

IDAHO DEPARTMENT OF FISH AND GAME

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AMERICAN FALLS-SNAKE RIVER FISHERIES INVESTIGATIONS



Final Report to Idaho Power Company from
Idaho Department of Fish and Game by

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ABSTRACT

As part of a cooperative agreement with Idaho Power Company, we evaluated fish plants, fishing pressure and catch in American Falls Reservoir and the Snake River from the reservoir downstream to Eagle Rock, a distance of 10.8 km (6.7 mi). In order to evaluate the contribution of hatchery rainbow trout to the creel we tagged 12,000 fish each year (1981 and 1982) and released them in April in American Falls Reservoir. Half of the annual release of tagged fish (6,000) were from Idaho's American Falls Hatchery and half (6,000) from the commercial Batise Hatchery.

In 1981 an estimated 33,803 anglers fished 148,735 hours at American Falls Reservoir and harvested 6,380 Batise rainbow, 27,383 American Falls rainbow, plus 3,751 rainbow released the previous year.

In 1982 an estimated 21,370 anglers fished 94,609 hours at American Falls Reservoir and harvested 421 Batise rainbow (1981 release), 1,588 Batise rainbow (1982 release), 2,659 American Falls rainbow (1981 release) and 8,288 American Falls rainbow (1982 release).

In 1981 an estimated 16,803 anglers fished the Snake River 55,708 hours and harvested 4,007 Batise rainbow, 16,951 American Falls rainbow, 1,550 holdover rainbow, 3,999 yellow perch and 2,254 black crappie.

In 1982 an estimated 13,327 anglers fished the Snake River 46,493 hours and harvested 323 Batise rainbow (1981 release), 1,730 Batise rainbow (1982 release), 5,106 American Falls rainbow (1981 release) and 5,665 American Falls rainbow (1982 release).

Returns from the 1981 tagged fish plant indicated that 12.3% of the Batise trout were caught in the reservoir and 5.5% in the river in 1981. In 1982 1.0% were caught in the reservoir and .6% in the river. Returns from the American Falls trout indicated that 14.4% were caught in the reservoir and 6.4% in the river in 1981. In 1982, 1.7% were caught in the reservoir and 2.6% in the river. For the two years total recovery of the tagged Batise trout was 19.3% and the American Falls trout 25.1%.

In April 1982 we again released 6,000 tagged trout from each hatchery in American Falls Reservoir. An estimated 2.3% were caught in the reservoir and 3.7% in the river for a total first year return of 6.0%.

A total of 121,855 American Falls Hatchery rainbow were planted in American Falls Reservoir in 1981. An estimated 52,446 (43.0%) of them were caught in 1981 and 1982. A total of 33,600 Batise rainbow were planted in American Falls Reservoir in 1981. An estimated 10,784 (32.1%) were caught in 1981 and 1982.

Growth and movements of the two groups of fish were very similar. Unfortunately a size differential between the two groups of fish in both years

probably accounted for most of the difference in return rates, with the American Falls fish being caught in higher numbers. My conclusion is that Batisse reared fish will perform in American Falls Reservoir as well as American Falls reared fish if they are released at the same size.

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INTRODUCTION

In a document dated 14 November 1980, the Idaho Department of Fish and Game and Idaho Power Company agreed on compensation measures to offset losses of trout at the rebuilt American Falls Dam. These losses occur because trout pass through hydroelectric turbines as they egress down-stream from American Falls Reservoir. This reservoir outmigration is a result of the poor water quality in mid and late summer. Water that passed downstream from the old American Falls Dam was used primarily for irrigation; therefore, little turbine mortality occurred. Most of the water now released at the dam passes through turbines and the potential exists to affect fishing in the Snake River downstream.

The Snake River between American Falls Dam and Lake Walcott (Eagle Rock), a distance of 10.8 km (6.7 mi), is known for both the quality and quantity of trout caught. This section was classified as Blue Ribbon or Class I by the Idaho Department of Fish and Game in 1968. It's also characterized by long pools and large riffles. Most of the river's elevational change occurs in the downstream section between Duck Point and Eagle Rock. A map of American Falls Reservoir and Snake River in the immediate vicinity is shown in Figure 1.

Starting in 1981, Idaho Power Company agreed to annually release 3,632 kg (8,000 lb) of hatchery-reared rainbow trout in American Falls Reservoir. The trout are to be released in mid-April at a mean size of 113 g (.25 lb). Idaho Power Company contracted the Idaho Department of Fish and Game to conduct a two-year evaluation of these fish plants.

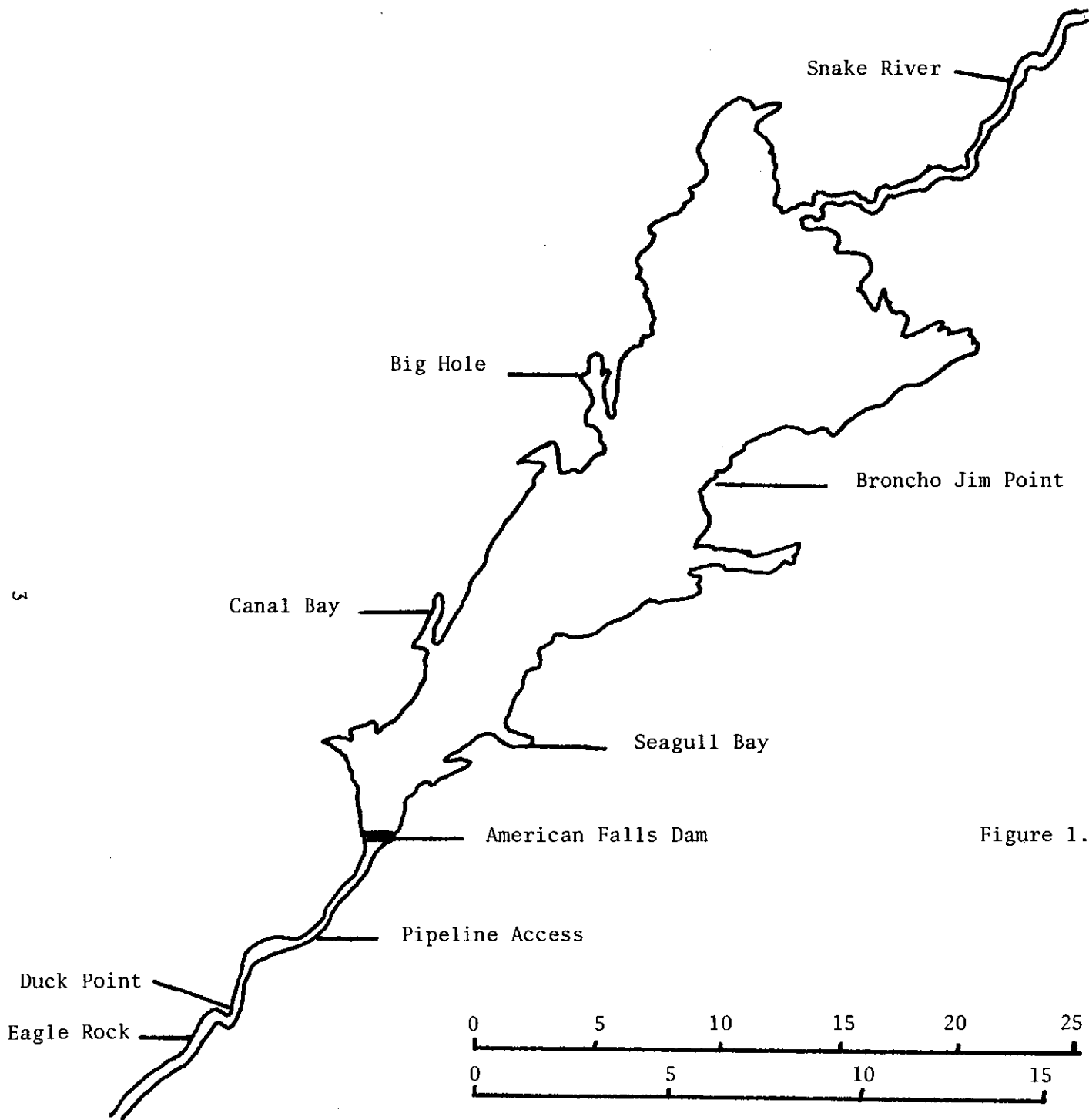


Figure 1. American Falls Reservoir and the Snake River in the immediate vicinity.

OBJECTIVES

1. Estimate the contribution of the released trout to the sports fishery in American Falls Reservoir and the Snake River downstream.
2. Determine the growth, condition and migration patterns of the re-leased fish.

TECHNIQUES

Contribution of Hatchery Trout

The American Falls Reservoir and Snake River (American Falls Dam to Eagle Rock) fisheries are supported by large releases of catchable-size rainbow trout. Idaho Department of Fish and Game's American Falls Hatchery releases about 100,000 rainbow trout each year in American Falls Reservoir. Starting in 1981 Idaho Power Company began providing about 30,000 rainbow (raised at Batise Hatchery) annually to be released in American Falls Reservoir as compensation for the loss of trout due to the rebuilding of American Falls Dam. The rainbow were released in April.

We desired to evaluate: 1) Contributions of the stocked rainbow trout to the fisheries in American Falls Reservoir and the Snake River and; 2) The relative suitability of rainbow trout raised at the Batise Hatchery by comparing their return with that of the rainbow raised at the American Falls Hatchery.

In order to evaluate the contribution of hatchery rainbow trout to the creel we tagged 12,000 fish each year (1981 and 1982) and released them in American Falls Reservoir at Seagull Bay. These fish were planted on 8 April 1981 and 14 April 1982. Half of the annual release of tagged fish (6,000) were from American Falls Hatchery and half (6,000) were from Batise Hatchery.

The 6,000 tagged trout released from American Falls Hatchery in 1981 averaged 232 mm (9.5 in) in length and 154 g (.34 lb) in weight. The 6,000 tagged trout released from the Batise Hatchery in 1981 averaged 209 mm (8.2 in) in length and 108 g (.24 lb) in weight.

In 1982, the 6,000 tagged trout released from American Falls Hatchery averaged 244 mm (9.6 in) in length and 157 g (.35 lb) in weight. The 1982 release of 6,000 Batise Hatchery fish averaged 225 mm (8.9 in) in length and 116 g (.26 lb) in weight.

Fish released from American Falls Hatchery each year were significantly larger than those released from the Batise Hatchery. This was supported by testing with a student's T-test.

Angler Use and Harvest Estimates

I utilized a stratified angler count/interview type of creel census to estimate angler use and harvest at both American Falls Reservoir and the Snake River.

American Falls Reservoir was considered as one entity during the census. In 1981 we considered the Snake River below American Falls as a single entity but divided it into three sections in our 1982 census. I figured use and harvest for each individual section in 1982. Section 1 was from the Dam downstream to the riffle at Pipeline Access; Section 2 was from the Pipeline Access riffle downstream to the riffle at Duck Point; and Section 3 was from the riffle at Duck Point downstream to Eagle Rock.

I divided the creel census covering the reservoir and river into two-week intervals and randomly chose one Saturday, one Sunday and two week-days as count days in each interval. I also divided each count day into four different blocks of time with each block covering three hours and evenly spaced from the others. I then randomly picked a one-hour count time in each block. We obtained total hours fished by multiplying the mean number of anglers per count times the daylight hours times the number of days of that class (Saturday, Sunday, weekday or holiday) in the inter-val. I multiplied the catch per hour for each species by estimated hours fished per two-week interval to obtain total catch. I used the same method to estimate the catch of tagged trout.

I utilized the ratio of total planted trout to total tagged trout from each hatchery to determine the total number of unmarked fish that came from each hatchery. I found that after allocating fish to the two groups in this manner that many undesigned rainbow remained. A portion of these fish entered the fishery early in the season before the fish planted that year began to enter it. These fish were from the previous year's plant. The remaining unidentified rainbow were largely from the plant of the year and were allocated between the two hatchery releases. In order to do this I used the ratio of total fish released from each hatchery but adjusted to reflect differential returns as demonstrated by tag returns from the two groups.

We censused the reservoir from 11 April to 6 November in 1981 and from 17 April to 29 October in 1982. The river was censused from 23 May to 31 October in 1981 and from 29 May to 31 October in 1982. In both years the river census covered the entire fishing season. We made aerial counts from 23 May to 25 September 1981 and from 29 May to 6 September 1982. Counts after 25 September 1981 and 6 September 1982 were made from the ground because of decreased fishing pressure.

We conducted angler interviews at both the reservoir and river by waiting at selected access sites and contacting anglers after they had completed fishing. We obtained catch data from all major river fishing areas for both comparisons between areas and more accurate estimates of catch. We contacted most reservoir anglers at access sites near the dam. In many cases, however, reservoir boat anglers may have fished at widely scattered locations.

A sample of fish were measured and weighed from each census area during each time interval in 1982.

RESULTS

AMERICAN FALLS RESERVOIR

Angler Use and Harvest

An estimated 33,803 anglers fished in American Falls Reservoir during the 1981 census period. These anglers fished 148,735 hours and harvested 6,380 Batisse rainbow, 27,383 American Falls rainbow, 3,751 rainbow re-leased in the previous year, 72 brown trout, 53 coho, 43 cutthroat, 222 yellow perch, 60 brown bullhead and 13 black crappie (Table 1). We inter-viewed 15.5% of the estimated anglers during 1981 (Table 1 - Appendix).

During 1982, an estimated 21,370 anglers fished 94,609 hours on American Falls Reservoir and caught 421 Batisse rainbow (1981 release), 1,588 Batisse rainbow (1982 release), 2,659 American Falls rainbow (1981 release), 8,288 American Falls rainbow (1982 release), 94 cutthroat and 26 brown trout (Table 2). We interviewed 13.7% of the estimated anglers during 1982 (Table 2 - Appendix).

Distribution of Fishing Pressure

In 1981 we classified 13,397 anglers fishing the reservoir as to location (Table 3). During the 1981 census, 92% of the reservoir anglers fished the lower one-third of the reservoir (the area from the dam to and including Seagull Bay and Canal Bay); 7% fished from the upper ends of Seagull Bay and Canal Bay upstream to and including Big Hole and Bronco Jim Point; and the remaining anglers (1%) fished the upper one-third of the reservoir.

In 1982 we classified 9,002 anglers fishing the reservoir as to location (Table 4). During the 1982 census 88% of the reservoir anglers fished the lower one-third of the reservoir; 11% fished the center one-third of the reservoir; and 1% fished the upper one-third of the reservoir.

Fishing Methods

During 1981, 57% of the anglers fished the reservoir using a boat and 43% fished from the bank. In 1982, boat anglers represented 63% of the fishing pressure and bank anglers 37%. The mean number of anglers per boat was 2.5 in 1981 and 2.1 in 1982.

In 1982 we classified anglers in regard to their fishing method. Forty-nine percent were using lures, 51% bait and 1% artificial flies.

Fish Size

In the early portion of the 1981 season (11 April to 5 June) the size of fish was largest, starting at 387 mm (15.2 in) and 758 g (1.67 lb) and

Table 1. Estimated angler effort and harvest of rainbow trout from American Falls Reservoir during the 1981 creel census. We planted 33,600 Batise rainbow and 121,855 American Falls rainbow in the reservoir in 1981.

Interval starting date <u>1/</u>	Number anglers	Hours fished	Harvest <u>2/</u>				Rainbow per hour
			Batise rainbow	Am. Falls rainbow	Holdover rainbow	Total rainbow	
11 April	2,077	6,793	0	0	573	573	.08
25 April	2,478	9,193	0	162	1,093	1,255	.14
9 May	1,772	6,324	0	0	496	496	.08
23 May	1,718	7,712	0	0	463	463	.06
6 June	1,175	4,957	39	61	1,126	1,226	.25
20 June	2,845	13,982	126	1,342	0	1,468	.10
4 July	3,626	16,065	269	3,270	0	3,539	.22
18 July	3,761	18,992	401	3,701	0	4,102	.21
1 August	3,339	16,329	1,151	2,687	0	3,838	.24
15 August	3,017	12,852	717	2,600	0	3,317	.26
29 August	3,966	16,499	2,380	6,941	0	9,321	.56
12 Sept.	2,507	10,804	936	5,139	0	6,075	.56
26 Sept.	593	3,270	155	511	0	666	.20
10 Oct.	236	1,395	35	54	0	89	.06
24 Oct.	693	3,568	171	915	0	1,086	.30
Totals	33,803	148,735	6,380	27,383	3,751	37,514	.25

1/ Each interval is two weeks long with the last ending 6 November.

2/ Harvest also included 72 brown trout, 53 coho, 222 yellow perch, 60 brown bullheads, 43 cutthroat and 13 black crappie.

Table 2. Estimated angler effort and harvest of trout from American Falls Reservoir during the 1982 creel census. Harvest of Batise rainbow is based on plants of 33,600 fish in 1981 and 30,800 in 1982. Harvest of American Falls rainbow is based on plants of 121,855 fish in 1981 and 75,057 in 1982.

Interval starting date <u>1/</u>	Number anglers	Hours fished	Estimated harvest <u>2/</u>				Rainbow per hour	
			Batise Rainbow		Am. Falls Rainbow			Total rainbow
			1981	1982	1981	1982		
19 April	1,562	5,887	37	0	235	0	272	.05
1 May	687	2,377	38	0	130	0	168	.07
15 May	932	4,083	11	0	193	0	204	.05
29 May	1,294	5,007	27	0	172	0	199	.04
12 June	2,321	9,540	0	161	162	714	1,037	.11
26 June	2,799	12,314	151	402	691	2,307	3,551	.29
10 July	3,453	16,608	101	440	366	2,466	3,373	.20
24 July	2,627	11,163	0	311	223	845	1,379	.12
7 August	2,144	9,263	56	107	0	682	845	.09
21 August	1,485	7,781	0	38	223	471	732	.09
4 Sept.	971	4,610	0	27	183	143	353	.08
18 Sept.	383	1,935	0	40	0	208	248	.13
2 Oct.	488	2,786	0	0	81	200	281	.10
16 Oct.	224	1,255	0	62	0	252	314	.25
Totals	21,370	94,609	421	1,588	2,659	8,288	12,956	.14

1/ Each interval is two weeks long with the last ending 29 October.

2/ Harvest also includes 94 cutthroat and 26 brown trout.

Table 3. Location of fishing pressure and number of boat and bank anglers at American Falls Reservoir, 1981.

Interval starting date <u>1/</u>	Dam to and including Seagull Bay and Low- Line Canal Bay		Upstream from Seagull Bay and Low-Line Canal Bay to and including Big Hole and Bronco Jim Point		Upstream from Big Hole Bay and Bronco Jim Point		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
11 April	327	198	0	12	0	0	327	210
25 April	419	374	21	15	0	0	440	389
9 May	274	430	4	16	0	2	278	448
23 May	228	312	16	33	16	2	260	347
6 June	158	487	20	49	6	3	184	539
20 June	306	905	12	40	10	6	328	951
4 July	165	889	33	273	1	14	199	1,176
18 July	239	1,085	27	133	2	1	268	1,219
1 August	402	966	49	96	2	5	453	1,067
15 August	664	389	38	11	0	0	702	400
29 August	1,001	609	7	29	0	0	1,008	638
12 Sept.	721	282	0	0	0	0	721	282
26 Sept.	292	24	0	0	0	0	292	24
10 Oct.	159	0	0	0	0	0	159	0
24 Oct.	70	0	18	0	0	0	88	0
Totals	5,425	6,950	245	707	37	33	5,707	7,690
Total by areas	12,375		952	952	70		13,397	
Percent bank to boat in area	44	56	26	74	53	47	43	57
Percent anglers between areas	92		7		1		100	

1/ All intervals were 14 days in length.

Table 4. Location of fishing pressure and number of boat and bank anglers at American Falls Reservoir, 1982.

Interval starting date <u>1/</u>	Dam to and including Seagull Bay and Low- Line Canal Bay		Upstream from Seagull Bay and Low-Line Canal Bay to and including Big Hole and Bronco Jim Point		Upstream from Big Hole Bay and Bronco Jim Point		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
17 April	299	157	34	23	0	0	333	180
1 May	157	75	11	19	0	0	168	94
15 May	244	151	13	23	0	0	257	174
29 May	154	318	14	50	8	3	176	371
12 June	152	439	20	123	24	0	196	562
26 June	142	1,062	8	156	28	0	178	1,218
10 July	220	1,016	8	177	5	2	233	1,195
24 July	191	554	30	47	0	5	221	606
7 August	313	418	37	38	1	1	351	457
21 August	286	306	33	38	0	0	319	344
4 Sept.	362	245	37	14	2	5	401	264
18 Sept.	103	164	1	0	0	0	104	164
2 Oct.	241	31	0	4	0	0	241	35
16 Oct.	120	38	2	0	0	0	122	38
Total	2,984	4,974	248	712	68	16	3,300	5,702
Total by areas	7,958		960		84		9,002	
Percent bank to boat in area	37	63	26	74	81	19	37	63
Percent anglers between areas	88		11		1		100	

1/ All intervals were 14 days in length.

increasing to 463 mm (18.2 in) and 1,232 g (2.72 lb) (Table 5). These fish were carryover fish that had been planted the previous year. Mean fish size dropped in early June as trout planted in April of 1981 began entering the creel. Size of fish dropped to 328 mm (12.9 in) and 329 g (0.72 lb) in June and increased to 414 mm (16.3 in) and 862 g (1.90 lb) by summer's end. Fish size in 1982 followed a pattern similar to that of 1981 (Table 6).

RESULTS

SNAKE RIVER

Angler Use and Harvest

An estimated 16,830 anglers fished the Snake River between American Falls Dam and Eagle Rock in 1981. These anglers fished an estimated 55,708 hours and harvested 4,007 Batise Hatchery rainbow, 16,951 American Falls Hatchery rainbow, 1,550 holdover rainbow, 3,999 yellow perch, 2,254 black crappie, 252 brown trout, 123 cutthroat, 80 mountain whitefish, 70 brown bullhead, 64 coho and 47 kokanee (Table 7). We interviewed 12.4% of the estimated anglers during 1981 (Table 3 - Appendix).

In 1982 an estimated 13,327 anglers fished 46,493 hours in the Snake River between American Falls Dam and Eagle Rock. These anglers harvested 323 Batise rainbow (1981 release), 1,730 Batise rainbow (1982 release), 5,106 American Falls rainbow (1981 release), 5,665 American Falls rainbow (1982 release), 411 brown trout, 184 yellow perch, 144 cutthroat and 23 black crappie (Table 8). Anglers caught 0.28 rainbow per hour. We interviewed 13.0% of the estimated anglers during 1982 (Table 4 - Appendix).

In 1982 we calculated use and harvest for the three sections of the Snake River that we censused. These included: 1) American Falls Dam down-stream to the riffle at Pipeline Access; 2) Pipeline Access downstream to Duck Point; and 3) Duck Point downstream to Eagle Rock.

In 1982 an estimated 9,172 anglers fished 32,265 hours in the river between American Falls Dam and the riffle at Pipeline Access. These anglers harvested 239 Batise rainbow (1981 release), 1,199 Batise rainbow (1982 re-lease), 3,850 American Falls rainbow (1981 release) and 3,815 American Falls rainbow (1982 release) (Table 9). Anglers harvested 0.28 rainbow per hour and 0.99 rainbow per angler from this area.

An estimated 2,309 anglers fished 7,774 hours in the river between Pipeline Access and Duck Point in 1982 (Table 10). These anglers harvested 54 Batise rainbow (1981 release), 321 Batise rainbow (1982 release), 807 American Falls rainbow (1981 release) and 1,129 American Falls rainbow (1982 release). Anglers harvested 0.30 rainbow per hour and 1.00 rainbow per angler from this area.

An estimated 1,846 anglers fished 6,454 hours between Duck Point and Eagle Rock in 1982 (Table 11). These anglers harvested 30 Batise rainbow (1981 release), 210 Batise rainbow (1982 release), 449 American Falls rainbow

Table 5. Mean sizes of rainbow trout caught at American Falls Reservoir during the 1981 census.

Interval	Mean total length			Mean weight		
	(mm)	(in)	(n)	(g)	(lb)	(n)
11 April-24 April	387	15.2	(21)	758	1.67	(20)
25 April-8 May	418	16.5	(17)	730	1.61	(17)
9 May-22 May	483	19.0	(4)	1,108	2.44	(4)
23 May-5 June	463	18.2	(2)	1,232	2.72	(2)
6 June-19 June	328	12.9	(6)	329	0.72	(5)
20 June-3 July	345	13.6	(7)	358	0.79	(1)
4 July-17 July	405	15.9	(18)	712	1.57	(16)
18 July-31 July	407	16.0	(54)	952	2.10	(40)
1 August-14 August	399	15.7	(43)	800	1.76	(40)
15 August-28 August	366	14.4	(7)	580	1.28	(7)
29 August-11 September	422	16.6	(363)	854	1.88	(264)
12 September-25 September	405	15.9	(58)	742	1.64	(28)
26 September-9 October	414	16.3	(3)	862	1.90	(3)

Table 6. Mean sizes of rainbow trout caught at American Falls Reservoir during the 1982 census.

Interval	Mean total length			Mean weight		
	(mm)	(in)	(n)	(g)	(lb)	(n)
17 April-30 April	444	17.5	(16)	800	1.76	(2)
1 May-14 May	424	16.7	(41)	812	1.79	(39)
15 May-28 May	423	16.7	(36)	815	1.80	(27)
29 May-11 June	436	17.2	(17)	877	1.93	(12)
12 June-25 June	405	15.9	(96)	597	1.32	(55)
26 June-9 July	382	15.0	(142)	614	1.35	(78)
10 July-23 July	375	14.8	(126)	592	1.31	(80)
24 July-6 August	401	15.8	(61)	736	1.62	(30)
7 August-20 August	345	13.6	(60)	725	1.60	(34)
21 August-3 September	398	15.7	(61)	629	1.39	(25)
4 September-17 September	399	15.7	(61)	796	1.75	(18)
18 September-1 October	425	16.7	(45)	702	1.55	(12)
2 October-15 October	419	16.5	(59)	805	1.77	(18)
16 October-29 October	426	16.8	(64)	826	1.82	(19)

Table 7. Estimated angler effort and harvest from the Snake River between American Falls Dam and Eagle Rock during the 1981 creel census. Calculations were based on plants in 1981 of 33,600 Batise trout and 121,855 American Falls trout in American Falls Reservoir and 1,680 trout in the Snake River.

Interval starting date <u>1/</u>	Number anglers	Hours fished	Harvest <u>2/</u>					
			Batise rainbow	Am. Falls rainbow	Holdover rainbow	Total rainbow	Yellow perch	Black crappie
23 May	3,577	12,305	50	0	1,550	1,600	568	233
6 June	1,603	5,018	148	268	0	416	100	250
20 June	1,143	4,128	74	310	0	384	1,005	401
4 July	1,754	6,719	276	1,698	0	1,974	573	1,075
18 July	1,123	3,334	79	600	0	679	200	34
1 August	1,523	3,777	222	1,570	0	1,792	323	87
15 August	1,294	4,359	309	1,171	0	1,480	349	174
29 August	1,220	4,452	443	2,490	0	2,933	688	0
12 Sept.	1,360	4,782	888	3,526	0	4,414	182	0
26 Sept.	450	1,768	423	1,015	0	1,438	11	0
10 Oct.	592	2,433	300	1,198	0	1,498	0	0
<u>24 Oct.</u>	<u>1,191</u>	<u>2,633</u>	<u>795</u>	<u>3,105</u>	<u>0</u>	<u>3,900</u>	<u>0</u>	<u>0</u>
Totals	16,830	55,708	4,007	16,951	1,550	22,508	3,999	2,254

1/ Each interval is 14 days long except the last which is 8 days.

2/ Harvest also includes 252 brown trout, 123 cutthroat, 80 mountain whitefish, 70 brown bullhead, 64 coho and 47 kokanee.

Table 8. Estimated angler effort and harvest of rainbow trout from the Snake River between American Falls Dam and Eagle Rock during the 1982 creel census. Harvest of Batise rainbow is based on plants of 33,600 trout in the reservoir in 1981 and 30,800 in 1982. Harvest of American Falls rainbow is based on plants of 121,855 trout in the reservoir and 1,680 in the river in 1981 and 75,057 trout in the reservoir in 1982.

Interval starting date ^{1/}	Number anglers	Number hours	Harvest ^{2/}				Total rainbow	Rainbow catch/ hour	Rainbow catch/ angler
			Batise		Am. Falls				
			1981	1982	1981	1982			
29 May	3,446	13,911	323	0	3,616	213	4,152	.30	1.21
12 June	2,409	7,488	0	150	473	707	1,330	.18	.55
26 June	1,521	3,986	0	72	124	243	439	.11	.29
10 July	1,073	4,128	0	302	350	285	937	.23	.87
24 July	1,133	3,259	0	160	0	598	758	.23	.67
7 August	911	3,285	0	160	122	965	1,247	.38	1.37
21 August	852	3,266	0	386	256	1,455	2,097	.64	2.46
4 Sept.	592	2,422	0	239	103	599	941	.39	1.59
18 Sept.	480	1,701	0	99	0	248	347	.20	.72
2 Oct.	519	1,759	0	149	0	213	362	.21	.70
16 Oct.	354	1,147	0	13	62	129	204	.18	.58
30 & 31 Oct.	37	141	0	0	0	10	10	.07	.27
Totals	13,327	46,493	323	1,730	5,106	5,665	12,824	.28	.96

^{1/} Each interval is 14 days long except the last which is 2 days.

^{2/} Harvest also includes 411 brown trout, 184 yellow perch, 144 cutthroat and 23 black crappie.

Table 9. Estimated angler effort and harvest of rainbow trout from the Snake River between American Falls Dam and the riffle at the Pipeline Access during the 1982 creel census. Harvest of Batise rainbow is based on plants of 33,600 trout in the reservoir in 1981 and 30,800 in 1982. Harvest of American Falls rainbow is based on plants of 121,855 trout in the reservoir and 1,680 in the river in 1981 and 75,057 trout in the reservoir in 1982.

Interval starting date <u>1/</u>	Number anglers	Number hours	Rainbow harvest				Total rainbow	Rainbow catch/hour	Rainbow catch/angler
			Batise		Am. Falls				
			1981	1982	1981	1982			
29 May	2,152	9,441	239	0	2,820	150	3,209	.34	.99
12 June	1,624	4,872	0	53	309	320	682	.14	.42
26 June	872	2,369	0	29	62	98	189	.08	.22
10 July	819	3,008	0	180	247	85	512	.17	.63
24 July	915	2,487	0	110	0	411	521	.21	.57
7 August	645	2,235	0	141	103	762	1,006	.45	1.56
21 August	602	2,276	0	289	165	1,049	1,503	.66	2.50
4 Sept.	422	1,649	0	169	82	425	676	.41	1.60
18 Sept.	408	1,467	0	87	0	206	293	.20	.72
2 Oct.	418	1,472	0	135	0	204	339	.23	.81
16 Oct.	261	860	0	6	62	95	163	.19	.63
30 & 31 Oct.	34	129	0	0	0	10	10	.08	.29
Totals	9,172	32,265	239	1,199	3,850	3,815	9,103	.28	.99

1/ Each interval is 14 days long except the last which is 2 days.

Table 10. Estimated angler effort and harvest of rainbow trout from the Snake River between the riffle at the Pipeline Access and the riffle upstream from Duck Point during the 1982 creel census. Harvest of Batise rainbow is based on plants of 33,600 trout in the reservoir in 1981 and 30,800 in 1982. Harvest of American Falls rainbow is based on plants of 121,855 trout in the reservoir and 1,680 in the river in 1981 and 75,057 trout in the reservoir in 1982.

Interval starting date ^{1/}	Number anglers	Number hours	Rainbow harvest				Total rainbow	Rainbow catch/hour	Rainbow catch/angler
			Batise 1981	Batise 1982	Am. Falls 1981	Am. Falls 1982			
29 May	793	2,536	54	0	542	38	634	.25	.80
12 June	414	1,275	0	76	82	275	433	.34	1.05
26 June	306	816	0	13	41	44	98	.12	.32
10 July	90	448	0	62	41	121	224	.50	2.49
24 July	102	475	0	20	0	75	95	.20	.93
7 August	154	615	0	4	19	113	136	.22	.88
21 August	210	763	0	88	82	326	496	.65	2.36
4 Sept.	61	322	0	32	0	86	118	.37	1.93
18 Sept.	29	104	0	10	0	24	34	.33	1.17
2 Oct.	95	268	0	14	0	8	22	.08	.23
16 Oct.	52	146	0	2	0	19	21	.14	.40
30 & 31 Oct.	<u>3</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>.00</u>	<u>.00</u>
Totals	2,309	7,774	54	321	807	1,129	2,311	.30	1.00

^{1/} Each interval is 14 days long except the last which is 2 days.

Table 11. Estimated angler effort and harvest of rainbow trout from the Snake River between the riffle at Duck Point and Eagle Rock during the 1982 creel census. Harvest of Batise rainbow is based on plants of 33,600 trout in the reservoir in 1981 and 30,800 in 1982. Harvest of American Falls rainbow is based on plants of 121,855 trout in the reservoir and 1,680 in the river in 1981 and 75,057 trout in the reservoir in 1982.

Interval starting date <u>1/</u>	Number anglers	Number hours	Batise		Am. Falls		Total rainbow	Rainbow catch/ hour	Rainbow catch/ angler
			1981	1982	1981	1982			
29 May	501	1,934	30	0	254	25	309	.16	.62
12 June	371	1,341	0	21	82	112	215	.16	.58
26 June	343	801	0	30	21	101	152	.19	.44
10 July	164	672	0	60	62	79	201	.30	1.22
24 July	116	297	0	30	0	112	142	.48	1.22
7 August	112	435	0	15	0	90	105	.24	.91
21 August	40	227	0	9	9	80	98	.43	2.45
4 Sept.	109	451	0	38	21	88	147	.33	1.35
18 Sept.	43	130	0	2	0	18	20	.15	.47
2 Oct.	6	19	0	0	0	1	1	.05	.17
16 Oct.	41	141	0	5	0	15	20	.14	.49
<u>30 & 31 Oct.</u>	<u>0</u>	<u>6</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>.00</u>	<u>.00</u>
Totals	1,846	6,454	30	210	449	721	1,410	.22	.76

1/ Each interval is 14 days long except the last which is 2 days.

(1981 release) and 721 American Falls rainbow (1982 release). Anglers caught 0.22 rainbow per hour and 0.76 rainbow per angler in this area.

During 1981 angler distribution between the sections was 69% from the Dam to Pipeline Access, 15% from Pipeline Access to Duck Point and 16% from Duck Point to Eagle Rock.

In 1982, 69% of the fishing pressure and 71% of the rainbow harvest occurred between American Falls Dam and Pipeline Access; 17% of the fishing pressure and 18% of the rainbow harvest occurred between Pipeline Access and Duck Point; and 14% of the fishing pressure and 11% of the harvest occurred between Duck Point and Eagle Rock. The distribution in 1982 was very close to that of 1981 with only a slight shift of pressure between the lower two sections.

Fishing Methods

In 1981, 57% of the anglers fishing from American Falls Dam to Eagle Rock fished from the bank and 43% from boats (Table 12). This varied from 59% bank anglers from the dam to Pipeline Access, 57% bank anglers between Pipeline Access and Duck Point and 49% bank anglers between Duck Point and Eagle Rock.

In 1982, 51% of the anglers fishing from American Falls Dam to Eagle Rock fished from the bank and 49% from boats (Table 13). This varied from 51% bank anglers from the dam to Pipeline Access, 45% between Pipeline Access and Duck Point and 58% between Duck Point and Eagle Rock.

During the 1982 census we classified Snake River anglers according to the terminal gear they used. A total of 89% were using bait, 7% lures and 4% flies.

Fish Size

In 1981, rainbow caught from the Snake River between the dam and Eagle Rock averaged 383 mm (15.1 in) and 678 g (1.49 lb) (Table 14). During 1982, rainbow caught from the Snake River between the dam and Eagle Rock averaged 396 mm (15.6 in) and 767 g (1.7 lb) (Table 15). Mean size of rainbow taken in the river between the dam and Pipeline Access was 397 mm (15.6 in) and 721 g (1.6 lb). Average size of rainbow caught in the river between Pipeline Access and Duck Point was 394 mm (15.5 in) and 819 g (1.8 lb). Mean size of rainbow harvested in the river between Duck Point and Eagle Rock was 423 mm (16.7 in) and 1,011 g (2.2 lb).

In 1982, fish size in the river section from Duck Point to Eagle Rock was larger than in the other two sections. Fish size was comparable in the two upper sections.

The mean total lengths of rainbow trout taken from the upstream area and middle area were comparable but fish in the middle area had a larger mean weight. Rainbow trout taken in the lower area were longer and weighed more than fish in either of the two upper sections.

Table 12, Location of fishing pressure and number of boat and bank anglers fishing the Snake River between American Falls Dam and Eagle Rock, 1981.

Interval starting date ^{1/}	Dam to riffle downstream from Pipeline Access		Riffle downstream from Pipeline Access to riffle upstream from Duck Point		Riffle upstream from Duck Point to Eagle Rock		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
23 May	333	366	145	169	122	160	600	695
6 June	157	93	28	25	52	25	237	143
20 June	155	77	47	10	41	32	243	119
4 July	164	156	32	75	54	55	250	286
18 July	82	76	9	27	32	58	123	161
1 August	112	111	61	13	46	58	219	182
15 August	164	181	14	19	24	20	202	220
29 August	174	157	51	7	30	16	255	180
12 Sept.	304	190	20	7	7	8	331	205
26 Sept.	132	61	4	2	6	0	142	63
10 Oct.	165	35	28	3	2	0	195	38
24 Oct.	264	22	39	0	5	0	308	22
Totals	2,206	1,525	478	357	421	432	3,105	2,314
Total by areas	3,731		835		853		5,419	
Percent bank to boat within area	59	41	57	43	49	51	57	43
Percent anglers between areas	69		15		16		100	

^{1/} Each interval is 14 days long except the last which is 8 days.

Table 13. Location of fishing pressure and number of boat and bank anglers fishing the Snake River between American Falls Dam and Eagle Rock, 1982.

Interval starting date <u>1/</u>	Dam to riffle down- stream from Pipeline Access		Riffle downstream from Pipeline Access to riffle upstream from Duck Point		Riffle upstream from Duck Point to Eagle Rock		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
29 May	486	625	185	142	167	42	838	809
12 June	194	185	53	55	73	58	320	298
26 June	146	110	46	35	38	31	230	176
10 July	127	116	8	33	20	49	155	198
24 July	114	108	15	21	18	13	147	142
7 August	96	105	15	36	15	30	126	171
21 August	66	160	21	50	18	15	105	225
4 Sept.	137	106	21	33	14	23	172	162
18 Sept.	92	53	2	9	10	2	104	64
2 Oct.	115	39	3	34	0	3	118	76
16 Oct.	90	10	6	19	10	16	106	45
30 Oct.	32	12	2	0	0	0	34	12
Totals	1,695	1,629	377	467	383	282	2,455	2,378
Total by areas	3,324		844		665		4,833	
Percent bank to boat within areas	51	49	45	55	58	42	51	49
Percent anglers between areas	69		17		14		100	

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1/ Each interval is 14 days long except the last which is 2 days.

Table 14. Mean sizes of rainbow trout taken from various locations of the Snake River between American Falls Dam and Eagle Rock during the 1981 census. The number in parentheses is the sample size.

Interval starting date <u>1/</u>	Mean total length			Mean weight		
	(mm)	(in)	(n)	(g)	(lb)	(n)
9 June	348	13.7	(11)	512	1.13	(11)
20 June	-	-	-	-	-	-
4 July	382	15.0	(5)	560	1.23	(5)
18 July	325	12.8	(2)	406	0.90	(2)
1 August	378	14.9	(7)	565	1.25	(6)
15 August	342	13.5	(14)	455	1.00	(11)
29 August	388	15.3	(59)	640	1.41	(60)
12 September	386	15.2	(7)	723	1.59	(6)
26 September	393	15.5	(13)	759	1.67	(13)
10 October	391	15.4	(7)	674	1.49	(7)
<u>24 October</u>	<u>408</u>	<u>16.1</u>	<u>(25)</u>	<u>959</u>	<u>2.11</u>	<u>(25)</u>
Means and totals	383	15.1	(150)	678	1.49	(146)

1/ Each interval is 14 days long except the last which is 8 days.

Table 15. Mean sizes of rainbow trout taken from various locations of the Snake River between American Falls Dam and Eagle Rock during the 1982 census. The number in parentheses is the sample size.

Interval starting date 1/	Dam to riffle down-stream from Pipeline Access		Riffle downstream from Pipeline Access to riffle upstream from Duck Point		Riffle upstream from Duck Point to Eagle Rock		Entire river	
	Mean total length (mm)	Mean weight (g)	Mean total length (mm)	Mean weight (g)	Mean total length (mm)	Mean weight (g)	Mean total length (mm)	Mean weight (g)
29 May	418 (438)	781 (329)	414 (97)	991 (63)	411 (75)	997 (58)	417 (610)	838 (450)
12 June	383 (45)	604 (40)	397 (21)	823 (11)	438 (27)	1,132 (21)	409 (93)	792 (72)
26 June	432 (11)	968 (10)	-	-	407 (5)	676 (5)	424 (16)	871 (15)
10 July	384 (47)	691 (40)	380 (5)	792 (5)	429 (5)	767 (3)	388 (57)	706 (48)
24 July	360 (60)	541 (49)	365 (13)	590 (5)	436 (27)	1,179 (18)	381 (100)	704 (72)
7 August	374 (83)	642 (58)	354 (15)	528 (11)	411 (10)	665 (2)	375 (108)	625 (71)
21 August	360 (89)	566 (60)	383 (24)	590 (14)	527 (15)	-	384 (128)	571 (74)
4 Sept.	380 (84)	607 (54)	372 (17)	575 (5)	360 (23)	442 (3)	375 (124)	597 (62)
18 Sept.	383 (45)	758 (13)	370 (8)	624 (8)	-	-	381 (53)	707 (21)
2 Oct.	400 (70)	938 (44)	381 (4)	650 (2)	575 (1)	-	402 (75)	926 (46)
16 Oct.	399 (42)	766 (28)	-	-	-	-	399 (42)	766 (28)
30 Oct.	429 (6)	925 (6)	-	-	-	-	429 (6)	925 (6)
Means & totals	397 (1,020)	721 (731)	394 (204)	819 (124)	423 (188)	1,011 (110)	396 (1,412)	767 (965)

1/ Each interval is 14 days long except the last which is 2 days.

RESULTS

HATCHERY RAINBOW EVALUATION

Catch Comparisons of Hatchery Rainbow

Considerably more catchable size rainbow trout were planted in American Falls Reservoir from American Falls Hatchery (121,855 in 1981; 75,057 in 1982) than from Batise Hatchery (33,600 in 1981; 30,800 in 1982). In order to compare returns from these two planting sources we tagged a similar sample (6,000 fish) from each hatchery each year. To derive accurate results relating to the comparable suitability of the two stocking sources these samples must contain the same number of fish and the fish must be of the same size. Sample size was equal but fish released from the American Falls Hatchery were significantly larger. This factor altered the utility of our results.

In 1981 a total of 6,000 tagged Batise Hatchery rainbow were released in American Falls Reservoir during April. These fish started to enter the reservoir and river fisheries in June. Tag returns from this group of fish in 1981 and 1982 indicate that most were caught in 1981. An estimated 12.3% of these fish were caught in the reservoir in 1981, 5.5% in the river in 1981, 1.0% in the reservoir in 1982, and 0.6% in the river in 1982. Total recovery of these tagged fish was 19.3% for the two years.

In 1981 a total of 6,000 tagged American Falls rainbow were released in American Falls Reservoir during April. These fish also started to enter the reservoir and river fisheries in June and most were caught during the year of their release. An estimated 14.4% of the tagged fish were caught in the reservoir in 1981, 6.4% in the river in 1981, 1.7% in the reservoir in 1982 and 2.6% in the river in 1982. Total harvest of this group of tagged fish was 25.1%.

Fish released from the American Falls Hatchery in 1981 returned to the creel in significantly larger numbers than did fish released from Batise Hatchery (25.1% vs. 19.1%). Because of the divergence in size at planting time we cannot assign this superiority of American Falls rainbow to their better suitability but must consider their larger size at release as a major factor.

In 1982 we again released 6,000 tagged Batise rainbow in American Falls Reservoir in April. Once again fish didn't enter the creel in substantial numbers until June. An estimated 2.3% of the tagged fish were caught in the reservoir in 1982 and 3.7% in the river. Total returns of these fish in their first year was 6.0% (about a third of the first year return of the fish released in 1981).

In 1982 we also released 6,000 tagged American Falls rainbow trout in American Falls Reservoir in April. Once again they did not return to the creel in large numbers until June. An estimated 4.9% of these tagged fish were caught in the reservoir in 1982 and 5.1% in the river in 1982. Total return of these fish to the creel in 1982 was 10% (about half of the first year return from the 1981 release).

As occurred for the 1981 release we found that American Falls rainbow had a higher return to the creel in 1982 than did Batise rainbow (10% vs. 6%). Fish size was significantly larger at release for American Falls Hatchery fish than for Batise Hatchery fish. I assign the better returns of American Falls fish to their larger size at release.

Returns of both groups of fish were greater in their first year for 1981 planted fish than those released in 1982. In 1981 the reservoir was extremely low and fish were forced to congregate near the dam as water levels receded and the remainder of the reservoir grew warmer and oxygen levels fell. As a result fish were readily available to anglers and more easily harvested. In 1982 the reservoir was full and temperatures and oxygen levels throughout the reservoir were more hospitable for fish. As a result fish were scattered throughout the reservoir and less available to anglers.

Returns to the Creel

We used the ratio of tagged fish to released fish to allocate unmarked fish to the appropriate group (Batise or American Falls releases). For example, 6,000 Batise rainbow were tagged from 33,600 Batise rainbow planted in 1981. Each tagged fish from this group represented 5.6 fish from the total release. We used this multiplier for tagged fish to estimate total harvest from that group of fish. This method is suitable if tagged fish and untagged fish suffer the same mortalities and return to the creel in the same percentage. We found that after allocating fish to the appropriate group by this method we still had a large number of unallocated fish that had been released that year. Tagged fish had obviously suffered greater mortalities than untagged fish and returned to the creel in lesser numbers. We then allocated these unspecified rainbow to the correct category. Fish caught prior to June (when the current year's release started to enter the creel) were obviously holdover fish from the prior year and were moved to that category. The remaining fish were assigned to the appropriate category by using a ratio of the percent of the total release from each hatchery and the differential return of the two groups as indicated by tag returns. These figures more accurately reflect total return to the creel of fish from each group than do the results of tag recoveries alone.

A total of 121,855 American Falls Hatchery rainbow were planted in American Falls Reservoir in 1981. An estimated 52,446 (43.0%) of these rainbow were recovered in 1981 and 1982. Returns were 27,553 fish from the reservoir in 1981, 17,108 from the river in 1981, 2,667 from the reservoir in 1982 and 5,118 from the river in 1982.

A total of 33,600 Batise Hatchery rainbow were planted in American Falls Reservoir in 1981. An estimated 10,784 of these fish (32.1%) were caught in 1981 and 1982. Returns were 6,210 from the reservoir in 1981, 3,850 from the river in 1981, 413 from the reservoir in 1982 and 311 from the river in 1982.

Total return to the creel from American Falls Hatchery fish was 43.0% while Batise hatchery fish returned at a rate of 32.1%.

Growth of Hatchery Rainbow

The mean length gain of Batise rainbow planted in 1981 and caught from both the reservoir and river in 1982 was 228 mm (9.0 in). The mean weight gain of these fish was 832 g (1.8 lb) (Table 16). The Batise rainbow planted in 1982 grew an average of 120 mm (4.7 in) and 322 g (.7 lb) from the time of planting (14 April 1982) to the time they were caught during the 1982 census period.

The mean length gain of American Falls trout planted in 1981 and caught from both the reservoir and river in 1982 was 195 mm (7.7 in). The mean weight gain of these fish was 651 g (1.4 lb) (Table 17). The American Falls rainbow planted in 1982 grew an average of 119 mm (4.7 in) and 325 g (.7 lb) from the time of planting to the time they were caught during the 1982 census period.

Fish from both these sources acquired about half their growth the first summer they were in the reservoir and the other half that fall to the time they were harvested the next fishing season.

Tagged Batise rainbow planted in 1981 grew slightly faster through 1982 than did tagged American Falls trout as their mean length and weight gain was 220 mm (9.0 in) and 832 g (1.8 lb) versus 195 mm (7.7 in) and 651 g (1.4 lb), respectively. Growth through the 1982 census period for tagged trout planted that spring and caught both in the reservoir and river was very similar. The Batise trout grew an average of 120 mm (4.7 in) and 322 g (.7 lb) while the American Falls trout grew an average of 119 mm (4.7 in) and 325 g (.7 lb).

Movement of Hatchery Rainbow

We recovered 2,195 tags from the reservoir and 1,429 tags from the river. Returns were 42% Batise fish and 58% American Falls fish from the reservoir and 41% Batise fish and 59% American Falls fish from the river. Movement through the dam to the river was virtually the same for rainbow released from Batise Hatchery or from American Falls Hatchery.

We did not have tags returned from rainbow caught from the river upstream from the reservoir. Fishing pressure in these upstream areas is low and we did not expect much tag recovery from this area if a small number of fish had moved upstream.

Table 16. Mean total lengths, weight and size change of tagged Batise trout caught by anglers at American Falls Reservoir and the Snake River in 1982. We released the 1981 trout in American Falls Reservoir on 8 April 1981 and the 1982 trout on 14 April 1982. The number in parentheses is the sample size.

Interval starting date <u>1/</u>	Batise trout - mean size when caught ^{2/}				Batise trout - mean gain since planting			
	Length (mm)		Weight (g)		Length (mm)		Weight (g)	
	1981	1982	1981	1982	1981	1982	1981	1982
12 June	-	292 (4)	-	287 (3)	-	67	-	171
26 June	453 (4)	345 (5)	1,010 (2)	-	244	120	902	-
10 July	419 (2)	308 (7)	870 (2)	345 (6)	210	83	762	229
24 July	-	356 (4)	-	-	-	131	-	-
7 August	412 (1)	355 (5)	-	450 (3)	203	130	-	334
21 August	-	344 (4)	-	458 (4)	-	119	-	342
4 Sept.	-	362 (5)	-	520 (5)	-	137	-	404
18 Sept.	-	357 (4)	-	390 (1)	-	132	-	274
2 Oct.	-	369 (5)	-	617 (3)	-	144	-	501
16 Oct.	-	401 (2)	-	421 (1)	-	176	-	305
Entire period	437 (7)	345 (45)	940 (4)	438 (26)	228	120	832	322

1/ Each interval was 14 days long.

2/ Mean total length and weight of Batise trout released in 1981 was 209 mm (8.2 in) and 108 g (.24 lb), respectively. Mean total length and weight of Batise trout released in 1982 was 225 mm (8.9 in) and 116 g (.26 lb), respectively.

Table 17. Mean total length, weight and size change of tagged American Falls trout caught by anglers at American Falls Reservoir and the Snake River in 1982. We released the 1981 trout in American Falls Reservoir on 8 April 1981 and the 1982 trout on 14 April 1982. The number in parentheses is the sample size.

Interval starting date <u>1/</u>	American Falls trout mean size when caught ^{2/}				American Falls trout mean gain since planting			
	Length (mm)		Weight (g)		Length (mm)		Weight (g)	
	1981	1982	1981	1982	1981	1982	1981	1982
15 May-28 May	414 (2)	-	790 (2)	-	182	-	636	-
29 May-11 June	395 (6)	316 (2)	630 (6)	618 (2)	163	72	476	461
12 June-25 June	436 (4)	319 (7)	911 (4)	328 (5)	204	75	757	171
26 June-9 July	446 (5)	337 (13)	-	447 (7)	214	93	-	290
10 July-23 July	444 (4)	354 (10)	963 (2)	491 (8)	212	110	809	334
24 July-6 August		371 (5)	-	427 (3)	-	127	-	270
7 August-20 August	470 (1)	354 (13)	1,150 (1)	495 (10)	238	110	996	338
21 Aug.-3 Sept.	421 (2)	447 (8)	-	477 (6)	189	203	-	320
4 Sept.-17 Sept.	410 (1)	362 (6)	750 (1)	400 (3)	178	118	596	243
18 Sept.-1 Oct.	-	359 (6)	-	720 (2)	-	115	-	563
2 Oct.-15 Oct.	417 (1)	398 (6)	-	471 (2)	185	154	-	314
16 Oct.-29 Oct.	465 (1)	377 (4)	850 (1)	800 (1)	233	133	696	643
30 Oct.	-	378 (1)	-	700 (1)	-	134	-	543
Entire period	427 (27)	363 (81)	805 (17)	482 (50)	195	119	651	325

1/ Each interval was 14 days long except the last which was 2 days.

2/ Mean total length and weight of American Falls trout released in 1981 was 232 mm (9.5 in) and 154 g (.34 lb), respectively. Mean total length and weight of American Falls trout released in 1982 was 244 mm (9.6 in) and 157 g (.35 lb), respectively.

DISCUSSION

Hatchery reared rainbow trout released in American Falls Reservoir do well and provide a good fishery in both the reservoir and in the Snake River below the dam. Returns to the creel are relatively good and growth is excellent.

The fishery in American Falls Reservoir depends entirely on plants of catchable size *hatchery* trout. Trout planted in April return to the creel better than those planted in other months because of the availability of zooplankton and the increase in fishing pressure associated with the summer fishing season. From the time of planting to the time of capture, the trout exhibit extremely fast growth because of the reservoir's trophic conditions.

In low water years such as 1981, the reservoir level drops considerably in midsummer. This results in *high* water temperatures and low oxygen concentrations in most of the reservoir. Trout concentrate in the deep water behind the dam and many move downstream into the river. When these conditions occur, fish are more readily available to the anglers and fishing is very good in the reservoir and in the river. In *high* flow years such as 1982, the drop in reservoir elevation is minimized and as a result, water temperatures and oxygen levels throughout the reservoir are more hospitable for trout. Trout retain a wider distribution in the reservoir and fewer move downstream into the river. Since the fish are less available to anglers, fishing is normally slower in these years. We can expect a lower first year harvest of fish in *high* flow years but better carryover to the following year.

The Snake River between American Falls Dam and Eagle Rock was classified as a Blue Ribbon or Class I stream. That is a stream having multistate value. Only 34% of the state's streams were rated as Class I streams and only 14% of Region 5 streams. This section of stream receives comparable or greater fishing pressure than other well-known Idaho fishing streams. It provided 5,158 angler hours per kilometer in 1981 and 4,305 angler hours per kilometer in 1982. Only short sections of Henry's Fork may have use this high. Henry's Fork (as a whole) had 2,342 angler hours per kilometer in 1972 (Jeppson 1973), Silver Creek had 821 in 1977 (Thurow 1978) and the Portneuf River had 1,250 in 1979 (Heimer 1980). The major attraction of this stretch of the Snake River is the large size of the rainbow trout caught here. In 1982 rainbow caught from this section of stream averaged 767 g (1.7 lb) each; much larger than in the other Class I streams listed above. Fish size was largest in the section of stream from Duck Point to Eagle Rock. Large size of the rainbow in this section of river is predominately due to good growth received in American Falls Reservoir prior to their movement downstream into the river.

A major objective of this study was to evaluate the suitability of rainbow trout reared at Batise Hatchery and released into American Falls Reservoir as compensation for turbine losses at American Falls Dam. We found that

American Falls reared fish returned to the creel better than did Batise reared fish (43.0% versus 32.1%). American Falls rainbow were significantly larger at release than Batise rainbow, and I believe that this size differential accounted for most of the better returns for American Falls fish. This difference might also be accounted for by the differential planting size. Movement from the reservoir to the river occurred at the same rate for both groups of fish. My conclusion is that Batise reared fish will perform in American Falls Reservoir as well as American Falls reared fish if they are released at the same size. Because of the better return of fish released at 1.54 g (.34 lb) than at 1.08 g (.24 lb), it would be advantageous to release Batise fish at this larger size. Idaho Power's annual release of 8,000 pounds of fish should be planted in the form of fish averaging 150 g (.33 lb) each.

RECOMMENDATIONS

1. Continue plants of catchable-size rainbow trout in American Falls Reservoir in early or mid April so they can grow and contribute to the fishery before reservoir water quality conditions deteriorate.
2. Plant trout average 150 g (.33 lb) to maximize returns to the creel.

LITERATURE CITED

- Heimer, John T. 1980. Portneuf River Fisheries Investigations. Job Performance Report. Project F-73-R-2. Idaho Department of Fish and Game. 25 pp.
- Jeppson, P. 1973. Survey of angler use, harvest and fish distribution in the Snake River, South Fork and North Fork. Job Performance Report. Project F-63-R-3. Idaho Department of Fish and Game. 21 pp.
- Thurrow, Russ 1978. Silver Creek Fisheries Investigations. Job Performance Report. Project F-66-R. Idaho Department of Fish and Game. 71 pp.
- Thurrow, Russ 1980. Blackfoot River Fisheries Investigations. Job Performance Report. Project F-73-R-1. Idaho Department of Fish and Game. 130 pp.

APPENDIX

Table 1 (Appendix). Number of anglers interviewed, their hours fished and catch from American Falls Reservoir during the 1981 creel census period.

Interval starting date 1/	Anglers interviewed			Total hours fished	Total catch				
	Resident	Nonresident	Total		Batise rainbow	Am. Falls rainbow	Unspecified rainbow	Total rainbow	Other ^{2/}
11 April	252	2	254	830	0	0	70	70	2
25 April	327	5	332	1,232	0	1	167	168	0
9 May	152	5	157	561	0	0	44	44	1
23 May	347	7	354	1,590	0	0	103	103	5
6 June	564	19	583	2,459	3	1	603	607	12
20 June	828	39	867	3,648	4	13	366	383	7
4 July	381	20	401	1,775	5	14	312	331	3
18 July	625	39	664	3,354	9	28	687	724	18
1 August	433	5	438	2,142	20	10	470	500	19
15 August	272	4	276	1,177	11	10	246	267	1
29 August	277	23	300	1,248	19	10	676	705	4
12 Sept.	258	8	266	1,147	7	13	645	665	0
26 Sept.	126	2	128	705	2	1	144	147	0
10 Oct.	60	4	64	378	1	0	23	24	0
24 Oct.	167	2	169	871	0	2	263	265	0
Totals	5,069	184	5,253	23,117	81	103	4,819	5,003	72

1/ This includes 17 brown trout, 13 coho, 7 cutthroat, 33 yellow perch, 1 black crappie and 1 brown bullhead.

Table 2 (Appendix). Number of anglers interviewed, their hours fished and catch from American Falls Reservoir during the 1982 creel census period.

Interval starting date	Anglers interviewed			Total hours fished	Total catch						
	Resident	Nonresident	Total		Baise rainbow		Am. Falls rainbow		Unspecified rainbow	Total rainbow	Other ^{1/}
					1981	1982	1981	1982			
17 April	103	0	103	389	0	0	0	0	18	18	0
1 May	202	2	204	706	1	0	0	0	49	50	0
15 May	318	3	321	1,406	0	0	2	0	68	70	9
29 May	154	2	156	604	0	0	0	0	24	24	0
12 June	291	2	293	1,205	0	2	1	3	125	131	6
26 June	382	22	404	1,779	4	5	5	3	496	513	5
10 July	355	10	365	1,757	2	4	2	10	339	357	1
24 July	168	9	177	753	0	3	1	2	87	93	0
7 August	206	7	213	920	1	0	0	1	82	84	0
21 August	133	3	136	713	0	0	1	2	64	67	0
4 Sept.	212	0	212	1,006	0	0	2	0	75	77	0
18 Sept.	121	4	125	631	0	0	0	0	81	81	1
2 Oct.	121	4	125	714	0	0	1	4	63	68	0
16 Oct.	98	1	99	554	0	2	0	2	134	138	0
Totals	2,864	69	2,933	13,137	8	16	15	27	1,705	1,771	22

^{1/} This includes 18 cutthroat and 4 brown trout.

Table 3 (Appendix). Number of anglers interviewed, their hours fished and catch from the Snake River between American Falls Dam and Eagle Rock during the 1981 creel census period.

Interval starting date <u>1/</u>	Anglers interviewed			Total hours fished	Total catch				
	Resident	Nonresident	Total		Batise rainbow	Am. Falls rainbow	Unspecified rainbow	Total rainbow	Other ^{2/}
23 May	207	13	220	757	0	0	97	97	59
6 June	111	8	119	372	1	0	28	29	25
20 June	156	8	164	592	0	0	54	54	200
4 July	122	4	126	483	0	2	139	141	121
18 July	147	12	159	472	0	2	93	95	37
1 August	187	23	210	521	3	8	237	248	51
15 August	257	22	279	939	11	9	298	318	120
29 August	124	4	128	467	7	11	307	325	81
12 Sept.	149	15	164	600	5	4	545	554	24
26 Sept.	90	0	90	354	10	4	274	288	6
10 Oct.	214	0	214	880	3	2	537	542	2
24 Oct.	<u>216</u>	<u>6</u>	<u>222</u>	<u>490</u>	<u>15</u>	<u>17</u>	<u>694</u>	<u>726</u>	<u>18</u>
Totals	1,980	115	2,095	6,927	55	59	3,303	3,417	744

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1/ Each interval is 14 days long except the last which is 8 days.

2/ This includes 451 yellow perch, 218 black crappie, 23 brown trout, 15 mountain whitefish, 13 cutthroat, 9 kokanee, 8 brown bullheads and 7 coho.

Table 4 (Appendix). Number of anglers, their hours fished and catch rates for various sections of the Snake River between American Falls Dam and Eagle Rock, 1982.

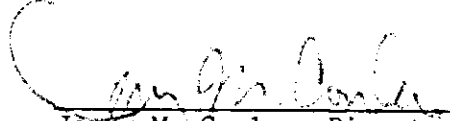
Dates inclusive	Dam to riffle downstream from Pipeline Access				Riffle downstream from Pipeline Access to riffle upstream from Duck Point				Riffle upstream from Duck Point to Eagle Rock				Entire river			
	Number anglers checked	Number hours fished	Number trout caught	Trout per hour	Number anglers checked	Number hours fished	Number trout caught	Trout per hour	Number anglers checked	Number hours fished	Number trout caught	Trout per hour	Number anglers checked	Number hours fished	Number trout caught	Trout per hour
29 May-11 June	349	1,531	525	.34	5	16	4	.25	21	81	13	.16	375	1,628	542	.33
12 June-25 June	224	672	91	.14	25	77	26	.34	31	112	34	.30	280	861	151	.18
26 June-9 July	162	440	34	.08	3	8	1	.12	27	63	12	.19	192	511	47	.09
10 July-23 July	114	419	71	.17	2	10	5	.50	20	82	25	.30	136	511	101	.20
24 July-6 August	110	299	64	.21	14	65	13	.20	25	64	31	.48	149	428	108	.25
7 August-20 August	84	291	130	.45	16	64	14	.22	17	66	15	.23	117	421	159	.38
21 Aug.-3 Sept.	45	170	113	.66	11	40	26	.65	7	40	17	.43	63	250	156	.62
4 Sept.-17 Sept.	73	285	117	.41	15	79	29	.37	16	66	21	.32	104	430	167	.39
18 Sept.-1 Oct.	85	306	60	.20	7	25	8	.43	11	33	5	.15	103	364	73	.20
2 Oct.-15 Oct.	83	292	67	.23	17	48	4	.08	8	25	1	.04	108	365	72	.20
16 Oct.-29 Oct.	75	247	47	.19	5	14	2	.14	10	34	0	.00	90	295	49	.17
30 and 31 Oct.	20	76	6	.08	2	4	0	.00	0	0	0	.00	22	80	6	.08
Totals	1,424	5,028	1,325	.26	122	450	132	.29	193	666	174	.26	1,739	6,144	1,631	.27

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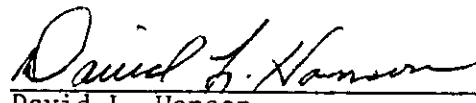
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