

IDAHO
DEPARTMENT OF FISH AND GAME

AMERICAN FALLS-SNAKE RIVER FISHERIES INVESTIGATIONS

Interim Report to Idaho Power Company from

Idaho Department of Fish and Game

Period Covered: 1 January-31 December 1981

by

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ABSTRACT

As part of a cooperative agreement with the Idaho Power Company, we conducted an evaluation of fish plants and the fishery in American Falls Reservoir and the Snake River from the reservoir downstream to Eagle Rock, a distance of 10 km (6 mi). We jaw tagged 6,000 catchable size rainbow trout at both the American Falls Hatchery and the Batise Springs private hatchery. We released both groups of fish in American Falls Reservoir on 8 April 1981. We also evaluated fishing pressure and catch from both the reservoir and river.

During the period 11 April-6 November 1981, an estimated 33,803 anglers fished 148,735 hours in American Falls Reservoir. They caught an estimated 735 Batise rainbow, 867 American Falls rainbow (from the two groups of 6,000 tagged trout) and 35,303 unspecified rainbow.

During the period 23 May-31 October 1981, an estimated 16,848 anglers fished 55,708 hours in the Snake River. They caught an estimated 322 Batise rainbow, 383 American Falls rainbow (from the two groups of 6,000 tagged trout) and 21,803 unspecified rainbow.

Anglers harvested an estimated 6,048 Batise trout from both the reservoir and river in 1981 (33,600 planted and 18% returns). Anglers harvested an estimated 25,590 American Falls trout from both the reservoir and the river (121,855 planted and 21% returns). Anglers caught an estimated 25,468 carryover rainbow trout from the river and reservoir in 1981, which were probably planted in previous years (the total 1981 harvest of 57,106 trout minus 31,638, the total harvest of Batise rainbow and American Falls rainbow).

Anglers caught an estimated 2,307 tagged trout (19% returns of all tagged trout planted) during the first 7 months after release. Of this total, 1,602 (69%) were taken from the reservoir, and 705 (31%) from the Snake River downstream. Also, 1,250 were from the American Falls Hatchery and 1,057 from the Batise Hatchery. The larger size of the American Falls trout at the time of planting (154 g vs. 108 g) may have affected the returns.

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INTRODUCTION

In an agreement dated 14 November 1980, the Idaho Department of Fish and Game and the Idaho Power Company decided on mitigation for losses of trout at the new American Falls Dam. These losses occur because trout are forced to pass through hydroelectric turbines when they egress downstream from American Falls Reservoir. This out migration from the reservoir is a result of its poor water quality in mid and late summer. Most water that passed downstream from the old American Falls Dam was used only for irrigation; therefore, little mortality occurred as they passed through the dam. As most now pass through turbines, it has the potential to affect fishing in the Snake River downstream.

The river downstream from the American Falls Dam to Lake Walcott (Eagle Rock) is known for both the quality and quantity of trout caught, and receives a considerable number of its trout from the reservoir.

Starting in 1981, Idaho Power Company agreed to release 3,632 kg (8,000 lb) of hatchery reared rainbow trout in American Falls Reservoir annually. The fish 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 perform a 2-year study to evaluate the contribution of these fish to the fishery in both the reservoir and the river.

OBJECTIVES

1. Estimate the total contribution of the trout in their first and second year after release to the sports fishery in American Falls Reservoir and the Snake River downstream.
2. Determine the growth, condition, and migration of the released fish.

TECHNIQUES USED

Private Hatchery-Origin, Marking and Size

We tagged 6,000 rainbow trout at the Batise Hatchery near Pocatello with size 8 Monel metal jaw tags between 23 and 27 March 1981. Mean total length and weight of a 574-fish sample was 209 mm (8.2 in), and 108 g (.24 lb), respectively. We released these fish in American Falls Reservoir at Seagull Bay on 8 April 1981.

State Hatchery-Origin, Marking and Size

We tagged 6,000 hatchery rainbow trout from Idaho's American Falls Hatchery with size 8 Monel metal jaw tags between 30 March and 3 April 1981. Mean total length and weight of a 598-fish sample was 232 mm (9.5 in) and 154 g (.34 lb), respectively. We released the fish in American Falls Reservoir at Seagull Bay on 8 April 1981.

Creel Census

I divided the creel census covering the reservoir and river into 2-week intervals, and randomly chose 1 Saturday, 1 Sunday, and 2 weekdays as count days in each interval. I also divided each count day into four different blocks of time with each block covering 3 hours and evenly spaced from the others. I then randomly picked a 1-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, or weekday) in the interval. I multiplied catch per hour data for each species by total hours fished per 2-week interval to obtain total catch. The same technique was used to estimate the catch of tagged trout.

We used the same census techniques for both the reservoir and river, with the only difference being the period covered (11 April-6 November for the reservoir and 23 May-31 October for the river). We made aerial counts during the period 23 May-25 September and ground counts the remainder of the time. All anglers had completed fishing when checked. A map of American Falls Reservoir and the Snake River in the immediate vicinity is shown in Figure 1.

Water Flows, Temperatures, and Dissolved Oxygen

We obtained information on water flows, temperatures, and dissolved oxygen during the census either from Idaho Power Company or the U. S. Bureau of Reclamation.

RESULTS

Creel Census-American Falls Reservoir

During the American Falls Reservoir creel census period, 11 April-6 November 1981, we interviewed 5,069 resident anglers, and 184 non-resident anglers after they had completed fishing (Table 1). They fished 23,117 hours (a mean of 4.4 hours each) to catch 81 rainbow trout (Batise origin), 103 rainbow trout (American Falls origin), 4,819 unmarked rainbow trout, 15 brown trout, 13 coho, 7 cutthroat trout, 30 yellow perch, 1 black crappie, and 1 brown bullhead.

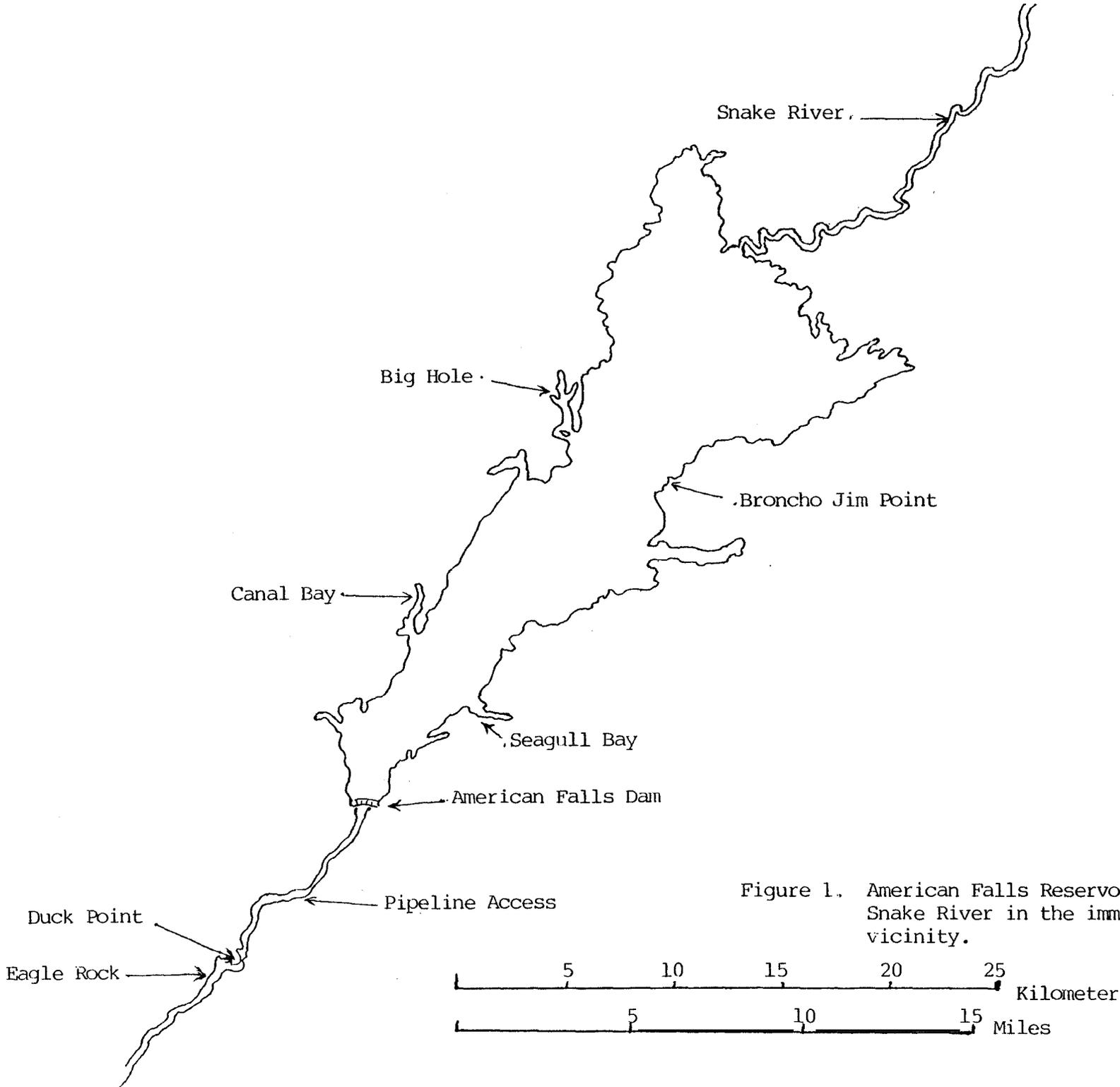


Figure 1. American Falls Reservoir and the Snake River in the immediate vicinity.

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

Interval dates	Anglers interviewed			Total hours fished	Total catch				
	Resident	Nonresident	Total		Batise rainbow	Am.Falls rainbow	Unspecified rainbow	Total rainbow	Other
11 April-24 April	252	2	254	830	0	0	70	70	2
25 April-8 May	327	5	332	1,232	0	1	167	168	0
9 May-22 May	152	5	157	561	0	0	44	44	1
23 May-5 June	347	7	354	1,590	0	0	103	103	5
6 June-19 June	564	19	583	2,459	3	1	603	607	12
20 June-3 July	828	39	867	3,648	4	13	366	383	7
4 July-17 July	381	20	401	1,775	5	14	312	331	3
18 July-31 July	625	39	664	3,354	9	28	687	724	18
1 August-14 August	433	5	438	2,142	20	10	470	500	19
15 August-28 August	272	4	276	1,177	11	10	246	267	1
29 August-11 Sept.	277	23	300	1,248	19	10	676	705	4
12 Sept.-25 Sept.	258	8	266	1,147	7	13	645	665	0
26 Sept.-9 October	126	2	128	705	2	1	144	147	0
10 October-23 October	60	4	64	378	1	0	23	24	0
24 October-6 November	<u>167</u>	<u>2</u>	<u>169</u>	<u>871</u>	<u>0</u>	<u>2</u>	<u>263</u>	<u>265</u>	<u>0</u>
Totals	5,069	184	5,253	23,117	81	103	4,819	5,003	72

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

During the census period an estimated 33,803 anglers fished 148,735 hours at American Falls Reservoir to catch 735 Batise rainbow, 867 American Falls rainbow, 35,303 unmarked rainbow, 72 brown trout, 53 coho, 43 cutthroat, 222 yellow perch, 60 brown bullheads, and 13 black crappie (Table 2).

Returns of trout from the American Falls Hatchery appeared better than from the Batise Hatchery. This might be expected since they were larger when planted (154 g, or .34 lb vs. 108 g or .24 lb). It appears that catchable trout planted in the reservoir are not caught in any appreciable numbers until at least 2 months after planting. The specific reasons for this delayed entry into the fishery is unknown. The lower fishing pressure and catch that occurred during the early part of the census may be a contributing factor.

We classified 13,397 anglers fishing the reservoir as to location and boat fishing or bank fishing (Table 3). Anglers preferred to fish the lower end of the reservoir, probably because of the trout concentrated there due to the increased depth and cooler water. In addition, this end is more accessible than the upper end. During the 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% of the anglers fished from the upper ends of Seagull Bay and Canal Bay upstream to and including Big Hole and Bronco Jim Point; the remaining anglers, < 1%, fished the upper one-third of the reservoir (upstream from Big Hole and Bronco Jim Point). Overall, boat anglers out-numbered bank anglers during the census, 7,690 (57%) to 5,707 (43%). Boat anglers represented 56% of the fishermen in the lower one-third of the reservoir, 74% in the middle one-third, and 47% in the upper one third. The mean number of anglers per boat was 2.5.

During the census we counted 13,185 anglers, of which 4,667 were fishing on Saturday, for a mean of 78 anglers per count; 4,027 were fishing on Sundays, for a mean of 67 anglers per count; and 4,491 were fishing on the weekdays, for a mean of 39 anglers per count (Table 4). We observed 16% of the reservoir anglers during Count 1, the early morning count; 30% during Count 2, the late morning count; 28% during Count 3, the afternoon count; and 26% during Count 4, the late afternoon-early evening count. Generally, reservoir fishing pressure was heaviest from mid-June through mid-September.

Creel Census-Snake River

We censused fishing pressure and catch from the Snake River (American Falls Dam to Eagle Rock) during the period it was open to fishing, 23 May to 31 October 1981. We interviewed 1,980 resident anglers and 115 non-resident anglers after they had completed fishing (Table 5). They fished 6,927 hours (a mean of 3.3 hours each) to catch 55 rainbow trout (Batise origin), 59 rainbow trout (American Falls origin), 3,303 unmarked rainbow trout, 451 yellow perch, 218 black crappie, 23 brown trout, 15 mountain whitefish, 13 cutthroat, 9 kokanee, 8 brown bullheads, and 7 coho.

Table 2. Estimated angler effort and catch of game fish from Americap Falls Reservoir during the 1981 creel census.

Interval Dates	Estimated number anglers	Estimated hours fished	Estimated catch				
			Batise rainbow	Am. Falls rainbow	Unspecified rainbow	Total rainbow	Other-
11 April-24 April	2,077	6,793	0	0	573	573	16
25 April-8 May	2,478	9,193	0	8	1,247	1,255	-
9 May-22 May	1,772	6,324	0	0 -	496	496	12
23 May-5 June	1,718	7,712	0	0	463	463	23
6 June-19 June	1,175	4,957	7	3	1,216	1,226	26
20 June-3 July	2,845	13,982	14	56	1,398	1,468	28
4 July-17 July	3,626	16,065	48	161	2,891	3,100	32
18 July-31 July	3,761	18,992	51	158	3,893	4,102	100
1 August-14 August	3,339	16,329	163	82	3,593	3,838	163
15 August-28 August	3,017	12,852	128	128	2,699	2,955	13
29 August-11 Sept.	3,966	16,499	247	131	8,943	9,321	50
12 Sept.-25 Sept.	2,507	10,804	64	128	6,075	6,267	-
26 Sept.-9 October	593	3,270	9	3	654	666	-
10 Oct.-23 October	236	1,395	4	0	85	89	-
24 October-6 November	<u>693</u>	<u>3,568</u>	<u>0</u>	<u>9</u>	<u>1,077</u>	<u>1,086</u>	<u>-</u>
Totals	33,803	148,735	735	867	35,303	36,905	463

1/ Includes 72 brown trout, 53 coho, 222 yellow perch, 60 brown bullheads, 43 cutthroat and 13 black crappie.

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

Interval dates	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		Upstream from Big Hole Bay and Bronco		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
11 April-24 April	327	198	0	12	0	0	327	210
25 April-8 May	419	374	21	15	0	0	440	389
9 May-22 May	274	430	4	16	0	2	278	448
23 May-5 June	228	312	16	33	16	2	260	347
6 June-19 June	158	487	20	49	6	3	184	539
20 June-3 July	306	905	12	40	10	6	328	951
4 July-17 July	165	889	33	27	1	14	199	1,176
18 July-31 July	239	1,085	27	13	2	1	268	1,219
1 August-14 August	402	966	49	96	2	5	453	1,067
15 August-28 August	664	389	38	11	0	0	702	400
29 August-11 Sept.	1,001	609	7	29	0	0	1,0	638
12 Sept.-25 Sept.	721	282	0	0	0	0	721	282
26 Sept.-9 October	292	24	0	0	0	0	292	24
10 October-23 October	159	0	0	0	0	0	159	0
24 October-6 November	70	0	18	0	0	0	88	0
Totals	5,425	6,950	245	707	37	33	5,7	7,690
Total by areas	12,375		952		70		13,3	
Percent bank to boat in area	44	56	26	74	53	47	43	57
Percent anglers between areas	92		7		<1		100	

Table 4. Number of anglers counted and mean angler counts on Saturdays, Sundays and weekdays at American Falls Reservoir during the 1981 creel census.

Census interval	Number anglers counted	Mean (4 counts)	Number anglers counted	Mean (4 counts)	Number anglers counted	Mean - ^{1/}	Total anglers counted	Mean all counts
11 April-24 April	123	31	129	32	285	36	537	34
25 April-8 May	288	72	282	70	259	32	829	52
9 May-22 May	349	87	204	51	101	13	654	41
23 May-5 June	353	88	171	43	85	11	609	38
6 June-19 June	157	39	160	40	190	24	507	32
20 June-3 July	496	124	492	123	294	37	1,282	80
4 July-17 July	453	113	505	126	415	52	1,373	86
18 July-31 July	421	105	438	109	628	70	1,487	93
1 August-14 August	708	177	373	93	427	53	1,508	94
15 August-28 August	184	46	385	71	633	70	1,102	69
29 August-11 September	559	140	613	153	474	59	1,646	103
12 September-25 September	316	79	239	60	448	56	1,003	63
26 September-9 October	177	44	13	3	126	16	316	20
10 October-23 October	37	9	73	18	49	6	159	10
24 October-6 November	46	11	50	12	77	19	173	14
Totals and means	4,667	78	4,027	67	4,491	39	13,185	56

^{1/} We made only four weekday counts during the last census interval.

Table 5. 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 dates	Anglers interviewed		Total hours fished	Batise rainbow	Am. Falls rainbow	Total catch		Other ^{1/}	
	Resident	Nonresident				Unspecified rainbow	Total rainbow		
23 May-5 June	207	13	220	757	0	0	97	97	59
6 June-19 June	111	8	119	372	1	0	28	29	25
20 June-3 July	156	8	164	592	0	0	54	54	200
4 July-17 July	122	4	126	483	0	2	139	141	121
18 July-31 July	147	12	159	472	0	2	93	95	37
1 August-14 August	187	23	210	521	3	8	237	248	51
15 August-28 August	257	22	279	939	11	9	298	318	120
29 August-11 September	124	4	128	467	7	11	307	325	81
12 September-25 September	149	15	164	600	5	4	545	554	24
26 September-9 October	90	0	90	354	10	4	274	288	6
10 October-23 October	214	0	214	880	3	2	537	542	2
24 October-31 October	216	6	222	490	15	17	694	726	18
Totals	1,98	11	2,09	6,927	55	59	3,30	3,417	744

^{1/} This includes 451 yellow perch, 218 black crappie, 23 brown trout, 15 mountain whitefish, 13 cutthroat, 9 kokanee, 8 brown bullheads, and 7 coho.

During the census period, an estimated 16,848 anglers fished the river 55,708 hours to catch 322 Batise rainbow, 383 American Falls rainbow, 21,803 unmarked rainbow, 3,999 yellow perch, 2,254 black crappie, and 636 other game fishes (Table 6). In the river trout from the American Falls Hatchery returned in greater numbers than trout from the Batise Hatchery. This might be expected because of their larger mean size when released. The reason for the delayed entry of the tagged trout into the river fishery is that they don't migrate from the reservoir until water quality parameters became marginal. A large reservoir out-migration occurs in early August. This coincides with the reduced dissolved oxygen in the reservoir water during that time. Overall, we classified 5,419 river anglers as to location and whether they were fishing from a boat or from the bank.

River fishing pressure was concentrated upstream from the Pipeline Access riffle where 69% of the fishing pressure occurred, river km 1,145.5 to 1,150.2 (river mi 711.8 to 714.7) (Table 7). Fifteen percent of the anglers fished from Duck Point riffle to the Pipeline Access riffle, river km 1,141.2 to 1,145.5 (river mi 709.1 to 711.8). Sixteen percent of the anglers fished from Eagle Rock upstream to the Duck Point riffle, river km 1,139.4 to 1,141.2 (river mi 708.0 to 709.1). Anglers probably concentrated in the upper river section because of their desire to fish its free flowing water, its easier access, and nearness to population centers. Bank anglers comprised 57% of the anglers and boat anglers 43%. Bank anglers comprised 59% of the anglers in the upper river area, 57% in the middle area, and 49% in the lower area.

During the census we counted 4,870 anglers, of which 2,011 were fishing on Saturdays, for a mean of 42 anglers per count; 1,462 were fishing on Sundays, for a mean of 30 anglers per count; and 1,397 were fishing on the weekdays, for a mean of 15 anglers per count (Table 8). We observed 10% of the anglers in Count 1; 26% in Count 2; 31% in Count 3; and 33% in Count 4. The heaviest fishing pressure during the season occurred during the first 2-week census period.

River fishing pressure seems to have dropped considerably between 1971 and 1979 (Table 9). Estimated hours fished in 1981 is comparable to that of 1979; however, rainbow catch is up. The estimated rainbow catch per hour for the 3 years, calculated by dividing the estimated catch by the estimated hours fished, is comparable (.29 in 1971, .25 in 1979, and .32 in 1981).

Anglers harvested an estimated 6,048 Batise trout from both the reservoir and river in 1981 (33,600 planted and 18% returns). Anglers harvested an estimated 25,590 American Falls trout from both the reservoir and the river (21,855 planted and 21% returns). Anglers caught an estimated 25,468 carry-over rainbow trout from the river and reservoir in 1981, which were probably planted in previous years (the total 1981 harvest of 57,106 trout minus 31,638, the total harvest of Batise rainbow and American Falls rainbow).

Anglers caught an estimated 2,307 tagged trout (19% returns of all tagged trout planted) during the first 7 months after release. Of this total, 1,602 (69%) were taken from the reservoir, and 705 (31%) from the Snake River downstream. Also, 1,250 were from the American Falls Hatchery and 1,057 from the Batise Hatchery. The larger size of the American Falls trout at the time of planting (154 g vs. 108 g) may have affected the returns.

Table 6. Estimated number of anglers, hours fished, and catch of game fish from the Snake River between American Falls Dam and Eagle Rock during the 1981 creel census.

Interval dates	Estimated number anglers	Estimated hours fished	Batise rainbow	Am.Falls rainbow	Unspecified rainbow	Total rainbow	Yellow perch	Black crappie	<u>1/</u> Other
23 May-5 June	3,577	12,305	9	0	1,600	1,600	568	233	181
6 June-19 June	1,603	5,018	15	0	401	416	100	250	0
20 June-3 July	1,143	4,128	0	0	384	384	1,005	401	22
4 July-17 July	1,754	6,719	0	26	1,948	1,974	573	1,075	67
18 July-31 July	1,123	3,334	0	13	666	679	200	34	34
1 Aug.-14 Aug.	1,523	3,777	22	56	1,714	1,792	323	87	53
15 Aug.-28 Aug.	1,294	4,359	43	43	1,394	1,480	349	174	42
29 Aug.-11 Sept.	1,220	4,452	66	106	2,761	2,933	688	0	93
12 Sept.-25 Sept.	1,360	4,782	38	33	4,343	4,414	182	0	9
26 Sept.-9 Oct.	450	1,768	50	20	1,368	1,438	11	0	22
10 Oct.-23 Oct.	592	2,433	8	6	1,484	1,498	0	0	6
24 Oct.-31 Oct.	1,191	2,633	80	80	3,740	3,900	0	0	107
Totals	16,830	55,708	322	383	21,803	22,508	3,999	2,254	636

1/ This includes 252 brown trout, 123 cutthroat, 80 mountain whitefish, 70 brown bullhead, 64 coho, and 47 kokanee.

Table 7. Location of fishing pressure and number of boat and bank anglers fishing the Snake River between American Falls Dam and Eagle Rock, 1981.

Interval dates	Dam to riffle down- stream from Pipeline Access		Riffle downstream from Pipeline Access to riffle		Riffle upstream Duck Point to Eagle		Totals	
	Bank	Boat	Bank	Boat	Bank	Boat	Bank	Boat
23 May-5 June	333	366	145	169	122	16	600	695
6 June-19 June	157	93	28	25	52	25	237	143
20 June-3 July	155	77	47	10	41	32	243	119
4 July-17 July	164	156	32	75	54	55	250	286
18 July-31 July	82	76	9	27	32	58	123	161
1 August-14 August	112	111	61	13	46	58	219	182
15 August-28 August	164	181	14	19	24	20	202	220
29 August-11 Sept.	174	157	51	7	30	16	255	180
12 Sept.-25 Sept.	304	190	20	7	7	8	331	205
26 Sept.-9 October	132	61	4	2	6	0	142	63
10 October-23 October	165	35	28	3	2	0	195	38
24 October-31 October	264	22	39	0	5	0	308	22
Totals	2,206	1,525	478	357	421	432	3,105	2,314
Total by areas		3,721		835		852		5,410
Percent bank to boat within area	59	41	57	43	49	51	57	43
Percent anglers between areas		69		15		16		100

Table 8. Number of anglers counted and mean angler counts for Saturdays, Sundays, and Weekdays, The anglers were fishing the Snake River between American Falls Dam and Eagle Rock during the 1981 census period.

Census interval	Saturdays		Sundays		Weekdays 1/		Total anglers counted	Mean all counts
	Number anglers counted	Mean (4 counts)	Number anglers counted	Mean (4 counts)	Number anglers counted	Mean (8 counts)		
23 May-5 June	588	147	188	47	153	19	929	58
6 June-19 June	131	33	92	23	147	18	370	23
20 June-3 July	104	26	156	39	103	13	363	23
4 July-17 July	201	50	136	34	199	25	536	34
18 July-31 July	97	24	95	24	92	11	284	18
1 August-14 August	152	38	185	46	64	8	401	25
15 August-28 August	140	35	168	42	114	14	422	26
29 August-11 September	116	29	185	46	134	17	435	27
12 September-25 September	160	40	63	16	137	17	360	22
26 September-9 October	130	33	26	6	51	6	207	13
10 October-23 October	54	13	64	16	115	14	233	15
24 October-31 October	138	35	104	26	88	22	330	28
Total and means	2,011	42	1,462	30	1,397	15	4,870	26

1/ We made four weekday counts during the last census interval.

Table 9. Estimated hours fished and trout catch from the Snake River between American Falls Dam and Eagle Rock (Lake Walcott) through comparable periods in 1971, 1979 and 1981.

Comparable dates	Estimated hours fished	Estimated trout catch		
		Rainbo	Cutthroat	Brown
24 May-26 September, 1971	71,947	21,087	268	24
26 May-28 September, 1979	46,416	11,482	176	171
23 May-25 September, 1981	48,874	15,672	112	208

Trout Growth

In 8 out of 9 2-week periods, the Batise trout showed faster length growth than the American Falls trout (mean total length when caught as compared to mean total length when planted) (Table 10). However, when comparing weight gains, the opposite was true as in 5 out of the 9 periods, the American Falls trout grew faster than the Batise trout (mean weight when caught vs. mean weight when planted). Overall, it appears that there was little difference in growth rates between trout from the two hatcheries.

Generally, the size of trout caught from the reservoir increased during the first part of the census as the fish which over-wintered entered the creel (Table 11). Mean sizes dropped considerably as the trout planted in April started entering the fishery. Although sample size is smaller, the mean size of trout caught from the river paralleled the reservoir by being larger at first, then getting smaller, then increasing somewhat (Table 12).

Fish Kill

Between 16 and 19 August 1981 a fish kill occurred in the Snake River downstream from American Falls. On 19 August we identified 1,032 dead fish between American Falls Dam and Marys Hole, a distance of approximately 5 km (3 mi). Of this total, 439 (43%) were Utah suckers, 280 (27%) Utah chubs, 169 (16%) mountain whitefish, 120 (12%) were carp and 24 (2%) trout. By both aerial and ground observations we estimated that between 8,000 and 10,000 fish died during this incident. The majority of dead fish appeared concentrated upstream from Neeley Rapids; however, some were observed downstream to Duck Point. The exact date fish started dying is unknown, but anglers reported seeing fish in distress a few days before 16 August.

On 19 August 1981, we observed approximately 100 mountain whitefish concentrated in the spring which enters the river at the American Falls sewage discharge point. These fish were obviously in distress, as some could be picked up by hand. In addition, about 50 were dead and located on the water's edge. External examination of these fish indicated that they had suffered no external injuries and, in fact, appeared quite natural. The fish were undoubtedly concentrated here because of the better water quality.

An incident at the American Falls Hatchery also occurred at this same time, resulting in a trout loss. Consequently, on 19 August we observed 22 dead trout in the hatchery's outfall and an additional 118 trout concentrated along the shoreline downstream from it. The trout near the hatchery outfall were probably the result of hatchery activities and not river conditions.

On 20 August 1981, peaking flows were started in the Snake River downstream from the American Falls Dam. This resulted in most dead fish being washed downstream and deposited where not visible. The kill appeared to be over about the time the peaking flows started; however, it could have continued and been masked by the flows.

The highest river temperatures of the year occurred on 15 and 16 August when 22.6C and 22.5C was recorded, respectively. It is unlikely that this temperature would affect populations of carp, suckers, and chubs.

During the summer months, river dissolved oxygen is recorded every 15 minutes at a site immediately downstream from American Falls Dam. The minimum dissolved oxygen during the period 16-19 August occurred on 19 August when 5.8 mg/l was recorded. Minimum dissolved oxygen concentrations for the other 3 days were as follows: 7.9 mg/l on 16 August, 8.1 mg/l on 17 August, and 6.7 mg/l on 18 August.

The specific cause of this kill is unknown. Water sampling by Idaho Department of Health and Welfare personnel on 21 August indicated that no major pollutants were in the river; however, they could have neutralized by that date.

Table 10. Mean total lengths, weights, and size change of tagged trout caught by anglers at the American Falls Reservoir and the Snake River in 1981. On 8 April 1981 (the date planted), the Batise trout had a mean total length and weight of 209 mm (8.2 in) and 108 g (.24 lb), respectively. On the same date, the American Falls trout had a mean total length and weight of 232 mm (9.5 in) and 154 g (.34 lb), respectively. The number in parenthesis is the sample size.

Period caught	Batise trout		American Falls trout		Mean gain since planting			
	Length	Weight	Length	Weight	Length		Weight	
					Batise trout	American Falls trout	Batise trout	American Falls trout
4 July-17 July	332(2)	376(1)	396(9)	478(8)	123	164	268	324
18 July-31 July	402(10)	671(7)	367(26)	654(16)	193	135	563	500
1 Aug.-14 Aug.	363(21)	553(19)	383(13)	631(10)	154	151	445	477
15 Aug.-28 Aug.	346(12)	491(10)	356(9)	513(8)	137	124	383	359
29 Aug.-11 Sept.	369(24)	542(22)	373(23)	560(22)	160	141	434	406
12 Sept-25 Sept.	396(8)	673(8)	372(10)	627(8)	187	140	565	473
26 Sept-9 Oct.	393(12)	750(12)	415(4)	864(4)	184	183	642	710
10 Oct-23 Oct.	392(5)	624(5)	388(2)	760(2)	183.	156	516	606
24 Oct-6 Nov.	398(5)	760(5)	409(12)	952(12)	189	177	652	798

Table 11. Sizes of rainbow trout, both tagged and untagged, caught at American Falls Reservoir during the 1981 census.

Interval dates	Total length		Weight	
	Sample size	Mean length (mm)	Sample size	Mean weight
11 April-24 April	21	387	20	758
25 April-8 May	17	418	16	730
9 May-22 May	4	483	4	1,108
23 May-5 June	2	463	2	1,232
6 June-19 June	6	328	5	329
20 June-3 July	7	345	1	358
4 July-17 July	18	405	16	712
18 July-31 July	54	407	40	952
1 August-14 August	43	399	40	800
15 August-28 August	7	366	7	580
29 August-11 September	363	422	264	854
12 September-25 September	58	405	28	742
26 September-9 October	3	414	3	862

Table 12. Sizes of rainbow trout, both tagged and untagged, caught from the Snake River during the 1981 census.

Interval dates	Total length		Weight	
	Sample size	Mean length (mm)	Sample size	Mean weight
9 June-19 June	11	348	11	512
20 June-3 July	-	-	-	-
4 July-17 July	5	382	5	560
18 July-31 July	2	325	2	406
1 August-14 August	7	378	6	565
15 August-28 August	14	342	11	455
29 August-11 September	59	388	60	640
12 September-25 September	7	386	6	723
26 September-9 October	13	393	13	759
10 October-23 October	7	391	7	674
24 October-31 October	25	408	25	959