Studies to evaluate the effectiveness of extended-length screens at The Dalles Dam, 1994

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Coastal Zone and Estuarine Studies Division

Northwest Fisheries Science Center

National Marine Fisheries Service

Seattle, Washington

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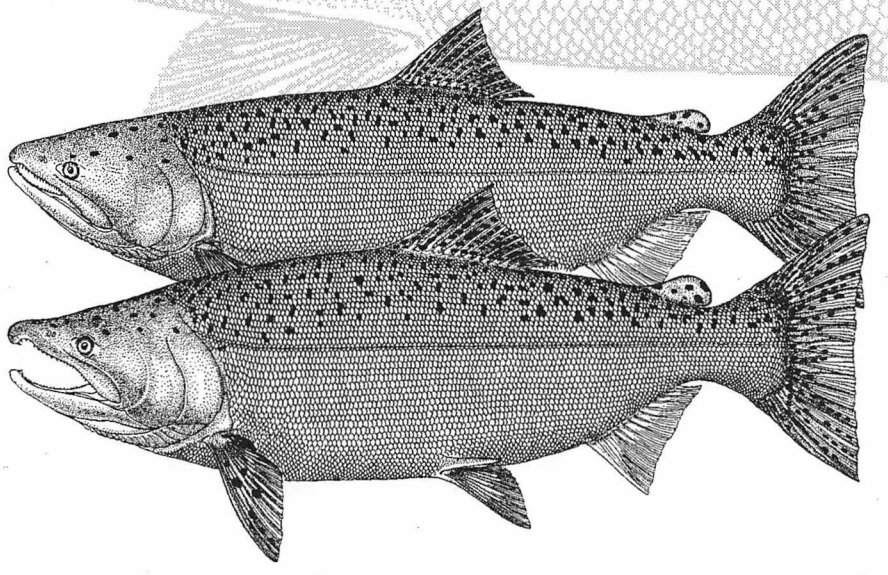
May 1995



STUDIES TO EVALUATE THE EFFECTIVENESS OF EXTENDED-LENGTH SCREENS AT THE DALLES DAM, 1994

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Report of Research

Funded by

U.S. Army Corps of Engineers
Portland District
Delivery Order E96930030

and

Coastal Zone and Estuarine Studies Division
Northwest Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
2725 Montlake Boulevard East
Seattle, Washington 98112-2097

May 1995

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INTRODUCTION

The Dalles Dam, at River Kilometer 308 (River Mile 192), is operated by the U.S. Army Corps of Engineers (COE) and is the second in a series of hydroelectric projects upstream from the mouth of the Columbia River. Completed in 1957, The Dalles Dam is equipped with 22 turbine units, an ice and trash sluiceway, 20 spillbays, and a navigation lock (Fig. 1). Unlike most other hydroelectric projects on the Columbia River, the powerhouse at The Dalles Dam is oriented parallel to the river flow.

The COE has designed a juvenile fish bypass system for The Dalles Dam similar to those in use at other COE Columbia and Snake River projects. In 1985 and 1986, the National Marine Fisheries Service (NMFS) conducted research at The Dalles Dam to determine the potential fish guidance efficiency (FGE) for yearling chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*O. nerka*), and steelhead (*O. mykiss*) attainable with standard-length submersible traveling screens (STSs) (Monk et al. 1986, 1987). Additionally, the vertical distribution of fish entering the turbine intake was measured to determine theoretical fish guidance efficiency (TFGE, an estimate of the percentage of fish theoretically guidable based upon hydraulic model studies and the vertical distribution of fish).

In 1985, the FGE of STSs at The Dalles Dam ranged from 44 to 55% for yearling chinook salmon, from 73 to 79% for steelhead, and from 8 to 14% (highest FGE obtained when the STS was lowered 0.8 m) for subyearling chinook salmon. From vertical distribution measurements, the TFGE of STSs was estimated to be

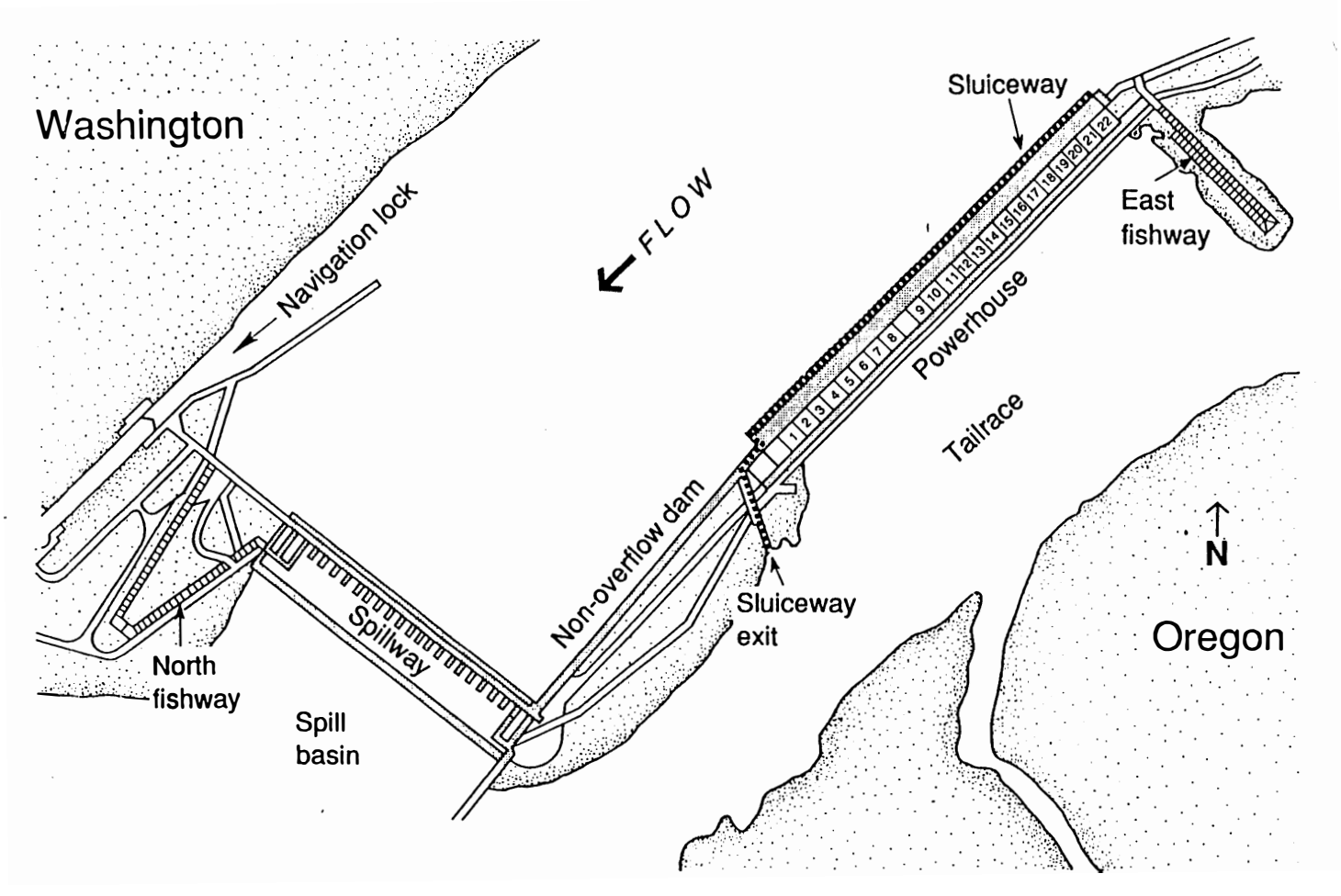

Figure 1.--Overview of The Dalles Dam with turbine units numbered.

67% for yearling chinook salmon, 57% for sockeye salmon, 83% for steelhead, and only 22% for subyearling chinook salmon. In 1986, lowering the STS again appeared to enhance FGE compared to an STS at standard elevation (56 vs. 44% for yearling chinook salmon). Although FGE for all species was nearly 90% of the TFGE expected with STSs, FGE was still well below a target level of 70%. These data and the encouraging results from tests with extended-length screens at McNary Dam in 1991 and 1992 (Brege et al. 1992, McComas et al. 1993) suggested that FGE at The Dalles Dam might be improved with longer screens.

In 1993, mean FGE at The Dalles Dam for yearling chinook salmon was 73, 60, and 44% for the extended-length submersible bar screen (ESBS), extended-length submersible traveling screen (ESTS), and STS, respectively. Mean FGE for subyearling chinook salmon was 59, 51, and 23% for the ESBS, ESTS, and STS, respectively.

Specific research objectives at The Dalles Dam in 1994 were

1) Determine the FGE of an ESBS and an ESTS with juvenile salmonids (especially yearling and subyearling chinook salmon), in the higher-flow turbine units at the east end of the powerhouse during the spring and summer outmigration.
2) Evaluate the effects of an ESBS and an ESTS on juvenile salmonid descaling rates in the higher-flow turbine units at the east end of the powerhouse.

3) Evaluate the horizontal distribution of juvenile salmonids as they enter the turbine units across the powerhouse.

The test schedule for the 1994 season is shown in Table 1.

OBJECTIVE 1: FISH GUIDANCE EFFICIENCY OF THE EXTENDED-LENGTH BAR SCREEN AND THE EXTENDED-LENGTH TRAVELING SCREEN

Approach

The methods for determining FGE were similar to those used in previous FGE studies with extended-length screens (Brege et al. 1992, McComas et al. 1993). Gatewell dip-net catches provided estimates of the number of guided fish (Swan et al. 1979); fyke-net catches provided estimates of the number of unguided fish (Fig. 2). Fish guidance efficiency for each species was calculated as gatewell catch (guided fish) divided by the total number of fish (guided plus unguided), by species, passing through the turbine intake during the test period:

$$FGE = \frac{GW}{GW+FN} X\ 100\%$$

where GW = *gatewell catch*
FN = *fyke-net catch*

Guided fish were confined to the bulkhead slot by a modified balanced-flow vertical barrier screen (VBS) that separated the bulkhead slot from the gate slot (Fig. 2). This VBS, originally

Table 1.--Test Schedule for the 1994 field season at The Dalles Dam.

Test series	Dates	Test turbine unit/slot	Flow[a] (kcfs)	Guidance device[b]	Test type[c]	Porosity of perforated plate (%)
1	18-22 April	18A	16.3	ESBS	DES	25
		18B	16.3	ESBS	DES	30
		18C	16.3	ESBS	DES	35
		19B	16.2	ESTS	DES	39
		19C	16.2	ESTS	DES	44
		20A	15.6	STS	DES	48
2	19-30 April	2B	10.8	N/A	HD	-
	2-4,10-27 May	12B	11.0	N/A	HD	-
		17B	12.2	N/A	HD	-
3	25-30 April	18B	16.6	ESBS	FGE	30
	13-20, 23-27 May	19B	16.7	ESTS	FGE	39
4	25-30 April	20A	15.5	STS	DES	48
	13-20, 23-27 May					
5	20-30 June	2B	10.4	N/A	HD	-
	1, 6-11 July	12B	10.4	N/A	HD	-
		17B	11.2	N/A	HD	-
6	20-30 June	18B	16.9	ESBS	FGE	30
	1, 5-8, 11-14 July	19B	17.0	ESTS	FGE	39
7	20-30 June	20A	15.5	STS	DES	48
	1, 5-8, 11-14 July					

[a]Test Series 1, 2, 4, 5, and 7, conducted without fyke-net frames in place; Test Series 3 and 6 conducted with fyke-net frames in place.
[b]ESBS = extended-length submersible bar screen,
ESTS = extended-length submersible traveling screen,
STS = standard-length submersible traveling screen.
N/A = no guidance device present
[c]DES = descaling test, HD = horizontal distribution test,
FGE = fish guidance efficiency test.

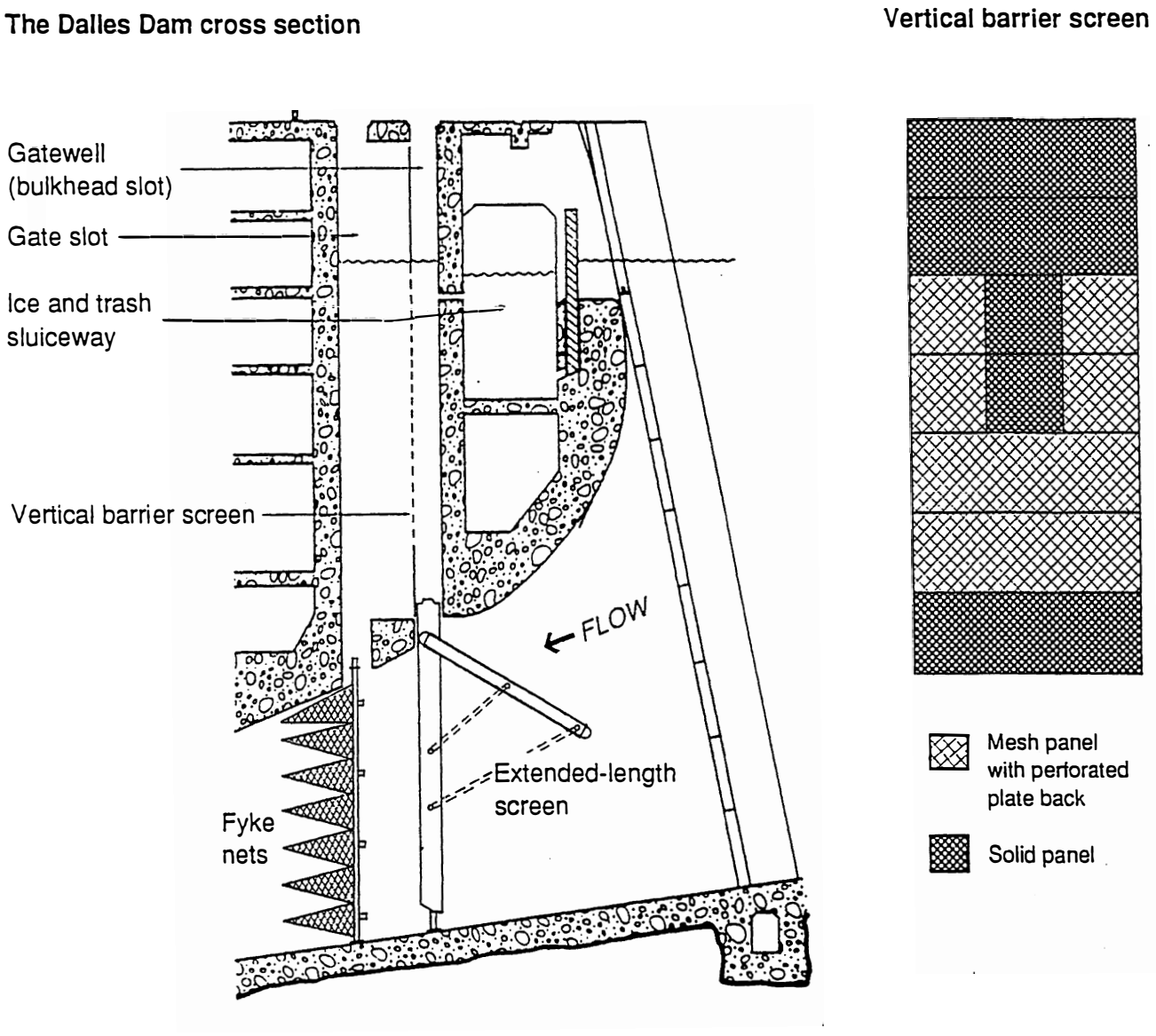

Figure 2.--Cross section of turbine unit at The Dalles Dam with extended-length screen and fyke nets in place.

designed for use with STSs, consisted of seven, 2.7-m high panels, each of which extended across the full width of the slot.

Each FGE test lasted a minimum of 1 hour and typically began at 2000 h (dusk) and ended between 2100 and 2400 h when it was estimated that the target number of fish (200 total) had been collected in the gatewell and fyke nets. Total numbers of fish collected were monitored by dipnetting the gatewells during the test.

Past FGE studies have utilized fyke nets attached to a frame beneath the STS to collect unguided fish. With the extended-length screens this is not possible since the screen framework fills the entire bulkhead slot from floor to ceiling of the turbine intake (Fig. 2). Therefore, a frame with fyke nets to collect unguided fish was installed in the downstream gate slot. As in 1993, redesigned fyke-net frames, more streamlined than older styles, were used to reduce the effect of the frame on flow through the test unit. Newly designed fyke nets were also used to minimize the water resistance and increase flow through the net.

With the extended-length screens, fyke nets were arranged in three columns (designated left, center, right, as viewed from the downstream side) and seven levels (numbered from top to bottom) (Fig. 2). Because the proportion of total fyke-net catch for each column cannot be reliably predicted with extended-length screens, cod ends were placed on all 21 fyke nets used in FGE tests with these screens. An analysis of fyke-net catch by net

column with extended-length screens at McNary Dam is included in McComas et al. 1994.

Fish guidance efficiency tests with an ESBS and ESTS were conducted simultaneously in the center slots of Units 18 and 19, respectively, during the spring and summer outmigration. There were no FGE tests conducted with an STS at The Dalles Dam in 1994.

Spring testing with extended-length screens began on 18 April with descaling tests (Table 1). As in 1993, descaling tests were conducted prior to starting FGE tests to determine if the initial configuration of prototype screens produced unacceptable levels of descaling. The absence of excessive descaling in tests conducted from 18 to 22 April led to the start of FGE tests on 25 April.

Units 18, 19, and 20 were operated only during FGE tests. Initial screen placement at the east end of the powerhouse is shown in Table 2.

During some of the first FGE tests in spring, numerous bits of hardware appeared along with the catch in the fyke nets in Slot 18B. When the ESBS was raised to deck level for inspection after the FGE test on 30 April, bolts and welds were found to be broken, several perforated plates were loose and some were missing. Tests were suspended until all screens could be raised to deck level and inspected. During this inspection process, the ESBS in Slot 18A became wedged in the slot and was severely damaged. Because this ESBS could not be used, the remaining

Table 2.--Screen arrangement, by screen type and porosity (%), for 1994 descaling and fish guidance efficiency (FGE) tests at The Dalles Dam (STS = standard-length submersible traveling screen, ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

	Slot								
Test	17C	18A	18B	18C	19A	19B	19C	20A	20B
Initial descaling	STS	ESBS	ESBS	ESBS	ESTS	ESTS	ESTS	STS	STS
	48	25	30	35	34[a]	39	44	48	48
Initial spring FGE	STS	ESBS	ESBS	ESBS	ESTS	ESTS	ESTS	STS	STS
	48	25	30	35	34	39	44	48	48
Final spring FGE[b]		ESBS	ESBS	STS	ESTS	ESTS	STS	STS	ESTS
		35	30	48	44	39	48	48	34
Summer FGE		ESBS	ESBS	STS	ESTS	ESTS	STS	STS	ESTS
		35	30	48	44	39	48	48	34

[a]34% porosity ESTS acquired from McNary Dam.
[b]Screens were rearranged after the 25% porosity ESBS was damaged during the spring testing.

screens had to be rearranged for subsequent tests (Table 2). Fish guidance efficiency tests resumed on 13 May when all screens had been repaired, rearranged, and deployed.

Only very low levels of spill (associated with adult attraction water tests) occurred at The Dalles Dam during the first six tests (25-30 April). Substantial spill for juvenile fish passage began 1 May at the project, but was shut off 1 hour prior to and for the duration of individual FGE tests.

Differences in FGE between the ESBS (Unit 18) and ESTS (Unit 19) for both yearling and subyearling chinook salmon were examined using analysis of variance (ANOVA) followed by a Fisher's Protected Least Significant Difference multiple comparison technique (Petersen 1985). Statistical significance was established for $\alpha = 0.05$. Test days on which less than 30 fish of the target species were collected were pooled with subsequent test days. When this occurred for one slot and not for the other on a given day, blocking by day was not used for the ANOVA. A randomized block design could not be used because of test days with insufficient sample size.

Results and Discussion

Yearling Fish

Testing for FGE began on 25 April and ended on 27 May when fish numbers dropped at the end of the spring outmigration (Appendix Table 1).

Tests conducted with ESBSs and ESTSs resulted in mean FGEs for yearling chinook salmon of 69 and 65%, respectively

(SEs = 3%). The difference was not statistically significant (F = 1.56, P = 0.2210).

Early in the season, FGE was somewhat higher than later on; mean FGEs for the first 6 tests were 76 and 72% for the ESBS and ESTS, respectively (SEs = 2%); again, the difference was not significant (F = 3.63, P = 0.1151). Variability in FGE estimates for yearling chinook salmon may be attributed to stock differences of fish passing the project during the testing season, degree of smoltification, increasing water temperatures, and spill interaction at the project. In 1993, FGE was 73, 60, and 44% for the ESBS, ESTS, and STS, respectively, for yearling chinook salmon on the west end of the powerhouse (Brege et al. 1994).

Figure 3 shows daily fluctuations in FGE for yearling chinook salmon. Fish numbers for other salmonids were too low for statistical comparisons; however, mean pooled FGE for steelhead was 77 and 75%, for coho salmon (*O. kisutch*) 89 and 85%, and for sockeye salmon 64 and 46% with the ESBS and ESTS, respectively. Total fish numbers used in the calculation of FGE for steelhead were 619 and 445, for coho salmon 326 and 198, and for sockeye salmon 280 and 262 with the ESBS and ESTS, respectively.

Net-level catches are shown in Figure 4. With both extended-length screens, the highest fyke-net catches were in Net Levels 4, 5, and 6, which differed from 1993 when the highest net-level catches were only in Levels 5 and 6.

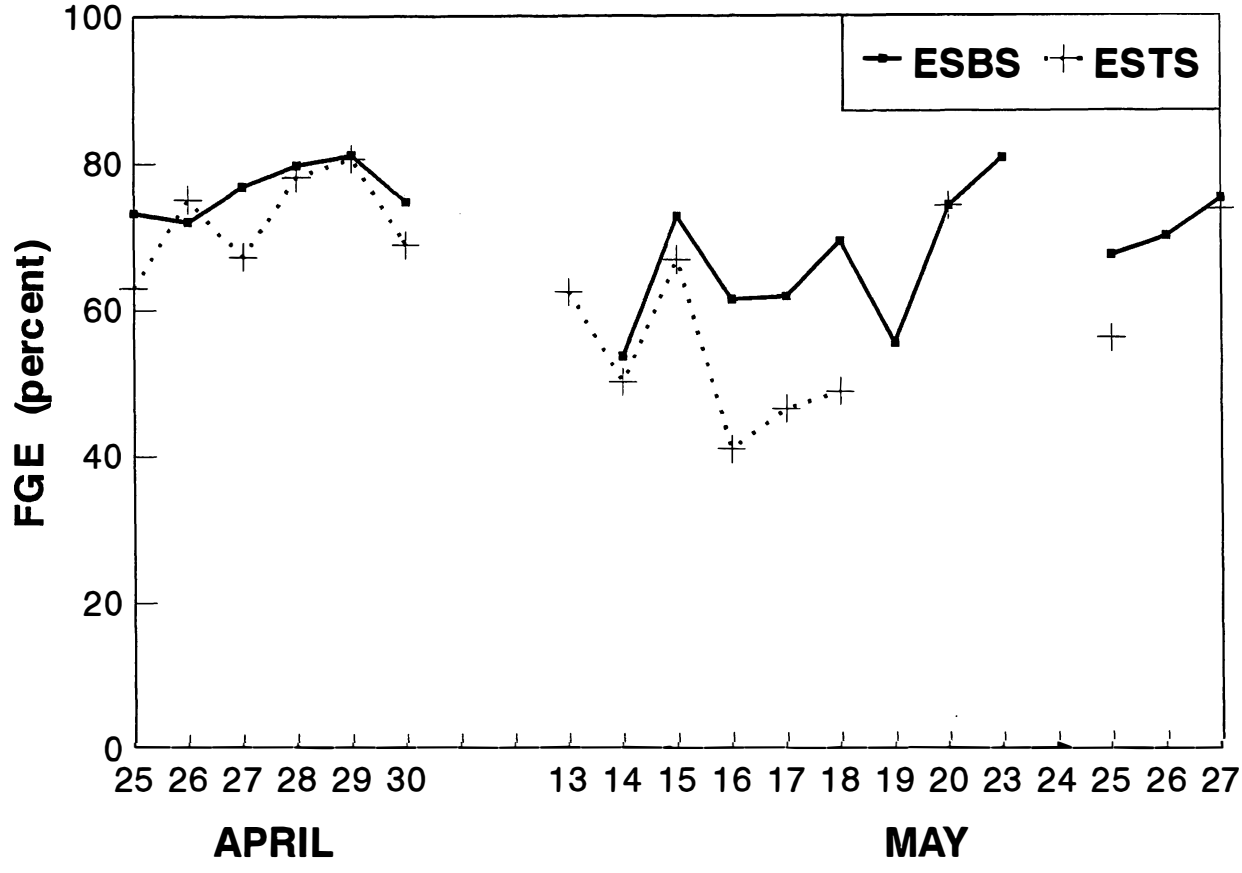

Figure 3.--Daily fish guidance efficiency (FGE) for yearling chinook salmon at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

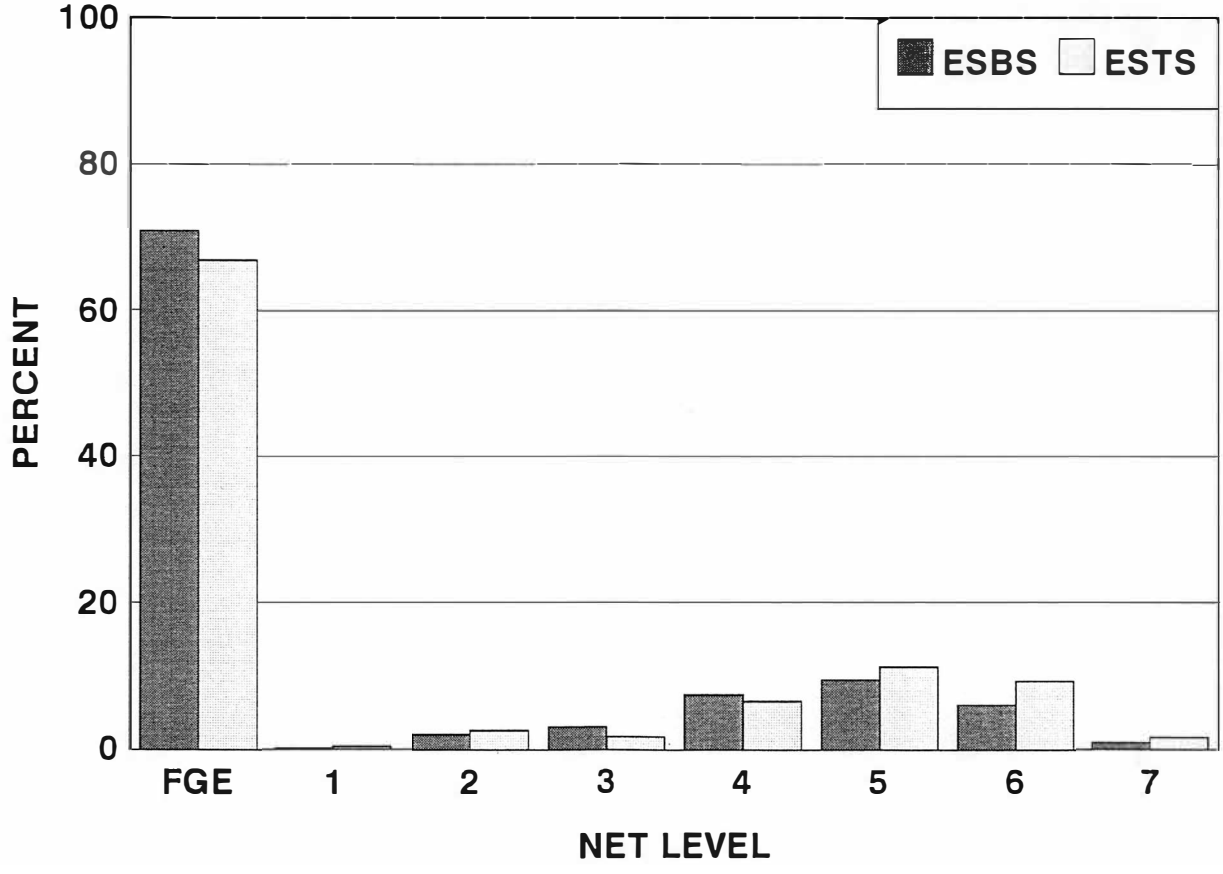

Figure 4.--Yearling chinook salmon seasonal fish guidance efficiency (FGE) and net catch by net level at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

Net catches with the ESBS were more evenly distributed among the three fyke-net columns in 1994, while net catches with the ESTS were more evenly distributed in 1993. With the ESBS, net catches for the left, center, and right columns were 34, 32, and 34% in 1994, and 42, 28, and 30% in 1993. With the ESTS, catches were 30, 36, and 34% in 1994, and 35, 33, and 32% in 1993.

Since the center-column net catch for the ESBS was less than one-third of the total catch, expanding the center-column net catch by three (as with the STS) might have produced biased FGE estimates for yearling chinook salmon; however, with only the center column in use, flows into the nets (and therefore, the catch distribution) may have been different.

Subyearling Fish

Subyearling chinook salmon FGE testing began on 20 June and concluded on 14 July. Other juvenile salmonids were captured, but not in sufficient numbers for statistical analysis (Appendix Table 1).

Spill during the summer FGE tests was less than 2 kcfs. This discharge, through Spillbay 1 (at the north end of the spillway, Fig. 1), was used to attract adult fish into the spillway entrance of the adult collection system. Spill of about 40 kcfs occurred nightly at the conclusion of FGE tests (typically 2300 h) and continued until 0400 h. On nights when no FGE tests were conducted, spill occurred from 2000 to 0400 h.

Mean FGE for subyearling chinook salmon at the east end of the powerhouse was significantly higher with the ESBS (54%) than with the ESTS (47%) ($F = 7.76$, $P = 0.0118$). Figure 5 shows the

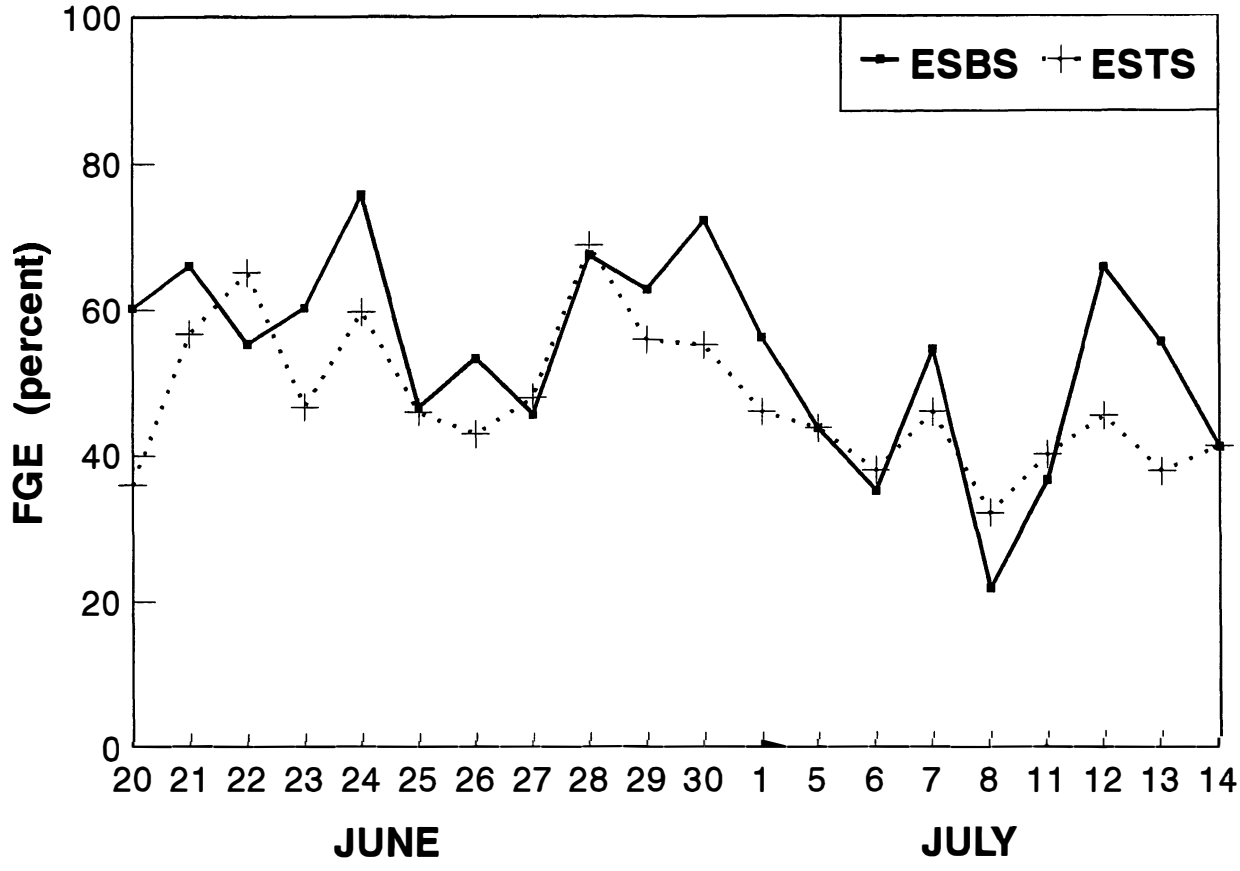

Figure 5.--Daily fish guidance efficiency (FGE) for subyearling chinook salmon at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

daily fluctuations in FGE for subyearling chinook salmon in 1994. The 1993 tests at the west end of the powerhouse resulted in FGE estimates of 59 and 51% with the ESBS and ESTS, respectively.

Net-level catches are shown in Figure 6. As in spring, the highest fyke-net catches with the extended-length screens were in Net Levels 4, 5, and 6. In 1993 at the west end of the powerhouse, net-level catches were highest in Net Levels 5 and 6.

Net catch was not evenly distributed among the three net columns for either of the extended-length screens. Net catches for the left, center, and right columns were 37, 34, and 29% in 1994 and 41, 30, and 29% in 1993 for the ESBS. For the ESTS, catches were 37, 35, and 28% in 1994, and 36, 36, and 28% in 1993. Since the center-column net catch varied from 30 to 36% of the total catch, expanding the center-column net catch by three (as with the STS) might have produced biased FGE estimates for extended-length screens with subyearling chinook salmon.

OBJECTIVE 2: EFFECTS OF EXTENDED-LENGTH SCREENS ON FISH DESCALING RATES

Approach

Fish descaling rates were monitored during descaling and FGE tests using standard Fish Transportation Oversight Team descaling criteria (Ceballos et al. 1993). Initially, a series of five descaling tests was conducted to determine if any of the screen types or configurations caused severe increases in descaling rates. Screens were arranged to compare various screen types, perforated plate porosity combinations, and resultant approach velocities (Table 3).

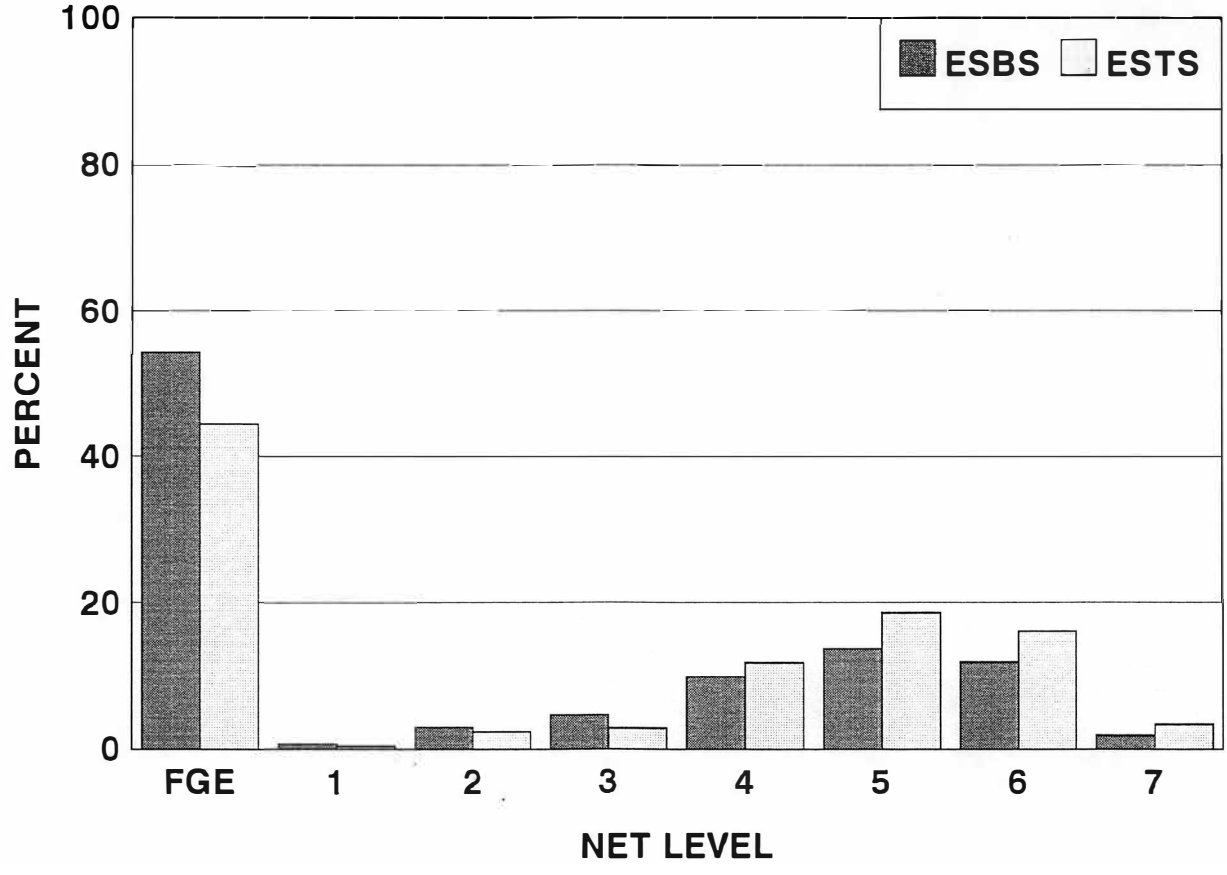

Figure 6.--Subyearling chinook salmon seasonal fish guidance efficiency (FGE) and net catch by net level at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

Table 3.--Initial descaling test results for yearling chinook salmon at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen, STS = standard-length submersible traveling screen). Total catch and mean descaling are combined results of five separate tests.

	Slot					
	18A	18B	18C	19B	19C	20A
Screen type	ESBS	ESBS	ESBS	ESTS	ESTS	STS
Porosity of perf. plate (%)	25	30	35	39	44	48
Est. approach velocity (fps)[a]	2.7	2.75	2.3	2.75	2.3	2.75
Total catch	400	478	279	353	136	97
Mean descaling (%)	3.3	2.7	0.4	7.1	2.2	2.1

[a]Approach velocity calculated at a turbine unit discharge of 17.8 kcfs for Units 18 and 19, and 15.5 kcfs for Unit 20.

Gatewells of turbine units containing the test screens were dipnetted prior to the start of a test to remove any residual fish. The units were then started and run for several hours or until a sufficient number of fish had been collected. The units were then shut down and the accumulated fish dipnetted out, anesthetized with tricaine methane sulfonate (MS-222), and examined.

Statistical comparisons of descaling rates were made with methods and parameter values similar to those used for FGE analyses.

Results and Discussion

Yearling Fish

Results of initial descaling tests (Test Series 1, Table 1) indicated that descaling rates with the extended-length screens, used in combination with selected perforated plate porosities, were, in most cases, similar to descaling rates with the STS (control) (Table 3).

During Test Series 3 and 4 (Table 1), mean descaling rates for yearling chinook salmon were 3.2, 3.4, and 0.0%, for the ESBS, ESTS, and STS, respectively (SEs = 0.7, 0.8, and 0.0%, respectively). Daily fluctuations in yearling chinook salmon descaling rates are shown in Figure 7. In 1993, mean descaling rates for yearling chinook salmon during FGE tests in turbine units at the west end of the powerhouse were 4.8, 5.1, and 6.1% for the ESBS, ESTS, and STS, respectively.

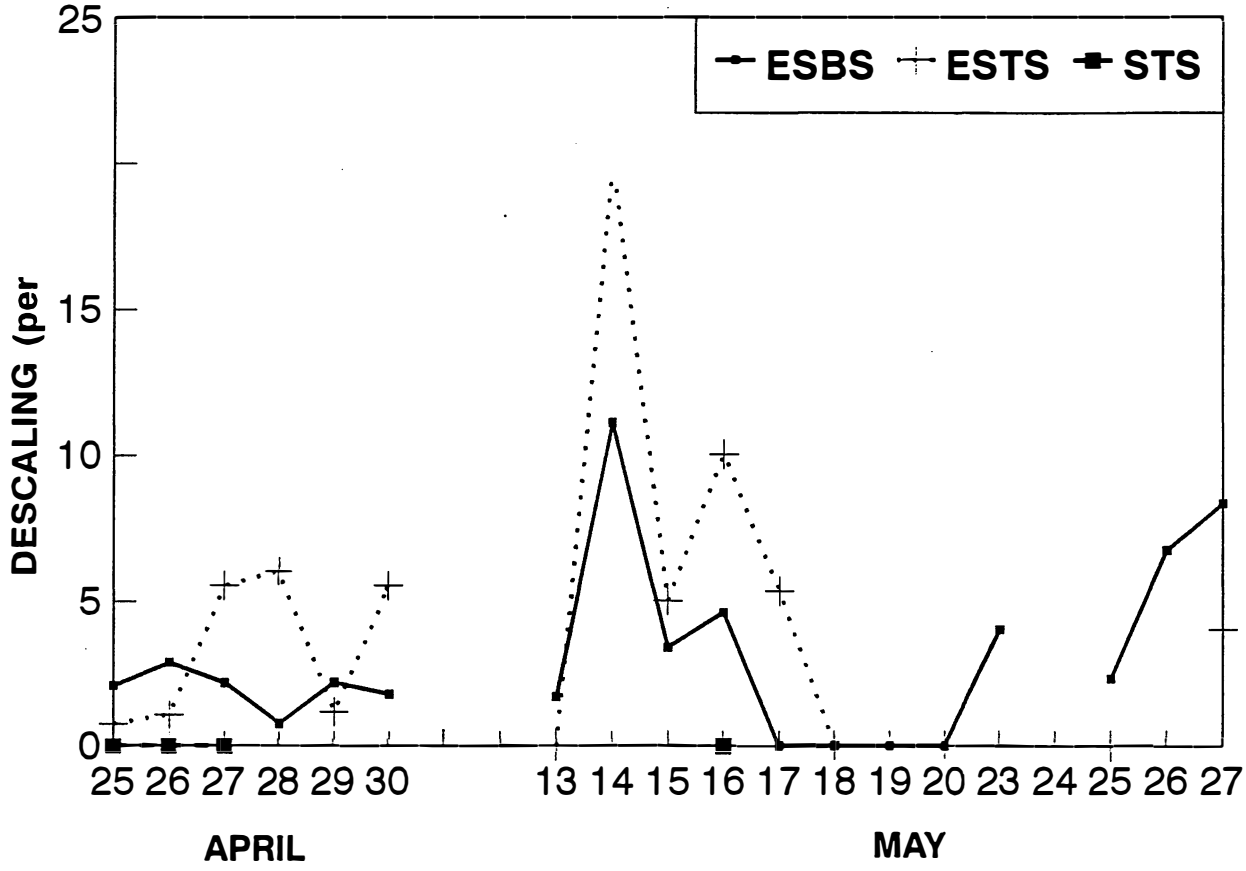

Figure 7.--Daily descaling rates for yearling chinook salmon at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen, STS = standard-length submersible traveling screen).

Although descaling rates were all low, there was a statistically significant difference in descaling rates between the extended-length screens and the control condition (STS) for yearling chinook salmon (i.e., the extended-length screen mean descaling rate was significantly greater than 0%). Fish numbers for other salmonids were too low for statistical comparisons; however, mean descaling rates for steelhead were 2.7, 3.6, and 6.7%, for coho salmon 1.0, 3.0, and 3.4%, and for sockeye salmon 9.6, 14.0, and 0.0%, for the ESBS, ESTS, and STS, respectively.

A summary of descaling rate results from all tests at The Dalles Dam in 1994 is provided in Appendix Table 2.

Subyearling Fish

The mean descaling rate was significantly higher for the ESTS (3.3%) than for either the ESBS (1.8%) or the STS (0.7%) ($F = 8.15$, $P = 0.0101$, SEs = 0.4%). Daily fluctuations in subyearling chinook salmon descaling rates are shown in Figure 8. In 1993 in the west end units, mean descaling rates were 4.5, 6.9, and 0.9% for the ESTS, ESBS, and the STS, respectively.

OBJECTIVE 3: HORIZONTAL DISTRIBUTION OF JUVENILE SALMONIDS ACROSS THE POWERHOUSE

Approach

The center slots of Turbine Units 2, 12, and 17 were dipnetted daily to determine the distribution of juvenile salmonids entering at different locations across the powerhouse. As shown in Figure 1, Unit 2 is situated at the west end of the powerhouse, Unit 12 near the center, and Unit 17 near the east

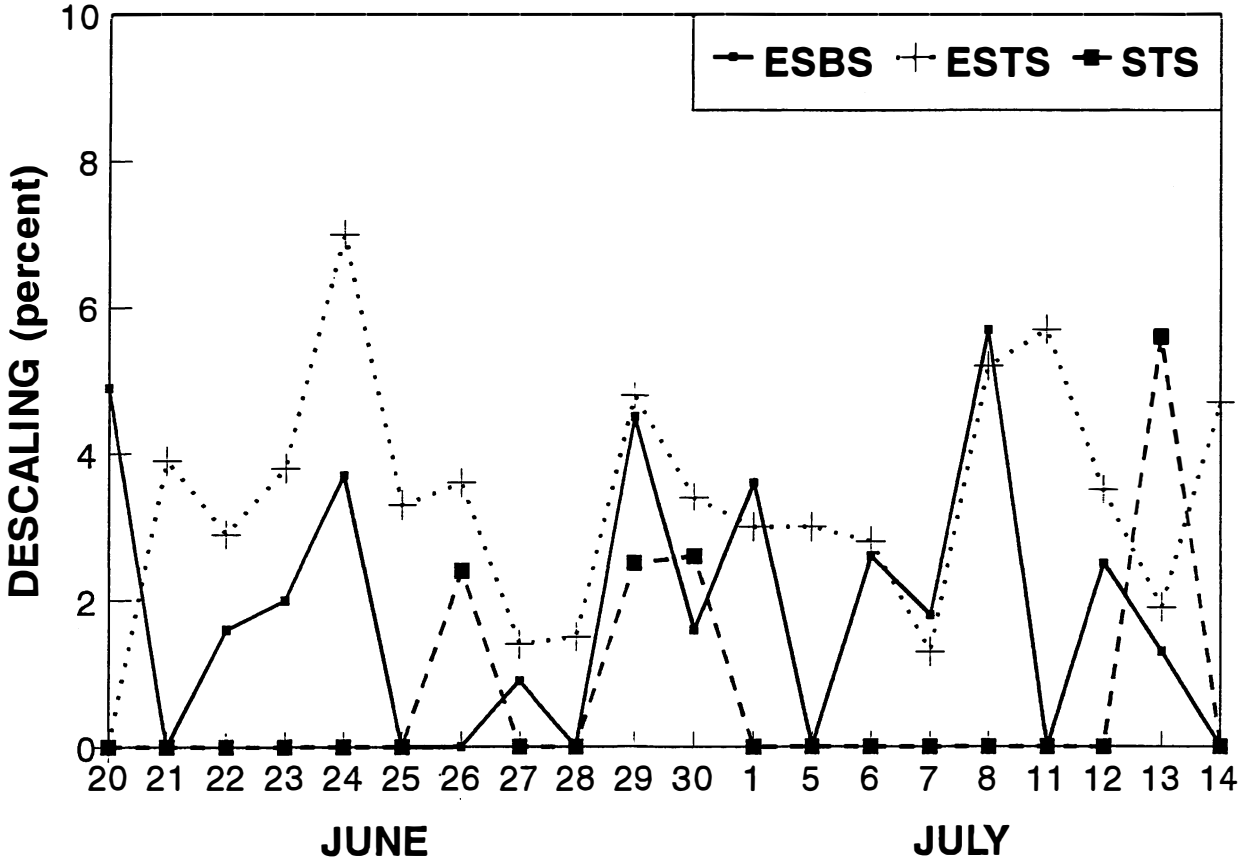

Figure 8.--Daily descaling rates for subyearling chinook salmon at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen, STS = standard-length submersible traveling screen).

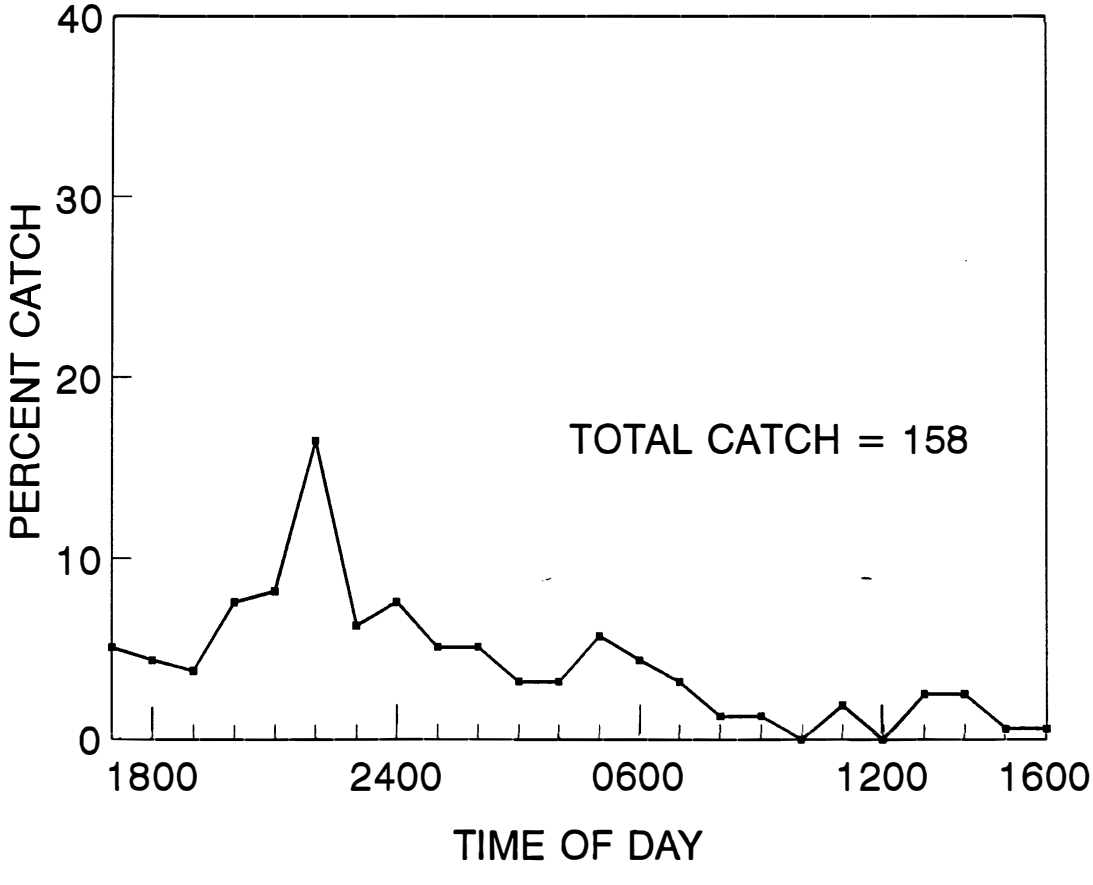

Figure 10.--Hourly gatewell dip-net catch (all salmonids combined), Slot 2B, The Dalles Dam, 3-4 May 1994.

CONCLUSIONS

1) Mean FGEs with the extended-length bar screen (69%) and the extended-length traveling screen (65%) were similar for yearling chinook salmon.
2) Although descaling rates were all low, the extended-length screens had significantly higher descaling rates (3.2% for the ESBS and 3.4% for the ESTS) than the STS (0%) for yearling chinook salmon.
3) Mean FGE with the extended-length submersible bar screen (54%) was significantly higher than with the extended-length submersible traveling screen (47%) for subyearling chinook salmon.
4) For subyearling chinook salmon, the extended-length submersible traveling screen had a significantly higher descaling rate (3.3%) than the extended-length submersible bar screen (1.8%) and the STS (0.7%). There was no significant difference between the descaling rates of the extended-length submersible bar screen and the STS.
5) Horizontal distribution measurements during spring and summer indicated that juvenile salmonid passage was considerably higher in the west turbine units of the powerhouse than in either the center or east units.

ACKNOWLEDGMENTS

We express our appreciation to our seasonal personnel for their interest and efforts during this study. We extend special thanks to the Portland District COE personnel, particularly Mr. John Ferguson, and at The Dalles Dam, Mr. Earl Miles, Mechanical Crew Foreman, Mr. Darryl Sterritt and Mr. Joe Ellis, shift leaders, Mr. Dale Rollins and Mr. Richard VanHoose, electricians, and Mr. Stephen Rich, Mr. Steven Dodson, and the members of the traveling screen crew, for their assistance and cooperation. We also extend special thanks to Mr. Wallace Iceberg and Mr. Phillip Weitz of our maintenance staff for their innovative ideas and efforts in the completion of this study.

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APPENDIX TABLES

Appendix Table 1.--Numbers of fish caught, by species, and fyke-net catch distributions for individual replicates of FGE tests at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen).

Date (test slot, screen type)

25 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot[1]	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1		2	1			1												
Level 2					4	2	1	7												
Level 3		1		1	8		5	13												
Level 4	1	2		3	5	20	19	44												
Level 5	2	4	2	8	14	11	17	42												
Level 6			2	2	7		5	12												
Level 7					1		3	4												
Net total	4	8	4	16	40	33	50	123												
Gatewell				2				336				7								
Total				18				459				7								
FGE (%)				11				73				100								

25 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	4	3	2	9	4	2	1	7												
Level 3		1		1	4	3	1	8												
Level 4		1	1	2	7	10	6	23												
Level 5		1		1	5	8	9	22												
Level 6					2	7	7	16			1	1								
Level 7			1	1			2	2												
Net total	4	6	4	14	22	30	26	78			1	1								
Gatewell				2				133												1
Total				16				211				1								1
FGE (%)				13				63				0								100

26 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2			1	1	2	3	2	7			1	1								
Level 3					4	1	1	6	2		1	3								
Level 4					1	7	8	16	1		1	2								
Level 5					3	11	8	22	3	1		4								
Level 6	2		2	4	5	2	9	16		2		2								
Level 7																				
Net total	3		3	6	15	24	28	67	6	3	3	12								
Gatewell								172				36								
Total				6				239				48								
FGE (%)				0				72				75								

[1] L = left, C = center, and R = right fyke-net column; Tot = total catch for net level.

Appendix Table 1.--Continued.

26 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1							1	1												
Level 2	7		6	13	4	1	4	9		1		1								
Level 3					2	5		7												
Level 4	3		1	4	3	6	1	10		2		2								
Level 5	1	3	1	5	4	10	12	26		1	1	2								
Level 6		2	2	4	3	4	2	9	1	1		2								
Level 7		1		1																
Net total	11	6	10	27	16	26	20	62	1	5	1	7								
Gatewell				1				186				41								
Total				28				248				48								
FGE (%)				4				75				85								

27 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2					3			3												
Level 3					7			7												
Level 4	1			1	4	7	1	12	1	1		2								
Level 5		3		3	2	6	3	11												
Level 6	1			1	3	2	4	9	1			1								
Level 7											1	1								
Net total	2	3		5	19	15	8	42	2	1	1	4								
Gatewell				2				139				21								
Total				7				181				25								
FGE (%)				29				77				84								

27 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2		4	6			2	2												
Level 2	5	3	2	10	3	1	1	5	1			1								
Level 3					1			1												
Level 4	1			1	4	3	1	8		1	1	2								
Level 5		1		1	7	10	9	26			1	1								
Level 6	3	1		4	4	2	3	9												
Level 7						1	2	3	1			1								
Net total	11	5	6	22	19	17	18	54	2	1	2	5								
Gatewell				1				109				13								
Total				23				163				18								
FGE (%)				4				67				72								

Appendix Table 1.--Continued.

28 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2					1			1	1			1								
Level 3	1			1	1	2	4	7												
Level 4					1	1	6	8												
Level 5	1	1	2	4	2	5	2	9			1	1								
Level 6	1			1		5		5												
Level 7	1			1																
Net total	4	1	2	7	5	13	12	30	1		1	2								
Gatewell				1				118				9								
Total				8				148				11								
FGE (%)				13				80				82								

28 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1		2	1			1			1	1								
Level 2	4	1	5	10			1	1												
Level 3	1	1		2	1			1												
Level 4						2	2	4												
Level 5	2	1	3	6	1		2	3												
Level 6	2		3	5	3	1		4												
Level 7		1		1																
Net total	10	5	11	26	6	3	5	14			1	1								
Gatewell				2				50				3								
Total				28				64				4								
FGE (%)				7				78				75								

29 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			1	1		1		1												
Level 2			2	2	2	2	1	5												
Level 3					1	1	1	3												
Level 4	2	2	1	5	3	2	5	10			2	2								
Level 5	2		2	4	1	4	2	7												
Level 6		1	3	4	2		4	6		1	1	2								
Level 7	1	1		2																
Net total	5	4	9	18	9	10	13	32		1	3	4								
Gatewell				2				137				22								
Total				20				169				26								
FGE (%)				10				81				85								

Appendix Table 1.--Continued.

29 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	4	5	4	13		2	1	3												
Level 3		2	1	3						1		1								
Level 4	1	1	1	3		3	2	5			1	1								
Level 5	1		2	3	1	1	2	4	1			1								
Level 6	1	3	1	5	3	1	2	6												
Level 7		1	3	4	1		1	2												
Net total	8	12	12	32	5	7	8	20	1	1	1	3								
Gatewell				2				83				16								
Total				34				103				19								
FGE (%)				6				81				84								

30 April (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1						1		1												
Level 2	1	2	1	4	3	1	2	6												
Level 3	2	2		4	2	1	1	4			2	2								
Level 4	1	1	2	4	2	4	3	9												
Level 5	1	4		5	3	3	3	9			1	1								
Level 6	3	1	1	5	3	2	3	8			1	1								
Level 7		1	1	2			1	1												
Net total	8	11	5	24	13	12	13	38			4	4								
Gatewell				4				112				18								3
Total				28				150				22								3
FGE (%)				14				75				82								100

30 April (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1						1		1												
Level 2	2	9	1	12																
Level 3	3			3	1			1												
Level 4		1		1	2	1	4	7												
Level 5	3	1	1	5	2	5	2	9												
Level 6	1			1	3	1	3	7												
Level 7		2	1	3																
Net total	9	13	3	25	8	8	9	25												
Gatewell				7				55				8								
Total				32				80				8								
FGE (%)				22				69				100								

Appendix Table 1.--Continued.

13 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1	1	3							1	1						2	2	4
Level 2	6	1	1	8			1	1									3	2		5
Level 3		1		1	5	2	2	9									4	2	2	8
Level 4	2	3	1	6	6	7	1	14	2			2	1			1	4	3	4	11
Level 5	2	8		10	5	12	10	27	1			1	1			1	7		4	11
Level 6	1	1	4	6	4	8	11	23	1		1	2					10	2	8	20
Level 7						1	1	2												
Net total	12	15	7	34	20	30	26	76	4		2	6	2			2	28	11	20	59
Gatewell				21				115				20				31				80
Total				55				191				26				33				139
FGE (%)				38				60				77				94				58

13 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	1	2	2	5		1		1							1	1	2	2		4
Level 3			1	1	1		3	4									4	1	2	7
Level 4	4	5	4	13	5	6	2	13					1	1		2	3	4	3	10
Level 5	2	1	3	6	3	7	3	13	1		1	2		2		2	13	12	7	32
Level 6	4	1	1	6	4	9	10	23		1		1		1		1	9	8	10	27
Level 7					3	2	2	7						1		1	3	2	1	6
Net total	12	9	11	32	16	25	20	61	1	1	1	3		5	2	7	34	29	23	86
Gatewell				25				101				11				8				48
Total				57				162				14				15				134
FGE (%)				44				62				79				53				36

14 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			1	1													1		1	2
Level 2	1	1		2		1	1	2											1	1
Level 3	1	1	1	3	2		3	5						1		1	1			1
Level 4	1	2	4	7	6		1	7					1	1		2				
Level 5	2	4	4	10	8	2	5	15	1	1		2			1	1	2		1	3
Level 6	5	1	3	9	2	1	5	8		2	1	3			1	1	1		1	2
Level 7	2			2	2	5	3	10		1		1					1			1
Net total	12	9	13	34	20	9	18	47	1	4	1	6	1	2	2	5	6		4	10
Gatewell				30				54				11				17				14
Total				64				101				17				22				24
FGE (%)				47				53				65				77				58

Appendix Table 1.--Continued.

14 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	4	5	2	11	1	1		2	1			1						1		1
Level 3	2	1	2	5	1			1		1		1								
Level 4	9	3	2	14	1	2	1	4									1	1		2
Level 5	9	3	6	18	2	1	2	5	2			2						2	1	3
Level 6	7	6	4	17	2	2	3	7					1	1		2	2			2
Level 7	1	1	3	5			1	1	1			1					1		1	2
Net total	32	19	19	70	7	6	7	20	4	1		5	1	1		2	4	4	2	10
Gatewell				18				20				11				1				3
Total				88				40				16				3				13
FGE (%)				20				50				69				33				23

15 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2	1		3	4	1	1	1	3	2		1	3						2	1	3
Level 3	3		1	4	1		1	2	4			4								
Level 4	5	6	5	16	4	4	2	10	4		1	5	1		1	2	1	2		3
Level 5	6	12	8	26	6	7	7	20	1	3	3	7	3	3	1	7		3		3
Level 6	4	4	3	11	4	4	1	9	4	4	2	10			3	3		1		1
Level 7					1			1												
Net total	20	22	21	63	17	16	12	45	15	7	7	29	4	3	5	12	1	8	1	10
Gatewell				59				119				91				89				9
Total				122				164				120				101				19
FGE (%)				48				73				76				88				47

15 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1													1			1
Level 2	5	4	3	12	3	1	1	5	1	2		3			1	1		2	2	4
Level 3							1	1	3			3		1		1				
Level 4	4	7	3	14	6	8	2	16	1	2	1	4			1	1	2	2	2	6
Level 5	9	5	9	23	10	14	16	40		2	5	7	1	1	3	5	4		6	10
Level 6	9	8	9	26	10	14	11	35	2	4	2	8	1	3	2	6		1		1
Level 7	3	3	2	8		2	2	4												
Net total	31	27	26	84	29	39	33	101	7	10	8	25	2	5	7	14	7	5	10	22
Gatewell				102				202				100				108				27
Total				186				303				125				122				49
FGE (%)				55				67				80				89				55

Appendix Table 1.--Continued.

16 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		2	3							2	2								
Level 2	2	2	4	8		1		1			1	1	1		1	2				
Level 3	5	3		8	3		2	5			2	2			1	1	1			1
Level 4	8	14	9	31	10	3		13		1		1	1	3	1	5	1			1
Level 5	9	15	11	35	1	7	3	11	1			1	2			2	2			2
Level 6	7	11	8	26	3	4	4	11									3		1	4
Level 7	1		1	2																
Net total	33	45	35	113	17	15	9	41	1	1	5	7	4	3	3	10	7		1	8
Gatewell				84				65				29				33				15
Total				197				106				36				43				23
FGE (%)				43				61				81				77				65

16 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1	1	3							1	1								
Level 2	7	4	2	13		1	1	2	2			2	1			1				
Level 3	3	3	3	9	1			1	1		1	2					1		1	2
Level 4	7	3	8	18	3			3	1			1					1		1	2
Level 5	16	12	12	40	2	5	4	11	1	2	2	5			1	1		1		1
Level 6	9	12	11	32	4	4	2	10			2	2	2	1		3				
Level 7			2	2			2	2												
Net total	43	35	39	117	10	10	9	29	5	2	6	13	3	1	1	5	2	1	2	5
Gatewell				58				20				14				17				8
Total				175				49				27				22				13
FGE (%)				33				41				52				77				62

17 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1			2	2												
Level 2	4	3	3	10	4	1		5									1			1
Level 3	4	3	1	8	1	1	3	5												
Level 4	8	7	3	18	7		4	11	1		2	3			1	1		1		1
Level 5	7	8	8	23	4	7	7	18	4	2	2	8			2	2				
Level 6	5	7	8	20	6	6	5	17	1	1	2	4			1	1	1			1
Level 7	2	3		5	1			1												
Net total	31	31	23	85	23	15	21	59	6	3	6	15			4	4	2	1		3
Gatewell				119				95				28				38				13
Total				204				154				43				42				16
FGE (%)				58				62				65				90				81

Appendix Table 1.--Continued.

17 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2	1			1												
Level 2	8	5	5	18							1	1								
Level 3	1	1	1	3			2	2											1	1
Level 4	7	9	11	27	3	1		4		2		2							1	2
Level 5	10	10	10	30	3	2	3	8	1		1	2							1	1
Level 6	5	9	11	25	3	3		6		1		1								
Level 7	3	2	2	7		1		1												
Net total	35	36	41	112	10	7	5	22	1	3	2	6							2	2	4
Gatewell				84				19				11				4				2
Total				196				41				17				4				6
FGE (%)				43				46				65				100				33

18 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	2		4	6	1	1		2	1			1							1	1	2
Level 3	3	1	1	5					1		2	3								
Level 4	5	3	2	10	1	1	2	4												
Level 5	9	8	9	26	2	3	3	8					1			1	1			1
Level 6	1		3	4	1	3	1	5		1		1								
Level 7	1		2	3			1	1												
Net total	22	12	21	55	5	8	7	20	2	1	2	5	1			1	1	1	1	3
Gatewell				63				45				14				15				9
Total				118				65				19				16				12
FGE (%)				53				69				74				94				75

18 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1		2																
Level 2	4	5		9		1	1	2												
Level 3	3		1	4	1			1			1	1								
Level 4	5	8	1	14	2	3	1	6			1	1								
Level 5	4	7	5	16	5	2	2	9	1			1							1	1
Level 6	1	5	3	9																
Level 7			1	1			2	2												
Net total	18	26	11	55	8	6	6	20	1		2	3							1	1
Gatewell				49				19				2				6				1
Total				104				39				5				6				2
FGE (%)				47				49				40				100				50

Appendix Table 1.--Continued.

19 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1					1			1								
Level 2		1	3	4	1			1												
Level 3	2	1	1	4	2	1		3												
Level 4	4	4	3	11	1	2		3		2		2								
Level 5	6	5	4	15	2		4	6			1	1					1			1
Level 6	4	3	3	10	3	1		4		1	1	2	1			1				
Level 7	1	2		3																
Net total	18	16	14	48	9	4	4	17	1	3	2	6	1			1	1			1
Gatewell				76				21				12				10				5
Total				124				38				18				11				6
FGE (%)				61				55				68				91				83

19 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			2	2		1		1												
Level 2	3	4	2	9						1		1								
Level 3																				
Level 4	4	4	4	12					1			1								
Level 5	6	5	3	14			2	2												
Level 6	4	4	9	17		1		1						1		1			1	1
Level 7			1	1																
Net total	17	17	21	55		2	2	4	1	1		2		1		1			1	1
Gatewell				33				9				2				5				4
Total				88				13				4				6				5
FGE (%)				38				69				50				83				80

20 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1		1		1																
Level 2	1		3	4	1			1		1		1								
Level 3	5	4		9	2			2												
Level 4	7	8	4	19	2	1	1	4												
Level 5	2	8	7	17	1	1	1	3	1		2	3								
Level 6	2	5	9	16		1	2	3	1			1								
Level 7	1			1						1		1								
Net total	18	26	23	67	6	3	4	13	2	2	2	6								
Gatewell				104				37				21				24				4
Total				171				50				27				24				4
FGE (%)				61				74				78				100				100

Appendix Table 1.--Continued.

20 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2	2	4		6																
Level 3	1	4	3	8															1	1
Level 4	7	5	3	15							1	1			1	1				
Level 5	6	6	9	21	1			1	1		3	4								
Level 6	6	1	6	13			1	1	1	2		3								
Level 7		1	1	2																
Net total	23	21	23	67	1		1	2	2	2	4	8			1	1			1	1
Gatewell				81				20				14				8				5
Total				148				22				22				9				6
FGE (%)				55				91				64				89				83

23 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	4	1	2	7																
Level 3	2	5	2	9																
Level 4	10	7	3	20	1		1	2									1			1
Level 5	12	8	11	31		2	1	3	1		1	2								
Level 6	11	6	7	24							1	1								
Level 7			2	2			1	1												
Net total	39	27	27	93	1	2	3	6	1		2	3					1			1
Gatewell				107				25				10				2				
Total				200				31				13				2				1
FGE (%)				54				81				77				100				0

23 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1		1	1	2																
Level 2	1	1	2	4			1	1												
Level 3		3	1	4					1			1								
Level 4	5	8	6	19														1		1
Level 5	14	6	8	28														1		1
Level 6	12	6	6	24																
Level 7		1	1	2																
Net total	32	26	25	83			1	1	1			1						2		2
Gatewell				52				6				7				2				1
Total				135				7				8				2				3
FGE (%)				39				86				88				100				33

Appendix Table 1.--Continued.

24 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2	1			1																
Level 3	3	3	6	12																
Level 4	4	7	4	15	2			2												
Level 5	4	7	6	17	2			2		1	2	3								
Level 6	3	3	2	8	1	1		2												
Level 7	1	2	1	4		2		2	1			1								
Net total	17	22	20	59	5	3		8	1	1	2	4								
Gatewell				89				12				18				9				2
Total				148				20				22				9				2
FGE (%)				60				60				82				100				100

24 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	5	3	1	9					1		1	2								
Level 3	1	2	1	4					1	1		2								
Level 4	8	6	5	19													1			1
Level 5	8	4	10	22					1			1								
Level 6	7	6	3	16			1	1			1	1								
Level 7	1	1	1	3																
Net total	30	22	21	73			1	1	3	1	2	6					1			1
Gatewell				75				8				8				1				1
Total				148				9				14				1				2
FGE (%)				51				89				57				100				50

25 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		3	4							1	1								
Level 2	5	1	2	8		1	1	2	1	1	1	3								
Level 3	3	1	3	7	2	1		3		1	1	2								
Level 4	4	4	1	9	3	1	3	7	1	1	1	3						1		1
Level 5	1	4		5	1	1	2	4		1		1								
Level 6	1	3	2	6	1	1	2	4		1		1					1			1
Level 7					1			1												
Net total	15	13	11	39	8	5	8	21	2	5	4	11					1	1		2
Gatewell				67				43				42				5				12
Total				106				64				53				5				14
FGE (%)				63				67				79				100				86

Appendix Table 1.--Continued.

25 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1		1	1	2																
Level 2	2	4	3	9	1	1		2												
Level 3	2	1		3			1	1	1	1		2								
Level 4	4	1	3	8			2	2		3	1	4								
Level 5	8	6	4	18			1	1		2		2								
Level 6		3	2	5		4	2	6	1			1					1			1
Level 7	4		1	5	2		1	3	1			1								
Net total	20	16	14	50	3	5	7	15	3	6	1	10					1			1
Gatewell				27				19				33				3				4
Total				77				34				43				3				5
FGE (%)				35				56				77				100				80

26 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2			2																
Level 2	2	1	2	5	1	1	1	3		1		1							1	1
Level 3	2	1	1	4		2		2	1			1								
Level 4	3	3	1	7	1			1			1	1							1	1
Level 5	6	3	3	12	1	2	1	4		1		1							1	1
Level 6	2	2	1	5	1	1	1	3												
Level 7										1		1								
Net total	17	10	8	35	4	6	3	13	1	3	1	5							3	3
Gatewell				53				30				35				8				3
Total				88				43				40				8				6
FGE (%)				60				70				88				100				50

26 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1			1		1		1			1	1								
Level 3		2		2						1	1	2							1	1
Level 4	1	4	2	7					1	1	1	3								
Level 5	4	2	4	10		1		1	1			1							1	1
Level 6		3	3	6	1	2	3	6		2	1	3					2			2
Level 7					1			1												
Net total	6	11	9	26	2	4	3	9	2	4	4	10					2		2	4
Gatewell				53				11				18				2				8
Total				79				20				28				2				12
FGE (%)				67				55				64				100				67

Appendix Table 1.--Continued.

27 May (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			1	1															1	1
Level 2	1	1		2	1			1												
Level 3		1		1					1	1		2								
Level 4	2	4	1	7		1	2	3		1	2	3					1			1
Level 5	7	2	3	12	1	3	3	7		2	2	4								
Level 6	2	1		3	1			1			2	2								
Level 7									1			1								
Net total	12	9	5	26	3	4	5	12	2	4	6	12					1	1		2
Gatewell				69				36				34				8				9
Total				95				48				46				8				11
FGE (%)				73				75				74				100				82

27 May (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2	3	3	8			1	1	1			1						1		1
Level 3							1	1												
Level 4	2	1	1	4		2		2												
Level 5	2	8	3	13			1	1			1	1								
Level 6	2	1	3	6		2	2	4									1			1
Level 7	2			2													1			1
Net total	10	13	10	33		4	5	9	1		1	2					2	1		3
Gatewell				49				25				22				3				8
Total				82				34				24				3				11
FGE (%)				60				74				92				100				73

20 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	3	2	3	8			1	1												
Level 3	5	3	2	10																
Level 4	5	2	5	12																
Level 5	13	5	6	24																
Level 6	3	4	6	13																
Level 7		1		1																
Net total	29	17	22	68			1	1												
Gatewell				103				8				6								1
Total				171				9				6								1
FGE (%)				60				89				100								100

Appendix Table 1.--Continued.

20 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2			2																
Level 2	2	3	1	6																
Level 3	2		1	3																
Level 4	6	6	1	13																
Level 5	7	7	7	21																
Level 6	6	3		9			1	1					1			1				
Level 7	1			1																
Net total	26	19	10	55			1	1					1			1				
Gatewell				31								4								
Total				86				1				4				1				
FGE (%)				36				0				100				0				

21 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2			2																
Level 2	2	1	5	8		1		1												
Level 3	6	1	1	8														1		1
Level 4	4	5	6	15			1	1												
Level 5	4	9	4	17	1			1												
Level 6	4	4	8	16																
Level 7		2		2																
Net total	22	22	24	68	1	1	1	3										1		1
Gatewell				132				6				1								
Total				200				9				1								1
FGE (%)				66				67				100								0

21 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2			2	2																
Level 3	1	2		3																
Level 4	3	5	1	9																
Level 5	4	7	3	14																
Level 6	2	3	2	7																
Level 7	1		1	2																
Net total	12	17	10	39																
Gatewell				51				1												
Total				90				1												
FGE (%)				57				100												

Appendix Table 1.--Continued.

22 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	3	1		4																
Level 3	2		3	5																
Level 4	10	8	3	21																
Level 5	9	2	3	14	1			1												
Level 6	2	2	1	5	1	1		2												
Level 7	1		1	2																
Net total	27	13	11	51	2	1		3												
Gatewell				63				2				2								
Total				114				5				2								
FGE (%)				55				40				100								

22 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2	3	1	6																
Level 3	4	1		5																
Level 4	2	1	4	7																
Level 5	3	4	3	10					1			1								
Level 6	3	4	1	8																
Level 7	1			1																
Net total	15	13	9	37					1			1								
Gatewell				69				5												
Total				106				5				1								
FGE (%)				65				100				0								

23 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1		1	2																
Level 3	2	1	3	6																
Level 4	3	3	1	7																
Level 5	2	5	4	11																
Level 6	1	1	2	4							1	1								
Level 7	2	1		3																
Net total	11	11	11	33							1	1								
Gatewell				50				1												
Total				83				1				1								
FGE (%)				60				100				0								

Appendix Table 1.--Continued.

23 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	3	2	1	6																
Level 3	1		3	4																
Level 4	5	5	3	13	1			1												
Level 5	7	8	5	20																
Level 6	3	5	7	15	1		1	2												
Level 7		2		2																
Net total	20	22	19	61	2		1	3												
Gatewell				53				2				3								1
Total				114				5				3								1
FGE (%)				46				40				100								100

24 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			1	1																
Level 2	5	1		6																
Level 3	1		3	4																
Level 4	6		3	9																
Level 5		2	1	3																
Level 6		3		3																
Level 7																				
Net total	12	6	8	26																
Gatewell				81				7				3								1
Total				107				7				3								1
FGE (%)				76				100				100								100

24 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2			2																
Level 2	1			1																
Level 3	1		2	3																
Level 4	3	1	1	5																
Level 5	4	3	4	11																
Level 6	1	2	2	5	1		1	2												
Level 7		2		2	1			1												
Net total	12	8	9	29	2		1	3												
Gatewell				43				5												
Total				72				8												
FGE (%)				60				63												

Appendix Table 1.--Continued.

25 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2		1	1	2																
Level 3	2	1	1	4																
Level 4	8	8	6	22	1			1												
Level 5	12	4	9	25																
Level 6	7	7	5	19			2	2												
Level 7	1	1	2	4																
Net total	31	22	25	78	1		2	3												
Gatewell				68				5				2								
Total				146				8				2								
FGE (%)				47				63				100								

25 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1	2		3																
Level 3	3			3																
Level 4	4	6	4	14																
Level 5	10	9	8	27			1	1												
Level 6	10	8	6	24		1		1												
Level 7			1	1																
Net total	28	25	19	72		1	1	2												
Gatewell				61				3												1
Total				133				5												1
FGE (%)				46				60												100

26 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			1	1																
Level 2	4			4						1		1								
Level 3	5	3	2	10																
Level 4	6	7	3	16																
Level 5	8	8	3	19	1			1												
Level 6	6	7	8	21	1			1												
Level 7	2	4	1	7																
Net total	31	29	18	78	2			2		1		1								
Gatewell				89				2				2								
Total				167				4				3								
FGE (%)				53				50				67								

Appendix Table 1.--Continued.

26 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1									1			1								
Level 2	4	2	2	8																
Level 3		5		5																
Level 4	9	11	5	25	1			1												
Level 5	12	12	12	36	1			1												
Level 6	8	14	9	31	1	1	1	3												
Level 7	4	1	2	7																
Net total	37	45	30	112	3	1	1	5	1			1								
Gatewell				84				6												1
Total				196				11				1								1
FGE (%)				43				55				0								100

27 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2		4	3	7																
Level 3	3	3	6	12			1	1												
Level 4	5	13	8	26	2			2		1		1						1		1
Level 5	10	13	11	34	1	1		2												
Level 6	16	17	11	44																
Level 7	3	3		6																
Net total	38	53	40	131	3	1	1	5		1		1						1		1
Gatewell				110				4				3								
Total				241				9				4								1
FGE (%)				46				44				75								0

27 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1	1	3																
Level 2	5	1	2	8																
Level 3	5	4	4	13			1	1												
Level 4	8	13	13	34																
Level 5	15	14	16	45	1			1												
Level 6	13	14	15	42			2	2									1			1
Level 7	2	2	2	6																
Net total	49	49	53	151	1		3	4									1			1
Gatewell				139				3				4				1				1
Total				290				7				4				1				2
FGE (%)				48				43				100				100				50

Appendix Table 1.--Continued.

28 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	5	1	3	9																
Level 3	2		4	6																
Level 4	3	1	2	6																
Level 5	1	1	1	3																
Level 6	1	2	1	4																
Level 7			1	1																
Net total	13	5	12	30																
Gatewell				62				6				2								
Total				92				6				2								
FGE (%)				67				100				100								

28 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2		1		1																
Level 3	1		1	2																
Level 4	1	1	3	5																
Level 5	4	2	6	12						1	1									
Level 6	3	3	3	9						1	1									
Level 7		2		2																
Net total	9	9	13	31						2	2									
Gatewell				68				10				2				1				
Total				99				10				4				1				
FGE (%)				69				100				50				100				

29 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2			2																
Level 2	4	2	3	9																
Level 3	2		2	4																
Level 4	1		2	3																
Level 5	4	10	6	20																
Level 6		1		1																
Level 7		1		1																
Net total	13	14	13	40																
Gatewell				67								1								
Total				107								1								
FGE (%)				63								100								

Appendix Table 1.--Continued.

29 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1	1	1	3																
Level 3	5	1	1	7																
Level 4	1	4	3	8																
Level 5	3	5	8	16		1		1												
Level 6	3	4	6	13																
Level 7	1	1	1	3																
Net total	14	16	20	50		1		1												
Gatewell				63																
Total				113				1												
FGE (%)				56				0												

30 June (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1		1	2																
Level 3	2	1	2	5																
Level 4		1	3	4																
Level 5	4	1	5	10																
Level 6	1	1	1	3																
Level 7																				
Net total	8	4	12	24																
Gatewell				62																
Total				86																
FGE (%)				72																

30 June (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1	1	2	4																
Level 3	1	1	1	3																
Level 4	8	1	3	12	1			1												
Level 5	6	2	5	13																
Level 6	8	4	2	14																
Level 7	1		1	2																
Net total	25	9	14	48	1			1												
Gatewell				59				2				1				1				
Total				107				3				1				1				
FGE (%)				55				67				100				100				

Appendix Table 1.--Continued.

1 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2																				
Level 3	2	2		4																
Level 4	4	2	3	9																
Level 5	6	7	4	17																
Level 6		6	6	12																
Level 7		1		1																
Net total	12	18	13	43																
Gatewell				55				1				1								
Total				98				1				1								
FGE (%)				56				100				100								

1 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2		1	3																
Level 3	1		1	2																
Level 4	12	5	8	25	1	2		3												
Level 5	8	7	7	22		1		1												
Level 6	6	13	3	22																
Level 7	2		3	5																
Net total	31	25	23	79	1	3		4												
Gatewell				67				1				2								
Total				146				5				2								
FGE (%)				46				20				100								

5 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	1	1	2	4																
Level 3	3	3	5	11																
Level 4	6	9	5	20																
Level 5	8	10	6	24	1			1												
Level 6	8	10	10	28		1		1	1			1								
Level 7	2	2		4																
Net total	29	35	28	92	1	1		2	1			1								
Gatewell				71				1				1								
Total				163				3				2								
FGE (%)				44				33				50								

Appendix Table 1.--Continued.

5 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1		1	2																
Level 2	2		2	4																
Level 3	2	5	2	9																
Level 4	18	21	6	45							1	1								
Level 5	18	14	23	55			1	1												
Level 6	8	21	17	46	2	1	1	4												
Level 7	5	1	4	10																
Net total	54	62	55	171	2	1	2	5			1	1								
Gatewell				132				1				1								
Total				303				6				2								
FGE (%)				44				17				50								

6 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2	3	2	1	6																
Level 3	1	5	3	9		1		1												
Level 4	10	17	9	36																
Level 5	8	12	9	29																
Level 6	21	18	16	55																
Level 7	2		3	5																
Net total	46	54	41	141		1		1												
Gatewell				76				3				1								
Total				217				4				1								
FGE (%)				35				75				100								

6 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2		4	1	5																
Level 3	8	7	4	19																
Level 4	20	17	17	54																
Level 5	31	20	27	78																
Level 6	23	20	21	64			1	1												
Level 7	5	3	4	12																
Net total	87	71	74	232			1	1												
Gatewell				141				1												
Total				373				2												
FGE (%)				38				50												

Appendix Table 1.--Continued.

7 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	2		1	3																
Level 2	1	1		2																
Level 3	2	1		3																
Level 4	3	4	4	11																
Level 5	2	2	7	11																
Level 6	8	7		15																
Level 7		1	1	2																
Net total	18	16	13	47																
Gatewell				56				1				1								
Total				103				1				1								
FGE (%)				54				100				100								

7 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1			1																
Level 2																				
Level 3	2		2	4																
Level 4	6	6	3	15	1			1												
Level 5	11	13	9	33																
Level 6	8	10	11	29																
Level 7	2	3	3	8																
Net total	30	32	28	90	1			1												
Gatewell				76				1				3								
Total				166				2				3								
FGE (%)				46				50				100								

8 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2			2																
Level 3		1	1	2					1			1								
Level 4	11	9	2	22						1		1								
Level 5	14	17	11	42																
Level 6	13	22	16	51		1		1												
Level 7	1	5	2	8																
Net total	41	54	32	127		1		1	1	1		2								
Gatewell				35								6								
Total				162				1				8								
FGE (%)				22				0				75								

8 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	3	1	2	6																
Level 3	1			1																
Level 4	17	19	9	45																
Level 5	30	35	30	95																
Level 6	34	30	15	79																
Level 7	5	7	7	19			1	1												
Net total	90	92	63	245			1	1												
Gatewell				115				1				1				1				
Total				360				2				1				1				
FGE (%)				32				50				100				100				

11 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	3			3																
Level 3	2	2	1	5																
Level 4	5	6	6	17																
Level 5	8	9	4	21																
Level 6	6	8	5	19																
Level 7	1	1	1	3																
Net total	25	26	17	68																
Gatewell				39																
Total				107																
FGE (%)				36																

11 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	1		4	5																
Level 3	1	3		4																
Level 4	16	10	4	30																
Level 5	13	17	4	34																
Level 6	20	19	9	48																
Level 7	3	1	6	10																
Net total	54	50	27	131																
Gatewell				87																
Total				218																
FGE (%)				40																

Appendix Table 1.--Continued.

12 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1			2	2																
Level 2	2	1	2	5																
Level 3	5		4	9																
Level 4	6	5	5	16																
Level 5	9	9	3	21																
Level 6	1	7	2	10																
Level 7			1	1																
Net total	23	22	19	64																
Gatewell				122																
Total				186																
FGE (%)				66																

12 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2			2																
Level 3		2	1	3																
Level 4	9	8	5	22																
Level 5	16	21	13	50																
Level 6	24	8	17	49																
Level 7	4	4	4	12																
Net total	55	43	40	138																
Gatewell				114				1												
Total				252				1												
FGE (%)				45				100												

13 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1	1	1	2	4																
Level 2	3	1	2	6																
Level 3	11	4	4	19																
Level 4	11	1	7	19																
Level 5	27	14	10	51																
Level 6	7	8	5	20																
Level 7			2	2																
Net total	60	29	32	121																
Gatewell				150																
Total				271																
FGE (%)				55																

Appendix Table 1.--Continued.

13 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	8	2		10																
Level 3	3	4	1	8																
Level 4	8	22	3	33																
Level 5	22	16	19	57																
Level 6	17	22	10	49																
Level 7	5	6	3	14																
Net total	63	72	36	171																
Gatewell				103																
Total				274																
FGE (%)				38																

14 July (18B, ESBS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2		1	1	2																
Level 3	1		2	3																
Level 4	2	2	2	6																
Level 5	4	6	2	12																
Level 6	4	7	2	13																
Level 7	1	2		3																
Net total	12	18	9	39																
Gatewell				27																
Total				66																
FGE (%)				41																

14 July (19B, ESTS)

Location	Subyearling chinook				Yearling chinook				Steelhead				Coho				Sockeye			
	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot	L	C	R	Tot
Level 1																				
Level 2	2			2																
Level 3	2		1	3																
Level 4	4	5	3	12																
Level 5	10	8	4	22																
Level 6	7	5	6	18																
Level 7	3	1	1	5																
Net total	28	19	15	62																
Gatewell				43																
Total				105																
FGE (%)				41																

Appendix Table 2.--Descaling data from fish guidance efficiency and descaling tests at The Dalles Dam, 1994 (ESBS = extended-length submersible bar screen, ESTS = extended-length submersible traveling screen, STS = standard-length submersible traveling screen).

Unit 18, Slot A: ESBS (25% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April				1	50	2.0	1	5	20.0						
19 April				1	28	3.6		1	0.0						
20 April					25	0.0		2	0.0						
21 April				2	114	1.8		5	0.0						
22 April		1	0.0	9	183	4.9		5	0.0						

Unit 18, Slot B: ESBS (30% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April				3	51	5.9		6	0.0						
19 April		1	0.0	3	35	8.6		1	0.0						
20 April				2	67	3.0		2	0.0						
21 April		1	0.0	3	105	2.9		4	0.0						
22 April				2	220	0.9		5	0.0						
25 April		2	0.0	7	336	2.1		7	0.0						
26 April				5	172	2.9	1	36	2.8						
27 April		2	0.0	3	139	2.2		21	0.0						
28 April		1	0.0	1	118	0.8	3	9	33.3						
29 April		2	0.0	3	137	2.2	2	22	9.1						
30 April		4	0.0	2	112	1.8		18	0.0					3	0.0
13 May		21	0.0	2	115	1.7		20	0.0	1	31	3.2	7	80	8.8
14 May		30	0.0	6	54	11.1		11	0.0		17	0.0	4	14	28.6
15 May		59	0.0	4	119	3.4		91	0.0	1	89	1.1		9	0.0
16 May		84	0.0	3	65	4.6	1	29	3.4	1	33	3.0	1	15	6.7
17 May		119	0.0		95	0.0	1	28	3.6		38	0.0	1	13	7.7
18 May		63	0.0		45	0.0		14	0.0		15	0.0		9	0.0
19 May		76	0.0		21	0.0	1	12	8.3		10	0.0		5	0.0
20 May		104	0.0		37	0.0		21	0.0		24	0.0		4	0.0
23 May		107	0.0	1	25	4.0	1	10	10.0		2	0.0			
24 May		89	0.0		12	0.0	1	18	5.6		9	0.0		2	0.0

Appendix Table 2.--Continued.

Unit 18, Slot B: ESBS (30% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
25 May	1	67	1.5	1	43	2.3		42	0.0		5	0.0	2	12	16.7
26 May		53	0.0	2	30	6.7		35	0.0		8	0.0	1	3	33.3
27 May		69	0.0	3	36	8.3	2	34	5.9		8	0.0	1	9	11.1
20 June	5	103	4.9	1	8	12.5		6	0.0					1	0.0
21 June		132	0.0		6	0.0	1	1	100.0						
22 June	1	63	1.6		2	0.0		2	0.0						
23 June	1	50	2.0		1	0.0									
24 June	3	81	3.7		7	0.0		3	0.0					1	0.0
25 June		68	0.0		5	0.0		2	0.0						
26 June		89	0.0		2	0.0	1	2	50.0						
27 June	1	110	0.9		4	0.0	1	3	33.3						
28 June		62	0.0		6	0.0		2	0.0						
29 June	3	67	4.5					1	0.0						
30 June	1	62	1.6												
1 July	2	55	3.6		1	0.0		1	0.0						
5 July		71	0.0		1	0.0		1	0.0						
6 July	2	76	2.6		3	0.0		1	0.0						
7 July	1	56	1.8		1	0.0		1	0.0						
8 July	2	35	5.7					6	0.0						
11 July		39	0.0												
12 July	3	122	2.5												
13 July	2	150	1.3												
14 July		27	0.0												

Unit 18, Slot C: ESBS (35% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April		1	0.0	1	45	2.2	1	6	16.7						
19 April		1	0.0		29	0.0	1	2	50.0						
20 April					22	0.0									
21 April					52	0.0		1	0.0						
22 April		1	0.0		131	0.0		6	0.0						

Appendix Table 2.--Continued.

Unit 19, Slot B: ESTS (39% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April	1	1	100.0	7	92	7.6		5	0.0						
19 April				5	56	8.9		2	0.0						
20 April		1	0.0	5	50	10.0									
21 April		1	0.0	4	33	12.1		2	0.0						
22 April		2	0.0	4	122	3.3	1	4	25.0						
25 April		2	0.0	1	133	0.8								1	0.0
26 April		1	0.0	2	186	1.1	1	41	2.4						
27 April		1	0.0	6	109	5.5		13	0.0						
28 April		2	0.0	3	50	6.0		3	0.0						
29 April		2	0.0	1	83	1.2	1	16	6.3						
30 April		7	0.0	3	55	5.5		8	0.0						
13 May		25	0.0		101	0.0		11	0.0		8	0.0	5	48	10.4
14 May		18	0.0	4	20	20.0		11	0.0		1	0.0		3	0.0
15 May	1	102	1.0	10	202	5.0	7	100	7.0	3	108	2.8	9	27	33.3
16 May	1	58	1.7	2	20	10.0	2	14	14.3	1	17	5.9	1	8	12.5
17 May	2	84	2.4	1	19	5.3		11	0.0		4	0.0		2	0.0
18 May		49	0.0		19	0.0		2	0.0		6	0.0		1	0.0
19 May		33	0.0		9	0.0		2	0.0		5	0.0	1	4	25.0
20 May		81	0.0		20	0.0		14	0.0		8	0.0		5	0.0
23 May	1	52	1.9	1	6	16.7		7	0.0		2	0.0		1	0.0
24 May		75	0.0		8	0.0		8	0.0		1	0.0		1	0.0
25 May		27	0.0		19	0.0		33	0.0	1	3	33.3		4	0.0
26 May	1	53	1.9	1	11	9.1		18	0.0		2	0.0		8	0.0
27 May	2	49	4.1	1	25	4.0	1	22	4.5		3	0.0	1	8	12.5
20 June		31	0.0					4	0.0						
21 June	2	51	3.9		1	0.0									
22 June	2	69	2.9	1	5	20.0									
23 June	2	53	3.8		2	0.0		3	0.0					1	0.0
24 June	3	43	7.0		5	0.0									
25 June	2	61	3.3		3	0.0								1	0.0
26 June	3	84	3.6		6	0.0							1	1	100.0
27 June	2	139	1.4		3	0.0	1	4	25.0		1	0.0	1	1	100.0
28 June	1	68	1.5		10	0.0		2	0.0		1	0.0			
29 June	3	63	4.8												
30 June	2	59	3.4		2	0.0		1	0.0		1	0.0			
1 July	2	67	3.0		1	0.0		2	0.0						
5 July	4	132	3.0		1	0.0		1	0.0						
6 July	4	141	2.8		1	0.0									
7 July	1	76	1.3		1	0.0		3	0.0						

Appendix Table 2.--Continued.

Unit 19, Slot B: ESTS (39% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
8 July	6	115	5.2		1	0.0		1	0.0		1	0.0			
11 July	5	87	5.7												
12 July	4	114	3.5		1	0.0									
13 July	2	103	1.9												
14 July	2	43	4.7					2	0.0						

Unit 19, Slot C: ESTS (44% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April		1	0.0	2	38	5.3		3	0.0						
19 April					17	0.0		2	0.0						
20 April		2	0.0	1	21	4.8									
21 April		5	0.0		10	0.0									
22 April		4	0.0		50	0.0									

Unit 20, Slot A: STS (48% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
18 April		19	0.0	2	33	6.1									
19 April		2	0.0		16	0.0		1	0.0						
20 April					12	0.0									
21 April		1	0.0		4	0.0									
22 April		1	0.0		32	0.0									
25 April					55	0.0									
26 April		4	0.0		53	0.0	1	10	10.0						
27 April		3	0.0		34	0.0		2	0.0						
28 April		4	0.0		10	0.0		2	0.0						
29 April		5	0.0		19	0.0		4	0.0						
30 April		6	0.0		18	0.0		1	0.0						

Appendix Table 2.--Continued.

Unit 20, Slot A: STS (48% porosity)

Test date	Subyearling chinook			Yearling chinook			Steelhead			Coho			Sockeye		
	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%	Desc.	Catch	%
13 May		18	0.0		19	0.0		8	0.0		5	0.0		29	0.0
14 May		20	0.0		7	0.0		2	0.0		2	0.0		1	0.0
15 May		37	0.0		50	0.0	3	33	9.1	1	38	2.6		6	0.0
16 May		34	0.0		9	0.0		6	0.0		3	0.0		5	0.0
17 May		39	0.0		4	0.0		5	0.0	1	3	33.3		1	0.0
18 May		27	0.0		2	0.0		3	0.0						
19 May		29	0.0				1	6	16.7		4	0.0			
20 May		29	0.0		5	0.0		6	0.0					1	0.0
23 May		37	0.0		2	0.0		3	0.0		1	0.0			
24 May		36	0.0		2	0.0		7	0.0		1	0.0			
25 May		23	0.0		6	0.0		7	0.0		1	0.0			
26 May		24	0.0		6	0.0	1	6	16.7					1	0.0
27 May		30	0.0	1	5	20.0	2	8	25.0		1	0.0		1	0.0
20 June		8	0.0		1	0.0									
21 June		18	0.0												
22 June		18	0.0		1	0.0		1	0.0						
23 June		29	0.0		4	0.0		1	0.0						
24 June		10	0.0		6	0.0									
25 June		18	0.0												
26 June	1	41	2.4		1	0.0									
27 June		51	0.0		5	0.0		2	0.0		1	0.0			
28 June		22	0.0		1	0.0									
29 June	1	40	2.5												
30 June	1	38	2.6												
1 July		33	0.0		1	0.0		2	0.0						
5 July		49	0.0					1	0.0						
6 July		32	0.0		1	0.0									
7 July		29	0.0					1	0.0						
8 July		51	0.0												
11 July		25	0.0												
12 July		31	0.0												
13 July	1	18	5.6												
14 July		11	0.0												

Appendix Table 3.--Juvenile salmonid horizontal distribution data from gatewell dip-net catch at The Dalles Dam, 1994.

Unit 2, Slot B

Test date	Subyearling chinook	Yearling chinook	Steelhead	Coho	Sockeye
19 April	271	21	2		
20 April	73	10	2		
21 April	17	37	4		
22 April	18	82	13		
25 April	6	403	41		
26 April	6	350	39		
27 April	2	187	36		
28 April	2	146	21		
29 April	3	89	22		
30 April	8	162	25	1	1
2 May	27	286	37		3
3 May	21	103	31		
4 May	60	61	29		6
10 May	6	70	19	4	10
11 May	31	28	19	4	10
13 May	51	59	33	12	17
14 May	29	24	9	24	5
15 May	28	27	12	22	3
16 May	45	50	59	88	3
17 May	84	20	16	54	1
18 May	56	20	22	21	
19 May	67	18	18	17	2
20 May	83	20	38	21	2
21 May	73	14	9	12	
23 May	146	13	10	5	
24 May	69	18	27	8	1
25 May	79	40	115	37	4
27 May	95	69	127	25	10
21 June	24	1	2		
22 June	162	11	1		
24 June	216	12	4		1
25 June	249	11	5		
26 June	139	3			
27 June	59	3			
28 June	102	4			
29 June	202	12	1		
1 July	132	7	2		
6 July	38	1	1		
7 July	30				
8 July	94		3	1	
11 July	171	2			

Appendix Table 3.--Continued.

Unit 12, Slot B

Test date	Subyearling chinook	Yearling chinook	Steelhead	Coho	Sockeye
19 April	51	5			
20 April	4	6			
21 April	6	12			
22 April	4	63	1		
25 April	4	194	14		
26 April	1	82	3		
27 April	3	71	13		
28 April	4	78	8		
29 April	3	48	4		2
30 April	1	46	4		
2 May	18	98	12		
4 May	25	37	5		
10 May	33	34	3	3	3
11 May	38	7	5	6	5
13 May	43	46	8	13	33
14 May	32	22	9	12	7
15 May	32	18	3	6	5
16 May	23	24	12	34	4
17 May	52	20	3	46	1
18 May	45	6	5	6	
19 May	32	12	2	4	1
20 May	29	8	13	5	1
21 May	17		2	2	
23 May	66	5		1	
24 May	27	3	7		
25 May	31	9	28	12	
27 May	64	18	25	4	1
21 June	33		2		
22 June	35	2			
24 June	52	1	2		
25 June	53	1	2		
26 June	21	1			
27 June	25	1			
28 June	41	4			
29 June	55	1			
1 July	93				
6 July	35				
7 July	36				1
8 July	64	1	1		
11 July	126		1		

Appendix Table 3.--Continued.

Unit 17, Slot B

Test date	Subyearling chinook	Yearling chinook	Steelhead	Coho	Sockeye
19 April	20	17			
20 April	5	8			
21 April	7	8			
22 April	2	10			
25 April	4	79	4		
26 April	1	22	1		
27 April	6	32	5		
28 April	3	22	1		
29 April	3	20	1		
30 April	6	9			
2 May	22	17	4		
4 May	43	6	3		
10 May	49				
11 May	25	2		7	
13 May	22	17	4		2
14 May	31	8	5	10	3
15 May	28	12	6	6	3
16 May	30	11	12	29	
17 May	39	11	6	19	3
18 May	42	2		5	1
19 May	29	4	2	2	
20 May	34	4		3	3
21 May	22	3	2	6	
23 May	59	1	1	1	
24 May	22	3	3		
25 May	23	4	3	3	
27 May	53	9	13	3	2
21 June	11				
22 June	13				
24 June	19		2		
25 June	11				
26 June	15				
27 June	14				
28 June	19	1	2		
29 June	10				
1 July	30		1		
6 July	10				
7 July	17				
8 July	22		1		
11 July	27				