ANNUAL PROGRESS REPORT

FISH RESEARCH PROJECT
OREGON

PROJECT TITLE: Scale Analysis

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CONTENTS

SUMMARY

Objectives for FY 1990 and 1991

1. Identify the rearing origin of coho salmon (wild, hatchery yearling, or hatchery accelerated) spawning in Oregon coastal streams and at hatchery broodstock collection facilities.

2. Determine the age composition and length at age of chinook salmon in Oregon coastal index streams.

3. Determine the age composition and early life history of spring and fall races of chinook salmon in the Rogue River.

4. Determine the age composition of chum salmon spawning in Tillamook Bay and Nestucca River tributaries.

5. Determine the age of maturity, spawning history, and growth rates of native redband trout.

6. Determine the length at age, age frequency, and changes in growth rates of largemouth and smallmouth bass sampled in Oregon rivers, lakes, and reservoirs.

7. Convert existing files in the scale archives to computerized dBASE files.

Accomplishments in FY 1990 and 1991

We completed objectives 1, 2, 4, and 5. At the request of Rogue River project personnel, we postponed work on objective 3 until we could analyze samples from several years at one time. In addition, we did not work on Objective 6 because managers did not request that we analyze scales from warmwater fish. Some work was completed on the conversion of archive files onto dBase IV but difficulty with the software caused us to postpone further work until we received an updated version of dBase IV.

Findings in FY 1990 and 1991

We identified the rearing origin of 1,380 coastal coho salmon returning in 1989 and 1990, and Ocean Salmon Management personnel used the data to exclude hatchery strays from spawning fish counts. Although hatchery coho salmon were found on the spawning grounds of all systems containing hatcheries, adjustments to wild fish counts were made only for the Siletz, Umpqua, and Coos rivers in 1989 and for the Nehalem, Salmon, and Yaquina rivers in 1990.

We read scales from nearly 4,000 fall chinook salmon that returned to seven coastal rivers in 1989 and 1990 to determine their age composition. In 1989, the average age composition was 3.9% age 2, 10.2% age 3, 29.6% age 4, 50.0% age 5, and 6.3% age 6. In 1990, the average age composition was 1.7% age 2, 7.9% age 3, 36.5% age 4, 44.0% age 5, 9.8% age 6, and 0.1% age 7.. These data were used by managers to assess the current status of coastal fall chinook stocks.

We read scales from 763 fall chinook salmon from the Rogue River in 1990 and found that the age composition was 2.6% age 2, 15.9% age 3, 69.8% age 4, 11.3% age 5, and 0.4% age 6

We aged scales from 126 chum salmon returning to Tillamook Bay in 1989 and found the highest percentage of age 5 fish on record (65.1%). Age 3 and age 4 fish made up 7.9% and 27.0%, respectively, of the 1989 run. With 21.5% age 3, 75.3% age 4, and 3.2% age 5, the 1990 age composition was more similar to previous age compostions than that of 1989.

We read scales from a sample of redband-type rainbow trout from the Klamath drainage and found many older fish that had spawned several times. It is believed that redband-type rainbow trout in some other drainages spawn when 3 years old and die, however we found individuals as old as 8 years with 4 spawning checks on their scales. We also completed preliminary reading of 430 scales from several trout species from southeastern Oregon.

INTRODUCTION

This project provides scale reading assistance to other projects and determines the rearing origin (hatchery or wild) of coastal coho salmon (*Oncorhynchus kisutch*) and the age composition of coastal chinook (*O. tshawytscha*) and chum salmon (*O. keta*). In 1989 and 1990, we analyzed scales for the Native Trout Project, the Rogue Basin Evaluation Project, and the Southeast District.

Prior to 1988 we analyzed rearing origin of coho salmon from the spawning grounds of the Lincoln District and Coos basin to identify strays from private hatcheries. In 1988 we began analyzing coho salmon scales from all coastal spawning grounds to identify strays from public and private hatcheries (Borgerson 1989).

Since 1986, we have monitored the age compostion and mean length at maturity of fall chinook salmon from the Nehalem, Wilson, Salmon, Siletz, Siuslaw, Coquille, and Chetco rivers. In this report we present data from the 1989 and 1990 return years only. Data from previous years are reported by Nicholas and Hankin (1988), Lewis et al. (1989), and Borgerson (1989).

We also received chinook salmon scales from other coastal rivers including the Rogue River. Fall chinook salmon from the Rogue River have been sampled for age composition in previous years (Cramer 1987).

The age composition of chum salmon from Tillamook Bay tributaries has been monitored informally for several years. While we analyzed scales from chum salmon that returned in 1989 and 1990 only, we also report the age composition for several recent years for comparison.

REARING ORIGINS OF COHO SALMON

The methods we used to identify the rearing origin from coho salmon scales are reported by Borgerson (1989). Appendixes A and B contain scale classifications from the spawning ground collections of 1989 and 1990, respectively. We were most concerned with the occurrence of hatchery accelerated fish from the private hatchery in Yaquina Bay in natural spawning areas of the Salmon, Siletz, Yaquina, and Alsea rivers. In the Coos basin we were concerned about hatchery yearling fish that had strayed from the private hatchery in Coos Bay. In other areas hatchery fish are most likely strays from local public hatcheries. In a few locations, hatchery juveniles were released into natural areas so returning adults with hatchery scale patterns are not considered strays.

Data on rearing origin of coho salmon were supplied to Ocean Salmon Management personnel to use in adjusting wild fish counts. Cooney and Jacobs (1990) and Jacobs and Cooney (1991) describe how counts of wild coho salmon are adjusted using scale data. Based on their criteria, wild fish counts were adjusted to exclude hatchery strays in the Siletz, Umpqua, and Coos rivers in 1989 and in Nehalem, Salmon, and Yaquina rivers in 1990. Most notable is the low incidence of stray hatchery accelerated fish in the Yaquina River in 1989.

Table 1. Age composition of fall chinook salmon stocks from seven index rivers for 1989 and 1990. The combined age composition for the years 1986-1990 is given for comparison.

Basin, year	Percent of spawners						Number of scales aged
	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	
Nehalem							
1989	0.4	4.4	16.0	74.2	4.9	--	225
1990	1.4	5.8	20.3	56.5	15.2	0.7	138
1986-90	0.9	5.6	26.5	58.3	8.5	0.1	763
Wilson							
1989	--	0.7	17.7	70.2	11.4	--	299
1990	0	2.4	13.8	62.3	21.5	--	247
1986-90	0.2	2.6	24.5	59.0	13.8	--	1,312
Salmon							
1989	0.8	6.6	14.0	63.6	15.0	--	379
1990	0.6	5.2	30.8	54.1	9.3	--	172
1986-90	2.1	11.7	31.6	46.9	7.7	--	2,089
Siletz							
1989	1.4	4.2	20.8	47.2	26.4	--	72
1990	1.6	4.8	22.2	58.7	11.1	--	63
1986-90	1.2	4.8	26.9	51.7	15.2	0.2	650
Siuslaw							
1989	4.8	20.7	29.1	45.0	0.5	--	547
1990	2.8	8.5	46.8	34.8	7.1	--	778
1986-90	4.6	12.9	40.9	38.0	3.6	--	2,202
Coquille							
1989	6.0	14.7	50.7	28.0	0.7	--	150
1990	0.9	12.9	40.9	39.5	5.8	--	342
1986-90	3.3	16.2	41.2	36.7	2.7	--	1,094
Chetco							
1989	10.5	8.9	57.5	22.0	1.1	--	372
1990	4.0	12.0	44.0	32.0	8.0	--	25
1986-90	11.3	14.6	53.3	19.2	1.5	--	733
Index rivers combined							
1989	3.9	10.2	29.6	50.0	6.3	--	2,044
1990	1.7	7.9	36.5	44.0	9.8	0.1	1,765
1986-90	3.2	10.4	35.1	44.2	7.1	0	8,843

Table 2. Means and standard deviations for length at age of fall chinook salmon stocks from seven index rivers for 1989 and 1990.

Basin, age	1989 Average length	1989 Standard deviation	1989 Number	1990 Average length	1990 Standard deviation	1990 Number
Nehalem						
Age 2	41.0	0.0	1	46.5	1.5	2
Age 3	59.7	12.8	10	60.1	3.1	8
Age 4	78.3	5.9	36	72.5	8.1	28
Age 5	84.7	4.9	162	78.0	15.6	78
Age 6	86.3	5.3	11	82.6	4.2	21
Wilson						
Age 2	--	--	0	--	--	0
Age 3	61.0	1.0	2	51.2	11.4	5
Age 4	74.6	7.5	54	76.0	10.5	33
Age 5	82.3	5.7	210	89.6	8.9	151
Age 6	87.2	7.0	34	94.4	9.7	52
Salmon						
Age 2	44.2	4.0	16	41.0	0.0	2
Age 3	63.4	6.2	42	62.2	7.1	21
Age 4	74.4	4.7	65	74.7	5.9	90
Age 5	84.5	4.5	281	81.5	4.7	97
Age 6	87.8	4.1	62	86.8	4.0	19
Siletz						
Age 2	40.7	0.0	1	38.5	0.0	1
Age 3	63.8	2.2	3	61.0	4.7	3
Age 4	74.6	4.8	15	69.2	7.6	15
Age 5	83.0	6.9	34	82.0	7.3	37
Age 6	86.7	7.3	18	88.7	11.8	7
Siuslaw						
Age 2	47.2	8.9	26	43.9	9.4	22
Age 3	62.8	6.6	113	61.3	6.7	66
Age 4	75.4	6.3	159	76.3	6.4	364
Age 5	84.2	4.9	245	82.0	5.8	270
Age 6	82.3	3.1	3	85.7	5.7	55
Coquille						
Age 2	40.6	2.6	9	42.7	3.3	3
Age 3	64.4	6.4	22	55.8	7.7	44
Age 4	75.2	5.2	75	72.4	7.0	140
Age 5	80.3	6.2	42	79.6	5.5	135
Age 6	84.0	0.0	1	82.1	5.8	20

Table 2. Continued.

Basin, age	1989 Average length	1989 Standard deviation	1989 Number	1990 Average length	1990 Standard deviation	1990 Number
Chetco						
Age 2	43.5	4.8	39	38.0	0.0	1
Age 3	57.3	3.9	33	55.0	8.5	3
Age 4	71.6	5.5	213	65.8	7.1	12
Age 5	79.2	6.4	83	74.6	5.1	8
Age 6	81.0	5.9	4	77.8	3.3	2

Table 3. Locations and sample sizes of fall chinook salmon scale collections from spawning grounds in non-index rivers.

Location	1989 Sample size	1990 Sample size
Lower Columbia tributaries	0	12
Necanicum	0	2
Nestucca	16	0
Yaquina	0	5
Alsea	17	1
Umpqua	114	2
Coos	29	18
New	0	22
Rogue	0	780
Hunter	0	5
Winchuck	0	1

Table 4. Age composition of fall chinook salmon stocks from non-index rivers for 1989 and 1990.

Basin, year	Percent of spawners						Number of scales aged
	Age 2	Age 3	Age 4	Age 5	Age 6	Age 7	
Umpqua 1989	6.5	8.4	44.9	39.3	0.9	--	107
Coos 1989	--	8.0	24.0	68.0	--	--	25
Rogue 1990	2.8	16.6	69.4	10.8	0.4	--	763

AGE COMPOSITION OF CHUM SALMON

Table 5 contains the age composition of chum salmon sampled on the spawning grounds of Tillamook Bay tributaries. As historical data in Table 5 indicate, the chum salmon run in Tillamook Bay was composed of mostly age 3 and age 4 fish. Age 5 fish made up less than 1% of the fish sampled in the 7 years between 1947 and 1962 (Oakley 1966). We suspect that the very high percentages of age 5 fish in 1983 and 1989 are mainly the result of extremely strong brood years followed by very weak brood years.

AGE COMPOSITION AND SPAWNING HISTORY OF TROUT

We read scales from rainbow trout (*Oncorhynchus mykiss*) and cutthroat trout (*Oncorhynchus clarki*) from several locations in southern and southeastern Oregon. The scales were collected, mounted, and impressed in

Table 5. Age composition of chum salmon from Tillamook Bay tributaries in 1989 and 1990. The age composition from other recent years is given for comparison.

Year	Percent age composition			Sample number	Source
	Age 3	Age 4	Age 5		
1978	25	72	3	239	Sams 1980
1979	50	45	5	113	Sams 1980
1982	20.4	78.4	1.1	88	McGie 1983
1983	24.4	39.0	36.6	41	McGie 1984
1989	7.9	27.0	65.1	126	
1990	21.5	75.3	3.2	158	

acetate using the same methods as we used for salmon. We identified annuli as bands of closely spaced circuli, and "spawning checks" were identified by crossing over of circuli usually accompanied by bands of resorbed circuli. Although true annuli were difficult to differentiate from "summer checks" or other checks, the spawning checks were quite obvious. The major concern we had for spawning checks was the possibility that we might count two checks as only one on an older, multiple-spawning fish if the spawning checks had "run together". This problem may have occurred with trout from Spring Creek that were 7 or 8 years old and had spawned several times. We had difficulty differentiating true (winter) annuli from false summer checks on fish from locations with high water temperature during the summer. This problem occurred with fish from lower elevation sites in southeastern Oregon.

We read scales from a small sample of redband-type rainbow trout from Deming Creek, a tributary of the Sprague River in the Klamath basin, to determine age and spawning history. These fish were sampled high in the

system and were considered resident. We did not detect multiple spawning checks on any of the 36 fish in our sample (Table 6).

We also read scales from a sample of redband-type rainbow trout that live in Upper Klamath Lake but make spawning migrations into Spring Creek. Some redband-type rainbow trout populations in Southeast Oregon seem to follow a life history in which individuals live to age 3, spawn, and die (Hosford and Pribyl 1983). Most of the trout spawning in Spring Creek were very large and seemed likely to be more than 3 years old. We found that the fish in our sample definitely had a more complex life history than that of some of the Southeast Oregon trout (Table 7).

Spring Creek trout are unusual because they have been found spawning during all months except September rather than in a specific season (personal communication in October 1990 with David V. Buchanan, Oregon Department of Fish and Wildlife, Research and Development Section, Corvallis, Oregon). Our samples came from April and May only, so we do not know if fish spawning at other times of the year exhibit a similiar life history.

We completed preliminary readings on scales from 430 trout from Trout Creek, Whitehorse-Willow Creek, and Silvies River rivers. The fish from Trout Creek are considered to be hybrids of rainbow trout and cutthroat trout. The Whitehorse-Willow trout are either a unique strain of cutthroat trout or a strain of the Lahontan subspecies. The Silvies trout were redband-type

Table 6. Age composition and average length at age of rainbow trout sampled in Deming Creek, a tributary of the South Fork Sprague River, April 1990.

Age (years)	Number	Percent of sample	Number with spawning checks	Average length, mm	Standard deviation
1	1	2.8	0	180.0	0
2	10	27.8	0	205.8	57.4
3	16	44.4	2	418.9	72.2
4	7	19.4	5	470.6	50.
>4	2	5.6	2	501.0	4.2
Total	36	100	9	359.7	128.5

Table 7. Age composition, spawning history, and average length of rainbow trout sampled in Spring Creek, a tributary of the Williamson River, in May, 1989 and in April and May, 1990. All fish sampled were on a spawning run.

Year, Age	Number	Percent of Sample	Number with previous spawning checks	Average length, mm	Standard deviation
1989					
3	2	10.5	0	461.0	9.0
4	5	26.3	3	451.2	51.9
5	5	26.3	5	475.0	39.4
6	4	21.1	4	534.3	19.1
7	1	5.3	1	578.0	0
8	2	10.5	2	593.5	28.5
Total	19	100	15	515.9	72.3
1990					
3	4	5.7	1	445.5	29.4
4	17	24.3	15	530.2	26.5
5	22	31.4	22	541.4	55.6
6	22	31.4	22	576.8	44.4
7	4	5.7	4	609.8	36.8
8	1	1.4	1	633.0	0
Total	70	100	65	549.5	56.2

rainbow (Buckman 1989). A final age composition cannot be reported until second readings are completed, however we did note a high degree of variation in size at age and scale growth patterns in fish from the same stream but sampled at different elevations.

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APPENDIX A

Stock composition of coho salmon sampled on spawning grounds in 1989.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			NECANICUM RIVER					
11/01-11/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	1	0
TOTAL	0	--	2	100	0	--	1	0
			MAINSTEM NEHALEM RIVER					
11/16-11/30	0	--	0	--	0	--	2	0
12/01-12/15	0	--	2	100	0	--	1	1
12/16-12/31	0	--	9	100	0	--	1	1
01/01-01/15	0	--	3	100	0	--	0	0
01/16-01/31	0	--	4	100	0	--	0	0
TOTAL	0	--	18	100	0	--	4	2
			NORTH FORK NEHALEM RIVER					
11/01-11/15	3	100	0	--	0	--	1	0
11/16-11/30	32	86.5	5	13.5	0	--	0	1
12/01-12/15	3	60.0	2	40.0	0	--	0	0
12/16-12/31	8	61.5	5	38.5	0	--	3	1
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	1	0
TOTAL	46	76.7	14	23.3	0	--	5	2
			KILCHIS RIVER					
11/16-11/30	1	100	0	--	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	0
TOTAL	1	50.0	1	50.0	0	--	0	0

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			SOUTH FORK TRASK RIVER					
11/01-11/15	15	100	0	--	0	--	0	1
11/16-11/30	49	89.1	6	10.9	0	--	0	0
TOTAL	64	91.4	6	8.6	0	--	0	1
			MAINSTEM WILSON RIVER					
12/01-12/15	0	--	0	--	1	100	0	0
			LITTLE NORTH FORK WILSON RIVER					
12/16-12/31	0	--	1	100	0	--	0	0
			DEVILS LAKE FORK WILSON RIVER					
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	0	--	6	100	0	--	0	0
12/16-12/31	0	--	1	100	0	--	0	0
TOTAL	0	--	8	100	0	--	0	0
			NESTUCCA RIVER					
11/01-11/15	1	100	0	--	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	0
01/01-01/15	0	--	1	100	0	--	0	0
TOTAL	1	33.3	2	66.7	0	--	0	0
			SALMON RIVER					
11/01-11/15	1	33.3	2	66.7	0	--	0	0

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			MAINSTEM SILETZ RIVER					
10/16-10/31	1	100	0	--	0	--	0	0
11/01-11/15	1	100	0	--	0	--	0	0
11/16-11/30	4	40.0	5	50.0	1	10.0	1	2
12/01-12/15	0	--	8	88.9	1	11.1	0	1
12/16-12/31	1	8.3	10	83.4	1	88.3	0	2
01/01-01/15	0	--	7	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	7	17.1	31	75.6	3	7.3	1	5
			ROCK CREEK, SILETZ RIVER					
Unknown	0	--	1	100	0	--	0	0
11/01-11/15	2	100	0	--	0	--	0	0
11/16-11/30	4	100	0	--	0	--	0	0
12/16-12/31	1	33.3	2	66.7	0	--	0	0
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	3	100	0	--	0	1
TOTAL	7	50.0	7	50.0	0	--	0	1
			MAINSTEM YAQUINA RIVER					
12/01-12/15	0	--	1	100	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	0	--	4	100	0	--	0	0
			ELK CREEK, YAQUINA RIVER					
11/16-11/30	0	--	0	--	0	--	0	1
12/16-12/31	0	--	1	100	0	--	0	0
TOTAL	0	--	1	100	0	--	0	1
			LITTLE ELK CREEK, YAQUINA RIVER					
11/16-11/30	0	--	0	--	1	100	0	0

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			NORTH FORK BEAVER CREEK					
01/16-01/31	0	--	1	100	0	--	0	0
			DRIFT CREEK, ALSEA RIVER					
11/01-11/15	1	50.0	0	--	1	50.0	1	0
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	0
12/16-12/31	0	--	1	100	0	--	0	0
01/16-01/31	0	--	2	100	0	--	0	0
02/01-02/15	0	--	2	100	0	--	0	0
TOTAL	1	11.1	7	77.8	1	11.1	1	0
			FIVE RIVERS, ALSEA RIVER					
11/01-11/15	0	--	1	100	0	--	0	0
11/16-11/30	1	50.0	1	50.0	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	1
12/16-12/31	0	--	4	100	0	--	0	0
01/16-01/31	0	--	17	100	0	--	0	0
TOTAL	1	4.0	24	96.0	0	--	0	1
			NORTH FORK ALSEA RIVER					
12/16-12/31	0	--	1	100	0	--	0	0
			YACHATS RIVER					
11/16-11/30	1	100	0	--	0	--	0	0
12/01-12/15	1	100	0	--	0	--	0	0
12/16-12/31	0	--	1	100	0	--	0	0
TOTAL	1	66.7	1	33.3	0	--	0	0

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			MAINSTEM SIUSLAW RIVER					
11/01-11/15	1	100	0	--	0	--	0	0
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	0	--	6	100	0	--	0	0
12/16-12/31	0	--	5	100	0	--	1	0
01/01-01/15	1	50.0	1	50.0	0	--	0	2
01/16-01/31	1	20.0	4	80.0	0	--	0	0
TOTAL	3	15.0	17	85.0	0	--	1	2
			LAKE CREEK, SIUSLAW RIVER					
11/01-11/15	1	100	0	--	0	--	0	0
11/16-11/30	0	--	2	100	0	--	0	0
12/01-12/15	0	--	5	100	0	--	0	2
12/16-12/31	1	25.0	3	75.0	0	--	1	0
01/01-01/15	0	--	5	100	0	--	0	0
01/16-01/31	0	--	5	100	0	--	0	1
TOTAL	2	9.1	20	90.9	0	--	1	3
			SILTCOOS LAKE					
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	0	--	6	100	0	--	2	1
12/16-12/31	0	--	8	100	0	--	1	1
01/01-01/15	0	--	1	100	0	--	0	1
01/16-01/31	0	--	15	100	0	--	0	2
02/01-02/15	0	--	2	100	0	--	1	0
TOTAL	0	--	33	100	0	--	4	5
			TAHKENITCH LAKE					
12/01-12/15	0	--	0	--	0	--	3	0
12/16-12/31	0	--	4	100	0	--	4	0
01/01-01/15	0	--	3	100	0	--	5	0
01/16-01/31	0	--	36	100	0	--	5	4
02/01-02/15	0	--	2	100	0	--	1	0
TOTAL	0	--	45	100	0	--	18	4

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regenerated (No.)
			MAINSTEM UMPQUA RIVER					
10/16-10/31	1	100	0	--	0	--	0	0
11/16-11/30	0	--	3	100	0	--	3	0
12/01-12/15	0	--	6	100	0	--	1	0
12/16-12/31	0	--	10	100	0	--	0	1
01/01-01/15	1	25.0	3	75.0	0	--	0	0
01/16-01/31	0	--	3	100	0	--	0	0
TOTAL	2	7.4	25	92.6	0	--	4	1
			SMITH RIVER, UMPQUA RIVER					
11/16-11/30	1	100	0	--	0	--	2	1
12/01-12/15	0	--	6	100	0	--	0	0
12/16-12/31	2	28.6	5	71.4	0	--	0	1
01/16-01/31	0	--	10	100	0	--	1	2
TOTAL	3	12.5	21	87.5	0	--	3	4
			SOUTH FORK UMPQUA RIVER					
12/01-12/15	3	75.0	1	25.0	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
01/01-01/15	1	20.0	4	80.0	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	4	33.3	8	66.7	0	--	0	0
			TENMILE LAKES					
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	50	100	0	--	6	2
TOTAL	0	--	51	100	0	--	6	2

Appendix A. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			MAINSTEM COOS RIVER					
12/01-12/15	1	25.5	3	75.5	0	--	0	0
12/16-12/31	0	--	0	--	0	--	1	0
01/01-01/15	0	--	2	100	0	--	2	0
TOTAL	1	16.7	5	83.3	0	--	3	0
			MILLICOMA RIVER, COOS RIVER					
12/01-12/15	0	--	1	100	0	--	0	0
12/16-12/31	1	25.0	3	75.0	0	--	0	0
01/16-01/31	0	--	2	100	0	--	0	0
TOTAL	1	14.3	6	85.7	0	--	0	0
			SOUTH FORK COOS RIVER					
12/01-12/15	1	100	0	--	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	4	100	0	--	0	0
TOTAL	1	12.5	7	87.5	0	--	0	0
			NORTH FORK COQUILLE RIVER					
12/01-12/15	0	--	0	--	0	--	1	0
12/16-12/31	1	50.0	1	50.0	0	--	1	0
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	2	50.0	2	50.0	0	--	1	0
TOTAL	3	42.9	4	57.1	0	--	3	0
			EAST FORK COQUILLE RIVER					
01/01-01/15	0	--	0	--	0	--	1	0
01/16-01/31	1	33.3	2	66.7	0	--	1	0
TOTAL	1	33.3	2	66.7	0	--	2	0

APPENDIX B

Stock composition of coho salmon sampled on spawning grounds in 1990.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			MAINSTEM NEHALEM RIVER					
11/01-11/15	3	75.0	1	25.0	0	--	1	1
11/16-11/31	2	100	0	--	0	--	1	0
12/01-12/15	6	75.0	2	25.0	0	--	1	1
12/16-12/31	0	--	1	100	0	--	0	0
TOTAL	11	73.3	4	26.7	0	--	3	3
			NORTH FORK NEHALEM RIVER					
11/01-11/15	2	100	0	--	0	--	1	0
11/16-11/30	9	100	0	--	0	--	2	1
12/01-12/15	7	87.5	1	12.5	0	--	0	1
12/16-12/31	0	--	1	100	0	--	0	0
TOTAL	18	90.0	2	10.0	0	--	3	2
			S. FORK TRASK RIVER					
11/01-11/15	52	98.1	1	1.9	0	--	2	4
11/16-11/30	2	100	0	--	0	--	0	0
12/01-12/15	2	66.7	1	33.3	0	--	0	1
TOTAL	56	96.6	2	3.4	0	--	2	5
			DEVILS LAKE FORK WILSON RIVER					
12/16-12/31	0	--	1	100	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	0
01/15-01/31	1	100	0	--	0	--		1
TOTAL	1	50.0	1	50.0	0	--	0	1

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			SALMON RIVER					
11/1-11/15	18	72.0	3	12.0	4	16.0	0	1
11/16-11/30	13	65.0	1	5.0	6	30.0	2	6
12/01-12/15	1	50.0	0	--	1	50.0	1	8
TOTAL	32	68.1	4	8.5	11	23.4	3	15
			MAINSTEM SILETZ RIVER					
11/01-11/15	0	--	1	100	0	--	1	0
11/16-11/30	0	--	2	66.7	1	33.3	0	0
12/01-12/15	0	--	1	100	0	--	0	0
TOTAL	0	--	4	80.0	1	20.0	1	0
			ROCK CREEK, SILETZ RIVER					
11/01-11/15	2	100	0	--	0	--	0	0
			SCHOONER CREEK TRAP, SILETZ RIVER					
10/01-10/15	0	--	0	--	1	100	0	0
10/16-10/31	2	15.4	1	7.7	10	76.9	0	1
11/01-11/15	1	--	0	--	7	87.5	0	2
11/16-11/30	0	--	0	--	2	100	0	0
12/01-12/15	1	100	0	--	0	--	0	1
TOTAL	4	16.0	1	4.0	20	80.0	0	4
			MAINSTEM YAQUINA RIVER					
11/01-11/15	0	--	2	50.0	2	50.0	0	0
11/16-11/30	0	--	1	14.3	6	85.7	0	2
12/01-12/15	0	--	5	55.6	4	44.4	0	1
12/16-12/31	0	--	0	--	0	--	0	2
01/01-01/15	0	--	4	100	0	--	0	0
TOTAL	0	--	12	50.0	12	50.0	0	5

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			BIG ELK CREEK, YAQUINA RIVER					
11/01-11/15	0	--	1	100	0	--	2	0
11/16-11/30	0	--	1	33.3	2	66.7	0	0
12/01-12/15	0	--	5	100	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	--	2	100	0	--	0	0
TOTAL	0	--	11	84.6	2	15.4	2	0
			MAINSTEM AND BAY, ALSEA RIVER					
09/01-09-15	0	--	1	100	0	--	0	0
09/16-09/30	1	100	0	--	0	--	0	0
10/01-10/15	0	--	0	--	0	--	0	0
10/15-10/31	0	--	0	--	0	--	0	0
11/01-11/15	0	--	1	50.0	1	50.0	1	0
TOTAL	1	25.0	2	50.0	1	25.0	1	0
			DRIFT CREEK, ALSEA RIVER					
12/01-12/15	0	--	0	--	0	--	1	1
12/16-12/31	0	--	1	100	0	--	0	1
01/15-01/31	0	--	1	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	0	--	3	100	0	--	1	1
			FIVE RIVERS, ALSEA RIVER					
11/01-11/15	0	--	0	--	0	--	0	1
11/16-11/30	0	--	0	--	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	0
12/16-12/31	0	--	1	100	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	0	--	6	100	0	--	0	1

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			YACHATS RIVER					
11/16-11/30	2	100	0	--	0	--	0	0
TOTAL	2	100	0	--	0	--	0	0
			MAINSTEM SIUSLAW RIVER					
12/01-12/15	0	--	2	100	0	--	0	0
			NORTH FORK SIUSLAW RIVER					
12/16-12/31	0	--	2	100	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	0	--	3	100	0	--	0	0
			LAKE CREEK, SIUSLAW RIVER					
11/16-11/30	0	--	0	--	0	--	1	0
12/01-12/15	2	50.0	2	50.0	0	--	1	1
12/16-12/31	0	--	0	--	0	--	1	1
01/01-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	0	1	100	0	--	0	0
TOTAL	2	40.0	3	60.0	0	--	3	2
			WOLF CREEK,SIUSLAW RIVER					
12/16-12/31	0	-	1	100	0	-	0	0
			SILTCOOS LAKE					
12/01-12/15	0	0.0	4	100	0	0.0	0	0
12/16-12/31	0	0.0	1	100	0	0.0	1	0
01/01-01/15	0	0.0	3	100	0	0.0	0	2
01/16-01/31	1	3.4	28	96.6		0.0	1	4
TOTAL	1	2.7	36	97.3	0	0.0	2	6

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			TAHKENITCH LAKE					
12/01-12/15	0	0	24	100	0	0	3	2
12/16-12/31	0	0	45	100	0	0	4	2
01/01-01/15	0	0	11	100	0	0	1	1
01/16-01/31	0	0	26	100	0	0	1	4
TOTAL	0	0	106	100	0	0	9	9
			MAINSTEM UMPQUA RIVER					
11/01-11/15	1	100	0	--	0	--	0	1
11/16-11/30	0	0.0	1	100	0	--	0	0
12/01-12/15	0	0.0	2	100	0	--	1	0
12/16-12/31	0	0.0	1	100	0	--	0	1
TOTAL	1	20.0	4	80.0	0	--	1	2
			SMITH RIVER, UMPQUA RIVER					
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	0	--	6	100	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
TOTAL	0	--	9	100	0	--	0	0
			SOUTH FORK UMPQUA RIVER					
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	2	100	0	--	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	1
TOTAL	2	40.0	3	60.0	0	--	0	1

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			TENMILE LAKES					
12/01-12/15	0	--	1	100	0	--	0	1
12/16-12/31	0	--		--	0	--	0	1
01/01-01/15	0	--		--	0	--	0	1
01/16-01/31	0	--	13	100	0	--	0	4
TOTAL	0	--	14	100	0	--	0	7
			MAINSTEM COOS RIVER					
11/01-11/15	2	100	0	--	0	--	1	1
11/16-11/30	0	--	0	--	0	--	0	1
12/01-12/15	0	--	0	--	0	--	0	0
12/16-12/31	0	--	0	--	0	--	0	1
01/01-01/15	0	--	1	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
02/01-02/15	0	--	1	100	0	--	0	0
TOTAL	2	40.0	3	60.0	0	--	1	3
			MILLICOMA RIVER, COOS RIVER					
12/01-12/15	0	--	1	100	0	--	0	0
12/16-12/31	0	--	2	100	0	--	0	1
01/15-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	1
TOTAL	0	--	4	100	0	--	0	2
			MAINSTEM COQUILLE RIVER					
12/16-12/31	1	100	0	--	0	--	1	0
01/01-01/15	0	--	0	--	0	--	1	0
01/16-01/31	1	100	0	--	0	--	0	0
TOTAL	2	100	0	--	0	--	2	

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regenerated (No.)
			NORTH FORK COQUILLE RIVER					
11/01-11/15	0	--	1	100	0	--	0	0
11/16-11/30	0	--	4	100	0	--	0	0
12/01-12/15	0	--	20	100	0	--	0	5
12/16-12/31	1	6.7	14	93.3	0	--	0	1
01/01-01/15		0.0	7	100	0	--	0	2
01/16-01/31		0.0	3	100	0	--	0	1
TOTAL	1	2.0	49	98.0	0	--	0	9
			EAST FORK COQUILLE RIVER					
11/16-11/30	0	--	1	100	0	--	0	0
12/01-12/15	3	60.0	2	40.0	0	--	0	0
12/16-12/31	0	--	0	--	0	--	0	0
01/01-01/15	0	--	0	--	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	3	42.9	4	57.1	0	--	0	0
			MIDDLE FORK COQUILLE RIVER					
11/16-11/30	0	--	2	100	0	--	0	0
12/01-12/15	0	--	1	100	0	--	0	0
TOTAL	0	--	3	100	0	--	0	0
			SOUTH FORK COQUILLE RIVER					
12/01-12/15	0	--	2	100	0	--	0	1
12/16-12/31	1	50.0	1	50.0	0	--	0	0
01/01-01/15	0	--	2	100	0	--	0	0
01/16-01/31	0	--	1	100	0	--	0	0
TOTAL	1	14.3	6	85.7	0	--	0	1

Appendix B. Continued.

Time period	Hatchery yearling No.	%	Wild No.	%	Hatchery accelerated No.	%	Jacks (No.)	Regen-erated (No.)
			NEW RIVER AND FLORAS CREEK					
12/01-12/15	1	100	0	--	0	--	1	0
12/16-12/31	0	--	0	--	0	--	0	2
01/01-01/15	0	--	4	100	0	--	0	0
01/16-01/31	0	20.0	4	80.0	0	--	0	0
TOTAL	1	20.0	4	80.0	0	--	1	2
			LOWER MAINSTEM ROGUE RIVER					
11/01-11/15	3	100	0	--	0	--	1	0
11/16-11/30	1	100	0	--	0	--	0	0
TOTAL	4	100	0	-	0	-	1	0