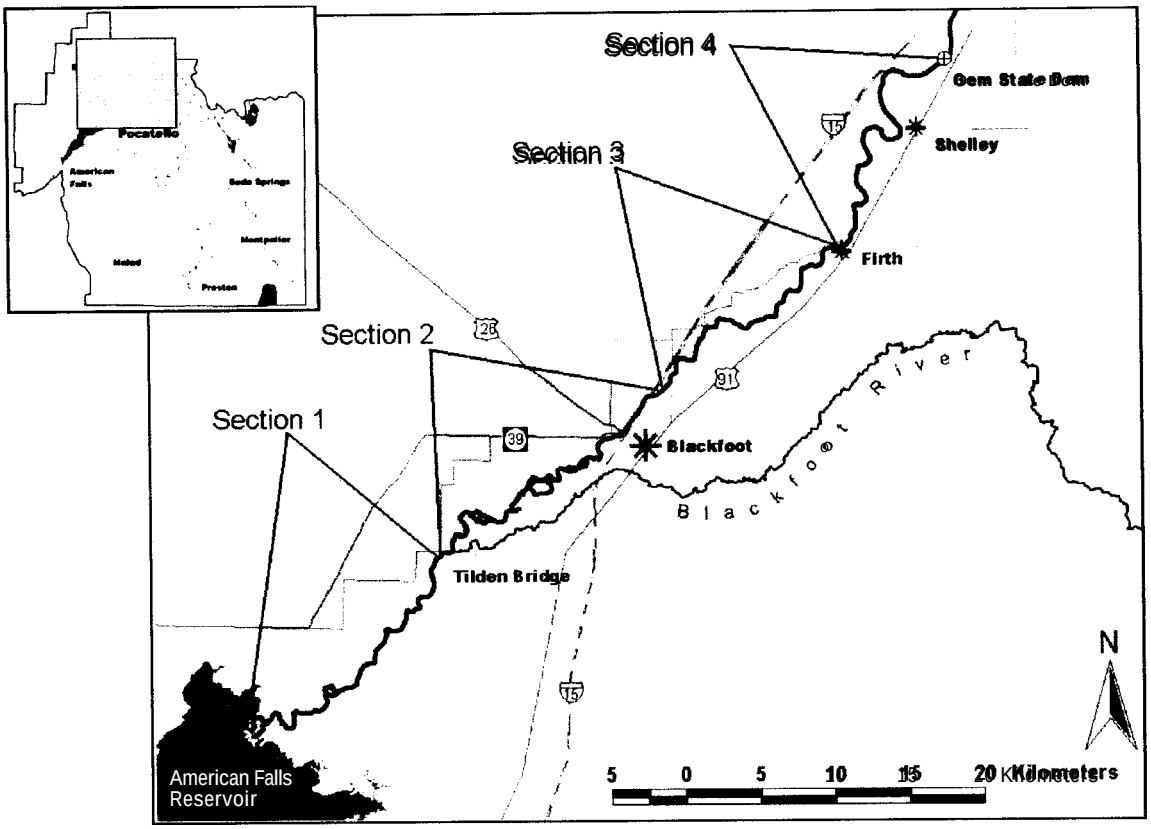


Figure 14. Creel survey section on the Snake River above American Falls Reservoir.

Opening Day below American Falls Dam

The Snake River between American Falls Dam and Eagle Rock (13.8 km) is a popular angler destination with seasonal (5 months) angler effort around 63,500 hours (Scully et al. 2000). A map of the river reach is provided in Figure 15. It generally receives a large amount of fishing pressure from boat anglers spread along the upper 2/3 of the reach and intense pressure from bank anglers in a few easily accessed locations. Traditionally, the fishing pressure has been greatest on the opening weekend and for the first two weeks of the season. At the request of anglers in the region, the creel limit was changed in 1998 on this stretch of the Snake River from a general limit of six trout to a six trout with a maximum of two trout greater than 16 inches. The goal of the change was to spread harvest of the targeted larger fish.

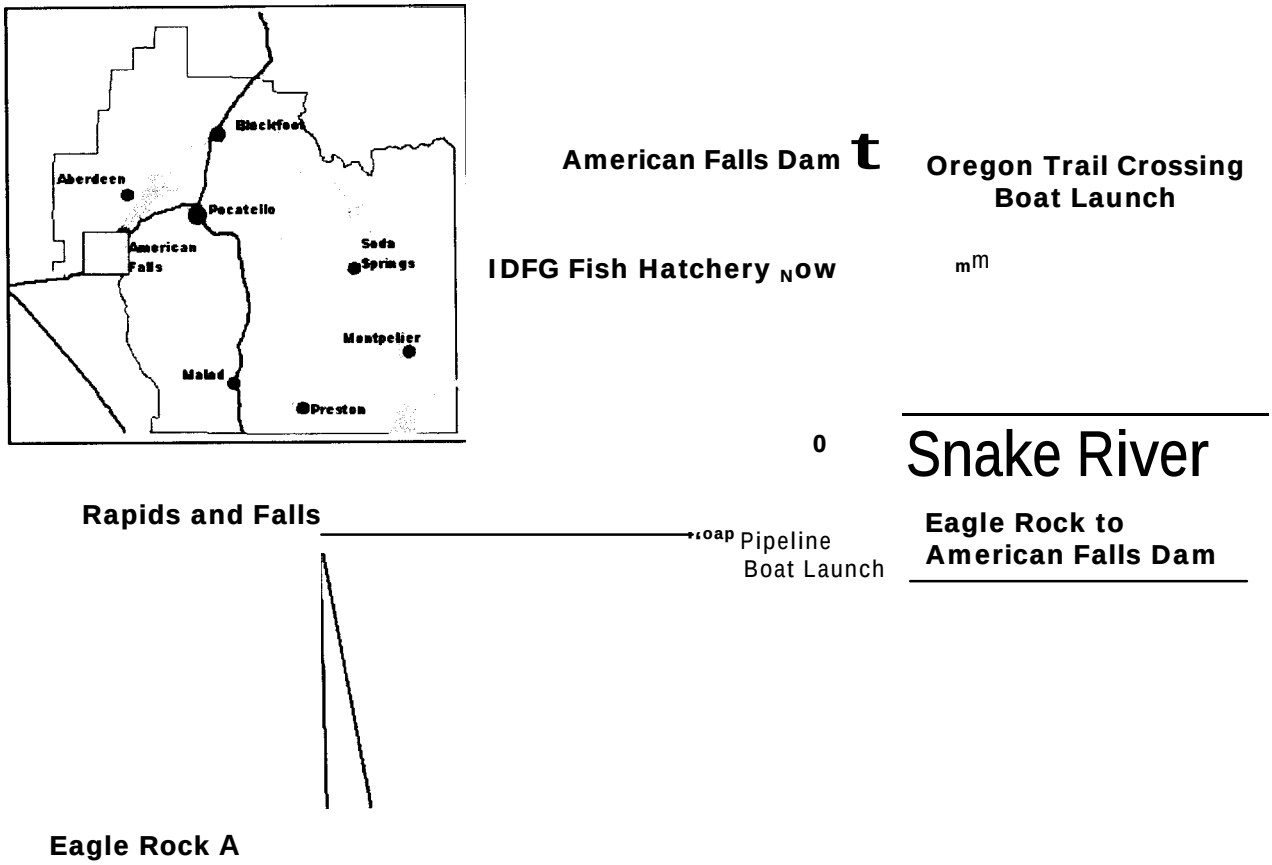


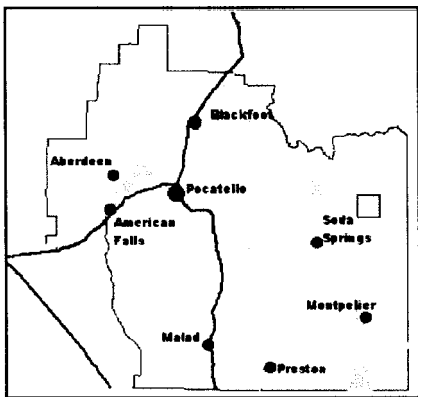
Figure 15. Opening day creel survey locations on the Snake River below American Falls Dam

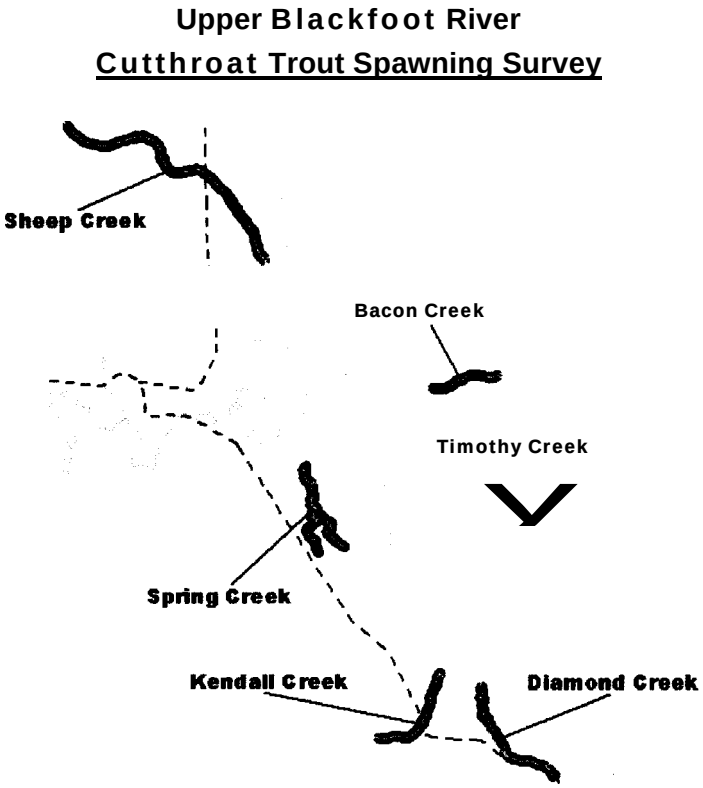
From 1995 through 1999, opening day check stations were conducted at the two major boat launches (Oregon Trail Crossing and Pipeline) and conservation officers, reservists, and other personnel conducted roving surveys of the other launches and favored bank angler locations. Anglers were asked where they were from, how many hours they had fished, how many fish were released and what fishing method they used. Total length of all harvested fish was recorded. In 2000, we continued the annual opening day survey with the additional use of aerial angler counts at periodic times of the day. Information from the aerial counts was combined with data from angler contacts in order to calculate total fishing effort and harvest for this river reach on opening day. Game species present in this stretch of the river include rainbow trout *Oncorhynchus mykiss,* cutthroat trout O. *clarki,* brown trout *Salmo trutta,* white sturgeon *Acipenser transmontanus,* smallmouth bass *Micropterus dolomieu,* and yellow perch *Perna flavescens.*

Blackfoot River

Spawner and Redd Surveys

In June of 2000, Department personnel conducted a visual survey of cutthroat trout spawners and redds along six tributaries to the upper Blackfoot River (Figure 16). Sampled reaches were some of the same reaches sampled by Department personnel as well as Caribou National Forest employees during the 1970s and 1980s (Heimer et al. 1987). Number of spawners (whether alive and dead) and number of identifiable redds were recorded for each reach. The record of spawner numbers from year to year provides an index of the size of each year's spawning population. Previous surveys had seen a marked decrease in spawner numbers beginning around 1982 through 1984.





Site	Length (m)
Bacon Creek	1091
Diamond Creek	2262
Kendall Creek	1716
Sheep Creek	4590
Spring Creek	3018
Timothy Creek	1401

Figure 16. Blackfoot River redd count reaches surveyed during June 2000.

Opening Day Check Station

Taken from Scully et al. 2000: "The upper Blackfoot River and Reservoir historically produced a large run of Yellowstone cutthroat trout O. *clarki bouvieri* that grew to large size. During the early 1980's, the fishery, first in the reservoir then in the river, collapsed. In order to restore the fishery, a management plan was developed for the entire system (Schill and LaBolle 1990). Included in the plan was elimination of all cutthroat trout harvest from the reservoir and a reduction in harvest (two fish greater than 18 inches) from the river. Due to requests from anglers, the river regulations were modified in 1998 to a catch-and-release requirement, in the hopes of speeding up the fishery's recovery.

Beginning in 1994, the department began monitoring the upper Blackfoot River fishery through the use of an opening-day creel survey and check station. The check station was set up in the same location used for wildlife check stations, north of Soda Springs on Highway 34 near the Trail Creek Road. Anglers were questioned on amount of time they fished and the number of fish caught. Any harvested fish were measured. Game species present in the river include Yellowstone cutthroat trout, rainbow trout O. *mykiss,* rainbow x cutthroat trout hybrids O. *clarki x O. mykiss,* and brook trout *Salvelinus fontinalis."*

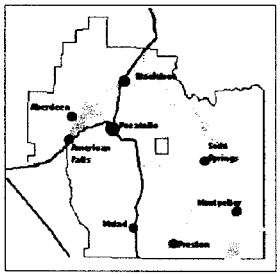
On July 1, 2000 we operated the check station to obtain creel survey data from anglers returning from the upper Blackfoot River opening day fishery.

Portneuf River

The upper Portneuf River (above Lava Hot Springs) has seen a resurgence in popularity with anglers throughout the region (personal observations). A sharp decline in popularity and angling effort was noted in 1991 by Scully et al. (1993) and several possible reasons were proposed. During the 1991 field season, a population estimate of trout in the upper Portneuf River was conducted on two sections. Trout densities (both rainbow and cutthroat trout) were found to be less than 0.1/100 m^2 in the upper section and 0.3 and 0.5/100 m^2 for rainbow and cutthroat trout in the lower section, respectively. Density levels were lower than in any year from 1979 to 1987, during which annual surveys were conducted. Efforts had begun in the mid-eighties to restore the river to its previous 'blue-ribbon' status. The main thrust of those efforts was the building of extensive riparian corridor fences on several landowners' property, most notably that of the King Creek Grazing Association.

In an effort to gauge the effectiveness of restoration projects, Department personnel and reservists conducted a mark-recapture population estimate of trout along two sections of the upper Portneuf River (Figure 17) during August 2000. The upper section was downstream of the section sampled in 1991. However, the lower section was exactly the same in both surveys. Attempts were made to categorize captured fish as hatchery rainbow trout (evidenced by eroded fins), wild rainbow trout, cutthroat trout, and rainbow x cutthroat hybrids.

Figure 17. Population estimate sites on the Portneuf River.

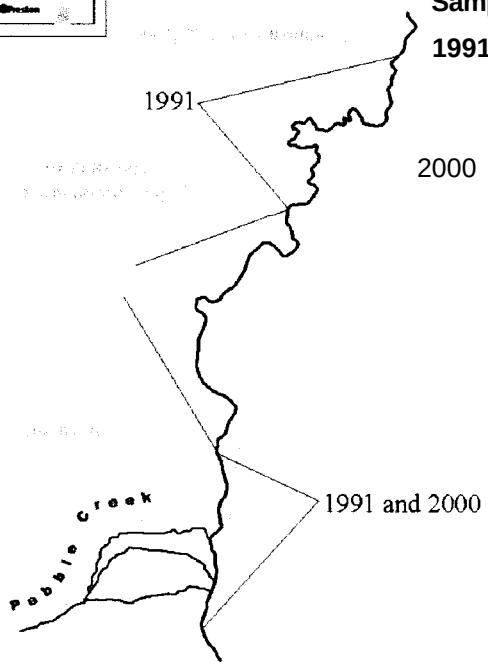


Upper Portneuf River

Population Estimate Sampling Sites 1991 and 2000

Bancroft 4

Lava Hot Springs



Thomas Fork

Taken from Scully et al. 2000: "Wallace (1978 and 1980) determined that essentially pure Bonneville cutthroat trout O. *clarki utah* populations inhabited the Thomas Fork of the Bear River and its tributaries (Preuss, Dry, and Giraffe creeks). Due to increased concern about the status of this sensitive species, in 1994 a Conservation Agreement for the protection and enhancement of the Bonneville cutthroat trout was developed for the Thomas Fork tributaries on Forest Service land. Restrictive grazing standards were imposed and riparian corridor fences were constructed in sensitive reaches of each stream.

Department personnel have monitored cutthroat trout fry (< 75 mm) and parr (> 75 mm) densities in the Thomas Fork tributaries since 1979. In recent years, sampling was done in alternate years using backpack-shocking units. Sampling was done in measured stream sections using either the Seber two-pass removal technique or the Peterson mark and recapture technique (Everhart et al. 1975). During 1998, we conducted slightly modified Seber two-pass removals on several sites of Dry, Giraffe, and Preuss creeks. The modification involves a rapid downstream pass, with current on, in conjunction with each individual upstream pass. This method helps capture previously stunned but missed fish and has increased our first-pass capture efficiency. Each site was randomly chosen within different strata on each creek. Additionally, each site was approximately 100 m long. Detailed measurements of length, width, depth, habitat, and riparian condition were made for each site."

In 2000 we monitored Bonneville cutthroat trout in the Thomas Fork drainage as required by the 1994 Conservation Agreement. We sampled six sites on Preuss Creek (two each on strata B, C, and D), four sites on Giraffe Creek (one each on strata B, C, D, and E), and four sites on Dry Creek (two each on stratums B and C) (Figure 18). We continued to use the modified Seber two-pass removal technique as described above.

Other Waters

During 2000, we sampled an additional 25 sites on seven different streams throughout the Region (Figure 19). Dairy, First, Second, and Third creeks all flow within the Bear River drainage and thus were potential habitat for Bonneville cutthroat trout. Mink, Rapid, and Rawlins creeks are within the Snake River drainage and therefore were potential Yellowstone cutthroat trout sites. Each site was sampled using backpack shocking equipment and following the modified Seber two-pass removal technique outlined in the Thomas Fork section of this report.

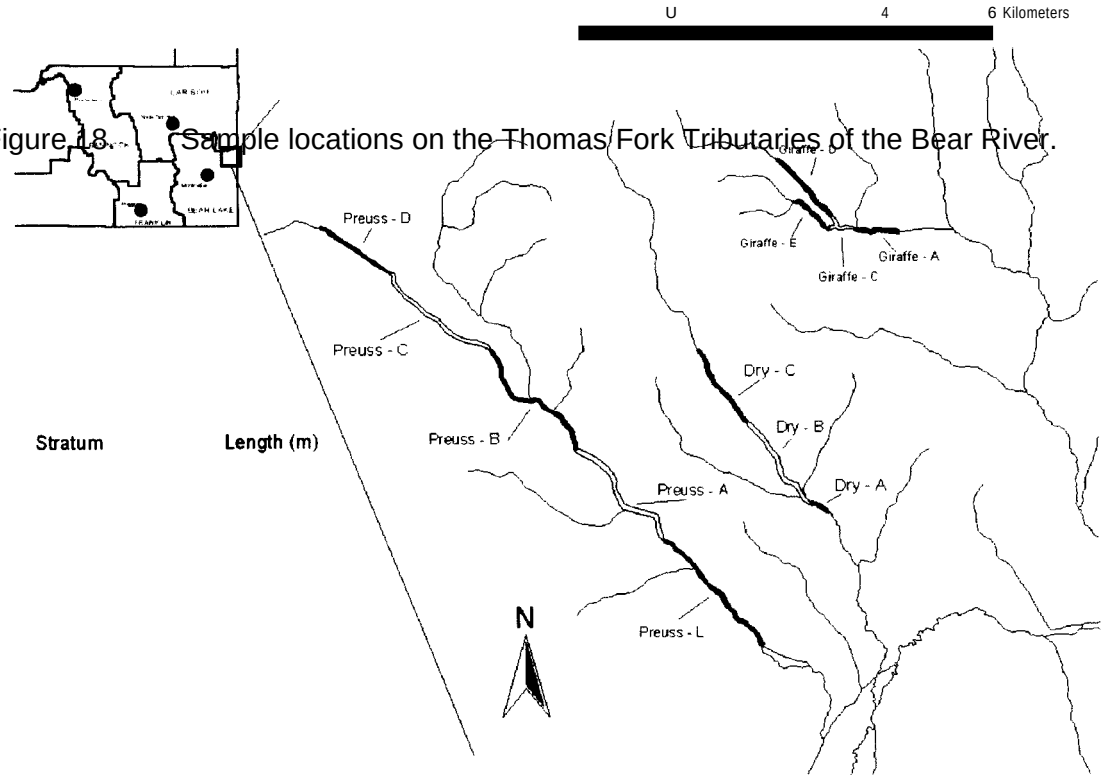


Figure 18. Sample locations on the Thomas Fork Tributaries of the Bear River.

Thomas Fork Tributaries

Dry-A	**440**
Dry -B	2100
Dry - C	1720
Giraffe - A	880
Giraffe - C	1030
Giraffe - D	1560
Giraffe - E	920
Preu ss - A	2750
Preuss - B	3030
Preu ss - C	2560
Preuss - D	1600
Preuss - L	**3590**

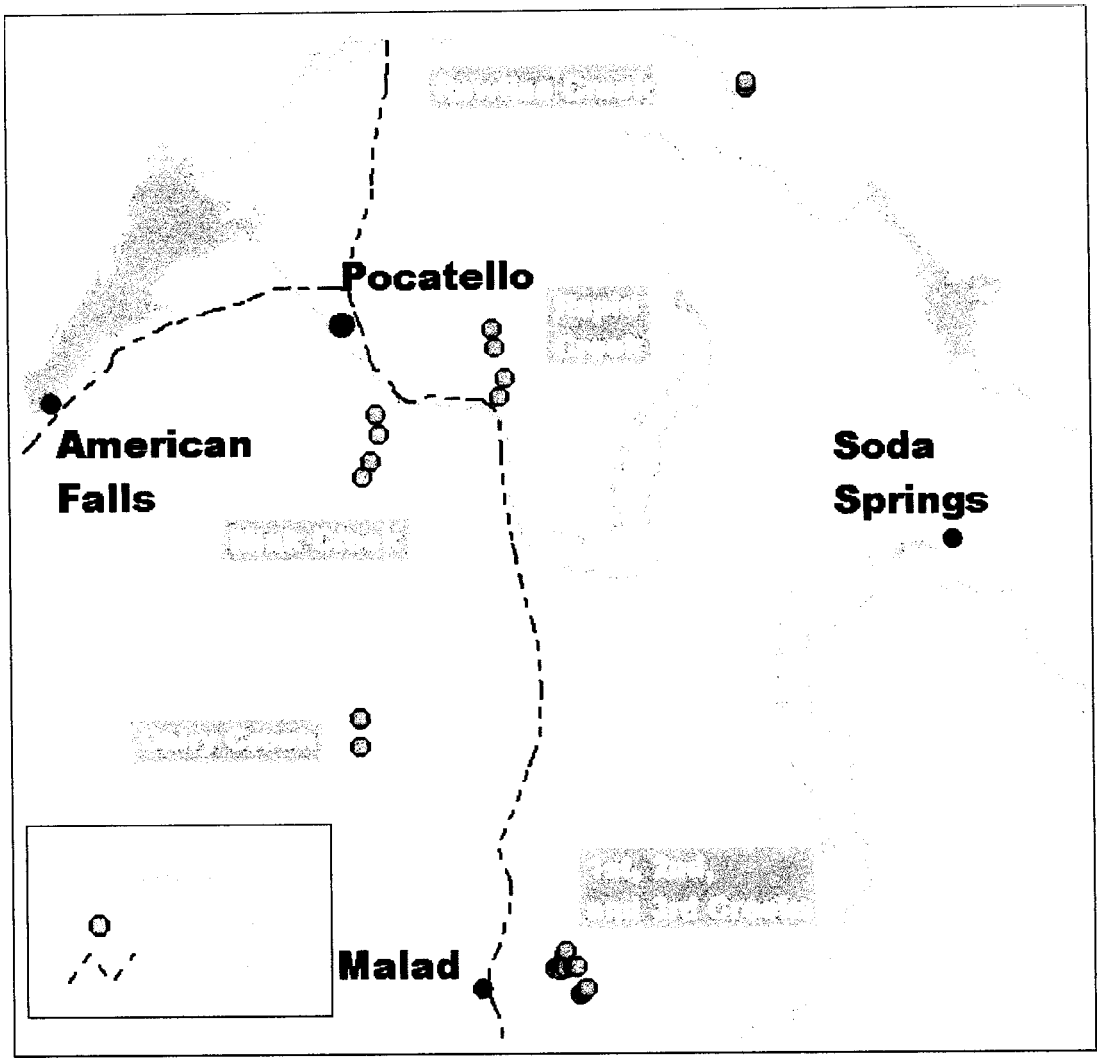


Figure 19. Stream survey locations sampled in 2000.

RESULTS AND DISCUSSION

Snake River Creel Survey Above American

Falls Reservoir

During the 2000 creel survey period, an estimated 26,091 anglers fished for 69,935 hours (2.68 h/angler and 672 h/km) and caught 15,041 fish (0.22 fish/h). Anglers harvested 44.9% of the fish they caught. The harvest was comprised of 89.2% rainbow trout, 7.3% brown trout, 3.1 % cutthroat trout, and 0.4% rainbow x cutthroat hybrids. A breakdown of the 2000 creel survey statistics is presented in Table 5. There was little correlation between river flow and catch rate or river flow and fishing effort (Figure 20). The difference in river flow between the gauges at Shelley and Blackfoot (Figure 20) indicate the amount of water diverted for use in irrigation.

Catch rate and fishing effort were highest during March, 0.38 fish/h and 15,147 hours respectively. It is unknown whether this pre-runoff fishing is typical as previous surveys did not include March within their sampling periods (Lukens 1988 and Scully et. al 1995). A compilation of creel data from the 1987, 1992 and 2000 surveys is presented in Table 6. The data from the 2000 survey is presented for the entire survey (March — August) and for the months of June - August in order to compare results with the 1992 survey. While effort remained equivalent, 2000 catch rates for the months of June — August were less than those found in 1992 (0.23 and 0.35 respectively). This drop in catch rate is present even though the number of fish stocked prior to the survey was nearly double for the 2000 season versus the 1992 season (IDFG Fish Stocking Database). River flow is also an unlikely cause in the decreased catch rate. Figure 21 depicts the flow rate of the Snake River near the town of Blackfoot during the 1992 and 2000 surveys. Other than the first three weeks of the survey periods, flow rates did not drastically differ between the two years throughout the survey period.

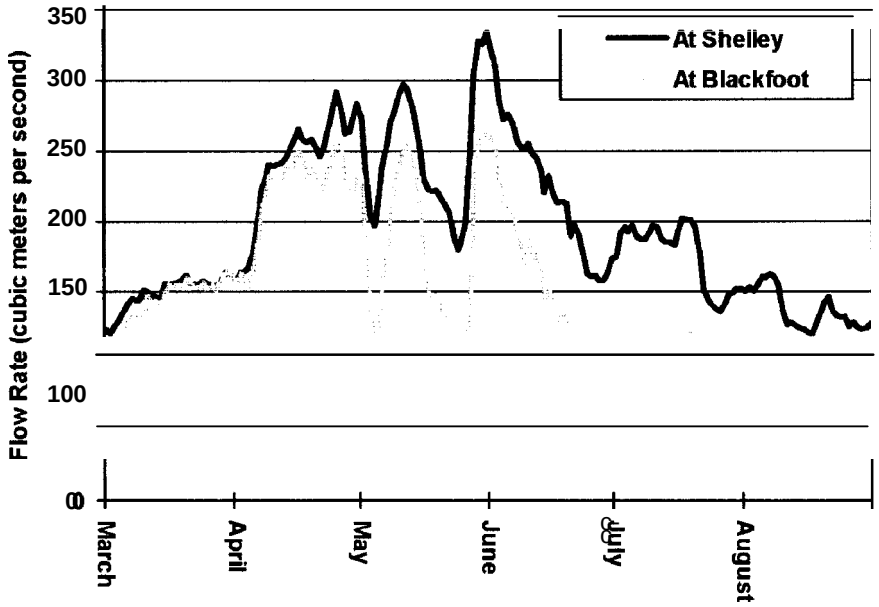
Lukens had previously recommended stocking brown trout fingerlings as an addition to the fishery throughout this stretch of the Snake River. Brown trout stocking began in 1991 with 27,500 fingerlings. These fish would have been available to the anglers surveyed during 1992. During the years 1992, 1996, 1997, and 1998, an additional 218,000 brown trout fingerlings were stocked into the river. Results from creel surveys reflected the influx of this new species to the fishery. The percentage of harvest comprised of brown trout increased from 1% in 1992 to 11% in 2000 (for the months of June - August). Department policy ended the brown trout stocking program statewide in 1999. It remains to be seen if the brown trout stocked in this stretch of the Snake River will establish a reproductively viable population.

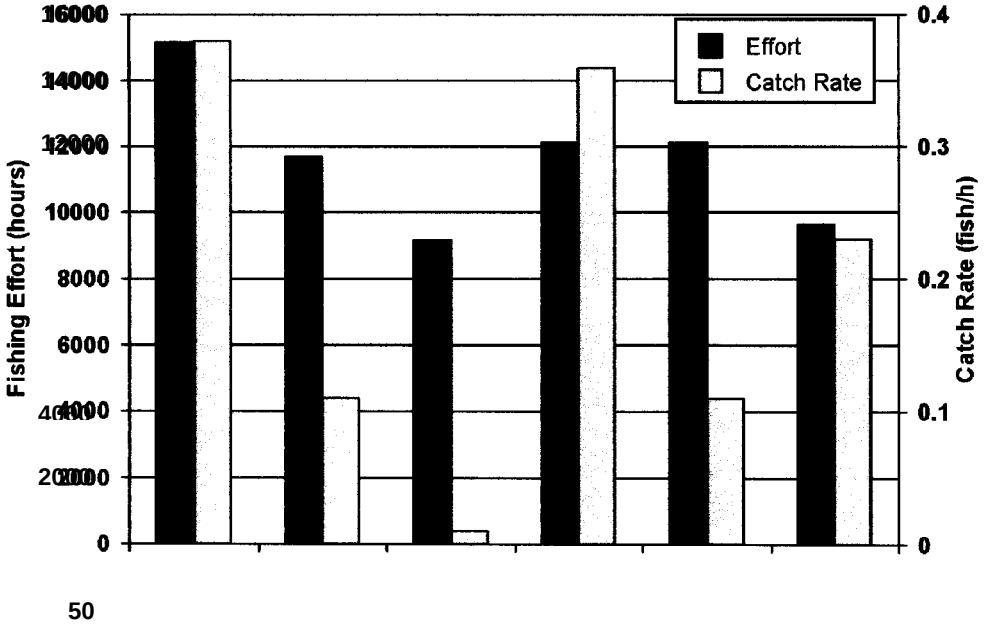
Upstream Contribution to American Falls Reservoir Fishery — Attempts to differentiate between stocked and wild produced rainbow trout using fluorescent grit-marked fish met with the same problems experienced during the American Falls Reservoir creel survey discussed earlier in this report. The use of equipment to identify marked fish was halted early in the survey.

Table 5. Basic creel statistics from the 2000 Snake River, Idaho, creel survey.

		March	April	May	June	July	August	Total
Anglers	Shore	3339	4644	1858	4802	1834	3499	19.975
	Boat	892	338	101	3596	816	374	6.116
	Total	**4231**	**4982**	**1959**	**8398**	**2650**	**3873**	**26.091**
Effort (hours)	Shore	10347	10333	8745	6190	4131	4568	44.314
	Boat	4800	1354	405	5960	8022	5080	25.620
	Total	**15147**	**11687**	**9150**	**12150**	**12153**	**9648**	**69.935**
Catch	Shore	3135	1241	120	2185	0	1158	7.839
	Boat	2631	0	0	2158	1378	1035	7.203
	Total	**5766**	**1241**	**120**	**4343**	**1378**	**2193**	**15.042**
Catch Rate (fish/h)	Shore	0.30	0.12	0.01	0.35	0.00	0.25	**0.18**
	Boat	0.55	0.00	0.00	0.36	0.17	0.20	0.28
	Total	**0.38**	**0.11**	**0.01**	**0.36**	**0.11**	**0.23**	**0.22**
Harvest	Shore	1802 (57.5%)	1241 (100.0%)	120 (100.0%)	991 (45.4%)	0 (0.0%)	605 (52.2%)	4.759 (60.7%)
	Boat	302 (11.5%)	0 (0.0%)	0 (0.0%)	608 (28.2%)	931 (67.6%)	156 (15.1%)	1.996 (27.7%)
	Total	**2104 (36.5%)**	**1241 (100.0%)**	**120 (100.0%)**	**1599 (36.8%)**	**931 (67.6%)**	**761 (34.7%)**	**6.755 (44.9%)**
Rainbow Trout (caught / %harvested)	Shore	2870 (55.8%)	1241 (100.0%)	0 (0.0%)	1931 (38.2%)	0 (0.0%)	1107 (50.1%)	7.149 **(57.8%)**
	Boat	2623 (11.5%)	0 (0.0%)	0 (0.0%)	1638 (37.1%)	1293 (66.7%)	714 (21.8%)	6.268 (30.8%)
	Total	**5493 (34.7%)**	**1241 (100.0%)**	**0 (0.0%)**	**3569 (37.7%)**	**1293 (66.7%)**	**1821 (39.0%)**	**13.417 (45.2%)**
Brown Trout (caught / %harvested)	Shore	266 (75.0%)	0	0	192 (100.0%)	0	0	457 **(85.5%)**
	Boat	**8** (0.0%)	0	0	260 (0.0%)	55 (100.0%)	322 (0.0%)	646 (8.6%)
	Total	**274 (72.8%)**	**0**	**0**	**452 (42.5%)**	**55 (100.0%)**	**322 (0.0%)**	**1.103 (40.5%)**
Other Species[1] (caught / %harvested)	Shore	0	0	120 (100.0%)	63 (100.0%)	0	50 (100.0%)	233 (100.00%)
	Boat	0	0	0	260 (0.0%)	29 (43.7%)	0	289 (4.4%)
	Total	**0**	**0**	**120 (100.0%)**	**323 (19.5%)**	**29 (43.7%)**	**50 (100.0%)**	**522 (47.0%)**

[1] Includes cutthroat trout and hybrid trout.


Flow Rate (cubic meters per second)
350
300
250
200
150
100
0
At Shelley
At Blackfoot
March
April
May
June
July
August


Fishing Effort (hours)
16000
14000
12000
10000
8000
6000
4000
2000
0
Catch Rate (fish/h)
0.4
0.3
0.2
0.1
0
Effort
Catch Rate

50

c C
co c
v)

Figure 20. Comparison of fishing effort and catch rate to river flow between the gauges at Shelley and Blackfoot on the Snake River.

Table 6. Statistics from the 1987, 1992 and 2000 creel surveys of the Snake River above American Falls Reservoir to Gem State Dam.

		1987 Jun-Nov	1992 Jun-Aug	2000 Mar-Aug	2000 Jun-Aug
Effort (h)	**Shore** (%)	16,936 (75%)	12,779 (51%)	44,314 (63%)	11,095 (43%)
	Boat (%)	5,738 (25%)	13,069 (49%)	25,620 (37%)	14,430 (57%)
	Total	**22,674**	**25,848**	**69,934**	**25,525**
Catch Rate (fish/h)		0.16	0.35	0.22	0.23
Rainbow Trout (% **of catch)**		2,748	8,969	13,417	5,036
		70%	92%	89%	84%
Brown Trout (% **of catch)**		740	134	1,103	633
		19%	1%	7%	11%
Cutthroat Trout (% **of catch)**		324	67	459	260
		8%	<1%	3%	4%
Hybrid Trout (% **of catch)**		93	98	63	48
		2%	<1%	<1%	1%
Whitefish (% **of catch)**			21		
			<1%		

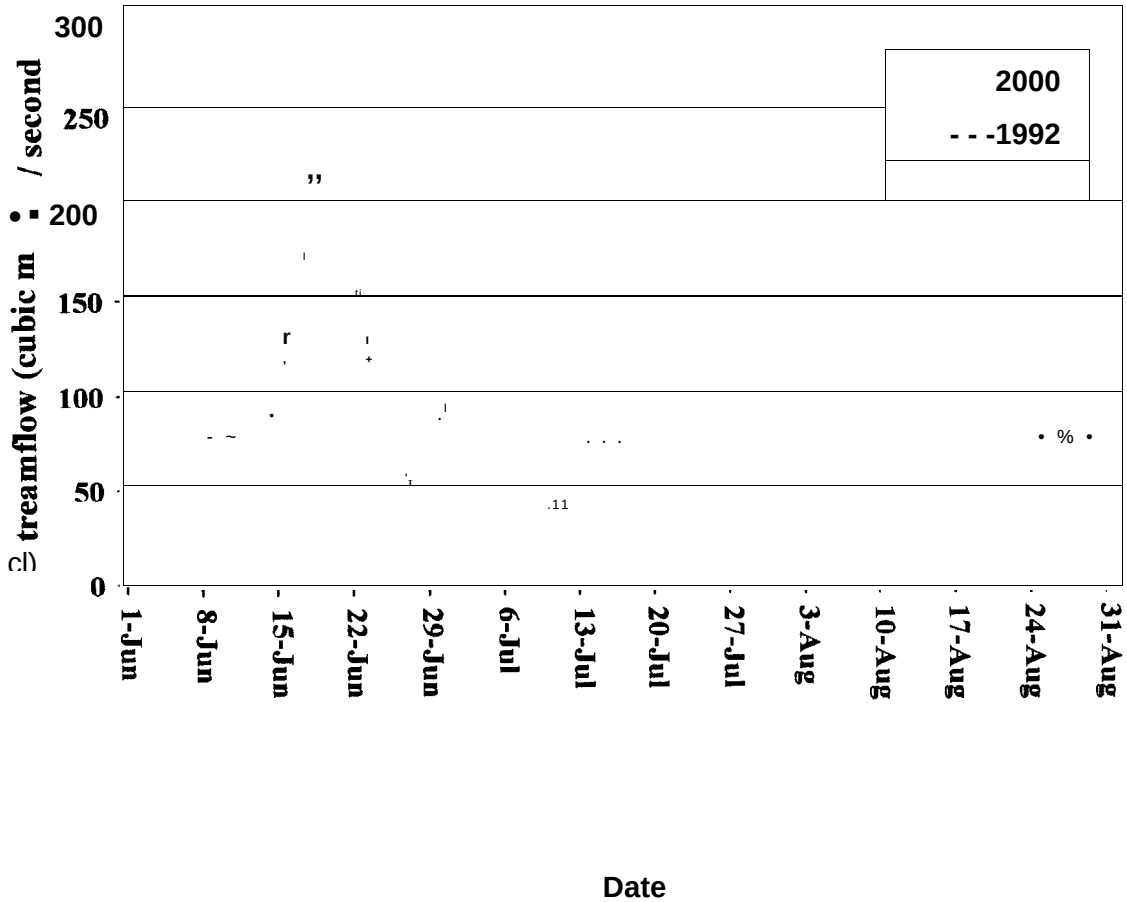


Figure 21 Snake River flow near Blackfoot, Idaho during the 1992 and 2000 creel surveys.

Opening Day below American Falls Dam

During the 2000 General Fishing Season opening day survey, we contacted 580 anglers who fished a total of 2,842 hours and caught a total of 1,010 fish for a catch rate of 0.36 fish/h. Boat anglers fared better than those fishing from shore at 0.40 fish/h compared to 0.11 fish/h, respectively. Anglers harvested **44%** of the fish they caught. Harvested fish were made up of 88.9% rainbow trout, 6.7% brown trout, 1.6% cutthroat trout, 1.3% rainbow x cutthroat hybrids, 1.3% smallmouth bass, and 0.2% largemouth bass. Mean length of harvested trout (all species) was 448 mm. Figure 22 depicts the length frequency distribution and relative weight analysis for harvested rainbow trout. Figure 23 depicts the length frequency distribution and relative weight analysis for harvested brown trout. Relative weights for rainbow and brown trout were calculated using formulas developed by Simpkins and Hubert (1996) and Milewski and Brown (1994) respectively.

Table 7 displays check station data from all years that the survey has been conducted. With the implementation of the regulation limiting harvest of trout >16 inches to two per angler, harvest rate on opening day has remained low (at or below 50%). Also notable in Table 7 is the wide variation in catch rate from year to year. Figure 24 depicts opening day river flow, a factor that correlates well (r = 0.87) with catch rate among all the surveys. On opening day, the discharge rate from American Falls Dam is the best predictor of how well fisherman will do. The

higher the discharge rate, the better the fishing. It is possible that the increased catch rates from higher flows are a result of increased entrainment losses from American Falls Reservoir. Opening day results from 1999 indicated that rainbow trout stocked directly into the Snake River

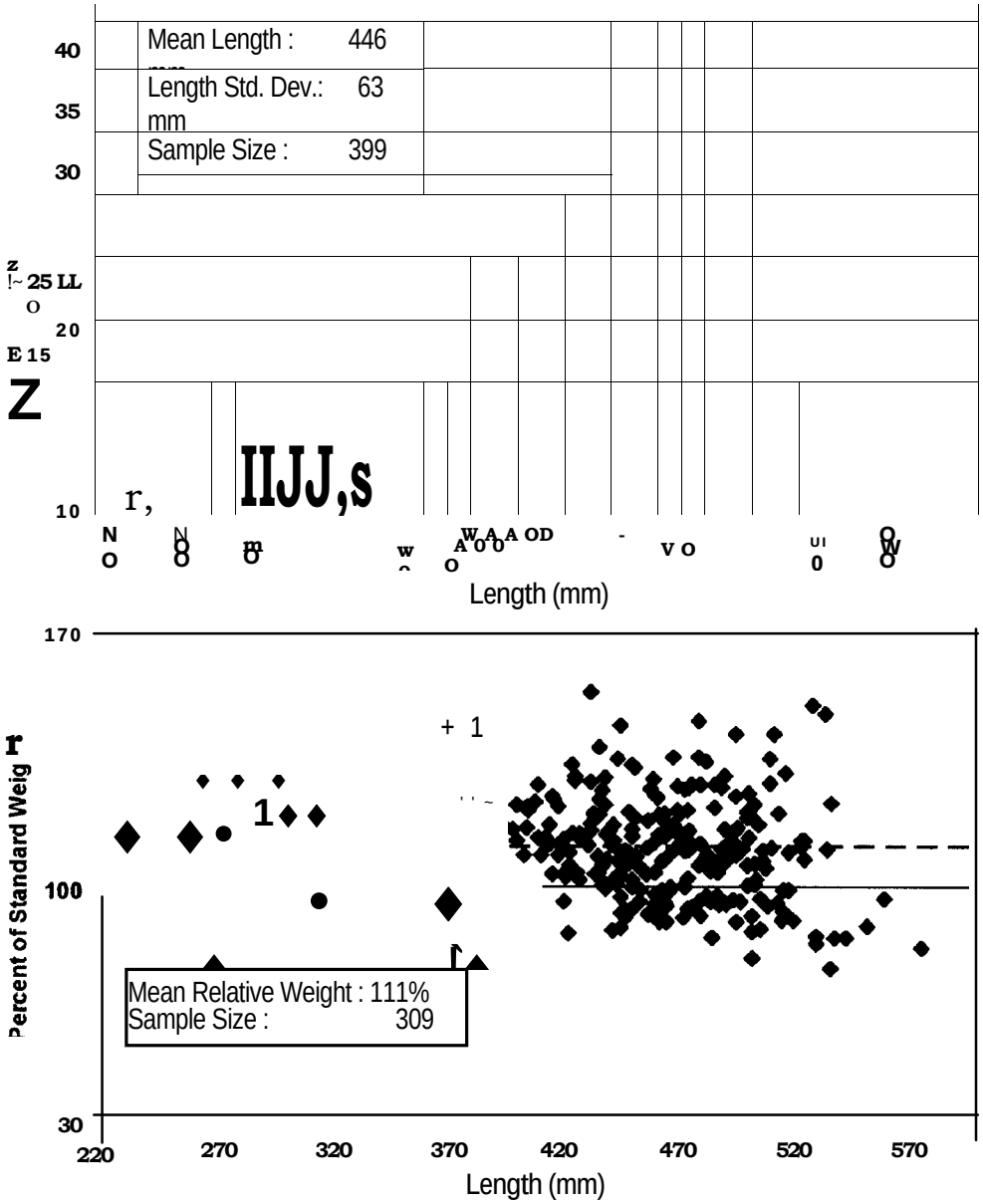


Figure 22. Length frequency distribution and relative weight analysis of rainbow trout harvested during the opening day 2000 below American Falls Dam

Table 7. Statistics from opening day check stations on the Snake River below American Falls Dam, Idaho for the years 1995 through 2000.

	1995	**1996**	**1997**	**1998**	**1999**	**2000**
Anglers Interviewed	148	138	162	414	368	580
Hours Fished[a]	677	514	506	1,448	1,640	2,842
Fish Caught•	564	151	519	1,940	1,402	1,010
Catch Rate (fish/h)	0.83	0.29	1.03	1.34	0.85	0.36
Fish Harvested	33%	83%	74%	47%	50%	44%
Mean Length of Harvested Trout (mm)	445	431	432	414	419	448

[a] Check stations were not operated for the same number of hours from year to year. Comparisons of absolute values between years are not reliable.

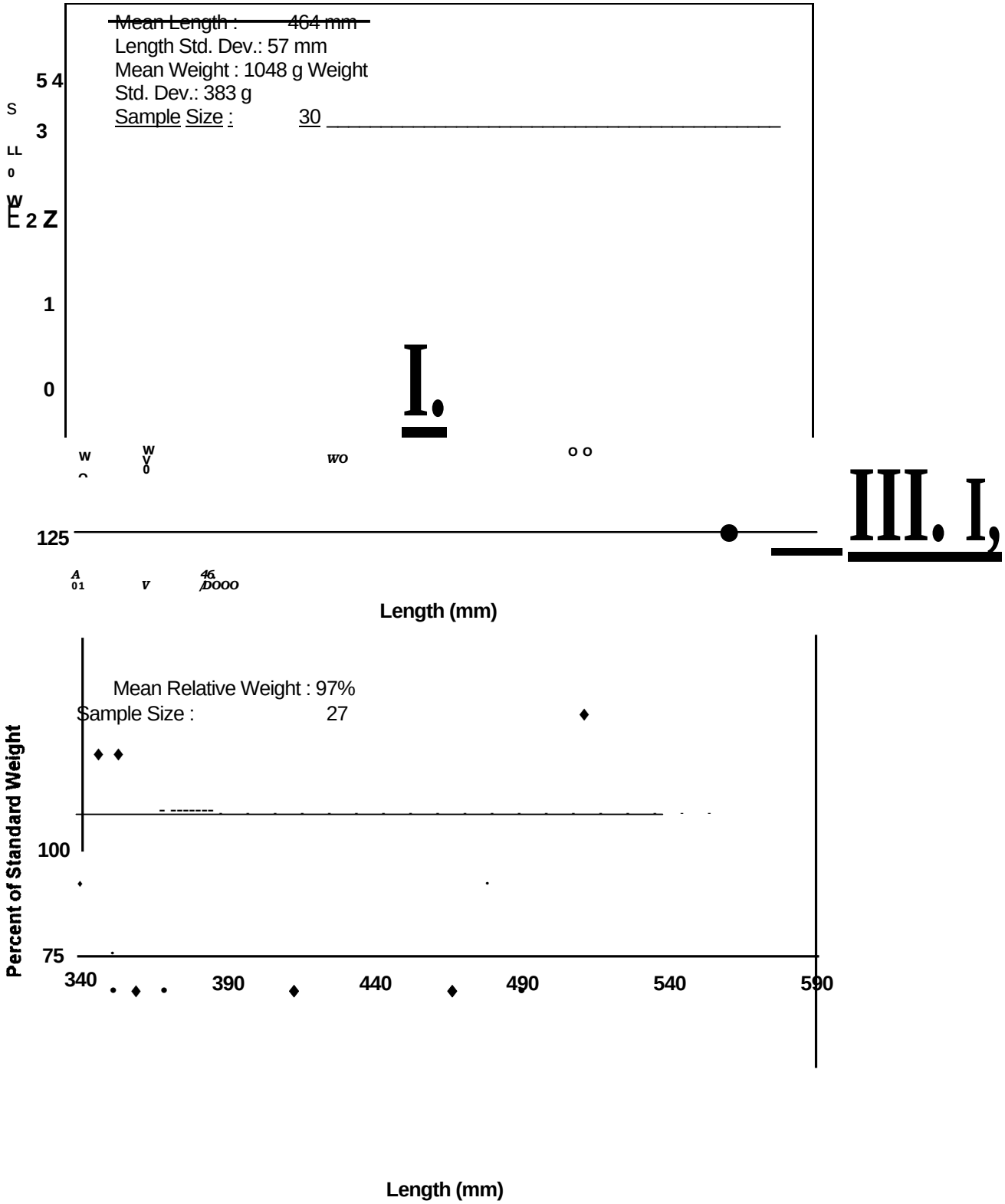


Figure 23. Length frequency distribution and relative weight analysis of brown trout harvested on opening day 2000 below American Falls Dam.

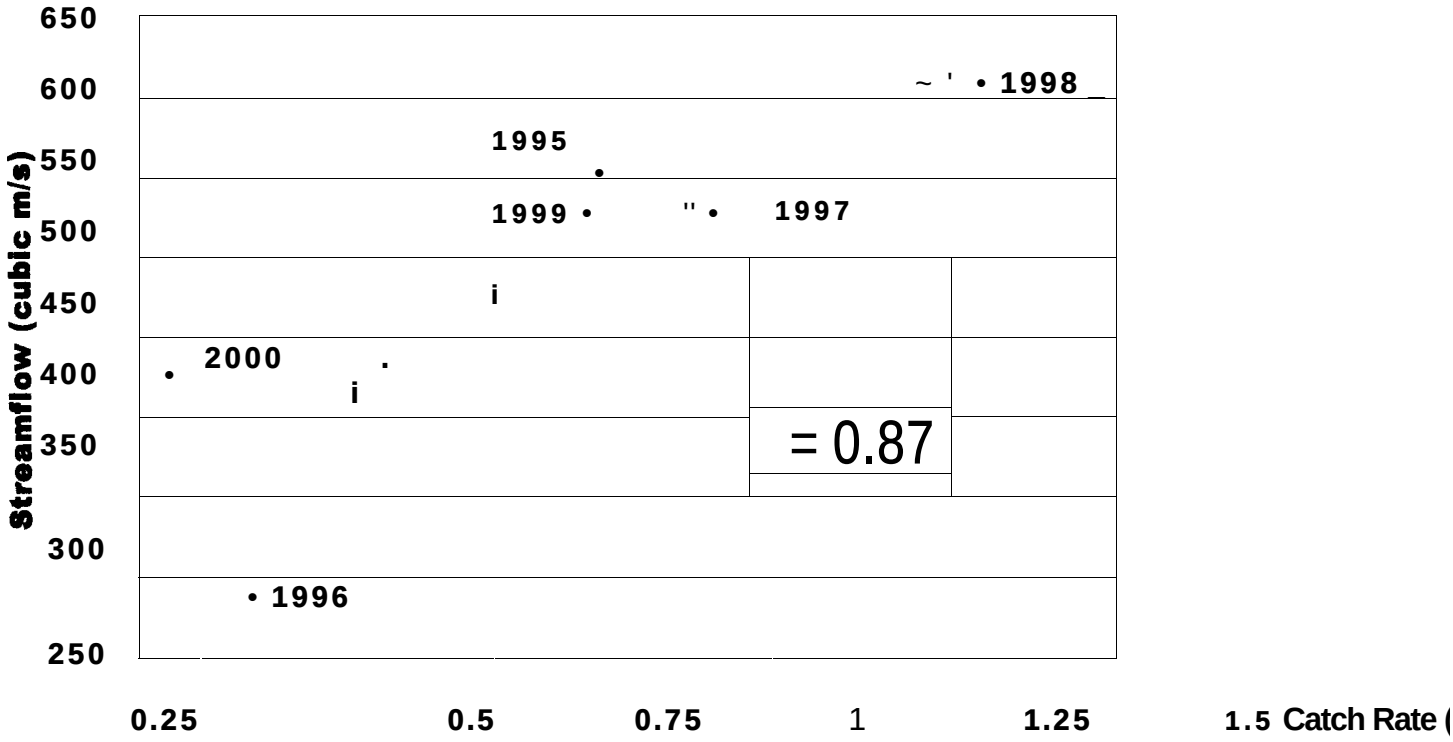


Figure 24. Chart depicting correlation between opening-day streamflow and catch rate on the Snake River below American Falls Dam, Idaho

(versus into the reservoir) accounted for only 18% of the total harvest (Scully et al. 2002). It was assumed that little to no natural recruitment occurs within this stretch of the Snake River. Combining results from the aerial angler/boat counts (5 periodic passes throughout the day) with data collected through individual angler contacts yields an overall estimate of 1,611 fish caught (95% by boat anglers) throughout the survey period (5:00 AM to 9:00 PM). Anglers harvested an estimated total of 695 fish.

Blackfoot River

Spawner and Redd Surveys

We surveyed a total of 14.1 km on six tributaries during the first two weeks of June. A total of 70 spawning cutthroat trout (5.0/km) and 111 redds (7.9/km) were observed during the surveys. The exclusion of Brown's Canyon Creek (access denied) and the inclusion of Diamond Creek (new survey reach) preclude direct comparisons with surveys conducted in the early to mid-eighties. However compared to recent years, the surveys indicate an increase in the number of spawners/redds (Table 8). All six streams had spawner/redd counts that were higher than the most previously sampled year. Further surveys and the reinstatement of the upper Blackfoot River trap should help verify if the noted increase in 2000 is not merely a statistical fluke.

Opening Day Check Station

Overall creel statistics from the check station are presented in Table 9. Opening day catch rates during 2000 were the lowest recorded (0.99 fish/h) since the beginning of the check station in 1994. The year 2000 continued an ongoing decline in catch rates starting with the initial and peak year of 1994 (1.90 fish/h). With a minor deviation in 1996, catch rates have made a steady decrease each year. It is unclear at this time what factor or factors are affecting catch rates. While an increase in angler pressure (i.e., more anglers per km of river) is a possibility, data collected from the check station cannot be used to either confirm or deny the hypothesis. During some years, opening day falls upon a weekend and invariably attracts a larger number of anglers. Also, the survey does not take into account those anglers who do not pass through the check station (i.e. individuals camping overnight or anglers who exit the area into Wyoming or returned west over the Bone Highway. Any future check stations should make an effort to determine total effort expended on the entire drainage during opening day by including the use of roving creel clerks and/or aerial counts. It remains to be seen if the increased spawner/redd counts will have an impact on catch rates in subsequent years.

Table 8. Cutthroat trout spawner and redd counts in selected sections of the upper Blackfoot River, Idaho drainage from 1978 through 2000.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of redds	Redds/km
Bacon	06/08/78	3.0	82	27.3	225	75.0
	06/11/79	3.9	49	12.6	0	0.0
	06/17/80	4.9	110	27.7	156	31.8
	06/03/81	4.4	155	35.0	218	50.0
	06/11/82	1.5	118	78.7	138	92.0
	06/13/83	7.8	214	27.4	232	29.7
	06/21/84	4.8	18	3.8	4	0.8
	06/13/85	2.1	4	1.9	25	11.9
	06/12/86	5.0	18	3.6	89	17.8
	06/08/87	3.7	15	4.1	27	7.3
	06/09/88	1.2	15	12.5	64	53.3
	06/07/89	1.2	33	27.5	29	24.2
	1990	No survey				
	06/??/91	1.2	0	0.0	16	13.3
	06/09/92	1.2	0	0.0	0	0.0
	06/24/93	1.2	1	0.8	3	2.5
	1994	No survey				
	1995	No survey				
	06/??/96	1.2	0	0.0	0	0.0
	1997	No survey				
	1998	No survey				
	1999	No survey				
	6/23/00	1.2	5	4.2	10	8.3
Brown's Canyon	06/12/78	1.9	23	12.1	4	1.3
	06/11/79	5.0	6	1.2	0	0.0
	06/12/80	3.5	26	7.5	26	7.4
	1981	No survey				
	06/11/82	1.5	14	9.3	3	2.0
	06/21/83	1.5	6	4.0	4	2.7
	06/20/84	1.6	**8**	5.0	2	1.3
	06/13/85	1.6	1	0.6	4	2.5
	06/12/86	1.6	1	0.6	6	3.8
	06/11/87	1.6	6	3.8	9	5.6
	06/07/88	1.6	4	2.5	15	9.4
	06/25/89	1.6	7	4.4	7	4.4
	1990	No survey				
	06/??/91	1.6	3	1.9	9	5.6
	06/09/92	1.6	0	0.0	0	0.0
	06/23/93	1.6	0	0.0	0	0.0

Table 8. Continued.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of redds	Redds/km
	1994			No survey		
	1995			No survey		
	1996			No survey		
	1997			No survey		
	1998			No survey		
	1999			No survey		
	2000			No survey		
Diamond (lower)	06/11/86	1.6	2	1.3	2	1.3
	06/09/87	1.6	0	0.0	6	3.8
	06/06/88	2.7	11	4.1	30	11.1
	1989			No survey		
	06/05/90	2.7	0	0.0	1	0.4
	06/03/91			No survey		
	06/10/92	2.7	0	0.0	0	0.0
	1994			No survey		
	1995			No survey		
	1996			No survey		
	1997			No survey		
	1998			No survey		
	1999			No survey		
	6/23/00	2.2	15	6.8	15	6.8
Diamond (Spring)	06/12/86	0.5	0	0.0	38	76.0
	06/08/87	0.5	3	6.0	21	42.0
	06/06/88	0.8	3	3.8	15	**18.8**
	06/07/89	0.8	0	0.0	15	18.8
	06/06/90	0.8	0	0.0	0	0.0
	06/03/91	0.8	0	0.0	1	1.3
	06/04/92	0.8	0	0.0	0	0.0
	06/15/93	0.8	0	0.0	0	0.0
	1994			No survey		
	1995			No survey		
	1996			No survey		
	1997			No survey		
	1998			No survey		
	1999			No survey		
	2000			No survey		
Kendall	06/10/78	1.0	4	4.0	2	2.0
	06/11/79	3.0	1	0.3	0	0.0
	06/17/80	2.0	10	5.0	4	2.0
	06/03/81	0.9	19	21.1	42	46.7

Table 8. Continued.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of redds	Redds/km
	06/11/82	0.7	48	68.6	16	22.9
	06/22/83	0.7	10	14.3	14	24.3
	1984			No survey		
	1985			No survey		
	06/11/86	1.5	3	2.0	1	0.7
	06/09/87	1.5	0	0.0	1	0.7
	06/07/88	1.6	1	0.6	7	4.4
	06/09/89	1.6	1	0.6	2	1.3
	06/04/90	1.6	0	0.0	0	0.0
	06/??/91	1.6	0	0.0	2	1.3
	06/04/92	1.6	1	0.6	0	0.0
	06/24/93	1.6	0	0.0	1	0.6
	1994			No survey		
	1995			No survey		
	06/??/96	1.6	0	0.0	0	0.0
	1997			No survey		
	1998			No survey		
	1999			No survey		
	6/23/00	1.6	0	0.0	4	2.5
Lanes	06/13/86	1.1	14	12.7	6	5.5
	06/11/87	1.1	0	0.0	0	0.0
	06/07/88	1.2	16	13.3	13	10.8
	1989			No survey		
	1990			No survey		
	1991			No survey		
	1992			No survey		
	06/24/93	1.2	0	0.0	2	1.7
	1994			No survey		
	1995			No survey		
	1996			No survey		
	1997			No survey		
	1998			No survey		
	1999			No survey		
	2000			No survey		
Sheep	06/29/78	2.1	66	31.4	17	8.1
	06/13/79	3.9	13	3.3	0	0.0
	06/18/80	6.1	42	6.9	100	16.3
	06/08/81	4.6	6	1.3	55	12.0
	06/18/82	1.3	**8**	6.2	22	16.9
	06/22/83	3.7	6	1.6	14	3.8
	06/20/84	2.9	12	4.1	10	3.5

Table 8. Continued.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of rdds	Redds/km
	06/13/85	2.5	0	0.0	22	**8.8**
	06/13/86	4.3	5	1.2	25	5.8
	06/10/87	4.3	6	1.4	25	5.8
	06/08/88	4.5	23	5.1	75	16.7
	06/09/89	4.5	22	4.9	41	9.1
	06/04/90	4.5	14	3.1	34	7.6
	06/04/91	4.5	10	2.2	29	6.4
	06/03/92	4.5	0	0.0	17	3.8
	06/24/93	4.5	0	0.0	10	2.2
	1994	No survey				
	06/23/95	4.5	0	0.0	10	2.2
	06/??/96	4.5	5	1.1	15	3.3
	1997	No survey				
	1998	No survey				
	1999	No survey				
	06/23/00	4.5	31	6.9	45	10.0
Spring	06/15/78	3.0	82	27.3	225	75.0
	06/11/79	3.9	49	12.6	0	0.0
	06/17/80	4.9	110	27.7	156	31.8
	06/03/81	4.4	155	35.0	218	50.0
	06/11/82	1.5	118	78.7	138	92.0
	06/13/83	7.8	214	27.4	232	29.7
	06/21/84	4.8	18	3.8	4	0.8
	06/13/85	2.1	4	1.9	25	11.9
	06/12/86	5.0	18	3.6	89	17.8
	06/08/87	3.7	15	4.1	27	7.3
	06/09/88	2.7	6	2.2	74	27.4
	06/08/89	2.7	11	4.1	47	17.4
	1990	No survey				
	06/05/91	2.7	4	1.5	11	4.1
	06/??/92	2.7	0	0.0	10	3.7
	1993	No survey				
	1994	No survey				
	06/23/95	2.7	2	0.7	13	4.8
	1996	No survey				
	1997	No survey				
	1998	No survey				
	1999	No survey				
	06/23/00	2.7	3	1.1	35	13.0
Stewart Canyon	06/10/81	2.3	1	0.4	1	0.4
	06/17/82	1.8	0	0.0	2	1.1

Table 8. Continued.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of redds	Redds/km
	1983	No survey				
	06/19/84	1.8	5	2.8	1	0.6
	06/12/85	1.8	4	2.2	0	0.0
	06/09/87	1.8	0	0.0	2	1.1
	06/06/88	1.8	5	2.8	16	8.9
	1989	No survey				
	06/05/90	1.8	0	0.0	0	0.0
	1991	No survey				
	06/05/92	1.8	0	0.0	0	0.0
	06/15/93	1.8	0	0.0	0	0.0
	1994	No survey				
	1995	No survey				
	06/??/96	1.8	0	0.0	4	2.2
	1997	No survey				
	1998	No survey				
	1999	No survey				
	2000	No survey				
Timber	06/10/81	1.4	3	2.1	3	2.1
	06/10/82	1.0	23	23.0	10	10.0
	06/13/83	2.0	80	40.0	46	23.0
	06/19/84	1.8	10	5.6	4	2.2
	06/12/85	1.8	10	5.6	3	1.7
	06/11/86	1.8	6	3.3	5	2.8
	06/08/87	1.8	0	0.0	0	0.0
	06/06/88	1.9	16	8.4	18	9.5
	1989	No survey				
	06/05/90	1.9	2	1.1	1	0.5
	1991	No survey				
	06/05/92	1.9	0	0.0	3	1.6
	06/15/93	1.9	7	3.7	0	0.0
	1994	No survey				
	1995	No survey				
	06/??/96	1.9	0	0.0	0	0.0
	1997	No survey				
	1998	No survey				
	1999	No survey				
	2000	No survey				
Timothy	06/16/78	3.9	52	13.3	25	6.4
	06/15/79	6.3	20	3.2	--	--
	06/17/80	7.0	135	19.3	--	--
	1981	No survey				

Table. Continued.

Creek Name	Date surveyed	Km surveyed	Number of spawners	Spawners/km	Number of redds	Redds/km
	06/12/82	0.6	14	23.3	4	6.7
	06/20/83	1.9	13	6.8	--	--
	06/19/84	1.2	13	10.8	--	--
	1985	No survey				
	06/12/86	4.0	18	4.5	12	3.0
	06/11/87	4.0	6	1.5	22	5.5
	06/09/88	1.4	15	10.7	28	20.0
	06/07/89	1.4	5	3.6	5	3.6
	06/06/90	1.4	26	18.6	68	48.6
	06/??/91	1.4	7	5.0	**8**	5.7
	06/09/92	1.4	8	5.7	4	2.9
	06/24/93	1.4	4	2.9	6	4.0
	1994	No survey				
	1995	No survey				
	06/??/96	1.4	0	0.0	0	0.0
	1997	No survey				
	1998	No survey				
	1999	No survey				
	06/23/00	1.4	0	0.0	2	1.4

Table 9. Comparison of creel statistics for the upper Blackfoot River, Idaho, on opening day, July 1, 1994 - 2000.

	Number of Anglers						Cutthroat Trout		Rainbow Trout		Hybrids		Brook Trout	
Year	Residents	Nonresidents	**Hours Fished**	**Catch Rate**	**Hours/Angler**	**Fish/Angler**	Kept	Released	Kept	Released	Kept	Released	Kept	Released
1994	33	4	155	1.90	4.30	8.00	4	229		104				
1995	38	17	223	1.52	4.05	6.15	20	208	7	103				
1996	56	13	340	1.65	4.92	8.13	15	545	1					
1997	65	23	333	1.43	3.78	5.42	22	453	2					
1998	30	9	188	1.44	4.82	6.95	NA[a]	252	3	4		3	8	1
1999	19	9	142	1.33	5.07	6.75	NA[a]	179	5	5				
2000	77	2	280	0.99	3.54	3.52	NA[a]	258	1	19				

[a] Regulation changes prohibit harvest of cutthroat trout from upper Blackfoot River.

Portneuf River

During the 2000 population estimate sampling on the upper Portneuf River, Department personnel captured and measured a total of 727 individual trout (Figure 25). The catch was comprised of 46% hatchery rainbow trout, 19% cutthroat trout, 19% rainbow x cutthroat hybrids, and 16% wild rainbow trout. In addition a single brown trout (< 1%) was captured during the four separate runs. For the upper section (Utah bridge to Maybe bridge), 310 fish were marked in the initial run and 175 fish collected in the second run including 24 recaptures for a population estimate of 2,268 trout (95% C.I. 1,529 to 3,534). Since the sampled reach was 3.67 km in length, the overall density of trout was 618 fish/km.

During sampling on the lower section (Maybe bridge to Slaughterhouse), 166 fish were marked in the initial run and 265 fish were collected in the second run including 74 recaptures for a population estimate of 904 fish (95% C.I. 733 to 1,144). The sampled reach was 1.93 km in length for an overall density of 468 fish/km. Survey statistics are presented in Table 10, including data from the 1991 population estimates Scully et al. (1993). Comparisons between the two different years (specifically the Maybe bridge to Slaughterhouse section) reveal a large increase in overall trout numbers and densities, approximately double those found in 1991. However, the increase in trout numbers has come at the expense of cutthroat trout percentages. It is hoped that the newly instituted sterilized-rainbow planting program can halt or at least slow down the rate of genetic introgression that is occurring in the river. Overall it appears that extensive riparian conservation/repair work has paid off on this section of the upper Portneuf River. Future efforts need to be made in both maintaining current projects and expanding into other regions of this once again `blue-ribbon' trout stream.

Thomas Fork

Tables 11, 12, and 13 present the results of population monitoring on three tributary streams of the Thomas Fork of the Bear River (Preuss, Giraffe and Dry creeks respectively). The tables include data collected from sampling 14 different locations in 2000. Overall, the 2000 results continued the trend seen during the 1998 sampling. Parr densities seem to have recovered from the drought years of the late 80's and early 90's. Even though catch-and-release fishing (no bait) has been reinstated for the drainage, the remoteness of the sampling reaches will likely diminish what little hooking mortality may occur. What is less clear is how far adult cutthroat trout in the larger mainstem move up into the tributaries during spawning season. The larger adult fish may be more susceptible to losses incurred by angling effort. The more likely threat to the continued existence of these fish is if extreme dry years were to return. A decrease in yearly moisture (especially if occurring over several years) would likely be accompanied by a marked decrease in parr densities. Continued monitoring and habitat protection/restoration efforts are needed to insure that when the dry years inevitably return, these 'pure-strain' fish will have the greatest chance for survival.

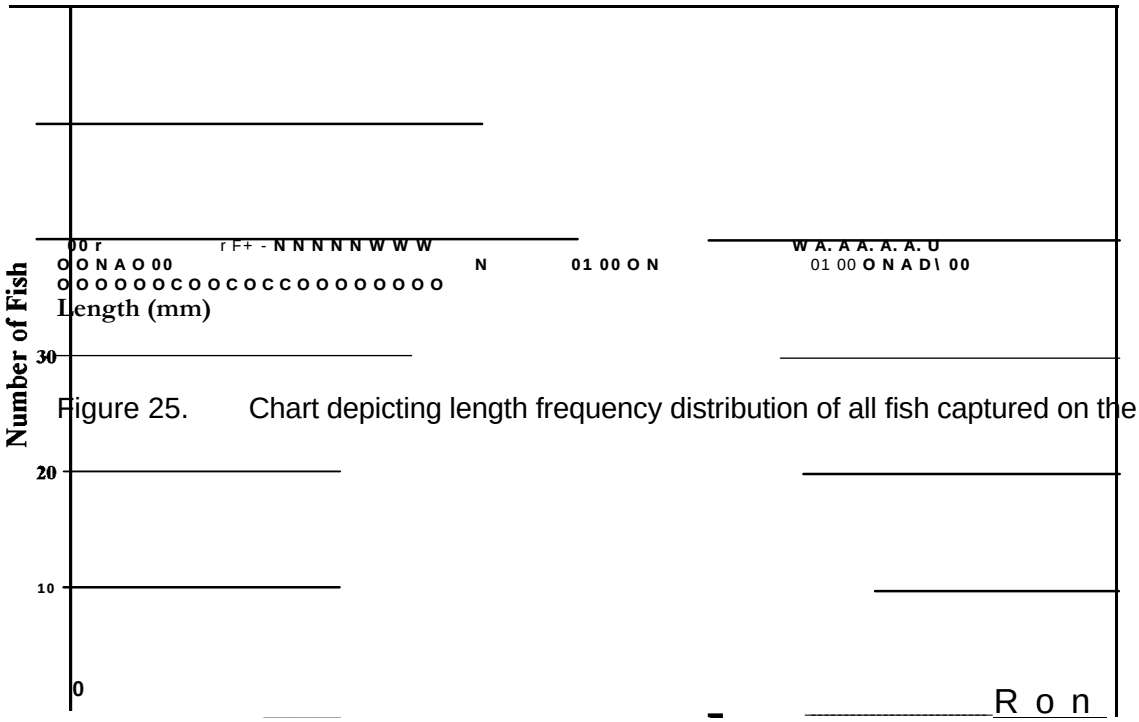


Figure 25. Chart depicting length frequency distribution of all fish captured on the upper Portneuf River, Idaho during the 2000 population estimate.

❑ Hybrid 19%

O Cutthroat 19%

■ Rainbow-wild

16%

■ **Rainbow-hatchery 46%**

Table 10. Population survey statistics from the August 2000 upper Portneuf River. The survey sections are listed in order from uppermost to the **bottom.**

Section / Year	Length	Population Estimate	Trout Density fish/km	Specie			
				Rainbow wild	Rainbow hatchery	Cutthroat	Hybrid
Kelly Bridge to Utah Bridge **1991**	3.76	83	22.1	43%	43%	14%	
Utah Bridge to Maybe **Bridge 2000**	3.67	2,268	618.0	27%	41%	**18%**	14%
Maybe Bridge to Slaughterhouse **2000**	1.93	904	468.4	16%	39%	21%	24%
Maybe Bridge to Slaughterhouse **1991**	1.93	395	204.7	32%	4%	64%	

Table 11. Bonneville cutthroat trout parr densities (numbers/100 m^2) found in Preuss Creek, Idaho from 1981 through 2000. Stratum A is lowest on the creek, just **above private** land. Stratum D is the upper section, **located above** the Crow Creek road that crosses Preuss Creek. Stratum L is the stretch located on private land directly downstream from the Forest Service boundary.

Year	Stratum A	Stratum B inside exclosure	Stratum B outside exclosure	Stratum C	Stratum D	Stratum L
1981		16.3	6.2			
1985		31.6	20.5			
1986		17.5	15			
1987	21	15	9.7			
1988					22	
1989	1	2.6	2.0			
1990		3.5	3.1			
1991		2	0, 0.6 (mean = 0.3)	0.7, 5.8 (mean = 3.3)	5.5, 1.7 (mean = 3.6)	
1993		1.5	0.5, 0.0 (mean = 0.3)	9.6, 3.0 (mean = 6.3)	1.1, 9.5 (mean = 5.3)	
1995		5.9	1.3, 3.5 (mean = 2.4)	2.6, 2.6 (mean = 2.6)	2.5, 0.8 (mean = 1.7)	
1997		11.1	3.5, 6.3 (mean = 4.9)	3.9, 6.7 (mean = 5.3)	**8.8,** 19.2 (mean = 14.0)	
1998						5.9, 1.3, 2.5 (mean = 3.2)
2000			5.7, 5.4 (mean = 5.6)	8.9, 6.0 (mean = 7.5)	17 4.3 (mean = 10.7)	

Table 12. Bonneville cutthroat trout parr densities (numbers/100 m^2) found in Giraffe Creek, Idaho from 1981 through 2000.

Year	Stratum A below exclo sure	Stratum B inside old exclo sure	Stratum C outside old exclo sure	Stratum D right fork	Stratum E left fork
1981		4.2	0.2		
1986		21.4	19.1		
1987		32.7	41.5		
1989		19.0	33.9		
1990		14.1	5.5		
1993		.5	0.0, 0.0		
1995		5.0	2.0, 6.0 mean = 4.0	0.0	4.7
1998	13.0, 21.7 mean = 17.3		11.1	5.9	9.7
2000		5.4	20.6	3.1	38.6

Table 13. Bonneville cutthroat trout parr densities (numbers/100 m^2) found in Dry Creek, Idaho from 1987 through 2000. Stratum A is located inside the cattle exclosure. Stratum B extends from the top of the exclosure for about 1750 meters. Stratum C extends from the top of Stratum B for about 1450 meters.

Year	Unspecified Locations	Stratum A inside exclosure	Stratum B	Stratum C
1987	14.4			
1990	4.3			
1993	0.0, 0.0, 0.0, 0.0 (mean = 0.0)			
1998		14.5	38.7,10 .9 (mean = 24.8)	12.3,10.0 (mean = 11.2)
2000			36.9, 17.5 (mean = 27.2)	18.6, 26.6 (mean = 22.6)

Other Waters

During 2000, we sampled 25 stream sites in addition to those previously discussed (Table 14). Streams sampled in the Bear River drainage all contained cutthroat trout. However, only two cutthroat trout were captured in the 316 m sampled in Dairy Creek. Tributaries to Deep Creek Reservoir, First, Second, and Third creeks, all contained healthy populations of cutthroat trout. While the presence of brook trout in First Creek may present some competition for young cutthroat, the complete absence of any rainbow trout hopefully indicates that little or no genetic introgression is occurring in the cutthroat trout population.

The Snake River drainage streams are more likely to experience genetic introgression. The three streams are now stocked with sterile rainbow trout. However, the presence of visually identifiable hybrids in Rawlins Creek indicates that introgression occurred before the sterile-rainbow program began. The presence of large numbers of brown trout in Rapid and Mink creeks is an indication of their connectivity with the lower Portneuf River. A large percent of the trout in the lower Portneuf River near Mink and Rapid creeks is brown trout. The headwaters of these two streams (sites B, C, and D, consecutively) contain few brown trout.

Table 14. Population estimates on 25 sites found within **the** Southeast **Region of Idaho** during **the summer of 2000.**

Drainage	Stream	Site	Length (m)	Mean Width (m)	Pop. Estimate° (95% Conf.	Trout Density (fish/100 m)	Species (%)				
							Cutthroat	Rainbow	Hybrid	Brook	Brown
Bear	Dairy Creek	**A**	**115**	2.5	0 (0 - 0)	0.00					
		B	103	1.4	2 (2 - 14)	1.39	100.0				
		C	98	1.5	0 (0 - 0)	0.00					
	First Creek	A	64	2.2	24 (24 - 35)	16.95	35.3			64.7	
		B	106	2.8	30 (30 - 35)	10.02	44.4			55.6	
		C	145	2.6	49 (49 - 51)	12.90	66.7			33.3	
		D	**148**	3.5	73 (73 - 80)	14.15	59.4			40.6	
	Second Creek	A	142	2.0	3 (3 - 6)	**1.08**	100.0				
		B	125	2.6	10 (10 - 21)	3.09	100.0				
		C	86	1.2	6 (6 - 6)	5.72	100.0				
		D	147	1.4	12 (12 - **18)**	5.99	100.0				
	Third Creek	A	107	2.4	3 (3 - 3)	1.20	100.0				
		B	**88**	2.5	5 (5 - 7)	2.24	100.0				
		C	74	2.0	12 (12 - 22)	8.11	100.0				
		D	91	2.1	0 (0 - 0)	0.00					
Snake	Rapid Creek	A	113	4.4	38 (38 - 41)	7.70	70.3	21.6			**8.1**
		B	84	4.6	42 (42 - 48)	10.96	87.2	2.6			10.3
		C	86	2.2	48 (48 - 53)	25.84	100.0				
		D	117	1.5	73 (73 - 72)	42.06	100.0				
	Mink Creek	A	119	3.9	50 (50 - 55)	10.66	6.3				93.7
		B	180	4.6	53 (53 - 72)	6.46	4.8	9.5			85.7
		C	55	3.5	53 (53 - 78)	27.43	35.9	**12.8**			51.3
		D	89	2.5	12 (12 - 12)	5.44	100.0				
	Rawlins	A	**118**	3.9	68 (68 - 76)	14.84	81.0	19.0			
		B	98	3.4	68 (68 - 75)	20.41	39.1	57.8	3.1		

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SOUTHEAST REGION 2000 ANNUAL PERFORMANCE REPORT

TECHNICAL GUIDANCE

State of: Idaho Program: F-71-R-25

Project II: Technical Guidance Subproject II-F: Southeast Region

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

We provided input to the Regional Environmental Staff Biologist on activities affecting fish and anglers. We communicated our concerns to the U.S. Bureau of Reclamation and Idaho Power Company during the severe drawdown event on American Falls Reservoir during June-October, 2000. We conducted presentations for various parties (anglers and non-anglers) concerning the current status and future plans for various fisheries within the region. We coordinated our stream electrofishing efforts with individuals from the Idaho Department of Environmental Quality, U.S. Bureau of Land Management, and the U.S. Forest Service. We provided information and assistance with the Department's *Comments to U.S. Fish and Wildlife Service Regarding Petition to List Yellowstone Cutthroat Trout as Threatened under the Endangered Species Act.* Department personnel monitored and assisted various individuals conducting fish collecting activities.

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2000 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: F-71-R-25

Project III: Habitat Management Subproject III-F: Southeast Region

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

ABSTRACT

We monitored several ongoing habitat restoration projects. Some, but not all of the duties performed by regional personnel include: (1) photo-point monitoring and establishment on the Portneuf River, (2) revetment construction and maintenance on the Portneuf and Blackfoot rivers, (3) inspection, repair andrebuild of livestock exclosure fences, (4) modification of four stock-watering gaps along 8.6 km of the upper Portneuf River and (5) maintenance of the Department constructed dam on the upper Blackfoot River.

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