Spawning salmon surveys and straying of
private hatchery coho salmon from Yaquina
Bay in coastal watersheds of Oregon, 1982.

Alan M. McGie

Oregon Department of Fish and Wildlife
Fish Division
Portland, Oregon 97208

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CONTENTS

INTRODUCTION

Spawning salmon have been counted in coastal streams since 1950 to assess the status of natural spawning stocks. The surveys were primarily established to determine escapement of wild salmon past commercial net fisheries operating in several large river systems. When commercial net fisheries were closed in 1957, the surveys were retained to determine escapement trends as ocean troll and sport fisheries developed.

The spawning salmon survey program has evolved through successive efforts over the years--primarily to reduce the number of surveys, consolidate data from a variety of drainages, and still provide meaningful trend data at minimal expense. From 1950 to 1974, the primary information on trends was obtained by the Fish Commission of Oregon (Berry 1975). In 1976, following merger of the Fish Commission and Wildlife Commission into a unified agency in 1975, the program was intensively reviewed and standardized (Cummings 1977). Escapement indexes developed by the Oregon Department of Fish and Wildlife were derived from limited surveys providing a breadth of coverage between coastal drainages at the expense of in-depth coverage within any single drainage.

Beidler and Nickelson (1980) evaluated the surveying effort for coho salmon prior to 1981. They recommended that (1) the standard index be expanded to at least 40 survey units (areas), (2) the peak count be replaced with estimates of the number of spawners in the index unit as an index of escapement, and (3) separate indexes be established for streams influenced by hatchery fish. The recommendations were first adopted in 1981 for coho salmon. Lack of funds prevented a similar improvement in surveys for fall chinook and chum salmon in coastal watersheds.

Additional sampling was conducted in Lincoln District streams and hatcheries to document straying of private hatchery coho salmon from Oregon Aqua-Foods' (OAF) facility at Yaquina Bay. The program was partially funded with $9,937 from Oregon Aqua-Foods and $3,565 in state funds totaling $12,937. The program was conducted in response to concerns by fisheries managers and the public on the possible long-term effects of interbreeding wild and stray hatchery stocks in district streams.

METHODS

Spawning Fish Surveys

District fisheries biologists were responsible for surveying index areas established in their respective districts. They were assisted by temporary personnel hired to conduct intensive surveys for coho salmon. Fall chinook salmon were counted between 8 October 1982 and 17 January 1983. Coho salmon were counted between 15 October 1982 and 14 February 1983. Chum salmon were counted between 1 November 1982 and 3 January 1983. Pre-established index areas were repeatedly sampled during the spawning season to obtain counts of live and dead salmon. Counts of jacks (age 2) were kept separate from adults ($\geq$ age 3).

The standard index area for coho salmon included 48 streams, totaling 53.0 miles (Table 1). The index areas were stratified into two groups based on the potential influence of hatchery fish on the counts. One group of surveys contained streams thought to have light to heavy hatchery influences; whereas, the second group of streams primarily contained wild spawners. Total survey distances were 28.8 and 24.2 miles for hatchery-influenced and wild

Table 1. Standard spawning surveys for coho salmon in Oregon coastal watersheds stratified into hatchery-influenced and wild fish spawning units.

River system	Index stream	Mileage
Hatchery-influenced surveys		
Necanicum R.	Upper Necanicum	1.5
Kilchis R.	Sams Downs Cr.	1.0
Wilson R.	Cedar Cr. a	2.9
	Upper Devil's Lake Fork	0.5
Tillamook R.	Simmons Cr.	0.6
Nestucca R.	Clear Cr. a	0.8
	Bear Cr.	0.8
Siletz R.	Gravel Cr.	1.0
	Fourth of July Cr.	0.8
Yaquina R.	Salmon Cr.	0.6
	Upper Yaquina R. a	2.0
Alsea R. (Five Rivers)	Lobster Cr. a	1.3
	Cherry Cr.	0.8
	Wilson Cr.	1.3
Smith R.	Buck Cr.	3.5
	Beaver Cr. a	1.5
	Little South Fork	1.0
Coos Bay	Larson Cr. a	1.3
Millicoma R.	Marlow Cr.	1.0
South Fk. Coos r.	Daniels Cr.	0.8
Coquille R.		
North Fork	North Fork	1.0
	Cherry Cr.	1.8
	Alder Cr.	1.0
Subtotal		28.8
Wild fish surveys		
Elk Cr.	West Fork	0.5
Nehalem R.	N.F. Cronin Cr.	0.5
	W. Humbug Cr.	1.0
	Hamilton Cr.	1.0
	Oak Ranch Cr.	1.0
	N.F. Wolf Cr. a	1.1
Little Nestucca R.	Bear Cr.	0.8
Drift Cr.	Horse Cr.	1.0
	Nettle Cr.	0.8
Beaver Cr.	N.F. Beaver Cr.	1.0
Yachats R.	Williamson Cr.	1.3
	School Fork	0.5
Siuslaw R., mainstem	Dogwood Cr.	1.0
	Doe Cr.	0.5
North Fork	Billie Cr.	1.3
Lake Cr.	Rogers Cr.	1.3
	Misery Cr.	0.8
	Panther Cr. a	0.8
Umpqua R.	Schofield Cr. a	2.0
	Dean Cr.	1.5
South Fork	North Myrtle Cr.	1.0
Cow Cr.	Quines Cr.	1.0
Coquille R.		
East Fork	Steel Cr. a	1.0
Middle Fork	Slater Cr.	0.5
South Fork	Salmon Cr.	1.0
Subtotal		24.2
Total Index		53.0

aStandard spawning fish survey streams formerly comprising the ODFW index area, 1950-80.

stocks, respectively. The standard index area for fall chinook salmon contained 12 streams totaling 11.0 miles.

The chum salmon index area was revised in 1982 and average peak fish/mile counts were recalculated back to 1948 when counts began in Tillamook Bay tributaries. Prior to 1960, the index area contained three streams totaling 1.7 miles. From 1960 to 1977, the index area contained six streams totaling 4.0 miles. The Clear Creek, Kilchis River, index was eliminated in 1960 after a culvert was improperly placed in the stream and counts drastically declined. From 1978 to 1981, the mileage was reduced to 3.7 miles when a trap was constructed in Coal Creek, Kilchis River, which eliminated 0.3 mile of the index unit. In 1982, the Clear Creek, Kilchis River, index was re-established after the culvert that formerly impeded the upstream movement of chum salmon was removed and replaced with a bridge. The current index area for chum salmon totals 4.3 miles (seven index streams) in the Tillamook Bay watershed. A new standard index area was established for chum salmon in Clear Creek, Nestucca River, where historical counts were available since 1950.

Average peak fish/mile in the index units was calculated from the following relationship:

$$(1) \qquad F/M = \frac{\sum\limits_{i=1}^{n} c_i}{\sum\limits_{i=1}^{n} m_i} \qquad \text{where,}$$

F/M = average fish per mile

c_i = peak count in index stream i

m_i = mileage surveyed in index stream i

n = number of streams surveyed

Separate average peak fish/mile estimates were made for jacks and adults. This constrasts to previous years where peak counts were obtained from the combined number of jacks and adults observed in the index units.

The total number of spawning coho salmon in the index area was estimated using area-under-the curve (AUC) techniques (Beidler and Nickelson 1980), expressed as fish/mile. This index was derived from the following relationship:

$$(2) \qquad \hat{N} = \sum_{i=1}^{n} C_i t_i / 11.3 \qquad \text{where,}$$

$\hat{N}$ = total estimated number of spawning fish in the index area

C_i = mean count in the ith period

t_i = number of days in the ith period

An average spawning life of 11.3 days was assumed to apply for coho salmon spawning in the index streams (Beidler and Nickelson 1980). The AUC estimates were based on several stipulations to avoid using streams where few data points were available or significant parts of the run were missed. These criteria were: (1) at least one survey was made prior to or on 8 November; (2) water visibility was acceptable; (3) at least one survey was made on or after 9 January; and (4) successive surveys were 10 or fewer days apart. However, two surveys between 10 and 20 days apart were allowed before the survey was discarded for AUC estimates. If the first or last count in the index area was other than zero, a zero count was assumed to occur 7 days before or after the actual count. All survey units that did not meet these criteria were eliminated from the AUC index.

The results of the spawning survey effort in individual streams, stratified by fishery districts and river basins, are presented in Appendices A, B, and C for fall chinook, coho, and chum salmon, respectively. The appendices summarize all data from surveys completed during the 1982-83 spawning season including non-standard units surveyed by district biologists and Research and Development Section biologists for other studies.

Scale samples were obtained from chum salmon carcasses at Tillamook Bay and Nestucca River to determine the age composition of the stocks. Length measurements were taken from the mid-eye to posterior scale (MEPS) and converted to "ocean" fork lengths (FL) from the linear regression FL = -2.5214 + 1.2048 (MEPS). Estimated fork lengths derived from the regression are approximate since the relationship was obtained for coho rather than chum salmon.

Hatchery Fish Strays

Twelve additional streams were selected for intensive surveys in the Yaquina River to augment the two standard index streams (Table 2). Carcasses of spawned-out coho salmon encountered in surveys in Lincoln District rivers were inspected for adipose fin marks indicating possible coded-wire-tagged fish and scale samples were taken from the key scale area to analyze rearing history. Sex, MEPS length, location, and date were recorded for each fish sampled.

Table 2. Yaquina River tributaries surveyed for stray coho salmon, 1982.

Area	Tributary
I (Tributaries of Yaquina Bay)	Beaver Creek Mill Creek
II (Tributaries of the lower Yaquina and lower Big Elk Creek)	Bear Creek Beaver Creek Deer Creek Hayes Creek Thornton Creek
III (Tributaries of the upper Yaquina River)	Bales Creek Salmon Creek [a] Upper Yaquina Creek [a]
IV (Tributaries of upper Big Elk Creek)	Grant Creek Rail Canyon Creek Wildcat Creek Wolf Creek

[a]*Standard spawning fish surveys.*

Hatchery coho salmon were examined for coded-wire tags at public and private hatchery facilities in the Lincoln District. Representative scale samples were obtained from unmarked adults at public hatcheries (Salmon River, Siletz, and Fall Creek) for life history analysis.

Scale analysis

Scales were analyzed using methods described by Nicholas and Van Dyke (1982), except the 1982 scale training populations were not specifically tailored to the Yaquina River as in 1981. The discriminant function used in 1982 was developed to classify coho caught in the ocean fisheries. The training populations contained wild scales collected from the Nehalem River south to the Coquille River, hatchery yearling scales from many Columbia River and all coastal Oregon coho hatcheries, and hatchery accelerated scales from the OAF facilities at Coos and Yaquina bays.

Among the three groups, the greatest rate of misclassification occurred between the wild and hatchery yearling groups. However, 94% of the hatchery accelerated group was correctly classified by the function which indicates that estimates of this component are reasonably accurate. The results of the analysis were not corrected for misclassifications.

Spawning Stock Size

The total number of hatchery and wild adult coho salmon spawning in the Yaquina River was estimated from the relationship:

$$(3) \qquad \hat{N}_{hw} = \sum_{i=1}^{n} (M/m_i)N_i \qquad \text{where,}$$

$\hat{N}_{hw}$ = total number of spawners from hatchery (h) and wild (w) stocks

M = total miles of spawning habitat in the drainage

$\hat{N}_i$ = total number of spawners in index stream i (Equation 2)

The estimated number of hatchery fish ($\hat{N}_h$) was calculated from:

$$(4) \qquad \hat{N}_h = \hat{N}_{hw}pr \qquad \text{where,}$$

p = percentage of adults spawning prior to 1 January

r = percentage of hatchery fish in the spawning population ($\hat{N}_i$)

The estimated number of wild fish ($\hat{N}_w$) was calculated from:

$$(5) \qquad \hat{N}_w = (\hat{N}_{hw}P - \hat{N}_h) + (\hat{N}_{hw} - \hat{N}_{hw}P)$$

Straying Rate

The rate of straying (S) by adult coho salmon from Oregon Aqua-Foods in the Yaquina River was obtained from the equation:

$$(6) \qquad S = \hat{N}_h/T + \hat{N}_h - W \qquad \text{where,}$$

T = the total return of adult coho to the private hatchery

W = the estimated number of wild coho adults captured at the private hatchery

RESULTS

Fall Chinook Salmon

Peak counts

Twelve standard index areas (11.0 miles) were surveyed in 1982 (Table 3). The standard index areas were surveyed 60 times totaling 61.2 miles.

The average fish/mile count in the 12 index streams was 79.0 adults and 10.8 jacks totaling 89.8 fall chinook salmon (Table 4). The adult index was within the range of counts experienced since 1977 (67.9 to 81.5 adults/mile).

There has been an upward trend in the average peak chinook/mile counts since the mid 1950's (Figure 1).

Coho Salmon

Peak counts

Coho salmon were counted in 48 index areas in 1982. The standard index streams were surveyed 508 times (559.1 miles) to obtain peak counts (Table 5). The average peak fish/mile in 48 index areas was 22.7 coho salmon, consisting of 16.1 adults and 6.6 jacks (Table 4). Peak counts of adults were

Table 3. Peak counts on selected spawning fall chinook surveys, 1950-82.

River / Trib.	Nehalem / Humbug	Tillamook / Tillamook	Nestucca / Niagara	Siletz / Sunshine	Yaquina / Grant	Alsea / Buck	Siuslaw / Lake	Coos / W.F. Millicoma	Coquille / Salmon	Rogue / Jim Hunt	Pistol / Deep	Winchuck / Bear
1950	13(0)[a]	—	5(1)	—	91(23)	—	—	—	—	—	—	—
1951	34(8)	—	11(0)	—	105(0)	—	—	—	—	—	—	—
1952	23(2)	115(0)	137(2)	51(0)	226(46)	69(20)	—	—	14(1)	—	—	—
1953	66(15)	34(13)	7(0)	17(2)	34(0)	1(0)	29(10)	—	—	—	—	—
1954	41(15)	22(9)	15(0)	12(0)	56(1)	6(0)	—	—	—	—	—	—
1955	29(18)	7(4)	42(7)	1(1)	112(46)	24(19)	—	—	—	—	—	—
1956	42(3)	12(7)	11(0)	8(0)	69(36)	1(0)	2(1)	—	—	—	—	—
1957	74(24)	36(13)	104(19)	51(2)	97(27)	33(9)	25(8)	—	13(2)	—	—	—
1958	69(11)	83(12)	51(2)	131(12)	88(6)	—	58(16)	—	16(7)	—	—	—
1959	68(6)	104(14)	36(0)	37(1)	74(4)	5(2)	40(5)	—	7(0)	—	—	—
1960	134(80)	100(47)	97(29)	46(21)	31(9)	19(8)	—	—	—	—	—	—
1961	104(8)	166(36)	69(4)	63(11)	52(1)	46(8)	48(22)	6(3)	24(14)	—	—	—
1962	78(9)	117(22)	47(8)	160(29)	47(15)	13(5)	16(4)	2(0)	1(0)	—	—	—
1963	133(37)	150(22)	90(2)	71(8)	80(13)	51(12)	29(2)	2(2)	3(0)	—	—	—
1964	126(14)	163(29)	53(8)	25(7)	25(3)	29(7)	247(35)	1(0)	11(2)	—	—	—
1965	143(43)	111(18)	125(2)	40(8)	78(34)	45(14)	39(11)	2(0)	140(49)	—	—	—
1966	103(8)	110(25)	80(7)	42(6)	82(15)	62(20)	122(11)	6(1)	74(19)	—	—	—
1967	66(2)	158(41)	61(6)	42(3)	48(13)	26(14)	141(31)	7(0)	17(0)	—	—	—
1968	46(2)	110(29)	43(2)	23(4)	41(9)	30(12)	84(32)	0(0)	20(4)	—	—	—
1969	31(2)	54(13)	36(8)	10(3)	88(20)	15(2)	192(52)	8(2)	7(0)	—	—	—
1970	57(3)	168(29)	47(8)	60(9)	115(10)	77(34)	332(76)	12(0)	59(23)	—	—	—
1971	94(10)	39(4)	36(1)	45(5)	95(17)	46(8)	59(10)	43(22)	22(5)	—	—	—
1972	117(46)	66(12)	92(10)	41(14)	48(12)	5(2)	144(56)	20(12)	12(4)	49(25)	—	—
1973	167(28)	85(1)	65(4)	47(0)	52(4)	24(4)	—	22(1)	18(0)	29(6)	—	—
1974	157(16)	49(4)	42(0)	49(2)	93(0)	13(0)	199(68)	44(28)	20(7)	—	—	—
1975	100(28)	—	—	—	—	10(1)	166(60)	26(4)	27(9)	46(3)	—	—
1976	174(39)	40(5)	0(0)	30(12)	16(6)	1(0)	262(74)	52(24)	0(0)[b]	0(0)[b]	—	2(2)[b]
1977	170(12)	56(2)	16(2)	47(2)	180(20)	15(2)	241(60)	27(8)	14(7)	98(36)	5(2)	30(1)
1978	172(6)	70(8)	34(3)	28(0)	181(6)	12(0)	139(24)	60(18)	43(3)	108(4)	—	33(0)
1979	170(2)	47(2)	53(3)	105(7)	198(54)	50(10)	140(12)	59(24)	41(8)	100(2)	—	20(3)
1980	93(3)	120(14)	65(1)	46(2)	149(4)	48(2)	234(16)	95(65)	105(31)	—	0(0)	13(0)
1981	149(1)	100(6)	42(1)	70(2)	198(13)	35(3)	183(43)	8(4)	51(8)	—	15(1)	10(0)
1982	83(13)	122(15)	101(12)	41(1)	178(18)	63(9)	240(34)	10(2)	108(13)	2(0)	26(1)	14(1)
Miles	1.0	1.8	0.4	1.2	1.7	1.0	0.8	0.5	0.8	0.5	0.5	0.8

[a] Figures in parentheses are the number of jacks included in the total number of fish to the left.
[b] Flows too low to allow spawning.

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Table 4. Average number of fish/mile observed in standard spawning index streams.

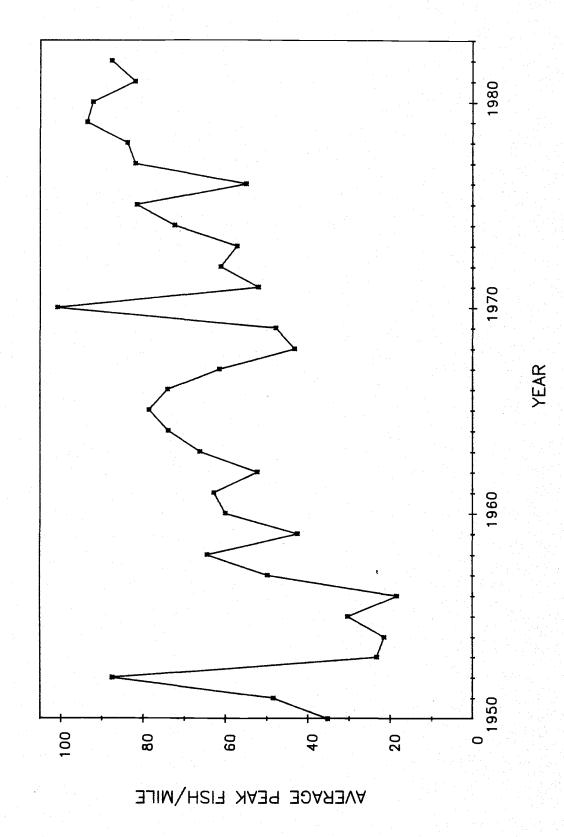| Year	Chinook Salmon				Coho Salmon				Chum Salmon	
	Miles	Jacks	Adults	Total	Miles	Jacks	Adults	Total	Miles	Adults
1948	.0	.0	.0	.0	.0	.0	.0	.0	1.7	654.7
1949	.0	.0	.0	.0	.0	.0	.0	.0	1.7	1,251.2
1950	3.1	7.7	27.4	35.2	10.1	2.9	22.3	25.1	2.5	349.6
1951	3.1	2.6	45.8	48.4	10.9	9.4	66.2	75.7	2.5	670.8
1952	7.1	9.9	77.6	87.5	10.9	3.9	49.1	53.0	2.5	296.4
1953	8.7	4.7	18.5	23.2	10.9	2.8	14.4	17.2	2.5	487.6
1954	7.1	3.5	17.9	21.4	10.9	4.1	15.0	19.1	2.5	615.2
1955	7.1	13.4	16.9	30.3	12.1	2.0	29.5	31.5	2.5	138.8
1956	7.9	5.9	12.4	18.4	12.9	12.0	37.6	49.6	2.5	127.6
1957	8.7	12.0	37.8	49.8	12.9	2.4	40.2	42.6	2.5	266.0
1958	7.7	8.6	55.8	64.4	13.6	2.9	14.3	17.2	2.5	273.2
1959	8.7	3.7	39.0	42.6	13.6	1.7	26.8	28.5	2.5	112.8
1960	7.1	27.3	32.8	60.1	14.4	8.1	13.7	21.7	4.8	65.4
1961	9.2	11.6	51.2	62.8	14.4	13.0	47.2	60.1	4.8	95.8
1962	9.2	10.0	42.3	52.3	14.4	4.7	37.0	41.7	4.8	458.3
1963	9.2	10.7	55.5	66.2	14.4	7.6	25.2	32.8	4.8	336.7
1964	9.2	11.4	62.5	73.9	14.4	8.5	53.8	62.3	4.8	314.0
1965	9.2	19.5	59.1	78.6	14.4	15.4	55.5	70.9	4.8	132.5
1966	9.2	12.2	61.8	74.0	14.4	4.4	33.8	38.3	4.8	309.6
1967	9.2	12.0	49.6	61.5	12.9	25.0	39.4	64.3	4.8	159.2
1968	9.2	10.2	32.9	43.2	11.3	2.0	25.3	27.3	4.8	174.8
1969	9.2	11.1	36.8	47.9	14.4	13.0	31.2	44.2	4.8	239.4
1970	9.2	20.9	79.9	100.8	14.4	6.0	42.6	48.7	4.8	403.3
1971	9.2	8.9	43.2	52.1	14.4	3.0	48.1	51.0	4.8	285.4
1972	9.7	19.9	41.3	61.2	14.4	5.7	14.9	20.6	4.8	442.3
1973	8.9	5.4	51.8	57.2	14.4	2.4	28.3	30.7	4.8	706.9
1974	9.2	13.6	58.8	72.4	14.4	11.0	17.9	29.0	4.8	693.5
1975	4.6	22.8	58.7	81.5	11.3	5.1	20.0	25.1	4.8	640.8
1976	10.5	15.4	39.5	55.0	14.4	5.1	20.3	25.4	4.8	242.3
1977	11.0	14.0	67.9	81.9	14.4	2.3	7.8	10.1	4.8	337.9
1978	10.5	6.9	77.0	83.8	14.4	2.8	9.4	12.2	4.5	614.0
1979	10.5	12.1	81.5	93.6	14.4	2.5	21.7	24.2	4.5	53.6
1980	10.5	13.1	79.0	92.2	14.4	5.5	13.5	19.0	4.5	184.7
1981	10.5	7.8	74.2	82.0	52.7	1.6	8.4	10.0	4.5	43.8
1982	11.0	10.8	79.0	89.8	53.0	6.6	16.1	22.7	5.1	523.3

FIG. 1. TRENDS IN THE EXCAPEMENT OF FALL CHINOOK SALMON IN OREGON COASTAL RIVERS SINCE 1950.
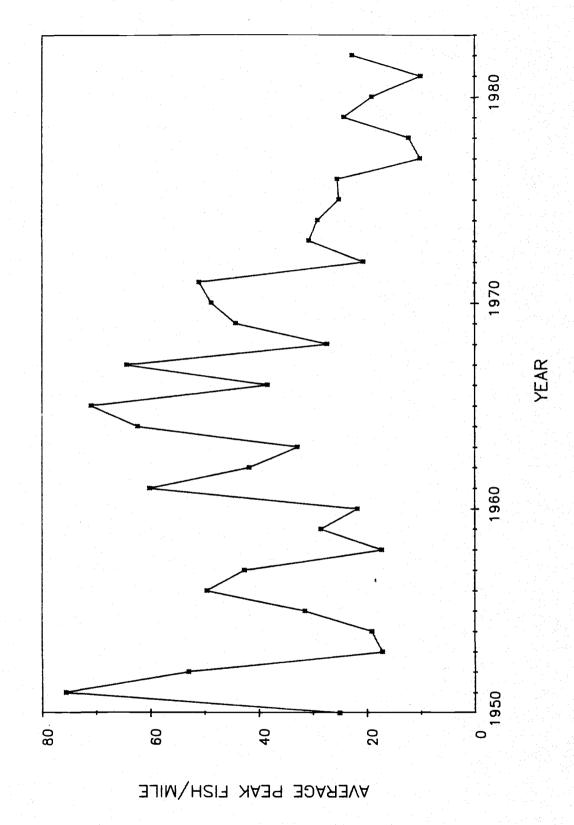
largest in the Astoria, Umpqua, and Coos/Coquille districts (19-21 adults/mile) and smallest in the Siuslaw District (7 adults/mile). Peak jack counts ranged from 1 to 3 jacks/mile in the northern fishery districts (Astoria, Tillamook, Lincoln, and Siuslaw) to 13-15 jacks/mile in southern districts (Umpqua and Coos/Coquille).

The trend in the average peak coho/mile counted in standard index streams has sharply declined since the mid 1960's (Figure 2).

Total escapement (AUC)

A sufficient number of surveys was conducted in 19 of the 48 stream areas (40%) to obtain escapement estimates of total fish spawning in the index areas using the AUC technique. Intermittent, but severe, floods throughout the spawning season prevented adequate surveying effort in the remaining index streams.

The estimated total escapement of spawners averaged 32 adults/mile and 10 jacks/mile based upon data obtained in 19 standard surveys (Table 5). The estimates of total spawners within each district were similar to fish/mile indexes, although no data were available for the Astoria District and only one stream qualified for AUC estimates in the Coos/Coquille District. The data indicate that peak fish/mile indexes for adults account for about 50% of the total estimated escapement in the survey area.

FIG. 2. TRENDS IN THE ESCAPEMENT OF COHO SALMON IN OREGON COASTAL RIVERS SINCE 1950.

Table 5. Summary of peak fish/mile counts and estimated total escapement of coho salmon in standard index streams by fishery district, 1982.

Fishery district	Survey effort		Total miles	Peak count per mile		Estimated escapements [a]		
	No. surveys	Miles		Adults	Jacks	No. surveys	Adults	Jacks
Astoria	7	6.6	55.8	19	3	0	--	--
Tillamook	7	7.4	78.1	12	1	3	36	5
Lincoln	10	10.6	124.6	15	2	3	39	2
Siuslaw	8	7.5	91.2	7	2	7	13	2
Umpqua	7	11.5	127.0	21	15	5	45	27
Coos/Coquille	9	9.4	82.4	19	13	1	70	30
Oregon Coast	48	53.0	559.1	16	7	19	32	10

[a]*Fish/mile derived from area-under-the-curve (AUC) estimates.*

Hatchery-influenced versus wild streams

The average peak fish/mile in hatchery-influenced streams was 18 adults and 6 jacks compared to 22 adults and 8 jacks in streams containing predominately wild stocks. The estimated total escapements were likewise similar in the two classifications. In hatchery-influenced streams, the estimated average total spawning density was 28 adults/mile and 4 jacks/mile compared to 24 adults/mile and 10 jacks/mile in streams believed to be restricted to wild spawners. These estimates are based on a total compilation of all standard and nonstandard index units surveyed during the 1982-83 spawning season. The nonstandard surveys comprised 45% or 460.4 miles of the total 1,019.5 miles reportedly surveyed for coho salmon. Nonstandard as well as standard surveys are summarized by Fishery District in Appendix B.

Escapements into Tenmile lakes

Peak counts of 127 adults and 105 jacks were obtained in 4.8 miles of streams surveyed at Tenmile lakes. Based on these counts and previous population estimates from tag-recapture programs, the total escapement in 1982 was 8,500 coho salmon comprised of 4,500 adults and 4,000 jacks. These estimates are nearly identical to estimates obtain in 1981 (4,500 adults and 3,000 jacks), indicating escapements have not improved in the lake system that once averaged 38,000 spawners (1949-73).

Chum Salmon

Tillamook Bay

Peak counts. Chum salmon have been irregularly counted in eight index areas since 1948 (Table 6). Seven index areas are currently used for standard surveys to assess the condition of the stocks in the Miami, Kilchis, and Wilson rivers. In 1982, the standard index areas were surveyed 41 times totaling 24.1 miles. The average peak fish/mile was 610.2 chum salmon in the standard index streams. The chum salmon escapement was excellent compared with historical average index counts in Tillamook Bay and Nestucca River combined (Table 4).

Average peak counts have widely fluctuated since 1948 (Figure 3). The fluctuations in recent years have primarily been in response to variable natural survival rates since the commercial gill-net fishery in Tillamook Bay was closed following the 1961 season.

Trap counts. A trap was installed in Coal Creek, Kilchis River, in 1977 to collect eggs from excess chum salmon for public and private hatchery use. The trap was operated by ODFW personnel and funded by private hatchery operators with the stipulation that private interests retain 90% of the eggs

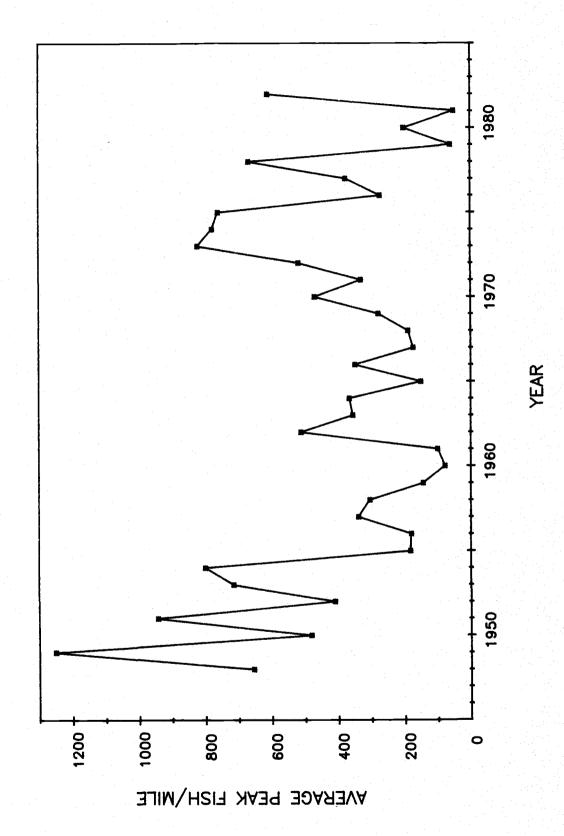Table 6. Peak counts of chum salmon in Tillamook Bay tributaries, 1948-82.

Year	Miami River Main Stem	Miami River Moss Cr.	Miami River Prouty Cr.	Kilchis River Main Stem	Kilchis River Coal Cr.	Kilchis River Clear Cr.	Wilson River Little North Fork	Tillamook River Main Stem [a]
1948	--	450	--	--	--	454	209	--
49	--	361	--	--	--	1,347	419	--
1950	--	256	--	--	--	420	142	--
51	--	193	--	--	--	699	712	--
52	--	29	--	--	--	487	182	--
53	--	330	--	--	--	780	104	--
54	--	73	--	--	--	906	381	--
55	--	14	--	--	--	201	97	--
56	--	10	--	--	--	102	194	--
57	--	54	--	--	--	351	172	--
58	--	34	--	--	--	331	153	--
59	--	7	--	--	--	87	152	--
1960	102	0	17	65	104	2	20	4
61 [b]	136	6	4	76	154	13	27	39
62	571	86	0	220	1,142	6	25	61
63	302	39	3	165	802	5	109	62
64	323	18	178	65	870	18	13	16
65	104	0	2	30	404	0	61	18
66	194	50	3	61	1,002	12	87	74
67	173	31	15	18	430	3	25	41
68	151	9	42	37	413	0	107	11
69	214	4	0	34	812	1	50	15
1970	135	183	33	85	1,383	23	64	27
71	102	73	62	105	889	2	94	13
72	235	13	70	271	1,358	0	127	83
73	371	333	119	325	1,662	3	474	68
74	416	111	136	1,266	813	85	373	63
75	349	173	85	797	1,328	22	310	66
76	148	19	0	397	313	2	214	45
77	182	--	--	284	916 [c]	--	124	122
78	857	--	--	985	300 [d]	--	326	182
79	27	--	5	52	57	--	82	14
1980	13	4	3	--	--	75	724	43
81	6	--	--	--	--	--	182	--
82	149	191	221	231	475	532	825	--
Miles	0.6	0.6	0.5	1.0	0.5	0.6	0.5	0.8

[a] Nonstandard survey unit.

[b] Commercial gill-net fisheries for chum salmon closed after the 1961 season.

[c] Trap constructed 0.5 mile above the mouth washed out on 25 November 1977. The estimated total run was 916 chum salmon (Sams 1980).

[d] Survey area shortened from 0.8 mile to 0.5 mile below the Coal Creek Trap since 1978.

FIGURE 3.   TRENDS IN THE ESCAPEMENT OF CHUM SALMON IN THE STANDARD INDEX AREAS OF TILLAMOOK BAY SINCE 1948.

and replant 10% as smolts in Coal Creek after a predetermined number of adults
was released upstream to spawn. The trap was placed in the standard spawning
fish survey unit about 0.5 mile above the mouth. As a result, the survey unit
was shortened from 0.8 to 0.5 mile. However, trap records have been
maintained by hatchery personnel since 1977 (Table 7), which are useful in
charting stock size trends in Coal Creek. In 1982, 1,661 chum salmon were
trapped in Coal Creek which was nearly as large as the record-high 1,746
recorded in 1978.

Table 7. Coal Creek, Kilchis River, chum salmon trapping records, 1977-82.

| Year | Released above | | Spawned[a] | | Buried | | Total |
	Males	Females	Males	Females	Males	Females	trapped
1977[b]	209	176	82	52	0	0	519
78	745	379	254	368	0	0	1,746
79	241	126	0	0	0	0	367
1980	365	209	--	53	38	0	665
81	272	224	--	109	0	0	605
82	958	334	3	366	0	0	1,661

[a]*Male chum used for spawning are usually released above the trap.*

[b]*Trap washed out 25 November 1977. Total chum salmon run estimated at 916 in
Coal Creek (Sams 1980).*

The sex ratio was 42% females and 58% males for chum salmon captured at
Coal Creek trap in 1982. The average sex ratio in previous years (1977-81)
was similar (43% females and 57% males).

Nestucca River

Chum salmon have been counted in Clear Creek, Nestucca River, since 1950
(Table 8). The annual surveys in the index stream provide a useful indicator
of the long-term trend of chum salmon in the Nestucca River. In 1982, the
index area was surveyed 11 times totaling 8.8 miles. The peak count was 45

chum salmon (56.3 fish/mile) on 22 November 1982. The survey in Clear Creek was hampered when a landowner denied access to the lower 0.2 mile of the index area where a greater proportion of chum salmon spawned in previous years. Therefore, the peak count was probably smaller relative to counts made in earlier years.
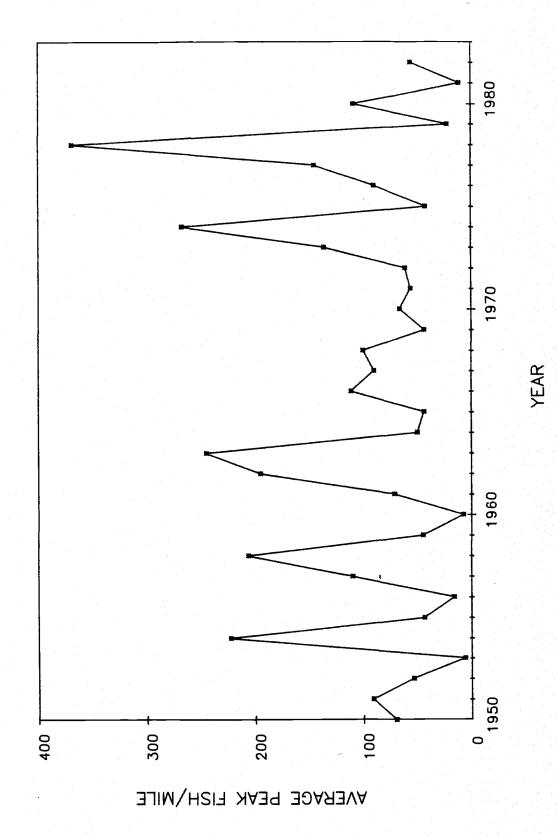
Table 8. Peak counts of chum salmon in Clear Creek, Nestucca River, 1950-82.

Year	Peak count [a]	Year	Peak count
1950	56	1970	53
51	73	71	45
52	43	72	49
53	5	73	109
54	178	74	214
55	35	75	34
56	13	76	72
57	88	77	116
58	165	78	295
59	36	79	18
1960	6	1980	87
61	57	81	9
62	156	82 [b]	45
63	196		
64	40		
65	35		
66	89		
67	72		
68	80		
69	35		

[a] Surveyed 0.8 mile.

[b] Landowner denied access to lower 0.2 mile of the survey and 0.2 mile was added to the upper end.

Peak counts of chum salmon have shown wide fluctuations since 1950 (Figure 4). A 4-year cycle of dominance has generally occurred since 1954 corresponding to the dominant age class of 4-year-old spawners prevalent in Oregon chum salmon stocks. Large number of spawners have generally produced large returns while small numbers of spawners have generally resulted in poor

FIG. 4. TRENDS IN THE ESCAPEMENT OF CHUM SALMON IN CLEAR CREEK, NESTUCCA RIVER, SINCE 1950.

returns 4 years later. Nestucca River chum salmon have primarily fluctuated from natural mortality factors alone since commercial gill-net fisheries were closed after March 1927 (Cleaver 1951). A large run failed to materialize in 1982 following the record high count in 1978; however, this may be partly a function of a lack of access to survey salmon in the lower 0.2 mile of Clear Creek.

Age-length composition

Scale samples were obtained from 88 chum salmon carcasses recovered in Tillamook Bay tributaries in 1982. The sample consisted of 46 males and 42 females. The age composition of the chum stocks was 20.4% age 3, 78.4% age 4, and 1.1% age 5 (Table 9). Cursory inspection of growth increments on age 4 fish indicated that growth was poor in the third year of life (1981) compared to the fourth year. This might indicate that food production and consequently growth was hampered by poor oceanic conditions in 1981. Mean lengths of female chum salmon in Tillamook Bay ranged from 67.7 cm FL at age 3 to 69.4 cm FL at age 4. Males were slightly larger, ranging from 70.7 cm FL at age 3 to 73.3 cm FL at age 4 (Table 10).

Table 9. Sex ratio and age composition of Tillamook Bay chum salmon, 1982.

| | Sex ratio | | | | Age composition | |
| | Males | | Females | | | |
Age	No.	%	No.	%	Total	%
3	11	23.9	7	16.7	18	20.4
4	34	73.9	35	83.3	69	78.4
5	1	2.2	0	0.0	1	1.1
Total	46	52.3	42	47.7	88	100.0

Table 10. Mean lengths of Tillamook Bay chum salmon, 1982.

| | Mean lengths [a] | | | |
| | Males | | Females | |
Age	MEPS	FL	MEPS	FL
3	60.8	70.7	58.3	67.7
4	62.9	73.3	59.7	69.4
5	66.0	77.0	--	--

[a]Mean "ocean" fork lengths converted from the regression $FL = -2.5214 + 1.2048$ (MEPS). MEPS lengths are mideye-posterior scale measurements.

Scale samples were obtained from only four chum salmon in the Nestucca River (one male and three females). The four salmon were progeny from the 1978 brood year (age 4).

Hatchery Coho Salmon Strays

Coded-wire tag recoveries

Nine CWT strays from Oregon Aqua-Foods were recovered in Yaquina Bay tributaries (Table 11). The tags were recovered in all four areas sampled, indicating that stray hatchery fish were distributed throughout the river system.

Tagged coho released by Oregon Aqua-Foods were also recovered at other Oregon coastal localities (Table 11). The relatively large number of strays recovered at Salmon River Hatchery compared with other coastal hatcheries probably reflects differences in the geographic positioning of the facilities rather than any measurable index of straying at each site (Nicholas et al. 1982). Salmon River Hatchery is located on the main stem a short distance above tidewater, while Siletz and Fall Creek hatcheries are located on tributaries much further upstream.

Table 11. Tagged coho released in Yaquina Bay by Oregon Aqua-Foods recovered at Oregon coastal sites in 1982.

Recovery site	Number
Salmon River Hatchery	22
Siletz River Hatchery	1
Siletz River	1
Oregon Aqua-Foods, Yaquina Bay	4,954 [a]
Yaquina River	9
Fall Creek Hatchery (Alsea River)	1
Alsea River	2 [b]
Beaver Creek	1
Elk River Hatchery	1
Total	4,992

[a]5,245 adipose-marked coho were examined, but tags were only recovered from 4,954.

[b]Includes one tagged coho recovered in the Alsea River sport fishery in September 1982.

Scale Analysis

Samplers collected 165 scales from coho salmon carcasses in Yaquina River tributaries and 574 at Salmon River, Siletz River, and Fall Creek hatcheries combined (Table 12). Scale samples collected in Yaquina River after 1 January 1983 were assumed to be from wild coho based on the results of similar studies in 1980 (Nicholas et al. 1982) and 1981 (Nicholas and Van Dyke 1982).

Table 12. Source of coho salmon scale samples collected in 1982-83.

		Total	Jacks	Adults Readable	Adults Unreadable
Spawning surveys:					
Yaquina	11/5 to 12/30	132	14	95	23
Yaquina	1/1 to 2/3	33	16	13 [a]	4
Hatcheries:					
Salmon River	11/4, 11/6	181	1	140	40
Siletz River	11/1	196	4	145	47
Fall Creek	11/8-9	197	3	157	37

[a]*All scales collected after 1 January 1983 were assumed to be from wild coho so were not included in the straying study. Some of these scales were used in the wild training population.*

Distribution. Scale analysis showed that hatchery and wild coho salmon were distributed throughout the Yaquina River (Table 13) similar to coded-wire tag recoveries. Hatchery strays were more abundant than wild coho salmon in each area of the watershed.

Table 13. Classification by discriminant analysis of coho salmon scale samples collected from Yaquina River tributaries by watershed area, 1982.

Area		Hatchery yearling No.	Hatchery yearling %	Hatchery accelerated No.	Hatchery accelerated %	Wild No.	Wild %	Total
I	Tidewater	13	29.5	22	50.0	0	20.5	44
II	Lower Big Elk & Yaquina	7	21.9	20	62.5	4	12.5	32 [a]
III	Upper Yaquina	0	0	4	57.1	3	42.9	7
IV	Upper Big Elk	1	7.7	10	76.9	1	7.7	12

[a]*One scale sample could not be classified.*

Timing. Coho salmon were first observed on 28 October 1982 and a few
live adults were observed as late as 25 January 1983. Hatchery fish strays
dominated the spawning population in October, November, and through much of
December (Table 14). The hatchery strays were primarily composed of
"accelerated" smolts liberated in the first year of life by Oregon
Aqua-Foods.

Table 14. Classification by discriminant analysis of coho salmon scale
samples collected from Yaquina River tributaries by time period, 1982.

Time period	Hatchery yearling		Hatchery accelerated		Wild		Total
	No.	%	No.	%	No.	%	
10/29 to 11/11	0	--	3	100.0	0	--	3
11/12 to 11/25	2	11.8	14	82.3	1	5.9	17
11/26 to 12/9	9	23.7	23	60.5	6	15.8	38
12/10 to 12/23	9	30.0	15	50.0	6	20.0	31 [a]
12/24 to 12/31	1	16.7	1	16.7	4	66.6	6
Total	21	22.1	56	58.9	17	17.9	95 [a]

[a]One scale sample could not be classified.

Lincoln District public hatcheries. Discriminant analysis of scale
samples collected at Lincoln District public hatcheries indicated that Salmon
River Hatchery contained about 14% accelerated hatchery stock compared to
about 3% at Fall Creek (Alsea River) Hatchery (Table 15). In contrast, no
accelerated hatchery fish was identified in scale samples collected at Siletz
River Hatchery. The results of the scale analysis are consistent with the
observed trends in the recoveries of Oregon Aqua-Foods' tags at the three
hatcheries. Percentages of wild stocks in the hatcheries ranged from about
10% to 18%.

Table 15. Classification by discriminant analysis of coho salmon collected at Salmon River, Siletz, and Fall Creek hatcheries, 1982.

Location	Hatchery yearling		Hatchery accelerated		Wild		Total
	No.	%	No.	%	No.	%	
Salmon River	94	67.1	20	14.3	25	17.9	140 [a]
Siletz	125	86.2	0	--	18	12.4	145 [b]
Fall Creek	136	86.6	5	3.2	16	10.2	157

[a] *One scale sample could not be classified.*

[b] *Two scale samples could not be classified.*

Abundance in Yaquina River

The area-under-the-curve estimates of the total spawning escapement of adult coho salmon in Yaquina River surveys were used to provide rough estimates of spawning stock sizes of hatchery and wild fish in Yaquina River. The estimates are predicated on the following assumptions: 1) there are 156 miles of coho salmon habitat in Yaqina River (Beidler and Nickelson 1980); 2) the spawning density in the surveys was representative of the total spawning population; and 3) fish counted in the survey areas were spawners rather than migrants to upstream spawning sites. Additional assumptions pertaining to AUC estimates are described by Beidler and Nickelson (1980). The estimates derived from AUC data are likely maximal since most violations of the assumptions tend to overestimate true population sizes.

The AUC population estimate was 292 adult coho in 10.5 miles. The population estimate was expanded by a factor of $156/10.5 = 14.86$ to determine a total spawning population of 4,339 adults. The estimated proportion of fish that spawned prior to 1 January was 95% while 5% (assumed to be all wild stock) spawned after 1 January 1983. These percentages applied to the

population estimates indicate that 4,122 spawned prior to 1 January and 217 thereafter. Since wild fish comprised about 18% of the spawners prior to 1 January (Table 14), the estimated stock sizes were 742 wild and 3,380 hatchery adults. Therefore, the total spawning population in Yaquina River consisted of 3,380 (78%) hatchery and 959 (22%) wild adults in 1982-83. The stock size estimates must be tempered with the realization that they rely on several unquantified biases in the data and underlying assumptions.

Straying rate. Ore-Aqua records showed that 42,694 adult coho salmon were recovered at the Yaquina Bay facility in 1982. Of these, an estimated 1,129 ($\pm$ 565) were wild spawners (Cummings 1983). Therefore, the estimated straying rate was 8% in the Yaquina River. It was not possible to calculate similar straying rates of Ore-Aqua coho to nearby drainages or an overall straying rate to all areas outside the hatchery.

DISCUSSION

The average peak count of adult fall chinook salmon fell within the range of counts experienced since 1977 (67.9 to 81.5 adults/mile). The record high counts in recent years suggest the stocks are healthy and escapement goals have been attained to achieve full natural production. The relatively stable peak counts since 1977 may indicate the stocks have attained maximum sustainable numbers of spawners in most coastal rivers. The peak count of jack fall chinook improved over 1981 and was within the range of peak counts obtained in recent years. The jack count indicates survival of the 1980 brood was relatively good.

Oregon coastal fall chinook contribute to fisheries from southeastern Alaska to central California. The stocks can be divided into two major production units based on their distribution of catch in ocean fisheries. Northern and central coastal fall chinook primarily contribute to Alaskan and British Columbia fisheries while southern Oregon stocks primarily contribute to Oregon and California fisheries. Different regulations govern the harvest of chinook from each major production unit which may influence the escapement in the production units. The average coastal peak counts are heavily influenced by surveys in the northern production unit. Trends in the southern production unit are difficult to assess due to the small number of surveys and erratic counts in index streams. No additional funds were authorized in the 1983-85 biennium to improve the surveys for chinook salmon in either major production unit.

The average escapement of adult coho salmon in 1982 was a distinct improvement over indexes collected since 1979. The improved escapement was a reflection of the severe restrictions imposed on ocean troll and sport fisheries by the Pacific Fishery Management Council. However, despite the improvement in adult escapements in 1982, the spawning index failed to achieve the interim goal of 19.7 adults/mile (about 170,000 adults). The interim goal was set to ultimately achieve an optimum level of 200,000 adults by 1987 in the Coho Salmon Management Plan (ODFW 1982).

Stray coho salmon from private hatcheries and returns from offstation presmolt and smolt releases probably inflate the peak counts in certain watersheds where index areas are located. The degree of influence is unknown which hampers any straightforward analysis of wild fish escapements in coastal streams. Stray spawners from private hatcheries generally overlapped the temporal and spatial distribution of wild fish spawners in the Yaquina River

in 1982 as well as the previous 2 years (Nicholas et al. 1982; Nicholas and Van Dyke 1982). The average total spawning density in hatchery-influenced streams was about 4 adults/mile larger than in streams believed to be restricted to wild spawners based on a compilation of all index units (standard and nonstandard) surveyed in 1982. The differential in total spawners may be influenced by hatchery strays and returns from hatchery transplants or other nonrelated factors (i.e. the hatchery-influenced streams may be inherently more productive than streams with wild stocks alone).

The peak counts of coho salmon in index units classified as wild were larger than peak counts in hatchery-influenced streams when all standard and nonstandard indexes were combined. In contrast, total estimates of spawners in the two strata from AUC data indicated the opposite was true. The difference is thought to be due to the influence of index units with wild fish in lake systems where counts of wild fish are traditionally much larger than in river systems. The indexes in lake systems have not qualified for AUC estimates but were included in peak counts for nonstandard surveys.

The chum salmon escapement was excellent at Tillamook Bay in 1982. This was reflected in the large peak counts obtained in all streams surveyed at Tillamook Bay. Chum salmon trapped in Coal Creek also approached the record-high number counted in 1978. Similar results were obtained in the Nestucca River, although access was denied to the prime spawning habitat in the lower 0.2 mile of Clear Creek. Scale samples indicated that 4-year-old chum salmon from the 1978 brood year dominated the runs in 1982.

Hatchery strays from Oregon Aqua-Foods comprised a significant proportion of the spawning stocks of coho salmon in Yaquina River. Although the straying rate was about 8%, this provided 78% of the naturally spawning adult coho salmon in Yaquina River because of the large numerical dominance of hatchery fish returning to the system. Scale analyses and the recovery of coded-wire tags indicate that hatchery fish strays from Oregon Aqua-Foods have also mingled with wild and hatchery spawning stocks in other coastal drainages. A relatively high proportion of strays from hatchery accelerated fish releases was identified at Salmon River Hatchery. The possible long-term affects of these strays are unknown but contemporary genetic theories suggest a potential loss in the "productivity" (yield) of the impacted stocks may occur.

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Appendix A

Peak Counts of Fall Chinook Salmon in Standard and Nonstandard
Index Streams Stratified by Fishery District and River Basins

Explanation of Columns in Appendix Tables

No. Sur.--the number of individual surveys included in the strata.

Miles--miles surveyed in the strata.

Times Sur.--number of actual surveys made within the strata.

Total Miles--cumulative total miles surveyed within the strata.
    For multiple surveys, it is the sum of the individual surveys
    times the frequency surveyed.

Peak Counts

1982 Peak--maximum combined live and dead salmon seen on a given survey.

Per Mile--peak count expressed as a fish/mile count.

Date--date of the survey when the peak count was observed.

1981 Peak--peak count obtained in the survey during the previous year.

Estimated Run Size (AUC)

Sur.--the number of surveys used for area-under-the curve (AUC estimates
    within the strata.

Run Size--the total estimated number of salmon that spawned in a given
    survey.

Per Mile--the total estimated number of fish/mile that spawned in a given
    strata.

1982-83 SPAWNING GROUND SURVEY SUMMARY

ASTORIA FISHERIES DISTRICT
CHINOOK SALMON

SURVEYS	NO. SUR MILES	MILES	TIMES SUR	TOTAL MILES	PEAK COUNTS (LIVE AND DEAD) ADULTS 1982 PEAK MILE	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK MILE	PER MILE	DATE	1981 PEAK	ESTIMATED RUN SIZE (AUC) ADULTS SUR	RUN SIZE MILE	PER MILE	JACKS RUN SIZE MILE	PER MILE
ASTORIA DISTRICT																	
STANDARD SURVEYS	1	1.0	2	2.0	70	70			13	13							
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	1.0	2	2.0	70				13								
NEHALEM RIVER																	
STANDARD SURVEYS	1	1.0	2	2.0	70	70			13	13							
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	1.0	2	2.0	70				13								
MAIN STEM	1	1.0	2	2.0	70	70			13	13							
HUMBUG CREEK	1	1.0	2	2.0	70	70	11/ 9/82	148	13	13	11/ 9/82	1					

1982-83 SPAWNING GROUND SURVEY SUMMARY

TILLAMOOK FISHERIES DISTRICT
CHINOOK SALMON

| | | | | PEAK COUNTS (LIVE AND DEAD) | | | | | | | | ESTIMATED RUN SIZE (AUC) | | |
| | | | | ADULTS | | | | JACKS | | | | ADULTS | | JACKS |
SURVEYS	NO. SUR MILES	TIMES SUR	TOTAL MILES	1982 PEAK	PER MILE	DATE	1981 PEAK	1982 PEAK	PER MILE	DATE	1981 PEAK	RUN SIZE MILE	SUR RUN SIZE MILE	RUN PER SIZE MILE
TILLAMOOK DISTRICT	4	3.5	38		99				13					
STANDARD SURVEYS	2	2.2	18		89				12					
NON STANDARD SURVEYS	2	1.3	20		117				15					
HATCHERY INFLUENCED	2	1.2	19		155				18					
NO HATCHERY INFLUENCE	2	2.3	19		70				11					
WILSON RIVER	1	.5	11		110				20					
STANDARD SURVEYS	0	0.0	0											
NON STANDARD SURVEYS	1	.5	11		110				20					
HATCHERY INFLUENCED	0	0.0	0											
NO HATCHERY INFLUENCE	1	.5	11		110				20					
LITTLE NORTH FORK	1	.5	11		110				20					
LITTLE NORTH FORK	1	.5	11	55	110	12/ 9/82		10	20	11/ 2/82	3			
TRASK RIVER	1	.8	9		121				11					
STANDARD SURVEYS	0	0.0	0											
NON STANDARD SURVEYS	1	.8	9		121				11					
HATCHERY INFLUENCED	1	.8	9		121				11					
NO HATCHERY INFLUENCE	0	0.0	0											
SOUTH FORK	1	.8	9		121				11					
EDWARDS CREEK	1	.8	9	97	121	11/26/82	91	9	11	11/11/82				
TILLAMOOK RIVER	1	1.8	8		59				8					
STANDARD SURVEYS	1	1.8	8		59				8					
NON STANDARD SURVEYS	0	0.0	0											
HATCHERY INFLUENCED	0	0.0	0											
NO HATCHERY INFLUENCE	1	1.8	8		59				8					
MAIN STEM	1	1.8	8		59				8					
TILLAMOOK RIVER	1	1.8	8	107	59	11/24/82	94	15	8	11/ 9/82	6			
NESTUCCA RIVER	1	.4	10		223				30					
STANDARD SURVEYS	1	.4	10		223				30					
NON STANDARD SURVEYS	0	0.0	0											
HATCHERY INFLUENCED	1	.4	10		223				30					
NO HATCHERY INFLUENCE	0	0.0	0											
MAIN STEM AND BAY	1	.4	10		223				30					
NIAGARA CREEK	1	.4	10	89	223	11/15/82	41	12	30	11/ 1/82	1			

1982-83 SPAWNING GROUND SURVEY SUMMARY

LINCOLN FISHERIES DISTRICT
CHINOOK SALMON

SURVEYS	NO. SUR MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK	PER MILE	DATE	1981 PEAK	EST RUN SIZE ADULTS SUR	RUN SIZE	PER MILE	EST RUN SIZE JACKS RUN SIZE	PER MILE
LINCOLN DISTRICT	5 6.9	20	27.4		45				4							
STANDARD SURVEYS	3 3.9	18	24.4		65				7							
NON STANDARD SURVEYS	2 3.0	2	3.0		18				0							
HATCHERY INFLUENCED	3 4.0	8	9.0		27				3							
NO HATCHERY INFLUENCE	2 2.9	12	18.4		69				7							
SILETZ RIVER	3 4.2	6	7.8		23				0							
STANDARD SURVEYS	1 1.2	4	4.8		33				1							
NON STANDARD SURVEYS	2 3.0	2	3.0		18				0							
HATCHERY INFLUENCED	2 3.0	2	3.0		18				0							
NO HATCHERY INFLUENCE	1 1.2	4	4.8		33				1							
MAIN STEM	1 1.0	1	1.0		36				1							
MAIN STEM AND BAY	2 3.2	5	6.8		18				0							
CEDAR CREEK	1 2.0	1	2.0	19	10	11/15/82	59	0	0		4					
EUCHRE CREEK	1 1.0	1	1.0	36	36	11/15/82	68	1	1	11/15/82						
SUNSHINE CREEK	1 1.2	4	4.8	40	33	11/ 5/82		1	1	11/ 5/82	2					
YAQUINA RIVER	1 1.7	8	13.6		94				11							
STANDARD SURVEYS	1 1.7	8	13.6		94				11							
NON STANDARD SURVEYS	0 0.0	0	0.0													
HATCHERY INFLUENCED	0 0.0	0	0.0													
NO HATCHERY INFLUENCE	1 1.7	8	13.6		94				11							
ELK CREEK	1 1.7	8	13.5		94				11							
GRANT CREEK (LOWER)	1 1.7	8	13.6	160	94	11/10/82	185	18	11	11/10/82	13					
ALSEA RIVER	1 1.0	6	6.0		54				9							
STANDARD SURVEYS	1 1.0	6	6.0		54				9							
NON STANDARD SURVEYS	0 0.0	0	0.0													
HATCHERY INFLUENCED	1 1.0	6	6.0		54				9							
NO HATCHERY INFLUENCE	0 0.0	0	0.0													
FIVE RIVERS	1 1.0	6	6.0		54				9							
BUCK CREEK	1 1.0	6	6.0	54	54	11/ 9/82	32	9	9	11/ 9/82	3					

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SIUSLAW FISHERIES DISTRICT
CHINOOK SALMON

SURVEYS	NO. SUR MILES	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK MILE	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK MILE	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	AUC ADULTS RUN SIZE	AUC ADULTS PER MILE	AUC JACKS RUN SIZE	AUC JACKS PER MILE
SIUSLAW DISTRICT																
STANDARD SURVEYS	3	2.6	28	24.4		95				16						
NON STANDARD SURVEYS	1	.8	8	6.4		258				43						
HATCHERY INFLUENCED	2	1.8	20	18.0		23				4						
NO HATCHERY INFLUENCE	0	0.0	0	0.0												
	3	2.6	28	24.4		95				16						
SIUSLAW RIVER																
STANDARD SURVEYS	3	2.6	28	24.4		95				16						
NON STANDARD SURVEYS	1	.8	8	6.4		258				43						
HATCHERY INFLUENCED	2	1.8	20	18.0		23				4						
NO HATCHERY INFLUENCE	0	0.0	0	0.0												
	3	2.6	28	24.4		95				16						
MAIN STEM AND BAY																
ESMOND CREEK	1	1.0	10	10.0		10				3						
	1	1.0	10	10.0	10	10	11/22/82	23	3	3	11/22/82	3				
NORTH FORK																
NORTH FORK	1	.8	10	8.0		40				6						
	1	.8	10	8.0	32	40	11/ 1/82	20	5	6	11/ 1/82	4				
LAKE CREEK																
LAKE CREEK	1	.8	8	6.4		258				43						
	1	.8	8	6.4	206	258	11/ 4/82	140	34	43	11/ 4/82	43				

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK MILE	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK MILE	PER MILE	DATE	1981 PEAK	EST RUN SIZE ADULTS SUR MILE	RUN PER SIZE MILE	JACKS RUN PER SIZE MILE
COOS/COQUILLE DISTRICT	8	5.4	14	8.8		107				19					
STANDARD SURVEYS	2	1.3	6	3.6		79				12					
NON STANDARD SURVEYS	6	4.1	8	5.2		116				22					
HATCHERY INFLUENCED	4	2.1	8	3.7		123				23					
NO HATCHERY INFLUENCE	4	3.3	6	5.1		98				17					
COOS RIVER	3	1.1	7	2.7		202				39					
STANDARD SURVEYS	1	.5	4	2.0		16				4					
NON STANDARD SURVEYS	2	.6	3	.7		357				68					
HATCHERY INFLUENCED	3	1.1	7	2.7		202				39					
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
MILLICOMA RIVER	1	.5	4	2.0		16				4					
WEST FORK	1	.5	4	2.0	8	16	11/ 2/82	4	2	4	11/ 5/82	4			
SOUTH FORK	2	.6	3	.7		357				68					
SOUTH FORK B	1	.1	2	.2	144	1440	11/ 3/82	126	24	240	11/ 3/82	26			
WILLIAMS RIVER A	1	.5	1	.5	70	140	11/ 3/82	42	17	34	11/ 3/82	17			
COQUILLE RIVER	5	4.3	7	6.1		83				14					
STANDARD SURVEYS	1	.8	2	1.6		119				16					
NON STANDARD SURVEYS	4	3.5	5	4.5		75				14					
HATCHERY INFLUENCED	1	1.0	1	1.0		36				6					
NO HATCHERY INFLUENCE	4	3.3	6	5.1		98				17					
NORTH FORK	1	1.0	1	1.0		36				6					
MIDDLE CREEK D	1	1.0	1	1.0	36	36	11/24/82	8	6	6	11/24/82	0			
EAST FORK	1	1.0	2	2.0		70				12					
EAST FORK (LOWER)	1	1.0	2	2.0	70	70	11/12/82	32	12	12	10/28/82	2			
MIDDLE FORK	1	.5	1	.5		126				34					
MIDDLE FORK	1	.5	1	.5	63	126	11/ 3/82	55	17	34	11/ 3/82	9			
SOUTH FORK	2	1.8	3	2.6		105				15					
SALMON CREEK (LOWER)	1	.8	2	1.6	95	119	11/ 5/82	43	13	16	11/ 5/82	8			
SOUTH FORK C	1	1.0	1	1.0	94	94	11/ 3/82	114	14	14	11/ 3/82	9			

1982-83 SPAWNING GROUND SURVEY SUMMARY

SOUTHWEST FISHERIES DISTRICT
CHINOOK SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	EST. ADULTS RUN SIZE	EST. ADULTS PER MILE	EST. JACKS RUN SIZE	EST. JACKS PER MILE
SOUTHWEST DISTRICT	4	2.8	10	6.9		44				5							
STANDARD SURVEYS	3	1.8	8	4.9		22				1							
NON STANDARD SURVEYS	1	1.0	2	2.0		84				12							
HATCHERY INFLUENCED	1	1.0	2	2.0		84				12							
NO HATCHERY INFLUENCE	3	1.8	8	4.9		22				1							
ROGUE RIVER	1	.5	2	1.0		4				0							
STANDARD SURVEYS	1	.5	2	1.0		4				0							
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	.5	2	1.0		4				0							
MAIN STEM	1	.5	2	1.0		4				0							
JIM HUNT CREEK	1	.5	2	1.0	2	4	11/24/82			0							
PISTOL RIVER	1	.5	3	1.5		50				2							
STANDARD SURVEYS	1	.5	3	1.5		50				2							
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	.5	3	1.5		50				2							
MAIN STEM	1	.5	3	1.5		50				2							
DEEP CREEK	1	.5	3	1.5	25	50	12/25/82	14	1	2	12/11/82	1					
CHETCO RIVER	1	1.0	2	2.0		84				12							
STANDARD SURVEYS	0	0.0	0	0.0													
NON STANDARD SURVEYS	1	1.0	2	2.0		84				12							
HATCHERY INFLUENCED	1	1.0	2	2.0		84				12							
NO HATCHERY INFLUENCE	0	0.0	0	0.0													
MAIN STEM	1	1.0	2	2.0		84				12							
BIG EMILY CREEK	1	1.0	2	2.0	84	84	12/10/82	75	12	12	12/10/82	21					
WINCHUCK RIVER	1	.8	3	2.4		16				1							
STANDARD SURVEYS	1	.8	3	2.4		16				1							
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	.3	3	2.4		16				1							
MAIN STEM	1	.8	3	2.4		16				1							
BEAR CREEK	1	.8	3	2.4	13	16	12/29/82	10	1	1	12/ 8/82	0					

Peak Counts and Estimated Spawning Density of Coho Salmon in Standard
and Nonstandard Index Streams Stratified by Fishery District and River
Basins

Explanation of Columns in Appendix Tables

No. Sur.--the number of individual surveys included in the strata.

Miles--miles surveyed in the strata.

Time Sur.--number of actual surveys made within the strata.

Total Miles--cumulative total miles surveyed within the strata.
    For multiple surveys, it is the sum of the individual surveys
    times the frequency surveyed.

Peak Counts

1982 Peak--maximum combined live and dead salmon seen on a given survey.

Per Mile--peak count expressed as a fish/mile count.

Date--date of the survey when the peak count was observed.

1981 Peak--peak count obtained in the survey during the previous year.

Estimated Run Size (AUC)

Sur.--the number of surveys used for area-under-the curve (AUC) estimates
    within the strata.

Run Size--the total estimated number of salmon that spawned in a given
    survey.

Per Mile--the total estimated number of fish/mile that spawned in a given
    strata.

1982-83 SPAWNING GROUND SURVEY SUMMARY

ASTORIA FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK
ASTORIA DISTRICT	7	6.6	61	55.8		19				3		
STANDARD SURVEYS	7	6.6	61	55.8		19				3		
NON STANDARD SURVEYS	0	0.0	0	0.0								
HATCHERY INFLUENCED	1	1.5	8	12.0		33				4		
NO HATCHERY INFLUENCE	6	5.1	53	43.8		15				2		
NECANICUM RIVER	1	1.5	8	12.0		33				4		
STANDARD SURVEYS	1	1.5	8	12.0		33				4		
NON STANDARD SURVEYS	0	0.0	0	0.0								
HATCHERY INFLUENCED	1	1.5	8	12.0		33				4		
NO HATCHERY INFLUENCE	0	0.0	0	0.0								
MAIN STEM	1	1.5	8	12.0		33				4		
UPPER NECANICUM	1	1.5	8	12.0	49	33	11/ 3/82	5	6	4	11/ 3/82	1
ELK CREEK	1	.5	9	4.5		12				2		
STANDARD SURVEYS	1	.5	9	4.5		12				2		
NON STANDARD SURVEYS	0	0.0	0	0.0								
HATCHERY INFLUENCED	0	0.0	0	0.0								
NO HATCHERY INFLUENCE	1	.5	9	4.5		12				2		
WEST FORK	1	.5	9	4.5		12				2		
WEST FORK	1	.5	9	4.5	6	12	11/11/82	7	1	2	12/24/82	1
NEHALEM RIVER	5	4.6	44	39.3		15				2		
STANDARD SURVEYS	5	4.6	44	39.3		15				2		
NON STANDARD SURVEYS	0	0.0	0	0.0								
HATCHERY INFLUENCED	0	0.0	0	0.0								
NO HATCHERY INFLUENCE	5	4.6	44	39.3		15				2		
MAIN STEM	5	4.6	44	39.3		15				2		
HAMILTON CREEK	1	1.0	7	7.0	5	15	11/10/82	2	1	2	11/10/82	1
NORTH FORK CRONIN CREEK	1	.5	11	5.5	9	18	12/ 8/82	4	1	2	12/14/82	1
NORTH FORK WOLF CREEK	1	1.1	8	3.8	26	24	12/ 9/82	4	2	2	12/ 9/82	0
OAK RANCH CREEK	1	1.0	8	8.0	11	11	12/10/82	3	1	1	11/24/82	0
WEST HUMBUG CREEK	1	1.0	10	10.0	20	20	12/ 7/82	16	5	5	12/ 7/82	0

Note: PEAK COUNTS (LIVE AND DEAD). ESTIMATED RUN SIZE (AUC) columns (ADULTS — SUR RUN SIZE PER MILE; JACKS — RUN SIZE MILE PER MILE) contain no entries.

TILLAMOOK FISHERIES DISTRICT
COHO SALMON

					PEAK COUNTS (LIVE AND DEAD)								ESTIMATED RUN SIZE (AUC)		
					ADULTS				JACKS				ADULTS		JACKS
SURVEYS	NO. SUR	SUR MILES	TIMES SUR	TOTAL MILES	1982 PEAK	PER MILE	DATE	1981 PEAK	1982 PEAK	PER MILE	DATE	1981 PEAK	SUR	RUN SIZE PER MILE	RUN SIZE PER MILE
TILLAMOOK DISTRICT	20	16.3	221	184.9		11				1			12	24	3
STANDARD SURVEYS	7	7.4	75	78.1		12				1			3	36	5
NON STANDARD SURVEYS	13	8.9	146	106.8		10				1			9	20	2
HATCHERY INFLUENCED	17	13.8	181	151.5		12				1			9	26	3
NO HATCHERY INFLUENCE	3	2.5	40	33.4		4				1			3	14	2
MIAMI RIVER	1	.5	11	5.5		0				0			1	0	3
STANDARD SURVEYS	0	0.0	0	0.0											
NON STANDARD SURVEYS	1	.5	11	5.5		0				0			1	0	
HATCHERY INFLUENCED	1	.5	11	5.5		0				0			1	0	
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
MAIN STEM	1	.5	11	5.5		0				0			1	0	
WALDRON CREEK	1	.5	11	5.5	0	0				0			1	0	3
KILCHIS RIVER	1	1.0	11	11.0		15				4			1	29	7
STANDARD SURVEYS	1	1.0	11	11.0		15				4			1	29	7
NON STANDARD SURVEYS	0	0.0	0	0.0											
HATCHERY INFLUENCED	1	1.0	11	11.0		15				4			1	29	7
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
LITTLE SOUTH FORK	1	1.0	11	11.0	15	15	11/ 3/82	3	4	4			1	29	
SAM DOWNS CREEK	1	1.0	11	11.0	15	15	11/ 3/82	3	4	4	11/ 3/82	2	1	29	7
WILSON RIVER	3	3.7	28	36.2		12				1			1	46	9
STANDARD SURVEYS	2	2.4	19	33.5		11				1					
NON STANDARD SURVEYS	1	.3	9	2.7		20				3			1	46	9
HATCHERY INFLUENCED	3	3.7	28	36.2		12				1			1	46	9
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
MAIN STEM	2	3.2	19	31.7		8				1			1	46	9
CEDAR CREEK	1	2.9	10	29.0	18	6	11/ 7/82	7	2	1	10/31/82	0			
UPPER CEDAR CREEK & TRIB A	1	.3	9	2.7	6	20	12/11/82	1		3	11/23/82	1	1	14	3
DEVIL'S LAKE FORK	1	.5	9	4.5		38				2					
UPPER DEVIL'S LAKE FORK	1	.5	9	4.5	19	38	10/31/82	23	1	2	10/31/82	2	1	29	
TRASK RIVER	3	.9	25	7.5		21				1					
STANDARD SURVEYS	0	0.0	0	0.0											
NON STANDARD SURVEYS	3	.9	25	7.5		21				1					
HATCHERY INFLUENCED	3	.9	25	7.5		21				1					

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1982-83 SPAWNING GROUND SURVEY SUMMARY

TILLAMOOK FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR MILES	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK	PER MILE	DATE	1981 PEAK	ADULTS SUR	RUN SIZE MILE	PER MILE	JACKS SUR	RUN SIZE MILE	PER MILE
NO HATCHERY INFLUENCE	0	0.0	0	0.0														
NORTH FORK																		
CRUISER CREEK NO. 1	3	.9	25	7.5		21			1									
CRUISER CREEK NO. 2	1	.3	9	2.7	0	0			0	0								
ELKHORN CREEK	1	.3	7	2.1	10	33	11/ 4/82		0									
ELKHORN CREEK	1	.3	9	2.7	9	30	11/12/82		3	1	11/12/82							
TILLAMOOK RIVER																		
STANDARD SURVEYS	1	.6	12	7.2		3			0									
NON STANDARD SURVEYS	1	.6	12	7.2		3			0									
HATCHERY INFLUENCED	0	0.0	6	0.0														
NO HATCHERY INFLUENCE	1	.6	12	7.2		3			0									
	0	0.0	0	0.0														
MAIN STEM																		
SIMMONS CREEK	1	.6	12	7.2		3			0									
SIMMONS CREEK	1	.6	12	7.2	2	3	10/26/82	5	0			0						
SAND LAKE	2	2.3	26	29.9		10			1				2		18			1
STANDARD SURVEYS	0	0.0	0	3.0														
NON STANDARD SURVEYS	2	2.3	26	29.9		10			1				2		18			1
HATCHERY INFLUENCED	2	2.3	26	29.9		10			1				2		18			1
NO HATCHERY INFLUENCE	0	0.0	0	0.0														
SAND LAKE	2	2.3	26	29.9		10			1				2		19			1
JEWELL CREEK	1	1.0	13	13.0	9	9	11/19/82	3	2	2	11/ 2/82	2	1	20	20			1
SAND CREEK	1	1.3	13	16.9	14	11	11/10/82	5	1	1	11/ 2/82	1	1	20	15		1	1
NESTUCCA RIVER	8	6.6	94	77.8		11			1				6		25			1
STANDARD SURVEYS	3	2.4	33	26.4		13			1				2		39			4
NON STANDARD SURVEYS	5	4.2	61	51.4		9			1				4		18			3
HATCHERY INFLUENCED	6	4.8	68	54.2		14			1				4		35			2
NO HATCHERY INFLUENCE	2	1.8	26	23.6		3			0				2		7			0
MAIN STEM AND BAY	5	4.3	56	43.2		15			1				3		45			3
BEAR CREEK	1	.8	10	8.0	2	3	11/22/82	4	0	0			1	58				
CLEAR CREEK	1	.8	11	8.8	28	35	11/22/82	10	2	3	11/ 9/82	4	1		73			7
EAST CREEK	1	1.0	11	11.0	15	15	11/ 9/82	7	2	2	11/23/82	1	1	26	53		6	1
ELK CREEK	1	.5	12	6.0	10	20	11/22/82	11	1	1	11/ 1/82	2	1	12	53		1	1
TESTAMENT CREEK	1	1.2	12	14.4	9	8	12/13/82	1	0	0		0	1		10			1
BEAVER CREEK	1	.5	12	6.0		4			0				1		2			0
UPPER EAST BEAVER	1	.5	12	6.0	2	4	11/ 9/82	0	0			0	1		2			0

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1982-83 SPAWNING GROUND SURVEY SUMMARY

TILLAMOOK FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR MILES	MILES SUR	TIMES SUR	TOTAL MILES	PEAK COUNTS (LIVE AND DEAD) — ADULTS 1982 PEAK	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK	PER MILE	DATE	1981 PEAK	ESTIMATED RUN SIZE (AUC) — ADULTS SUR	RUN SIZE	PER MILE	JACKS RUN SIZE	PER MILE
LITTLE NESTUCCA	2	1.8	26	23.6									2		7		
BEAR CREEK	1	.8	12	9.6	2	3	11/10/82	2	0	0		0	1	5	6	0	0
LOUIE/BAXTER CREEK	1	1.0	14	14.0	3	3	12/2/82	3	0	0		0	1	8	8	0	0
NESKOWIN CREEK	1	.7	14	9.8	6	9	11/23/82	4	3	4	11/23/82	1	1	20	29	3	5
STANDARD SURVEYS	0	0.0	0	0.0													
NON STANDARD SURVEYS	1	.7	14	9.8	6	9	11/23/82	4	3	4	11/23/82	1	1	20	29	3	5
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	.7	14	9.8	6	9	11/23/82	4	3	4	11/23/82	1	1	20	29	3	5
MAIN STEM	1	.7	14	9.8	6	9	11/23/82	4	3	4	11/23/82	1	1	20	29	3	5
NESKOWIN CREEK	1	.7	14	9.8	6	9	11/23/82	4	3	4	11/23/82	1	1	20	29	3	5

1982-83 SPAWNING GROUND SURVEY SUMMARY

LINCOLN FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	PEAK COUNTS (LIVE AND DEAD) ADULTS 1982 PEAK	ADULTS DATE	ADULTS 1981 PEAK	ADULTS PER MILE	JACKS DATE	JACKS 1981 PEAK	JACKS PER MILE	EST. RUN SIZE (AUC) ADULTS SUR	ADULTS RUN SIZE	ADULTS PER MILE	JACKS RUN SIZE	JACKS PER MILE
LINCOLN DISTRICT	36	28.5	428	341.1				16			2	16		27		2
STANDARD SURVEYS	10	10.6	120	124.6				15			2	3		39		2
NON STANDARD SURVEYS	26	17.9	308	216.5				17			2	13		24		2
HATCHERY INFLUENCED	28	23.0	331	272.7				17			2	16		27		2
NO HATCHERY INFLUENCE	8	5.5	97	68.4				14			3					
SILETZ RIVER	5	4.3	45	41.2				17			1	1		43		2
STANDARD SURVEYS	2	1.8	23	20.2				23			2	1		43		2
NON STANDARD SURVEYS	3	2.5	22	21.0				14			1					
HATCHERY INFLUENCED	5	4.3	45	41.2				17			1	1		43		2
NO HATCHERY INFLUENCE	0	0.0	0	0.0												
MAIN STEM AND BAY	3	2.3	25	21.2		11/15/82	8	26	12/7/82	2	2	1		43		2
DEWEY CREEK	1	.5	2	1.0	18		1	18		2	2	1		43		
FOURTH OF JULY CREEK	1	.8	14	11.2	14	11/27/82	13	18	12/7/82	1	2	1	35	43		2
GRAVEL CREEK	1	1.0	9	9.0	27	10/28/82	3	27	10/28/82	2	3	1		43		
SCHOONER CREEK																
SCHOONER CREEK (LOWER)	2	2.0	20	20.0	8	11/8/82	8	7		1						
SCHOONER CREEK (UPPER)	1	1.0	10	13.0	9	11/26/82	12	9	11/4/82	3	1					
YAQUINA RIVER	20	15.3	250	190.7				19			2	14		26		2
STANDARD SURVEYS	2	2.6	23	27.8				20			2	1		52		3
NON STANDARD SURVEYS	18	12.7	227	162.9				19			3	13		24		2
HATCHERY INFLUENCED	20	15.3	250	190.7				19			2	14		26		2
NO HATCHERY INFLUENCE	0	0.0	0	0.0												
MAIN STEM AND BAY	11	10.0	137	124.0				18			2	7		26		3
BALES CR (LEFT FORK)	1	.7	12	8.4	8	11/15/82	11	14	11/29/82	3	2					
BALES CR (MOUTH TO FORKS)	1	.3	9	2.7	4	12/10/82	3	13	12/10/82	0	2					
BALES CR (RIGHT FORK)	1	.9	9	8.1	9	11/22/82	8	10	11/22/82	1	1					
BEAVER CREEK (UPPER)	1	.8	12	9.6	38	11/16/82	32	48	11/24/82	6	4	1	44	55	4	5
HAYES CREEK (LOWER)	1	1.0	15	15.0	29	11/22/82	6	29	11/22/82	6	2	1	42	42	2	2
MILL CR (GRANDCHILD)	1	.5	14	7.0	5	11/24/82	6	10	12/13/82	1	2	1	5	10	2	2
MILL CR (HOUSE TO RESERVOIR)	1	1.1	14	15.4	14	11/24/82	55	13	12/23/82	3	4	1	19	17	3	3
MILL CR (TRIB TO HOUSE)	1	.7	14	3.8	11	12/13/82	18	16	12/2/82	2	1	1	7	10	1	1
MILL CR (UNNAMED TRIB)	1	1.0	14	14.0	7	12/2/82	9	7	11/8/82	2	2	1	13	13	2	2
THORNTON CREEK	1	1.0	14	14.0	22	11/22/82	5	22	1/13/83	1	5	1	35	35	2	2
UPPER YAQUINA RIVER	1	2.0	10	20.0	28	11/22/82	42	14	11/22/82	4	2	1		23		2
ELK CREEK	8	4.7	100	58.9				19			3	6		23		2

LINCOLN FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	SUR MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	EST SUR	EST ADULTS RUN SIZE	EST ADULTS PER MILE	EST JACKS RUN SIZE	EST JACKS PER MILE
BEAR CREEK (LOWER)	1	.5	11	5.5	8	16	11/24/82	12	3	6	1/24/83	5					0
BEAR CREEK (UPPER)	1	.4	10	4.0	16	40	11/24/82	23	2	5	12/13/82	3					3
BEAVER CREEK (LOWER)	1	.5	13	6.5	5	10	12/ 8/82	6	0	0		0	1	7	14	9	3
DEER CREEK	1	1.1	13	14.3	19	17	11/22/82	7	2	2	11/ 1/82	1	1	30	27	3	3
RAIL CANYON CREEK	1	.6	13	7.8	8	13	12/24/82	17	0	0		0	1	11	18	0	0
WILDCAT CREEK	1	.8	12	9.6	20	25	11/17/82	19	4	5	11/24/82	1	1	37	46	4	5
WOLF CREEK (LOWER)	1	.3	14	4.2	11	37	11/22/82	7	0	0		0	1	6	27	3	0
WOLF CREEK (UPPER)	1	.5	14	7.0	2	4	1/17/83	8	4	8	1/ 3/83	0	1	3	6	3	6
LITTLE ELK CREEK	1	.6	13	7.8		40		16		2			1	31	52		
SALMON CREEK	1	.6	13	7.8	24	40	11/22/82	16	1	2	12/13/82	1	1	31	52		0
BEAVER CREEK	3	2.3	42	32.2	15	15				5							
STANDARD SURVEYS	1	1.0	14	14.0	20	20				6							
NON STANDARD SURVEYS	2	1.3	28	18.2	12	12				4							
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	3	2.3	42	32.2	15	15				5							
NORTH FORK	3	2.3	42	32.2	20	15				5							
NORTH FORK BEAVER CREEK	1	1.0	14	14.0	20	20	11/24/82	11	6	6	11/24/82	2					
NORTH FORK OF NORTH FORK	1	.5	14	7.0	9	18	11/18/82	12	3	6	1/28/83	1					
SOUTH FORK OF NORTH FORK	1	.8	14	11.2	6	8	11/18/82	8	2	3	11/24/82	1					
ALSEA RIVER	8	6.6	91	77.0	10	10				2				20	20		
STANDARD SURVEYS	5	5.2	60	62.6	10	10				2				20	20		
NON STANDARD SURVEYS	3	1.4	31	14.4	9	9				1							
HATCHERY INFLUENCED	3	3.4	36	40.8	6	6				2				20			
NO HATCHERY INFLUENCE	5	3.2	55	36.2	13	13				2							
DRIFT CREEK	5	3.2	55	36.2	13	13				2							
DRIFT CREEK NO. 1	1	.6	10	6.0	7	12	11/ 3/82	5	0	0		0					
DRIFT CREEK NO. 2	1	.4	10	4.0	5	5	12/29/82	3	1	3	12/29/82	0					
DRIFT CREEK NO. 3	1	.4	11	4.4	3	8	12/ 7/82	7	0	0		0					
HOPSE CREEK	1	1.0	13	13.0	19	19	11/ 3/82	12	3	3	11/ 3/82	1					
NETTLE CREEK	1	.8	11	8.8	11	14	11/24/82	31	2	3	10/27/82	3					
FIVE RIVERS	3	3.4	36	40.8	6	6				2				20			5
CHERRY CREEK	1	.8	12	9.6	5	6	11/23/82	17	3	4	11/23/82	1					
LOBSTER CREEK	1	1.3	11	14.3	9	7	11/ 3/82	23	2	2	11/ 9/82	2					
WILSON CREEK	1	1.3	13	16.9	7	5	12/ 7/82	23	2	2	12/ 7/82	1	1	26	20	7	5

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1982-83 SPAWNING GROUND SURVEY SUMMARY

SIUSLAW FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	EST. ADULTS SUR	EST. ADULTS RUN SIZE	EST. ADULTS PER MILE	EST. JACKS RUN SIZE	EST. JACKS PER MILE
SIUSLAW DISTRICT	27	20.5	275	205.3		27				7			20		21		3
STANDARD SURVEYS	8	7.5	97	91.2		7				2			7		13		2
NON STANDARD SURVEYS	19	13.0	178	114.1		39				16			13		25		3
HATCHERY INFLUENCED	13	8.1	167	105.8		20				3			13		25		3
NO HATCHERY INFLUENCE	14	12.4	108	99.5		32				9			7		13		2
YACHATS RIVER	2	1.8	16	14.4		3				2			1		16		2
STANDARD SURVEYS	2	1.8	16	14.4		3				2			1		16		2
NON STANDARD SURVEYS	0	0.0	0	0.0													
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	2	1.8	16	14.4		3				2			1		16		2
MAIN STEM	1	.5	8	4.0		8				2			1		16		2
SCHOOL FORK	1	.5	8	4.0	4	8	12/7/82	2	2	2	12/23/82	0	1	8	16	1	2
NORTH FORK	1	1.3	8	10.4		2				2			1		16		2
WILLIAMSON CREEK	1	1.3	8	10.4	2	2	1/12/83	1	2	2	1/12/83	0	1	8	16	1	2
SIUSLAW RIVER	19	13.8	248	182.6		15				2			19		21		3
STANDARD SURVEYS	6	5.7	81	76.8		8				2			6		12		2
NON STANDARD SURVEYS	13	8.1	167	105.8		20				3			13		25		3
HATCHERY INFLUENCED	13	8.1	167	105.8		20				3			13		25		3
NO HATCHERY INFLUENCE	6	5.7	81	76.8		8				2			6		12		2
MAIN STEM AND BAY	9	5.2	111	64.3	9	22				4			9		25		4
BUCK CREEK (LOWER)	1	.5	12	6.0	6	12	11/9/82	0	3	6	12/7/82	0	1	10	20		7
BUCK CREEK (UPPER)	1	.3	12	3.6	0	0		0	0	0		0	1	0	0		3
DOE CREEK	1	.5	13	6.5	1	2	12/14/82	0	0	0		0	1	1	1		3
DOGWOOD CREEK	1	1.0	12	12.0	4	4	11/22/82	0	0	0		0	1	4	4		3
HADSALL CREEK (LOWER)	1	.6	13	7.8	37	62	11/8/82	1	4	7	11/8/82	0	1	36	60		7
HADSALL CREEK (UPPER)	1	.5	12	6.0	22	44	11/1/82	3	2	4	11/24/82	1	1	37	73		9
KNOWLES CREEK (LOWER)	1	.5	12	6.0	5	10	11/8/82	5	0	0	11/8/82	1	1		9		3
KNOWLES CREEK (UPPER)	1	.8	13	10.4	40	50	11/8/82	5	9	11	11/6/82	2	1	47	59	8	10
OXBOW CREEK	1	.5	12	6.0	0	0		0	1	2	12/29/82	3	1	0	0		3
NORTH FORK	1	1.3	14	18.2	9	7	1/17/83	4	5	4	12/27/82	2	1		21		5
BILLIE CREEK	1	1.3	14	18.2	9	7	1/17/83	4	5	4	12/27/82	2	1	27	21	7	5
LAKE CREEK	8	6.9	110	94.9		11				4			8		19		2
GREEN CREEK (LOWER)	1	1.0	14	14.0	14	14	11/10/82	4	1	1	11/10/82	0	1	20	20	1	1
GREEN CREEK (UPPER)	1	.8	14	11.2	3	4	11/3/82	4	1	1	11/17/82	0	1	8	10	1	2

1982-83 SPAWNING GROUND SURVEY SUMMARY

SIUSLAW FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK MILE	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK MILE	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	SUR	ADULTS RUN SIZE	ADULTS PER MILE	JACKS RUN SIZE	JACKS PER MILE
GREENLEAF CREEK	1	1.0	14	14.0	14	14	12/ 5/82	0	1	1	11/11/82	0	1	30	30	2	2
MISERY CREEK	1	.8	14	11.2	4	5	11/23/82	5	0	0		3	1	6	8	0	0
NELSON CREEK (LOWER)	1	.5	13	6.5	9	18	11/24/82	1	1	2	11/24/82	0	1	7	15	1	1
NELSON CREEK (UPPER)	1	.7	13	9.1	7	10	11/ 4/82	7	1	1	11/ 4/82	0	1	19	27	1	1
PANTHER CREEK	1	.8	15	12.0	16	20	12/20/82	6	3	4	12/20/82	2	1	21	26	3	4
ROGERS CREEK	1	1.3	13	16.9	10	8	1/17/83	5	1	1	11/10/82	2	1	17	13	1	1
WOLF CREEK	1	.4	13	5.2		8		0	0	0		0	1		6	0	0
EAMES CREEK	1	.4	13	5.2	3	8	11/ 9/82	0	0	0		0	1	3	6	0	0
SILTCOOS RIVER	5	4.1	9	6.7		34				7							
STANDARD SURVEYS	0	0.0	0	0.0													
NON STANDARD SURVEYS	5	4.1	9	6.7		34				7							
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	5	4.1	9	6.7		34				7							
MAPLE CREEK	3	1.6	6	3.2		45				10							
HENDERSON CREEK	1	.3	2	.6	22	73	1/14/83		6	20	1/ 5/83						
MAPLE CREEK	1	.8	2	1.6	12	15	1/ 5/83		2	3	1/ 5/83						
NORTH PRONG CREEK	1	.5	2	1.0	38	76	1/ 5/83		8	16	1/ 5/83						
FIDDLE CREEK	2	2.5	3	3.5		27				5							
ALDER CREEK	1	1.0	2	2.0	16	16	1/13/83		8	8	1/ 5/83						
FIDDLE CREEK	1	1.5	1	1.5	51	34	1/13/83		5	3	1/13/83						
TAHKENITCH CREEK	1	.8	2	1.6		259				94							
STANDARD SURVEYS	0	0.0	3	0.0													
NON STANDARD SURVEYS	1	.8	2	1.6		259				94							
HATCHERY INFLUENCED	0	0.0	0	0.0													
NO HATCHERY INFLUENCE	1	.8	2	1.6		259				94							
LEITEL CREEK	1	.8	2	1.6	207	259	1/ 5/83		75	94	1/14/83						
LEITEL CREEK	1	.8	2	1.6	207	259	1/ 5/83		75	94	1/14/83						

PEAK COUNTS (LIVE AND DEAD)
ESTIMATED RUN SIZE (AUC)

1982-83 SPAWNING GROUND SURVEY SUMMARY

UMPQUA FISHERIES DISTRICT
COHO SALMON

| | | | | PEAK COUNTS (LIVE AND DEAD) | | | | | | | | ESTIMATED RUN SIZE (AUC) | | | | |
| | | | | ADULTS | | | | JACKS | | | | ADULTS | | | JACKS | |
SURVEYS	NO. SUR MILES	TIMES SUR	TOTAL MILES	1982 PEAK/MILE	1982 PEAK	DATE	1981 PEAK	1982 PEAK/MILE	1982 PEAK	DATE	1981 PEAK	SUR	RUN SIZE	PER MILE	RUN SIZE	PER MILE
UMPQUA DISTRICT																
STANDARD SURVEYS	7	77	127.0	24				15				5		45		27
NON STANDARD SURVEYS	0	0	0.0													
HATCHERY INFLUENCED	3	33	66.5	16				8				2		23		8
NO HATCHERY INFLUENCE	4	44	60.5	27				22				3		59		39
UMPQUA RIVER																
STANDARD SURVEYS	7	77	127.0	21				15				5		45		27
NON STANDARD SURVEYS	0	0	0.0													
HATCHERY INFLUENCED	3	33	66.5	16				8				2		23		8
NO HATCHERY INFLUENCE	4	44	60.5	27				22				3		59		39
MAIN STEM AND BAY	2	22	38.5	42				34				2		88		58
DEAN CREEK	1	11	16.5	12	8	11/23/82	2	1	1	11/23/82	2	1	14	10	3	2
SCHOLFIELD CREEK	1	11	22.0	135	68	12/2/82	16	59	59	12/2/82	5	1	334	167	230	115
SMITH RIVER	3	33	66.5	16				8				2		23		9
BEAVER CREEK	1	12	18.0	23	15	11/23/82	8	9	3	11/23/82	3	1	27	18	5	3
BUCK CREEK	1	11	38.5	60	17	11/22/82	14	24	7	12/9/82	18	1	99	28	47	14
LITTLE SOUTH FORK	1	10	10.0	12	12	12/20/82	2	18	18	12/20/82	3					
SOUTH FORK	2	22	22.0	1				1				1				
NORTH MYRTLE CREEK	1	10	10.0	1	1	1/3/83	1	1	1	1/3/83	0	1		0		0
QUINES CREEK	1	12	12.0	1	1	12/13/82	1	1	0	12/13/82	0	1		0		0

1982-83 SPAWNING GROUND SURVEY SUMMARY

COOS/COQUILLE FISHERIES DISTRICT
COHO SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	EST SUR	ADULTS RUN SIZE PER MILE	JACKS RUN SIZE PER MILE
COOS/COQUILLE DISTRICT	21	18.4	110	105.4		23				16					
STANDARD SURVEYS	9	9.4	78	82.4		19				13			1	70	30
NON STANDARD SURVEYS	12	9.0	32	23.0		27				19			1	70	30
HATCHERY INFLUENCED	18	15.9	87	85.4		24				18					
NO HATCHERY INFLUENCE	3	2.5	23	20.0		16				5			1	70	30
TENMILE CREEK	10	7.0	30	21.0		33				25					
STANDARD SURVEYS	0	0.0	0	0.0											
NON STANDARD SURVEYS	10	7.0	30	21.0		33				25					
HATCHERY INFLUENCED	10	7.0	30	21.0		33				25					
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
NORTH TENMILE LAKE	3	2.2	9	6.6		48				32					
ALDER CREEK (STD UNIT)	1	.5	3	1.5	19	38	1/17/83	24	12	24	12/7/82	8			
BIG CREEK (STD UNIT)	1	.5	3	1.5	53	106	1/17/83	45	34	68	12/7/82	21			
NOBLE CR (STD UNIT)	1	1.2	3	3.6	33	28	1/20/83		24	20	12/8/82				
SOUTH TENMILE LAKE	7	4.8	21	14.4		26				22					
ADAMS (MF STD UNIT)	1	.8	3	2.4	11	14	1/ 6/83	6	13	16	1/ 6/83	5			
ADAMS (RF STD UNIT)	1	.7	3	2.1	11	16	12/19/82	11	10	14	12/19/82	6			
HATCHERY CREEK (LEFT FORK)	1	.1	3	.3	2	20	12/7/82	2	1	16	12/7/82	1			
HATCHERY CREEK (MAIN STEM)	1	.5	3	1.5	7	14	12/7/82	7	5	10	12/7/82	2			
HATCHERY CREEK (RIGHT FORK)	1	.1	3	.3	4	40	12/20/82	4	3	30	12/20/82	0			
JOHNSON (RF STD UNIT)	1	.8	3	2.4	55	69	12/20/82	63	48	60	12/7/82	22			
ROBERTS (STD UNIT NO. 2)	1	1.8	3	5.4	37	21	1/10/83	59	25	14	12/23/82	20			
COOS RIVER	5	5.1	32	33.0		20				14			1	70	30
STANDARD SURVEYS	3	3.1	30	31.0		29				22			1	70	30
NON STANDARD SURVEYS	2	2.0	2	2.0		7				0					
HATCHERY INFLUENCED	5	5.1	32	33.0		20				14			1	70	30
NO HATCHERY INFLUENCE	0	0.0	0	0.0											
MAIN STEM AND BAY	1	1.3	10	13.0		35				38					
LARSON CREEK	1	1.3	10	13.0	46	35	12/23/82	14	49	38	12/23/82	8			
MILLICOMA RIVER	1	1.0	10	10.0		32				10			1	70	30
MARLOW CREEK	1	1.0	10	10.0	32	32	11/21/82	17	10	10	11/21/82	3	1	70	30
SOUTH FORK	3	2.8	12	10.0		9				4					
BIG CREEK	1	1.0	1	1.0	6	6	12/3/82	2	0	0		1			
DANIELS CREEK	1	.8	10	9.0	12	15	11/22/82	7	10	13	1/ 6/83	3			

1982-83 SPAWNING GROUND SURVEY SUMMARY

COOS/COQUILLE FISHERIES DISTRICT
COHO SALMON

PEAK COUNTS (LIVE AND DEAD) — ESTIMATED RUN SIZE (AUC)

SURVEYS	NO. SUR MILES	SUR MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	ADULTS PER MILE	ADULTS DATE	ADULTS 1981 PEAK	JACKS 1982 PEAK	JACKS PER MILE	JACKS DATE	JACKS 1981 PEAK	ADULTS RUN SIZE	ADULTS PER MILE	JACKS RUN SIZE	JACKS PER MILE
MORGAN CREEK	1	1.0	1	1.0	8	8	12/ 6/82	0	0	0		3				
COQUILLE RIVER																
STANDARD SURVEYS	6	6.3	48	51.4	15	15				8						
NON STANDARD SURVEYS	0	0.0	0	0.0						8						
HATCHERY INFLUENCED	3	3.8	25	31.4	14	14				10						
NO HATCHERY INFLUENCE	3	2.5	23	20.0	16	16				5						
NORTH FORK	3	3.8	25	31.4	14	14			10	10						
ALDER CREEK	1	1.0	9	9.0	17	17	12/23/82	18	19	19	12/23/82	10				
CHEFRY CREEK A	1	1.8	8	14.4	26	14	12/2/82	8	17	9	1/12/83	2				
NORTH FORK (UPPER-A)	1	1.0	8	8.0	10	10	12/11/82	3	3	3	11/24/82	1				
EAST FORK	1	1.0	10	10.0	29	29			8	8						
STEEL CREEK	1	1.0	10	10.0	29	29	12/ 5/82	14	8	8	12/ 9/82	8				
MIDDLE FORK	1	.5	6	3.0	3	6				6						
SLATER CREEK	1	.5	6	3.0	6	6	1/13/83	6	3	6	11/21/82	1				
SOUTH FORK	1	1.0	7	7.0	7	7				2						
SALMON CREEK (UPPER)	1	1.0	7	7.0	7	7	11/ 9/82	5	2	2	12/10/82	0				

APPENDIX C

Peak Counts of Chum Salmon in Standard and Nonstandard Index Streams
Stratified by Fishery District and River Basins

Explanation of Columns in Appendix Tables

No. Sur.--the number of individual surveys included in the strata.

Miles--miles surveyed in the strata.

Times Sur.--number of actual surveys made within the strata.

Total Miles--cumulative total miles surveyed within the strata.
    For multiple surveys, it is the sum of the individual surveys
    times the frequency surveyed.

Peak Counts

1982 Peak--maximum combined live and dead salmon seen on a given survey.

Per Mile--peak count expressed as a fish/mile count.

Date--date of the survey when the peak count was observed.

1981 Peak--peak count obtained in the survey during the previous year.

Estimated Run Size (AUC)

Sur.--the number of surveys used for area-under-the curve (AUC) estimates
    within the strata.

Run Size--the total estimated number of salmon that spawned in a given
    survey.

Per Mile--the total estimated number of fish/mile that spawned in a given
    strata.

1982-83 SPAWNING GROUND SURVEY SUMMARY

TILLAMOOK FISHERIES DISTRICT
CHUM SALMON

SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	ADULTS 1982 PEAK	PER MILE	DATE	1981 PEAK	JACKS 1982 PEAK	PER MILE	DATE	1981 PEAK	EST RUN SIZE ADULTS	PER MILE	JACKS	PER MILE
TILLAMOOK DISTRICT																
STANDARD SURVEYS	8	5.1	52	32.9		523				0						
	8	5.1	52	32.9		523				0						
NON STANDARD SURVEYS	0	.0	0	.0												
HATCHERY INFLUENCED	1	.5	4	2.3		952				0						
NO HATCHERY INFLUENCE	7	.6	48	30.9		477				0						
MIAMI RIVER																
STANDARD SURVEYS	3	1.7	16	9.0		330				0						
	3	1.7	16	9.0		330				0						
NON STANDARD SURVEYS	0	.3	0	.0												
HATCHERY INFLUENCED	0	.0	0	.0												
NO HATCHERY INFLUENCE	3	1.7	16	9.0		330				0						
MAIN STEM	3	1.7	16	9.0		330				0						
MIAMI RIVER	1	.5	4	2.4	149	248	11/23/82	6		0						
MOSS CREEK	1	.6	6	3.5	191	318	12/10/82			0						
PROUT CREEK	1	.5	6	3.6	221	442	11/23/82			3						
KILCHIS RIVER																
STANDARD SURVEYS	3	2.1	14	9.0		590				0						
	3	2.1	14	9.6		530				0						
NON STANDARD SURVEYS	0	.0	0	.0												
HATCHERY INFLUENCED	1	.5	4	2.0		950				0						
NO HATCHERY INFLUENCE	2	1.5	10	7.6		477				3						
MAIN STEM	3	2.1	14	9.6		590				0						
CLEAR CREEK	1	.6	6	3.6	532	887	11/23/82			0						
CCAL CREEK	1	.5	4	2.0	475	954	12/12/82			0						
KILCHIS RIVER	1	1.0	4	4.0	231	231	11/23/82			0						
WILSON RIVER																
STANDARD SURVEYS	1	.5	11	5.5		1650				0						
	1	.5	11	5.5		1650				0						
NON STANDARD SURVEYS	0	.0	0	.0												
HATCHERY INFLUENCED	0	.0	0	.0												
NO HATCHERY INFLUENCE	1	.5	11	5.5		1650				0						
LITTLE NORTH FORK																
LITTLE NORTH FORK	1	.5	11	5.5	825	1650	11/24/82	182		3						
VESTUCCA RIVER																
STANDARD SURVEYS	1	.8	11	8.8	56	56				0						
	1	.8	11	8.8	56	56				0						
NON STANDARD SURVEYS	0	.0	0	.0												
HATCHERY INFLUENCED	0	.0	0	.0												

1982-83 SPAWNING GROUND SURVEY SUMMARY

TILLAMOOK FISHERIES DISTRICT
CHUM SALMON

				PEAK COUNTS (LIVE AND DEAD)							ESTIMATED RUN SIZE (AUC)			
				ADULTS			JACKS				ADULTS		JACKS	
SURVEYS	NO. SUR MILES	TIMES SUR	TOTAL MILES	1982 PEAK MILE	PER DATE	1981 PEAK	1982 PEAK MILE	PER DATE	1981 PEAK		RUN SIZE	PER SUR MILE	RUN SIZE	PER MILE
NO HATCHERY INFLUENCE	1	11	8.8	56			0							
MAIN STEM AND BAY	1	.8	8.8	55			0							
CLEAR CREEK	1	.8	8.8	45	56 11/22/82		0							

LINCOLN FISHERIES DISTRICT
CHUM SALMON

					PEAK COUNTS (LIVE AND DEAD)							ESTIMATED RUN SIZE (AUC)					
					ADULTS			JACKS				ADULTS			JACKS		
SURVEYS	NO. SUR	MILES	TIMES SUR	TOTAL MILES	1982 PEAK PER MILE	DATE	1981 PEAK	1982 PEAK PER MILE	DATE	1981 PEAK		SUR	RUN SIZE	PER MILE	RUN SIZE	PER MILE	
LINCOLN DISTRICT	1	1.5	1	1.5	1			0									
STANDARD SURVEYS	0	.0	0	.0													
NON STANDARD SURVEYS	1	1.5	1	1.5	1			0									
HATCHERY INFLUENCED	1	1.5	1	1.5	1			0									
NO HATCHERY INFLUENCE	0	.0	0	.0													
YAQUINA RIVER	1	1.5	1	1.5	1			0									
STANDARD SURVEYS	0	.0	0	.0													
NON STANDARD SURVEYS	1	1.5	1	1.5	1			0									
HATCHERY INFLUENCED	1	1.5	1	1.5	1			0									
NO HATCHERY INFLUENCE	0	.0	0	.0													
MAIN STEM	1	1.5	1	1.5	1			0									
SIMPSON CR (MOUTH TO	1	1.5	1	1.5	1	11/15/92	1	0		0							