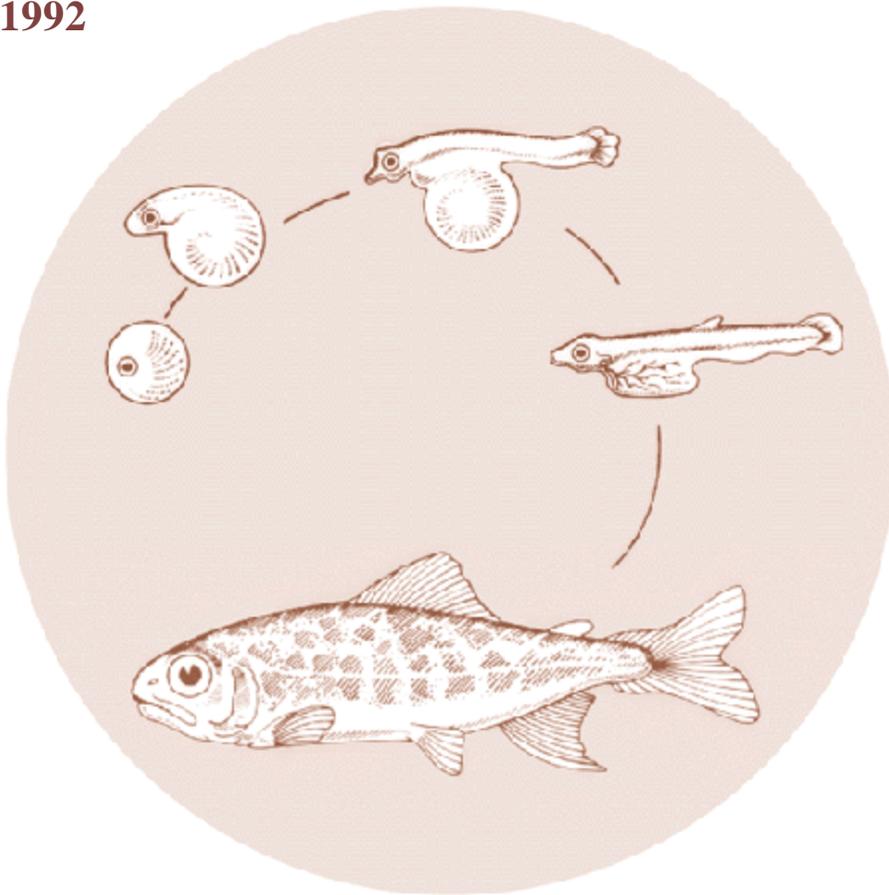


Salmon Supplementation Studies in Idaho Rivers

Idaho Supplementation Studies

Annual Report
1992



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Salmon Supplementation Studies in Idaho Rivers
Annual Report 1992

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INTRODUCTION

This is the first annual summary of results for chinook salmon supplementation studies in Idaho Rivers conducted by the Nez Perce Tribe Department of Fisheries Management. The Nez Perce Tribe has coordinated chinook salmon supplementation research activities with the Bonneville Power Administration, Idaho Department of Fish and Game, U. S. Fish and Wildlife Service, National Marine Fisheries Service, U. S. Forest Service, and the Shoshone Bannock Tribe. The project is a cooperative effort involving members of the Idaho Supplementation Technical Advisory Committee (ISTAC). This project has also been extensively coordinated with the Supplementation Technical Work Group (STWG) which identified specific research needs and integrated and coordinated supplementation research activities through development of a five year work plan.

In this study we are assessing what strategies, both brood stock and release stage, are best for supplementing natural or depleted spring and summer chinook populations and what effect supplementation has on these populations. This research should identify which of the supplementation strategies employed are beneficial in terms of increasing adult returns and the ability of these returns to sustain themselves. Biological evaluation points will be parr density, survival to Lower Granite Dam, adult return to weirs, redd counts and presmolt and smolt yield from both treatment and control streams. Genetic monitoring of treatment and control populations will also occur. The supplementation research study has the following objectives:

- 1) Monitor and evaluate the effect of supplementation on presmolt and smolt numbers and spawning escapements of naturally produced salmon.
- 2) Monitor and evaluate changes in natural productivity and genetic composition of target and adjacent populations following supplementation.
- 3) Determine which supplementation strategies (brood stock and release stage) provide the quickest and highest response in natural production without adverse effects on productivity.
- 4) Coordinate supplementation research planning and field evaluation program activities and management recommendations for the Nez Perce Tribe.

DESCRIPTION OF STUDY SITE

Our study streams include Squaw, Papoose, Yoosa, Eldorado, Lolo, and Newsome Creeks in the Clearwater River drainage, and Slate and Lake Creeks and the Secesh River in the Salmon River drainage. Of these streams, all are supplementation streams except Lake Creek and the Secesh River which are controls.

METHODS

All methods for the 1992 field season were followed as described in Bowles and Leitzinger (1991).

RESULTS

Fish Densities

Fish densities (number/ha) are presented by habitat type snorkeled (Table 1). Stream visibilities were adequate to snorkel all study streams, therefore electrofishing was not used. .

Redd Counts

We made three redd counts from the ground approximately 1.5 to 2 weeks apart for most study streams (Table 2).

Fish Marking

All marked fish (both natural and treatment) captured and/or released in study streams were tabulated (Table 3). Study streams not listed included those with low chinook salmon parr densities which were not feasible for obtaining an adequate sample size for PIT tagging.

Emigrant Trapping:

An emigrant trap (screw trap) was used in Lolo Creek to assess fall emigration to lower Lolo Creek and out of Lola Creek to the Clearwater River. Numbers PIT tagged for each trapping location were tabulated (Table 3).

Dam Detections

Pit tag detections at the lower Clearwater fish trap (IDFG) and at the lower Snake River dams in the spring 1993 will be used to estimate parr and emigrant survival to Lower Granite Dam. Detection facilities usually begin operations in March.

Table 1. Fish densities (number/ha) in Idaho study streams, 1992.

Stream	Habitat Type	Area (ha)	Chinook Age 0+	Chinook Age 1+	Chinook Adults	Steelhead Wild	Steelhead Hatchery	Cutthroat Trout	Brook Trout	Bull Trout	Whitefish	Other ^a
Lake Cr.	run	749.9	0.27	0.00	0.00	2.13	0.00	0.00	0.00	0.00	1.73	0
	run	846.5	6.02	4.61	0.24	2.95	0.00	0.00	0.35	0.35	1.65	Dace
	riffle	196.4	0.00	0.00	0.00	1.53	0.00	0.00	0.00	0.00	5.09	0
	run	561.1	5.70	0.18	0.00	4.81	0.00	0.00	1.07	0.00	1.07	TF
	run	282.1	5.32	0.00	0.00	10.99	0.00	0.00	9.22	0.00	0.00	0
	run	184.0	1.09	0.00	0.00	1.63	0.00	0.00	2.17	0.54	0.00	0
	riffle	131.1	3.05	0.00	0.00	3.05	0.00	0.00	1.53	0.00	0.00	0
	pool	422.1	0.00	0.00	0.00	3.08	0.00	0.00	4.98	0.24	0.00	0
Secesh R.	run	763.6	8.38	0.13	0.00	1.83	0.00	0.00	0.00	0.13	1.83	Dace
	run	726.2	9.23	0.83	0.00	3.30	0.00	0.00	0.00	0.14	0.69	0
	pool	471.8	9.11	0.00	0.21	4.66	0.00	0.00	0.00	0.00	0.21	Sc
	run	275.6	2.54	0.00	0.00	1.81	0.00	0.00	0.00	0.00	0.00	0
	run	568.3	13.55	0.18	0.00	0.70	0.00	0.00	0.00	0.00	2.11	Dace
	riffle	151.1	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	run	1175.7	8.85	0.26	0.00	3.57	0.00	0.00	0.17	0.09	0.94	0
	pocket	714.9	1.96	0.00	0.00	6.71	0.00	0.00	0.00	0.00	0.42	Dace
	pocket	675.0	2.22	0.00	0.00	4.74	0.00	0.00	0.00	0.00	0.44	0
	run	377.3	1.86	0.27	0.00	3.45	0.00	0.00	0.27	0.27	1.59	0
Slate Cr.	run	644.0	2.02	0.00	0.00	17.55	0.16	0.00	0.00	0.00	0.00	0
	pool	784.5	0.25	0.00	0.00	18.61	0.00	0.00	0.00	0.00	0.00	0
	pocket	650.0	0.00	0.00	0.00	15.54	0.00	0.00	0.00	0.00	0.00	0
	run	210.6	0.95	0.47	0.00	24.69	0.00	0.00	0.00	0.00	0.00	0
	pocket	531.7	1.13	0.00	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0
	pocket	619.6	2.74	0.00	0.00	9.04	0.00	0.00	0.00	0.16	0.32	0
	pocket	240.1	0.00	0.00	0.00	8.33	0.00	0.00	0.00	0.42	0.00	0
Yoosa Cr.	run	204.2	4.90	0.49	0.00	26.44	0.00	0.00	0.00	0.00	0.00	Cf
	riffle	145.5	0.69	0.00	0.00	4.12	0.00	0.00	0.00	0.00	0.00	0
	riffle	85.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	run	192.5	6.75	0.52	0.00	7.27	0.00	0.00	0.00	0.00	0.00	0
	riffle	80.1	0.00	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0
	run	282.7	0.00	0.00	0.00	2.12	0.00	0.00	0.00	0.00	0.00	0
	run	271.9	5.15	0.00	0.00	30.89	0.00	0.00	0.37	0.00	0.00	0
	riffle	104.9	0.00	0.00	0.00	10.49	0.00	0.00	0.00	0.00	0.00	TF
	pool	340.3	0.00	0.00	0.00	0.29	0.00	0.00	0.29	0.00	0.00	0
	riffle	127.9	0.00	0.00	0.00	0.00	0.00	0.00	2.35	0.00	0.00	0
	riffle	305.4	0.00	0.00	0.00	3.93	0.00	0.00	0.00	0.00	0.00	TF
	pool	88.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	run	108.8	0.00	0.00	0.00	22.06	0.00	0.92	1.84	0.00	0.00	0
	run	580.2	0.00	0.00	0.00	1.90	0.00	0.00	0.00	0.00	0.00	TF
	pool	22.3	0.00	0.00	0.00	4.48	0.00	0.00	0.00	0.00	0.00	0
	riffle	41.2	0.00	0.00	0.00	12.14	0.00	0.00	0.00	0.00	0.00	0
	run	86.9	0.00	0.00	0.00	3.45	0.00	0.00	0.00	0.00	0.00	0
Eldorado Cr.	run	161.8	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.62	0
	riffle	219.1	0.00	0.00	0.00	2.28	0.00	0.00	0.00	0.00	0.46	0
	run	182.8	1.64	0.00	0.00	16.41	0.00	0.00	0.00	0.00	0.00	0
	riffle	121.9	0.00	0.00	0.00	2.46	0.00	0.00	0.00	0.00	0.00	0
	pocket	580.9	0.00	0.00	0.00	1.21	0.00	0.00	0.00	0.00	0.00	TF,Cf
	run	211.0	0.00	0.00	0.00	3.32	0.00	0.00	0.00	0.00	0.00	0
	pool	156.2	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00	0
	riffle	51.5	0.00	0.00	0.00	5.83	0.00	0.00	0.00	0.00	0.00	Dace
	pool	240.2	0.00	0.00	0.00	2.08	0.00	0.00	0.00	0.00	0.00	Dace
	riffle	141.5	0.00	0.00	0.00	2.83	0.00	0.00	0.00	0.00	0.00	Sc
	run	658.4	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	TF,Cf,Dace
	run	433.4	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	Dace
	riffle	91.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	run	165.4	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	Cf
Eldorado Cr.	riffle	187.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	run	269.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	riffle	69.4	0.00	0.00	0.00	1.44	0.00	0.00	0.00	0.00	0.00	0
	run	358.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	pool	236.2	0.00	0.00	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0
	run	593.0	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0
	run	113.2	0.00	0.88	0.00	3.53	0.00	0.00	0.00	0.00	0.00	Dace
	pool	395.6	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	Dace
	pool	516.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
	pool	267.3	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0
Lolo Cr.	run	590.8	0.51	0.00	0.00	4.40	0.00	0.00	0.00	0.00	0.34	0
	riffle	766.9	0.00	0.00	0.00	7.69	0.00	0.00	0.00	0.00	0.65	0
	run	1083.3	2.40	0.00	0.00	12.00	0.00	0.00	0.00	0.00	0.65	Dace
	riffle	255.4	1.17	0.00	0.00	9.79	0.00	0.00	0.00	0.00	0.78	0
	riffle	269.3	0.00	0.00	0.00	22.65	0.00	0.00	0.00	0.00	4.46	0
	pool	1692.8	0.00	0.00	0.12	3.01	0.00	0.00	0.00	0.00	0.12	0
	run	299.5	0.00	0.00	0.00	10.35	0.00	0.00	0.00	0.00	0.00	0
	riffle	355.0	0.00	0.00	0.00	10.14	0.00	0.00	0.00	0.00	0.00	0
	run	642.4	1.71	0.00	0.00	9.65	0.00	0.00	0.00	0.00	0.16	0
	run	381.7	0.26	0.00	0.00	2.36	0.00	0.26	0.00	0.00	0.00	0

Table 1. Cont.

Stream	Habitat Type	Area (ha)	Chinook Age 0+	Chinook Age 1+	Chinook Adults	Steelhead Wild	Steelhead Hatchery	Cutthroat Trout	Brook Trout	Bull Trout	Whitefish	Other	
Lolo Cr.	riffle	238.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0	
	pool	292.7	0.00	0.00	0.00	1.02	0.00	0.00	0.00	0.00	0.00	0	
	pool	638.0	0.00	0.00	0.94	3.61	0.00	0.00	0.00	0.00	1.10	0	
	riffle	284.1	0.00	0.00	0.00	8.10	0.00	0.00	0.00	0.00	0.00	0	
	riffle	540.4	0.00	0.00	0.00	4.81	0.00	0.00	0.00	0.00	0.00	0	
	run	585.1	0.68	0.00	0.00	3.59	0.00	0.00	0.00	0.00	0.17	0	
	riffle	124.4	0.80	0.00	0.00	5.63	0.00	0.00	0.00	0.00	1.61	0	
	pocket	539.4	0.56	0.00	0.00	4.45	0.00	0.19	0.00	0.00	0.37	0	
	pool	684.8	0.00	0.15	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0	
	run	491.7	0.20	0.00	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0	
	pool	923.9	0.54	0.00	0.00	2.49	0.00	0.00	0.00	0.00	0.76	0	
	pool	666.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	Unid Cypr	
	riffle	136.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
	run	477.2	3.35	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0	
	riffle	160.2	0.62	0.00	0.00	3.75	0.00	0.00	0.00	0.00	0.00	0	
	run	183.0	2.73	0.00	1.09	6.01	0.00	0.00	0.00	0.00	0.00	0	
	riffle	87.2	5.73	0.00	0.00	37.84	0.00	0.00	0.00	0.00	0.00	0	
	run	283.5	8.82	0.00	0.00	8.82	0.00	0.00	0.00	0.00	0.35	0	
	riffle	234.5	0.00	0.00	0.00	2.56	0.00	0.00	0.00	0.00	0.85	0	
	pool	613.0	9.14	0.16	0.00	4.73	0.00	0.00	0.00	0.00	0.16	0	
	pool	600.0	20.67	0.00	0.00	6.17	0.00	0.00	0.00	0.00	1.00	0	
	run	275.6	8.71	0.36	1.09	5.08	0.00	0.00	0.00	0.00	0.00	0	
	pool	335.4	14.91	1.79	0.60	7.75	0.00	0.00	0.60	0.00	0.00	0	
	riffle	301.3	1.33	0.00	0.00	0.66	0.00	0.00	0.33	0.00	0.00	0	
	pocket	440.0	2.50	0.00	0.00	4.09	0.00	0.00	0.00	0.00	0.23	0	
	pool	165.8	7.84	0.00	0.00	15.68	0.00	0.00	0.00	0.00	0.00	0	
	pocket	148.2	5.40	0.00	0.00	12.82	0.00	0.00	0.00	0.00	0.67	0	
	Newsome Cr.	riffle	108.6	0.00	0.00	0.00	2.76	0.00	0.00	0.00	0.00	0.92	0
		run	299.0	0.00	0.00	0.00	9.70	0.00	0.00	0.00	0.00	1.00	0
		pool	338.6	0.00	0.00	0.00	14.18	0.00	0.00	0.00	0.00	3.25	Dace, Sc
run		156.9	0.00	0.00	0.00	3.19	0.00	0.00	0.00	0.00	12.75	0	
pocket		192.4	0.00	0.00	0.00	13.51	0.00	1.04	0.00	0.00	8.32	0	
pool		319.8	0.94	0.31	0.00	10.01	0.00	0.00	0.00	0.00	11.26	Dace, Sc, S	
riffle		191.2	0.00	0.00	0.00	5.23	0.00	0.00	0.00	0.00	0.00	0	
riffle		131.2	0.00	0.00	0.00	4.57	0.00	0.00	0.00	0.00	5.34	TF	
run		166.9	0.00	0.00	0.00	7.79	0.00	1.20	0.00	0.00	8.39	0	
riffle		196.2	0.00	0.00	0.00	5.10	0.00	0.00	0.00	0.00	4.59	0	
pool		107.6	0.00	0.00	0.00	5.58	0.00	0.00	0.00	0.00	2.79	Sc	
Newsome Cr.	run	87.8	0.00	1.14	0.00	9.11	0.00	0.00	0.00	1.14	109.34	0	
	riffle	72.2	0.00	0.00	0.00	8.31	0.00	1.39	0.00	0.00	0.00	S	
	pool	78.7	0.00	0.00	0.00	11.44	0.00	0.00	0.00	0.00	38.12	Dace	
	run	193.9	0.00	0.00	0.00	5.16	0.00	0.00	0.00	0.00	6.70	Sc	
	pool	92.4	0.00	0.00	0.00	4.33	0.00	0.00	0.00	0.00	20.57	0	
	run	165.8	0.00	0.00	0.00	5.43	0.00	0.00	0.00	0.00	8.44	Dace	
	pool	79.0	0.00	2.53	0.00	10.13	0.00	1.27	0.00	0.00	13.92	0	
Squaw Cr.	pool	133.4	10.49	0.00	0.00	35.23	0.00	4.50	0.00	3.00	0.00	0	
	run	130.2	3.07	0.00	0.00	33.79	0.00	2.30	0.00	0.77	0.00	0	
	riffle	153.1	2.61	0.00	0.00	26.78	0.00	1.96	0.00	0.00	0.00	0	
	run	123.9	0.00	0.00	0.00	16.14	0.00	2.42	0.00	0.00	0.00	0	
	riffle	190.1	0.00	0.00	0.00	16.83	0.00	1.58	0.00	0.00	0.00	TF	
	pool	133.6	0.00	0.00	0.00	50.15	0.00	8.98	0.00	0.00	0.00	0	
	pocket	158.7	0.00	0.00	0.00	11.97	0.00	0.00	0.00	0.63	0.00	0	
	run	171.3	0.00	0.00	0.00	6.42	0.00	0.00	0.00	0.00	0.00	0	
	run	300.7	2.00	0.00	0.00	7.32	0.00	0.33	0.00	0.00	0.00	0	
	riffle	195.5	0.00	0.00	0.00	9.21	0.00	0.51	0.00	0.00	0.00	0	
	pool	200.1	0.00	0.00	0.00	13.49	0.00	3.50	0.00	1.00	0.00	0	
	run	139.5	0.00	0.00	0.00	17.92	0.00	0.72	0.00	0.00	0.00	0	
	riffle	256.4	0.00	0.00	0.00	10.53	0.00	0.00	0.00	0.00	0.00	0	
	pocket	96.6	0.00	0.00	0.00	13.46	0.00	0.00	0.00	0.00	0.00	0	
	riffle	94.3	0.00	0.00	0.00	9.54	0.00	0.00	0.00	0.00	0.00	0	
	pool	43.5	0.00	0.00	0.00	22.99	0.00	2.30	0.00	2.30	0.00	0	
	run	111.6	0.00	0.00	0.00	14.34	0.00	0.90	0.00	0.00	0.00	0	
	riffle	248.1	0.00	0.00	0.00	2.82	0.00	0.00	0.00	0.81	0.00	0	
	run	85.7	0.00	0.00	0.00	21.00	0.00	2.33	0.00	0.00	0.00	0	
	pocket	123.3	0.00	0.00	0.00	14.60	0.00	0.00	0.00	0.81	0.00	0	
	pocket	296.3	0.00	0.00	0.00	12.82	0.00	0.67	0.00	0.00	0.00	0	
riffle	150.3	1.33	0.00	0.00	9.98	0.00	0.67	0.00	0.00	0.00	0		
pocket	86.0	1.16	0.00	0.00	17.44	0.00	2.33	0.00	1.16	0.00	0		
run	108.2	0.00	0.00	0.00	6.47	0.00	2.77	0.00	0.00	0.00	0		
pocket	164.4	0.00	0.00	0.00	1.22	0.00	1.22	0.00	1.22	0.00	0		
Papoose Cr.	pool	209.4	0.00	0.00	0.00	38.68	0.00	0.00	0.00	0.00	0.00	0	
	riffle	191.9	0.00	0.00	0.00	21.37	0.00	0.52	0.00	0.00	0.00	0	
	run	74.9	0.00	0.00	0.00	18.69	0.00	2.67	0.00	4.01	0.00	0	
	riffle	147.1	0.00	0.00	0.00	18.35	0.00	0.00	0.00	0.00	0.00	0	
	run	200.4	0.00	2.50	0.00	20.96	0.00	2.99	0.00	1.00	0.00	0	
	riffle	119.0	0.00	0.00	0.00	20.17	0.00	0.84	0.00	0.00	0.00	0	
	run	155.8	0.00	0.00	0.00	11.55	0.00	0.64	0.00	0.00	0.00	0	
	pool	130.9	0.00	1.53	0.00	21.39	0.00	3.06	0.00	0.00	0.00	0	

Table 1. Cont.

Stream	Habitat Type	Area (ha)	Chinook Age 0+	Chinook Age 1+	Chinook Adults	Steelhead Wild	Steelhead Hatchery	Cutthroat Trout	Brook Trout	Bull Trout	Whitefish	Other ^a
	rifle	101.9	0.00	0.00	0.00	7.85	0.00	0.00	0.00	0.00	0.00	0
	run	111.2	0.00	0.00	0.00	19.78	0.00	3.60	0.00	0.00	0.00	0
	run	259.8	0.00	0.00	0.00	12.32	0.00	4.23	0.00	0.00	0.00	0
	rifle	132.0	0.00	0.00	0.00	13.64	0.00	0.00	0.00	0.00	0.00	0
	run	94.0	0.00	0.00	0.00	20.21	0.00	5.32	0.00	0.00	0.00	0
	run	159.4	0.00	3.76	0.00	26.98	0.00	6.27	0.00	0.00	0.00	TF, Sc
	rifle	27.25	0.00	0.00	0.00	29.36	0.00	3.67	0.00	0.00	0.00	0
	run	95.0	0.00	0.00	0.00	25.26	0.00	5.26	0.00	0.00	0.00	0
	rifle	185.5	0.00	0.54	0.00	20.49	0.00	0.54	0.00	0.00	0.00	TF
	pool	63.1	0.00	3.17	0.00	41.20	0.00	17.43	0.00	1.58	0.00	0
	pool	47.0	0.00	0.00	0.00	55.32	0.00	10.64	0.00	0.00	0.00	0
	run	134.2	0.00	0.00	0.00	23.10	0.00	4.47	0.00	0.00	0.00	0

^a TF = tailed frog, Sc = sculpin, Cf = crawfish, Unid Cypr = unidentified Cyprinid, S = sucker

Table 2. Chinook salmon redd counts on Idaho study streams, 1992.

Date	Stream	No. new redds	No. Live Adults	No. Carcasses
8/18	Lake	14	5	0
8/31	Lake	21	3	9
9/14	Lake	8	0	0
Totals		43	8	9
8/19	Secesh	37	26	2
9/1	Secesh	22	32	22
9/15	Secesh	7	4	24
Totals		66	62	48
8/17	Slate	0	0	0
9/17	Slate	4	0	1
Totals		4	0	1
8/17	Yoosa	0	0	0
8/31	Yoosa	0	0	0
9/14	Yoosa	0	0	0
8/17	Eldorado	0	0	0
9/1	Eldorado	0	0	0
9/14	Eldorado	0	0	0
8/18	Lolo	0	11	0
9/1	Lolo	7	20	1
9/14	Lolo	12	2	2
Totals		19	33	3
8/24	Newsome	0	0	0
9/3	Newsome	2	8	0
9/17	Newsome	0	0	0
Totals		2	8	0
8/19	Squaw	0	0	0
9/2	Squaw	1	1	0
9/16	Squaw	0	0	0
Totals		1	1	0
8/18	Papoose	3	1	0
9/2	Papoose	5	2	0
9/16	Papoose	2	0	0
Totals		10	3	0

Table 3. Summary of marked chinook salmon captured and/or released in Idaho study streams, 1992.

Date Released	Stream	Life stage	Mark type	Stock source	Number released
3/18	Eldorado	smolts	All Ad-clip, 500/PIT tag	DNFH	183,000 (approx)
8/6-9/27	Lolo (km 53)a	parr	PIT tag	Natural	350
10/23- 11/10	Lolo (km 41)b	parr	PIT tag	Natural	324
11/12- 11/24	Lolo (km 1)b	parr	PIT tag	Natural	259
3/17	Papoose	smolts	64,171 CWT 4,096 Ad-C 4,506 Rt V	KNFH clipped	72,773
7/16	Squaw	parr	Rt ventral clip	Rapid R.	10,000
8/17	Lake	parr	PIT tagc	Natural	255
8/19	Secesh	parr	PIT tagc	Natural	327

^a Captured by minnow traps and electrofishing

^b Captured by outmigration "screw trap"

^c Captured and PIT tagged by the National Marine Fisheries Service

1993 Work Plans

The 1993 Work Plan will remain the same as in original experimental design (Bowles and Leitzinger 1991). Through coordination with the IDFG, we are planning to capture (screw trap) and PIT tag natural chinook salmon smolts outmigrating on Johnson Creek in the spring, 1993.

Literature Cited

Bowles, E. and E. Leitzinger. 1991. Salmon supplementation studies in Idaho Rivers. Experimental Design to the U.S. Department of Energy, Bonneville Power Administration, Project No.89-098, Contract No. DE-BI79-89BPO1466.