CZES Coastal Zone and Estuarine Studies

Migrational Characteristics of Juvenile Salmon and Steelhead Trout in the Columbia River System – 1981

Volume 1

Assessment of the 1981 Smolt Migration

by

Carl W. Sims
Richard C. Johnsen
Dean A. Brege

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INTRODUCTION

The National Marine Fisheries Service (NMFS) monitored juvenile salmonid migrations in the Snake and Columbia Rivers in 1981. The purpose of this monitoring was to define the timing of migrations, measure smolt travel time, and provide estimates of the magnitude of the smolt migrations at Lower Granite and John Day Dams.

METHODS

Juvenile salmonid migrations were monitored at Lower Granite and John Day Dams in 1981. Fish entering the fingerling collection system were sampled at Lower Granite Dam. An air-lift pump system was used at John Day Dam to sample Turbine Intake Units 3B and 3C (Sims et al. 1981). Sampling schedules at the two sites were as follows:

Lower Granite Dam	3 April - 26 June
John Day Dam	21 April - 28 September

A percentage of smolts sampled at Lower Granite Dam were marked by freeze branding and released back into the reservoir above the dam. Recoveries of these marked fish (adjusted to reflect sample size and the percentage of total river flow at Lower Granite Dam passing through the turbines from 2200 through 0600 h each day) were used to calculate flow-efficiency regression lines (Figure 1).

Similar flow-efficiency regressions were calculated for John Day Dam based on mark recoveries from McNary Dam tailrace releases (adjusted to reflect the percent of total flow passing through Turbine Intake Unit 3 between 2200 and 0600 h) in 1978 through 1981 (Figure 2). Population estimates for chinook salmon and steelhead at both dams were computed from these flow-efficiency regression lines. Passage estimates for sockeye salmon were based on chinook salmon regressions and therefore should be

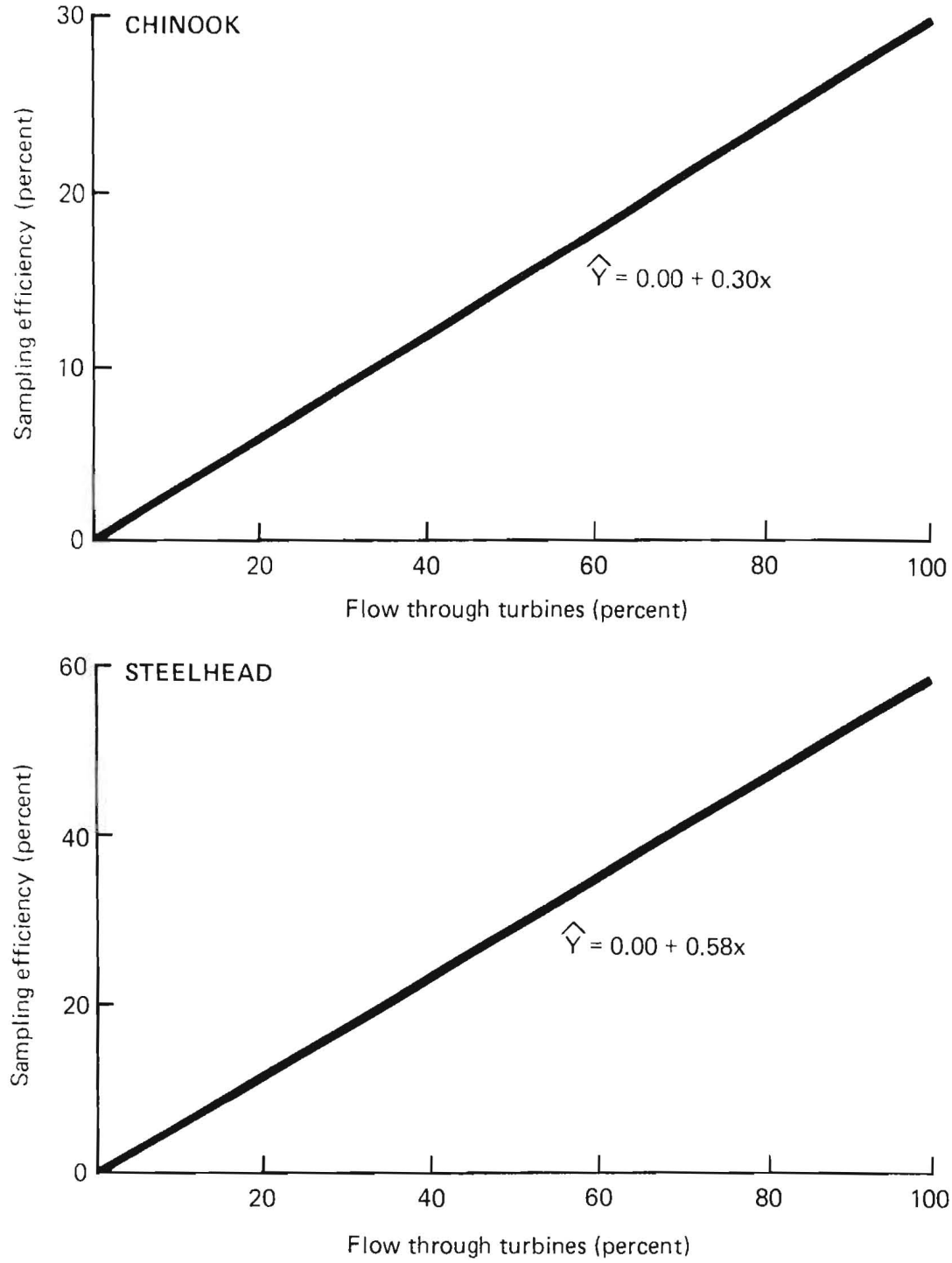

Figure 1.--Flow-sampling efficiency relationships for yearling chinook salmon and steelhead at Lower Granite Dam in 1981.

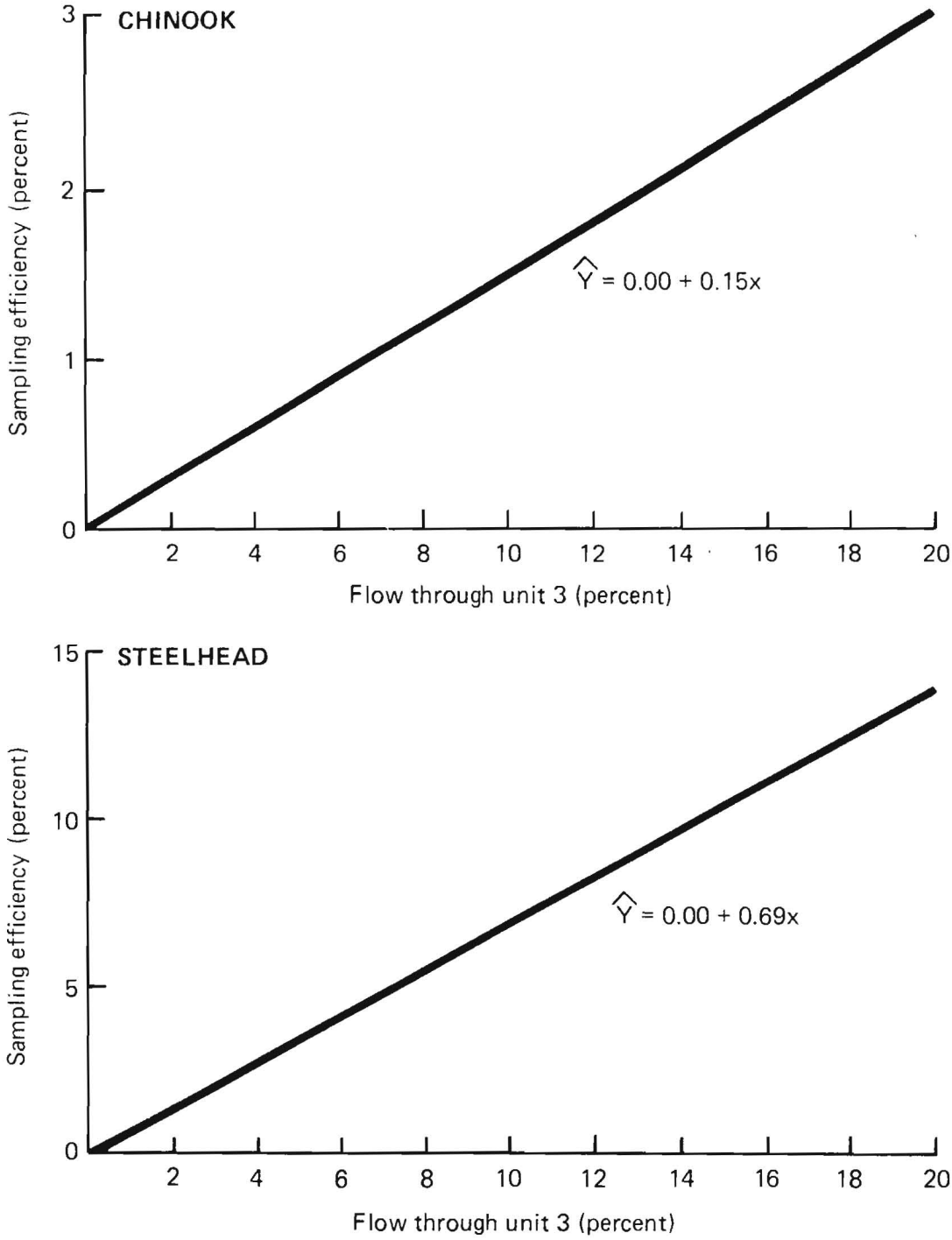

Figure 2.--Flow-sampling efficiency relationships for yearling chinook salmon and steelhead at John Dam Dam in 1981.

considered as relative values. Coho salmon passage estimates were based on combined chinook salmon and steelhead effiency regressions. Previous mark recovery experiments have shown that coho salmon recapture efficiencies fall about halfway between chinook salmon and steelhead efficiencies. (See Appendices F and G for regression derivations.)

Travel time from Lower Granite Dam to John Day Dam was based on marked fish released above Lower Granite Dam and subsequently recovered at Lower Granite and John Day Dams. Travel time was equal to the difference between the median dates of recovery of these marked fish at the two dams. It should be emphasized that travel time calculated in this manner reflect only the rate of movement of those fish surviving from the upper to the lower dam.

Because of the current critical status of upriver runs, it was decided not to sacrifice any fish with excised adipose fins for recovery of coded wire tags in 1981. Since there was no branding at hatcheries, no information on survival and timing from hatcheries was obtained. The only branding was for the efficiency releases and for the summer flow study (funded by Bonneville Power Administration). The latter fish were branded for release in John Day Reservoir, and the results obtained would not be applicable to this study.

RESULTS AND DISCUSSION

Assessment of the 1981 Smolt Outmigrations

Funding to monitor smolt migrations at McNary Dam was not available in 1981. As a result, estimates of smolt survival from the Snake and upper Columbia Rivers could not be made. Without this survival information, an accurate assessment of the 1981 outmigration was not possible. However,

timing and magnitude of the smolt migrations at Lower Granite and John Day Dams were defined and travel time between the two dams calculated.

Daily catch summaries and passage estimates provided a general guideline for defining timing of migrations at Lower Granite and John Day Dams (Appendices A and B). Mark recovery and release summaries are included in Appendices C, D, and E.

Timing of Migrations and Travel Time

Smolts began to appear at Lower Granite Dam on 3 April. By 6 June, 90% of the yearling chinook salmon smolt migration and 92% of the steelhead migration had passed the dam (Figure 3, Appendix Tables A1 and A2). The yearling chinook salmon and steelhead migrations peaked at Lower Granite Dam on 28 April and 11 May, respectively.

Flows in the Snake River during 1981 were about 16,000 cfs lower during the peak period of chinook salmon migration and about 90,000 cfs lower during the peak period of steelhead migration than in 1980. Flows at Lower Granite Dam exceeded minimum flows recommended for fish migrations (85,000 cfs) 76% of the time during the major period of the chinook salmon migration (31 of 41 days) and 63% of the time during the major period of the steelhead migration (24 of 38 days). Spilling occurred at Lower Granite Dam during 56% of the chinook salmon migration and during 54% of the steelhead migration.

Monitoring at John Day Dam began on 21 April. The yearling chinook salmon migration peaked on 14 May and continued through the third week in July (Figure 4). Approximately 90% of the migration passed the dam between 3 May and 4 June (Appendix Table B1). The steelhead migration was bimodal.

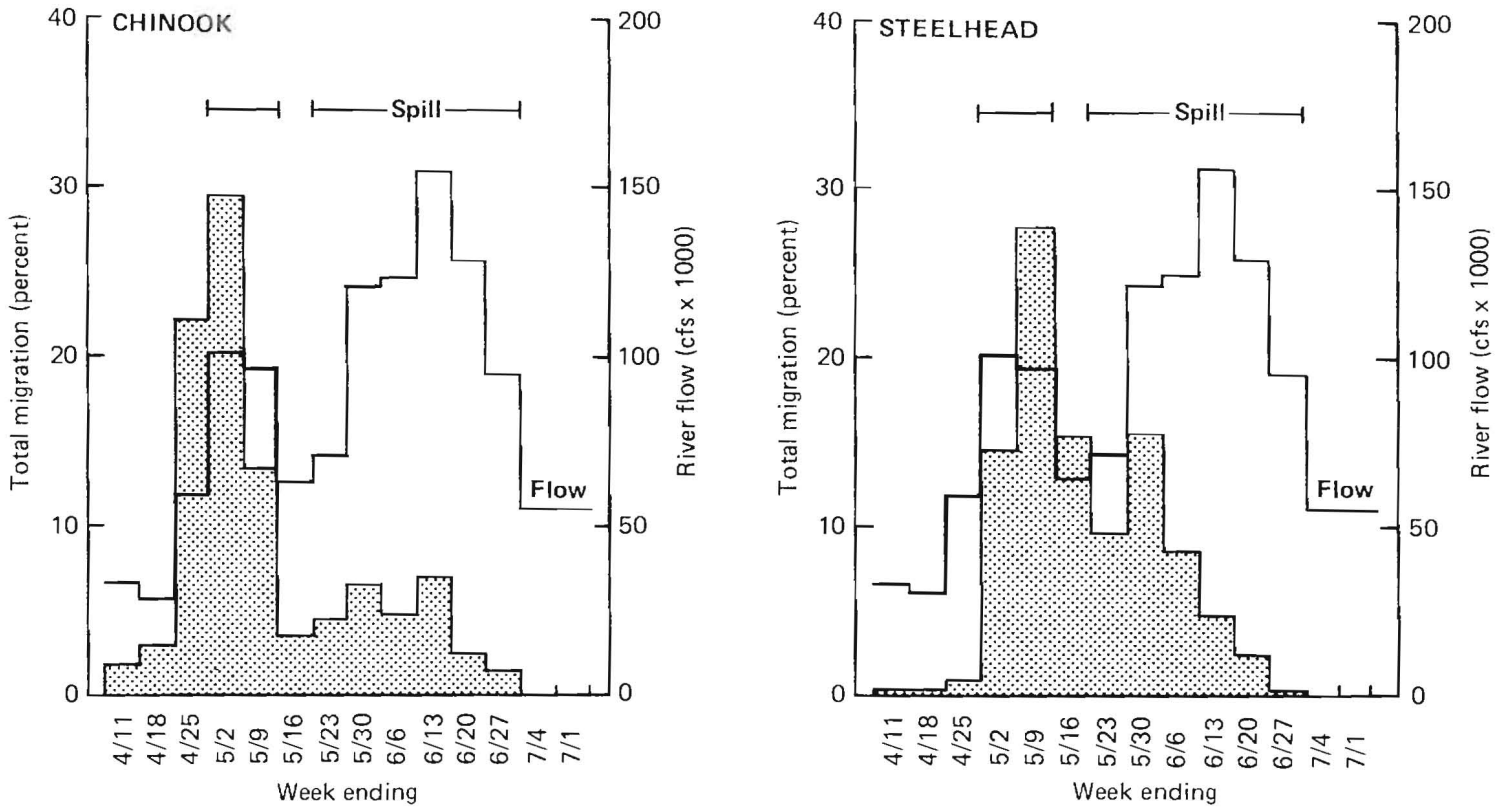

Figure 3.--Timing of the yearling chinook salmon and steelhead migrations at Lower Granite Dam, 1981.

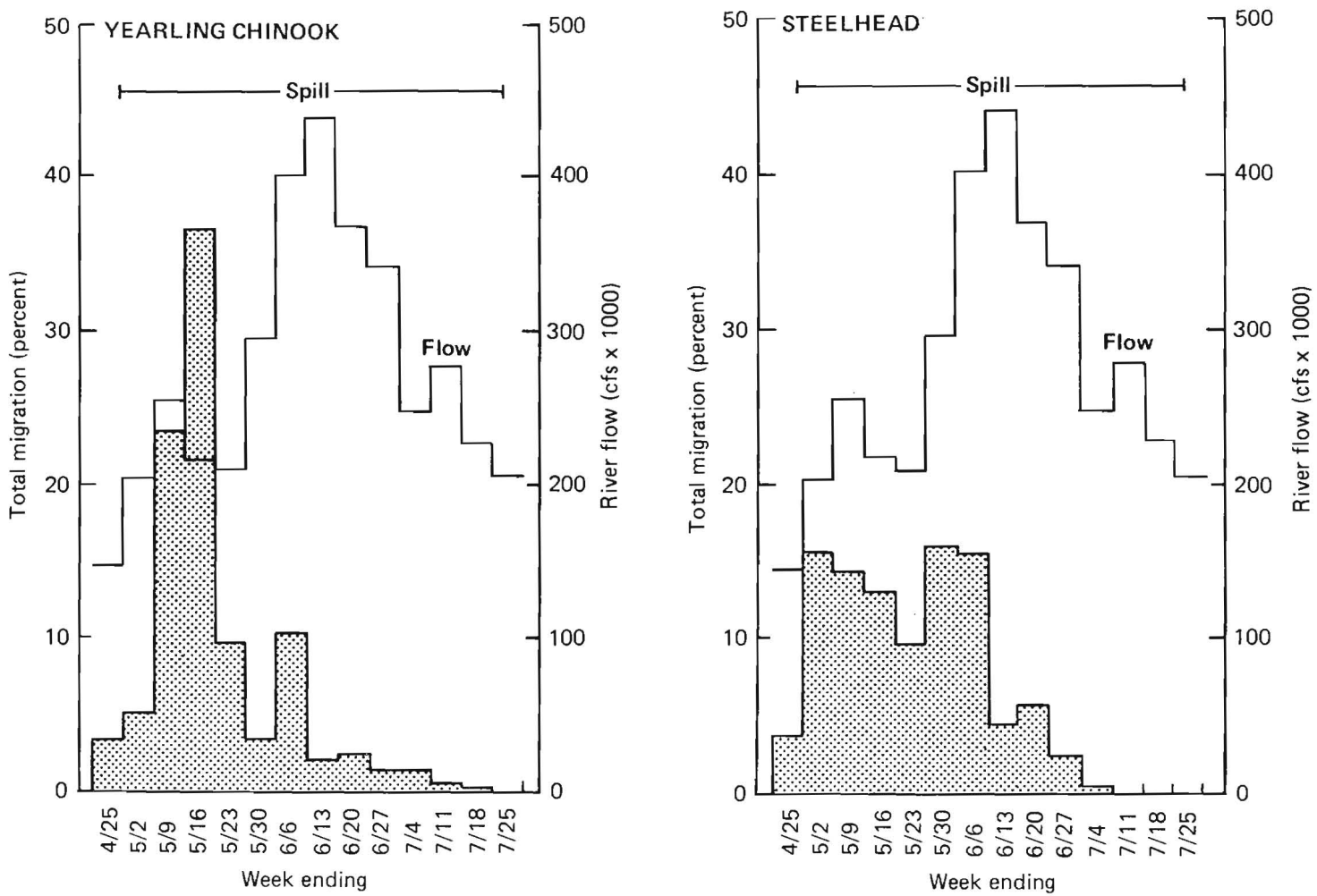

Figure 4.--Timing of the yearling chinook salmon and steelhead migrations at John Day Dam, 1981.

The first peak (representing Columbia River fish) occurred on 28 April. The Snake River migration peaked on 24 May. Overall, 90% of the steelhead passed John Day Dam between 28 May and 11 June (Appendix Table B2). There were three peaks of migrations of 0-age chinook salmon at John Day Dam in 1981 (Figure 5, Appendix Table B3). The first peak, representing an April release of hatchery fish in John Day Reservoir, occurred on 29 April. Two peaks occurred during the normal summer migration: one on 4 July and the second on 28 July. Peak migrations of coho and sockeye salmon occurred on 25 May and 27 May, respectively (Figure 6, Appendix Tables B4 and B5). Flows at John Day Dam during the major periods of Snake River migrations were 42,000 cfs (for chinook salmon) and 23,000 cfs (for steelhead) lower than in 1980. Flows at John Day Dam exceeded minimum flow recommendations (220,000 cfs) 81% of the time during the major period of the yearling chinook salmon migration (26 of 32 days) and 86% of the time during the major period of the steelhead migration (37 of 43 days). Spilling occurred at John Day Dam during 94% of the yearling chinook salmon migration, 87% of the steelhead migration, and 80% of the 0-age chinook salmon migration.

Based on marked recoveries, travel time of Snake River smolts from Lower Granite Dam was measured at 12 days for chinook salmon and 15 days for steelhead in 1981 (Table 1). Flows in the Snake River during 1981 were about 16,000 cfs lower during the peak period of the chinook salmon migration and 10,000 cfs lower during the peak steelhead migration than they were in 1980. Based on the travel time/flow curve developed over the past 9 years (Figure 7) and levels of Snake River flow in 1981, we would have expected travel times of 14 days for chinook salmon and 15 days for steelhead.

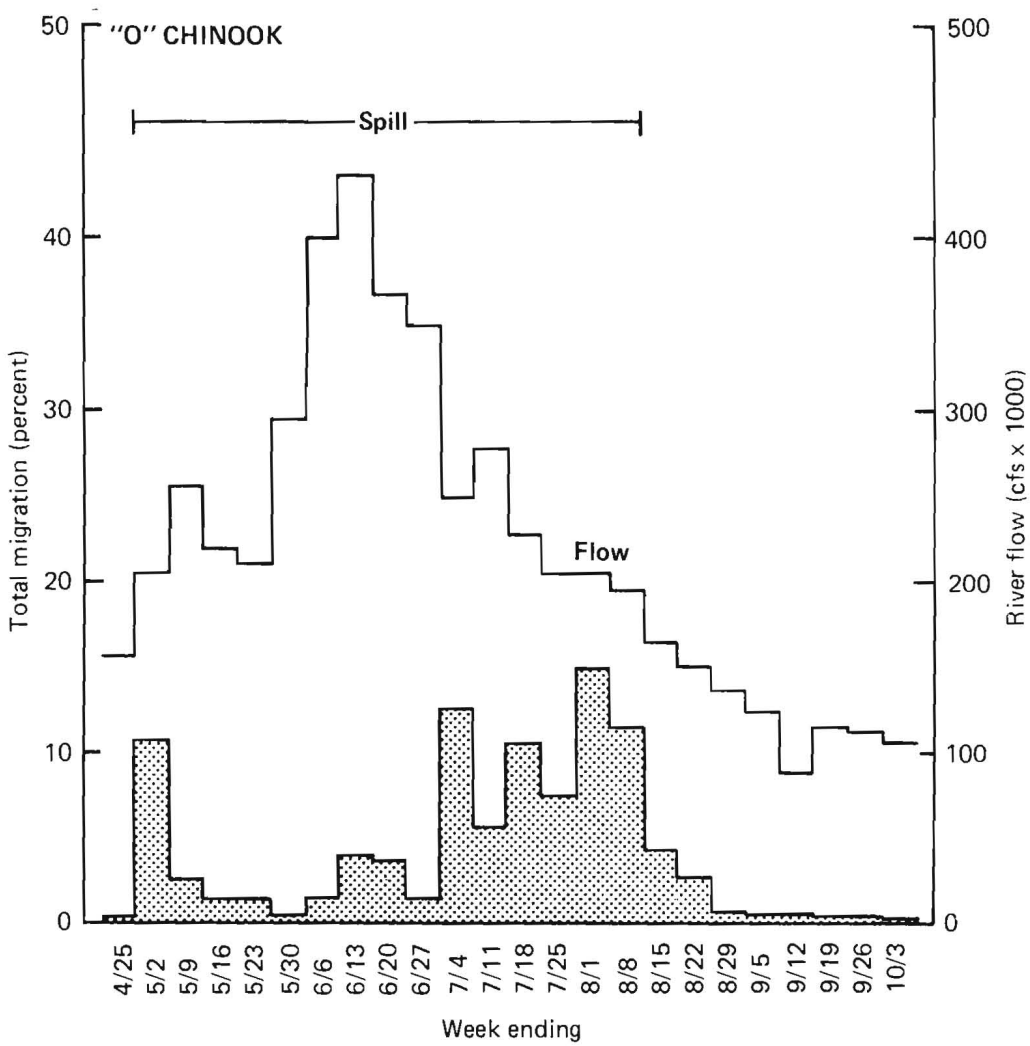

Figure 5.--Timing of the 0-age chinook salmon migration at John Day Dam, 1981.

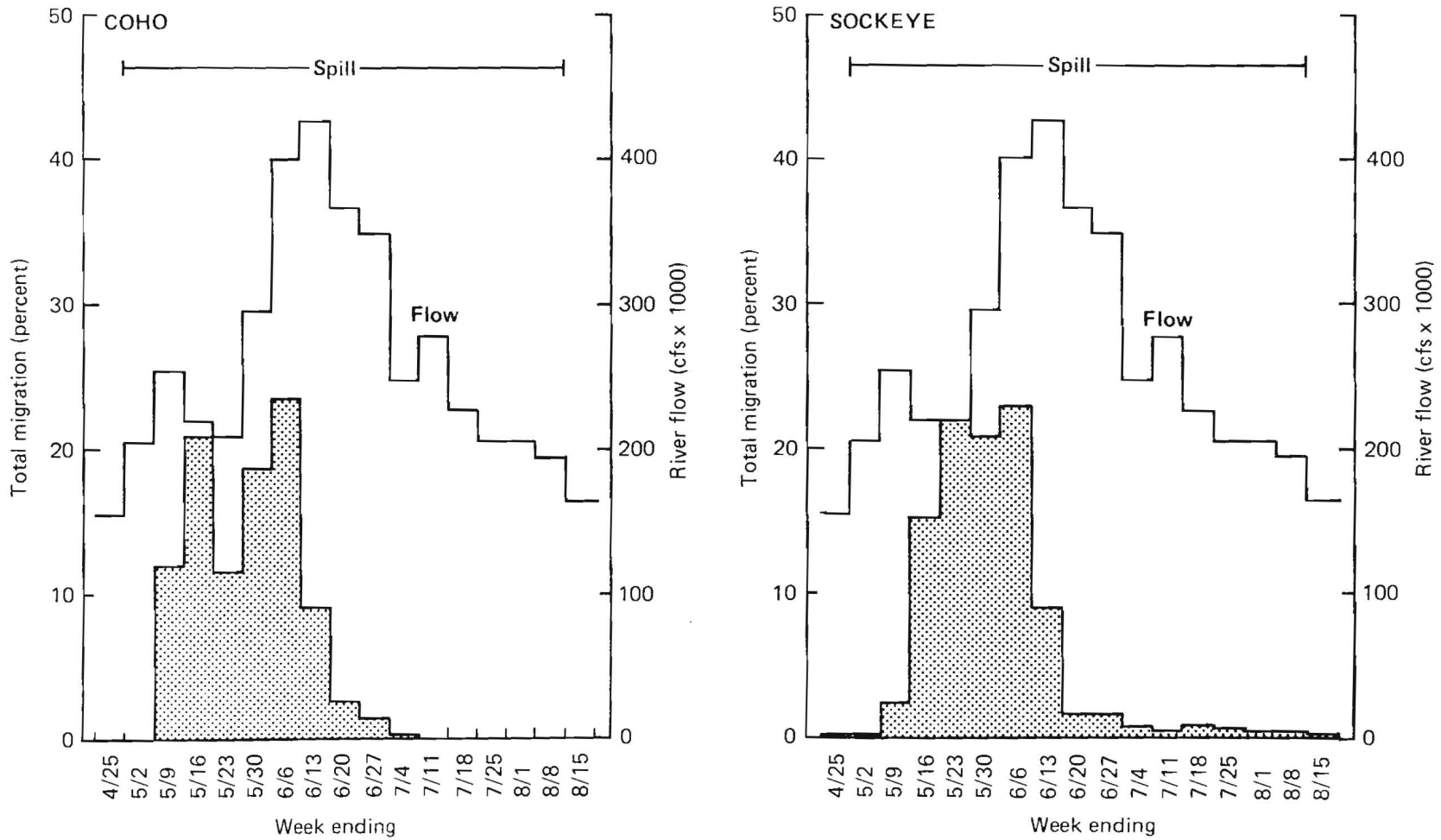

Figure 6.--Timing of the coho and sockeye salmon migrations at John Day Dam, 1981.

Table 1.--Travel time from Lower Granite Dam to John Day Dam for yearling chinook salmon and steelhead smolts, 1973-81.

Year	Average river flow at Ice Harbor Dam (cfs)[a]		Average river flow at John Day Dam (cfs)[a]		Average travel time (days)	
	Chinook	Steelhead	Chinook	Steelhead	Chinook	Steelhead
1973	71,000	68,000	150,000	146,000	22	20
1974	158,000	103,000	351,000	317,000	12	14
1975	140,000	136,000	344,000	344,000	12	10
1976	110,000	167,000	363,000	339,000	15	17
1977	40,000	40,000	125,000	119,000	36	37
1978	106,000	106,000	268,000	273,000	11	10
1979	85,000	89,000	255,000	255,000	13	13
1980	110,000	99,000	261,000	249,000	12	10
1981	94,000	89,000	219,000	226,000	12	15

a/ At migration peak ± 7 days.

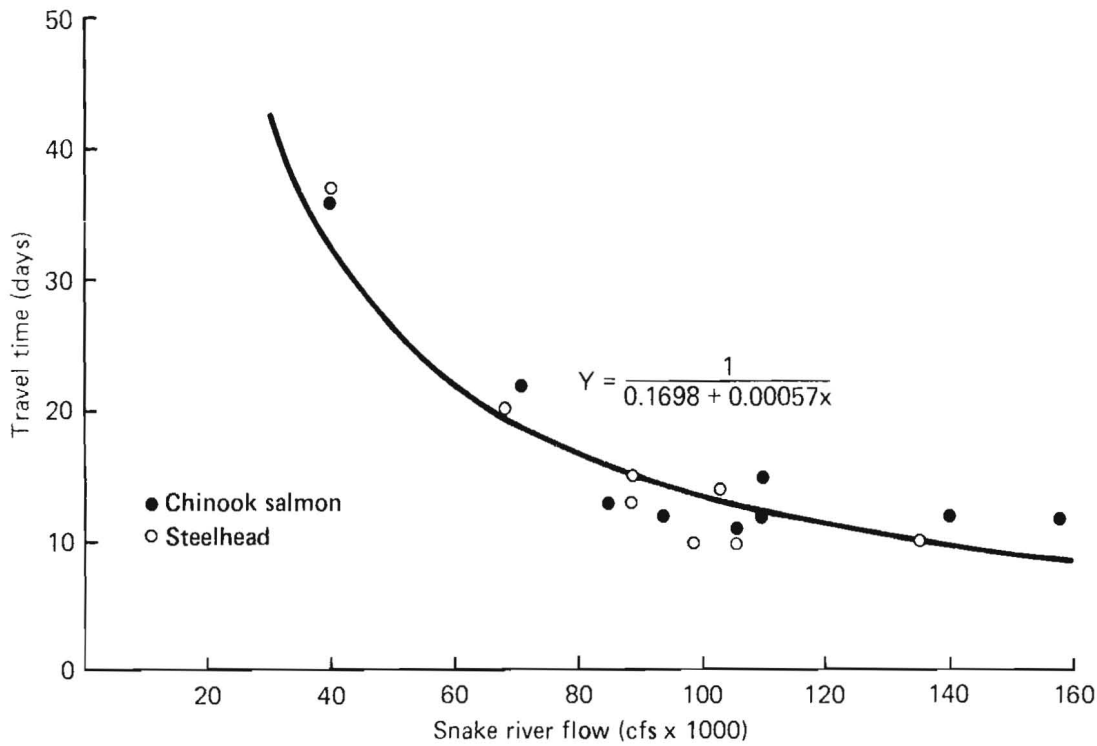

Figure 7.--Travel time/river flow relationships for Snake River smolts 1973-1981.

Magnitude of Smolt Migrations

Approximately 3.2 million chinook salmon smolts and 3.7 million steelhead smolts were estimated to have arrived at Lower Granite Dam in 1981 (Table 2). This compared to 5.6 million chinook salmon and 3.6 million steelhead in 1980 (Sims et al. 1981). Approximately 1.4 million chinook salmon (44%) and 2.8 million steelhead (76%) were collected at Lower Granite and Little Goose Dams and transported downstream. Additional numbers of Snake River fish were collected at McNary Dam and transported but because we did not monitor at McNary Dam in 1981, it is not possible to define how many. Daily estimates of numbers of chinook salmon and steelhead smolts passing Lower Granite Dam in 1981 are contained in Appendix A.

Approximately 7.7 million smolts were estimated to have passed John Day Dam in 1981. This total included 1.6 million yearling chinook salmon, 0.5 million steelhead, 0.06 million coho salmon, 0.6 million sockeye salmon, and 5.1 million summer/fall chinook salmon. This compared to 3.4 million yearling chinook salmon, 0.8 million steelhead, 0.1 million coho salmon, 0.3 million sockeye salmon, and 3.7 million summer/fall chinook salmon in 1980. As in 1980, the magnitude of the summer/fall chinook salmon migration was influenced by the release of approximately 1.0 million hatchery fish into John Day Reservoir in mid-April. Daily estimates of numbers of juveniles passing John Day Dam in 1981 by species are contained in Appendix B.

Table 2.--Estimated smolt migrations (millions of fish) for 1981.

	Yearling chinook	Steelhead	Coho a/	Sockeye b/	0-age chinook
Lower Granite	3.19	3.71	c/	c/	c/
Trans. Granite	0.84	1.89	c/	c/	c/
Trans. Goose	0.58	0.88	c/	c/	c/
Trans. McNary d/	1.23	0.37	0.10	0.31	2.10
John Day d/	1.55	0.50	0.06	0.55	5.05

a/ Based on steelhead efficiency curve.

b/ Based on chinook salmon efficiency curve.

c/ No estimates calculated.

d/ Numbers of fish shown include both Columbia and Snake River migrants.

SUMMARY AND CONCLUSIONS

NMFS monitored juvenile migrations of salmon and steelhead at Lower Granite and John Day Dams in 1981. Timing of migrations, smolt travel time, and magnitude of migrations were defined. Survival estimates of Snake River migrations could not be defined in 1981 because monitoring was not conducted at McNary Dams. Results of 1981 research are summarized as follows:

1. Approximately 3.2 million chinook salmon and 3.7 million steelhead arrived at Lower Granite Dam in 1981. The smolt migrations peaked at Lower Granite Dam on 28 April (chinook salmon) and 11 May (steelhead).

2. Travel time from Lower Granite Dam to John Day Dam was 12 days for chinook salmon and 15 days for steelhead. Flows in the Snake River during 1981 were 16,000 cfs lower during the peak period of chinook salmon migration and about 10,000 cfs lower during peak steelhead migration than they were in 1980.

3. Approximately 1.6 million yearling chinook salmon, 0.5 million steelhead, 0.06 million coho salmon, 0.6 million sockeye salmon, and 5.1 million fall/summer chinook salmon passed John Day Dam. It was not possible to break these estimates down into Snake River and Columbia River segments because we did not monitor at McNary Dam in 1981.

Any meaningful assessment of the annual smolt migrations from the Snake River must include survival estimates. It is not possible to obtain survival estimates of Snake River stocks without monitoring at McNary Dam. Therefore, it is essential that sampling at McNary Dam is included in all future monitoring programs.

LITERATURE CITED

Sims, C.W., J.G. Williams, D.A. Faurot, R.C. Johnsen, and D.A. Brege. 1981. Migrational characteristics of juvenile salmon and steelhead in the Columbia River basin and related passage research at John Day Dam. NOAA, NMFS, Northwest and Alaska Fisheries Center, Seattle, Washington. Annual report to U.S. Army Corps of Engineers. Vol. 1.

APPENDIX A

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- LOWER GRANITE DAM -

APPENDIX TABLE A1

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- LOWER GRANITE DAM -

YEARLING CHINOOK PASSAGE LOWER GRANITE DAM 1981

DATE	% TURBINE FLOW	SAMPLING EFFICIENCY (%)	NUMBER COLLECTED	ESTIMATED PASSAGE	
040381	100.00	29.67	902	3,040	
040481	100.00	29.67	897	3,023	
040581	100.00	29.67	897	3,023	
040681	100.00	29.67	897	3,023	
040781	100.00	29.67	1,660	5,594	
040881	100.00	29.67	1,562	5,264	
040981	100.00	29.67	3,851	12,978	
041081	100.00	29.67	3,277	11,043	
041181	100.00	29.67	1,723	5,807	
041281	100.00	29.67	4,242	14,296	
041391	100.00	29.67	5,292	17,834	
041481	100.00	29.67	4,536	15,286	
041581	100.00	29.67	3,445	11,610	
041681	100.00	29.67	3,804	12,819	
041781	100.00	29.67	4,406	14,848	
041881	100.00	29.67	2,546	8,580	
041981	100.00	29.67	6,343	21,376	
042081	100.00	29.67	19,884	67,009	
042181	100.00	29.67	27,731	93,453	-10%[a]
042281	100.00	29.67	32,809	110,566	
042381	100.00	29.67	34,163	115,129	
042481	100.00	29.67	39,920	134,530	
042581	100.00	29.67	49,218	165,865	
042681	100.00	29.67	57,921	195,194	
042781	99.50	29.57	77,673	262,535	
042881	100.00	29.67	43,582	146,871	
042981	100.00	29.67	34,754	117,121	
043081	100.00	29.67	25,165	87,071	-50%[a]
050181	85.75	25.45	14,587	57,327	
050281	94.13	27.93	19,431	69,563	
050381 > 050481	79.10	23.47	78,923	336,212	
050581	97.98	29.07	8,766	30,155	
050681	100.00	29.67	6,366	21,453	
050781	100.00	29.67	4,578	15,428	
050881	100.00	29.67	3,390	11,424	
050981	100.00	29.67	2,973	10,019	
051081 > 051181	100.00	29.67	8,507	28,669	
051281	100.00	29.67	4,314	14,538	

APPENDIX TABLE A1 - Continued

DATE	% TURBINE FLOW	SAMPLING EFFICIENCY (%)	NUMBER COLLECTED	ESTIMATED PASSAGE
051381	100.00	29.67	5,485	18,484
051481	100.00	29.67	4,547	15,323
051581	100.00	29.67	3,297	11,111
051681	100.00	29.67	7,142	24,069
051781				
051881>	100.00	29.67	11,018	37,131
051981	100.00	29.67	2,816	9,490
052081	100.00	29.67	3,750	12,638
052181	100.00	29.67	3,712	12,509
052281	100.00	29.67	7,861	26,492
052381	100.00	29.67	13,670	46,068
052481				
052581>	100.00	29.67	19,220	64,776
052681	98.36	29.24	9,420	32,216
052781	87.00	25.84	7,674	29,698
052881	82.63	24.57	10,818	44,029
052981	84.06	24.94	5,754	23,074
053081	85.37	25.38	4,490	17,691
053181				
060181>	79.08	23.47	6,329	26,962
060281	77.93	23.15	4,912	21,220
060381	91.31	27.10	10,352	38,199
060481	81.77	24.27	3,989	16,435
060581	91.90	27.32	3,483	12,748
060681	29.01	8.62	3,264	37,862
060781				
060881>	25.98	7.72	9,927	128,555 -90%[a/]
060981				
061081>	29.44	8.75	5,049	57,710
061181				
061281>	40.66	12.08	3,791	31,389
061381	37.78	11.22	795	7,083
061481				
061581>	26.28	7.81	986	12,631
061681	46.67	13.87	1,058	7,628
061781				
061881>	87.54	25.97	4,705	18,114
061981				
062081>	72.68	21.60	8,751	40,517
062181				
062281>	60.19	17.89	3,890	21,745
062381				
062481>	92.35	27.40	4,033	14,720
062581				
062681>	100.00	29.67	2,584	8,708
		TOTALS	843,507	3,186,596

a/ Cumulative passage (% of total).

APPENDIX TABLE A2

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- LOWER GRANITE DAM -

STEELHEAD PASSAGE LOWER GRANITE DAM 1981

DATE	% TURBINE FLOW	SAMPLING EFFICIENCY (%)	NUMBER COLLECTED	ESTIMATED PASSAGE	
040381	100.00	58.36	300	514	
040481	100.00	58.36	288	493	
040581	100.00	58.36	288	493	
040681	100.00	58.36	288	493	
040781	100.00	58.36	371	636	
040881	100.00	58.36	272	466	
040981	100.00	58.36	389	667	
041081	100.00	58.36	325	557	
041181	100.00	58.36	96	164	
041281	100.00	58.36	240	411	
041381	100.00	58.36	245	420	
041481	100.00	58.36	155	266	
041581	100.00	58.36	171	293	
041681	100.00	58.36	258	442	
041781	100.00	58.36	184	315	
041881	100.00	58.36	119	204	
041981	100.00	58.36	153	262	
042081	100.00	58.36	504	864	
042181	100.00	58.36	655	1,122	
042281	100.00	58.36	907	1,554	
042381	100.00	58.36	1,867	3,199	
042481	100.00	58.36	3,664	6,278	
042581	100.00	58.36	12,693	21,749	
042681	100.00	58.36	33,663	57,682	
042781	99.50	58.07	45,120	77,701	
042881	100.00	58.36	48,557	83,203	
042981	100.00	58.36	38,273	65,581	
043081	97.19	56.72	40,920	72,144	-10%[a]
050181	85.75	50.04	41,786	83,499	
050281	94.13	54.93	56,230	102,359	
050381					
050481>	79.10	46.68	254,285	544,784	
050581	97.98	57.18	38,426	67,200	
050681	100.00	58.36	40,713	69,762	
050781	100.00	58.36	51,611	88,436	
050881	100.00	58.36	72,472	124,181	
050981	100.00	58.36	74,672	127,951	
051081					
051181>	100.00	58.36	145,159	248,730	-50%[a]
051281	100.00	58.36	60,467	103,610	

APPENDIX TABLE A2 - Continued

DATE	% TURBINE FLOW	SAMPLING EFFICIENCY (%)	NUMBER COLLECTED	ESTIMATED PASSAGE
051381	100.00	58.36	39,647	67,935
051481	100.00	58.36	25,203	43,185
051581	100.00	58.36	28,755	49,272
051681	100.00	58.36	27,842	47,707
051781				
051881>	100.00	58.36	45,580	78,101
051981	100.00	58.36	16,500	28,273
052081	100.00	58.36	16,657	28,542
052181	100.00	58.36	12,651	21,678
052281	100.00	58.36	26,231	44,947
052381	100.00	58.36	90,709	155,430
052481				
052581>	100.00	58.36	136,666	234,178
052681	98.36	57.40	51,033	88,903
052781	87.00	50.77	41,791	82,309
052881	82.63	48.22	33,251	68,953
052981	84.06	49.06	30,935	63,059
053081	85.37	49.82	18,753	37,640
053181				
060181>	79.08	46.15	36,082	78,182
060281	77.93	45.48	18,064	39,719
060381	91.31	53.29	12,172	22,842
060481	81.77	47.72	12,884	26,999
060581	91.90	53.63	12,721	23,719
060681	29.01	16.93	21,735	128,380 -90%a/
060781				
060881>	25.98	15.16	8,937	58,944
060981				
061081>	29.44	17.18	8,883	51,702
061181				
061281>	40.66	23.73	9,556	40,271
061381	37.78	22.05	5,870	26,623
061481				
061581>	26.28	15.34	7,435	48,478
061681	46.67	27.24	2,984	10,956
061781				
061881>	87.54	51.09	5,593	10,948
061981				
062081>	72.68	42.42	7,003	16,510
062181				
062281>	60.19	35.13	4,749	14,171
062381				
062481>	92.35	53.90	4,978	9,236
062581				
062681>	100.00	58.36	4,116	7,053
		TOTALS	1,892,752	3,713,530

a/ Cumulative passage (% of total).

APPENDIX B

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

APPENDIX TABLE B1

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

YEARLING CHINOOK PASSAGE JOHN DAY DAM 1981

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE	
042181	12.05	1.83	269	14,699	
042281	11.45	1.74	131	7,529	
042381	10.70	1.62	137	8,457	
042481	10.15	1.54	146	9,481	
042581	8.80	1.34	151	11,269	
042681	9.45	1.43	145	10,140	
042781	11.00	1.67	149	8,922	
042881	9.10	1.38	302	21,884	
042981	8.20	1.25	169	13,520	
043081	7.25	1.10	103	9,364	
050181	8.35	1.27	80	6,299	
050281	8.05	1.22	103	8,443	
050381	8.00	1.22	317	25,984	-10%a/
050481	8.30	1.26	256	20,317	
050581	7.80	1.18	332	28,136	
050681	7.35	1.12	412	36,786	
050781	7.25	1.10	768	69,818	
050881	6.40	0.97	1,039	107,113	
050981	10.00	1.52	1,176	77,368	
051081	7.45	1.13	657	58,142	
051181	10.25	1.56	722	46,282	
051281	9.70	1.47	472	32,109	
051381	7.15	1.09	748	68,624	
051481	7.00	1.06	1,901	179,340	-50%a/
051581	7.00	1.06	1,163	109,717	
051681	7.15	1.09	800	73,394	
051781	10.65	1.62	319	19,691	
051881	9.75	1.48	128	8,649	
051981	7.35	1.12	586	52,321	
052081	8.55	1.30	324	24,923	
052181	11.45	1.74	254	14,598	
052281	7.85	1.19	312	26,218	
052381	11.50	1.74	85	4,885	
052481	9.05	1.37	215	15,693	
052581	7.15	1.09	62	5,688	
052681	9.95	1.51	38	2,517	
052781	5.60	0.85	43	5,059	
052881	5.60	0.85	88	10,353	
052981	4.30	0.66	49	7,424	
053081	4.30	0.66	63	9,545	

APPENDIX TABLE B1 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
053181	4.60	0.70	198	28,286
060181	4.15	0.63	190	30,159
060281	3.80	0.58	144	24,828
060381	3.85	0.59	213	36,102
060481	3.80	0.58	133	22,931 -90%a/
060581	4.20	0.64	43	6,719
060681	3.90	0.60	55	9,167
060781	3.80	0.58	23	3,966
060881	3.85	0.59	14	2,373
060981	3.95	0.60	13	2,167
061081	4.30	0.66	17	2,576
061181	4.35	0.66	42	6,364
061281	4.70	0.72	28	3,889
061381				
061481>	4.25	0.65	139	21,385
061581	3.65	0.56	40	7,143
061681	4.00	0.61	26	4,262
061781	4.40	0.67	26	3,881
061881	4.85	0.74	27	3,649
061981	4.55	0.69	26	3,768
062081				
062181>	3.80	0.58	62	10,690
062281	3.90	0.60	12	2,000
062381	4.00	0.61	2	328
062481	3.90	0.60	5	833
062581	4.30	0.66	25	3,788
062681	4.90	0.75	32	4,267
062781				
062881>	4.90	0.75	48	6,400
062981	6.65	1.01	13	1,287
063081	7.15	1.09	77	7,064
070181	6.60	1.00	39	3,900
070281	6.95	1.06	37	3,491
070381	6.40	0.97	22	2,268
070481	6.00	0.91	18	1,978
070581	5.50	0.84	8	952
070681	6.25	0.95	4	421
070781	5.30	0.81	18	2,222
070881	5.05	0.77	6	779
070981	6.00	0.91	8	879
071081	5.60	0.85	0	0
071181				
071281>	7.80	1.18	40	3,390
071381	8.50	1.29	15	1,163
071481	8.10	1.23	2	163
071581	6.85	1.04	0	0
		TOTALS	17,104	1,552,579

a/ Cumulative passage (% of total).

APPENDIX TABLE B2

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

STEELHEAD PASSAGE JOHN DAY DAM 1981

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE	
042181	12.05	8.32	133	1,599	
042281	11.45	7.91	164	2,073	
042381	10.70	7.39	252	3,410	
042481	10.15	7.01	352	5,021	
042581	8.80	6.08	428	7,039	
042681	9.45	6.53	280	4,288	
042781	11.00	7.60	483	6,355	
042881	9.10	6.28	1,551	24,697	-10%[a]
042981	8.20	5.66	1,103	19,488	
043081	7.25	5.01	454	9,062	
050181	8.35	5.77	444	7,695	
050281	8.05	5.56	334	6,007	
050381	8.00	5.52	268	4,855	
050481	8.30	5.73	416	7,260	
050581	7.80	5.39	662	12,282	
050681	7.35	5.08	498	9,803	
050781	7.25	5.01	496	9,900	
050881	6.40	4.42	700	15,837	
050981	10.00	6.91	731	10,579	
051081	7.45	5.14	538	10,467	
051181	10.25	7.08	522	7,373	
051281	9.70	6.70	418	6,239	
051381	7.15	4.94	563	11,397	
051481	7.00	4.83	486	10,062	
051581	7.00	4.83	492	10,186	
051681	7.15	4.94	428	8,664	
051781	10.65	7.35	277	3,769	
051881	9.75	6.73	194	2,883	
051981	7.35	5.08	467	9,193	
052081	8.55	5.90	536	9,085	-50%[a]
052181	11.45	7.91	431	5,449	
052281	7.85	5.42	564	10,406	
052381	11.50	7.94	539	6,788	
052481	9.05	6.25	1,345	21,520	
052581	7.15	4.94	385	7,794	
052681	9.95	6.87	228	3,319	
052781	5.60	3.87	208	5,375	
052881	5.60	3.87	464	11,990	
052981	4.30	2.97	433	14,579	
053081	4.30	2.97	437	14,714	

APPENDIX TABLE B2 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
053181	4.60	3.17	306	9,653
060181	4.15	2.87	525	18,293
060281	3.80	2.62	360	13,740
060381	3.85	2.66	361	13,571
060481	3.80	2.62	267	10,191
060581	4.20	2.90	133	4,586
060681	3.90	2.69	194	7,212
060781	3.80	2.62	65	2,481
060881	3.85	2.66	47	1,767
060981	3.95	2.73	81	2,967
061081	4.30	2.97	76	2,559
061181	4.35	3.00	152	5,067 -90%a/
061281	4.70	3.25	210	6,462
061381				
061481>	4.25	2.93	312	10,648
061581	3.65	2.52	32	1,270
061681	4.00	2.76	155	5,616
061781	4.40	3.04	147	4,836
061881	4.85	3.35	94	2,806
061981	4.55	3.14	95	3,025
062081				
062181>	3.80	2.62	138	5,267
062281	3.90	2.69	68	2,528
062381	4.00	2.76	39	1,413
062481	3.90	2.69	29	1,078
062581	4.30	2.97	18	606
062681	4.90	3.38	12	355
062781				
062881>	4.90	3.38	28	828
062981	6.65	4.59	6	131
063081	7.15	4.94	7	142
070181	6.60	4.56	4	88
070281	6.95	4.80	2	42
070381	6.40	4.42	1	23
070481	6.00	4.14	1	24
070581	5.50	3.80	3	79
070681	6.25	4.32	0	0
070781	5.30	3.66	3	82
070881	5.05	3.49	2	57
070981	6.00	4.14	3	72
071081	5.60	3.87	0	0
071181				
071281>	7.80	5.39	3	56
071381	8.50	5.87	1	17
071481	8.10	5.59	1	18
071581	6.85	4.73	0	0
		TOTALS	23,685	498,158

a/ Cumulative passage (% of total).

APPENDIX TABLE B3

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

"0" CHINOOK PASSAGE JOHN DAY DAM 1981

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE	
042181	12.05	1.83	0	0	
042281	11.45	1.74	0	0	
042381	10.70	1.62	0	0	
042481	10.15	1.54	2	130	
042581	8.80	1.34	112	8,386	
042681	9.45	1.43	973	67,866	
042781	11.00	1.67	725	43,471	
042881	9.10	1.38	1,979	143,318	
042981	8.20	1.24	1,939	155,752	
043081	7.25	1.10	703	63,824	
050181	8.35	1.27	424	33,450	-10%a/
050281	8.05	1.22	420	34,362	
050381	8.00	1.21	370	30,460	
050481	8.30	1.26	350	27,777	
050581	7.80	1.18	144	12,157	
050681	7.35	1.12	183	16,390	
050781	7.25	1.10	132	11,984	
050881	6.40	0.97	269	27,643	
050981	10.00	1.52	164	10,813	
051081	7.45	1.13	68	6,009	
051181	10.25	1.55	42	2,702	
051281	9.70	1.47	78	5,301	
051381	7.15	1.09	156	14,360	
051481	7.00	1.06	250	23,503	
051581	7.00	1.06	42	3,948	
051681	7.15	1.09	139	12,795	
051781	10.65	1.61	124	7,678	
051881	9.75	1.48	167	11,291	
051981	7.35	1.12	372	33,316	
052081	8.55	1.30	78	6,010	
052181	11.45	1.74	23	1,325	
052281	7.85	1.19	27	2,265	
052381	11.50	1.74	29	1,664	
052481	9.05	1.37	57	4,151	
052581	7.15	1.09	26	2,393	
052681	9.95	1.51	26	1,723	
052781	5.60	0.85	18	2,112	
052881	5.60	0.85	26	3,051	
052981	4.30	0.66	10	1,524	
053081	4.30	0.66	13	1,982	

APPENDIX TABLE B3 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
053181	4.60	0.70	33	4,706
060181	4.15	0.63	18	2,842
060281	3.80	0.58	56	9,648
060381	3.85	0.59	46	7,823
060481	3.80	0.58	89	15,333
060581	4.20	0.64	76	11,859
060681	3.90	0.60	111	18,638
060781	3.80	0.58	116	20,000
060881	3.85	0.59	131	22,278
060981	3.95	0.60	107	17,741
061081	4.30	0.66	322	49,088
061181	4.35	0.66	396	59,682
061281	4.70	0.72	178	24,847
061381				
061481>	4.25	0.65	126	19,432
061581	3.65	0.56	304	54,499
061681	4.00	0.61	252	41,267
061781	4.40	0.67	130	19,372
061881	4.85	0.74	275	39,917
061981	4.55	0.69	74	10,667
062081				
062181>	3.80	0.58	174	29,976
062281	3.90	0.60	149	25,018
062381	4.00	0.61	20	3,275
062481	3.90	0.60	41	6,884
062581	4.30	0.66	69	10,519
062681	4.90	0.75	100	13,394
062781				
062881>	4.90	0.75	59	7,903
062981	6.65	1.01	67	6,628
063081	7.15	1.09	441	40,594
070181	6.60	1.00	508	50,633
070281	6.95	1.06	1,423	134,733
070381	6.40	0.97	1,733	178,090
070481	6.00	0.91	2,043	223,842
070581	5.50	0.84	683	81,583
070681	6.25	0.95	538	56,605
070781	5.30	0.81	271	33,582
070881	5.05	0.77	324	42,120
070891	6.00	0.91	296	32,431
071081	5.60	0.85	108	12,672
071181				
071281>	7.80	1.18	534	45,081
071381	8.50	1.29	455	35,265
071481	8.10	1.23	1,349	109,690
071581	6.85	1.04	713	68,488 -50%a/
071681	7.25	1.10	1,064	96,599

APPENDIX TABLE B3 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
071781	7.05	1.07	1,262	117,805
071881				
071981>	10.15	1.54	2,559	166,233
072081	9.30	1.41	488	34,584
072181	8.30	1.26	1,007	79,919
072281	10.50	1.59	782	49,112
072381	9.30	1.41	341	24,166
072481	9.20	1.40	448	32,093
072581				
072681>	12.35	1.87	2,487	132,878
072781	12.35	1.87	2,263	120,910
072881	8.10	1.23	3,215	261,419
072981	8.50	1.29	1,186	91,921
073081	11.20	1.70	847	49,883
073181	7.30	1.11	983	88,637
080181	7.90	1.20	925	77,107
080281	9.15	1.39	389	28,018
080381	14.30	2.17	420	19,390
080481	12.05	1.83	767	41,449
080581	7.00	1.06	1,756	165,082
080681	8.40	1.28	1,320	103,519
080781	7.70	1.17	1,137	97,228
080881	7.00	1.06	1,217	114,411
080981	12.55	1.90	1,104	58,049 -90%a/
081081	10.35	1.57	447	28,478
081181	19.40	2.94	677	23,056
081281	12.05	1.83	440	24,092
081381	9.30	1.41	448	31,749
081481	12.15	1.84	375	20,364
081581				
081681>	8.35	1.27	606	47,782
081781	11.40	1.73	157	9,077
081881	11.80	1.79	126	7,039
081981	10.25	1.56	71	4,564
082081	12,80	1.94	328	16,896
082181	14.40	2.18	1,461	66,917
082281	13.05	1.98	263	13,289
082381	12.05	1.83	80	4,377
082481	15.40	2.33	69	2,956
082581	12.25	1.86	185	9,956
082681				
082781>	12.91	1.96	189	9,657
082881	13.60	2.06	43	2,085
082981				
083081>	14.19	2.16	230	10,394
083181	14.91	2.22	137	6,085
090181	16.65	2.48	84	3,341

APPENDIX TABLE B3 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
090281	17.46	2.60	346	13,124
090381	15.38	2.29	74	3,186
090481	17.21	2.37	126	4,849
090581				
090681>				
090781>	18.63	2.50	696	27,458
090881	18.34	2.73	58	2,125
090981	14.25	2.20	85	4,009
091081	15.05	2.24	128	5,714
091181	17.57	2.62	40	1,527
091281				
091381>	17.05	2.78	207	7,446
091481	22.58	3.41	86	2,522
091581	17.63	2.66	144	5,409
091681	24.43	3.69	77	2,087
091781	22.89	3.46	102	2,951
091881	21.22	3.20	96	2,996
091981				
092081>	20.21	2.60	361	13,875
092181	22.86	3.45	41	1,187
092281				
092381>	15.49	2.64	154	5,823
092481	15.43	2.33	17	730
092581	21.41	3.23	46	1,423
092681				
092781>				
092881>	23.40	2.99	332	11,104
		TOTALS	63,217	5,047,642

a/ Cumulative passage (% of total).

APPENDIX TABLE B4

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

COHO PASSAGE[a/] JOHN DAY DAM 1981

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE	
050781	7.25	3.05	11	361	
050881	6.40	2.69	103	3,832	
050981	10.00	4.20	287	6,833	-10%[b/]
051081	7.45	3.13	171	5,465	
051181	10.25	4.31	122	2,834	
051281	9.70	4.07	74	1,816	
051381	7.15	3.00	94	3,130	
051481	7.00	2.94	81	2,755	
051581	7.00	2.94	37	1,258	
051681	7.15	3.00	61	2,031	
051781	10.65	4.47	25	559	
051881	9.75	4.10	13	317	
051981	7.35	3.09	72	2,332	
052081	8.55	3.59	60	1,671	
052181	11.45	4.81	85	1,768	
052281	7.85	3.30	95	2,881	
052381	11.50	4.83	48	994	
052481	9.05	3.80	104	2,736	
052581	7.15	3.00	39	1,299	-50%[b/]
052681	9.95	4.18	49	1,172	
052781	5.60	2.35	39	1,658	
052881	5.60	2.35	103	4,383	
052981	4.30	1.81	50	2,768	
053081	4.30	1.81	60	3,315	
053181	4.60	1.93	27	1,398	
060181	4.15	1.74	99	5,680	
060281	3.80	1.60	48	3,008	
060381	3.85	1.62	53	3,278	
060481	3.80	1.60	63	3,938	
060581	4.20	1.76	42	2,381	
060681	3.90	1.64	34	2,076	
060781	3.80	1.60	27	1,688	
060881	3.85	1.62	14	864	
060981	3.95	1.66	28	1,688	-90%[b/]
061081	4.30	1.81	32	1,772	
061181	4.35	1.83	23	1,259	
061281	4.70	1.97	12	608	
061381					
061481>	4.25	1.79	19	1,064	
061581	3.65	1.53	2	130	

APPENDIX TABLE B4 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
061681	4.00	1.68	5	298
061781	4.40	1.85	5	271
061881	4.85	2.04	6	295
061981	4.55	1.91	6	314
062081				
062181>	3.80	1.60	17	1,065
062281	3.90	1.64	2	122
062381	4.00	1.68	3	179
062481	3.90	1.64	2	122
062581	4.30	1.81	4	221
062681	4.90	2.06	4	194
062781	4.90	2.06	2	97
062981	6.65	2.79	0	0
063081	7.15	3.00	2	67
		TOTALS	2,464	92,245

a/ Based on combined chinook and steelhead efficiency regression formula.

b/ Cumulative passage (% of total).

APPENDIX TABLE B5

DAILY SAMPLE CATCH AND PASSAGE ESTIMATE SUMMARIES

- JOHN DAY DAM -

SOCKEYE PASSAGE JOHN DAY DAM 1981

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE	
042181	12.05	1.83	2	109	
042281	11.45	1.74	1	57	
042381	10.70	1.62	2	123	
042481	10.15	1.52	0	0	
042581	8.80	1.34	1	75	
042681	9.45	1.43	3	210	
042781	11.00	1.67	0	0	
042881	9.10	1.38	0	0	
042981	8.20	1.25	0	0	
043081	7.25	1.10	0	0	
050181	8.35	1.27	0	0	
050281	8.05	1.22	5	410	
050381	8.00	1.22	5	410	
050481	8.30	1.26	6	476	
050581	7.80	1.18	1	85	
050681	7.35	1.12	7	625	
050781	7.25	1.10	30	2,727	
050881	6.40	0.97	31	3,196	
050981	10.00	1.52	90	5,921	
051081	7.45	1.13	63	5,575	
051181	10.25	1.56	75	4,808	
051281	9.70	1.47	34	2,313	
051381	7.15	1.09	51	4,679	
051481	7.00	1.06	120	11,321	
051581	7.00	1.06	388	36,604	-10%a/
051681	7.15	1.09	203	18,624	
051781	10.65	1.62	254	15,679	
051881	9.75	1.48	125	8,446	
051981	7.35	1.12	372	33,214	
052081	8.55	1.30	325	25,000	
052181	11.45	1.74	190	10,920	
052281	7.85	1.19	137	11,513	
052381	11.50	1.74	293	16,839	
052481	9.05	1.37	255	18,613	
052581	7.15	1.09	268	24,587	
052681	9.95	1.51	198	13,113	
052781	5.60	0.85	96	11,294	-50%a/
052881	5.60	0.85	162	19,059	
052981	4.30	0.66	119	18,030	
053081	4.30	0.66	69	10,455	

APPENDIX TABLE B5 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
053181	4.60	0.70	75	10,714
060181	4.15	0.63	133	21,111
060281	3.80	0.58	84	14,483
060381	3.85	0..59	148	25,085
060481	3.80	0.58	135	23,276
060581	4.20	0.64	100	15,625
060681	3.90	0.60	100	16,667
060781	3.80	0.58	64	11,034
060881	3.85	0.59	30	5,085
060981	3.95	0.60	58	9,667
061081	4.30	0.66	103	15,606
061181	4.35	0.66	41	6,212
061281	4.70	0.72	18	2,500
061381				
061481>	4.25	0.65	14	2,154
061581	3.65	0.56	1	179
061681	4.00	0.61	8	1,311
061781	4.40	0.67	12	1,791
061881	4.85	0.74	15	2,027
061981	4.55	0.69	10	1,449
062081				
062181>	3.80	0.58	16	2,759
062281	3.90	0.60	2	333
062381	4.00	0.61	10	1,639
062481	3.90	0.60	9	1,500
062581	4.30	0.66	11	1,667
062681	4.90	0.75	13	1,733
062781				
062881>	4.90	0.75	21	2,800
062981	6.65	1.01	1	99
063081	7.15	1.09	8	734
070181	6.60	1.00	5	500
070281	6.95	1.06	7	660
070381	6.40	0.97	9	928
070481	6.00	0.91	3	330
070581	5.50	0.84	4	476
070681	6.25	0.95	2	211
070781	5.30	0.81	5	617
070881	5.05	0.77	3	390
070981	6.00	0.91	3	330
071081	5.60	0.85	2	235
071181				
071281>	7.80	1.18	6	508
071381	8.50	1.29	14	1,085
071481	8.10	1.23	6	488
071581	6.85	1.04	4	385
071681	7.25	1.10	12	1,091

APPENDIX TABLE B5 - Continued

DATE	% FLOW UNIT 3	SAMPLING EFFICIENCY (%)	CATCH UNIT 3	ESTIMATED PASSAGE
071781	7.05	1.07	10	935 -90%[a]
071881				
071981>	10.15	1.54	11	714
072081	9.30	1.41	7	496
072181	8.30	1.26	13	1,032
072281	10.50	1.59	13	818
072381	9.30	1.41	5	355
072481	9.20	1.40	8	571
072581				
072681>	12.35	1.87	7	374
072781	12.35	1.87	7	374
072881	8.10	1.23	5	407
072981	8.50	1.29	2	155
073081	11.20	1.70	13	765
073181	7.30	1.11	6	541
080181	7.90	1.20	3	250
080281	9.15	1.39	4	288
080381	14.30	2.17	1	46
080481	12.05	1.83	7	383
080581	7.00	1.06	11	1,038
080681	8.40	1.28	3	234
080781	7.70	1.17	3	256
080881	7.00	1.06	3	283
080981	12.55	1.90	2	105
081081	10.35	1.57	5	318
081181	19.40	2.94	0	0
081281	12.05	1.83	0	0
081381	9.30	1.41	1	71
081481	12.15	1.84	0	0
081581				
081681>	8.35	1.27	0	0
		TOTALS	5,456	553,393

a/ Cumulative passage (% of total).

APPENDIX C

MARK RECAPTURE SUMMARY

- LOWER GRANITE DAM -

APPENDIX TABLE C1

BRAND RECAPTURE SUMMARY[a/]

- LOWER GRANITE DAM -

BRAND RECAPTURE SUMMARY LOWER GRANITE DAM 1981

LA P 1 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810424	8	118	397
810425	10	131	441
810427	18	318	1,071
810428	34	575	1,936
810429	31	503	1,694
810430	8	141	475
810501	9	98	330
810502	3	38	128
810504	1	19	64
TOTAL	112	1,941	6,536

LA P 2 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810504	4	78	263
810505	1	8	27
810521	2	17	57
TOTAL	7	103	347

LA P 3 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810511	4	52	175
810515	2	22	74
810516	7	57	192
810522	1	8	27
810523	1	10	34
TOTAL	15	149	502

APPENDIX TABLE C1 - Continued

LA P 4 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810516	1	8	27
810520	1	12	40
810522	5	41	138
810523	9	92	310
810525	9	159	535
810526	2	26	88
810527	1	15	51
810602	4	38	128
TOTAL	32	391	1,317

LA S 1 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810504	3	58	195
810505	1	8	27
TOTAL	4	66	222

LA S 2 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810511	1	13	44
810512	1	15	51
810518	4	47	158
810519	1	10	34
810522	1	8	27
810523	2	20	67
810603	1	8	27
TOTAL	28	121	408

LA Y 1 MARKED CHINOOK 1'S

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810527	3	46	155
810528	1	17	57
810530	1	11	37
810601	5	64	215
810602	6	58	195
810603	20	145	488
810604	1	12	40
810606	1	24	81
810607	2	8	27
TOTAL	40	385	1,295

APPENDIX TABLE C1 - Continued

LA P 1 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810425	2	26	45
810427	6	106	182
810428	13	220	377
810429	23	373	639
810430	12	211	362
810501	9	98	168
810502	9	116	199
810504	1	19	33
TOTAL	75	1,169	2,005

LA P 2 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810504	10	186	319
810505	6	47	81
810506	1	14	24
810507	10	78	134
810508	2	22	38
810511	4	52	89
810515	1	11	19
810518	1	12	21
810521	1	9	15
810528	1	17	29
TOTAL	37	448	769

LA P 3 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810508	6	67	115
810509	11	114	195
810511	40	520	891
810512	14	205	351
810513	22	383	656
810514	7	112	192
810515	7	77	132
810516	21	171	293
810518	22	257	440
810519	8	77	132
810520	5	58	99
810521	2	17	29
810522	7	58	99
810523	2	20	34
810528	2	34	58
810602	2	19	33
810606	1	29	41
TOTAL	179	2,218	3,790

APPENDIX TABLE C1 - Continued

LA P 4 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810515	8	88	151
810516	22	179	307
810518	66	772	1,323
810519	25	241	413
810520	21	243	416
810521	28	244	418
810522	44	364	624
810523	89	907	1,554
810525	63	1,115	1,911
810526	30	402	689
810527	7	106	182
810528	10	172	295
810529	6	173	296
810530	5	54	93
810601	5	64	110
810602	5	49	84
810604	1	12	21
810605	1	5	9
810606	2	48	82
810607	2	8	14
810613	1	26	45
810620	4	6	10
TOTAL	445	5,278	9,047

LA S 1 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810504	9	176	302
810505	9	69	118
810506	1	14	24
810507	2	16	27
810508	1	11	19
810509	1	10	17
810512	1	15	26
810514	1	16	27
810515	2	22	38
810520	1	12	21
TOTAL	28	361	619

APPENDIX TABLE C1 - Continued

LA S 2 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810508	13	145	248
810509	16	166	284
810511	35	455	780
810512	19	279	478
810513	21	366	627
810514	9	144	247
810515	20	221	379
810516	40	326	559
810518	29	339	581
810519	5	48	82
810520	4	46	79
810521	6	52	89
810522	8	66	113
810523	1	10	17
810525	2	35	60
810527	1	15	26
810528	3	52	89
810530	1	11	19
TOTAL	233	2,776	4,757

LA S 3 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810515	1	11	19
TOTAL	1	11	19

LA T 2 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810423	5	39	67
810424	6	88	151
810425	10	131	224
810427	53	937	1,606
810428	44	744	1,275
810429	47	762	1,306
810430	25	440	754
810501	37	401	687
810502	39	499	855
810504	142	2,783	4,769
810505	144	1,118	1,916
810506	70	952	1,631
810507	113	883	1,513
810508	79	881	1,510

APPENDIX TABLE C1 - Continued

LA T 2 MARKED STEELHEAD (Continued)

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810509	74	767	1,314
810511	111	1,444	2,474
810512	32	470	805
810513	15	261	447
810514	9	144	247
810515	13	143	245
810516	25	204	350
810518	14	164	281
810519	2	19	33
810520	2	23	39
810521	3	26	49
810522	7	58	99
810523	11	112	192
810525	31	549	941
810526	9	120	206
810527	3	46	79
810528	1	17	29
810529	3	79	135
810601	1	13	22
810602	2	19	33
810607	1	4	7
TOTAL	1,183	15,340	26,291

LA Y 1 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810525	7	124	212
810526	19	254	435
810527	5	76	130
810528	15	259	444
810529	20	521	893
810530	31	335	574
810601	57	738	1,265
810602	32	312	535
810603	11	80	137
810604	3	35	60
810605	5	26	45
810606	12	290	497
810607	2	8	14
810620	1	1	
TOTAL	220	3,059	5,241

APPENDIX TABLE C1 - Continued

LA Y 2 MARKED STEELHEAD

DATE	NUMBER	ADJ. NUMBER	TOTAL PASSAGE
810605	12	64	110
810606	36	872	1,494
810607	15	58	99
810610	2	126	216
810612	1	42	72
810615	1	80	137
TOTAL	67	1,242	2,128

a/ Adjusted for sample size and amount of spill. Adjusted number is number of brands recaptured, divided by percent of collected fish sampled on date shown. Total passage = adjusted number divided by sampling efficiency on date of recapture (see Appendix A for sampling efficiency by species by date).

APPENDIX D

MARK RECAPTURE SUMMARY

- JOHN DAY DAM, 1981 -

APPENDIX TABLE D1

BRAND RECAPTURE SUMMARY[a/]

- JOHN DAY DAM -

BRAND RECAPTURE SUMMARY JOHN DAY DAM 1981

LA 3X 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810821	1	46
810825	2	108
810902	1	72
810904	1	55
810908	3	283
810910	1	64
810920	1	52
TOTAL	10	680

LA 3X 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810825	1	54
810827	1	51
810828	1	49
810831	4	190
810904	2	78
810908	2	73
810910	1	45
810914	3	88
810915	1	38
810920	2	77
TOTAL	18	743

LA 3X 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810831	1	45
810908	2	189
810915	1	32
810923	1	55
810928	1	33
TOTAL	6	354

APPENDIX TABLE D1 - Continued

LA AR 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810920	1	52
TOTAL	1	52

LA AR 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810827	1	51
TOTAL	1	51

LD AR 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810908	1	37
810909	1	47
810920	1	38
TOTAL	3	122

LP AR 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810920	1	38
TOTAL	1	38

LA D 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810923	1	38
TOTAL	1	38

LA D 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810928	1	33
TOTAL	1	33

APPENDIX TABLE D1 - Continued

LA HE 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810706	5	526
810707	1	123
810708	1	130
810713	1	78
810722	1	63
TOTAL	9	920

LA ID 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810630	1	92
810701	3	300
810702	9	849
810703	5	515
810704	5	550
810706	1	105
810707	1	123
810708	2	260
810713	1	78
TOTAL	28	2,872

LA ID 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810625	1	152
810626	1	133
810630	1	92
810702	7	660
810703	2	206
810704	9	990
810706	8	842
810707	1	123
810708	1	130
810713	7	543
810714	2	163
810715	1	96
810728	1	81
810729	1	78
810808	1	94
TOTAL	44	4,383

APPENDIX TABLE D1 - Continued

LA ID 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810626	4	533
810630	3	275
810701	1	91
810702	3	283
810703	3	309
810704	3	330
810706	9	947
810714	1	81
810716	1	91
810717	3	280
810720	3	213
810730	1	59
810802	1	72
810810	1	64
TOTAL	34	3,628

LA ID 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810704	13	1,429
810706	8	842
810707	2	247
810708	1	130
810710	1	118
810713	1	78
810714	1	81
810715	4	385
810716	3	273
810720	1	71
810723	1	71
810729	1	78
810807	1	85
TOTAL	38	3,888

LA IM 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810714	2	163
810715	1	96
810717	2	187
810720	5	355
810721	1	79

APPENDIX TABLE D1 - Continued

LA IM 1 MARKED CHINOOK O'S (Continued)

810722	3	189
810724	2	143
810727	11	588
810728	10	813
810729	2	155
810730	2	118
810731	6	541
810801	4	333
810803	2	92
810804	4	219
810805	6	566
810807	2	171
810808	1	94
810811	1	34
810812	1	55
810813	1	71
810814	1	54
810817	1	58
810824	1	43
810902	1	38
810915	1	38
810920	1	38
810928	1	33
TOTAL	76	5,364

LA IM 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810727	7	374
810728	4	325
810729	4	310
810730	3	176
810731	2	180
810801	1	83
810803	1	46
810804	3	164
810805	6	566
810806	3	234
810807	5	427
810809	3	158
810812	1	55
810813	1	71
810814	1	54
810902	1	38
810928	2	67
TOTAL	48	3,328

APPENDIX TABLE D1 - Continued

LA IM 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810724	2	143
810727	3	160
810728	1	81
810729	1	78
810730	1	59
810731	3	270
810801	4	83
810802	2	144
810803	5	230
810804	3	164
810805	4	377
810806	2	156
810807	5	427
810808	2	189
810812	2	109
810813	2	142
810814	2	109
810817	3	173
810818	1	56
810821	4	183
810822	3	152
810824	1	43
810901	1	40
810908	4	147
810920	1	38
TOTAL	62	3,753

LA IM 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810731	1	90
810802	1	72
810803	1	46
810804	2	109
810805	8	755
810806	4	313
810807	8	648
810808	3	283
810809	2	105
810812	1	55
810813	2	142
810814	1	54
810817	4	231
810821	5	229
810822	2	102

APPENDIX TABLE D1 - Continued

LA IM 4 MARKED CHINOOK O'S (Continued)

810824	2	86
810831	2	90
810904	1	39
810908	4	147
810914	1	29
810915	1	38
810917	1	29
810918	1	31
TOTAL	58	3,723

LA SP 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810812	2	109
810814	1	54
TOTAL	3	163

LA SP 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810801	1	83
810808	1	94
810820	1	52
810909	1	47
TOTAL	4	236

LA SP 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810708	1	130
810713	1	78
810715	1	96
810716	1	91
810720	1	71
810728	1	81
810808	1	94
TOTAL	7	641

APPENDIX TABLE D1 - Continued

RA SP 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810716	3	273
810717	1	93
810722	1	63
810727	2	107
810728	1	81
810804	1	55
TOTAL	9	672

RA SP 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810717	1	93
810720	2	142
810722	1	63
810730	1	59
810805	1	94
810806	1	78
TOTAL	7	529

RA SP 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810721	1	79
810722	5	314
810723	1	71
810724	2	143
810727	4	214
810728	2	163
810804	1	55
810805	2	189
810808	1	94
810812	1	55
TOTAL	20	1,377

RA SP 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810723	1	71
810724	2	143
810727	1	53
810728	2	163

APPENDIX TABLE D1 - Continued

RA SP 4 MARKED CHINOOK O'S (Continued)

810729	2	155
810805	1	94
810807	2	171
810821	1	46
810920	1	47
TOTAL	13	943

RD SP 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810727	1	53
TOTAL	1	53

RD SP 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810728	1	81
810730	2	118
810731	1	91
810804	1	55
810808	2	189
810809	2	105
810810	1	64
810811	2	68
810814	1	54
810821	1	46
810824	1	43
810827	1	51
810831	1	45
810904	1	39
TOTAL	19	1,049

RD SP 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810730	4	235
810731	1	90
810801	1	83
810805	1	94
810807	2	171
810808	1	94
810813	1	71
810819	1	64
810821	1	46
TOTAL	13	948

APPENDIX TABLE D1 - Continued

RD SP 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810730	1	59
810804	2	109
810806	1	78
810807	2	171
810809	2	105
810820	1	52
TOTAL	9	574

LA UP 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810808	2	189
810809	3	158
810810	1	64
810813	2	142
810818	1	56
810821	1	46
810908	1	37
TOTAL	11	692

LA UP 3 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810821	2	92
810822	2	101
810824	1	43
810825	2	108
810827	1	51
810904	1	39
810908	1	37
810920	1	38
TOTAL	11	509

LA UP 4 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810821	3	138
810831	1	45
810902	1	38
810908	2	73
810916	1	27
810920	1	38
TOTAL	9	432

APPENDIX TABLE D1 - Continued

LD WV 1 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810817	1	58
TOTAL	1	58

LD WV 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810821	1	46
TOTAL	1	46

LA X 2 MARKED CHINOOK O'S

DATE	NUMBER	TOTAL PASSAGE
810708	1	130
TOTAL	1	130

APPENDIX TABLE D1 - Continued

LA IU 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810512	1	68
810513	1	92
810514	5	472
810515	6	417
810516	5	459
810517	2	123
810519	1	89
810520	2	154
810521	1	57
810522	1	84
TOTAL	25	2,015

LA K 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810531	1	143
810601	1	159
810603	1	169
810604	1	172
TOTAL	4	643

LA K 2 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810604	3	517
TOTAL	3	517

LA K 3 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810607	2	345
TOTAL	2	345

APPENDIX TABLE D1 - Continued

LA P 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810508	1	103
810509	1	66
810510	1	88
810511	5	321
810514	1	94
TOTAL	9	672

LA P 2 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810514	1	94
810515	1	69
TOTAL	2	163

LA P 4 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810601	1	159
810602	1	172
TOTAL	2	331

LA R 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810519	8	714
810520	3	231
810521	2	115
810522	1	84
810601	1	159
810603	1	169
TOTAL	16	1,472

APPENDIX TABLE D1 - Continued

LA R 2 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810519	1	89
810520	5	385
810521	5	287
TOTAL	11	761

LA R 3 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810523	4	230
810524	2	146
810525	1	92
910527	1	118
810528	1	118
TOTAL	9	704

LA R 4 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810524	1	73
810527	1	118
810528	2	235
TOTAL	4	426

LA W 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810504	5	397
810506	2	179
810508	1	103
810511	2	128
TOTAL	10	807

APPENDIX TABLE D1 - Continued

LA W 2 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810507	1	91
810508	6	619
810509	4	263
810511	9	577
810512	1	68
810513	1	92
TOTAL	22	1,710

LA W 3 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810511	2	128
810512	3	204
810513	1	92
810514	7	660
810515	1	69
810516	1	92
TOTAL	15	1,245

LA W 4 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810514	1	94
810515	6	417
810516	4	367
810517	2	123
810518	1	68
TOTAL	14	1,069

LA V 1 MARKED CHINOOK 1'S

DATE	NUMBER	TOTAL PASSAGE
810611	2	303
TOTAL	2	303

APPENDIX TABLE D1 - Continued

LA IC 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810514	1	21
TOTAL	1	21

LA IF 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810529	14	468
810530	7	237
810601	1	35
810605	2	69
TOTAL	24	809

LA IU 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810529	1	33
810531	8	252
810601	31	1,092
810602	12	455
810603	9	341
810604	6	227
810605	6	206
TOTAL	73	2,606

LA K 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810531	7	220
810601	9	317
810602	2	76
810603	1	38
810605	1	34
TOTAL	20	685

APPENDIX TABLE D1 - Continued

LA K 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810604	14	530
810605	1	34
810606	1	37
810607	2	76
TOTAL	18	677

LA K 3 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810607	7	266
TOTAL	7	266

LA P 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810518	1	15
TOTAL	1	15

LA P 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810514	1	21
810528	1	26
TOTAL	2	47

LA P 3 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810528	1	26
810530	1	34
TOTAL	2	60

APPENDIX TABLE D1 - Continued

LA P 4 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810601	1	35
TOTAL	1	35

RA P 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810508	1	23
TOTAL	1	23

LA R 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810518	7	104
810519	4	78
810521	1	13
810528	1	26
810603	1	38
TOTAL	14	259

LA R 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810518	1	15
810519	12	235
810520	8	135
810521	2	25
810522	1	18
810524	1	16
810525	5	101
TOTAL	30	545

APPENDIX TABLE D1 - Continued

LA R 3 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810522	10	184
810523	1	13
810524	2	32
TOTAL	13	229

LA R 4 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810527	1	26
810528	1	26
810529	3	100
TOTAL	5	152

LA S 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810517	1	14
810518	1	15
TOTAL	2	29

LA S 2 MARKED STEELEHAD

DATE	NUMBER	TOTAL PASSAGE
810539	1	34
810603	1	38
810609	1	37
TOTAL	3	109

LA T 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810507	1	20
810508	3	68
810509	1	14

APPENDIX TABLE D1 - Continued

LA T 2 MARKED STEELHEAD (Continued)

810510	1	18
810511	2	28
810512	1	15
810513	2	41
810514	5	104
810515	1	15
810516	7	149
810517	2	27
810519	4	78
810520	2	34
810521	3	38
810528	3	78
810530	1	34
810531	1	31
810601	1	35
810603	2	76
810604	1	38
810611	1	33
TOTAL	45	974

LA W 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810504	5	87
810505	1	19
810506	4	78
810507	1	20
810510	1	18
810511	4	56
TOTAL	16	278

LA W 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810508	5	113
810509	1	14
810511	7	98
810513	1	20
TOTAL	14	245

APPENDIX TABLE D1 - Continued

LA W 3 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810511	8	113
810512	5	75
810513	5	102
810515	4	61
810516	6	128
810518	1	15
810524	1	16
TOTAL	30	510

LA W 4 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810515	16	244
810516	15	320
810517	3	41
TOTAL	34	605

LA Y 1 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810603	1	38
810605	1	34
810606	1	37
810608	1	37
TOTAL	4	146

LA Y 2 MARKED STEELHEAD

DATE	NUMBER	TOTAL PASSAGE
810611	2	67
810612	4	123
810615	14	553
TOTAL	20	743

APPENDIX TABLE D1 - Continued

LA IN 1 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810606	1	37
810607	1	38
810610	2	67
810615	1	40
TOTAL	5	182

LA IN 2 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810610	1	34
810630	1	20
TOTAL	2	54

RA IN 1 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810601	1	35
810603	1	38
810604	1	38
TOTAL	3	111

RA IN 3 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810608	1	37
TOTAL	1	37

RA IN 4 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810531	1	31

APPENDIX TABLE D1 - Continued

RA IN 4 MARKED COHO (Continued)

810605	1	34
810609	1	37
810610	3	101
810612	1	31
TOTAL	7	234

LA IY 1 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810609	1	37
810610	1	34
810611	2	67
TOTAL	4	138

LA IY 2 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810604	1	38
810605	1	34
810606	1	37
810607	3	114
810609	1	37
810610	3	101
810611	4	134
910615	1	40
TOTAL	15	535

LA IY 3 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810604	1	38
810606	2	74
810607	2	76
810608	1	37
810609	2	74
810610	2	67
810611	2	67
810617	1	33
TOTAL	13	466

APPENDIX TABLE D1 - Continued

RA IY 1 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810602	1	38
810604	3	114
810609	1	37
810611	1	33
TOTAL	6	222

RA IY 2 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810602	1	38
810603	2	76
810604	7	265
810605	1	34
810607	1	38
810609	1	37
810610	1	34
TOTAL	14	522

RA IY 3 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810604	6	227
810605	1	34
810607	1	38
810609	2	74
810610	1	34
TOTAL	11	407

LA K 1 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810531	1	31
810601	2	70
TOTAL	3	101

APPENDIX TABLE D1 - Continued

LA K 2 MARKED COHO

DATE	NUMBER	TOTAL PASSAGE
810604	4	152
TOTAL	4	152

LA IF 1 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810531	2	286
TOTAL	2	286

LA K 1 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810601	1	159
TOTAL	1	159

LA K 2 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810609	1	167
810703	1	109
TOTAL	2	276

LA K 3 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810607	1	172
810608	1	169
TOTAL	2	341

LA R 3 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810524	1	73
810525	1	92
810526	1	66
810531	1	143

APPENDIX TABLE D1 - Continued

LA R 3 MARKED SOCKEYE (Continued)

810602	1	172
TOTAL	5	546

LA AR 4 MARKED SOCKEYE

DATE	NUMBER	TOTAL PASSAGE
810526	2	132
810529	1	152
810531	1	143
810602	1	172
810605	1	156
TOTAL	6	755

a/ Passage equals number of brands recaptured divided by sampling efficiency on date of recapture (see Appendix B for sampling efficiency by species by date).

APPENDIX E

MARK RELEASE SUMMARY, 1981

Report Date 82/01/21
Last Revision Date :82/01/21

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
LM						5	79	MCKENZIE HAT	MCKENZIE ABV LEABURG	493	810226	810226	50819	145	13	0
MCKENZIE R MORTALITY TESTS																
LMLV						6	80	S SANTIAM HAT	M FK WILLAM@DEXTER	491	810413	810416	25000			
LV						6	80	RND BUTTE HAT	DESCHUTES@RM 100	489	810420	810420	26813		4	0
PRODUCTION																
LV					RED PIG	6	80	S SANTIAM HAT	M FK WILLAM@DEXTER	491	810427	810429	40000			
LVRM						6	80	S SANTIAM HAT	M FK WILLAM@DEXTER	491	810413	810416	25000			
LVRP						6	80	RND BUTTE HAT	DESCHUTES@RM 64	433	810427	810427	25897		4	0
PRODUCTION																
LVRV						6	80	RND BUTTE HAT	DESCHUTES@RM 100	489	810428	810428	27516		4	0
PRODUCTION																
LVRV RM						6	80	RND BUTTE HAT	DESCHUTES@RM 100	489	810429	810429	25263		4	0
PRODUCTION																
RM						5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	810226	810226	50223	143	13	0
MCKENZIE R MORTALITY TESTS																
RMRV						6	80	S SANTIAM HAT	M FK WILLAM@DEXTER	491	810413	810416	25000			
RV						9	79	KALAMA FALLS HAT	KALAMA R@RM 15	141	810331	810331	457800			
STOCK ID ONLY																
RV						6	80	RND BUTTE HAT	DESCHUTES@RM 100	489	810421	810421	25403		5	0
PRODUCTION																
RV					RED PIG	6	80	S SANTIAM HAT	M FK WILLAM@DEXTER	491	810427	810429	40000			
RVLP						6	80	RND BUTTE HAT	DESCHUTES@RM 43	395	810422	810422	25615		5	0
PRODUCTION																
TC						5		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810503	143	145		
MIGRATION RATE																

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
					TC MIGRATION RATE	4		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810503	452	147		
					TC MIGRATION RATE	6		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810503	414	204		
*	LA	3X	1			9		MCNARY D	MCNARY TAIL (031730)	469	810817	810817	2547			
*	LA	3X	2			9		MCNARY D	MCNARY TAIL (031730)	469	810820	810820	2536			
*	LA	3X	3			9		MCNARY D	MCNARY TAIL (031730)	469	810826	810826	1577			
	LA	AR	1		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 233	375	810818	810818	472			
	LA	AR	2		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 223	359	810819	810819	206			
	LD	AR	1		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 253	407	810826	810826	512			
	LD	AR	2		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 241	388	810827	810827	623			
	LP	AR	1		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 234	376	810902	810902	246			
	LP	AR	2		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 223	359	810903	810903	795			
	LA	D	1		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 267	430	810910	810910	522			
	LA	D	2		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 241	388	810911	810911	596			
	LA	D	3		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 233	375	810915	810915	268			
	LA	D	4		AD BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 223	359	810916	810916	64			

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
				PURPOSE OF RELEASE												
	LD	D	1			9		COLUMBIA RIVER	JOHN DAY RES@RM 267	430	810923	810923	327			
				BPA STUDIES												
	LD	D	2			9		COLUMBIA RIVER	JOHN DAY RES@RM 255	410	810924	810924	213			
				BPA STUDIES												
	LD	D	3			9		COLUMBIA RIVER	JOHN DAY RES@RM 242	389	810925	810925	212			
				BPA STUDIES												
	LD	D	4			9		COLUMBIA RIVER	JOHN DAY RES@RM 233	375	810929	810929	217			
				BPA STUDIES												
	LP	D	1			9		COLUMBIA RIVER	JOHN DAY RES@RM 233	375	811015	811015	135			
				BPA STUDIES												
	LP	D	2			9		COLUMBIA RIVER	JOHN DAY RES@RM 267	430	811021	811021	301			
				BPA STUDIES												
	LP	D	3			9		COLUMBIA RIVER	JOHN DAY RES@RM 241	388	811022	811022	297			
				BPA STUDIES												
	LP	D	4			9		COLUMBIA RIVER	JOHN DAY RES@RM 233	375	811027	811027	176			
				BPA STUDIES												
	RA	D	1			9		COLUMBIA RIVER	JOHN DAY RES@RM 218	350	811028	811028	89			
				BPA STUDIES												
	LA	HE	1			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810703	810703	1313			
				INDEXING EFFICIENCY												
	RA	HE	1			9		COLUMBIA RIVER	JOHN DAY D	347	810623	810623	89			
				BYPASS STUDIES												
	RD	HE	1			9		COLUMBIA RIVER	JOHN DAY D	347	810701	810701	41			
				BYPASS STUDIES												
	RD	HE	1			5		COLUMBIA RIVER	JOHN DAY D	347	810701	810701	11			
				BYPASS STUDIES												
	RA	I+	1			9		MCNARY D	BLW BONN D	230	810709	810714	10096			
*				TRUCK TRANSPORT					(031733)							
	RA	I+	2			9		MCNARY D	BLW BONN D	230	810720	810723	10018			
*				TRUCK TRANSPORT					(031733)							

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	RA	I+	3			9		MCNARY D	BLW BONN D (031733)	230	810715	810718	10142			
*					TRUCK TRANSPORT											
	RA	I+	4			9		MCNARY D	BLW BONN D (031733)	230	810727	810731	12668			
*					TRUCK TRANSPORT											
	LA	ID	1			9		MCNARY D	MCNARY TAIL (031731)	469	810615	810615	3325			
*																
	LA	ID	2			9		MCNARY D	MCNARY TAIL (031731)	469	810618	810618	4654			
*																
	LA	ID	3			9		MCNARY D	MCNARY TAIL (031731)	469	810624	810624	3458			
*																
	LA	ID	4			9		MCNARY D	MCNARY TAIL (031731)	469	810629	810629	6286			
*																
	LA	IF	1			6		MCNARY D	MCNARY TAIL	469	810526	810526	2503			
	LA	IF	1			5		MCNARY D	MCNARY TAIL	469	810526	810526	1206			
	LA	IF	1			1		MCNARY D	MCNARY TAIL	469	810526	810526	606			
	LA	IM	1			9		MCNARY D	MCNARY TAIL (031732)	469	810710	810710	10115			
*					CONTROL											
	LA	IM	2			9		MCNARY D	MCNARY TAIL (031732)	469	810722	810722	10012			
*					CONTROL											
	LA	IM	3			9		MCNARY D	MCNARY TAIL (031732)	469	810716	810716	10143			
*					CONTROL											
	LA	IM	4			9		MCNARY D	MCNARY TAIL (031732)	469	810729	810729	12310			
*					CONTROL											
	LA	IN	1			4	79	TURTLE ROCK PD	ROCK ISLAND D GATEWELL REL	725	810529	810529	1108			
					BYPASS STUDIES											
	LA	IN	2			4	79	TURTLE ROCK PD	ROCK ISLAND D GATEWELL REL	725	810601	810601	1000			
					BYPASS STUDIES											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	LA	IN	3		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810601	810601	1000			
				BYPASS STUDIES												
	LA	IN	4		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810601	810601	1000			
				BYPASS STUDIES												
	RA	IN	1		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810516	810516	1024			
				BYPASS STUDIES												
	RA	IN	2		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810516	810516	1017			
				BYPASS STUDIES												
	RA	IN	3		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810526	810526	1048			
				BYPASS STUDIES												
	RA	IN	4		4	79	TURTLE ROCK PD		ROCK ISLAND D GATEWELL REL	725	810527	810527	1020			
				BYPASS STUDIES												
	LA	IT	1		9		COLUMBIA RIVER		JONES BEACH SHORE	75	810416	810418	232	78		
				MIGRATION RATE												
	LA	IT	1		5		COLUMBIA RIVER		JONES BEACH SHORE	75	810416	810418	506	143		
				MIGRATION RATE												
	LA	IT	1		4		COLUMBIA RIVER		JONES BEACH SHORE	75	810416	810418	111	144		
				MIGRATION RATE												
	LA	IT	1		6		COLUMBIA RIVER		JONES BEACH SHORE	75	810416	810418	37	199		
				MIGRATION RATE												
	LA	IT	2		9		COLUMBIA RIVER		JONES BEACH MID R	75	810505	810505	420	82		
				MIGRATION RATE												
	LA	IT	2		5		COLUMBIA RIVER		JONES BEACH MID R	75	810505	810505	233	148		
				MIGRATION RATE												
	LA	IT	2		4		COLUMBIA RIVER		JONES BEACH MID R	75	810505	810505	770	142		
				MIGRATION RATE												
	LA	IT	2		6		COLUMBIA RIVER		JONES BEACH MID R	75	810505	810505	125	198		
				MIGRATION RATE												
	LA	IT	3		9		COLUMBIA RIVER		JONES BEACH SHORE	75	810526	810526	198	64		
				MIGRATION RATE												

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
	LA	IT	3			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	166	123		
					MIGRATION RATE											
	LA	IT	3			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	472	134		
					MIGRATION RATE											
	LA	IT	3			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	334	230		
					MIGRATION RATE											
	LA	IT	3			1		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	167	122		
					MIGRATION RATE											
	LD	IT	1			9		COLUMBIA RIVER	JONES BEACH MID R	75	810421	810421	551	80		
					MIGRATION RATE											
	LD	IT	1			5		COLUMBIA RIVER	JONES BEACH MID R	75	810421	810421	244	160		
					MIGRATION RATE											
	LD	IT	1			4		COLUMBIA RIVER	JONES BEACH MID R	75	810421	810421	115	141		
					MIGRATION RATE											
	LD	IT	1			6		COLUMBIA RIVER	JONES BEACH MID R	75	810421	810421	18	204		
					MIGRATION RATE											
	LD	IT	2			9		COLUMBIA RIVER	JONES BEACH MID R	75	810507	810507	485	76		
					MIGRATION RATE											
	LD	IT	2			5		COLUMBIA RIVER	JONES BEACH MID R	75	810507	810507	469	139		
					MIGRATION RATE											
	LD	IT	2			4		COLUMBIA RIVER	JONES BEACH MID R	75	810507	810507	1437	138		
					MIGRATION RATE											
	LD	IT	2			6		COLUMBIA RIVER	JONES BEACH MID R	75	810507	810507	239	136		
					MIGRATION RATE											
	LD	IT	3			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810710	810710	517	76		
					MIG TIMING THRU ESTUARY											
	LD	IT	3			9		COLUMBIA RIVER	JONES BEACH MID R	75	810710	810710	53	102		
					MIG TIMING THRU ESTUARY											
	LD	IT	3			4		COLUMBIA RIVER	JONES BEACH MID R	75	810710	810710	25	142		
					MIG TIMING THRU ESTUARY											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
	LP	IT	1			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810423	810423	1		80	
					MIGRATION RATE											
	LP	IT	1			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810423	810423	66		158	
					MIGRATION RATE											
	LP	IT	1			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810423	810423	87		146	
					MIGRATION RATE											
	LP	IT	1			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810423	810423	10		201	
					MIGRATION RATE											
	LP	IT	2			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810519	810519	3		139	
					MIGRATION RATE											
	LP	IT	2			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810519	810519	11		143	
					MIGRATION RATE											
	RA	IT	1			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810402	810402	370		74	
					MIGRATION RATE											
	RA	IT	1			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810402	810402	139		180	
					MIGRATION RATE											
	RA	IT	1			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810402	810402	11		132	
					MIGRATION RATE											
	RA	IT	1			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810402	810402	2		268	
					MIGRATION RATE											
	RA	IT	2			9		COLUMBIA RIVER	JONES BEACH MID R	75	810425	810425	542		81	
					MIGRATION RATE											
	RA	IT	2			5		COLUMBIA RIVER	JONES BEACH MID R	75	810425	810425	113		158	
					MIGRATION RATE											
	RA	IT	2			4		COLUMBIA RIVER	JONES BEACH MID R	75	810425	810425	293		146	
					MIGRATION RATE											
	RA	IT	2			6		COLUMBIA RIVER	JONES BEACH MID R	75	810425	810425	57		201	
					MIGRATION RATE											
	RA	IT	3			4		COLUMBIA RIVER	JONES BEACH MID R	75	810521	810521	682		141	
					MIGRATION RATE											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
	RA	IT	3			6		COLUMBIA RIVER	JONES BEACH MID R	75	810521	810521	279	203		
					MIGRATION RATE											
	RA	IT	3			1		COLUMBIA RIVER	JONES BEACH MID R	75	810521	810521	35	115		
					MIGRATION RATE											
	RA	IT	3			9		COLUMBIA RIVER	JONES BEACH MID R	75	810521	810521	910	78		
					MIGRATION RATE											
	RA	IT	3			5		COLUMBIA RIVER	JONES BEACH MID R	75	810521	810521	119	142		
					MIGRATION RATE											
	RD	IT	1			9		COLUMBIA RIVER	JONES BEACH MID R	75	810406	810406	324	72		
					MIGRATION RATE											
	RD	IT	1			5		COLUMBIA RIVER	JONES BEACH MID R	75	810406	810406	362	170		
					MIGRATION RATE											
	RD	IT	1			4		COLUMBIA RIVER	JONES BEACH MID R	75	810406	810406	23	142		
					MIGRATION RATE											
	RD	IT	1			6		COLUMBIA RIVER	JONES BEACH MID R	75	810406	810406	2	255		
					MIGRATION RATE											
	RD	IT	2			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810430	810430	2224	83		
					MIGRATION RATE											
	RD	IT	2			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810430	810430	183	139		
					MIGRATION RATE											
	RD	IT	2			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810430	810430	478	145		
					MIGRATION RATE											
	RD	IT	2			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810430	810430	24	195		
					MIGRATION RATE											
	RD	IT	3			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810523	810523	451	74		
					MIGRATION RATE											
	RD	IT	3			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810523	810523	34	142		
					MIGRATION RATE											
	RD	IT	3			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810523	810523	543	141		
					MIGRATION RATE											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
	RD	IT	3			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810523	810523	277	203		
					MIGRATION RATE											
	RD	IT	3			1		COLUMBIA RIVER	JONES BEACH SHORE	75	810523	810523	28	115		
					MIGRATION RATE											
	RP	IT	1			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810414	810414	156	178		
					MIGRATION RATE											
	RP	IT	1			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810414	810414	27	135		
					MIGRATION RATE											
	RP	IT	1			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810414	810414	2	220		
					MIGRATION RATE											
	RP	IT	2			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810502	311	145		
					MIGRATION RATE											
	RP	IT	2			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810502	456	146		
					MIGRATION RATE											
	RP	IT	2			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810502	121	206		
					MIGRATION RATE											
	RP	IT	2			9		COLUMBIA RIVER	JONES BEACH SHORE	75	810502	810503	1534	82		
					MIGRATION RATE											
	RP	IT	3			5		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	77	132		
					MIGRATION RATE											
	RP	IT	3			4		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	560	136		
					MIGRATION RATE											
	RP	IT	3			6		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	212	199		
					MIGRATION RATE											
	RP	IT	3			1		COLUMBIA RIVER	JONES BEACH SHORE	75	810526	810526	94	127		
					MIGRATION RATE											
	LA	IU	1			5		LO GRANITE D	LIT GOOSE TAIL	633	810504	810504	5346			
	LA	IU	1			6		LO GRANITE D	LIT GOOSE TAIL	633	810525	810525	6096			
					TAILRACE CONTROL											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
	LA	IY	1			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810527	810527	5020			
					BYPASS STUDIES				FOREBAY REL							
	LA	IY	2			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810528	810528	4989			
					BYPASS STUDIES				FOREBAY REL							
	LA	IY	3			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810529	810529	4974			
					BYPASS STUDIES				FOREBAY REL							
	RA	IY	1			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810524	810524	5000			
					BYPASS STUDIES				FOREBAY REL							
	RA	IY	2			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810525	810525	4993			
					BYPASS STUDIES				FOREBAY REL							
	RA	IY	3			4	79	TURTLE ROCK PD	ROCK ISLAND D	725	810526	810526	4995			
					BYPASS STUDIES				FOREBAY REL							
	LA	K	1			6		MCNARY D	MCNARY TAIL	469	810528	810528	2150			
	LA	K	1			5		MCNARY D	MCNARY TAIL	469	810528	810528	1290			
	LA	K	1			1		MCNARY D	MCNARY TAIL	469	810528	810528	993			
	LA	K	1			4		MCNARY D	MCNARY TAIL	469	810528	810528	889			
	LA	K	2			1		MCNARY D	MCNARY TAIL	469	810601	810601	445			
	LA	K	2			6		MCNARY D	MCNARY TAIL	469	810601	810601	1294			
	LA	K	2			5		MCNARY D	MCNARY TAIL	469	810601	810601	590			
	LA	K	2			4		MCNARY D	MCNARY TAIL	469	810601	810601	361			
	LA	K	3			6		MCNARY D	MCNARY TAIL	469	810604	810604	867			

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP OTHER MARK PURPOSE OF RELEASE	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	LA	K	3		5		MCNARY D	MCNARY TAIL	469	810604	810604	466			
	LA	K	3		4		MCNARY D	MCNARY TAIL	469	810604	810604	165			
	LA	K	3		1		MCNARY D	MCNARY TAIL	469	810604	810604	351			
	LA	O	1	BPA STUDIES	9		COLUMBIA RIVER	JOHN DAY RES@RM 218	350	810626	810626	177			
	LA	P	1	TC EFFICIENCY	6		LO GRANITE D	GRANITE ROCK BARGE 13 KM ABV DAM	706	810422	810427	1554			
	LA	P	1	TC EFFICIENCY	5		LO GRANITE D	GRANITE ROCK BARGE 13 KM ABV DAM	706	810422	810427	8069			
	LA	P	2	TC EFFICIENCY;TRUCK	6		LO GRANITE D	CLARKSTON WASH	742	810501	810501	1723			
	LA	P	2	TC EFFICIENCY;TRUCK	5		LO GRANITE D	CLARKSTON WASH	742	810501	810501	574			
	LA	P	3	TC EFFICIENCY;TRUCK	6		LO GRANITE D	CLARKSTON WASH	742	810505	810509	5537			
	LA	P	3	TC EFFICIENCY;TRUCK	5		LO GRANITE D	CLARKSTON WASH	742	810505	810509	668			
	LA	P	4	FOREBAY INDEXING	5		LO GRANITE D	CLARKSTON WASH	742	810511	810521	1682			
	LA	P	4	FOREBAY INDEXING	6		LO GRANITE D	CLARKSTON WASH	742	810511	810521	11192			
	LA	R	1		6		MCNARY D	MCNARY TAIL	469	810514	810514	1221			
	LA	R	1		5		MCNARY D	MCNARY TAIL	469	810514	810514	1227			
	LA	R	2		6		MCNARY D	MCNARY TAIL	469	810515	810515	1610			

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	LA	R	2			5		MCNARY D	MCNARY TAIL	469	810515	810515	1960			
	LA	R	3			6		MCNARY D	MCNARY TAIL	469	810518	810518	1081			
	LA	R	3			1		MCNARY D	MCNARY TAIL	469	810518	810518	786			
	LA	R	3			5		MCNARY D	MCNARY TAIL	469	810518	810518	2086			
	LA	R	4			1		MCNARY D	MCNARY TAIL	469	810521	810521	1975			
	LA	R	4			6		MCNARY D	MCNARY TAIL	469	810521	810521	1125			
	LA	R	4			5		MCNARY D	MCNARY TAIL	469	810521	810521	2034			
	LA	S	1			5		LO GRANITE D	CLARKSTON WASH	742	810501	810501	711			
					EFFICIENCY;TRUCK											
	LA	S	1			6		LO GRANITE D	CLARKSTON WASH	742	810501	810501	2200			
					EFFICIENCY;TRUCK											
	LA	S	2			5		LO GRANITE D	CLARKSTON WASH	742	810505	810509	660			
					EFFICIENCY;TRUCK											
	LA	S	2			6		LO GRANITE D	CLARKSTON WASH	742	810505	810509	6810			
					EFFICIENCY;TRUCK											
	LA	SP	1			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810706	810706	721			
					INDEXING EFFICIENCY											
	LA	SP	2			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810730	810730	716			
					INDEXING EFFICIENCY											
	LA	SP	3			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810808	810808	895			
					INDEXING EFFICIENCY											
	LD	SP	1			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810908	810908	503			
					INDEXING EFFICIENCY											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE / REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	LD	SP	3			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810817	810717	475			
				INDEXING EFFICIENCY												
	RA	SP	1			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810713	810713	1204			
				INDEXING EFFICIENCY												
	RA	SP	2			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810714	810714	548			
				INDEXING EFFICIENCY												
	RA	SP	3			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810720	810720	2168			
				INDEXING EFFICIENCY												
	RA	SP	4			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810721	810721	929			
				INDEXING EFFICIENCY												
	RD	SP	1			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810722	810722	613			
				INDEXING EFFICIENCY												
	RD	SP	2			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810727	810727	2370			
				INDEXING EFFICIENCY												
	RD	SP	3			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810728	810728	1424			
				INDEXING EFFICIENCY												
	RD	SP	4			9	80	COLUMBIA RIVER	BLALOCK MID R	375	810729	810729	952			
				INDEXING EFFICIENCY												
	LD	U	1			9		BONNEVILLE HAT	PRESCOTT ORE	115	810516	810520	24966	85	69	
				SURVIVAL AND EFFICIENCY					(5/16/81,12483-5/20/81,12483)							
	LD	U	2			9		LIT WH SAL HAT	PRESCOTT ORE	115	810612	810615	25436	78	125	
				SURVIVAL AND EFFICIENCY					(6/12/81,12718-6/15/81,12718)							
	LD	U	3			9		WASHOUGAL HAT	PRESCOTT ORE	115	810705	810709	25094	83	71	
				SURVIVAL AND EFFICIENCY					(810705,12547-810709,12547)							
	RD	U	1			9		SPRING CR HAT	PRESCOTT ORE	115	810424	810427	24684	83	75	
				SURVIVAL AND EFFICIENCY					(810424,12342-810427,12342)							
	RD	U	2			9		BONNEVILLE HAT	PRESCOTT ORE	115	810501	810504	25241	80	82	
				SURVIVAL AND EFFICIENCY					(810501,12620-810504,12621)							
	RD	U	3			9		SPRING CR HAT	PRESCOTT ORE	115	810508	810511	25508	85	65	
				SURVIVAL AND EFFICIENCY					(810508,12754-810511,12754)							

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
				PURPOSE OF RELEASE												
*	LA	UP	1			9		MCNARY D	MCNARY TAIL (031730)	469	810803	810803	2512			
*	LA	UP	2			9		MCNARY D	MCNARY TAIL (031730)	469	810806	810806	2399			
*	LA	UP	3			9		MCNARY D	MCNARY TAIL (031730)	469	810810	810810	2663			
*	LA	UP	4			9		MCNARY D	MCNARY TAIL (031730)	469	810813	810813	2545			
	LA	W	1			6		MCNARY D	MCNARY TAIL	469	810430	810430	930			
	LA	W	1			5		MCNARY D	MCNARY TAIL	469	810430	810430	2471			
	LA	W	2			6		MCNARY D	MCNARY TAIL	469	810504	810504	993			
	LA	W	2			5		MCNARY D	MCNARY TAIL	469	810504	810504	2531			
	LA	W	3			6		MCNARY D	MCNARY TAIL	469	810507	810507	970			
	LA	W	3			5		MCNARY D	MCNARY TAIL	469	810507	810507	2523			
	LA	W	4			6		MCNARY D	MCNARY TAIL	469	810511	810511	542			
	LA	W	4			5		MCNARY D	MCNARY TAIL	469	810511	810511	1107			
	LA	WV	1	AD BPA STUDIES		9		COLUMBIA RIVER	JOHN DAY RES@RM 268	431	810708	810708	157			
	LA	WV	2	AD BPA STUDIES		9		COLUMBIA RIVER	JOHN DAY RES@RM 232	373	810714	810714	264			
	LA	WV	3	AD BPA STUDIES		9		COLUMBIA RIVER	JOHN DAY RES@RM 224	360	810715	810715	117			

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
	LA	WV	4		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 218	350	810716	810716	654			
					BPA STUDIES											
	LD	WV	1		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 223	359	810723	810723	366			
					BPA STUDIES											
	LD	WV	2		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 218	350	810724	810724	570			
					BPA STUDIES											
	LD	WV	3		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 240	386	810730	810730	328			
					BPA STUDIES											
	LD	WV	4		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 218	350	810731	810731	614			
					BPA STUDIES											
	LP	WV	1		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 232	373	810804	810804	1110			
					BPA STUDIES											
	LP	WV	2		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 223	359	810805	810805	1070			
					BPA STUDIES											
	LP	WV	3		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 218	350	810806	810806	1238			
					BPA STUDIES											
	LP	WV	4		AD		9	COLUMBIA RIVER	JOHN DAY RES@RM 267	430	810813	810813	332			
					BPA STUDIES											
	LA	X	1				9	COLUMBIA RIVER	JOHN DAY RES@RM 263	423	810630	810630	140			
					BPA STUDIES											
	LA	X	2				9	COLUMBIA RIVER	JOHN DAY RES@RM 241	388	810701	810701	565			
					BPA STUDIES											
	LP	X	1				9	COLUMBIA RIVER	JOHN DAY RES@RM 233	375	810702	810702	389			
					BPA STUDIES											
	LA	Y	1				5	LO GRANITE D	CLARKSTON WASH	742	810523	810530	1662			
					FOREBAY INDEXING											
	LA	Y	1				6	LO GRANITE D	CLARKSTON WASH	742	810523	810530	7334			
					FOREBAY INDEXING											
	LA	Y	2				6	LO GRANITE D	CLARKSTON WASH	742	810603	810605	3491			
					FOREBAY INDEXING											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
	RA	Z	1			5		LO GRANITE D	BLW BONN D	230	810420	810525	40000			
*					NMFS BARGE REL				CWT CEYB							
	RA	Z	2			5		LO GRANITE D	BLW BONN D	230	810420	810525	40000			
*					NMFS BARGE REL				CWT CEYB							
010301					AD	9	80	WEYCO PD	GRAYS R@RM 21	68	810515	810612	169459		120	3330768
					5% EVAL											
010302					AD	9	80	WEYCO PD	GRAYS R@RM 21	68	810515	810612	64303		120	1208740
					5% EVAL											
031730						9		MCNARY D	MCNARY TAIL	469	810803	810826	16779			
*					CONTROL REL				(LA 3X 1,2,3;LA UP 1,2,3,4)							
031731						9		MCNARY D	MCNARY TAIL	469	810615	810630	17723			
*					CONTROL REL				(LA ID 1,2,3,4)							
031732						9		MCNARY D	MCNARY TAIL	469	810709	810731	42580			
*					CONTROL REL				(LA IM 1,2,3,4)							
031733						9		MCNARY D	BLW BONN D	230	810709	810731	42924			
*					TRUCK TRANS				(RA I+ 1,2,3,4)							
050336						6	80	WARM SPRING HAT	WARM SPR R@HAT	485	810422	810422	4486		13	0
					CONTRIBUTION											
050339					AD	6	80	WARM SPRING HAT	WARM SPR R@HAT	485	810422	810422	4486	140	13	0
					PRODUCTION REL											
050729					AD	6	80	WARM SPRING HAT	WARM SPR R@HWY 26	511	810401	810402	97999	110	54	0
					PRODUCTION REL											
050740					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810325	810325	104666		90	4743187
					PRODUCTION REL											
050741					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810415	810415	76731	80	71	3117822
					PRODUCTION REL											
050742						9	80	SPRING CR HAT	SPRING CR HAT	269	810505	810505	63436		65	3141542
					TIME OF RELEASE											
050743					AD	9	80	SPRING CR HAT	ROCK CR	368	810421	810422	25723		75	123914
					PRODUCTION REL											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
050744						9	80	ABERNATHY SCDC	ABERNATHY CR	91	810415	810526	22353		165	278007
					CONTRIBUTION											
050745						9	80	ABERNATHY SCDC	ABERNATHY CR	91	810415	810526	74138		165	826658
					CONTRIBUTION											
050746					AD	9	80	SPRING CR HAT	ROCK CR	368	810421	810422	150544		75	724732
					PRODUCTION REL											
050747						9	80	LIT WH SAL HAT	LIT WH SAL R@RM 2	261	810604	810605	183444	75	94	6587263
					TIME OF RELEASE											
050748					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810325	810325	28825		118	1345344
					PRODUCTION REL											
050749					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810415	810415	30911	80	71	1254974
					PRODUCTION REL											
050750					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810325	810325	13745		121	635235
					PRODUCTION REL											
050751					AD	9	80	SPRING CR HAT	SPRING CR HAT	269	810325	810325	15378		102	748052
					PRODUCTION REL											
050752						9	80	SPRING CR HAT	SPRING CR HAT	269	810812	810812	7344		15	283422
					DENSITY											
050822					AD	5	79	WARM SPRING HAT	WARM SPR R@HAT	485	810402	810402	66700	155	8	
					PRODUCTION REL											
050823					AD	5	79	WARM SPRING HAT	WARM SPR R@HAT	485	810409	810416	170167	140	18	
					PRODUCTION REL											
050824					AD	5	79	WARM SPRING HAT	WARM SPR R@HAT	485	810402	810402	32300	155	8	
					PRODUCTION REL											
050825					AD	5	79	WARM SPRING HAT	WARM SPR R@HAT	485	810409	810409	85970	140	20	
					PRODUCTION REL											
050826					AD	4	79	EAGLE CR HAT	CLACKAMAS R	247	810422	810422	126785	140	14	0
					PRODUCTION REL .45											
050827						4	79	EAGLE CR HAT	CLACKAMAS R	247	810421	810421	43568		14	0
					DENSITY/LOADING .15											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
050828						4	79	EAGLE CR HAT	CLACKAMAS R	247	810421	810421	83740		14	0
					DENSITY/LOADING .30											
050829						4	79	EAGLE CR HAT	CLACKAMAS R	247	810421	810421	83740		14	0
					DENSITY/LOADING											
050841						6	79	SATUS CR	SATUS CR	651	810522	810528	422			0
					CONTRIBUTION											
050842						6	79	DRY CR	DRY CR	681	810413	810501	2669	166		921
					CONTRIBUTION											
050844						6	79	SATUS CR	SATUS CR	651	810522	810528	422	161		1284
					SMOLT PROD AND TIMING											
050849						9	80	LIT WH SAL HAT	LIT WH SAL R@RM 2	261	810604	810605	52403	75	94	1883345
					TIME OF RELEASE											
050850						9	80	LIT WH SAL HAT	LIT WH SAL R@RM 2	261	810604	810605	13339	75	94	489226
					TIME OF RELEASE											
071627					AD	6	80	PATTERSON SLOUGH	WALLOWA HAT	940	810403	810415	37043		6	374
					REARING STUDY											
071734					AD	5	79	BONNEVILLE HAT	TANNER CR	231	801111	801111	51274		14	602636
					LATE FALLS-UPRIVER BRIGHTS											
071913					AD	5	79	BONNEVILLE HAT	TANNER CR	231	801111	801111	47799		9	96
					TULES											
072054					AD	5	80	MCKENZIE HAT			820301	820301			100	
072056					AD	9	79	JOHN DAY R	JOHN DAY R@RM 16	374	800901	800930	98	175		2
					WILD											
072058					AD	9	79	JOHN DAY R	N FK JOHN D@RM 60	744	800601	800930	7397	175		105
					WILD											
072059					AD	9	79	JOHN DAY R	JOHN D@GRANIT CK	788	800701	800930	8447	175		155
					WILD											
072060					AD	9	79	JOHN DAY R	JOHN D@GRANIT CK	788	800901	800930	517	175		9
					WILD											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
				PURPOSE OF RELEASE												
072061				AD WILD		5	79	JOHN DAY R	JOHN DAY R@RM 175	629	810223	810508	1608		30	0
072062				AD WILD		5	79	JOHN DAY R	JOHN DAY R@RM 245	741	810224	810403	232		30	0
072063				AD WILD		5	79	JOHN DAY R	M FK JOHN D@RM 32	749	810303	810416	333		30	0
072101				AD WILD		5	79	JOHN DAY R	N FK JOHN D@RM 97	803	810224	810416	270		30	0
072122				ADRV		4	79	BIG CR HAT	BIG CR	49	810505	810505	26463		19	2177
072123				ADRV		4	79	BIG CR HAT	BIG CR	49	810608	810608	27790		18	1340
072124				ADRV		4	79	BIG CR HAT	BIG CR	49	810505	810505	27575		19	2236
072125				ADRV		4	79	BIG CR HAT	BIG CR	49	810608	810608	27921		19	1500
072126				ADRV		4	79	BIG CR HAT	BIG CR	49	810706	810706	27436		19	1782
072127				AD		4	79	CASCADE HAT	TANNER CR	231	810506	810506	24918		17	64937
072128				AD		4	79	CASCADE HAT	TANNER CR	231	810608	810608	27912		17	43900
072129				AD		4	79	CASCADE HAT	TANNER CR	231	810706	810706	27727		17	39756
072130				AD		4	79	CASCADE HAT	TANNER CR	231	810506	810506	26689		17	52854
072131				AD		4	79	CASCADE HAT	TANNER CR	231	810608	810608	26085		17	40762
072132				AD		4	79	CASCADE HAT	TANNER CR	231	810706	810706	28938		17	38147

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE											
072148					AD	9	79	DESCHUTES R	MAUPIN TRAP@RM 50	408	800511	800620	116		98	
072154					AD RB HATCHERY EVAL	5	79	RND BUTTE HAT	DESCHUTES@RM 84	463	801006	801006	27250		6	2014
072156					AD REARED WELL WATER	9	80	BONNEVILLE HAT	TANNER CR	231	810424	810424	129961	76	73	5012220
072158					AD	9	80	KLASKANINE HAT	S FK KLASKANINE R	31	810515	810515	73085		75	1726000
072159					AD	9	80	VANDERVELDT PD	TUCKER CR	29	810522	810522	48307		70	1308000
072201					AD STOCK EVAL PNRC	6	79	WALLOWA HAT	WALLOWA HAT	940	800421	800421	25283		11	3425
072202					AD STOCK EVAL PNRC	6	79	WALLOWA HAT	WALLOWA HAT	940	810403	810408	55180		5	6820
072217					AD EFFECTS OF GRADING AND SELECTIVE REL	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	810316	810316	30173		6	2201
072218					AD	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	801105	801105	32363		11	2006
072219					AD	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	801105	801105	36432		6	59860
072220					AD EFFECTS OF GRADING AND SELECTIVE REL	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	810316	810316	35645		4	287
072221					AD	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	801105	801105	37930		15	1996
072222					AD EFFECTS OF GRADING AND SELECTIVE REL	5	79	MCKENZIE HAT	MCKENZIE@LEABURG	492	810316	810316	36005		9	2793
072223					AD	5	80	MCKENZIE HAT			811101	811101	35219		100	
072224					AD PRODUCTION	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	801106	801106	27821		11	4121

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
072225					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	810316	810316	26564		7	5489
					EFFECTS OF GRADING AND SELECTIVE REL											
072226					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	801105	801105	28379		5	314019
					PRODUCTION											
072227					AD	9	80	KLASKANINE HAT	KLASKANINE R	37	810518	810518	82120		86	3123896
					HATCHERY EVAL											
072238					ADRV	4	79	BIG CR HAT	BIG CR	49	810706	810706	26938		19	2861
072247					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	801105	801105	49990		20	1334
					COMPARE N SANTIAM AND CARSON STOCKS											
072248					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	801106	801107	49971		19	1652
					COMPARE N SANTIAM AND CARSON STOCKS											
072249					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810318	810320	50272		15	11511
					CARSON STOCK COMPARISON STUDY											
072250					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810317	810320	49674		14	1170
					CARSON STOCK COMPARISON STUDY											
072251					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810316	810323	47137		14	3063
					CARSON STOCK COMPARISON STUDY											
072252					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810323	810324	39656		14	34183
					N SANTIAM STOCK COMPARISON STUDY											
072253					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810316	810324	42225		14	8649
					N SANTIAM STOCK COMPARISON STUDY											
072254					AD	5	79	MARION FKS HAT	N SANTIAM@MINTO	452	810316	810318	48313		20	3469
					N SANTIAM STOCK COMPARISON STUDY											
072255					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	27642		19	158262
					DIET:FROZEN WET FISH IN OMP-2											
072256					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	27316		19	36504
					DIET:ACIDIFIED WET FISH IN OMP-2											
072257					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	28943		18	157883
					DIET:FROZEN WET FISH IN OMP-2											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
072258					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	28043		19	36182
					DIET:ACIDIFIED WET FISH IN OMP-2											
072259					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	29859	133	18	34312
					DIET:PRESS CAKE											
072260					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	28107	132	18	35852
					DIET:OMP-4											
072261					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	29767	134	18	158058
					DIET:OMP-2											
072262					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	27794	133	18	36211
					DIET:PRESS CAKE											
072263					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	29654	132	19	34258
					DIET:OMP-4											
072301					AD	4	79	BONNEVILLE HAT	TANNER CR	231	810501	810501	28896	134	18	158784
					DIET:OMP-2											
072302					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	801105	801105	31472		17	116405
					PRODUCTION											
072303					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	810316	810316	31219		4	
					OAKRIDGE STOCK GRADING AND SELECTIVE REL											
072304					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	801105	801105	30719		16	917
					PRODUCTION											
072305					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	810316	810316	29928		7	456
					DEXTER STOCK GRADING AND SELECTIVE REL											
072306					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	801105	801105	30132		28	1453
					PRODUCTION											
072307					AD	5	79	OAKRIDGE HAT	M FK WILLAM@DEXTER	491	810316	810316	31681		9	713
					DEXTER STOCK GRADING AND SELECTIVE REL											
072309					AD	5	79	RND BUTTE HAT	DESCHUTES@RM 100	489	810420	810420	28891		5	309
					HATCHERY EVAL											
072310					AD	5	79	RND BUTTE HAT	DESCHUTES@RM 181	621	810310	810310	29996		7	454
					DESCHUTES RESEARCH											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
072311					AD	5	79	RND BUTTE HAT	DESCHUTES@RM 100	489	810302	810505	24302		9	1144
					HATCHERY EVAL											
072329					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	75717	85	68	3115704
					REARED TANNER CR WATER											
072331					AD	9	80	BIG CR HAT	BIG CR	49	810507	810518	50222		77	1857523
					EVALUATION											
072332					AD	9	80	KLASKANINE HAT	KLASKANINE R	37	810518	810518	18888		86	718535
					HATCHERY EVAL											
072333					AD	9	80	BIG CR HAT	BIG CR	49	810507	810518	51105		77	1890207
					EVALUATION											
072334					AD	9	80	BIG CR HAT	BIG CR	49	810507	810518	49951		77	1699552
					EVALUATION											
072335					AD	9	80	STAYTON PD	ABV WILLAM FALLS	208	810427	810615	242481		75	5.6
072341					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	50805	82	69	264855
					DIET:OMP-2											
072342					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	51609	83	72	266426
					DIET:OMP-2											
072343					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	53235	82	75	262198
					DIET:OMP-4											
072344					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	51818	84	68	268022
					DIET:OMP-4											
072345					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	51044	81	76	258727
					DIET:PRESS CAKE											
072346					AD	9	80	BONNEVILLE HAT	TANNER CR	231	810512	810512	50868	84	68	258792
					DIET:PRESS CAKE											
072347						9	80	RND BUTTE HAT	DESCHUTES@RM 100	489	811005	811005	44212	19	6	4260
					HATCHERY EVAL											
072349						9	80	RND BUTTE HAT	DESCHUTES@RM 100	489	811005	811005	26911	15	11	2519
					HATCHERY EVAL											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE			REMARKS							
072358				AD		9	80 BONNEVILLE HAT	TANNER CR	231	810528	810528	102827		45	2098
					REARED WELL WATER										
072506				AD		9	80 BONNEVILLE HAT	TANNER CR	231	810612	810612	99632		64	2450
					ACCELERATED GROUP			BRIGHTS WILD							
072507				AD		9	80 BONNEVILLE HAT	TANNER CR	231	810730	810730	102221		35	2514
								BRIGHTS WILD							
100519						5	79 KOOSKIA HAT	CLEAR CR	868	810407	810407	17900		15	104529
					AGE AT RELEASE-STOCK EVAL										
102117						5	79 MCCALL HAT	S FK SALMON R	1153	810406	810406	40450		39	117545
					CONTROL										
102118						5	79 MCCALL HAT	S FK SALMON R	1153	810406	810406	40850		39	1134
					VICCINATED-VIBRIO										
102127						5	79 RED R HAT	S FK CLEARWATER	1003	800916	800916	49500		25	215500
102128						5	79 MCCALL HAT	S FK SALMON R	1153	810406	810406	47625		39	1322
					PLACEBO										
102210						9	80 HAGERMAN HAT	LO GRANITE RES	699	810526	810526	55400		34	4833
					CONTROL										
102211						9	80 HAGERMAN HAT	BLW BONN D	230	810528	810528	55700		51	5434
					TRANSPORT										
102218						5	80 KOOSKIA HAT	CLEAR CR	868	810521	810521	38300		36	532467
					AGE AT RELEASE										
102219						5	79 KOOSKIA HAT	CLEAR CR	868	810407	810407	37725		13	75763
					AGE AT RELEASE-STOCK EVAL										
102220						5	79 KOOSKIA HAT	CLEAR CR	868	810408	810408	38625		16	108178
					AGE AT RELEASE-STOCK EVAL										
102221						5	79 HAYDEN PD	LEMHI R	1294	810408	810408	50000		19	503799
					CONTROL										
102222						5	79 HAYDEN PD	LEMHI R	1294	810408	810408	51000		19	1201
					IMPRINTED W/MORPHOLINE										

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
					PURPOSE OF RELEASE				REMARKS							
102236						5	79	RAPID R HAT	RAPID R HAT	967	810412	810412	49000		15	746
					VACCINATED-VIBRIO											
102237						5	79	RAPID R HAT	RAPID R HAT	967	810412	810412	44250		15	674
					PLACEBO											
102238						5	79	RAPID R HAT	RAPID R HAT	967	810412	810412	51925		15	742605
					CONTROL											
102239						6	80	HAGERMAN HAT	PAHSIMEROI R	1311	810401	810401	49550		4	653
					CONTROL											
102240						6	80	HAGERMAN HAT	PAHSIMEROI R	1311	810401	810401	38425		7	748
					STOCK REL											
102241						6	80	NIAGARA SPRINGS	PAHSIMEROI R	1311	810330	810330	37550		5	2569
					VACCINATED-VIBRIO											
102242						6	80	NIAGARA SPRINGS	PAHSIMEROI R	1311	810330	810330	37950		5	2583
					PLACEBO											
102243						6	80	NIAGARA SPRINGS	PAHSIMEROI R	1311	810401	810401	38475		5	743367
					CONTROL											
102251						6	79	DWORSHAK HAT	N FK CLEARWATER	809	810504	810504	38200		9	0
					AGE 1 REL											
102252						6	80	DWORSHAK HAT	S FK CLEARWATER	1003	810504	810504	39300		9	1766
					SYSTEM II.MINERALS ADDED											
102253						6	80	DWORSHAK HAT	S FK CLEARWATER	1003	810504	810504	41300		9	544
					SYSTEM III.NO MINERALS											
102341						6	80	DWORSHAK HAT	CLEAR CREEK	868	810429	810429	41350		9	844
					RELEASE LOCATION											
621608	LA	T	2		AD	6	80	TUCANNON HAT	GRAND RONDE R	793	810504	810515	106806			
*					IDENT BROOD STOCK.FOR NEW LYONS FERRY HAT				(LA T2,621608)							
632008					AD	9	80	KLICKITAT HAT	KLICKITAT R	358	810605	810605	130010		78	2349069
					5% EVAL											
632021						9	79	LEWIS R	LEWIS R	163	800701	800701	63048		195	3300
					WILD											

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK	SP	BY	HATCHERY OR SOURCE	RELEASE SITE / REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
632036				AD 5% EVAL		9	80	KALAMA FALLS HAT	KALAMA R@RM 15	141	810522	810528	175370		119	3611297
632105						9	79	KALAMA R	KALAMA R@RM 15	141	800601	800601	100355		157	2300000
632106				AD DIET STUDY:DRY DIET		4	79	GRAYS R HAT	GRAYS R@RM 21	68	810430	810430	97532		18	86425
632137				AD 5% EVAL DELAYED		5	79	COWLITZ HAT	COWLITZ R@RM 50	189	810321	810401	20719		9	543634
632148						9	80	WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810706	810901	25390		81	41
632150				AD 5% EVAL DELAYED		4	79	WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810430	810430	51784		18	1525916
632151				AD COL R EVAL TIMING STUDY		4	79	WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810527	810527	52895		20	67498
632153				AD COL R EVAL TIMING STUDY		5	79	WASHOUGAL HAT	WASHOUGAL R@RM 15	221	800601	800601	314605		99	5700000
632155						9	80	PR RAPID SPAW CH	PR RAPID SPAW CH	639	810623	810624	194669		115	3794635
632156				AD 5% EVAL		9	80	COWLITZ HAT	COWLITZ R@RM 50	189	810627	810628	153216		86	3128708
632160				AD 5% EVAL		9	79	LEWIS R	LEWIS R	163	800701	800701	103690		150	1790
632201				AD 5% EVAL		9	80	SEA RESOURCES	CHINOOK R PD	11	810416	810429	44037		95	857335
632202				AD COL R EVAL TIMING STUDY		4		WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810430	810430	51976		18	901324
632203				AD COL R EVAL TIMING STUDY		4		WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810527	810527	52432		20	23031
632207						9	79	LEWIS R	LEWIS R	163	800601	800601	26181		310	358

RELEASE DATA 1981

MAG TAG MULT	LOC	BR	ROT	CLIP	OTHER MARK PURPOSE OF RELEASE	SP	BY	HATCHERY OR SOURCE	RELEASE SITE REMARKS	KM	ST.REL.	END.REL.	NO.REL.	MM	#/LB	NO.UNMKD
632234					AD 5% EVAL	9	80	ELOKOMIN HAT	ELOKOMIN R COMBINED W/632317	94	810601	810601	82820		115	1379679
632243					AD DIET STUDY:OMP	4	79	GRAYS R HAT	GRAYS R@RM 21	68	810430	810430	99921		17	103734
632251					AD 5% EVAL	9	80	WASHOUGAL HAT	WASHOUGAL R@RM 15	221	810626	810630	277290	83	71	5227710
632254					AD 5% EVAL	9	80	LO KALAMA HAT	KALAMA R@RM 6	127	810601	810611	155331		100	2843369
632255					AD 5% EVAL	9	80	COWLITZ HAT	COWLITZ R@RM 50	189	810612	810628	121271		77	2775588
632261					AD 5% EVAL	9	80	PR RAPID SPAW CH	PR RAPID SPAW CH	639	810518	810518	42089		67	788111
632263					AD 5% EVAL	9	80	GRAYS R HAT	GRAYS R@RM 21 COMBINED W/632340	68	810601	810608	37138		93	573241
632317					AD 5% EVAL	9	80	ELOKOMIN HAT	ELOKOMIN R COMBINED W/632234	94	810601	810601	82821		97	1379680
632340					AD 5% EVAL	9	80	GRAYS R HAT	GRAYS R@RM 21 COMBINED W/632263	68	810601	810608	37138		82	573242
CEYB *					NMFS BARGE REL	5		LO GRANITE D	BLW BONN D (RA Z 1,2)	230	810420	810525	40000			

Species code
- 3 = sockeye salmon
- 4 = coho salmon
- 5 = yearling chinook salmon
- 6 = steelhead
- 9 = 0-age chinook salmon

APPENDIX F

DERIVATION OF FLOW-EFFICIENCY

REGRESSION FORMULAS

- LOWER GRANITE DAM -

APPENDIX TABLE F1.--Derivation of flow-efficiency regression formula for chinook salmon at Lower Granite Dam, 1981.

Date	% Turbine flow	Brands recovered[1/]	No. brands recovered adjusted to 100% turbine flow
4/24	100	118	118
4/25	100	131	131
4/26			
4/27>	99	317	320
4/28	100	575	575
4/29	100	502	502
4/30	97	137	141
5/01	85	84	98
5/02	94	36	38
5/03			
5/04>	79	525	661
5/05	98	15	16
5/06	100	0	0
5/07	100	0	0
5/08	100	0	0
5/09	100	0	0
5/10			
5/11>	100	65	65
5/12	100	15	15
5/13	100	0	0
5/14	100	0	0
5.15	100	22	22
5/16	100	65	65
5/17			
5/18>	100	46	46
5/19	100	10	10
5/20	100	12	12
5/21	100	0	0
5/22	100	58	58
5/23	100	122	122
5/24			
5/25>	100	159	159
5/26	98	26	27
5/27	87	53	61
5/28	83	14	17
5/29	84	0	0
5/30	85	9	11
5/31			
6/01>	79	51	64
6/02	78	76	97
6/03	91	139	152

APPENDIX TABLE F1.--(Continued)

Date	% Turbine flow	Brands recovered[1/]	No. brands recovered adjusted to 100% turbine flow
6/ 4	82	10	12
6/ 5	92	0	0
6/ 6	29	7	24
6/ 7			
6/ 8	26	22	85
	TOTALS	3,421	3,724

1/ Adjusted for sample size.

Mark Releases:

Mark	No. released	Adjusted for marking & reservoir mortality	% Adjustment
LAP1	8,069	6,859	15
LAP2	1,723	1,378	
LAP3	668	534	20
LAP4	1,682	1,346	20
LAS1	711	569	20
LAS2	660	528	20
LAY1	1,662	1,330	20
	TOTAL	12,544	

Sampling efficiency (100% turbine flow) = 3724/12,544 = 29.70%

(X) % Turbine flow	($\hat{Y}$) Calculated sampling efficiency (%)
100	29.70
75	22.28
50	14.85
25	7.43

Regression formula $\hat{Y} = 0.00 + 0.30X$ expresses the above relationship.

APPENDIX TABLE F2.--Derivation of flow-efficiency regression formula for steelhead trout at Lower Granite Dam, 1981.

Date	% Turbine flow	Brands recovered[1/]	No. brands recovered adjusted to 100% turbine flow
4/24	100	0	0
4/25	100	26	26
4/26			
4/27>	99	106	107
4/28	100	220	220
4/29	100	373	373
4/30	97	205	211
5/01	85	92	98
5/02	94	108	115
5/03			
5/04>	79	1,306	1,653
5/05	98	114	116
5/06	100	27	27
5/07	100	94	94
5/08	100	246	246
5/09	100	291	291
5/10			
5/11>	100	1,027	1,027
5/12	100	500	500
5/13	100	748	748
5/14	100	272	272
5/15	100	429	429
5/16	100	672	672
5/17			
5/18>	100	1,369	1,369
5/19	100	365	365
5/20	100	348	348
5/21	100	322	322
5/22	100	490	490
5/23	100	938	938
5/24			
5/25>	100	1,274	1,274
5/26	98	647	660
5/27	87	171	197
5/28	83	442	533
5/29	84	570	678
5/30	85	338	398
5/31			
6/01>	79	630	797
6/02	78	296	379
6/03	91	73	80
6/04	82	39	47

APPENDIX TABLE F2.--(Continued)

Date	% Turbine flow	Brands recovered[1/]	No. brands recovered adjusted to 100% turbine flow
6/05	92	88	96
6/06	29	320	1,232
6/07			
6/08>	26	211	812
6/09			
6/10>	29	37	127
6/11			
6/12>	41	18	43
6/13	38	11	28
6/14			
6/15>	26	20	78
6/16	29	0	0
6/17			
6/18>	42	0	0
6/19	47	0	0
6/20	51	66	130
	TOTALS	17,939	18,646

1/ Adjusted for sample size.

Mark releases:

Mark	No. released	Adjusted for marking & reservoir mortality	% adjustment
LAP1	1,554	1,321	15
LAP2	1,723	1,378	20
LAP3	5,537	4,430	20
LAP4	11,192	8,954	20
LAS1	2,200	1,760	20
LAS2	6,810	5,448	20
LAY1	7,334	5,867	20
LAY2	3,491	2,793	20
	TOTAL	31,951	

APPENDIX TABLE F2.--(Continued)

Sampling efficiency (100% turbine flow) = 18,646/31,951 = 58.36%

(X) % turbine flow	$(\hat{Y})$ Calculated sampling efficiency (%)
100	58.36
75	43.77
50	29.18
25	14.59

Regression formula $\hat{Y} = 0.00 + 0.58X$ expresses the above relationship.

APPENDIX G

DERIVATION OF FLOW-EFFICIENCY

REGRESSION FORMULAS

- JOHN DAY DAM -

APPENDIX TABLE G1.--Derivation of flow-efficiency regression formula for chinook salmon at John Day Dam, 1978-81.

Mark recoveries

Year	No. released[1/]	No. recovered	Recoveries adj. for 100% flow Unit 3	Sampling eficiency 100% flow Unit 3 (%)
1978	25,261	241	402	1.60
1979	24,807	277	353	1.42
1980	37,268	442	568	1.52
1981	14,178	141	212	1.50

(X) % flow Unit 3	($\hat{Y}$) Calculated sampling efficiency (%) 1978	1979	1980	1981
5	0.80	0.71	0.76	0.75
10	1.60	1.42	1.52	1.50
15	2.40	2.13	2.28	2.25
20	3.20	2.84	3.04	3.00

Regression formula $\hat{Y} = 0.00 + 0.15X$ expresses the above relationship.

1/ McNary tailrace releases adjusted for 20% marking and reservoir mortality.

APPENDIX TABLE G2.--Derivation of flow efficiency regression formula for steelhead trout at John Day Dam, 1978-81.

Mark recoveries:

Year	No. released 1/	No. recovered	Recoveries adj. for 100% flow Unit 3	Sampling efficiency 100% flow Unit 3 (%)
1978	7,934	345	524	6.60
1979	6,550	358	505	7.71
1980	17,033	834	1,090	6.40

(X) % flow Unit 3	($\hat{Y}$) Calculated sampling efficiency (%) 1978	1979	1980
5	3.30	3.85	3.20
10	6.60	7.71	6.40
15	9.90	11.56	9.60
20	13.20	15.42	12.80

Regression formula $\hat{Y} = 0.00 + 0.69X$ expresses the above relationship.

1/ McNary tailrace releases adjusted for 20% marking and reservoir mortality.