REVIEW OF 1999 FISHERIES AND SUMMARY OF 2000 STOCK ABUNDANCE ESTIMATES

Situation: Mr. Doug Milward, Salmon Technical Team Chairman, will review the results of the 1999 fisheries and the stock abundance projections for 2000. The agencies, tribes, Council advisors, and public will then be afforded an opportunity to comment on these issues. Under agency comments, the states of Oregon and Washington may also provide details of the 1999 selective recreational fisheries (retention of coho only if marked by a healed adipose fin clip).

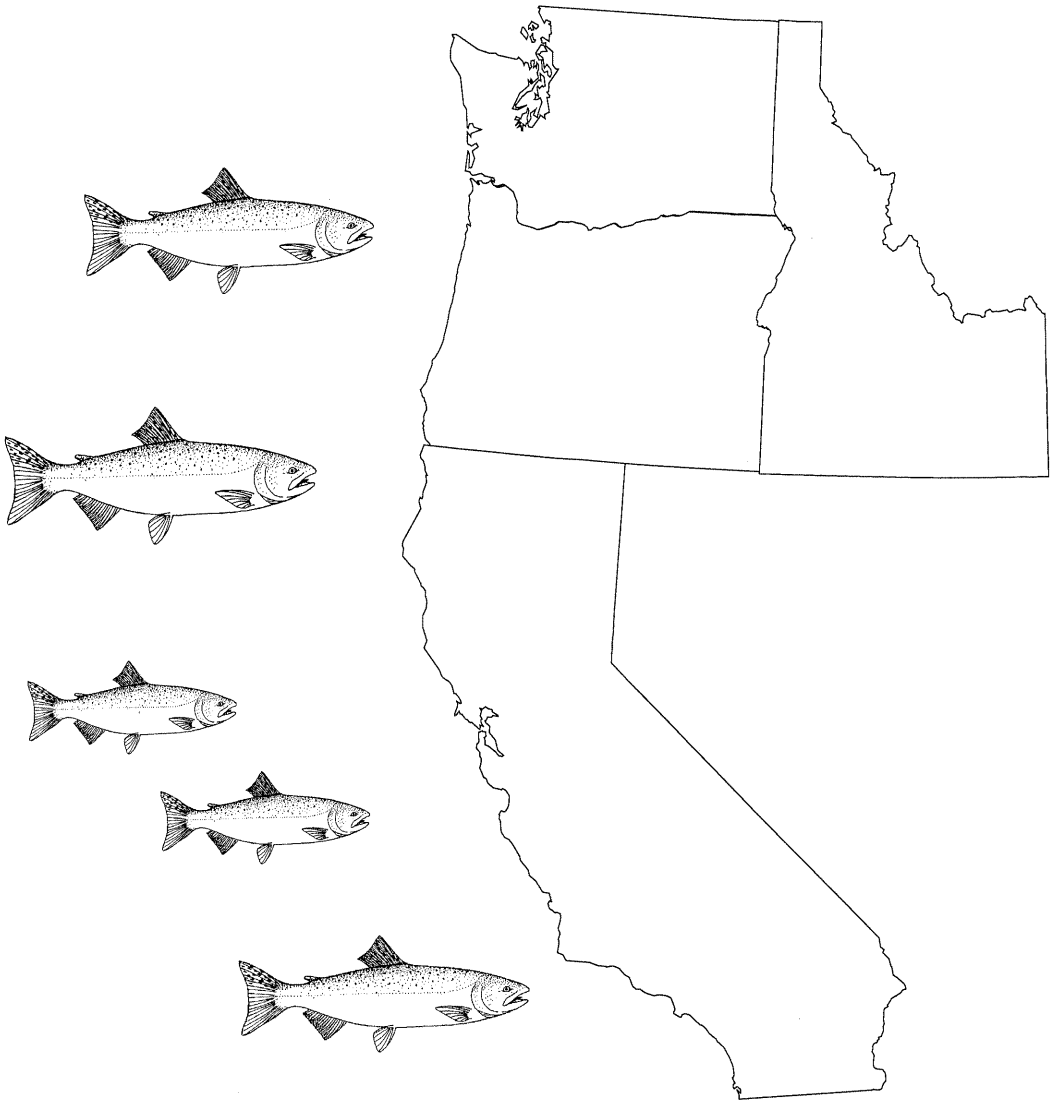
Council Action: None.

Reference Materials:

1. *Review of 1999 Ocean Salmon Fisheries* (included with briefing book).
2. *Preseason Report I Stock Abundance Analysis for 2000 Ocean Salmon Fisheries* (included with briefing book).

PFMC
02/22/00

REVIEW OF 1999 OCEAN SALMON FISHERIES



Pacific Fishery Management Council
2130 SW Fifth Avenue, Suite 224
Portland, Oregon 97201
(503) 326-6352

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Chapters I through III and Appendices A, B, and C of this review were prepared by the Salmon Technical Team. Chapter IV and Appendix D were prepared by Mr. James Seger, Pacific Fishery Management Council staff economist, with assistance from Salmon Technical Team members. Compilation and final editing of the report were performed by the Pacific Fishery Management Council staff.

Salmon Technical Team

Mr. Doug Milward, Chair
Washington Department of Fish and Wildlife, Olympia, WA

Mr. Allen Grover
California Department of Fish and Game, Healdsburg, CA

Dr. Robert Kope
National Marine Fisheries Service, Seattle, WA

Mr. Curt Melcher
Oregon Department of Fish and Wildlife, Portland, OR

Mr. Michael Mohr
National Marine Fisheries Service, Tiburon, CA

Dr. Gary Morishima
Indian Tribes, Mercer Island, WA

Mr. Dell Simmons
National Marine Fisheries Service, Lacey, WA

Pacific Fishery Management Council Staff

Dr. John Coon
Ms. Kerry Aden
Ms. Renee Heyden
Ms. Sandra Krause
Mr. James Seger

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LIST OF ACRONYMS AND ABBREVIATIONS

ADFG	Alaska Department of Fish and Game
CCC	central California coast (coho)
CDFG	California Department of Fish and Game
Council	Pacific Fishery Management Council
CRFMP	Columbia River Fishery Management Plan
CRTAC	Columbia River Technical Advisory Committee
CVI	Central Valley Index
CWT	coded-wire tag
EEZ	exclusive economic zone (from 3-200 miles from shore)
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FMP	fishery management plan
FRAM	Fisheries Regulatory Assessment Model
GSI	genetic stock identification
HRM	Harvest Rate Model
KMZ	Klamath management zone (ocean zone between Humbug Mountain and Horse Mountain where management emphasis is on Klamath River fall chinook)
KRTAT	Klamath River Technical Advisory Team
LFI	Lyons Ferry age three/four fall chinook index
LRH	lower Columbia River hatchery (tule fall chinook returning to hatcheries below Bonneville Dam)
LRW	lower Columbia River wild (bright fall chinook spawning naturally below Bonneville Dam)
MCB	mid-Columbia River brights (bright hatchery fall chinook released in the Mid-Columbia River)
MOC	mid-Oregon coast
MSY	maximum sustainable yield
NA	not available
NMFS	National Marine Fisheries Service
NOC	north Oregon coast
ODFW	Oregon Department of Fish and Wildlife
OC	Oregon coast (coho)
OCN	Oregon coastal natural (coho)
OPI	Oregon Production Index (coho salmon stock index south of Leadbetter Point)
PSC	Pacific Salmon Commission
RK	Rogue/Klamath (coho)
SCH	Spring Creek Hatchery (tule fall chinook returning to Spring Creek Hatchery)
SONC	southern Oregon/northern California (coho)
SRS	Stratified Random Sampling
STEP	Salmon Trout Enhancement Program
STT	Salmon Technical Team (formerly the Salmon Plan Development Team)
TAC	total allowable catch
URB	upper river brights (naturally spawning bright fall chinook normally migrating past McNary Dam)
USFWS	U.S. Fish and Wildlife Service
VSI	visual stock identification
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife
WFMP	Willamette Fish Management Plan

INTRODUCTION

The Salmon Technical Team (STT) has prepared this postseason review of the 1999 ocean salmon fisheries off the coasts of Washington, Oregon, and California to help assess Council salmon management. The STT will provide three additional reports prior to the beginning of the ocean salmon season to guide the Council's selection of annual fishery management measures. The reports will provide estimates of stock abundance and analyze the impacts of the Council's proposed and adopted management recommendations.

Pacific coast fisheries in Council-managed waters (ocean fisheries south of the Canadian border to Mexico from 3 to 200 miles offshore) are directed toward and harvest primarily chinook or king salmon *Oncorhynchus tshawytscha* and coho or silver salmon *Oncorhynchus kisutch*. Small numbers of pink salmon *Oncorhynchus gorbuscha* also are harvested, especially in odd numbered years. There are no directed fisheries for other Pacific salmon species, and they occur rarely (sockeye) or in very limited numbers (steelhead and chum) in Council-managed harvests.

The Council's annual review of ocean fisheries provides a summary of important biological and socioeconomic data from which to assess the impacts of past management actions, determine how well management objectives are being met, and improve regulations for the future. The Council will formally review this report at its March meeting prior to the development of management options for the approaching fishing season.

Chapter I summarizes ocean salmon fishery regulations and landings within the Council management area and management actions and landings under the jurisdiction of the Pacific Salmon Commission. Appendix A includes tables which detail historical harvest data by state and by management area.

For chinook and coho salmon, respectively, Chapters II and III assess the achievement of pertinent management objectives by salmon stock (including those listed under the Endangered Species Act), outline the regulations to achieve the objectives, and summarize inside catch and spawner escapement data. Detailed information for other salmon species is not included since Council fisheries have very minor impacts on pink salmon escapements and no measurable impacts on sockeye or chum salmon.

Socioeconomic impacts of the regulations are discussed in Chapter IV. Appendices B through D provide historical data on inland landings and escapements, ocean regulations, and fishery-related socioeconomics, respectively.

COMMON TABLE CONVENTIONS

All 1999 data provided in this report are preliminary at this time. Tables containing Oregon historical ocean fishery data reflect recent statistical modifications to earlier estimates (first applied in the 1995 report). The following conventions apply with respect to the report's tables:

1. Totals may not precisely equal the sum of individual years due to rounding of numbers.

2. A dash indicates there are no data appropriate for a particular table cell, or in the case of fishing effort or landings, the season was closed.

3. A double dash indicates no records are available.

4. "NA" indicates data are not available at the time of publication.

CHAPTER I
COASTWIDE OCEAN FISHING SUMMARY

Chapter I contains or references tables which summarize the current and historical ocean salmon fishing regulations and harvest data. In addition, the chapter provides a brief summary of the Council's regulatory objectives, by management area, for the most recent fishing year and reports on the results of the Council's selective fisheries for marked hatchery coho and resulting bycatch mortality of wild salmon. The final section in the chapter provides a brief summary of management information and harvests under the authority of the Pacific Salmon Commission (PSC).

COUNCIL-AREA REGULATIONS AND LANDINGS

Summaries of the 1999 non-Indian commercial troll, treaty Indian commercial troll, and recreational ocean salmon fishing regulations for both the exclusive economic zone (3 to 200 miles from shore) and state territorial waters (0 to 3 miles from shore) are provided in Tables I-1, I-2, and I-3, respectively. Historical summaries of the regulations for each of the three Pacific coast states and for treaty Indian troll fisheries are provided in Appendix C, Tables C-1 through C-7. Table C-9 provides a summary of inseason regulatory actions and events during the 1999 season.

Catch, quota, and fishing effort statistics are presented in a series of tables as listed below:

- Table I-4 — Council area commercial and recreational ocean salmon fishing effort and landings of chinook, coho, and pink salmon by state of landing.
- Table I-5 — Council area commercial and recreational ocean salmon fishing effort and landings of chinook, coho, and pink salmon by management area.
- Table I-6 — The 1999 coho and chinook quotas for each fishery compared with actual harvests.
- Appendix A: Tables A-1 through A-19 - Historical monthly ocean salmon harvest data by state and port area.

  Tables A-20 through A-29 - Historical monthly ocean salmon harvest data by management area.
- Appendix B: Tables B-1 through B-42 - Historical inside harvest and escapement data.
- Appendix C: Table C-8 - Historical record of annual preseason catch quotas for the area north of Cape Falcon, as well as the stocks that were critical for ocean salmon management actions.

TABLE I-1. Summary of actual ocean **non-Indian commercial troll** salmon fishing regulations for 1999. (Page 1 of 2)

Area and Season	Salmon Species	Actual Quota (Guideline*) Chinook	Coho[a/]	Special Restrictions[b/]
U.S.-Canada Border to Cape Falcon, Oregon May 1-June 15 (46 days)	All except coho	24,000*	-	Columbia River Control Zone closed; minimum size limit 28 in (total length).
Cape Flattery to Leadbetter Pt., Washington		7,000[c/]	20,000[c/]	Minimum size limits: chinook - 28 in.; coho 16 in. Vessels must land and deliver fish within 24 hours of any closure. July 10-30: no more than 4 spreads per line; gear restricted to plugs 6 inches or longer; flashers without hooks may be used if installed below the 2nd spread from the top and will not count as a spread; no more than 1 flasher per line; each vessel may possess, land and deliver no more than 100 coho per open period.
Cape Flattery to Cape Alava west of 125°05'00" W July 10-13; 17-20; 24-27; 31; Aug. 1- 3 (16 days)	All salmon			
Cape Alava to Leadbetter Pt. July 10-13; 17-20; 24-27; 31; Aug. 1-3; 14-17 (20 days) Sept. 5-13; 22-30 (18 days)	All salmon All except chinook			
Cape Falcon to Humbug Mt., Oregon Apr. 1-July 17; Aug. 1-29; Sept. 1-Oct.. 31 (198 days)	All except coho	None	-	Closed Apr. 1-Sept. 15 at mouth of Tillamook Bay.
Twin Rocks to Pyramid Rock, Oregon Nov. 1-15 (15 days)	Chinook only	None	-	Open 0-3 nautical miles.
Cape Blanco to Humbug Mt., Oregon (off Elk R.) Nov. 1-Dec. 15 (45 days)	Chinook only	None	-	Open 0-3 nautical miles. Landings restricted to Port Orford.
Humbug Mt. to Oregon-California Border May 1-31 (31 days)	All except coho	None	-	-
Sisters Rocks to Mack Arch, Oregon (off Rogue R.) Aug. 1-31 (31 days)	All except coho	1,400	-	Open 0-4 nautical miles. Salmon must be landed in Port Orford, Gold Beach or Brookings within 24 hours of any closure. Closed within 1 mi of the Rogue River mouth.
Goat Isl. to 42°01'20" N, Oregon (off Chetco R.) Oct. 15-31 (17 days)	Chinook only	1,000	-	Open 0-3 nautical miles. Single daily landing limit of 20 chinook into the port of Brookings.
House Rock to Humboldt S. Jetty Sept 1-30 (30 days)	All except coho	7,000[d/]	-	All fish must be landed in the area under a limit of 30 fish per day. Klamath River Mouth Control Zone closed.
Horse Mt., California to Pt. Arena, California Sept. 1-30 (30 days)	All except coho	None	-	-
Pt. Arena to Pt. Reyes July 17-Sept. 30 (76 days)	All except coho	None	-	Minimum size limit (total length) is 27 inches.
Fort Ross to Pt. Reyes July 1-12 (12 days)	All except coho	2,500	-	Test fishery open 0-6 nautical miles; landing limit of 30 fish per day; all fish must be landed in the area. Minimum size limit is 26 in.
Pt. Reyes to Pt. San Pedro July 1-Sept. 30 (92 days)	All except coho	None	-	Minimum size limit (total length) is 27 in.
Pt. San Pedro to U.S.-Mexico Border May 1-Aug. 21; Sept. 1-30 (143 days)	All except coho	None	-	Minimum size limit 27 in. after June 30.
Pillar Pt. to Pigeon Pt. Apr. 14-16 (3 days)	All except coho	3,000	-	Test fishery to determine species composition requires fish to be landed within the area under a daily limit of 30 fish and within 24 hours of each closure. Minimum size limit 26 in.
Pt. Piedras Blancas to Pt. Conception Apr. 14-16; 21-23; 26-28 (9 days)	All except coho	2,500	-	Same as test fishery above except beginning Apr. 21 a landing limit of 90 fish per open period.
Pt. Conception to Pt. Pitas Apr. 14-16; 21-23; 26-28 (9 days)	All except coho	2,500	-	Same as for Pt. Piedras Blancas to Pt. Conception.

TABLE I-1. Summary of actual ocean **non-Indian commercial troll** salmon fishing regulations for 1999. (Page 2 of 2)

a/ The overall hook-and-release mortality impact for all ocean commercial fisheries south of Cape Falcon was projected preseason to be 4,400 coho.
b/ Single-point, single-shank barbless hooks required in all open areas coastwide. Unless otherwise noted, minimum size limits (total length): chinook - 28 inches north of Cape Falcon; 26 inches south of Cape Falcon; coho - 16 inches. No more than 4 spreads per line off Oregon south of Cape Falcon. No more than 6 lines per boat allowed off California.
c/ Inseason, 1,000 chinook were traded to the commercial quota (for nonretention mortality in the all-salmon-except chinook fishery) from the overall recreational quota in return for 2,000 coho for the LaPush recreational subarea quota.
d/ Within the 7,000 chinook quota is a guideline limiting landings at the port of Brookings to no more than 1,0000 chinook.

TABLE I-2. Summary of actual **treaty Indian commercial ocean and Area 4B troll** salmon seasons for 1999. (Page 1 of 1)

Tribe and Area	Seasons[a/] Salmon Species	Dates	Days	Minimum Size Limit (Inches) Chinook	Coho
Quinault					
Areas 2 and 3	All except coho	May 1-June 30	61	24	-
	All	Aug. 1-Sept. 15	46	24	16
Hoh and Quileute					
Area 3	All except coho	May 1-June 30	61	24	-
	All	Aug. 1-Sept. 15	46	24	16
Makah					
Areas 3N, 4 and 4A	All except coho	May 1-June 30	61	24	-
	All	Aug. 1-6; Aug. 10-Sept. 15[b/]	43	24	16
Area 4B	All except coho	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	24[c/]	-
	All	Aug. 1-Sept. 15; Dec. 1-31	77	24[c/]	16
S'Klallam					
Area 4B	All except coho	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	24[c/]	-
	All	Aug. 1-Sept. 15; Dec. 1-31	77	24[c/]	16

a/ The overall quotas for these fisheries during the May 1-Sept. 30 ocean salmon management period were 30,000 chinook and 38,500 coho. These quotas include troll catches by the S'Klallam and Makah tribes in Washington State Statistical Area 4B from May 1-Sept. 30. The overall chinook quota was divided to provide 20,000 chinook for the May 1-Jun. 30 chinook-directed season and 10,000 chinook for the Aug.-Sept. all-salmon season. Transfer of any unused chinook quota from the May-June season to the Aug.-Sept. season was not allowed. Barbless hooks were required in all ocean fisheries.

b/ Area 4 was closed Aug. 7-9 to limit chinook catch and help assure access to the coho quota.

c/ Minimum length limit 22 inches prior to May 1 and after September 30.

TABLE I-3. Summary of actual ocean **recreational** salmon fishing regulations for 1999. (Page 1 of 2)

Area and Season	Salmon Species	Actual Quota (*Guideline) Chinook	Coho[a/]	Daily Limit and Special Restrictions[b/]
U.S.-Canada Border to Cape Alava, Washington July 19 -Sept. 30 (74 days)	All except chinook	-	10,200	2 salmon, all retained coho must have a healed adipose fin clip.
Cape Alava to Queets River, Washington July 19-Sept. 30 (74 days)	All salmon	400*[c/]	2,600[c/]	2 salmon, all retained coho must have a healed adipose fin clip.
Queets River to Leadbetter Pt., Washington Sun.-Thurs.: July 19-Sept. 2; 7 days per week: Sept. 3-30 (season total of 62 days)	All salmon	13,400*[c/]	42,200	2 salmon, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun.-Sat.). Closed 0-3 nautical miles beginning Aug. 22.
Leadbetter Pt. to Cape Falcon, Oregon Sun.-Thurs.: July 19-Sept. 2 7 days per week: Sept. 3-30 (season total of 62 days)	All salmon	7,600*[c/]	55,000	2 salmon, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun.-Sat.). Coho retention is prohibited between Tillamook Head and Cape Falcon beginning Aug. 1. Closed in Columbia Control Zone (newly defined for 1999).
Cape Falcon to Humbug Mt., Oregon (except as listed for Twin Rocks to Pyramid Rock subarea below)				
Apr. 1-July 9; Aug. 1-Oct. 31 (192 days)	All except coho	None	-	2 salmon; no more than 6 fish in 7 consecutive days. Special gear restriction.[d/]
July 10-11; 14-15; 18-19; 22-23; 26-27;30-31 (12 days)	All salmon	None	15,000	2 salmon, all retained coho must have a healed adipose fin clip; no special gear restrictions except single point, single shank barbless hooks.
Twin Rocks to Pyramid Rock inside 3 nautical miles (off Tillamook Bay)				Triangular control zone closed at mouth of Tillamook Bay Apr. 1-30; Jun. 1-July 9; and Aug. 1-Sept. 15. Special gear restriction except barbless hooks allowed.[d/]
Apr. 1-July 9 (100 days)	Chinook only	None	-	2 adult and 5 jack salmon; no more than 2 adults in 7 consecutive days.
July 10-11; 14-15; 18-19; 22-23; 26-27;30-31 (12 days)	All salmon	None	-	2 salmon, all retained coho must have a healed adipose fin clip; no gear restriction.
Aug. 1-Nov. 15 (107 days)	Chinook only	None	-	2 adult and 5 jack salmon; no more than 4 adults in 7 consecutive days.
Cape Blanco to Humbug Mt., Oregon (off Elk R. inside 3 nm) Nov. 1-Dec. 15 (45 days)	Chinook only	None	-	2 salmon; open 0-3 nautical miles.
Humbug Mt., Oregon to Horse Mt., California May 29-July 4; July 29-Sept. 14 (85 days)	All except coho	None	-	1 salmon; no more than 4 fish in 7 consecutive days. Klamath Control Zone closed in Aug.
Goat Is. to 42°01'20" N, Oregon (off Chetco R. inside 3 nm) Oct. 2-11 (10 days)	Chinook only	None	-	1 salmon; no more than 4 fish per season. Open 0-3 nautical miles.
Horse Mt. to Pt. Arena, California Feb. 13-July 4; July 25-Nov. 14 (255 days)	All except coho	None	-	2 salmon. Gear restricted when fishing by means other than trolling.[e/]
Pt. Arena to Pigeon Pt. Mar. 27-Oct. 31 (219 days)	All except coho	None	-	2 salmon. From Aug. 1-Sept. 6, daily bag limit of first 2 fish (no minimum size restriction). Gear restricted when fishing by means other than trolling.[e/] Sacramento Control Zone closed Mar. 27-31.
Pigeon Pt. to U.S.-Mexico Border Mar. 13-Sept. 6 (178 days)	Al except coho	None	-	2 salmon. From Aug. 1-Sept. 6, daily bag limit of first 2 fish (no minimum size restriction). Gear restricted when fishing by means other than trolling.[e/]

a/ Overall recreational hook-and-release mortality between Cape Falcon and the U.S.-Mexico border was projected preseason to be 6,800 coho.

b/ No more than one rod and single-point, single-shank barbless hooks required north of Pt. Conception, California. Unless otherwise noted: minimum size limits are (1) 24 inches for chinook and 16 inches for coho north of Cape Falcon, (2) 20 inches for chinook and 16 inches for coho from Cape Falcon to Horse Mt. and (3) 24 inches for chinook in openings south of Horse Mt.

c/ Inseason, 2,000 coho were added to the preseason subarea quota for La Push (Cape Alava to Queets River) through a trade from the troll fishery in return for 1,000 chinook from the overall recreational quota.

d/ During the time coho retention is prohibited, legal gear is limited to artificial lures and plugs of any size, or bait no less than 6 inches long (excluding hooks and swivels). All gear must have no more than 2 single point, single shank, barbless hooks. Divers are prohibited and flashers may be used only with downriggers.

e/ If angling by any other means than trolling between Horse Mt. and Pt. Conception, no more than 2 single point, single shank, barbless circle hooks shall be used. The distance between the 2 hooks must not exceed 5 inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). A circle hook is defined as a hook with a generally circular shape and a point which turns inwards, pointing directly to the shank at a 90° angle. Circle hooks are not required when artificial lures are used without bait. ***Trolling defined:*** Angling from a boat or floating device that is moving forward by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing a fish.

Table I-4. Council area commercial and recreational ocean salmon fishing effort and landings by state. Data are provisional, pending further review of data compilation methods. A double dash ("- -") indicates no records are available. Less than 50 fish or pounds may be shown as zero. (page 1 of 5)

	COMMERCIAL TROLL							RECREATIONAL					
	Effort (thousands of days fished)	Catch						Effort (thousands of salmon angler trips)	Catch (thousands of fish)				Salmon Per Angler Trip
		Thousands of Fish			Thousands of Pounds (Dressed Weight)								
Year		Chinook	Coho	Pink	Chinook	Coho	Pink		Chinook	Coho	Pink	Total	
						----- WASHINGTON [a] -----							
1966	- -	167.2	884.9	29.4	1,739.9	5,335.6	121.7	369.8	144.4	340.7	1.4	486.5	1.3
1967	- -	131.7	779.4	380.6	1,477.7	5,363.1	1692.3	407.6	160.4	455.0	52.8	668.2	1.6
1968	- -	162.8	713.8	4.8	1,625.3	3,950.4	17.1	380.8	144.5	447.3	0.5	592.2	1.6
1969	- -	186.9	463.8	59.4	1,990.1	2,854.0	295.9	392.2	152.8	402.7	16.7	572.1	1.5
1970	51.6	213.9	744.0	6.7	2,217.2	5,282.0	30.8	459.1	161.1	493.0	1.7	655.7	1.4
1971	68.4	252.2	1,264.1	20.6	2,655.5	6,841.6	89.8	443.3	160.0	747.3	9.0	916.3	2.1
1972	52.5	196.9	574.5	3.5	2,184.6	3,404.0	10.0	490.5	212.3	541.8	0.0	754.0	1.5
1973	50.3	310.4	700.9	55.4	3,254.1	3,749.2	260.1	479.7	203.8	471.7	7.9	683.3	1.4
1974	57.2	349.3	1,037.7	1.3	3,699.1	5,592.4	5.3	464.9	214.6	595.3	0.0	809.9	1.7
1975	52.7	268.3	774.2	77.2	2,834.5	4,416.8	371.9	535.9	261.6	481.1	13.6	756.2	1.4
1976	60.1	350.8	1,384.8	1.5	3,744.2	6,231.0	5.8	538.1	170.7	942.8	0.4	1,114.0	2.1
1977	55.5	258.5	715.2	288.1	2,784.6	3,707.5	1383.2	530.0	175.0	490.2	29.3	694.5	1.3
1978	42.3	156.1	607.7	3.5	2,022.6	2,798.8	13.4	482.8	96.4	469.8	0.2	566.4	1.2
1979	42.1	139.2	666.3	560.7	1,656.3	3,664.8	2534.2	317.2	74.8	293.4	17.8	386.0	1.2
1980	26.7	124.6	391.8	1.7	1,611.3	1,971.8	7.4	281.0	53.6	362.9	0.1	416.5	1.5
1981	27.2	102.2	401.4	236.9	1,153.0	1,750.3	927.2	236.8	84.7	237.9	10.2	332.8	1.4
1982 [b]	18.6	142.5	381.1	0.3	1,552.7	1,931.1	0.9	218.7	106.8	206.5	0.0	313.3	1.4
1983	12.1	57.7	67.6	106.1	588.6	279.2	372.9	209.7	48.4	209.3	4.5	262.1	1.3
1984	1.9	13.8	66.6	0.0	123.5	286.5	0.1	36.8	6.9	40.4	0.0	47.3	1.3
1985	7.5	46.4	217.8	108.7	464.0	1,049.0	487.5	114.8	26.6	167.9	3.1	197.5	1.7
1986	6.2	45.7	160.4	0.2	452.3	609.8	0.4	109.3	21.1	174.8	0.0	195.9	1.8
1987	6.0	75.0	138.5	19.5	712.7	580.3	70.0	101.5	40.5	123.9	1.8	166.2	1.6
1988	9.9	106.1	72.7	0.0	1,085.9	299.8	0.2	68.9	18.9	88.9	0.0	107.9	1.6
1989	9.1	73.7	144.5	47.8	721.9	604.7	172.0	142.2	19.9	212.9	2.0	234.8	1.7
1990	9.3	65.6	181.2	0.1	623.0	955.6	0.4	175.2	30.0	224.8	0.0	254.9	1.5
1991	7.6	51.0	136.2	48.1	482.9	634.3	160.6	127.2	12.7	207.7	2.2	222.6	1.8
1992	6.4	66.8	93.6	0.0	677.8	334.8	0.0	108.9	18.4	123.6	0.0	142.0	1.3
1993	6.7	55.8	73.1	6.3	563.4	336.1	19.9	128.8	13.0	126.0	2.4	141.4	1.1
1994	0.3	5.2	-	0.0	52.8	-	0.0	-	-	-	-	-	-
1995	1.2	11.3	56.2	41.7	85.1	254.8	136.7	54.8	0.5	68.3	2.8	71.6	1.3
1996	1.0	13.8	36.0	0.0	0.0	215.8	0.0	43.3	0.2	51.4	0.0	51.6	1.2
1997	0.9	21.8	15.7	1.8	80.9	94.0	- -	29.7	4.0	26.8	1.4	32.1	1.1
1998	0.3	20.3	7.9	0.0	227.7	43.0	0.0	19.7	2.2	20.7	0.0	22.9	1.2
1999 [c]	1.1	45.0	37.3	1.6	417.8	137.9	5.2	50.8	9.9	40.1	2.2	52.2	1.0

Table I-4. Council area commercial and recreational ocean salmon fishing effort and landings by state. Data are provisional, pending further review of data compilation methods. A double dash ("- -") indicates no records are available. Less than 50 fish or pounds may be shown as zero. (page 2 of 5)

	COMMERCIAL TROLL							RECREATIONAL					
	Effort	Catch						Effort	Catch (thousands of fish)				
	(thousands of days fished)	Thousands of Fish			Thousands of Pounds (Dressed Weight)			(thousands of salmon angler trips)					Salmon Per Angler Trip
Year		Chinook	Coho	Pink	Chinook	Coho	Pink		Chinook	Coho	Pink	Total	
						----- OREGON [d/] -----							
1966	--	95.3	646.1	--	797.2	4,484.9	--	--	--	--	--	--	--
1967	--	99.7	1,004.0	--	1,115.9	7,201.3	--	--	--	--	--	--	--
1968	--	110.2	825.4	--	993.4	4,398.3	--	--	--	--	--	--	--
1969	--	140.3	557.3	--	1,201.5	3,171.5	--	--	--	--	--	--	--
1970	--	164.7	989.7	--	1,685.0	7,536.1	--	--	--	--	--	--	--
1971	43.9	102.9	1,490.1	--	1,000.7	8,765.1	--	--	--	--	--	--	--
1972	38.4	127.3	824.6	--	1,303.7	4,856.3	--	--	--	--	--	--	--
1973	50.2	363.3	785.4	--	3,461.3	5,137.1	--	--	--	--	--	--	--
1974	47.9	224.1	1,137.2	--	2,290.4	7,230.9	0.1	326.1	34.6	306.4	--	341.0	1.0
1975	56.5	224.7	657.5	--	2,583.3	4,087.5	0.9	402.8	75.4	250.1	--	325.5	0.8
1976	82.1	184.3	1,827.0	--	1,921.6	9,061.2	0.0	536.5	79.1	500.0	--	579.1	1.1
1977	65.2	340.0	446.1	--	3,464.9	2,640.8	586.1	366.0	58.1	179.9	--	238.0	0.7
1978	45.2	191.5	611.6	--	1,893.6	2,779.0	0.2	403.4	22.8	259.3	--	282.1	0.7
1979	48.8	245.5	714.6	20.5	2,579.7	4,586.3	106.3	301.1	20.9	180.8	--	201.7	0.7
1980	39.9	209.4	383.3	0.3	2,170.9	2,188.9	1.6	331.4	19.0	325.8	--	344.9	1.0
1981	45.3	160.7	622.5	60.2	1,572.5	3,324.3	327.0	311.0	29.2	199.8	--	229.0	0.7
1982	33.7	232.0	564.0	0.0	2,351.3	2,708.4	0.0	226.0	38.7	175.1	--	213.8	0.9
1983	22.1	79.5	319.6	0.1	655.0	1,097.9	0.2	226.0	24.7	146.9	0.1	171.7	0.8
1984	7.9	64.3	13.8	0.0	549.4	69.8	0.0	153.1	17.0	122.6	0.0	139.7	0.9
1985	21.0	217.0	84.2	44.9	2,029.9	483.8	258.6	251.6	55.9	182.5	8.0	246.4	1.0
1986	32.5	402.7	440.4	0.0	3,370.3	1,904.6	0.0	187.0	22.8	218.9	0.0	241.8	1.3
1987	39.5	529.3	354.0	17.6	5,182.4	1,915.9	87.3	255.1	59.4	180.5	1.0	241.0	0.9
1988	51.1	470.0	623.2	0.0	4,389.0	3,336.0	0.0	250.7	38.3	226.9	0.0	265.2	1.1
1989	42.3	353.5	455.7	3.8	3,531.9	1,995.5	17.6	266.3	32.0	273.3	1.3	306.6	1.2
1990	26.2	232.4	122.3	0.0	2,180.9	633.8	0.0	246.6	26.5	200.6	0.0	227.2	0.9
1991	14.9	74.8	306.9	1.8	694.7	1,411.0	7.6	190.1	14.4	259.1	0.3	273.8	1.4
1992	9.2	110.5	49.8	0.0	1,012.6	206.6	0.0	165.3	12.6	185.8	0.0	198.5	1.2
1993	9.5	81.5	1.7	0.0	760.6	9.1	0.0	79.6	6.4	58.1	0.0	64.6	0.8
1994	3.8	25.3	-	0.0	286.6	-	0.0	26.9	6.0	0.0	0.0	6.1	0.2
1995	7.9	214.8	-	0.1	1,940.6	-	0.4	35.8	6.7	11.9	0.0	18.7	0.5
1996	8.5	177.2	-	0.0	1,925.1	-	0.0	44.0	11.2	7.2	0.0	18.4	0.4
1997	7.8	149.7	-	0.0	1,539.9	-	0.1	30.1	7.7	6.0	0.0	13.7	0.5
1998	7.2	124.9	-	0.0	1,397.7	-	0.0	26.0	4.1	2.3	0.0	6.4	0.2
1999[c/]	5.1	63.5	0.2	0.1	720.6	-	0.2	49.4	7.7	13.6	0.0	21.4	0.4

Table I-4. Council area commercial and recreational ocean salmon fishing effort and landings by state. Data are provisional, pending further review of data compilation methods. A double dash ("- -") indicates no records are available. Less than 50 fish or pounds may be shown as zero. (page 3 of 5)

	COMMERCIAL TROLL							RECREATIONAL					
	Effort	Catch						Effort	Catch (thousands of fish)				
	(thousands	Thousands of Fish			Thousands of Pounds (Dressed Weight)			(thousands of					Salmon Per
Year	of days fished)	Chinook	Coho	Pink	Chinook	Coho	Pink	salmon angler trips)	Chinook	Coho	Pink	Total	Angler Trip
						----- CALIFORNIA -----							
1966	- -	553.6	445.8	1.0	5,979.0	3,467.5	0.5	128.7	73.6	32.4	0.0	106.0	0.8
1967	- -	337.9	414.1	30.4	3,866.4	3,375.9	159.4	210.8	72.6	50.3	0.0	122.8	0.6
1968	- -	472.0	362.4	0.5	4,612.5	2,337.6	1.8	185.7	154.2	40.4	0.0	194.6	1.0
1969	- -	551.4	193.3	4.9	4,895.3	1,234.5	21.1	218.7	155.8	28.2	0.0	184.0	0.8
1970	43.7	516.6	182.9	0.1	5,269.5	1,341.8	0.2	205.1	147.8	14.6	0.0	162.4	0.8
1971	38.6	433.9	442.1	1.2	4,925.8	3,183.8	7.2	296.3	188.3	67.4	0.0	255.7	0.9
1972	37.8	492.2	158.0	0.0	5,372.8	1,050.4	0.2	242.9	200.5	44.6	0.0	245.1	1.0
1973	55.6	817.0	348.1	19.0	7,586.8	1,993.9	88.3	259.6	198.0	31.6	0.0	229.6	0.9
1974	51.1	491.6	656.9	0.3	5,048.5	3,700.1	0.9	255.4	157.5	76.6	0.0	234.1	0.9
1975	43.0	578.7	204.0	3.1	5,781.3	1,128.3	15.5	182.5	103.7	21.2	0.0	125.0	0.7
1976	60.0	539.9	621.8	0.0	4,943.9	2,843.8	0.0	187.2	81.0	57.9	0.0	138.9	0.7
1977	61.5	600.2	45.2	1.8	5,637.0	283.2	9.3	181.3	103.6	14.2	0.0	117.8	0.7
1978	98.4	637.7	315.8	0.0	5,492.4	1,295.1	0.0	150.7	72.7	41.2	0.0	114.0	0.8
1979	104.1	726.8	184.4	0.7	7,547.8	1,198.0	3.8	153.7	119.6	21.3	0.0	140.9	0.9
1980	82.5	588.7	49.8	0.1	5,715.2	301.6	0.4	144.4	85.2	21.2	0.0	106.4	0.7
1981	68.5	588.1	83.9	5.4	5,534.8	477.2	28.3	123.0	84.0	10.6	0.0	94.6	0.8
1982	93.1	765.2	91.9	0.0	7,448.6	551.9	0.0	171.3	137.2	26.7	0.0	163.9	1.0
1983	43.5	294.0	59.9	0.0	2,144.4	266.4	0.0	122.7	63.8	27.2	0.0	91.1	0.7
1984	42.2	299.8	47.0	0.0	2,621.2	348.4	0.0	127.0	87.8	19.0	0.0	106.8	0.8
1985	51.6	366.3	11.0	6.8	4,519.2	80.4	39.7	191.9	171.1	15.8	0.0	186.9	1.0
1986	54.7	825.6	36.4	0.0	7,396.8	201.6	0.0	195.6	141.6	18.7	0.0	160.3	0.8
1987	58.6	876.3	43.7	0.9	9,047.2	245.6	3.4	268.3	192.5	47.3	0.0	239.8	0.9
1988	75.7	1,317.2	51.0	0.0	14,430.8	319.5	0.0	245.4	171.4	34.7	0.0	206.1	0.8
1989	57.4	530.9	41.9	0.7	5,489.8	230.6	4.5	244.9	186.6	49.6	0.0	236.2	1.0
1990	46.2	423.4	61.0	0.0	4,122.4	313.7	0.0	252.1	139.8	51.6	0.0	191.5	0.8
1991	35.3	294.9	82.3	0.0	3,237.9	459.2	0.0	196.6	80.8	69.3	0.0	150.1	0.8
1992	20.3	163.4	2.5	0.0	1,632.1	11.3	0.0	127.9	73.6	11.5	0.0	85.1	0.7
1993	25.9	279.6	-	0.0	2,536.9	-	0.0	174.9	110.0	29.8	0.0	139.8	0.8
1994	21.2	295.6	-	0.0	3,103.1	-	0.0	189.9	183.2	0.5	0.0	183.7	1.0
1995	25.8	679.3	-	0.0	6,633.5	-	0.0	378.5	397.2	0.9	0.0	398.1	1.1
1996	21.1	380.6	-	0.0	4,113.4	-	0.0	225.4	164.2	0.6	0.0	164.8	0.7
1997	18.6	487.7	-	0.0	5,247.8	-	0.0	232.3	227.5	0.5	0.0	228.0	1.0
1998	12.0	216.2	-	0.0	1,745.5	-	0.0	149.9	121.3	0.1	0.0	121.4	0.8
1999[c/]	14.0	264.5	-	0.0	3,482.8	-	0.0	148.0	87.6	0.6	-	88.2	0.6

Table I-4. Council area commercial and recreational ocean salmon fishing effort and landings by state. Data are provisional, pending further review of data compilation methods. A double dash ("- -") indicates no records are available. Less than 50 fish or pounds may be shown as zero. (page 4 of 5)

	COMMERCIAL TROLL							RECREATIONAL					
	Effort	Catch						Effort	Catch (thousands of fish)				
	(thousands	Thousands of Fish			Thousands of Pounds (Dressed Weight)			(thousands of					Salmon Per
Year	of days fished)	Chinook	Coho	Pink	Chinook	Coho	Pink	salmon angler trips)	Chinook	Coho	Pink	Total	Angler Trip
						----- COUNCIL AREA [a/b/d/] -----							
1966	- -	816.1	1,976.8	- -	8,516.1	13,287.9	- -	- -	- -	- -	- -	- -	- -
1967	- -	569.3	2,197.5	- -	6,460.0	15,940.4	- -	- -	- -	- -	- -	- -	- -
1968	- -	744.9	1,901.6	- -	7,231.2	10,686.4	- -	- -	- -	- -	- -	- -	- -
1969	- -	878.6	1,214.5	- -	8,086.9	7,260.0	- -	- -	- -	- -	- -	- -	- -
1970	- -	895.2	1,916.7	- -	9,171.7	14,159.9	- -	- -	- -	- -	- -	- -	- -
1971	150.9	789.0	3,196.3	- -	8,582.0	18,790.6	- -	- -	- -	- -	- -	- -	- -
1972	128.7	816.4	1,557.1	- -	8,861.1	9,310.7	- -	- -	- -	- -	- -	- -	- -
1973	156.2	1,490.7	1,834.3	- -	14,302.2	10,880.1	- -	- -	- -	- -	- -	- -	- -
1974	156.2	1,064.9	2,831.8	- -	11,037.9	16,523.3	- -	1,046.4	406.6	978.3	0.0	1,385.0	1.3
1975	152.2	1,071.7	1,635.7	- -	11,199.1	9,632.7	- -	1,121.2	440.7	752.4	13.6	1,206.7	1.1
1976	202.2	1,075.1	3,833.5	- -	10,609.7	18,136.0	- -	1,261.8	330.8	1,500.8	0.4	1,832.0	1.5
1977	182.2	1,198.7	1,206.5	- -	11,886.6	6,631.6	- -	1,077.3	336.6	684.4	29.3	1,050.2	1.0
1978	185.9	985.3	1,535.1	- -	9,408.6	6,872.9	- -	1,036.9	191.9	770.4	0.2	962.5	0.9
1979	195.0	1,111.4	1,565.4	581.9	11,783.7	9,449.0	2644.3	772.1	215.3	495.5	17.8	728.6	0.9
1980	149.1	922.6	824.9	2.1	9,497.4	4,462.2	9.4	756.8	157.8	709.9	0.1	867.7	1.1
1981	141.0	851.0	1,107.8	302.5	8,260.3	5,551.8	1282.5	670.8	197.9	448.3	10.2	656.4	1.0
1982	145.3	1,139.7	1,037.0	0.3	11,352.6	5,191.4	0.9	616.0	282.7	408.3	0.0	691.1	1.1
1983	77.6	431.3	447.1	106.2	3,387.9	1,643.5	373.1	558.4	136.9	383.4	4.6	524.9	0.9
1984	52.0	377.9	127.4	0.0	3,294.2	704.7	0.1	316.8	111.7	182.0	0.0	293.8	0.9
1985	80.1	629.7	312.9	160.4	7,013.1	1,613.2	785.8	558.3	253.6	366.2	11.1	630.8	1.1
1986	93.4	1,273.9	637.1	0.2	11,219.3	2,716.0	0.4	491.9	185.5	412.4	0.1	598.0	1.2
1987	104.1	1,480.6	536.1	38.0	14,942.2	2,741.9	160.8	624.8	292.5	351.7	2.8	647.0	1.0
1988	136.7	1,893.3	746.9	0.0	19,905.7	3,955.3	0.2	565.0	228.6	350.5	0.0	579.1	1.0
1989	108.7	958.1	642.2	52.4	9,743.5	2,830.8	194.1	653.4	238.5	535.7	3.3	777.6	1.2
1990	81.7	721.5	364.6	0.1	6,926.2	1,903.1	0.4	673.8	196.4	477.1	0.0	673.5	1.0
1991	57.8	420.6	525.4	49.9	4,415.5	2,504.5	168.2	513.8	107.9	536.1	2.5	646.5	1.3
1992	35.9	340.7	145.9	0.0	3,322.5	552.7	0.0	402.1	104.6	320.9	0.0	425.5	1.1
1993	42.1	416.9	74.8	6.3	3,860.9	345.2	19.9	383.3	129.4	213.9	2.5	345.8	0.9
1994	25.2	326.2	0.0	0.0	3,442.5	0.0	0.0	216.8	189.2	0.5	0.0	189.8	0.9
1995	34.9	905.4	56.2	41.8	8,659.2	254.8	137.1	469.1	404.4	81.1	2.9	488.3	1.0
1996	30.6	571.6	36.0	0.0	6,038.5	215.8	0.0	312.6	175.6	59.2	0.0	234.8	0.8
1997	27.3	659.2	15.7	1.9	6,868.6	94.0	- -	292.1	239.1	33.2	1.4	273.8	0.9
1998	19.5	361.4	7.9	0.0	3,370.9	43.0	0.0	195.5	127.6	23.1	0.0	150.7	0.8
1999[c/]	20.3	373.0	37.4	1.7	4,621.1	137.9	5.4	248.2	105.2	54.4	2.2	161.8	0.7

Table I-4. Council area commercial and recreational ocean salmon fishing effort and landings by state. Data are provisional, pending further review of data compilation methods. A double dash ("- -") indicates no records are available. Less than 50 fish or pounds may be shown as zero. (page 5 of 5)

a/ For Washington, commercial effort and landings Include: (1) treaty Indian fisheries (ocean and Area 4B only from May 1-Sept. 30) beginning in 1972; (2) prior to 1978, catch off British Columbia landed in Washington; and (3) catch off Alaska landed in Washington. Beginning in 1989, recreational angler trips and catch include state-managed, late-season Area 4B fishery. See Table IV-15 for Area 4B data.

b/ Recreational effort and catch Includes Washington-based effort and catch from Oregon state waters (July 26-Aug. 1) and Strait of Juan de Fuca after WDFW and NMFS ocean closures in 1982.

c/ Preliminary.

d/ Oregon commercial troll landings include small numbers of salmon caught outside the Council management area (i.e., Alaska) prior to 1990. Oregon recreational effort data are total angler trips prior to 1979 and salmon trips beginning in 1979. Significantly reduced salmon per angler trip beginning in 1994 reflects regulations requiring nonretention of coho in the recreational fishery south of Cape Falcon.

Table I-5. Council area commercial and recreational ocean salmon fishing effort and landings by management area. (Page 1 of 1)

	COMMERCIAL TROLL				RECREATIONAL					
	Effort (thousands of days	Catch (thousands of fish)			Effort (thousands of salmon angler	Catch (thousands of fish)				Salmon Per
Year	fished)	Chinook	Coho	Pink	trips)	Chinook	Coho	Pink	total	Angler Trip
----- U.S.-CANADA BORDER TO CAPE FALCON -----										
Treaty Indian (north of Leadbetter Point):[a/]										
1997	0.455	14.025	15.662	1.810	-	-	-	-	-	-
1998[b/]	0.193	14.387	7.927	0.000	-	-	-	-	-	-
1999[b/]	0.414	27.365	33.441	1.563	-	-	-	-	-	-
Non-Indian:										
1997	0.452	6.447	0.000	0.005	33.301	4.152	32.569	1.410	38.131	1.145
1998[b/]	0.139	5.929	0.000	0.000	21.767	2.292	22.887	0.013	25.192	1.157
1999[b/]	0.730	17.456	3.815	0.053	57.883	10.820	47.663	2.194	60.677	1.048
----- CAPE FALCON TO HUMBUG MOUNTAIN -----										
1997	7.428	145.929	0.000	0.048	9.962	2.408	0.038	0.000	2.446	0.246
1998[b/]	6.960	123.468	0.000	0.001	9.743	2.019	0.093	0.000	2.112	0.217
1999[b/]	4.826	60.987	0.000	0.055	26.217	3.340	6.046	0.000	9.386	0.358
----- HUMBUG MOUNTAIN TO HORSE MOUNTAIN TO (KMZ) -----										
1997	0.477	5.026	0.000	0.000	35.535	14.070	0.328	0.000	14.398	0.405
1998[b/]	0.361	3.244	0.000	0.000	24.129	4.875	0.100	0.000	4.975	0.206
1999[b/]	0.402	3.862	0.000	0.000	33.596	9.635	0.177	0.000	9.812	0.292
----- HORSE MOUNTAIN TO U.S.-MEXICO BORDER -----										
1997	18.770	485.992	0.000	0.000	215.418	219.885	0.285	0.000	220.170	1.022
1998[b/]	12.658	224.434	0.000	0.000	141.792	119.100	0.040	0.000	119.140	0.840
1999[b/]	13.885	261.952	0.000	0.000	130.203	81.429	0.467	0.000	81.896	0.629

a/ May through September.
b/ Preliminary.

TABLE I-6. **Coho and chinook harvest quotas** for 1999 compared with actual harvest in thousands of fish by management area and fishery. (Page 1 of 1)

Fishery Governed by Quota	Chinook			Coho		
	Quota or Guideline[a/]	Catch	Catch/Quota[b/]	Quota	Catch	Catch/Quota[b/]
NORTH OF CAPE FALCON						
TREATY INDIAN TROLL						
May 1-Jun. 30	20.0	19.634	98%	Coho Retention Prohibited		
Aug. 1-Sept. 15	10.0	7.731	77%	38.5	33.441	87%
Subtotal Treaty Indian Troll	30.0	27.365	91%	38.5	33.441	87%
NON-INDIAN TROLL[c/]						
U.S.-Canada Border to Cape Falcon (May 1-Jun. 15)	24.0*	11.266	47%	Coho Retention Prohibited		
Cape Flattery to Leadbetter Pt. (July 10-Sept. 30)	8.0[d/]	6.190	77%	18.0	3.815	21%
Subtotal Non-Indian Troll	29.5[d/]	17.456	59%	18.0	3.815	21%
RECREATIONAL (selective coho fisheries)[b/]						
U.S.-Canada Border to Cape Alava (July 19-Sept. 30)	0.1[e/]	0.000	-	10.2	5.370	53%
Cape Alava to Queets River (July 19-Sept. 30)	0.4*	0.984	246%	4.6[f/]	2.577	56%
Queets River to Leadbetter Pt. (July 19-Sept. 30)	13.4*	6.585	49%	42.2	12.595	30%
Leadbetter Pt. to Cape Falcon (July 19-Sept. 30)	7.6*	3.251	43%	55.0	27.121	49%
Subtotal Recreational	20.5[g/]	10.820	53%	112.0	47.663	43%
TOTAL NORTH OF CAPE FALCON	80.0	55.641	70%	168.5	84.919	50%
SOUTH OF CAPE FALCON						
TROLL (all except coho)				Coho Retention Prohibited		
Klamath Management Zone:						
Humbug Mt. to OR-CA Border (May 1-31)	3.6	0.004	0%			
Sisters Rocks to Mack Arch (Aug. 1-31)	2.5	0.844	34%			
House Rock to Humboldt S. Jetty (Sept. 1-30)	7.0	2.650	38%			
Goat Island to 42°01'20" N (Oct. 12-31)	1.0	0.364	36%			
Fort Ross to Pt. Reyes (July 1-12)	2.5	3.247	130%			
Pillar Pt. to Pigeon Pt. (Apr. 14-16) test	3.0	3.266	109%			
Pt. Piedras Blancas to Pt. Conception (Apr. 14-28) test	2.5	0.002	0%			
Pt. Conception to Pitas Pt. (Apr. 14-28) test	2.5	0.000	0%			
Subtotal Troll	24.6	10.377	42%			
RECREATIONAL						
Cape Falcon to Humbug Mt. (July 10-31 selective fishery)	-	-	-	15.0	6.058	40%
TOTAL SOUTH OF CAPE FALCON	24.6	10.377	42%	15.0	6.058	40%
Buoy 10 (Aug. 8-Oct. 31)	10.0[h/]			50.3[h/]		

a/ Guidelines are marked with an asterisk (*).
b/ Percent based on actual catch, not rounded numbers.
c/ Preseason, trollers traded 12,500 coho for 3,500 chinook from the recreational fishery. The recreational coho quotas were for selective fisheries and represent a landed catch of marked hatchery coho (healed adipose fin clip).
d/ Inseason: (1) trollers rolled 2,500 chinook (on an equal impact basis) from the May-June guideline to the 4,500 preseason guideline for the July-Sept. fishery; and (2) trollers traded 2,000 coho (from the preseason 20,000 coho quota) to the La Push recreational fishery for 1,000 chinook from the overall recreational quota. Some of the troll chinook quota was used for nonretention mortality since the fishery was changed from all salmon to all salmon except chinook in Sept.
e/ Nonretention mortality for the all-salmon-except-chinook season.
f/ Increased inseason from 2,600 to 4,600 by a trade from the commercial troll fishery.
g/ Overall preseason quota of 21,500 chinook reduced by an inseason trade of 1,000 chinook to the commercial fishery for 2,000 coho to the Cape Flattery to Leadbetter Pt. subarea quota.
h/ Expected catch, not a quota or guideline.

REGULATORY OBJECTIVES BY MANAGEMENT AREA

The sections below provide a brief outline of the regulatory objectives which shaped the 1999 ocean salmon fisheries by management area and species. Further details of the conservation and allocation objectives by salmon stock and an assessment of performance are provided in Chapters II and III for chinook and coho, respectively.

Horse Mountain to U.S.-Mexico Border

Chinook Fisheries

The Council structured chinook salmon fisheries south of Horse Mountain (near Shelter Cove, California) to meet the following objectives (in order of most to least constraining):

1. A 31% increase in the adult spawner replacement rate of Sacramento River winter chinook.

2. A minimum natural spawner escapement of 35,000 adult Klamath River fall chinook plus enough fish to accommodate the inriver recreational fishery and harvest by Klamath-Trinity River Basin tribes with federally recognized fishing rights.

3. The escapement goal range for Sacramento River fall chinook of 122,000 to 180,000 hatchery and natural adults.

Under the adopted regulations, the Salmon Technical Team (STT) projected a total harvest south of Horse Mountain of 523,100 chinook and a coastwide ocean harvest rate on age-four Klamath River fall chinook (for fisheries from September 1, 1998 through August 31, 1999) of 12.3%.

Coho Fisheries

The Council prohibited all retention of coho in this area in conformance with the terms of the 1999 National Marine Fisheries Service (NMFS) Biological Opinion for threatened central California coast (CCC) coho. No projection of nonretention fishery impacts is available for CCC coho. All harvest of coho has been prohibited south of Horse Mountain beginning with the 1994 season.

Humbug Mountain to Horse Mountain

Chinook Fisheries

The Council structured chinook salmon fisheries between Humbug Mountain (near Port Orford, Oregon) and Horse Mountain (near Shelter Cove, California), the Klamath management zone (KMZ), to meet the following objectives (in order of most to least constraining):

1. Conservation and allocation objectives for Klamath River fall chinook as follows: a minimum natural spawner escapement of 35,000 adults, 50% of the allowable adult harvest for tribal subsistence and commercial fisheries, 18% of the ocean harvest to the KMZ recreational fishery, and 19% of the non-Indian harvest to the Klamath River recreational fishery.[1/]

1/ Allocation of the Klamath River fall chinook harvest for the KMZ ocean recreational fishery differs from the Council's identified objective of 17%. The increase to 18% resulted from a reduction in the troll fishery off central Oregon to allow an increase in the recreational coho retention fishery in the same area without increasing total impacts on OCN coho. This action also resulted in a projected increase to the ocean escapement of Klamath River fall chinook, part of which, the California Fish and Game Commission allocated to the inriver recreational fishery. This increased the allocation to the inriver fishery to 19% rather than the Council's objective of 15%. Deviations in the 1999 allocations are not intended to set a precedent for future years.

2. An Oregon coastal natural (OCN) coho exploitation rate of not more than 15% as allowed under Amendment 13, the Oregon Plan for Salmon and Watersheds, and the NMFS 1999 Biological Opinion for threatened California and Oregon coastal coho stocks.

Under the adopted regulations, the STT projected a total harvest in the KMZ of 34,700 chinook and a coastwide ocean harvest rate on age-four Klamath River fall chinook (for fisheries from September 1, 1998 through August 31, 1999) of 12.3%.

Coho Fisheries

The Council prohibited retention of coho in the KMZ as a part of the effort to conform to the jeopardy standard in the 1999 NMFS Biological Opinion for threatened CCC, northern California, and OCN coho. Coho are managed as a unit south of Cape Falcon, and details of the Council's management objectives shaping the 1999 fisheries are presented more fully in the Cape Falcon to Humbug Mountain section.

The STT projected nonretention mortality resulting from fisheries in this area to be equivalent to exploitation rates of 2.67% for Rogue/Klamath (RK) hatchery coho and 0.82% for OCN coho stocks. This equates to an estimated 859 RK coho and 466 OCN coho. Beginning in 1994, no retention of coho has been allowed in this area.

Cape Falcon to Humbug Mountain

Chinook Fisheries

The Council structured chinook salmon fisheries between Cape Falcon (near Manzanita, Oregon) and Humbug Mountain (near Port Orford, Oregon) to meet the following objectives (in order of most to least constraining):

1. A minimum natural spawner escapement of 35,000 adult Klamath River fall chinook plus enough fish to accommodate the inriver recreational fishery and harvest by Klamath-Trinity Basin tribes with federally recognized fishing rights.

2. An OCN coho exploitation rate of not more than 15% as allowed under Amendment 13 and required by the NMFS 1999 Biological Opinion to meet the terms of the Oregon Plan for Salmon and Watersheds.

3. The index escapement goal range for Oregon coastal chinook of 150,000 to 200,000 adult chinook.

Under the adopted regulations, the STT projected a total harvest in this area of 155,900 chinook and a coastwide ocean fishery exploitation rate on age-four Klamath River fall chinook (for fisheries from September 1, 1998 through August 31, 1999) of 12.3%.

Coho Fisheries

The Council structured coho salmon fisheries between Cape Falcon and Humbug Mountain to conform to the jeopardy standard in the 1999 NMFS Biological Opinion for threatened northern California, and OCN coho. The jeopardy standard required, (1) no more than a 15% combined coastwide marine and freshwater exploitation rate for OCN coho; and (2) no more than a 13% coastwide marine exploitation rate for RK hatchery coho (surrogate for the southern Oregon/northern California (SONC) coho ESU). In meeting the jeopardy standard, the Council adopted seasons for which the STT projected:

1. A coastwide marine and freshwater exploitation rate for OCN coho of 8.7%.

2. A coastwide marine exploitation rate for RK coho of 4.9%.

The Council's marine exploitation rate for OCN coho assumed an 8% hook-and-release mortality rate in recreational fisheries off Oregon and Washington. The STT conducted sensitivity analysis by doubling the hook-and-release mortality rate resulting in an OCN exploitation rate of 11.9%

Under the adopted regulations, the STT projected harvest impacts from a limited recreational selective fishery for hatchery coho and nonretention mortality resulting from fisheries in this area to be equivalent to exploitation rates of 0.08% for RK hatchery coho and 0.79% for OCN coho stocks. This equates to an estimated 26 RK coho and 455 OCN coho. The selective recreational fishery for hatchery coho under a quota of 15,000 during July was the first season to allow retention of coho in this area since 1993.

U.S.-Canada Border to Cape Falcon

Chinook Fisheries

Management objectives for chinook fisheries in this area are to provide for viable ocean and inriver fisheries while protecting depressed Columbia River natural stocks and meeting hatchery fall chinook brood stock needs. The Council structured chinook salmon fisheries between Cape Falcon, Oregon and the U.S.-Canada Border to meet the following objectives (in order of most to least constraining):

1. A reduced harvest impact on the threatened lower Columbia River ESU as required by the 1999 NMFS Biological Opinion (the chinook FRAM predicted exploitation rates of 7.2%, 19.2%, and 3% on lower Columbia River springs, tules, and bright fall chinook, respectively.

2. Conservation concerns for threatened Puget Sound chinook in the northern areas near the Strait of Juan de Fuca (nontreaty troll fishery kept 17 miles away from the Strait of Juan de Fuca during the summer fishery and the Area 4 recreational fishery not allowed to retain chinook in order to reduce impacts on these stocks).

3. A maximum OCN coho exploitation rate of no more than 15% as allowed under Amendment 13 and required by the NMFS 1999 Biological Opinion to meet the terms of the Oregon Plan for Salmon and Watersheds.

Impacts on threatened Snake River fall chinook were not constraining in 1999 due to restrictions for other stock considerations and due to significant constraints in the Canadian ocean salmon fisheries.

The Council adopted harvest quotas of 28,500, 30,000, and 21,500 chinook for commercial non-Indian, commercial treaty Indian troll, and recreational fisheries, respectively.

Coho Fisheries

Fisheries between Cape Falcon, Oregon and the U.S.-Canada Border are constrained by management objectives and treaty Indian obligations for individual stock management units and stock listed under the ESA. The Council structured coho salmon fisheries to meet the following objectives (in order of most to least constraining):

1. Provide access to harvestable coho stocks while constraining impacts on weak natural coho stocks, especially Queets and OCN, to acceptable levels.

2. Meet FMP objectives for allocation of impacts for commercial and recreational ocean fisheries.

3. Meet inside/outside and treaty/nontreaty allocation objectives.

The Council adopted commercial harvest quotas of 20,000 and 38,500 coho for the non-Indian and treaty Indian troll fisheries, respectively. The adopted recreational fishery quota equated to selective fishery impacts associated with a landed catch of 110,000 marked hatchery coho.

SELECTIVE COHO FISHERIES AND SALMON BYCATCH

Recreational fisheries selective for marked hatchery coho (healed adipose fin clip) were planned for the area south of Cape Falcon, the four ocean areas north of Cape Falcon, and the inside fisheries at Buoy 10 and the Strait of Juan de Fuca (Areas 5 and 6). Preseason and inseason assessments of mark rates, catches, numbers of coho released, and bycatch mortality are summarized in Table I-7. The fisheries in each of these areas opened as scheduled and ran through their cut-off dates without reaching their quotas for coho. Fisheries were sampled by on-water observers and dockside interviews. The mark rate in fisheries south of La Push were very close to the preseason predicted rates. The mark rates for the La Push and Neah Bay fisheries (Areas 3, 4A, and 4B) were lower than predicted. The Strait of Juan de Fuca fishery (Areas 5 and 6) was affected by substantial numbers of two-year-old marked coho in the fishery. Since these two-year-old fish were not accounted for in the preseason modeling, their presence in the fishery artificially raised the mark rate. The mark rate without these fish would probably have been close to that observed in Neah Bay where all coho less than 16 inches were not legal and were removed from the sample.

PACIFIC SALMON COMMISSION

The Pacific Salmon Treaty (PST) between the U.S. and Canada became effective in March 1985 and established the Pacific Salmon Commission (PSC) with the responsibility for implementing the treaty. Because many of the stocks under the jurisdiction of the Council are significantly affected by management actions taken in Canadian and Alaskan waters, considerable interaction between the Council and PSC can be expected at both the policy and technical levels. Actual catches for fisheries of the most relevance to the Council are summarized in Tables I-8 and I-9. Note that these catch statistics do not reflect incidental mortality losses associated with the regulation of these fisheries, except as noted.

Chinook Fisheries

Northern British Columbia and southeast Alaska fisheries affect far-north migrating stocks originating in Washington, Oregon, and Idaho. These include Washington coastal, Columbia River bright, spring, and summer; and far-north migrating Oregon coastal chinook stocks. The West Coast Vancouver Island (WCVI) troll, and Georgia Strait troll and recreational fisheries affect far-north migrating stocks to a lesser degree, but have a major impact on more southerly distributed Columbia River tule and Puget Sound stocks.

In June 1999, the U.S. and Canada reached agreement on a framework for chinook fishing regimes for 1999 through 2008. Under this agreement, Southeast Alaskan (all gear), Northern British Columbia (troll and recreational) and WCVI (troll and outside recreational) fisheries are to be regulated under aggregate abundance-based management (AABM) regimes. These fishery regimes establish catch ceilings that are derived from estimates of total aggregate abundance of all stocks contributing to the fisheries and target fishery harvest rates. The regime for the WCVI fisheries was designed with the intention of reducing fishery harvest rates by approximately 35% from observed levels had they been applied during the period from 1985 through 1996. Over the course of the next few years, the U.S. and Canada will explore the development of management regimes for AABM fisheries that are based on total mortality rather than catch.

For fisheries that are not driven by aggregate abundance-based regimes, the 1999 agreement establishes conservation obligations to reduce harvest rates on depressed chinook stocks by 36.5% for Canadian fisheries and 40% for U.S. fisheries, relative to levels observed during 1979 through 1982. This individual stock based management (ISBM) obligation must be taken into account during Council preseason management planning processes.

In 1999, AABM fisheries were conducted in accordance with the obligations set forth in the June 1999 PST agreement. Southeast Alaska (SEAK) fisheries were constrained by an all gear catch ceiling of 195,600 "treaty" chinook (total catch less hatchery add-on catch). Approximately 193,400 treaty chinook were taken by SEAK fisheries in 1999. Canadian fisheries in the North/Central and WCVI areas were constrained due to concerns for fall chinook returning to river systems on the WCVI and depressed coho stocks. Chinook catches for north coastal AABM fisheries totaled 70,400 compared to an allowable catch ceiling of 145,000 chinook.

TABLE I-7. Summary of 1999 recreational fisheries selective for marked hatchery coho (preliminary data). (Page 1 of 1)

Area	Anticipated Mark Rate	Observed Mark Rate	Quota	Anticipated Nonretention Mortality[a/]	Landed Coho Catch			Coho Released	Estimated Nonretention Mortality	Angler Days
					Total	Marked	Unmarked			
Ocean Fisheries:										
Neah Bay	43%	26%	18,200	3,927	5,370	5,176	194	19,011	2,211	8,102
La Push	54%	40%	2,600	418	2,677	2,535	42	4,744	602	2,921
Westport	61%	60%	42,200	5,736	12,595	12,494	101	8,657	1,704	19,072
Columbia River	75%	78%	55,000	4,219	27,127	26,947	180	7,644	2,350	28,093
Cape Falcon to Humbug Mt.	70%	62%	15,000	1,662	6,058	5,991	67	3,638	733	14,768
Inside Fisheries:										
Strait of Juan de Fuca	40%	41%	53,688[b/]	11,884	8,267	8,176	91	37,187	NA	23,645
Buoy 10	73%	79%	45,400[b/]	4,453	8,872	8,825	47	2,358	750	49,190

a/ Hook-and-release plus drop-off mortality.
b/ Expected catch.

TABLE I-8. Chinook catch by Southeast Alaska marine fisheries. (Page 1 of 1)

	Total Catches			Treaty Chinook		
Year	Troll	Net	Sport	Troll	Net	Sport
1985	216.1	34.7	24.9	212.2	34.2	23.0
1986	237.7	21.7	22.6	231.6	20.5	19.2
1987	242.6	15.5	24.3	231.1	14.0	20.5
1988	231.4	21.8	26.2	217.1	17.4	22.2
1989	235.7	24.2	31.1	224.2	18.5	26.8
1990	287.9	27.7	51.2	263.6	16.1	41.4
1991	264.1	32.8	60.5	231.6	20.0	45.1
1992	183.7	32.1	42.9	162.6	24.0	35.3
1993	226.9	28.0	49.2	212.4	16.5	42.7
1994	186.2	35.7	42.4	177.1	23.3	35.5
1995	138.1	48.0	49.7	115.3	28.6	34.9
1996	141.4	37.4	38.5	108.1	9.2	29.1
1997	246.5	25.0	67.7	221.9	13.9	55.8
1998	192.0	23.5	55.5	183.4	13.4	48.0
1999[a/]	145.9	32.6	60.6	132.8	13.0	47.6

a/ Preliminary.

TABLE I-9. Chinook and coho catches by Canadian marine fisheries in thousands of fish. (Page 1 of 1)

	Northern B.C.		Central B.C.		North-Central B.C.	WCVI				Strait of Georgia		Strait of Georgia Sport		Juan de Fuca		
Year	Troll	Net	Troll	Net	Sport	NW Troll	SW Troll	Net	Outside Sport	Troll	Net	North	South	Troll	Net	Sport
								CHINOOK								
1985	186.7	70.7	28.8	27.3	9.9	74.3	279.8	22.0	10.2	55.7	7.6	127.8	79.2	0.0	44.6	27.8
1986	153.0	42.7	52.6	55.3	12.6	81.0	261.1	5.9	4.1	43.9	3.4	100.4	47.1	0.3	59.9	34.4
1987	177.5	41.2	64.0	21.4	13.8	113.1	265.8	0.6	26.5	38.7	2.8	52.7	43.5	0.0	11.3	24.9
1988	152.4	40.4	31.1	21.8	19.3	171.3	237.4	16.5	24.3	19.6	0.7	56.5	31.4	0.0	11.8	31.2
1989	207.7	48.9	19.1	7.5	35.7	71.5	132.2	40.8	38.0	28.5	2.4	72.1	28.2	0.0	32.0	32.5
1990	154.1	39.0	27.3	30.3	32.0	114.8	183.1	29.6	50.2	34.4	2.0	58.6	23.2	0.0	12.8	30.1
1991	194.0	56.6	27.9	18.9	32.5	74.8	128.1	61.3	42.5	32.2	2.0	75.3	21.2	0.0	11.8	19.0
1992	142.3	43.8	42.3	20.8	37.9	216.5	130.2	9.8	44.1	37.3	2.7	75.1	20.4	0.0	15.6	21.1
1993	161.8	45.0	24.8	11.2	38.2	167.8	106.9	29.4	63.1	33.4	4.1	79.0	25.9	0.0	2.8	14.0
1994	164.5	26.5	20.1	15.4	38.9	71.0	75.0	3.7	50.6	13.0	1.2	45.1	11.4	0.0	13.8	14.4
1995	56.4	28.2	4.7	9.1	30.0	28.8	52.2	0.5	28.2	0.0	0.2	38.0	9.7	0.0	1.5	14.4
1996	0.0	30.9	0.0	4.1	11.0	0.0	0.0	0.0	3.2	0.0	0.0	55.2	15.3	0.0	0.6	19.0
1997	82.1	18.9	10.5	1.8	36.5	25.9	26.6	0.2	NA	0.8	0.0	35.3	7.5	0.0	0.4	13.5
1998	116.4	7.6	3.8	5.7	22.1	7.2	3.1	1.6	NA	0.1	0.0	10.1	4.3	0.0	0.2	9.7
1999[a/]	44.6	11.3	2.1	4.2	25.8	21.3	34.7	1.0	17.1	0.1	0.0	32.7	12.2	0.0	0.2	13.8
								COHO								
1985	527.8	176.4	135.2	96.9	18.0	377.0	1,012.0	7.5	1.6	191.2	31.8	569.7	133.2	0.3	224.7	25.3
1986	1,089.5	212.6	593.4	277.5	20.2	610.5	1,546.3	10.6	1.1	181.4	16.2	442.4	94.8	2.9	202.5	34.7
1987	595.7	100.3	214.5	93.3	24.4	525.1	1,295.9	7.2	24.6	217.5	14.0	472.1	107.9	0.2	216.4	61.6
1988	348.0	61.7	183.9	107.8	23.1	555.9	1,039.9	11.0	5.3	256.5	3.5	824.3	184.6	0.2	56.7	75.9
1989	573.4	161.4	123.2	28.9	26.3	578.8	1,373.2	39.7	44.5	73.3	5.1	332.6	75.1	0.1	342.1	89.4
1990	974.8	163.7	261.2	153.5	46.0	729.5	1,134.1	2.7	19.8	163.2	8.0	493.1	67.5	0.1	154.1	69.4
1991	982.3	196.2	105.7	47.6	43.1	664.6	1,225.3	5.2	49.8	11.6	7.2	35.0	11.5	0.0	180.4	110.6
1992	516.3	122.1	237.8	67.6	40.5	935.5	736.3	9.7	37.5	137.3	5.7	358.5	117.3	0.0	106.0	119.7
1993	337.2	134.5	72.6	37.8	31.2	422.0	531.8	3.5	13.7	276.0	7.2	552.1	177.7	0.0	6.2	108.9
1994	740.0	174.5	57.6	94.1	58.9	207.7	1,044.1	4.7	16.4	50.8	0.7	148.0	28.2	0.0	131.0	118.6
1995	295.4	111.1	18.7	28.1	37.3	276.9	1,068.5	1.4	41.2	0.0	0.0	11.2	3.5	0.0	36.7	71.5
1996	424.9	122.2	12.2	29.5	59.1	235.9	552.7	1.0	25.1	0.0	0.0	26.7	7.1	0.7	4.2	94.0
1997	158.6	28.6	8.2	12.0	37.1	0.0	0.0	0.0	NA	0.0	0.0	2.6	2.8	0.0	0.4	99.5
1998	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	NA	0.0	0.0	0.1	1.2	0.0	0.0	0.1
1999[b/]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

a/ Preliminary.

Canada's principal management objective for the 1999 WCVI chinook troll fishery was to address concerns for southern B.C. coho stocks. Non-retention of coho and limitations on incidental coho mortalities limited the timing of the chinook fishery. The fishing pattern in 1999 differed substantially from previous years. One troll opening took place off the WCVI in 1999. The fishery operated under a 55 cm minimum size limit from October 1 through October 22 after coho stocks of concern were believed to have left the fishing area. The total WCVI troll chinook catch for 1999 was approximately 56,000 fish, based on hail and logbook data. Because this fishery occurred after most maturing chinook stocks have left the area, it is anticipated the 1999 catch will be counted against the allowable catch level established for the 2000 season.

Fisheries in the Strait of Georgia and Johnstone Strait areas were managed in response to concerns for lower Georgia Strait chinook and coho stocks. There was no directed chinook troll fishery in the Strait of Georgia. The recreational catch of chinook in the Strait of Georgia was estimated at 52,000 fish to the end of October. The Strait of Georgia recreational fishery operated under "slot size limits" during part of the year to provide increased protection for maturing Nooksack spring chinook.

No direct management measures for chinook salmon within the Council management area are specified in the 1999 PST agreement except for the ISBM commitment. The Council's ocean fisheries and inside fisheries were designed to minimize impacts on spawning escapements of depressed stocks, but the information necessary to evaluate the impacts of Council area fisheries is not yet available.

Coho Fisheries

The June 1999 PST agreement included a commitment to develop abundance-based regimes for a specified set of fisheries along the Washington- British Columbia border. These regimes are to be designed to conserve natural coho production units from Washington, Oregon, and southern British Columbia by establishing exploitation rate constraints based on projected resource status. Details of the regime are to be developed through bilateral work groups over the course of the next few years.

All Canadian fisheries operated under coho nonretention restrictions in 1999. Canadian WCVI fisheries significantly impact many of the coho stocks that influence the Council's management actions in the area north of Cape Falcon. The total estimated hook-and-release mortality of coho in South Coast British Columbia commercial and recreational fisheries combined was 23,300 fish.

CHAPTER II
CHINOOK SALMON MANAGEMENT

CENTRAL VALLEY CHINOOK STOCKS

Central Valley chinook salmon stocks include all fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin rivers and their tributaries. Of these stocks, two are currently listed under the Endangered Species Act (ESA), (1) Sacramento River winter chinook listed as endangered in January 1994, and (2) Central Valley spring chinook listed as threatened in September 1999. Spring chinook are also listed as threatened under the California Endangered Species Act (CESA) as of February 1999.

Management Objectives

The following conservation objectives guided Council management of Central Valley chinook salmon stocks in the 1999 fisheries, (1) the spawner escapement goal range for Sacramento River fall chinook of 122,000 to 180,000 hatchery and natural adults combined, not including the San Joaquin River; and (2) the National Marine Fisheries Service (NMFS) jeopardy standard requiring a 31% increase in the adult spawner replacement rate for endangered Sacramento River winter chinook relative to the observed 1989 through 1993 mean rate. This jeopardy standard was first applied in 1997 and equates to a 1.77 adult replacement rate.

Regulations to Achieve Objectives

Harvest impacts on Central Valley chinook are a primary management concern in fisheries south of Point Arena, California. For 1999, no specific restrictions were required for ocean salmon fisheries to meet the conservation objective for Sacramento River fall chinook. Under the 1999 regulations, the Salmon Technical Team (STT) projected a spawner escapement in the Sacramento River of 292,900 fall chinook adults, well above the conservation objective range.

With regard to endangered Sacramento River winter chinook, the STT projected the 1999 fisheries would just meet the NMFS jeopardy standard for Sacramento River winter chinook of 1.77 spawners per brood spawner. Regulations instituted south of Horse Mountain, California to achieve this standard included shortened seasons, increased minimum sizes, and specific gear restrictions, primarily in the recreational fishery.

Commercial Troll

To meet the Sacramento River winter chinook jeopardy standard, season duration of the commercial fishery was more limited than in previous years, and the minimum size limit was increased to 27 inches after June 30 to help reduce retention of the generally smaller Sacramento River winter chinook. Two test fisheries were also conducted in the commercial fishery to help identify stock composition of the catch at various times and areas in the hope of eventually shaping seasons that minimize impacts on listed or Klamath stocks while providing harvest opportunity for more abundant Sacramento River fall chinook.

Recreational

Recreational restrictions to protect Sacramento River winter chinook included the season closure immediately following Labor Day south of Pigeon Point, the 24-inch minimum size limit south of Horse Mountain (except for the period August 1 through September 6), and a requirement between Horse Mountain and Point Conception for anglers to use circle hooks if fishing by means other than trolling. Circle hooks have a lower nonretention mortality rate than "J" hooks when used in mooching.

Inside Harvest

Although no estimate is made for the 1999 season, recreational harvest regulations continued to allow extensive harvest of fall chinook. A comprehensive angler survey of the Sacramento River system, conducted from 1990 through 1994, showed the recreational catch averaged 25% of the river run. The river regulations, as they have since 1990, closed the mainstem Sacramento River to retention of salmon from January to July when winter chinook adults are present. In response to low escapements in recent years, the San Joaquin River and its tributaries (Stanislaus, Toulumne, and Merced) were closed to recreational salmon fishing.

Escapement and Management Performance

Sacramento River Fall Chinook

In 1999, 273,300 natural and hatchery fall chinook adults returned to spawn in the Sacramento River Basin. This compares to a preseason expectation of 292,900 adults and the Council's conservation objective of 122,000 to 180,000 adult spawners. Sacramento River hatchery returns totaled 41,000 adults. Available data indicate a majority of the Sacramento River Basin's naturally spawning fall chinook population is comprised of hatchery-produced fish. Table II-1 and Figure II-1 display historical natural and hatchery fall spawner escapements. For a finer breakdown of the historical escapements, see Appendix B, Tables B-1 and B-2.

Sacramento River Winter and Spring Chinook

Historical spawner escapements for Sacramento River winter and spring chinook salmon are presented in Appendix B, Table B-3.

Spawner escapement of threatened winter chinook salmon in 1999 was estimated to be approximately 1000 adults, resulting in a three-year adult spawner replacement rate of 1.45. This rate is below the goal of 1.77, but above the 1998 replacement rate of 1.38. Winter chinook returns to the upper Sacramento River in 1999 were estimated using partial counts at the Red Bluff Diversion Dam fish ladders. The gates at the dam were opened during the bulk of the run to facilitate salmon passage. Ocean fishery impacts on the returning cohort of winter chinook spawners in 1999 were primarily incurred during the 1998 season and in the early 1999 recreational season off California.

Threatened spring chinook returns to the Sacramento River totaled approximately 10,100 fish (jacks and adults), of which approximately 6,400 fish returned to the upper river (above the mouth of the Feather River). The 1999 return could not be partitioned into adults and jacks due to a lack of age composition data. A NMFS jeopardy standard has not yet been established for the spring stock.

San Joaquin River Fall Chinook

San Joaquin River spawning areas are utilized primarily by fall chinook salmon. The estimated San Joaquin River fall chinook salmon spawning escapement in 1999 totaled 2,100 naturals and 4,800 hatchery jacks and adults (Appendix B, Tables B-1 and B-2 provide historical spawner escapements). Salmon production in the San Joaquin River is largely determined by spring outflows three years earlier. In 1999, spawner returns to the San Joaquin River were a small fraction of total Central Valley spawner escapement.

Test Fisheries

Two test fisheries were conducted off California in 1999. In April, a test fishery was conducted to determine the contribution rates of Sacramento River winter chinook and Central Valley spring chinook to the commercial catch in two areas: Pillar Point to Pigeon Point (3,000 fish quota) and Point Piedras Blancas to Pitas Point (5,000 fish quota). In the Pillar Point fishery, 617 tissue samples and 275 coded-wire tags (CWTs) were collected from an estimated 3,300 salmon landed (the quota was reached after only 3 days of fishing). Genetic analysis estimated that 30.97% of these fish were spring chinook (Feather River

TABLE II-1. **Sacramento River** natural and hatchery **adult fall chinook** escapements in thousands of fish. (Page 1 of 1)

Year	Upper River[a/]			Lower River			Total		Grand Total
	Hatchery	Natural[b/]	Subtotal	Hatchery	Natural[a/]	Subtotal	Hatchery	Natural[a/]	
1970	3.0	64.0	67.0	10.2	83.0	93.2	13.2	147.0	160.2
1971	1.5	62.6	64.1	10.2	75.3	85.5	11.7	137.9	149.6
1972	1.6	35.0	36.6	6.8	44.0	50.8	8.4	79.0	87.4
1973	3.0	48.0	51.0	18.0	151.0	169.0	21.0	199.0	220.0
1974	1.3	66.0	67.3	11.6	122.0	133.6	12.9	188.0	200.9
1975	1.8	71.0	72.8	10.8	69.0	79.8	12.6	140.0	152.6
1976	1.8	79.0	80.8	8.6	75.3	83.9	10.4	154.3	164.7
1977	4.7	46.8	51.5	13.2	83.0	96.2	17.9	129.8	147.7
1978	1.1	76.0	77.1	10.0	47.0	57.0	11.1	123.0	134.1
1979	4.7	77.0	81.7	10.6	71.0	81.6	15.3	148.0	163.3
1980	8.8	53.0	61.8	16.5	72.0	88.5	25.3	125.0	150.3
1981	5.7	51.0	56.7	25.1	91.0	116.1	30.8	142.0	172.8
1982	16.2	37.0	53.2	14.5	93.5	108.0	30.7	130.5	161.2
1983	5.4	40.6	46.0	12.5	49.5	62.0	17.9	90.1	108.0
1984	18.7	48.7	67.4	19.1	68.5	87.6	37.8	117.2	155.0
1985	13.1	107.7	120.8	12.9	101.3	114.2	26.0	209.0	235.0
1986	11.3	109.5	120.8	11.3	102.9	114.2	22.6	212.4	235.0
1987	11.3	73.4	84.7	9.9	77.0	86.9	21.2	150.4	171.6
1988	12.5	125.2	137.7	14.2	71.8	86.0	26.7	197.0	223.7
1989	10.2	65.9	76.1	15.7	54.5	70.2	25.9	120.4	146.3
1990	13.5	50.8	64.3	8.9	34.1	43.0	22.4	84.9	107.3
1991	10.0	33.6	43.6	14.7	53.1	67.8	24.7	86.7	111.4
1992	6.2	33.0	39.2	15.4	29.2	44.6	21.6	62.2	83.8
1993	7.1	54.4	61.5	17.1	48.9	66.0	24.2	103.3	127.5
1994	11.5	50.4	61.9	17.7	62.1	79.8	29.2	112.5	141.7
1995	24.8	92.8	117.6	16.8	133.4	150.2	41.6	226.2	267.8
1996	18.8	83.8	102.6	14.1	127.7	141.8	32.9	211.5	244.4
1997	45.4	154.8	200.2	19.2	104.5	123.7	64.6	259.3	323.9
1998	42.4	60.1	102.5	26.8	108.2	135.0	69.2	168.3	237.5
1999[c/]	23.7	148.3	172.1	17.3	83.9	101.2	41.0	232.3	273.3

a/ Above the Feather River.
b/ Fish spawning in natural areas are the result of hatchery and natural production.
c/ Preliminary.

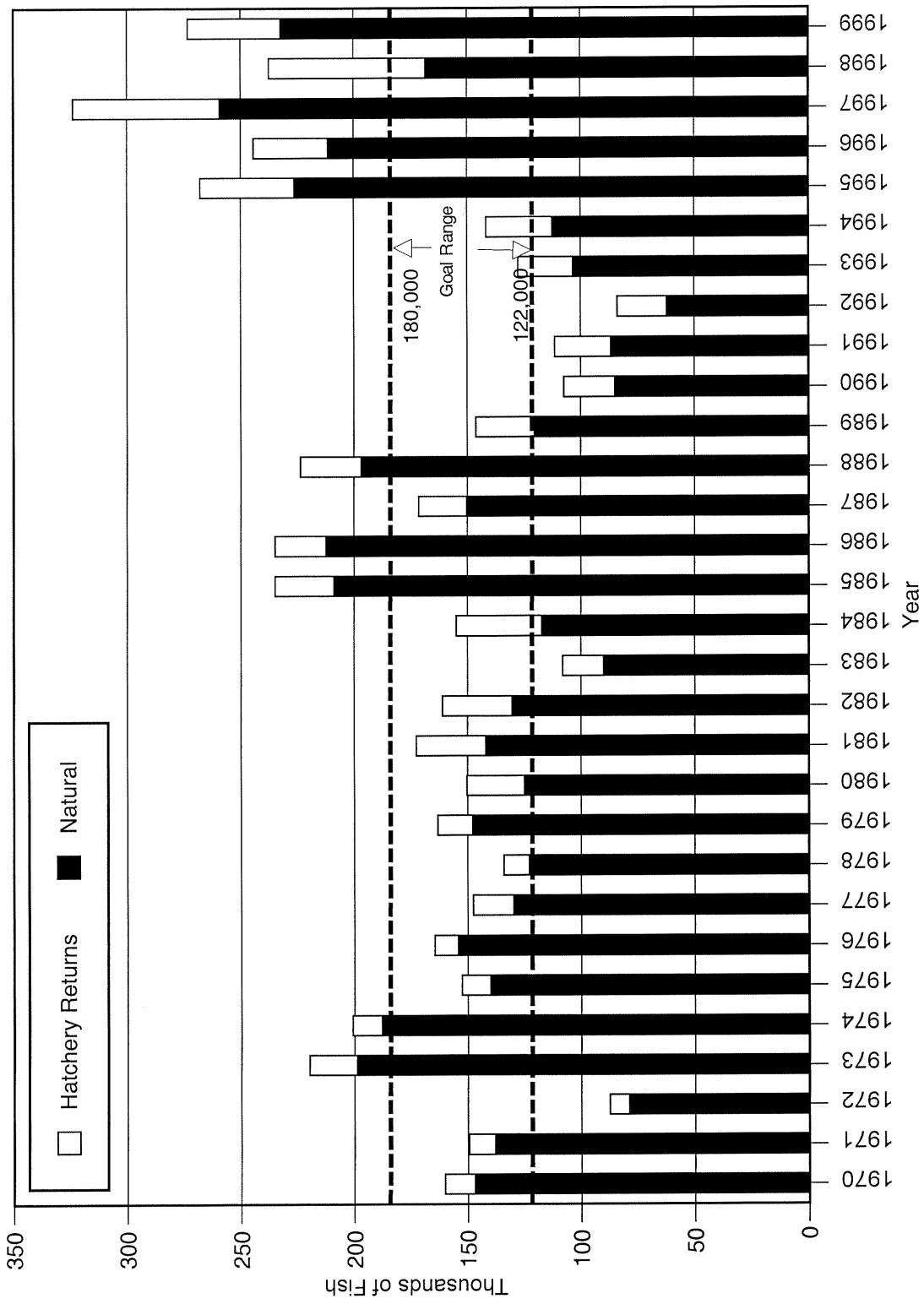

FIGURE II-1. Sacramento River fall chinook spawning escapements, 1970-1999.

Hatchery 25.94%; natural stocks 5.04%), and 0.62% of these fish were winter chinook. In the southern test fishery, no real fishing effort was exerted (2 salmon landed), and no analysis was performed.

In July, a test fishery was conducted between Fort Ross and Point Reyes, within 6 nautical miles of shore, to determine if an "inside" commercial fishery would result in a lower contribution rate of Klamath River fall chinook than would otherwise be expected from an "outside" fishery in this area. During the 12-day fishery, 481 tissue samples and 163 CWTs were collected from an estimated 3,200 salmon landed. Genetic analysis estimated that 2.8% of these fish were Klamath River chinook, 15.6% were Central Valley spring chinook (Feather River Hatchery 15.4%; natural stocks 0.02%), 5.1% California coastal, and 0.39% were winter chinook.

NORTHERN CALIFORNIA COAST CHINOOK STOCKS

Northern California stocks include fall and spring stocks north of the Russian River. Primary river systems in this area (from north to south) are the Smith, Klamath, Mad, Eel, and Mattole Rivers. In September 1999, the coastal chinook stocks south of the Klamath River were listed as threatened under the ESA.

Management Objectives

The Klamath River fall chinook conservation objective provided primary guidance for Council management of northern California chinook salmon stocks in the 1999 fisheries. Specific management objectives for the recently listed northern California coast stocks have not yet been established. The objective for Klamath River fall chinook is a harvest rate plan (Amendment 9) calling for a minimum natural spawning escapement rate of 33-34%, with a natural adult spawning escapement floor of 35,000 fish. In addition, harvest allocation objectives include equal sharing of fall chinook harvest between non-Indian and Indian fishers with recognized federal fishing rights, and equitable sharing among non-Indian ocean and inside fishers.

Regulations to Achieve Objectives

Harvest impacts on northern California coastal chinook are a primary management concern for commercial ocean fisheries from Pigeon Point, California to Florence, Oregon and for recreational fisheries from Horse Mountain, California to Humbug Mountain, Oregon–the Klamath management zone (KMZ). To achieve the management objectives for Klamath River fall chinook, the adopted regulations provided for, (1) an ocean fishery exploitation rate on age-4 Klamath River fall chinook (for fisheries from September 1, 1998, through August 31, 1999) of 12.3%; (2) a Klamath River inriver run target of 67,400 fall chinook adults resulting in a spawner escapement of 35,000 fish in natural areas taking into account a projected inriver harvest impact of 18,100 adults and returns to basin hatcheries; (3) roughly equal sharing of harvest between non-Indian (ocean and river) and river-Indian fishers, (4) 19% of the non-Indian harvest to the Klamath River recreational fisheries, and (5) 18% of the ocean allocation for the KMZ recreational fishery. Meeting these various objectives resulted in a projected split of the harvest of age-4 Klamath River fall chinook between California and Oregon fisheries outside the KMZ recreational fishery of 57/43, respectively.

To achieve these objectives, fishing opportunity was substantially limited within the KMZ and in the Fort Bragg area (Horse Mountain to Point Arena, California). Commercial fisheries in the Fort Bragg area and the California portion of the KMZ were limited to the month of September, while the Oregon portion of the KMZ was closed to commercial fishing in June and July and had limited area openings under quotas in August and September. Recreational fishing was also limited in the KMZ by a 1-fish daily-bag-limit, and a 24-day closure in July.

Inside Harvest

Inside harvest estimates for streams outside the Klamath River Basin are not available. The Indian and recreational fisheries in the Klamath River were managed under quotas. The State of California managed the recreational fishery under a 2,900 adult fall chinook quota. The U.S. Department of the Interior adopted a tribal river harvest quota of 15,300 adult fall chinook. Adult chinook landings totaled 14,400 fish (94% of the quota) in the Indian fishery and 2,300 fish (79% of the quota) in the recreational fishery (Table II-2).

TABLE II-2. **Klamath River adult inriver fall chinook** run size, spawning escapement, recreational catch, Indian net harvest, and non-landed fishing mortalities in numbers of fish and percent of the total inriver run size. (Page 1 of 1)

	Spawning Escapement		Inriver Recreational Catch		Indian Net Catch		Non-landed Fishing Mortality		Inriver Run Size
Year	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers
1978	71,500	77	1,700	2	18,200	20	1,500	2	92,800
1979	34,300	67	2,100	4	13,700	27	1,100	2	51,200
1980	28,000	61	4,500	10	12,000	26	1,100	2	45,600
1981	38,300	48	6,000	7	33,000	41	2,800	3	80,100
1982	42,400	64	8,300	12	14,500	22	1,300	2	66,500
1983	44,600	78	4,200	7	7,900	14	700	1	57,500
1984	23,600	50	3,300	7	18,700	40	1,600	3	47,100
1985	48,200	75	3,600	6	11,600	18	1,000	2	64,400
1986	146,300	75	21,000	11	25,100	13	2,400	1	194,800
1987	130,800	63	20,200	10	53,100	25	4,700	2	208,800
1988	112,800	59	22,200	12	51,700	27	4,600	2	191,300
1989	65,900	53	8,800	7	45,600	37	3,800	3	124,000
1990	23,600	66	3,600	10	7,900	22	700	2	35,800
1991	18,100	56	3,400	10	10,200	31	900	3	32,600
1992	19,400	73	1,000	4	5,800	22	500	2	26,700
1993	43,500	76	3,200	6	9,600	17	800	1	57,100
1994	47,100	76	1,800	3	11,700	19	1,000	2	61,600
1995	190,700	89	6,100	3	15,600	7	1,400	1	213,700
1996	101,400	58	12,800	7	56,500	32	4,800	3	175,400
1997	64,800	77	5,700	7	12,100	15	1,100	1	83,700
1998	71,700	79	7,700	9	10,200	11	1,000	1	90,500
1999[a/]	33,000	65	2,300	5	14,400	27	1,200	2	50,900

a/ Preliminary.

Escapement and Management Performance

Threatened California North Coast Chinook

Historical indices of spawner abundance, or actual spawning escapement estimates, for chinook salmon in California coastal streams outside of the Klamath River Basin are limited to cursory, nonsystematic surveys of one tributary of the Mad River and two tributaries of the Eel River (Appendix B, Table B-7). Surveys in 1998 and 1999 indicate numbers of chinook spawned in those areas were comparable to recent years. No conservation objectives for spawner escapements are in place for these river systems. Limitations for Klamath River fall chinook likely maintain low ocean harvest impacts for north coastal stocks.

Klamath River Fall Chinook

The preliminary 1999 inriver run size estimate for Klamath River Basin fall chinook salmon is 50,905 adults compared to the preseason predicted ocean escapement (inriver run size) of 67,400 adults. The escapement to natural spawning areas of 18,600 adults did not meet the preseason prediction of 35,000 adults, the floor level conservation objective. The estimate of hatchery returns is 14,400 adults. Table II-2, Figure II-2 and Appendix B, Table B-4 present historical harvest and escapement data for Klamath River fall chinook.

Natural spawning escapements in upper Klamath River tributaries (Salmon, Scott, and Shasta Rivers), where spawning is only minimally affected by hatchery strays, totaled 4,900 adults, compared to the 1998 escapement of 6,900 adults. The Shasta River is the most important chinook salmon spawning stream in the upper Klamath River. Counts of chinook salmon spawners in the Shasta River date from 1930 (Appendix B, Table B-6). The 1999 count of 1,300 adults was less than the 1998 run of 2,500 adult fish. The Shasta River supported a run of 30,700 adults as recently as 1964 and historically has received as many as 63,700 adults.

Allocation

The success of the Council's harvest allocation goals and the ocean fishery exploitation rate on age-4 Klamath River fall chinook for 1999 ocean troll and recreational fisheries cannot be determined at this time, because some CWT data are not yet available.

OREGON COAST CHINOOK STOCKS

Oregon coast chinook stocks include all fall and spring stocks from Oregon streams south of the Columbia River. These stocks are categorized into two major subgroups based on ocean migration patterns. Although their ocean harvest distributions somewhat overlap, they have been labeled as either north or south/local migrating. North migrating chinook stocks include stocks north of and including the Elk River, with the exception of Umpqua River spring chinook. South/local migrating chinook stocks include Rogue River spring and fall chinook, Umpqua River spring chinook, and fall chinook from smaller rivers south of the Elk River.

Management Objectives

The conservation objective for Oregon coast salmon is an aggregate of 150,000 to 200,000 natural adult spawners as indicated by peak spawner counts of 60 to 90 fish per mile in standard index surveys. Preseason abundance estimates are not developed for this stock, and it has not been of critical management concern. Constraints for Oregon coastal natural (OCN) coho and Klamath River fall chinook management objectives generally result in reduced ocean fishery impacts on Oregon South Coast chinook stocks. Humbug Mountain to Cape Falcon chinook fisheries have a minor impact on most of the stocks originating from the north Oregon coast which have a northerly marine distribution pattern.

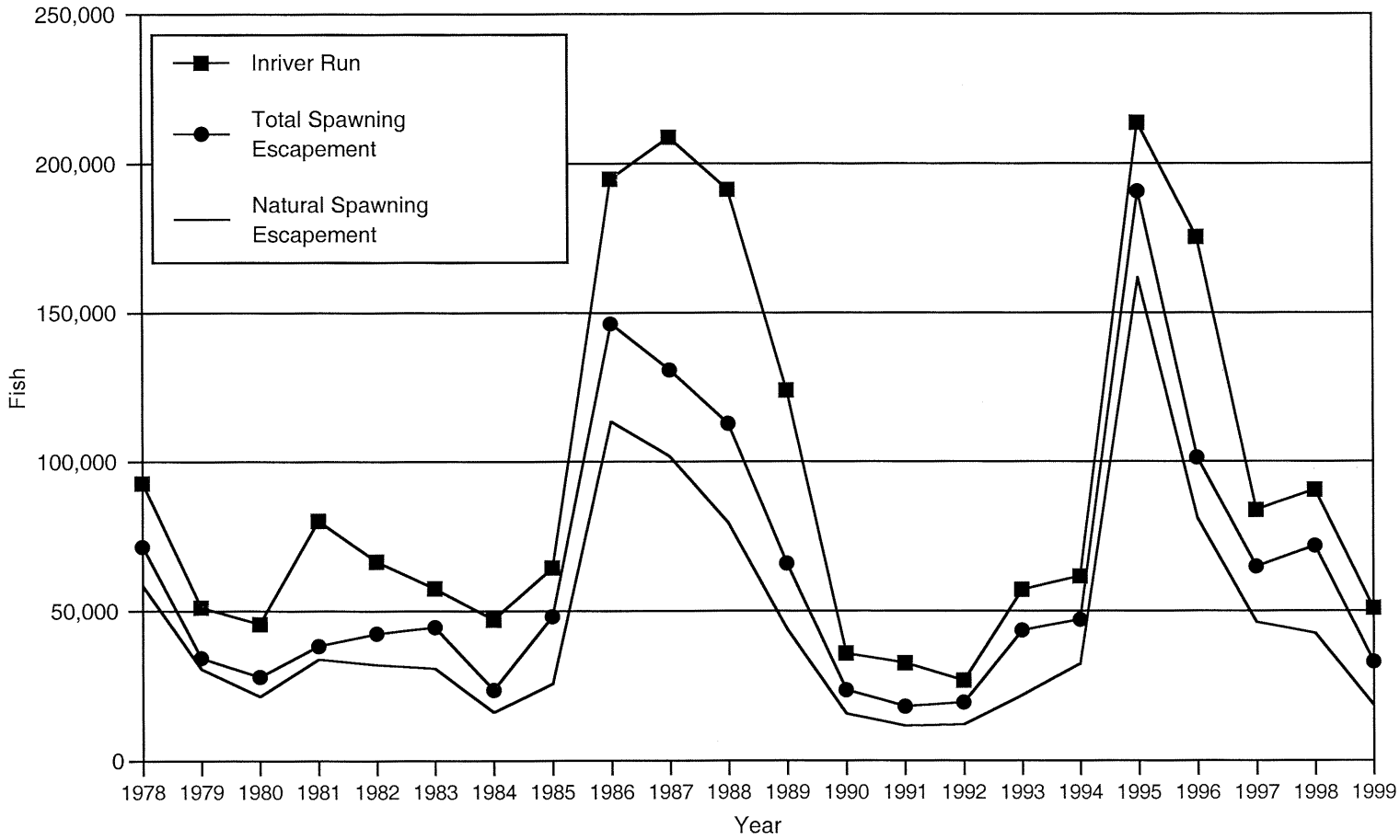

FIGURE II-2. Klamath River fall chinook salmon inriver run and spawning escapements, 1978-1999.

Regulations to Achieve Objectives

The areas of primary management concern for ocean fisheries impacting Oregon coast chinook vary between the north and south/local migrating stocks, although there is some overlap. Based on CWT analysis, the populations from ten major north Oregon coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in PSC ocean fisheries off British Columbia and southeast Alaska, and to a much lesser degree in Council area fisheries off Washington and Oregon, primarily in terminal area fisheries. Analysis of CWTs indicates the population from five major mid-Oregon coast (MOC) systems from the Coos through the Elk Rivers are harvested primarily in ocean fisheries off British Columbia, Washington, and Oregon, with minor contributions to California fisheries. South/local stocks are important contributors to ocean fisheries off Oregon and northern California. Another central Oregon stock, Umpqua River spring chinook, contributes primarily to ocean fisheries off Oregon and California, and to a lesser degree off Washington, British Columbia, and southeastern Alaska.

There are no preseason abundance estimates available for Oregon coast chinook. However, based on postseason abundance indicators, impacts from Council fisheries on this stock have not been critical at the harvest levels of recent years. Under the 1999 regulations, the STT expected the aggregate conservation objective for this stock to be met with the restraints required for Klamath River fall chinook and OCN coho.

Inside Harvest

Inside recreational harvest of fall and spring chinook occurs in most Oregon coastal estuaries and rivers. Complete estimates of the 1999 recreational chinook harvest are not available at this time. Historical estimates of the recreational harvest of fall and spring chinook, derived from Oregon Department of Fish and Wildlife (ODFW) salmon and steelhead angler tag returns, are reported in Table II-3.

Escapement and Goal Assessment

Actual escapement is not estimated for this stock aggregate. Achievement of an aggregate 150,000 to 200,000 naturally spawning adults is assessed through indices (e.g., stream surveys, dam counts, etc.). The escapement goal is equivalent to peak spawner index counts of 60 to 90 adults per mile for both subgroups, and includes both spring and fall chinook.

North Migrating Chinook

An index of adult spawners (peak count per index mile) in nine standard streams is used to measure natural spawner escapement trends for north migrating fall chinook. Data have been collected since about 1950 for most systems. Overall peak chinook adult index spawner counts in 1999 are preliminarily estimated at 124 adults per mile, exceeding the goal range of 60 to 90 adults per mile (Table II-4, Figure II-3).

South/Local Migrating Chinook

Standard fall chinook spawning index escapement data for the smaller southern Oregon coastal rivers (south of the Elk River) are available for the Winchuck, Chetco, and Pistol Rivers (Appendix B, Table B-8). Rogue River carcass counts are used as a trend indicator of escapement for naturally produced fall chinook (Table II-4). In addition, two trend indicators of escapement for naturally produced spring chinook are utilized, (1) Rogue River counts at Gold Ray Dam, and (2) Umpqua River counts at Winchester Dam (Table II-4). Escapement based on these indicators peaked during the 1986 through 1988 period following several years of reduced abundance (Figures II-3 and II-4). Ocean and spawner escapement returned to low levels from 1989 through 1999.

The aggregate Oregon coast goal of 150,000 to 200,000 naturally spawning chinook adults was probably met in 1999.

Preliminary estimates of total fall and spring chinook returns to Oregon coastal hatcheries in 1999 are 3,100 and 18,100 adults, respectively (Table II-3). Hatchery egg-take goals are expected to be met at all stations.

TABLE II-3. **Oregon coastal spring and fall chinook** hatchery return and harvest in estuary and freshwater fisheries. (Page 1 of 1)

	Return to Facilities				
	Public Hatchery[a/]		Private	Estuary and Freshwater Harvest[b/]	
Year	Spring	Fall	All	Spring	Fall
			THOUSANDS OF CHINOOK		
1976	2.9	0.5	-	13.5	24.3
1977	2.4	4.2	-	13.8	35.6
1978	4.4	1.6	-	13.1	43.4
1979	7.0	2.0	0.4	16.4	31.2
1980	7.9	1.8	3.4	11.9	22.7
1981	2.5	1.8	5.1	11.2	30.0
1982	4.1	2.3	12.1	11.6	25.1
1983	3.9	4.0	6.1	4.9	21.5
1984	5.6	3.3	6.3	4.1	29.0
1985	8.7	3.5	34.6	9.0	29.5
1986	30.6	5.8	70.8	17.3	36.5
1987	22.8	7.1	38.7	20.2	54.8
1988	22.0	6.4	25.0	28.9	61.7
1989	32.7	4.3	14.7	23.7	53.7
1990	6.3	3.4	7.8	15.5	39.8
1991	5.4	3.1	4.1	11.1	47.7
1992	2.7	4.4	-	8.0	44.5
1993	10.6	2.8	-	16.4	54.8
1994	4.8	3.0	-	9.2	46.7
1995	55.0	3.3	-	31.1	62.0
1996	26.7	3.6	-	25.6	65.9
1997	29.1	2.0	-	14.7	43.0
1998	11.0	2.6	-	NA	NA
1999[c/]	18.1	3.1	-	NA	NA

a/ Adults only.

b/ Freshwater harvests are derived from ODFW salmon/steelhead angler tag information and represent fish larger than 24 inches (i.e., adults). Includes both hatchery and natural fish.

c/ Preliminary.

TABLE II-4. Spawner Indices for naturally produced Oregon coastal fall chinook and south migrating/localized spring chinook.[a/] (Page 1 of 2)

Year	Fall Chinook Spawner Indices		South/local Migrating Spring Chinook Spawner Indices	
	North Migrating Peak Count Adults Per Mile	Rogue River (south/local migrating) Adult Carcass Counts (thousands)	Rogue River Gold Ray Dam Counts (thousands)	Umpqua River Winchester Dam Counts (thousands)
1941	-	-	41.8	-
1942	-	-	36.1	-
1943	-	-	30.6	-
1945	-	-	32.0	-
1946	-	-	28.4	2.5
1947	-	-	22.6	3.8
1948	-	-	27.0	2.5
1949	-	-	18.8	2.6
1950	-	-	15.5	2.3
1951	-	-	19.4	3.6
1952	-	-	15.9	5.2
1953	-	-	31.5	3.9
1954	-	-	24.7	1.5
1955	-	-	15.7	6.6
1956	-	-	28.1	8.0
1957	-	-	17.7	4.0
1958	-	-	15.0	3.6
1959	-	-	14.0	3.1
1960	-	-	24.4	3.4
1961	51	-	31.8	4.4
1962	42	-	31.4	3.3
1963	56	-	40.6	8.7
1964	63	-	37.3	6.6
1965	59	-	47.6	9.0
1966	62	-	31.4	6.7
1967	50	-	14.7	6.5
1968	33	-	19.5	6.2
1969	37	-	59.0	10.7
1970	80	-	45.1	6.1
1971	43	-	28.3	6.0
1972	41	-	30.0	7.9
1973	52	-	34.7	11.4
1974	59	-	16.5	5.8
1975	55	-	20.4	5.4
1976	49	-	20.4	5.5
1977	71	1.1	14.9	6.8
1978	73	9.2	40.2	5.4
1979	81	8.0	29.3	5.5
1980	89	2.2	24.2	5.7
1981	82	4.4	12.8	4.6
1982	90	2.8	23.2	6.5
1983	42	1.6	9.8	3.0
1984	98	2.0	8.4	4.5
1985	132	5.5	27.8	7.5
1986	109	16.9	40.4	8.3
1987	121	29.1	37.4	8.3
1988	214	20.7	38.8	7.8
1989	137	7.4	7.9	7.6
1990	121	1.9	18.0	5.5
1991	150	2.8	9.3	2.4
1992	138	2.3	2.2	2.5
1993	63	5.4	12.6	3.8
1994	125	7.4	3.6	2.8
1995	101	4.0	20.7	6.2

TABLE II-4. Spawner Indices for naturally produced Oregon coastal fall chinook and south migrating/localized spring chinook.[a/] (Page 2 of 2)

Year	Fall Chinook Spawner Indices		South/local Migrating Spring Chinook Spawner Indices	
	North Migrating Peak Count Adults Per Mile	Rogue River (south/local migrating) Adult Carcass Counts (thousands)	Rogue River Gold Ray Dam Counts (thousands)	Umpqua River Winchester Dam Counts (thousands)
1996	147	1.7	10.3	4.3
1997	105	1.6	9.6	3.3
1998	98	2.6	3.7	4.0
1999[b/]	124	2.5	6.0	2.8

a/ North migrating peak counts are taken on nine miles of standard index surveys over nine river systems (see Appendix B, Table B-11 for individual system counts). Complete carcass counts are listed in Appendix B, Table B-10. Complete counts for Gold Ray and Winchester dams are listed in Appendix B, Table B-9.

b/ Preliminary.

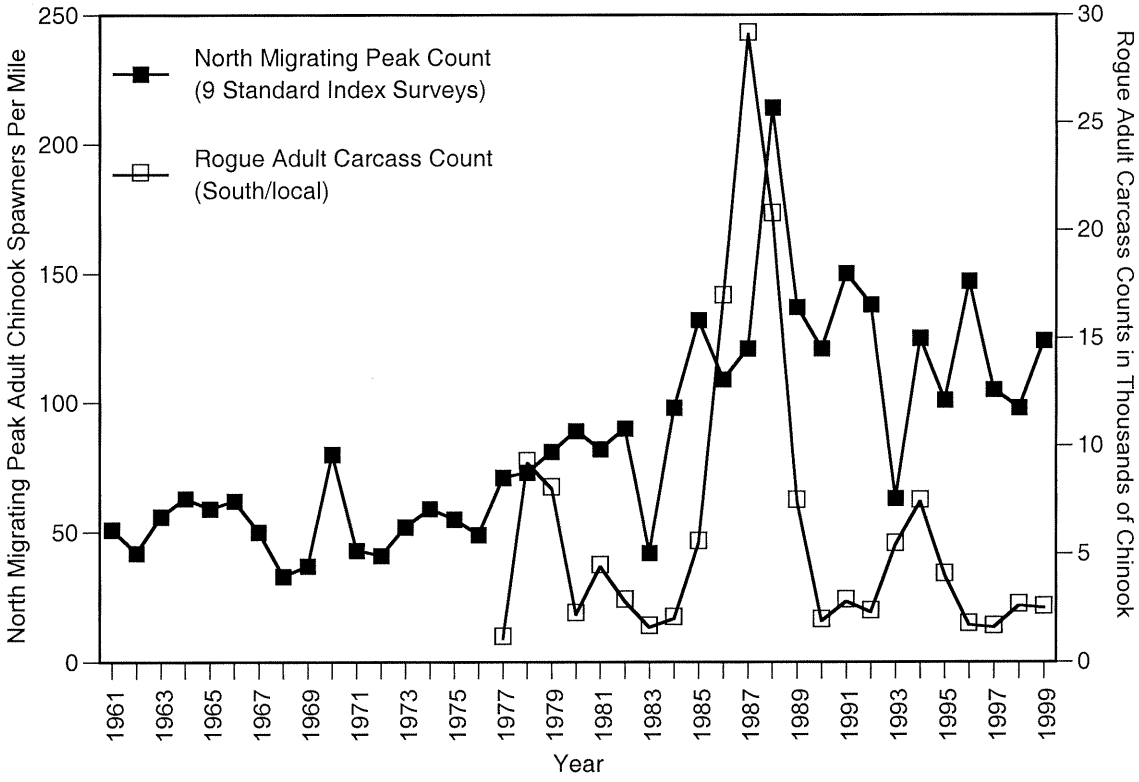

FIGURE II-3. Spawner indices for naturally produced Oregon Coastal fall chinook. (See Appendix B, Tables B-10 and B-11 for detailed counts.

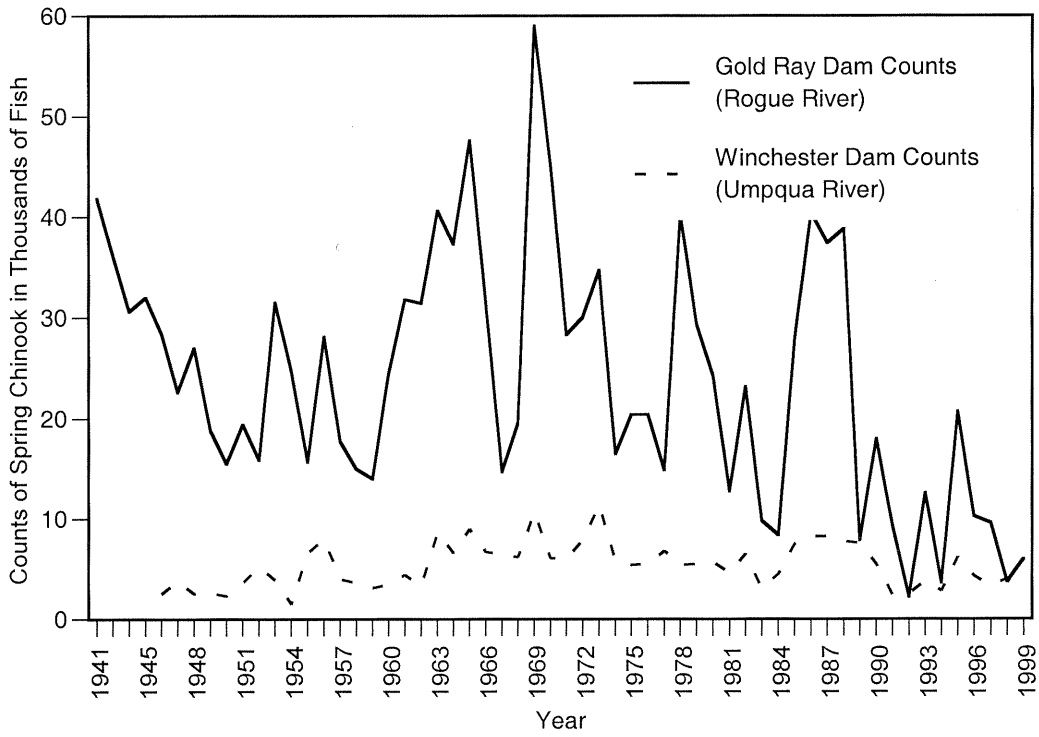

FIGURE II-4. Escapement indices for naturally produced Oregon coastal south/local migrating spring chinook, 1941-1999 (See Appendix B, TABLE B-9 for counts of hatchery produced chinook).

COLUMBIA RIVER BASIN CHINOOK STOCKS

Columbia River Basin chinook salmon stocks include all fall, summer, and spring stocks of the Columbia River and its tributaries. NMFS has listed five ESUs within the Columbia Basin under the ESA, (1) Snake River fall listed as threatened April 1992; (2) Snake River spring/summer listed as threatened April 1992; (3) Upper Columbia River spring listed as endangered March 1999; (4) lower Columbia River listed as threatened March 1999; and (5) Upper Willamette River spring listed as threatened March 1999.

The assessment below covers five major stock groups of Columbia River Basin fall chinook: lower river hatchery tule stock (LRH), lower river wild bright stock (LRW), Spring Creek Hatchery tule stock (SCH), upriver bright stock (URB), and mid-Columbia bright stock (MCB). Management details for Columbia River summer and spring chinook stocks are not discussed since Council-managed ocean salmon fisheries have very limited impacts on summer stocks (less than a 2% exploitation rate in base-period fisheries), and impacts on spring stocks are rare. Appendix Tables B-12 through B-19 contain historical harvest and escapement data for fall, summer, and spring stocks. Additional information on these stocks can be found in *Status Report - Columbia River Fish Runs and Fisheries* published annually by the joint staffs of ODFW and the Washington Department of Fish and Wildlife (WDFW).

Management Objectives

Council-area fisheries north of Cape Falcon in 1999 were constrained to minimize the catch of threatened LRW. Other considerations factored into the Council's management for Columbia River fall stocks are escapements of other wild and hatchery fall chinook and maintaining the Snake River Fall Index (SRFI) at or below 0.70 for all ocean fisheries (i.e., no less than a 30% reduction from the 1988 through 1993 base period exploitation rate for all ocean fisheries combined). Due to restrictions in other fisheries (especially in Canada), neither the SRFI nor the escapements for stocks other than the LRW stock constrained Council fisheries in 1999.

Regulations to Achieve Objectives

Ocean salmon fishery regulations to minimize recreational and commercial impacts on the threatened LRW chinook include trading allowable commercial chinook impacts to the recreational fishery for coho impacts and restricting the majority of the commercial troll season to the May/June time frame.

Inside Harvest

Management of Columbia River fall chinook in recent years has been done through the Columbia River Fish Management Plan (CRFMP) and annual management agreements among the *U.S. versus Oregon* parties. The CRFMP expired on December 31, 1998. However, the parties to *U.S. versus Oregon* reached an agreement on management of upper Columbia River fall chinook , steelhead, and coho for the period of August 1 through December 31, 1999. The fall fisheries were to be managed for a 30% reduction in the harvest rate of Snake River wild fall chinook relative to the 1988 through 1993 based period, as represented by a 31.29% harvest rate index of the aggregate URB.

Harvestable surplus was projected for most stocks with the exception of the LRW which was projected to be under-escaped. Total catch of chinook in all non-Indian commercial fisheries was 8,000 fish including 2,100 fish in select area (extreme terminal) fisheries. Total fall chinook recreational catch inside the Columbia River was 23,800 fish, including 10,000 fish in the Buoy 10 fishery and 5,100 fish in the Hanford reach.

The total catch of chinook in 1999 treaty Indian fisheries was 76,500 fish. As in recent years, low prices offered by licensed fish buyers resulted in about half of the catch being sold directly to the public or retained for personal consumption.

All Columbia River mainstem fisheries in 1999 were managed to stay within the 30% harvest rate reduction guidelines for threatened Snake River wild fall chinook. Non-Indian fisheries were also managed to provide

protection to the projected poor return of LRW chinook. The goal of a 30% harvest rate reduction (a 31.29% exploitation rate) on Snake River wild fall chinook was achieved, with a preliminary estimate of 29%. The 1988 through 1993 base-period average harvest rate was 44.7%.

Escapement and Management Performance

Preliminary estimates of adult ocean escapement for the five fall stocks, based upon preliminary CWT readings, catch estimates, dam counts, hatchery returns, and estimates of natural spawners are 41,100 LRH, 3,900 LRW, 51,700 SCH, 165,800 URB, and 49,100 MCB. The ocean escapement of LRW stock in 1999 was the lowest on record and due, in part, to flooding in 1995 and 1996. Total ocean escapement of the five stocks was 311,600 fish compared to the forecast of 231,400 fish. The largest differences were for URB and MCB (102,100 URB adults forecast, 165,800 actual return and 26,700 MCB adults forecast, 48,200 actual return).

Table II-5 at the end of the chapter summarizes the escapement objectives and performance of Columbia River fall chinook stocks. All fall chinook met their FMP targets except LRW. The MCB stock fell short of its CRMP hatchery goal, but surplus URB stock was available to meet program production goals in 1999. Appendix B, tables B-12 through B-19 contain more detailed historical escapement data for Columbia River fall, summer, and spring stocks.

No specific escapement goal has been established for threatened Snake River wild fall chinook. Because nearly all spawning of this stock occurs upstream from Lower Granite Dam, establishing a spawning escapement goal at Lower Granite Dam would be appropriate. In their *Proposed Recovery Plan for Snake River Salmon*, NMFS has proposed a delisting goal for Snake River fall chinook that provides for an eight-year (approximately two generation) geometric mean of at least 2,500 natural spawners in the mainstem Snake River annually. The total adult fall chinook count at Lower Granite Dam in 1999 was 3,400 compared to 1,900 fish in 1998. The estimate of wild escapement over Lower Granite Dam in 1999 is currently not available. Historical estimates of the number of adult wild Snake River fall chinook counted at Lower Granite Dam are provided in Appendix B, Table B-18.

WASHINGTON COASTAL CHINOOK STOCKS

Washington coastal chinook stocks include all fall, summer, and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of the Elwha River). This stock complex consists of several natural stocks, generally of small to medium-sized populations, and some hatchery production (Willapa Bay and Quinault River). The primary stocks pertinent to ocean salmon fishery management are Willapa Bay (natural and hatchery), Grays Harbor, Quinault, Queets, Hoh, Quillayute, and Hoko.

Management Objectives

Spawning escapement goals for stocks managed within this complex, established in U.S. District Court by WDFW and the treaty tribes, are recognized in the Council's FMP conservation objectives. Objectives for Grays Harbor and the North Coast river systems have been established pursuant to the U.S. District Court order in *Hoh versus Baldrige*. However, annual natural spawning escapement targets may vary from the conservation objectives below if agreed to by WDFW and the treaty tribes under the provisions of *Hoh versus Baldrige* and subsequent U.S. District Court orders. After agreement is reached on the annual targets, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for treaty allocation and inside non-Indian fishery needs.

Regulations to Achieve Objectives

Stocks in this complex tend to range further north than most Columbia River stocks and, while present in fisheries from Cape Falcon to southeast Alaska, tend to have limited impacts in Council-area ocean fisheries. Preseason abundance estimates are generally not available for Council management, and these stocks qualify as **exceptions** to the Council's overfishing criteria in Amendment 14 due to generally low

fishery impacts. However, the recreational fishery in the Westport area (Area 2) was closed inside 3 miles of shore beginning August 22 to protect Grays Harbor chinook. This stock was not expected to be at a harvestable level and may be concentrated off Grays Harbor in late August and September.

Willapa Bay Chinook

Inside Harvest

Run size, harvest, and escapement data for Willapa Bay fall chinook are presented in Appendix B, Table B-22.

The chinook nontreaty gillnet fishery in July and the first half of August has not occurred since 1993. This fishery generally harvests Columbia river tule stocks in a mix similar to adjacent ocean area catches.

An initial forecast of 14,874 fall chinook did not provide for any chinook directed gillnet days. Due to the extreme low run size forecast, the in-season update fishery was not performed. Chinook harvest in non-targeted gillnet fisheries in 1999 totaled 265 fish. This is the lowest chinook catch in recent history.

Recreational harvest estimates are not yet available for 1999. Recreational fisheries were directed at hatchery coho and chinook. The freshwater recreational fishery closed to the taking of adult chinook at 12:01 a.m., September 30. Release of wild (unmarked) coho and single point barbless hooks were required throughout the season.

Escapement and Management Performance

Willapa Bay chinook are managed for hatchery stocks, which are the predominant component of the run. Chinook returns to hatcheries of 4,895 fish were insufficient to meet hatchery production goals which are based on an escapement of about 8,200 fish.

The escapement goal for naturally spawning chinook in Willapa Bay is 4,350 adults. An estimate of the 1999 natural spawning escapement is not yet available.

Grays Harbor Chinook

Inside Harvest

Run size, harvest, and escapement data for Grays Harbor chinook are presented in Appendix B, Table B-24.

The 1999 terminal run forecast for spring chinook was 2,560 adult fish and exceeded the escapement goal of 1,400 natural adults. Net fisheries were scheduled by the Quinault Indian Nation and the Chehalis Tribe which harvested 3 and 178 spring chinook respectively. A recreational season was conducted on the Chehalis River, but catch estimates are not yet available.

No summer non-indian gillnet fishery was directed at non-local chinook stocks in 1999.

The 1999 Grays Harbor fall chinook forecast was 11,977 wild and 3,232 hatchery adults. The escapement goal for wild chinook is 14,600. Wild Chehalis chinook were the primary constraint in all fisheries in 1999 with a forecast approximately 75% of the spawning goal. Total fall chinook taken in net fisheries in 1999 was 1,900 treaty and 100 nontreaty. The Chehalis Tribe harvested 1 fall chinook.

Recreational catch estimates are not yet available.

Escapement and Management Performance

Chehalis River spring chinook are of natural origin and managed for an escapement goal of 1,400 adults. A final escapement estimate for 1999 is not yet available.

Grays Harbor fall chinook are managed for a natural spawning escapement goat of 14,600 adults. Final escapement estimates are not yet available. There is no management goal for Grays Harbor fall chinook hatchery production.

Quinault River Chinook

Inside Harvest

Historical terminal gillnet harvest data for Quinault River chinook stocks are presented in Appendix B, Table B-26.

A run of naturally spawning spring/summer chinook enters the river from April through July, followed by hatchery and natural fall chinook. The spring/summer chinook run is typically small. The treaty Indian gillnet catch of spring/summer chinook was 10 fish. These fish were taken incidentally during fisheries directed at sockeye and steelhead.

The 1999 harvest of Quinault River fall chinook was taken while the treaty Indian fishery targeted hatchery salmon production during August through mid-November. The treaty Indian net catch totaled 4,839 chinook.

Escapement and Management Performance

Natural escapement estimates are not yet available for 1999. Hatchery production egg take for fall chinook was slightly below the goal.

Queets River Chinook

Inside Harvest

Historical terminal run size, catch and escapement data for Queets River spring/summer and fall chinook are presented in Appendix B, Tables B-28 and B-29, respectively.

The treaty Indian gillnet fishery harvest of spring/summer fish was limited to a small-scale collection fishery and harvested 12 fish. This fishery utilized small mesh gear to increase the catch of summer steelhead while collecting the available spring/summer chinook inseason update information and age data. The nontreaty inriver recreational fishery was closed.

Fall chinook were harvested in conjunction with fall coho, beginning September 1, utilizing a fishing pattern set forth in a preseason management agreement between the Quinault Nation and the WDFW. The inriver natural run was estimated inseason to be 4,000 fish. Preliminary escapement data indicates the inseason estimate was high. The treaty Indian gillnet fishery harvested 939 fall chinook, and the inriver recreational fishery harvested 232 fish of this stock. The management agreement was intended to minimize impacts on wild coho in response to the run size anticipated under the preseason forecasts and the Council's adopted regulations.

Escapement and Management Performance

Preliminary data indicate the 1999 spawning escapement for the Queets River spring/summer chinook stock was below the escapement floor level of 700 fish.

Spawning escapement for Queets River natural fall chinook is estimated at 2,923 adults, exceeding the minimum goal of 2,500 adult spawners established for this stock. Hatchery escapement is estimated at 288 fish.

Hoh River Chinook

Inside Harvest

Historic terminal run size, catch, and escapement data for Hoh River spring/summer and fall chinook are presented in Appendix B, Tables B-31 and B-32, respectively.

The tribal spring/summer chinook fishery on the Hoh River targeted spring/summer chinook, based on a preseason forecast of 930 fish, at a rate initially set at 6.7% of the run for the tribal fishery. The nontreaty recreational fishery was initially closed to retention of spring/summer chinook with an expected mortality of 14 chinook during the fishery on summer steelhead. The resulting escapement was expected to be just below the floor of 900 fish. The tribal fishery was initially scheduled for 10, one-day per-week commercial openings from week #19 to #35 with an additional provision for 15 wild fish to be taken outside of this schedule. Data from tribal fishing through the week of July 5 suggested the run size was larger than preseason expectations. During the week of July 9 the state and tribe agreed to a change of the respective fisheries, adding two commercial days and five additional ceremonial and subsistence chinook to the tribal schedule, and opening the nontreaty recreational fishery to five days per week, one adult per day. This was expected to allow for a spawning escapement meeting the floor of 900. The tribal fishery caught 175 chinook, 107 of which were wild.

The tribal fall fishery on Hoh River fall chinook was based on a preseason forcast expected to fall between 2,700 and 3,600. Escapement was anticipated to be above the floor of 1,200 fish. Harvest rates can vary substantially depending upon coho management, river flows, and run entry timing. The tribal netting schedule and nontreaty recreational fisheries were conducted as described earlier for coho. The tribal gillnet fishery caught 621 chinook, confirming a lower than expected harvest and run size, with approximately 610 of the catch being wild origin and the remainder hatchery dip-ins.

Escapement and Management Performance

Preliminary spawning ground survey data suggest that escapement of spring/summer chinook was slightly above 1,000, indicating the run size was slightly larger than the preseason expectations.

The preliminary escapement estimates of fall chinook is 2,000 adults, above the escapement floor. Data are inconclusive at this point with good escapement levels observed in larger tributary areas and lower than normal numbers reported in mainstem areas where high flows occurred prior to peak spawn timing.

Quillayute River Chinook

Inside Harvest

Historical terminal run size, catch, and escapement data for Quillayute River spring, summer, and fall chinook are presented in Appendix B, Tables B-34 and B-35, respectively. Spring and summer chinook are managed separately. However, spring and summer data are combined in Table B-34, because separate data for each stock are only available back to 1988.

The recreational and tribal fisheries for spring, summer, and fall chinook were established by preseason agreement between WDFW and the Quileute Tribe. The preseason terminal run size prediction for spring chinook was 698 adults. The Treaty Indian gillnet spring chinook catch was 313 fish, taken during the early May to late June fishery. The recreational catch estimate is not available.

The preseason summer chinook run size estimate was 1,289 adults. Total gillnet catch for the season was 55 fish, taken from early May through August. Recreational fishing effort on this stock is low during the summer period, due to low streamflows and small run size. The recreational spring/summer chinook fishery opened March 1 and continued through the summer season. The recreational catch estimate is not available.

The preseason fall chinook run size estimate was 6,600 adults. Total catch for the treaty gillnet fishery was 1,094 fish. A catch estimate for the recreational fishery is not available.

Escapement and goal assessment

The spring/summer management agreement called for an escapement goal of 200 hatchery spring chinook. The actual rack return was 250 adults, meeting the egg take requirements.

The summer chinook run is managed to achieve a 1,200 adult and jack escapement. The preliminary escapement of 1,561 meets the goal. Broodstock taken from the river for an enhancement program by the Quileute Tribe are counted as part of the natural escapement estimate.

Terminal area fisheries on fall chinook are managed for a target 40% harvest rate, with a minimum escapement of 3,000 adults. The preliminary estimate of fall chinook escapement is 3,924.

PUGET SOUND CHINOOK STOCKS

Puget Sound chinook stocks include all fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). This stock complex consists of numerous natural chinook stocks of small to medium sized populations and significant hatchery production. The primary stocks of significance to ocean salmon fishery management are eastern Strait of Juan de Fuca, Skokomish, Nooksack, Skagit, Stillaguamish, and Snohomish. The Puget Sound ESU, which encompasses all of these stocks, was listed as threatened in March, 1999.

Management Objectives

The stocks within this complex and their respective conservation objectives were established in U.S. District Court by WDFW and the Treaty tribes. The conservation objectives for stocks managed primarily for natural production were developed by a State/Tribal Management Plan Development Team following the Boldt Decision and were based on "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The objectives were estimated for the average spawning escapements during periods that were thought to represent spawner abundances that provided maximum production. The objectives for stocks managed for artificial production are based on hatchery escapement needs. Annual management targets (expected hatchery plus natural escapement) for specific rivers or regions of origin may vary from the conservation objectives by following fixed procedures established in U.S. District Court as outlined in "Memorandum Adopting Salmon Management Plan" (*U.S. versus Washington*, 626 F. Supp. 1405 [1985]).

Regulations to Achieve Objectives

Puget Sound stocks contribute to fisheries off British Columbia and are present into southeast Alaska, but are impacted to a minor degree by Council-area ocean fisheries. Base period, Council-area ocean fishery exploitation rates (adult equivalent) of 2% or less are below a management threshold which allows effective Council management of these stocks, and they qualify as **exceptions** to the Council's overfishing criteria under Amendment 14. Conservation concerns for threatened Puget Sound chinook in the northern areas near the Strait of Juan de Fuca led managers to close the area within 17 miles of the Strait of Juan de Fuca to the commercial, nontreaty troll fishery. The recreational fisheries in Areas 4 and 4B were not allowed to retain chinook in order to reduce impacts on these stocks.

Inside Harvest

Commercial inside fishery harvest of Puget Sound chinook is managed on the basis of six regional stock management units: Strait of Juan de Fuca, Nooksack-Samish, Skagit, Stillaguamish-Snohomish, South Puget Sound, and Hood Canal. Harvest of chinook for each management unit is regulated according to the natural spawning escapement goal or hatchery program escapement goal for that unit. Commercial net and troll harvest (treaty Indian and non-Indian) is presented in Appendix B, Table B-37. These catches include

some fish of non-Puget Sound origin. The total commercial chinook harvest in Puget Sound in 1999 was 87,700 fish, compared to 56,000 chinook caught in 1998. The non-Indian net catch was 9,500 chinook, compared to 12,400 chinook caught in 1998. The treaty Indian net and troll harvest was 78,200 chinook, compared to 43,600 chinook caught in 1998.

Historic chinook recreational catches in the Puget Sound recreational fishery for years from 1971 through 1998 are presented in Appendix B, Table B-38. Catch estimates for the 1999 Puget Sound recreational fishery are not yet available.

Escapement and Management Performance

Historic hatchery and natural run component escapements and net catches for summer/fall chinook for each Puget Sound region of origin are presented in Appendix B, Table B-39. Historic spring chinook escapement data are presented in Appendix B, Table B-42.

Puget Sound spring chinook hatchery escapements were close to the preseason predictions while preliminary data suggest that most Puget Sound hatcheries met their summer/fall chinook goals with the exception of Elwha.

Puget Sound summer/fall chinook remained depressed in 1999. Estimates of 1999 natural spawning escapements for summer/fall chinook stocks are unavailable at this time. Preliminary data suggest the Puget Sound spring chinook natural stocks did not meet their escapement goals.

COASTWIDE GOAL ASSESSMENT SUMMARY

A summary of 1999 performance for chinook salmon stocks in relation to Council conservation objectives (Amendment 14) is presented in Table II-5.

TABLE II-5. Performance of chinook salmon stocks in relation to 1999 conservation objectives (preliminary data). (Page 1 of 1)

System and Stock	1999 FMP Conservation Objective	Achievement
Sacramento River Chinook		
Fall	122,000-180,000 natural and hatchery adults.	273,300 hatchery and natural adult escapement, 52% above upper end of target range.
Winter (Endangered)	No less than a 31% increase in the adult 3-year replacement rate above the mean rate observed for the 1989-1993 brood years (i.e., a 1.77 cohort replacement rate).	1.45 adult replacement rate (based on dam count), 82% of target.
Spring (Threatened)	Not yet defined. Impacts limited by restraints for winter chinook.	-
California North Coast Chinook		
Klamath River Fall	Inriver run size target of 67,400 adults to provide an expected escapement of 35,000 natural adult spawners, the floor level.	50,905 adult inriver run size, 76% of target. 18,600 natural adult spawners, 53% of floor.
California Coastal (Threatened)	None defined. Impacts limited by restraints for Klamath River fall chinook.	-
Oregon Coast Chinook		
North and South/Local Migrating Stocks	150,000-200,000 natural adult spawners (equivalent to peak spawner index counts of 60-90 adults per mile).	107 natural adult spawners per mile, 19% above upper end of aggregate stock index range.
Columbia River Basin Fall Chinook		
LRW (Threatened North Lewis River Fall)	MSY objective of 5,700 natural North Lewis River adult spawners (jeopardy standard not defined); chinook FRAM projected 3% exploitation rate for 1999.	3,700 natural adult spawners, 65% of MSY target.
LRH	15,400 adult hatchery spawners	20,200 adult hatchery spawners, 131% of target.
SCH	7,000 adult hatchery spawners	14,600 adult hatchery spawners, 209% of target.
MCB	No FMP objective; CRMP target of 9,100 hatchery adults	6,300 adult hatchery spawners, 69% of CRMP target.
URB	40,000 natural and hatchery adults above McNary Dam, plus meet treaty Indian obligations. U.S. v. Oregon parties agreed to a 1999 target of 46,000 adults.	78,400 natural and hatchery adults over McNary Dam, 196% of FMP target.
Snake River Fall Chinook (Threatened)	SRFI $\leq$0.70 for all ocean fisheries combined (i.e., no less than a 30% reduction from the 1988-1993 base period exploitation rate).	Preseason SRFI projection of 0.65. No postseason estimate can be made.
Washington Coastal Chinook		
Fall	Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations.	Escapement estimates: Grays Harbor natural stock not yet available; objectives met for Queets, Hoh, and Quillayute Rivers; hatchery egg-take goals not achieved for Willapa Bay. Data necessary for allocation determinations are not available.
Spring/Summer	Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations.	Escapement estimates: Grays Harbor and Queets not yet available; objectives met for Hoh and Quillayute Rivers. Data necessary for allocation determinations not yet available.
Puget Sound Chinook (Threatened)	NMFS jeopardy standard not yet developed. Minor part of Washington ocean harvest and the Council's ocean management not directed toward these stocks.	Natural chinook stock escapement estimates not available. For details see Chapter II text.

CHAPTER III
COHO SALMON MANAGEMENT

OREGON PRODUCTION INDEX AREA COHO STOCKS

Oregon production index (OPI) area coho stocks include all Washington, Oregon, and California natural and hatchery stocks from streams south of Leadbetter Point, Washington. The largest naturally produced component of the OPI coho stock is Oregon coastal natural (OCN) coho, managed as a stock aggregate with four identified components that include coho produced from Oregon river and lake systems south of the Columbia River. National Marine Fisheries Service (NMFS) has identified three evolutionarily significant units (ESU) within the naturally produced OPI area coho stocks which are listed as threatened: central California coast (CCC) coho listed October 1996, southern Oregon/northern California (SONC) coho listed May 1997, and Oregon coast (OC) coho listed August 1998. The latter two ESUs encompass all the components of OCN coho.

Management Objectives

In establishing ocean salmon fisheries which impact OPI area coho stocks, the Council was guided by the reasonable and prudent alternatives of the 1999 NMFS Supplemental Biological Opinion and Incidental Take Statement for CCC, SONC, and OC coho which required:

1. No directed coho fisheries or retention of coho in all commercial and recreational fisheries off California to protect threatened CCC coho.

2. Marine fishery impacts on threatened CCC and SONC coho must be no more than 13% as indicated by projected impacts on Rogue/Klamath (RK) hatchery coho.

3. Marine and freshwater fishery impacts on OCN coho should not exceed 15%.

Regulations to Achieve Objectives

The OPI area coho stocks contribute primarily to ocean fisheries off Oregon and northern California, and to a lesser degree to ocean fisheries off Washington and British Columbia. With regard to coho, the 1999 ocean salmon fisheries within the OPI area were severely limited to meet the NMFS jeopardy standards for ESA listed species as outlined above. The Council prohibited retention of coho in all fisheries off California and adopted seasons which the Salmon Technical Team (STT) projected would result in exploitation rates of 4.9% for RK coho in marine fisheries and an overall 8.7% for OCN coho in marine and freshwater fisheries combined. Under the adopted fisheries, the OCN spawner escapement index was projected to be 52,800 adults by stratified random sampling (SRS) accounting, better than double the average of the previous two years.

Commercial Troll

Commercial troll fisheries in the OPI area were closed to the retention of coho (in effect since 1993). Additionally, chinook fishery closures (primarily in July) and gear restrictions (4-spread requirement) were used to reduce OCN impacts.

Recreational

Retention of coho has been extremely limited in the recreational fisheries since 1993. All coho directed fisheries in the OPI area were selective for marked hatchery coho (in effect since 1998). Additionally, gear restrictions and closed periods were used during some chinook directed fisheries to reduce coho impacts.

Inside Harvest

Inside harvest estimates of coho are not available for any river system in California.

The inside recreational harvest of coho in 1999 in Oregon coastal streams, as in recent years, was very restricted and limited to areas where surplus hatchery coho returns were expected. Selective fisheries for adipose fin-clipped hatchery coho occurred in nine freshwater areas. Estimates of the 1999 inriver recreational coho harvest are not available at this time. Historical estimates of the recreational harvest of adult coho in Oregon coastal estuaries and rivers, derived from Oregon Department of Fish and Wildlife (ODFW) salmon and steelhead angler tag returns, are reported in Table III-1.

Inside commercial coho harvest in recent years has been limited to returns to private aquaculture operations. All private Oregon facilities have ceased operations; thus, there were no returns in 1999 (Table III-1).

Coho harvest statistics for Columbia River commercial and recreational fisheries are presented in Appendix B, Table B-20. The 1999 Columbia River non-Indian commercial gillnet fishery harvested 80,200 adult coho, compared to 23,000 coho in 1998. Terminal area fisheries in both Oregon and Washington accounted for 22,700 of the total 1999 coho catch. The lower river mainstem commercial gillnet fishery landed 57,500 coho during late September and October all-species seasons. The treaty Indian mainstem commercial gillnet coho catch was 1,700 fish, compared to the 1998 catch of 200 coho.

The total mainstem and Buoy 10 recreational fisheries below Bonneville Dam harvested 10,200 coho compared to 14,000 adult coho in 1998. In 1999, Columbia River managers opened the Buoy 10 fishery August 1 through December 31 for both chinook and coho. Emergency regulations closing the Buoy 10 fishery to chinook salmon retention were implemented effective August 30 due to larger than anticipated chinook catches. Retention of coho was selective for fish with a healed adipose fin clip. Angler compliance with the adipose fin-clip requirement was good at 99%. The 1999 Buoy 10 harvest and effort totaled 8,900 coho and 49,190 angler trips (Table III-2). Historical Buoy 10 catch and effort data are provided in Appendix B, Table B-21.

Oregon and Washington conducted an on-the-water observation program for the Buoy 10 selective fishery. Preseason the STT (using the coho Fishery Regulation Assessment Model [FRAM]) predicted the mark rate for the Buoy 10 fishery would be 73%. From on-the-water observations and dockside interviews, the mark rate for the Buoy 10 fishery was 79%..

Escapement and Management Performance

Central California Coast and Northern California Coho

Spawner estimates are not available for CCC coho. Estimates are available for escapement to Klamath River Basin hatcheries, but not for coho spawning in natural areas. In 1999, coho returns to Iron Gate and Trinity River hatcheries totaled 3,130 adults (2,979 coho to Trinity River and 151 coho to Iron Gate), compared to a combined goal of 2,000 adult coho.

Oregon Coast Coho

Natural spawner escapement in 1999 to Oregon coastal river and lake systems from the Coquille River north is preliminarily estimated at 46,900 adult coho by SRS accounting. This compares to 30,900 adults in 1998. Historical spawner escapement estimates of naturally produced coho are reported in Table III-1 and have been adjusted to reflect SRS accounting.

Preliminary information based on SRS surveys indicate some improvement for 1999 in the recent trend of disproportionately low spawner distribution for north and north-central coastal rivers. The number of adult spawners observed per mile on north and north-central coast rivers was estimated at 53% and 59%, respectively, of the densities observed on south-central rivers (Table III-3 and Figure III-1). This is more than double the same percentages observed in 1997 and 1998.

TABLE III-1. Estimated returns to Oregon coastal streams and lakes in thousands of adult coho (SRS spawner accounting). (Page 1 of 1)

Year	Returns to Hatchery Facilities			Count at North Fork Umpqua Winchester Dam	Number of OCN Spawners[a/]			Inside Harvest Impacts[b/]	Ocean Escapement to Oregon Coast[a/]
	Private	Public	STEP[c/]		Lakes	Rivers	Total		
1970	-	36.2	-	0.2	20.5	51.2	71.7	39.8	147.9
1971	-	29.1	-	0.6	29.2	65.6	94.8	24.1	148.6
1972	-	12.9	-	0.3	10.0	24.1	34.1	16.6	63.9
1973	-	18.4	-	0.4	17.6	37.8	55.4	15.4	89.6
1974	-	35.1	-	0.4	6.4	28.1	34.5	13.5	83.5
1975	-	4.9	-	0.5	5.6	34.8	40.4	13.5	59.3
1976	-	38.7	-	0.3	1.5	39.2	40.7	19.6	99.3
1977	4.2	6.5	-	0.4	5.8	13.7	19.5	13.5	44.1
1978	12.3	5.6	-	0.5	1.6	18.2	19.8	4.5	42.7
1979	49.2	22.2	-	0.4	6.6	38.4	45.0	1.5	118.3
1980	38.7	21.9	-	0.2	4.7	25.6	30.3	6.3	97.4
1981	117.8	21.2	-	0.1	2.5	30.1	32.6	9.9	181.6
1982	184.7	14.8	-	2.7	7.9	68.3	76.2	14.7	293.1
1983	133.9	9.5	-	1.2	3.3	19.4	22.7	6.8	174.1
1984	115.4	28.6	-	3.2	14.7	59.7	74.4	17.4	239.0
1985	332.0	15.8	-	4.0	7.6	66.3	73.9	15.7	441.4
1986	453.7	35.8	2.5	9.6	11.8	58.2	70.0	30.3	601.9
1987	119.3	12.3	0.2	2.2	4.2	25.9	30.1	7.7	171.8
1988	116.1	33.7	1.2	1.2	5.8	51.0	56.8	13.3	222.3
1989	46.9	37.3	1.2	3.0	4.8	41.6	46.4	15.1	149.9
1990	35.6	15.4	1.6	2.3	4.4	16.5	20.9	9.5	85.3
1991	35.1	39.6	4.9	5.2	7.3	29.1	36.4	31.5	152.7
1992	-	23.3	0.6	6.0	2.0	37.7	39.7	18.7	88.3
1993	-	20.2	2.0	3.3	10.1	44.3	54.4	13.3	93.2
1994	-	23.4	1.8	2.8	5.8	37.9	43.7	2.4	74.1
1995	-	25.2	0.4	4.2	11.2	41.2	52.4	3.6	85.8
1996	-	23.8	1.0	6.2	13.5	59.5	73.0	4	108.0
1997	-	17.6	0.2	3.6	8.6	14.1	22.7	4.5	48.6
1998	-	15.2	0.2	5.3	11.1	19.8	30.9	3.1	54.7
1999[d/]	-	14.1	0.4	4.5	12.7	34.2	46.9	2.8	68.7

a/ Does not include estimates for the southern OCN component (Rogue River). Spawner escapements to rivers have historically been estimated by a nonrandom standard index of streams north of the Rogue River. A total coastwide spawner escapement methodology based on SRS was initiated in 1990 and implemented concurrently with the standard index methodology. The SRS methodology indicated that actual escapements were less than estimated by the standard rivers index. The spawner index data for years prior to 1990 have been recalibrated in this table to be comparable with the SRS estimates.

b/ Freshwater sport catch from ODFW salmon/steelhead angler tag information and represents only those fish greater than 24 inches. Includes estimated mortality from hook-and-release.

c/ Oregon coastal Salmon Trout Enhancement Program (STEP) production from hatchery smolt rearing sites only.

d/ Preliminary.

TABLE III-2. Estimated weekly **effort** (in angler trips) and **catches** of chinook and coho in the 1999 **Buoy 10 recreational** fisheries (all data are preliminary).[a/] (Page 1 of 1)

Week Number	Ending Date of Period	Angler Trips	Catch		Catch Per Trip
			Chinook	Coho	
31	Aug-1	620	26	18	0.07
32	Aug-3	1,904	122	27	0.08
33	Aug-15	4,243	302	111	0.07
34	Aug-22	13,960	6,130	1,034	0.51
35	Aug-29	17,454	3,484	3,561	0.40
36	Sep-5	6,046	20	2,980	0.50
37	Sep-12	2,781	2	644	0.23
38	Sep-19	1,486	0	456	0.31
39	Sep-26	535	0	41	0.08
40	Oct-3	112	0	0	0.00
41-44	Oct-31	49	0	0	0.00
Total		49,190	10,086	8,872	0.38

a/ Includes boat-based and shore-based fisheries at Clatsop Spit, the South Jetty of the Columbia River and the North Jetty of the Columbia River after the ocean closed. Fishery was open August 8-23 for all species except nonfin-clipped coho and steelhead.

TABLE III-3. OCN adult coho salmon conservation objective, fishery impacts, and spawner escapement, based on SRS. (Page 1 of 1)

	Fishery Impact (Total Marine and Freshwater Exploitation Rate)			Adjusted SRS Adult Coho Spawner Population Estimates in Thousands of Spawners by Stock Component[a/]					Adult Coho Spawners Per Spawner Habitat Mile				
Year	Conservation Objective[b/]	Preseason Projection	Postseason Estimate[c/]	Northern[d/]	North Central[e/]	South Central[f/]	Southern[g/]	Coastwide	Northern[d/]	North Central[e/]	South Central[f/]	Southern[g/]	Coastwide Average
1990	-	-	-	2.2	5.6	13.1	3.1	24.0	2	5	8	8	6
1991	-	0.460	0.454	9.3	6.7	20.3	1.0	37.3	10	6	13	2	9
1992	-	0.420	0.511	2.4	15.4	21.9	2.2[h/]	41.9	3	13	14	5[h/]	10
1993	-	0.260	0.423	4.5	7.8	42.1	0.4[h/]	54.8	5	7	26	1[h/]	14
1994	≤0.20	0.111	0.068	4.1	9.7	29.9	5.4	49.1	5	8	18	13	12
1995	≤0.20	0.118	0.124	4.0	13.6	34.8	3.8	56.2	4	12	21	9	14
1996	≤0.20	0.125	0.083	3.3	18.1	51.5	4.6	77.5	4	16	32	11	19
1997	≤0.20	0.110	0.124	2.1	2.8	17.7	8.3	30.9	2	3	16	20	8
1998	≤0.13	0.119	0.078	2.6	3.3	25.2	3.3	34.4	3	2	14	8	9
1999[i/]	≤0.15	0.087	NA	8.3	11.5	27.0	2.0	48.8	9	10	17	5	12

a/ A spawner escapement methodology study based on SRS has been in effect since 1990 in which coho salmon population estimates have been made for Oregon coastal river systems from the Coquille River and north. Spawner population estimates include an adjustment for observation error.

b/ Prior to 1994, the conservation objective was expressed in terms of the total escapement of OCN spawners in index numbers rather than as an exploitation rate. The index escapement objectives from 1981 through 1993 are provided in Table III-2 of the *Review of 1998 Ocean Salmon Fisheries* and Table 1 of Amendment 11. From 1994 through 1997, Amendment 11 specified that at low stock sizes, only incidental harvest of OCN coho could occur and that impacts could not exceed 20%. Beginning in 1998, the OCN conservation objective has been as specified in Amendment 13 which is also the basis for the NMFS jeopardy standards under the Endangered Species Act listing.

c/ From the coho FRAM, except the estimates prior to 1994 represent the OPI composite exploitation rate for hatchery and natural stocks.

d/ Estimate based on 899 miles of spawner habitat within Nehalem, Tillamook, and Nestucca Rivers and other direct ocean tributaries from Necanicum River through Neskowin Creek.

e/ Estimate based on 1,163 miles of spawner habitat within Siletz, Yaquina, Alsea, and Siuslaw Rivers and other direct ocean tributaries from the Salmon through Siuslaw Rivers.

f/ Estimate based on 1,622 miles of spawner habitat within Umpqua, Coos, and Coquille Rivers. Also includes spawners using tributaries to Siltcoos, Tahkenitch, and Tenmile Lakes.

g/ Estimate based on a mark-recapture methodology and 410 miles of spawner habitat within the Rogue River.

h/ Unreliable estimate.

i/ Preliminary.

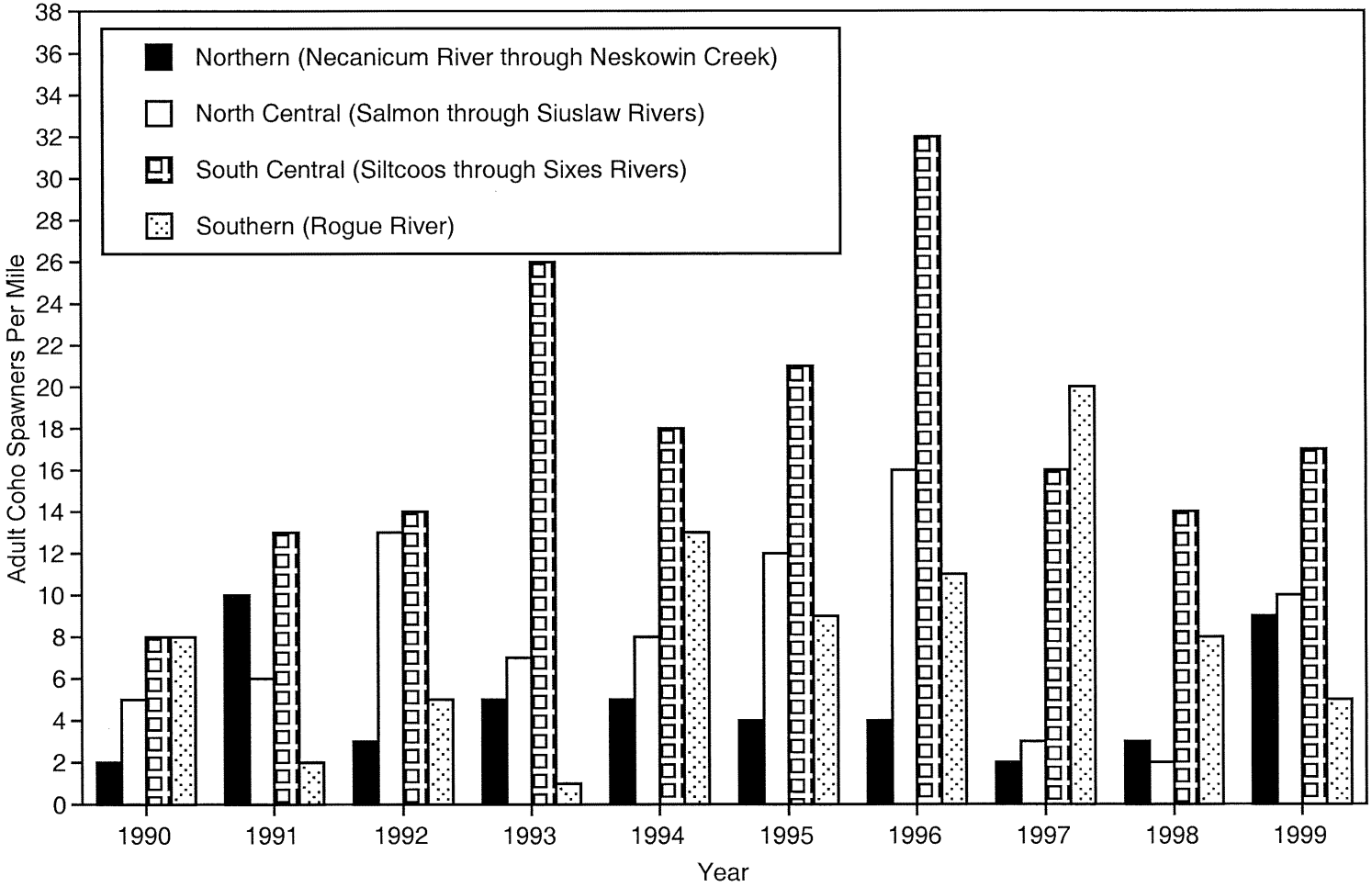

FIGURE III-1. Oregon coastal natural adult coho salmon spawners per spawner habitat mile by coastal region based on SRS, 1990-1999.

Preliminary estimates of total coho returns to Oregon coastal public hatcheries and STEP smolt production facilities were 14,100 and 200 adults, respectively (Table III-1). Hatchery egg-take goals are expected to be met at all public hatchery stations.

Columbia River Coho

The 1999 ocean escapement of adult early and late Columbia River coho stocks was 246,400 fish, compared to 161,800 adults in 1998 (Appendix B, Table B-20). The 1999 Columbia River coho abundance was sufficient to meet all hatchery brood stock escapement needs.

WASHINGTON COASTAL COHO STOCKS

Washington coastal stocks include all natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western strait of Juan de Fuca (west of the Elwha River). The primary stocks in this group which are most pertinent to ocean salmon fishery management are Willapa Bay (hatchery), Grays Harbor, Quinault (hatchery), Queets, Hoh, and Quillayute coho.

Management Objectives

Management goals for Grays Harbor and Olympic Peninsula coho stocks include achieving natural spawning escapement objectives and treaty allocation requirements, although Grays Harbor also contains a significant amount of hatchery production. The conservation objectives for these stocks are based on maximum sustainable yield (MSY) spawner escapements established pursuant to the U.S. District Court order in *Hoh versus Baldrige*. Annual natural spawning escapement targets and total escapement objectives are established by the Washington Department of Fish and Wildlife (WDFW) and treaty tribes under the provisions of *U.S. versus Washington* and subsequent U.S. District Court orders. After agreement to annual targets is reached by the parties in this litigation, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for providing treaty allocation requirements and inside, non-Indian fishery needs. The conservation objectives for the Queets, Hoh, and Quillayute rivers were developed as ranges intended to bracket the current best estimates of MSY escapement. The range of each objective reflects the degree of uncertainty inherent by using the high estimate of recruits-per-spawner and low estimate of carrying capacity for the lower bound, and the low estimate of recruits-per-spawner with the high estimate of smolt carrying capacity for the upper end of the range. The ranges were subsequently adjusted upward for risk aversion and again for habitat considerations by 26% to 184%.

Regulations to Achieve Objectives

Washington coastal coho stocks contribute primarily to ocean fisheries off Washington with increasing fishery impacts toward the northern end of the state and off British Columbia. To manage for optimum yield in the 1999 fisheries, the Council regulations were aimed at protecting escapements for depressed natural stocks, especially Queets, an also Strait of Juan de Fuca coho. Toward that end, the overall harvest quotas were limited to levels well below those of the late 1980s and early 1990s and all retention of coho in recreational ocean fisheries north of Cape Falcon was limited to marked hatchery fish.

Willapa Bay Coho

Inside Harvest

Run size, harvest, and escapement data for Willapa Bay coho are presented in Appendix B, Table B-23.

The gillnet catch of coho in Willapa Bay in 1999 totaled 5,468 fish (3,833 wild and 1,635 hatchery). Based on the preseason forecast for a terminal run of 48,800 fish, the scheduled fisheries were expected to harvest approximately 7,444 total coho.

Recreational harvest estimates are not yet available for 1999. All recreational fisheries opened at the usual time, were of normal duration, and maintained normal bag limits.

Willapa Bay was open to recreational fishing from August 16 through January 31 with a daily-bag-limit of six salmon, two of which could be adults. All retained coho were required to have a healed adipose fin clip. Estimates of total catch are not yet available for Willapa Bay.

Escapement and Management Performance

Willapa Bay coho are managed for hatchery production. Escapement to Willapa Bay hatcheries in 1999 numbered 18,219 coho. Estimates of natural spawning escapement for 1999 are not yet available.

Grays Harbor Coho

Inside Harvest

Run size, harvest and escapement data for Grays Harbor coho are presented in Appendix B, Table B-25. The forecasted run size for Grays Harbor wild coho was for 83,709 fish (57,700 wild and 26,009 hatchery). A total of 14,500 coho (wild, hatchery, and net-pen origin) were harvested in net fisheries. This included 12,100 coho in the Quinault Indian Nation fisheries, 1,700 in the non-treaty gillnet fishery, and 800 in the Chehalis tribal fishery.

Recreational harvests are not yet available for 1999. Recreational fisheries opened a little later in 1999 to minimize impacts to chinook. The Chehalis River and it's tributaries were open to non-selective coho harvest through November 15, after which fish without a healed adipose fin clip were required to be released. The Humptulips recreational fishery required release of all coho without a healed adipose fin clip throughout the season.

Escapement and Management Performance

Grays Harbor coho are managed for natural production. Natural spawning escapement estimates are not yet available. Initial indications are that the escapement goal of 35,400 fish will be met.

The preliminary estimates of the total return to Grays Harbor hatcheries is 26,471 coho. Net pen reared coho also returned to Grays Harbor in 1999 and contributed to the coho harvest, but no estimate of escapement is available.

Quinault River Coho

Inside Harvest

Historical terminal run size, harvest, and escapement for Quinault River coho are presented in Appendix B, Table B-27.

Quinault River coho are managed for hatchery production. The treaty Indian gillnet fishery targeted chinook and coho from early September through mid-November. A total of 15,490 coho were harvested by the gillnet fishery in 1999.

Escapement and Management Performance

Quinault River coho are managed for hatchery production. Escapement estimates for Quinault River coho in 1999 are 15,579 and 5,571 adult hatchery and natural coho, respectively. Hatchery production objectives were achieved for Quinault River coho.

Queets River Coho

Inside Harvest

Historical terminal run size, harvest, and escapement for Queets River coho are presented in Appendix B, Table B-30.

Queets River fisheries were established by preseason agreement, based on preseason abundance estimates and planned Council ocean fisheries. The treaty Indian gillnet fishery was structured to target returning hatchery coho during September and early October, followed by a reduced level of fishing to update natural coho and chinook run sizes through mid-October. The in-season updates indicated the natural coho run was above the preseason forecast. The total harvest of fall coho by the net fishery was 3,972 fish. The gillnet harvest was comprised primarily of hatchery fish. Recreational fisheries operated in the Queets, Clearwater, and Salmon rivers, with retention allowed only for fish with a healed adipose fin clip.

Escapement and Management Performance

Analysis of spawning escapement survey data for Queets River coho has not yet been completed. Based on the in-season run size and in-river catch estimates, the preliminary natural and supplemental spawning escapement estimate is 3,577 adults, below the lower end of the escapement goal range of 5,800 to 14,500 natural adults.

Hoh River Coho

Inside Harvest

Historical terminal run size, harvest, and escapement for Hoh River coho are presented in Appendix B, Table B-33.

The preseason terminal run size forecast was 2,814 under Council recommended fisheries regulations, within the lower end of the spawning escapement range established for this stock. The tribal terminal fishery was conducted with 6-inch and larger normal mesh size at two days per week from weeks 36 through 39, then at one day per week with normal 6-inch and larger mesh size during weeks 40 through 46, with an additional day added under an 8-inch and larger mesh size restriction during weeks 41 and 43. The tribal fishery then closed during weeks 47 and 48. The nontreaty recreational fishery opened with a standard bag limit below the highway 101 bridge, and on October 16 opened above the bridge to Morgan's Crossing for the first time in several years. The opening of the upper area was timed to occur after most spring/summer chinook had completed migration and spawning. The tribal steelhead fishery opened with normal 6 inches and larger mesh beginning week 49. Initially, lower than expected catches of wild coho occurred through week 42, followed by larger than expected catches beginning week 43 during both large mesh and small mesh openings. The 1999 tribal fishery was expected to catch 21% of the terminal coho run. The entry of significant numbers of wild coho was delayed a full three weeks from normal timing into the river. Based on preliminary spawner ground survey estimates, the coho run appears to have been larger than expected. The tribe harvested about 1,731 coho, of which 1,380 were wild coho with the balance dip-in marked and unmarked hatchery fish.

Escapement and Management Performance

The preliminary 1999 escapement estimate of 4,900 adult wild coho is within the upper half of the escapement goal range.

Quillayute River Coho

Inside harvest

Historical terminal run size, harvest, and escapements for Quillayute River summer and fall coho are presented in Appendix B, Table B-36.

The recreational and tribal fisheries for summer and fall coho were established by agreement of WDFW and the Quileute Tribe, respectively. The summer coho run in the Quillayute River is managed primarily for it's hatchery component. The treaty gillnet fishery harvested 945 summer coho from mid-August through mid-September. A small recreational fishery harvested a limited number of summer coho during this period.

The fall coho preseason terminal run size prediction was 6,941 hatchery adults and 12,756 wild adults. Both the hatchery and wild stock returns were larger than predicted preseason. The treaty gillnet fishery harvested 22,378 total coho during this period. A recreational harvest is not available.

Escapement and goal assessment

The summer coho run in the Quillayute River is managed primarily for the hatchery component. The summer coho hatchery rack return was 7,298 adults, far in excess of the 300 adult goal.

The hatchery fall coho rack return was 12,834 adults, far in excess of the 600 adult goal. Preliminary spawner escapement estimates indicate the wild escapement will approach the upper end of the goal range established for this stock of 6,300 to 15,800 adults.

PUGET SOUND COHO STOCKS

Puget Sound coho salmon stocks include natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). The primary stocks in this group which are most pertinent to ocean salmon fishery management are eastern Strait of Juan de Fuca, Hood Canal, Skagit, Stillaguamish, Snohomish, and South Puget Sound (hatchery) coho.

Management Objectives

The Puget Sound Salmon Management Plan defines management objectives and long term goals for these stocks as developed by representatives from federal, state, and tribal agencies. Conservation objectives for specific stocks are currently based on either maximum sustainable production principles for stocks managed primarily for natural production or upon hatchery escapement needs for stocks managed for artificial production. However, a transition to exploitation rate management is currently under consideration by the involved managers. Annual escapement targets for these coho stocks are developed through procedures established in U.S. District Court. Puget Sound management procedures are outlined in a "Memorandum Adopting Salmon Management Plan" (*U.S. versus Washington*, 626 F. Supp. 1405 [1985]). The original conservation objectives were developed by a State/Tribal Management Plan Development Team following the Boldt Decision with the goal for natural spawning stocks defined as "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The methodology used to develop the objectives was based on assessment of the quantity and quality of rearing habitat and the number of adult spawners required to fully seed the habitat. Some objectives have subsequently been modified by the U.S. District Court Fisheries Advisory Board and later determinations of the WDFW/Tribal Technical Committee.

Regulations to Achieve Objectives

Puget Sound coho stocks contribute primarily to ocean fisheries off Washington with increasing fishery impacts toward the northern end of the state and off British Columbia. These stocks did not play a primary roll in 1999 ocean fishery management considerations since the needs of Washington coastal and OCN stocks were more critical. The selective regulations for marked hatchery coho in ocean and Puget Sound

Regulations to Achieve Objectives

Puget Sound coho stocks contribute primarily to ocean fisheries off Washington with increasing fishery impacts toward the northern end of the state and off British Columbia. These stocks did not play a primary roll in 1999 ocean fishery management considerations since the needs of Washington coastal and OCN stocks were more critical. The selective regulations for marked hatchery coho in ocean and Puget Sound recreational fisheries served to provide additional protection for wild Puget Sound coho stocks and also for Thompson River coho in Canada.

Inside Harvest

Commercial inside fishery harvest of Puget Sound coho is managed on the basis of six regional management stock units: Strait of Juan de Fuca, Nooksack-Samish, Skagit, Stillaguamish-Snohomish, South Puget Sound, and Hood Canal. Harvest of coho for each management unit is regulated according to the natural spawning escapement or hatchery program escapement goal for that unit. Commercial net and troll harvest (treaty Indian and non-Indian) for all coho stocks combined is presented in Appendix B, Table B-37. The 1999 total Puget Sound commercial catch of coho was 114,200 fish, compared to a catch of 161,600 coho in 1998. Non-Indian harvest was 11,900 coho, compared to a catch of 12,500 coho in 1998. Treaty Indian net and troll fisheries harvested 102,300 coho, compared to a catch of 149,100 coho in 1998.

Historic coho recreational catches in the Puget Sound recreational fishery for the years from 1971 through 1998 are listed in Appendix B, Table B-38.

Escapement and Management Performance

Estimates of 1999 natural spawning escapements are unavailable at this time. Historic hatchery and natural run component escapements and net catches for each Puget Sound region of origin are presented in Appendix B, Table B-40.

In general, Puget Sound hatchery coho escapement and egg-take goals were met in all regions except for South Puget Sound.

COASTWIDE GOAL ASSESSMENT SUMMARY

A summary of 1999 performance for coho salmon by stock in relation to the Council's conservation objectives (Amendment 14) is presented in Table III-4.

TABLE III-4. Performance of **coho** salmon stocks in relation to 1999 conservation objectives (preliminary data). (Page 1 of 1)

System and Stock	1999 FMP Conservation Objective	Achievement
Puget Sound Coho	Natural spawner escapement objectives as provided below and in state-tribal agreements; meet hatchery egg-take goals; and meet treaty Indian allocation requirements and inside non-Indian fishery needs for 6 management units.	Data not available for 1999 natural spawner escapements. Hatchery egg-take goals met, except for South Puget Sound. No information available on catch allocation.
Eastern Strait of Juan de Fuca	3,130 natural adult spawners	Preseason expected ocean escapement of 8,800 adult fish for eastern and western Strait of Juan de Fuca combined.
Hood Canal	21,500 natural adult spawners	Preseason expected ocean escapement of 45,200 adult fish.
Skagit	30,000 natural adult spawners	Preseason expected ocean escapement of 53,400 adult fish.
Stillaguamish	17,000 natural adult spawners	Preseason expected ocean escapement of 27,300 adult fish.
Snohomish	70,000 natural adult spawners	Preseason expected ocean escapement of 108,100 adult fish.
Washington Coast Coho	Natural spawner escapement objectives as provided below and in state-tribal agreements; meet hatchery egg-take goals; and meet treaty Indian obligations.	Hatchery egg-take goals achieved. No information available on catch allocation.
Western Strait of Juan De Fuca	9,720 natural spawners	Postseason estimate not available. Preseason expectation for an ocean escapement of 8,800 adult fish for eastern and western Strait of Juan de Fuca combined.
Quillayute Fall	6,300 to 15,800 natural adult spawners	Postseason estimate not available, but expected to be in the upper end of the range. Preseason expectation for an ocean escapement of 12,800 adult fish.
Hoh	2,000 to 5,000 natural adult spawners	4,900 natural adult spawners
Queets	5,800 to 14,500 natural adult spawners	3,577 natural adult spawners
Grays Harbor	35,400 natural adult spawners	Postseason estimate not available, but the objective is expected to be met. Preseason expectation for an ocean escapement of 50,300 adult fish.
OPI Area Coho (Columbia River and coastal stocks south of Leadbetter Point)	Natural spawner escapement objectives as provided below; meet hatchery egg-take goals; and meet treaty Indian obligations.	Hatchery egg-take goals achieved. No information available on catch allocation.
OCN (Threatened)	Combined marine and freshwater exploitation rate ≤15% for the 4 stock components. Council adopted a projected exploitation rate of 8.7% with an expected 52,800 adult spawners (SRS of rivers and lakes from the Coquille River north).	Postseason exploitation rate estimate not available. Preliminary OCN escapement of 46,900 adult spawners (SRS of rivers and lakes from the Coquille River north).
Northern California (Threatened) and CCC (Threatened)	No directed coho fisheries or retention of coho off California. Marine exploitation rate ≤13% as indicated by R/K hatchery stocks. Council adopted a projected exploitation rate on R/K hatchery coho of 4.9%.	No directed coho fisheries or retention of coho off California. Postseason exploitation estimate not available.

CHAPTER IV
SOCIOECONOMIC ASSESSMENT OF THE 1999 OCEAN SALMON FISHERIES

Total 1999 exvessel value for the Council-managed non-Indian commercial troll fishery was $8.4 million. In inflation-adjusted terms, exvessel value was 51% above its 1998 level but was 78% below the 1976 through 1998 average. The number of vessel-based ocean salmon sport angler trips taken on the West Coast in 1999 (244,800 angler trips) increased 29% from 1998 but was 58% less than the 1976 through 1998 average. The total state level income impact associated with the recreational and troll ocean fisheries for all three states combined was $39.7 million, up 36% from the recent historic low of $29.2 million of 1998, but 70% below the 1976-1998 average.

ALLOCATION OF THE SALMON RESOURCE

Salmon management by the Council involves numerous allocation issues including:

- Determination of the amount of salmon available for ocean harvest after consideration of expected abundances, harvests by inside fisheries, and spawning escapement goals.
- Allocation of harvest among broad management areas and among ports within the management areas.
- Allocation of harvest between Indian and non-Indian harvesters.
- Allocation of the non-Indian harvest between troll and recreational harvesters.

The amount of fish available for harvest in Council management areas depends, in part, on harvest in Canada and Alaska. Allocation of harvest between the West Coast, Canada, and Alaska is determined within the constraints of the Pacific Salmon Treaty Act.

Figures IV-1 and IV-2 show the catches which have resulted from the Council's management of the ocean commercial troll and recreational fisheries (all tables and figures are at the end of the chapter). The figures show that, in general, the recreational fishery has tended to have a more stable harvest than the troll fishery (in both absolute and relative terms); the majority of the annual variation in available ocean harvest is usually taken up in the troll fishery. However, both fisheries have suffered substantial declines in recent years, the effects of which are amplified when specific geographic areas are considered.

Fisheries in different areas will impact a particular stock at different rates, therefore, decisions on allowable harvests for a particular stock often have implicit allocational effects on the geographic distribution of the salmon harvest. Seasons are often shaped with an eye toward providing the needed stock protection, while balancing the often conflicting objectives of maximizing ocean harvest and fairly distributing the conservation burdens along the coast. The following briefly describes some of the major stock conservation concerns that have magnified the conflict between these objectives in recent years and presented the Council with some of its greatest season shaping challenges.

Beginning in 1996, recreational seasons south of Point Arena California were significantly restricted to reduce impacts on Sacramento River winter chinook. Limiting impacts on Sacramento River winter chinook was also the primary focus of season shaping for the 1999 commercial fishery south of Point Arena. In the commercial fishery, a size limit increase from 26" to 27" was implemented south of Point Arena after June 30 to protect Sacramento River winter chinook.

Commercial and recreational fisheries in the Klamath Management Zone (KMZ) area have been restricted, because they have a high impact rate on Klamath River fall chinook--a stock which has been depressed for several years. In 1996, KMZ fisheries were allowed to expand to a small degree: there was a commercial troll fishery in the Crescent City and Eureka areas for the first time since 1991, and the first commercial Indian fishery in the river since 1989. While 1997 and 1998 fisheries were more restrictive than 1996

fisheries and no in-river Indian fisheries were allowed, there was another small expansion in 1999, which allowed managers to increase fishing opportunities, including the provision of an Indian in-river commercial fishery. Recreational seasons north of Point Arena and within the KMZ have been further shaped in some years to protect coho.

Beginning in 1993 for the commercial fishery and 1994 for the recreational fishery, coho retention was prohibited south of Cape Falcon in order to protect Oregon coastal natural coho. In July 1999, a limited fishery for hatchery coho was allowed off the central Oregon coast (Cape Falcon to Humbug Mountain). The opportunity to retain hatchery coho was created by the mass-marking of most hatchery coho fish with adipose fin clips. The restriction on coho retention in the mid-1990s had a devastating impact on the recreational fishery off central Oregon and a somewhat less but still significant impact on the troll fishery in the same area, both of which have historically depended on coho harvest. To date, the coho restrictions have had virtually no affect on California fisheries south of Point Arena, which depend primarily on chinook and have relatively minor coho impacts. The July 1999 selective recreational fishery allowed for a significant increase in the recreational effort off of the central Oregon coast, however, even with the increase effort was far below historic levels.

North of Cape Falcon, recreational regulations selective for hatchery-marked coho provided some of the longest seasons in the last 20 years. However, the fishery was not open during peak participation periods, such as the July 4 weekend and recreational effort levels were not sufficient to take the entire available quota. No selective fishing opportunities were provided for commercial troll fisheries.

Success in achievement of stock management goals and objectives is evaluated in the first three chapters of this review.

COMMERCIAL SALMON FISHERIES

West Coast Non-Indian Ocean Troll Fishery

Inseason Price Trends

Monthly exvessel price data provide information on seasonal price trends (Table IV-1). The absence of a breakdown of price by size category for California makes it difficult to tell whether price changes are a function of seasonal changes in market conditions or a shift in the size category of fish landed.

Annual Trends (Seasons, Value, Prices, and Pounds)

Available information on chinook and coho exvessel price and value by species, compiled from state fish tickets and expressed both in nominal terms and real (inflation adjusted) 1999 dollars, is presented in Tables IV-2, IV-3, and IV-4. Data on pink salmon is provided in Table IV-5. The gross domestic product implicit price deflator, developed by the Bureau of Economic Analysis, is used to adjust nominal to real values (Table D-22). Weight of landings by species and port for chinook and coho is presented in Tables IV-6, IV-7 and IV-8. These tables and the following discussion refer to the non-Indian commercial troll fishery in Council management areas and associated state territorial ocean area waters.

Total 1999 exvessel value for the Council-managed non-Indian commercial troll fishery was $8.4 million. In inflation-adjusted terms, exvessel value was 51% above its 1998 level but was 78% below the 1976 through 1998 average.

In 1999, there was some non-Indian commercial ocean coho fishing opportunities along the West Coast for the first time since 1996. The opportunities came during the months of July and August in the area north of Leadbetter Point, Washington (off of Westport, La Push, and Neah Bay). As in 1997 and 1998, there were some commercial ocean salmon fisheries for all major port areas of the West Coast, though opportunities were sparse at best north of Cape Falcon, in the KMZ, and in the Fort Bragg area. In 1996,

there were commercial fisheries coastwide with the exception of the area around Ilwaco/Astoria, and in 1995 there were no troll fisheries in ocean areas around Westport, Ilwaco/Astoria, Crescent City, and Eureka. In 1994, there were no non-Indian ocean commercial fisheries north of Cape Falcon and none in the California portion of the KMZ (Crescent City and Eureka).

The 1999 exvessel value of the California commercial ocean salmon catch ($6.6 million) was 112% above the 1998 value but still 65% below the 1976 through 1998 average. The 1999 exvessel value for the Oregon commercial troll catch ($1.4 million) was about twice the 1994 low, but down 40% from 1998 and still 88% below the 1976 through 1998 average. The 1999 exvessel value for the Washington non-Indian ocean commercial troll catch ($396,000) was over twice any value observed since 1993, but 94% below the 1976 through 1998 average (all values adjusted for inflation).

Average West Coast ocean harvest chinook price per pound increased 14% in 1999 to $1.90, the second year in a row of increasing average price after 7 years in a row of declining prices (Figure IV-3).

Coastwide, the non-Indian chinook harvest decreased by 3% in terms of number of fish compared to 1998 (Figure IV-1). This decrease in catch was counteracted by a 36% increase in average chinook weights (Tables D-1, D-2, and D-3): a 14% increase in chinook price; and the addition of coho retention opportunities in northern Washington. The increase in average weight per fish accounted for the majority of the increase in exvessel value compared to 1998 levels (Figure IV-4). About 79% of the coastwide chinook harvest (by weight) was taken in California, from the San Francisco area south, as compared to about 54% in 1998 and 75% in 1997 (Table IV-6, IV-7 and IV-8).

Ocean Troll Salmon Harvesters

Coastwide, 1,030 vessels participated in the 1999 salmon troll fishery, down 3% to from 1998, and about 81% below the average number of vessels participating from 1986 through 1990. The active fleet in California decreased by 25 vessels (4%), the active fleet in Oregon decreased by 45 vessels (12%) and the active fleet in Washington increased by 34 vessels (148%), all comparisons to 1998 (Tables D-4, D-5, and D-6; note: the tables are for each state, there may be a small amount of double counting where vessels participated in more than one state). Coastwide, the number of salmon limited entry permits issued decreased by 304 (9%), to 3,101 permits. Thirty-three percent of all permits made salmon landings in 1999. From 1982 through 1990 there was an average of 5,984 permits of which an average of 69% were used in the salmon fishery (on an annual basis)

Average per vessel exvessel value increased 56% as compared to 1998 (adjusted for inflation), to approximately $8,100. Per vessel, average exvessel values decreased by 121% in California, while decreasing in Oregon by 32% and by 28% in Washington. Some caution needs to be exercised in interpreting the per vessel average. For example, the averages may be influenced as much by the entry or exit of a disproportionate number of small or large harvesters as by any change in the average revenues of those remaining in the fishery from one year to the next.

Additional historic information on landings by vessel size, percentages of the fleet responsible for the majority of harvest, and harvest by residence of those participating in the fishery off each state is provided in Appendix D.

West Coast Treaty Indian Ocean Troll Fishery

Treaty Indian ocean troll fisheries are allocated a share of the total ocean salmon harvest. Some of the Indian harvest is for ceremonial and subsistence purposes; however, there is also a commercial harvest. Commercial Indian fisheries provide food to consumers and generate income in local and state economies through expenditures on harvesting, processing, and marketing of the catch. The treaty ocean troll fishery harvested 27,400 chinook (221,900 pounds) and 33,400 coho (167,000 pounds) in 1999, compared to 14,400 chinook (163,700 pounds) and 7,900 coho (55,100 pounds) in 1998 (1998 poundage values from Pacific Coast Fisheries Information Network [PacFIN], 1999 poundage values based on number of fish from

Table A-25 times average weight per fish from Table D-3). The nominal exvessel value for 1998 chinook and coho landings was $245,000 (PacFIN annual vessel summary files). The PacFIN values for the 1999 Indian fisheries were not sufficiently complete to report as of the date of this review.

Columbia River Commercial Fishery

Harvests in the ocean salmon fisheries impact inriver fisheries by their effects on the amount of fish available for inside harvest. Information is presented in Table IV-9 on the exvessel value of Columbia River commercial harvest of chinook, coho, and chum. All prices and values in the table and the following discussion are in real (inflation adjusted) dollars. Exvessel prices for inriver gillnet catches of chinook vary considerably with race (spring versus fall chinook) and stock (tules versus brights). Spring chinook generally bring the highest prices and fall chinook tules and chums the lowest.

The total 1999 exvessel value for commercial salmon harvested in the Columbia River was $1.2 million, over twice the 1998 level. The total 1999 exvessel value for non-Indian commercial salmon harvested in the Columbia River was $830,000. This value is almost three times the 1998 level but was still 87% below the 1987 through 1995 average harvest. The total 1999 exvessel value for treaty Indian salmon harvested in the Columbia River was $411,000. This value is 44% above the 1998 value but 83% below the value of the 1987 through 1995 average harvest. These values represent only those sales made to licensed fish buyers. Indian fisher sales to the public are accounted for in harvest monitoring, but estimates of the value of such sales are not included in Table IV-9. The volume of sales to the public is reported to have increased substantially in recent years.

Other Inside Commercial Fisheries

Puget Sound and Washington Coastal Inside Fisheries

Information on the 1999 values for Puget Sound and Washington coastal inside fisheries is incomplete. According to PacFIN data, the 1981 through 1998 inflation adjusted average value for chinook and coho taken in the commercial non-Indian Puget Sound and Washington inside fisheries (excluding the Columbia River) was $5.1 million. The total chinook and coho exvessel value for these non-Indian fisheries in 1998 was $0.4 million (inflation adjusted to 1999 dollars). The 1981 through 1998 inflation adjusted average value for chinook and coho taken in the Indian commercial Puget Sound and Washington inside fisheries (excluding the Columbia River) was $8.0 million. The total chinook and coho exvessel value for these non-Indian fisheries in 1998 was $1.2 million (inflation adjusted).

Klamath River Fisheries

From 1987 through 1989, Yurok and Hoopa Valley Reservation commercial Indian gillnet fisheries in the Klamath river averaged about 27,400 fall chinook a year. Since 1989, there have been commercial Indian gillnet fisheries in the Klamath River only in 1996 and 1999. The 1996 harvest was 40,147 fall chinook and the 1999 harvest was 2,077 fall chinook. For the 1996 harvest, the value at first sale for the harvest was estimated at $525,000 (unadjusted for inflation, $548,000 adjusted to 1999 dollars). The average weight of fish landed was 13.5 pounds. The 1989 harvest of 27,504 chinook was sold for $852,000 (unadjusted for inflation, $1.1 million adjusted to 1999 dollars) and had an average weight of 15.4 pounds.

CEREMONIAL AND SUBSISTENCE SALMON FISHERIES

In addition to the commercial Indian fisheries discussed above, fish are taken in Indian fisheries each year for ceremonial and subsistence purposes. The amounts of salmon used for ceremonial and subsistence purposes are documented in Appendix B. There is some discussion of the importance of ceremonial and subsistence fish to Indian communities in Appendix B to Amendment 14 of the salmon fishery management plan.

RECREATIONAL SALMON FISHERIES

Ocean

The number of vessel-based ocean salmon sport angler trips taken on the West Coast in 1999 (244,800 angler trips) increased 29% from 1998 but was 58% less than the 1976 through 1998 average. The number of 1999 trips decreased by 3% in California, increased by 90% in Oregon and increased by 285% in Washington, as compared to 1998 (Figure IV-5).

Recreational salmon fishing takes place primarily in one of two modes (1) anglers fishing from privately owned pleasure crafts and (2) anglers employing the services of the charter boat fleet. In general, success rates on charter vessels tend to be higher than success rates on private vessels. There are small amounts of shore based effort directed toward ocean area salmon, primarily fishing occurring off jetties and piers. In 1999, the proportion of angler trips taken on charter vessels decreased in California and Washington, while increasing in Oregon, as compared to 1998 (Figure IV-5 and Table IV-10). Tables IV-11, IV-12, and IV-13 break out effort by port area and mode for each state.

California

Ocean salmon angler effort in California (147,900 angler trips) decreased 3% in 1999 as compared to 1998 (Table IV-10) and was 24% below the 1976 through 1998 average. In the KMZ ports, Crescent City and Eureka, participation increased back to 1997 levels after a decline in 1998. Effort also increased in Fort Bragg and San Francisco. The decline in total trips for California was a result of a decline in participation in the Monterey port area. While for the state as a whole the share of trips taken on charter vessel declined only 4%, most of this decline in charter vessel share occurred as a result of changes in the Monterey area. The 8,800 charter vessel trips taken in the Monterey port area constituted only 13% of the 1995 peak (68,900 trips) and was less than half the 1998 level (19,700 trips). Most of the increases in number of trips from Fort Bragg north came in the private vessel category and most of the increase in the San Francisco area was the result of an increase in the number of charter vessel trips.

Angler success rates, measured in retained fish per angler trip, decreased an average of 26% to 0.60 fish per day in 1999, compared to 0.80 fish per day in 1998. In 1999, anglers on charter vessels landed about 0.08 fish more per day than anglers fishing from private vessels (the difference in 1997 was 0.16 fish). The average differential between charter and private boat angler success rates from 1976 through 1998 was 0.33 fish per day.

Oregon

Ocean recreational salmon based angler trips in Oregon (49,500 angler trips) were up 90% compared to 1998 levels. This is the highest effort level since 1993. Most of the increase can be associated with the south of Cape Falcon selective hatchery-marked coho fishery which ran from July 10 through the end of the month in the Cape Falcon to Humbug Mountain management area. Fishing from the Columbia River jetty when Buoy 10 is closed is not included in the estimates of ocean angler effort. The charter industry share of the Oregon recreational effort continued to be below historic levels (Figure IV-5 and Table IV-12).

Over the ten years from 1984 to 1993, coho comprised over 85% of the recreational fishery catch. Since 1994, the lack of opportunity to retain coho south of Cape Falcon has generally resulted in lower-than-average angler success rates. With the opportunity to retain coho in a selective fishery south of Cape Falcon in 1999, retained fish per day increased to 0.43, up from 0.25 in 1998 and above the 1994 through 1998 average of 0.37 fish per day. Average retained fish per day in the Cape Falcon to Humbug Mountain area during July (the month of the selective fishery) was 0.47 fish per day. The July fishery was selective for hatchery-marked coho for 12 of the 21 days it was open in July.

For Oregon, the 1999 angler success rate on charter vessels was 0.78 fish per day and that on private vessels was 0.39 fish per day. These averages are strongly influenced by the success rates in areas south of Cape Falcon (Table IV-12).

Washington

In 1999, there were 47,400 ocean angler trips taken on vessels on the Washington coast, an increase of 285% from 1998 and the highest effort level since 1995. The increase in effort was facilitated by a season length that was generally longer than those seen since 1981. The longer season was made possible by regulations prohibiting the retention of coho other than hatchery-marked coho (a selective fishery for hatchery-marked coho). While longer in terms of season days, the 1999 season did not include the July 4 holiday weekend (a period of high participation rates) and much of the length of the season in 1999 came after Labor Day (a period of low participation rates). Prior to 1992, seasons along the Washington coast generally included the July 4 weekend. The proportion of vessel angler trips made from charter vessels declined from 45% in 1998 to 37% in 1999 (Figure IV-5 and Table IV-13).

The angler success rates (in terms of retained fish per angler trip) for both charter and private vessels together averaged 1.05 fish per angler trip in 1999, compared to 1.2 fish per trip in 1998 and 1.06 fish per trip in 1997. The 1979 through 1998 average is 1.42 fish per trip. Not included in these figures is angler effort which occurs from the ocean side of the Columbia River jetty when the Buoy 10 fishery is closed and angler effort in the state managed Area 4B add-on fishery.

Partial week closures have been used in the recreational fishery north of Cape Falcon in an attempt to encourage increased angler participation in nonsalmon recreational fishing as well as to extend the salmon season. Since 1996, the Sunday through Thursday openings have been used only in the Westport and Columbia River port areas. Table IV-14 provides data on type and target species of angler trips by port. Bottomfish trips are reported for Washington only. In 1999, bottomfish effort in all modes out of all ports decreased with the exception of private vessel trips out of the Columbia River (where it remained stable) and charter vessel trip out of La Push. The amount of sturgeon effort was down 10% in 1999, compared to 1998. Sturgeon trips represented 47% of the total 1999 recreational effort out of the Columbia River estuary area reported in Table IV-14, as compared to 66% in 1998. In general sturgeon effort was above most levels seen for the period covered by Table IV-14 (1984 through 1999).

Buoy 10 and Area 4B Add-on Fisheries

As in 1998, the 1999 Buoy 10 fishery was selective for hatchery-marked coho (unmarked coho had to be discarded). Angler retention rates in the Buoy 10 fishery rose from 0.31 fish per day in 1998 to 0.38 fish per day in 1999. The 0.38 fish per day retention rate was generally above those rates seen since 1992 (with the exception of 1997 when the rate was 0.63 fish per day). The timing of the Buoy 10 season is one of the more significant factors influencing angler success rates in the fishery. Effort in 1999 was up about two-thirds compared to 1998, to 49,600 trips, (including trips made from the jetty by bank anglers when the Buoy 10 fishery was open, Table IV-15).

In 1999, there was no late-season Area 4B add-on fishery, because effort out of Neah Bay through the end of September had not been sufficient to take the ocean quota (Table IV-15).

There are numerous other inside recreational fishing opportunities in Puget Sound and coastal streams and estuaries which are not addressed in this chapter of the review. (See Appendix B for some indication of harvest in these other fisheries).

SALMON FISHERY INCOME IMPACTS AND COMMUNITY DEPENDENCE

Coastal community impacts are presented in order to address concerns about the effects of regulations on local economies and small businesses. Income impact estimates per commercial pound and per recreational day were generated using the Fishery Economic Assessment Model. Reference information on the model is available from the Council.

Interpretation of State and Coastal Community Income Impacts

Estimated state and community income impacts of commercial and recreational ocean salmon fisheries and selected state-managed fisheries are shown in Tables IV-16 through IV-20. The impacts presented are estimates of total personal income associated with activity in the commercial and recreational salmon fisheries in counties and states. Income impact estimates are based on the landings in the area, an inventory of the fleet and processors, estimates of fleet and processor expenditures, surveys of the expenditure patterns of recreational fishers, and income coefficients from the U.S. Forest Service IMPLAN model. Commercial ocean harvest not landed in the coastal areas (e.g., landed in Puget Sound ports) is not included in the estimates of coastal community impacts, but is included in the estimate of state impacts.

The numbers presented here are estimates of annual trends and the possible redirection of money between nonfishing-dependent and fishing-dependent sectors; they are likely an upper bounds on the local community and state income impacts which may have been generated by West Coast ocean salmon fisheries as well as some selected inside fisheries. All income impact estimates in this review are reported in real (inflation adjusted) 1999 dollars.

West Coast Ocean Fishery Income Impacts

The total state level income impact associated with the recreational and troll ocean fisheries for all three states combined was $39.7 million, up 36% from the historic low of $29.2 million of 1998, but 70% below the 1976 through 1998 average. State level income impacts related to the commercial non-Indian ocean troll fishery ($19.4 million) were up 50% compared to 1998, but were 77% below the 1976 through 1998 average; and those impacts related to the 1999 ocean recreational fishery ($20.3 million) were up 24% compared to 1999, but were 55% below the 1976 through 1998 average (all comparisons are adjusted for inflation). These coastwide values, while low compared to historic averages, do not reveal the greater reductions which have occurred in particular communities.

Selected Inside Fisheries

Columbia River Commercial Fisheries

In the past, the non-Indian and treaty Indian Columbia River commercial fisheries generated a substantial amount of community income for the Oregon and Washington communities on the Columbia River. For 1999, income impacts associated with the Columbia River commercial catch are estimated to be $2.6 million, compared to $1.3 million in 1998 and a 1987 through 1995 average of $18.3 million (inflation adjusted, Table IV-19).

Buoy 10 and Area 4B Add-On

Estimated local community income impacts associated with the 1999 Buoy 10 fishery ($2.1 million) were 60% above 1998 levels, but 46% below the 1987 through 1998 inflation adjusted average of $3.9 million (Table IV-20). In 1999, there was no late season Area 4B add-on fishery, because effort out of Neah Bay through the end of September had not been sufficient to take the ocean quota (Table IV-20).

TABLE IV-1. Average monthly **exvessel** troll salmon **price** in dollars per dressed pound for **California, Oregon, and Washington** in 1999. (Page 1 of 1)

Species/Grade	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				CALIFORNIA					
Chinook[a/]	2.95	2.42	1.60	1.89	2.30	2.75	-	-	1.89
Coho	-	-	-	-	-	-	-	-	-
				OREGON					
Chinook									
Large (>11 Pounds)	2.83	2.83	1.69	1.77	1.90	2.34	2.85	3.03	1.97
Medium (7-11 Pounds)	2.49	2.49	1.51	1.55	1.64	2.13	2.76	2.92	1.70
Small (<7 Pounds)	2.12	2.16	1.36	1.37	1.46	1.88	2.77	3.00	1.51
Ungraded Chinook	2.76	2.95	1.93	1.89	2.02	2.37	2.93	3.01	2.30
Weighted Average	2.63	2.73	1.66	1.73	1.81	2.29	2.89	3.02	1.94
Mixed Coho	-	-	-	1.00	1.03	-	-	-	1.03
				WASHINGTON[b/]					
Chinook									
Large (>11 Pounds)	-	2.35	1.87	1.45	1.44	-	-	-	1.79
Medium (8-11 Pounds)	-	2.42	1.87	1.53	1.55	-	-	-	1.93
Small (<8 Pounds)	-	1.61	1.17	1.25	1.24	-	-	-	1.36
Ungraded Chinook	-	2.53	1.86	-	1.41	-	-	-	2.23
Weighted Average	-	2.31	1.84	1.46	1.47	-	-	-	1.81
Mixed Coho	-	-	-	0.86	0.85	1.14	-	-	0.88

a/ Chinook salmon are typically sold in two and sometimes three size categories. Prices paid in these categories are not extracted from dealer ticket information.
b/ Non-Indian data only.

TABLE IV-2. **Troll** chinook and coho landed in **California**, estimates of **exvessel value and average price** (dollars per dressed pound). (Page 1 of 1)

	Chinook				Coho				Total[a/]	
Year	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[b/] (dollars)	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[b/] (dollars)	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)
1979	17,356	34,358	2.53	5.01	2,303	4,559	2.19	4.34	19,659	38,917
1980	12,741	23,165	2.27	4.13	408	742	1.36	2.47	13,149	23,907
1981	13,417	22,324	2.25	3.74	905	1,506	1.94	3.23	14,322	23,830
1982	18,754	29,417	2.55	4.00	735	1,153	1.36	2.13	19,489	30,570
1983	4,290	6,464	2.09	3.15	318	479	1.25	1.88	4,608	6,943
1984	6,875	9,989	2.67	3.88	687	998	1.99	2.89	7,562	10,988
1985	11,390	16,047	2.56	3.61	125	176	1.57	2.21	11,515	16,223
1986	14,874	20,509	2.01	2.77	238	328	1.18	1.63	15,112	20,837
1987	25,130	33,680	2.78	3.73	493	661	2.00	2.68	25,623	34,341
1988	41,221	53,447	2.86	3.71	706	915	2.21	2.87	41,927	54,363
1989	13,095	16,349	2.39	2.98	390	487	1.69	2.11	13,485	16,836
1990	11,434	13,738	2.77	3.33	622	747	1.98	2.38	12,056	14,485
1991	8,351	9,706	2.58	3.00	696	809	1.52	1.77	9,047	10,515
1992	4,487	5,105	2.74	3.12	18	20	1.63	1.85	4,505	5,125
1993	5,707	6,323	2.25	2.49	-	-	-	-	5,707	6,323
1994	6,437	6,985	2.07	2.25	-	-	-	-	6,437	6,985
1995	11,693	12,424	1.76	1.87	-	-	-	-	11,693	12,424
1996	5,984	6,243	1.44	1.50	-	-	-	-	5,984	6,243
1997	7,288	7,479	1.38	1.42	-	-	-	-	7,288	7,479
1998	3,060	3,104	1.66	1.68	-	-	-	-	3,060	3,104
1999[c/]	6,594	6,594	1.89	1.89	-	-	-	-	6,594	6,594

a/ Does not include pink landings.
b/ Expressed in 1999 dollars.
c/ Preliminary.

TABLE IV-3. **Troll** chinook and coho landed in **Oregon**, estimates of **exvessel value and average price** (dollars per dressed pound). (Page 1 of 1)

	Chinook				Coho				Total[a/]	
Year	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[b/] (dollars)	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[b/] (dollars)	Nominal Value (thousands of dollars)	Real Value[b/] (thousands of dollars)
1971-1975	2,036	5,940	0.89	2.64	3,658	10,932	0.64	1.88	5,694	16,872
1976-1980	5,366	11,194	2.16	4.57	6,407	13,935	1.51	3.18	11,773	25,129
1981	4,039	6,720	2.57	4.28	5,534	9,208	1.66	2.76	9,573	15,928
1982	6,094	9,559	2.59	4.06	3,801	5,962	1.40	2.20	9,895	15,521
1983	1,244	1,874	1.90	2.86	1,052	1,585	0.96	1.45	2,296	3,459
1984	1,477	2,162	2.74	4.01	118	180	1.66	2.53	1,595	2,341
1985	5,045	7,108	2.48	3.49	729	1,027	1.51	2.13	5,774	8,135
1986	5,976	8,240	1.77	2.44	1,978	2,727	1.04	1.43	7,954	10,968
1987	13,467	18,049	2.60	3.48	3,296	4,417	1.72	2.31	16,763	22,467
1988	13,940	18,075	3.19	4.14	7,596	9,849	2.28	2.96	21,536	27,924
1989	7,894	9,856	2.23	2.78	2,131	2,661	1.07	1.34	10,025	12,516
1990	5,627	6,761	2.58	3.10	1,014	1,218	1.60	1.92	6,641	7,979
1991	1,721	2,000	2.47	2.87	1,399	1,626	0.99	1.15	3,120	3,626
1992	2,490	2,833	2.46	2.80	222	253	1.08	1.23	2,712	3,085
1993	1,661	1,840	2.18	2.42	10	11	1.13	1.25	1,671	1,851
1994	690	749	2.40	2.60	-	-	-	-	690	749
1995	3,294	3,500	1.70	1.81	-	-	-	-	3,294	3,500
1996	3,007	3,137	1.56	1.63	-	-	-	-	3,007	3,137
1997	2,469	2,534	1.60	1.64	-	-	-	-	2,469	2,534
1998[c/]	2,297	2,330	1.64	1.66	-	-	-	-	2,297	2,330
1999[c/]	1,400	1,400	1.94	1.94	1	1	1.03	1.03	1,401	1,401

a/ Does not include pink landings.
b/ Expressed in 1999 dollars.
c/ Preliminary.

TABLE IV-4. **Non-Indian troll** chinook and coho landed in **Washington**, estimates of **exvessel value and average price** (dollars per dressed pound).[a/] (Page 1 of 1)

Year or Average	Chinook				Coho				Total[b/]	
	Nominal Value (thousands of dollars)	Real Value[c/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[c/] (dollars)	Nominal Value (thousands of dollars)	Real Value[c/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[c/] (dollars)	Nominal Value (thousands of dollars)	Real Value[c/] (thousands of dollars)
1971-1975	2,714	8,021	0.89	2.65	3,060	9,066	0.66	1.97	5,775	17,087
1976-1980	5,313	11,480	2.39	5.01	6,086	13,120	1.67	3.51	11,399	24,600
1981	3,279	5,456	2.66	4.43	2,642	4,396	1.52	2.53	5,921	9,852
1982	4,246	6,660	2.57	4.03	2,484	3,896	1.34	2.10	6,730	10,556
1983	1,152	1,736	1.72	2.59	313	472	0.93	1.40	1,465	2,207
1984	255	371	2.78	4.04	155	225	1.48	2.15	410	596
1985	837	1,179	2.57	3.62	764	1,076	1.32	1.86	1,601	2,256
1986	808	1,114	2.35	3.24	367	506	1.16	1.60	1,175	1,620
1987	1,606	2,152	2.97	3.98	354	474	1.67	2.24	1,960	2,626
1988	2,289	2,968	2.95	3.82	48[d/]	62	2.45	3.18	2,337	3,030
1989	955	1,192	2.22	2.78	275	343	1.31	1.64	1,230	1,536
1990	890	1,069	2.57	3.09	758	911	1.52	1.83	1,648	1,980
1991	783	910	2.54	2.95	343	399	1.13	1.31	1,126	1,309
1992	1,200	1,365	2.41	2.74	99	113	1.33	1.51	1,299	1,478
1993	728	807	2.21	2.44	67	74	1.02	1.12	795	881
1994	e/	e/	e/	e/	-	-	-	-	e/	e/
1995	e/	e/	e/	e/	91	97	0.83	0.88	91	97
1996	e/	e/	e/	e/	59	61	0.86	0.90	59	87
1997	125	128	1.55	1.59	-	0	-	0.00	125	128
1998	123	125	1.51	1.53	-	0	-	0.00	123	125
1999	377	377	1.90	1.90	19	19	0.88	0.88	396	396

a/ All values in this table are based on preliminary information available at the start of each year's salmon review.
b/ Does not include pink landings.
c/ Expressed in 1999 dollars.
d/ There was no legal coho fishery in 1988. This value is for landings of fish caught south of Cape Falcon and seizures of illegal fish.
e/ Chinook were caught off Oregon and landed in Washington. Value information is not provided in order to preserve confidentiality.

TABLE IV-5. **Non-Indian troll** caught **pink** salmon landed in **Oregon and Washington**, estimates of exvessel value and average price (dollars per dressed pound). (Page 1 of 1)

	Oregon				Washington				Total	
Year	Nominal Value (thousands of dollars)	Real Value[a/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[a/] (dollars)	Nominal Value (thousands of dollars)	Real Value[a/] (thousands of dollars)	Nominal Price Per Pound (dollars)	Real Price Per Pound[a/] (dollars)	Nominal Value (thousands of dollars)	Real Value[a/] (thousands of dollars)
1977	244	559	0.64	1.47	836	1,912	0.53	1.22	1,080	2,471
1978	b/	b/	1.40	3.00	13	27	0.82	1.76	13	27
1979	91	179	0.85	1.69	1,564	3,096	0.54	1.07	1,655	3,276
1980	1	2	0.87	1.57	7	13	0.91	1.66	9	16
1981	215	358	0.80	1.33	522	868	0.50	0.83	737	1,226
1982	b/	b/	0.75	1.18	1	1	0.56	0.88	1	1
1983	b/	b/	0.74	1.11	97	147	0.28	0.42	97	147
1984	-	-	-	-	b/	b/	0.64	0.93	0	0
1985	172	242	0.66	0.94	242	341	0.46	0.65	414	583
1986	1	1	0.56	0.77	b/	b/	0.21	0.29	1	1
1987	69	93	0.79	1.06	7	10	0.62	0.84	77	103
1988	2	2	1.64	2.13	b/	b/	0.88	1.15	2	2
1989	13	17	0.74	0.92	107	133	0.70	0.88	120	150
1990	1	1	1.28	1.54	b/	b/	0.73	0.88	1	1
1991	4	5	0.53	0.62	79	91	0.47	0.55	83	96
1992	b/	b/	1.02	1.16	b/	b/	0.54	0.61	b/	b/
1993	b/	b/	0.62	0.68	5	6	0.54	0.60	5	6
1994	-	-	-	-	-	-	-	-	-	-
1995	b/	b/	0.60	0.64	30	32	0.26	0.28	30	32
1996	-	-	-	-	b/	b/	0.90	0.94	b/	b/
1997	b/	b/	0.56	0.58	b/	b/	0.20	0.21	b/	b/
1998	-	-	-	-	-	b/	-	0.91	-	b/
1999[c/]	b/	b/	0.67	0.67	b/	b/	0.38	0.38	b/	b/

a/ Expressed in 1999 dollars.
b/ Less than 500.
c/ Preliminary.

TABLE IV-6. **Pounds** of salmon **landed** by the commercial **troll** ocean fishery for major **California** port areas.[a/] (Page 1 of 1)

Year or Average	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	State Total
			CHINOOK (thousands of dressed pounds)			
1976-1980	393	1,403	1,449	1,733	889	5,867
1981-1985	350	428	1,128	1,806	742	4,454
1986	151	457	2,147	2,751	1,891	7,397
1987	313	656	3,115	3,874	1,090	9,047
1988	188	557	4,201	7,177	2,307	14,431
1989	103	220	1,359	2,545	1,263	5,490
1990	20	133	671	1,892	1,407	4,122
1991	4	79	467	1,685	1,004	3,238
1992	b/	1	21	996	613	1,632
1993	3	11	220	1,316	987	2,537
1994	b/	6	77	2,189	831	3,103
1995	5	26	130	3,277	3,197	6,633
1996	3	92	278	1,695	2,046	4,113
1997	b/	14	35	2,711	2,488	5,248
1998	1	22	35	1,080	709	1,845
1999[c/]	1	24	28	2,363	1,066	3,483
			COHO (thousands of dressed pounds)			
1976-1980	360	391	277	109	48	1,184
1981-1985	89	104	89	54	9	345
1986	30	30	103	30	8	202
1987	32	67	140	7	1	246
1988	19	78	174	46	2	320
1989	29	24	137	38	3	231
1990	-	15	125	142	32	314
1991	1	19	55	270	115	459
1992	-	b/	b/	10	1	11
1993	-	-	-	-	-	-
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	-	-	-	-	-	-
1999	-	-	-	-	-	-

a/ The major port areas listed include the following ports: Crescent City includes only Crescent City; Eureka also includes Trinidad and Humboldt Bay locations; Fort Bragg also includes Shelter Cove, Noyo Harbor, Mendocino, and Pt. Arena; San Francisco also includes Bodega Bay, San Francisco Bay, and Half Moon Bay; Monterey also includes Santa Cruz, Moss Landing, Monterey, Morro Bay, and Santa Barbara.

b/ Less than 500 pounds.

c/ Preliminary.

TABLE IV-7. **Pounds** of salmon **landed** by the commercial **troll** ocean salmon fishery for major **Oregon** port areas.[a/] (Page 1 of 1)

Year or Average	Astoria	Tillamook	Newport	Coos Bay	Brookings	State Total
			CHINOOK (thousands of dressed pounds)			
1976-1980	171	118	530	908	700	2,427
1981-1985	92	45	271	638	386	1,432
1986	61	119	751	1,990	449	3,370
1987	83	419	997	2,997	685	5,182
1988	37	341	1,231	2,198	580	4,387
1989	50	302	777	1,945	449	3,532
1990	28	139	388	1,452	174	2,181
1991	9	110	267	292	18	695
1992	17	108	676	206	7	1,013
1993	5	86	460	182	28	761
1994	b/	29	165	45	47	287
1995	6	96	1,330	453	55	1,941
1996	21	125	1,219	417	142	1,926
1997	3	32	1,053	381	73	1,542
1998	b/	66	953	326	52	1,398
1999[c/]	13	32	194	403	80	721
			COHO (thousands of dressed pounds)			
1976-1980	385	660	1,190	1,661	357	4,252
1981-1985	133	293	451	550	111	1,537
1986	109	418	885	393	101	1,905
1987	57	380	517	894	67	1,916
1988	17	766	1,375	1,087	91	3,336
1989	115	530	615	672	63	1,996
1990	69	272	73	197	24	634
1991	69	431	440	464	7	1,411
1992	6	33	112	55	b/	206
1993	8	1	-	-	-	9
1994	-	-	-	-	-	-
1995	-	-	-	-	-	-
1996	-	-	-	-	-	-
1997	-	-	-	-	-	-
1998	-	-	-	-	-	-
1999[c/]	1	-	-	-	-	1

a/ The port areas listed include landings in the following ports: Astoria also includes Gearhart/Seaside and Cannon Beach; Tillamook also includes Garibaldi, Netarts, Pacific City, and Nehalem Bay; Newport also includes Depoe Bay, Siletz Bay, Salmon River, and Waldport; Coos Bay also includes Florence, Winchester Bay, Charleston, and Bandon; Brookings also includes Port Orford and Gold Beach.

b/ Less than 500.

c/ Preliminary.

TABLE IV-8 a/b/ **Pounds** of salmon **landed** by the **non-Indian commercial troll** ocean salmon fishery for major **Washington** port areas. (Page 1 of 1)

Year	Neah Bay	La Push	Westport	Ilwaco	Coastal Community Total	Puget Sound	State Total
			CHINOOK (thousands of dressed pounds)				
1976-1980	288	421	919	261	1,889	426	1,543
1981-1985	88	32	370	74	564	124	689
1986	50	21	141	75	286	55	342
1987	42	20	367	65	494	51	545
1988	94	30	250	57	430	348	778
1989	20	2	277	28	327	124	451
1990	149	15	135	17	315	34	349
1991	128	7	127	14	276	32	308
1992	160	46	232	10	447	58	507
1993	122	35	132	2	291	41	332
1994 c/	-	-	-	-	-	7	7
1995 c/	-	-	3	-	3	12	15
1996 c/	-	-	4	1	5	13	19
1997	20	d/	45	0	66	15	80
1998	30	0	34	0	64	18	82
1999	62	2	66	3	134	65	199
			COHO (thousands of dressed pounds)				
1976-1980	600	786	1,066	678	3,130	496	3,626
1981-1985	133	63	277	142	616	128	744
1986	58	30	118	72	279	38	317
1987	9	15	135	47	206	7	213
1988	1	0	2	8	11	9	20
1989	121	2	19	79	221	24	245
1990	159	46	214	61	480	20	501
1991	87	16	126	45	274	31	304
1992	25	13	21	4	63	12	75
1993	11	7	43	2	63	3	66
1994	-	-	-	-	-	-	-
1995	84	18	7	-	109	2	111
1996	45	1	23	0	68	d/	68
1997	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-
1999	7	1	4	1	12	9	21

a/ All values in this table are based on preliminary information available at the start of each year's review.

b/ The major port areas listed may include smaller ports as follows: Neah Bay includes only Neah Bay; La Push also includes Kalaloch; Westport also includes Aberdeen, Bay City, Copalis Beach, Hoquiam, Moclips, Taholah, Bay Center, Grayland Beach, Raymond, South Bend, and Tokeland; Ilwaco also includes Long Beach, Nahcotta, Naselle, and all Columbia River Ports; Puget Sound includes all Puget Sound ports east of Neah Bay.

c/ There was no ocean commercial fishery for chinook north of Cape Falcon, however, chinook were caught off Oregon and landed in Washington.

d/ Less than 500.

TABLE IV-9. **Exvessel values** (expressed in 1999 dollars) of inriver **commercial** harvest of **Columbia River** salmon.[a/] (Page 1 of 1)

Fishery	Species	Average Price Per Landed Pound[b/] (dollars) 1987-1995	1996	1997	1998	1999[c/]	Exvessel Value (thousands of dollars) 1987-1995	1996	1997	1998	1999[c/]	Pounds (thousands) 1987-1995	1996	1997	1998	1999[c/]
	OREGON															
Non-Indian[d/]	Chinook															
Gillnet	Spring[e/]	3.92	2.25	2.62	2.61	2.81	488	25	68	92	79	122	11	26	35	28
	Fall	1.42	0.51	0.80	0.98	1.23	2,455	64	58	31	88	1,248	126	73	31	72
	Tules	0.45	0.13	0.19	0.23	0.19	141	13	14	5	3	210	103	70	22	17
	Coho	1.37	0.65	0.76	0.67	0.84	1,342	139	113	129	394	819	215	149	193	469
	Chum	0.45	0.14	0.26	0.19	0.23	1	g/	0	g/	g/	3	g/	0	g/	-
	TOTAL						4,426	240	253	257	565	2,401	455	318	282	586
Treaty Indian	Chinook															
All Gears	Spring	4.10	0.00	0.00	0.00	0.00	2	0	0	0	0	g/	0	0	0	0
	Fall	1.33	0.64	0.67	0.80	0.84	1,021	34	44	40	64	594	53	66	50	76
	Tules	0.35	0.13	0.16	0.15	0.10	23	12	11	4	5	85	96	70	23	51
	Coho	0.99	0.26	0.26	0.20	0.71	8	g/	g/	g/	3	7	1	1	g/	4
	TOTAL						1,054	46	56	43	72	686	150	137	74	131
	WASHINGTON[f/]															
Non-Indian	Chinook															
Gillnet	Spring	3.95	5.22	5.00	0.00	2.82	282	2	1	-	g/	68	g/	g/	0	g/
	Fall[g/]	1.31	0.62	0.93	1.04	1.03	918	26	8	28	85	509	42	9	27	82
	Coho	1.38	0.70	0.81	0.47	0.84	544	10	2	g/	180	364	14	3	g/	215
	Chum	0.41	0.39	0.31	0.00	0.23	1	g/	g/	0	g/	2	g/	g/	0	1
	TOTAL						1,745	38	12	28	265	942	57	12	28	298
Treaty Indian	Chinook															
All Gears[h/]	Spring	3.92	4.17	3.94	4.06	4.00	7	0	1	g/	g/	2	0	g/	g/	g/
	Fall[i/]	1.08	0.32	0.43	0.48	0.54	1,376	185	273	242	331	911	573	633	508	613
	Coho	1.03	0.31	0.42	0.44	0.71	20	g/	1	1	8	16	g/	2	1	11
	TOTAL						1,403	185	275	243	339	929	574	635	509	623
Columbia River Total							9,659	509	596	571	1,241	4,959	1,236	1,102	893	1,638

a/ Excluding pinks and sockeye salmon.
b/ Gill net exvessel salmon prices are recorded in round weight and, therefore, are not strictly comparable to exvessel troll prices.
c/ Preliminary.
d/ Mainstem below Bonneville and select areas (Youngs Bay, Tongue Point, Blind Slough, and Deep River).
e/ "Spring" is the combined totals for the "winter" fishery in the mainstem (January through February): the "spring" fisheries for Youngs Bay (February through July); and Tongue Point and Blind Slough (May through July).
f/ Washington prices are based on a combination of Washington and Oregon value information.
g/ Includes fall brights, tules, and jacks. Price changes may reflect a change in the mix of brights, tules, and jacks rather than annual price changes.
h/ Includes Drano Lake (Little White Salmon River north), Priest Rapids Pool, and Klickitat dipnet fisheries.
i/ Includes fall brights, tules, and jacks. Price changes may reflect a change in the mix of brights, tules, and jacks rather than annual price changes.

TABLE IV-10. **California, Oregon, and Washington** ocean **recreational** salmon **effort** in thousands of angler trips and **catch** in thousands of fish by boat type. (Page 1 of 2)

Year or Average	Angler Trips		Chinook Catch[a/]		Coho Catch[a/]	
	Charter	Private	Charter	Private	Charter	Private
			CALIFORNIA			
1981-1990	82.4	111.4	87.4	50.4	3.4	26.7
1981	61.1	60.8	59.8	24.2	1.1	9.5
1982	79.9	91.4	91.5	47.2	3.9	22.8
1983	56.9	65.8	46.5	17.3	0.5	26.7
1984	61.5	65.5	68.2	19.6	0.8	18.2
1985	85.1	106.8	107.3	63.8	1.4	14.4
1986	86.4	109.2	86.5	55.1	2.2	16.5
1987	105.0	163.3	121.8	70.7	4.3	43.0
1988	101.7	140.7	109.1	62.3	3.5	31.2
1989	108.0	137.0	105.0	81.7	6.2	43.4
1990	78.4	173.7	78.3	61.6	10.2	41.5
1991	69.2	127.4	39.9	40.6	13.5	55.8
1992	47.7	80.2	42.4	31.1	1.0	10.5
1993	66.0	108.9	66.0	44.0	4.2	25.6
1994	72.8	117.1	99.1	84.1	b/	0.5
1995	152.9	225.6	182.0	215.2	b/	0.9
1996	84.6	140.9	72.9	91.2	b/	0.6
1997	102.6	131.7	122.4	106.6	b/	0.5
1998	67.0	85.0	59.7	62.3	b/	0.1
1999[c/]	62.4	85.6	40.0	47.7	b/	0.6
			OREGON[d/e/]			
1981-1990	51.1	186.2	6.6	27.8	59.3	132.6
1979	73.7	187.7	5.4	13.3	59.8	101.8
1980	79.1	218.9	5.1	11.9	98.3	207.5
1981	65.4	245.8	6.6	22.5	64.5	135.3
1982	43.3	182.7	8.2	30.6	48.5	126.7
1983	41.9	184.1	4.7	20.0	39.7	107.2
1984	24.3	128.7	2.2	14.8	27.3	96.1
1985	53.4	198.2	9.2	46.6	60.2	122.8
1986	43.7	143.3	4.2	18.7	75.0	143.9
1987	60.9	194.2	14.3	45.1	61.9	118.7
1988	62.5	188.2	7.3	31.0	73.5	153.3
1989	60.2	206.1	4.2	27.9	85.8	187.5
1990	55.3	191.2	5.1	21.5	61.6	139.1
1991	40.3	149.7	1.9	12.5	68.9	190.2
1992	30.0	135.4	2.7	9.9	46.2	139.6
1993	13.4	66.9	0.9	5.6	16.2	43.1
1994	1.4	25.5	0.5	5.5	-	b/
1995	4.6	31.2	0.3	6.4	4.0	7.9
1996	5.6	38.3	1.2	10.1	3.0	4.2
1997	3.9	26.4	1.5	6.2	2.4	3.6
1998	1.8	24.2	0.5	3.6	0.5	1.8
1999[c/]	5.5	43.9	0.9	6.9	3.4	10.3

TABLE IV-10. **California, Oregon, and Washington** ocean **recreational** salmon **effort** in thousands of angler trips and **catch** in thousands of fish by boat type. (Page 2 of 2)

Year or Average	Angler Trips		Chinook Catch[a/]		Coho Catch[a/]	
	Charter	Private	Charter	Private	Charter	Private
			WASHINGTON[f/g/]			
1981-1990	77.8	64.7	29.3	11.9	95.7	73.3
1979	220.8	89.8	61.1	15.7	227.9	62.4
1980	193.9	86.2	41.1	12.5	288.4	73.1
1981	162.2	74.6	62.8	21.7	182.4	55.5
1982	131.9	86.8	85.8	21.0	124.0	82.5
1983	123.0	90.4	39.1	9.5	122.6	89.2
1984	29.9	46.8	7.7	7.4	38.5	49.6
1985	62.9	49.8	17.4	9.2	99.0	69.0
1986	58.1	51.4	13.3	7.9	98.0	77.7
1987	53.7	48.3	27.7	12.9	59.9	58.6
1988	32.4	37.1	11.2	7.8	46.1	43.7
1989	58.5	65.9	11.2	8.1	95.2	94.5
1990	65.0	94.4	16.6	13.0	90.9	113.6
1991	43.7	69.6	5.0	7.3	80.2	111.6
1992	38.2	56.8	11.8	6.6	48.5	62.6
1993	40.2	68.9	5.8	6.9	52.8	62.3
1994	-	-	-	-	-	-
1995	17.9	30.0	b/	0.4	26.1	37.4
1996	15.3	23.5	b/	0.2	24.5	24.4
1997	12.5	15.1	1.7	2.3	12.5	12.8
1998	5.5	6.8	1.1	0.9	5.6	7.1
1999[c/]	17.5	29.9	5.7	4.1	16.3	23.7

a/ Catch numbers may include some illegal harvest.
b/ Less than 50 fish.
c/ Preliminary.
d/ Salmon data from surveyed ports only. These generally include Astoria, Garibaldi, Depoe Bay, Newport, Winchester Bay, Coos Bay, and Brookings. Since 1981, Pacific City and Florence have also been included. Gold Beach data are included from 1981-1987. Astoria was not included in 1994.
e/ Numbers do not include angling from the Columbia River jetty.
f/ Numbers do not include angling from the Columbia River jetty or from the late-season state waters Area 4B fishery.
g/ Values for 1982-1985 include some inriver Columbia River fishing after closure of the ocean fishery.

TABLE IV-11. Estimates of **California recreational** ocean salmon angler **trips** by port area and boat type. (Page 1 of 2)

Year	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	State Total
			CHARTER TRIPS (thousands)			
1976	0.8	2.2	4.1	66.2	7.9	81.2
1977	1.0	1.2	1.7	72.0	4.8	80.7
1978	2.4	1.3	0.9	47.3	1.3	53.2
1979	2.2	0.7	3.3	69.6	3.1	79.0
1980	1.4	0.6	2.0	62.4	2.9	69.3
1981	0.6	0.5	1.3	56.1	2.7	61.1
1982	0.5	0.4	2.4	72.2	4.4	79.9
1983	0.5	1.4	1.6	50.8	2.7	56.9
1984	0.5	0.9	1.4	56.8	1.9	61.5
1985	1.6	3.5	2.3	74.6	3.2	85.1
1986	1.1	2.8	2.8	69.6	10.1	86.4
1987	1.5	3.8	4.6	82.9	12.3	105.0
1988	0.9	2.5	5.6	81.1	11.7	101.7
1989	0.6	5.4	4.5	83.5	14.0	108.0
1990	0.8	3.2	2.7	54.3	17.4	78.4
1991	1.0	2.1	5.4	43.7	17.0	69.2
1992	0.1	0.2	1.5	38.6	7.3	47.7
1993	0.4	1.0	2.0	53.2	9.4	66.0
1994	0.2	0.2	1.3	63.9	7.2	72.8
1995	0.1	0.7	3.8	79.2	68.9	152.9
1996	a/	0.6	5.0	57.6	21.4	84.6
1997	-	0.8	2.2	69.1	30.6	102.6
1998	-	0.3	2.7	44.2	19.7	67.0
1999 b/	-	0.4	2.2	51.0	8.8	62.4
			PRIVATE TRIPS (thousands)			
1976	27.9	28.2	13.0	30.5	6.3	106.0
1977	21.8	25.5	14.0	34.2	5.1	100.7
1978	15.0	19.8	8.5	48.7	5.4	97.5
1979	9.6	17.3	6.5	34.7	6.7	74.8
1980	17.8	22.5	4.4	23.7	6.7	75.1
1981	13.4	15.8	6.8	19.0	5.7	60.8
1982	24.6	22.3	8.0	28.7	7.7	91.4
1983	21.2	21.5	6.8	9.5	6.8	65.8
1984	23.3	17.9	4.6	8.2	11.4	65.5
1985	29.5	31.4	12.6	18.7	14.6	106.8
1986	24.5	26.1	10.4	22.1	26.1	109.2
1987	50.6	42.4	9.4	25.5	35.4	163.3
1988	43.0	30.3	12.2	27.0	28.2	140.7
1989	33.0	37.7	13.0	11.5	41.7	137.0
1990	41.9	35.4	11.9	35.4	49.0	173.7
1991	24.5	25.3	17.2	26.5	33.8	127.4
1992	9.0	8.9	9.7	23.4	29.1	80.2
1993	15.0	17.3	17.4	29.6	29.7	108.9
1994	9.4	6.3	18.1	43.7	39.6	117.1
1995	11.8	12.0	25.4	62.2	114.2	225.6
1996	11.3	13.6	26.2	46.6	43.2	140.9
1997	6.6	11.6	18.0	42.1	53.5	131.7
1998	3.3	6.4	5.7	36.9	32.7	85.0
1999 b/	5.8	11.6	8.2	38.8	21.2	85.6

TABLE IV-11. Estimates of **California recreational** ocean salmon angler **trips** by port area and boat type. (Page 2 of 2)

Year	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	State Total
			TOTAL TRIPS (thousands)			
1976	28.7	30.5	17.0	96.8	14.2	187.2
1977	22.8	26.7	15.7	106.2	9.9	181.3
1978	17.4	21.2	9.5	96.1	6.6	150.7
1979	11.7	18.0	9.8	104.3	9.9	153.7
1980	19.2	23.1	6.4	86.1	9.6	144.4
1981	14.1	16.3	8.1	75.1	8.4	122.0
1982	25.1	22.8	10.4	100.9	12.1	171.3
1983	21.7	22.8	8.4	60.3	9.5	122.7
1984	23.8	18.8	6.0	65.0	13.3	127.0
1985	31.0	34.9	15.0	93.3	17.8	191.9
1986	25.6	28.9	13.2	91.7	36.2	195.6
1987	52.1	46.1	14.0	108.4	47.7	268.3
1988	43.9	32.8	17.8	108.1	39.9	242.4
1989	33.6	43.0	17.5	95.0	55.7	244.9
1990	42.7	38.7	14.6	89.7	66.5	252.1
1991	25.6	27.4	22.6	70.2	50.8	196.6
1992	9.1	9.1	11.2	62.0	36.4	127.9
1993	15.4	18.3	19.3	82.8	39.1	174.9
1994	9.7	6.4	19.4	107.6	46.8	189.9
1995	11.9	12.8	29.3	141.5	183.1	378.5
1996	11.3	14.2	31.3	104.2	64.5	225.4
1997	6.6	12.4	20.2	111.2	84.0	234.4
1998	3.3	6.7	8.3	81.0	52.4	151.8
1999[b/]	5.8	12.0	10.4	89.8	30.0	148.0

a/ Less than 50.
b/ Preliminary.

TABLE IV-12. Estimates of **Oregon recreational** ocean salmon angler **trips** by port area and boat type. (Page 1 of 2)

Year	Astoria	Tillamook	Newport	Coos Bay	Brookings	State Total
			CHARTER TRIPS (thousands)			
1979	18.5	2.8	26.7	22.7	3.0	73.7
1980	26.3	3.7	26.7	19.6	2.8	79.1
1981	16.0	3.1	25.5	17.6	3.2	65.4
1982	11.8	2.1	14.6	11.4	3.4	43.3
1983	12.9	1.8	11.5	12.1	3.6	41.9
1984	2.7	2.5	11.1	5.9	2.1	24.3
1985	8.3	5.3	23.1	12.5	4.2	53.4
1986	7.7	3.0	20.0	9.6	3.4	43.7
1987	8.0	5.5	28.4	14.4	4.6	60.9
1988	2.4	7.3	34.2	15.6	3.0	62.5
1989	9.1	5.2	28.3	13.1	4.4	60.2
1990	8.5	5.5	26.6	12.2	2.5	55.3
1991	8.1	2.5	19.2	8.4	2.1	40.3
1992	4.6	2.7	14.8	7.4	0.5	30.0
1993	5.8	0.5	4.7	1.8	0.6	13.4
1994	0.0[a/]	1.2	b/	b/	0.2	1.4
1995	2.5	1.2	0.6	b/	0.3	4.6
1996	1.9	0.8	2.1	0.1	0.6	5.6
1997	1.3	0.3	1.8	0.0	0.5	3.9
1998	0.4	0.1	0.8	0.2	0.3	1.8
1999[c/]	1.7	0.3	2.3	0.5	0.7	5.5
			PRIVATE TRIPS (thousands)			
1979	24.3	16.3	45.4	52.9	48.8	187.7
1980	20.1	29.3	56.6	65.2	47.7	218.9
1981	28.7	34.9	51.8	66.3	64.0	245.8
1982	15.4	22.5	38.8	47.9	58.0	182.7
1983	18.0	23.5	31.0	59.6	52.1	184.1
1984	4.4	21.3	32.8	34.3	35.9	128.7
1985	11.7	33.2	47.4	51.0	54.8	198.2
1986	12.8	15.0	32.2	34.0	49.3	143.3
1987	9.1	23.6	48.6	48.1	64.8	194.2
1988	3.2	26.0	55.5	53.5	50.0	188.2
1989	10.7	26.1	54.4	53.5	61.3	206.1
1990	17.0	28.0	44.8	52.8	48.6	191.2
1991	13.6	18.5	34.0	49.3	34.4	149.7
1992	8.3	23.4	38.3	48.2	17.2	135.4
1993	12.7	5.1	12.4	13.6	23.2	66.9
1994	0.0[a/]	9.1	0.1	0.4	16.0	25.5
1995	7.2	3.9	0.4	0.7	19.1	31.2
1996	3.7	7.5	0.6	3.8	22.7	38.3
1997	2.3	3.4	0.6	3.9	16.1	26.4
1998	1.7	5.9	0.5	2.2	13.8	24.2
1999[c/]	5.7	10.9	5.0	7.1	15.1	43.8

TABLE IV-12. Estimates of **Oregon recreational** ocean salmon angler **trips** by port area and boat type. (Page 2 of 2)

Year	Astoria	Tillamook	Newport	Coos Bay	Brookings	State Total
			TOTAL TRIPS (thousands)			
1979	43.3	31.0	72.4	94.7	60.0	301.3
1980	46.3	47.8	83.9	97.4	56.0	331.4
1981	44.7	38.0	77.3	83.9	67.1	311.0
1982	27.2	24.6	53.5	59.4	61.4	226.0
1983	30.9	25.3	42.6	71.6	55.7	226.0
1984	8.3	25.0	41.5	40.2	38.0	153.1
1985	20.0	38.6	70.6	63.5	59.0	251.6
1986	20.5	17.9	52.2	43.6	52.7	187.0
1987	17.1	29.1	76.9	62.6	69.4	255.1
1988	5.7	33.3	89.6	69.0	53.1	250.7
1989	19.8	31.3	82.8	66.6	65.8	266.3
1990	25.5	33.5	71.4	65.0	51.1	246.6
1991	21.7	21.0	53.3	57.7	36.4	190.1
1992	12.9	26.1	53.1	55.6	17.7	165.3
1993	17.8	5.6	17.1	15.3	23.8	79.6
1994	0.0[a/]	10.3	0.1	0.4	16.2	26.9
1995	9.6	5.1	0.9	0.7	19.4	35.8
1996	5.6	8.3	2.8	3.9	23.3	44.0
1997	3.6	3.7	2.4	3.9	16.6	30.2
1998	2.1	6.0	1.3	2.4	14.1	26.0
1999[c/]	7.4	11.2	7.4	7.6	15.8	49.4

a/ The fishery north of Cape Falcon was closed, and it is assumed that no trips were taken out of Astoria into the south of Cape Falcon area. No samplers were stationed in Astoria.
b/ Less than 50 fish.
c/ Preliminary.

TABLE IV-13. Estimates of **Washington recreational** ocean salmon angler **trips** by port area. (Page 1 of 1)

Year	Neah Bay[a/]	La Push	Westport	Ilwaco[b/]	Coastal Area Total
		CHARTER TRIPS (thousands)			
1984[c/]	0.3	0.0	11.6	18.0	29.9
1985[c/]	2.0	0.0	42.2	20.7	64.9
1986	2.4	0.0	36.6	19.1	58.1
1987	1.9	0.0	34.1	17.7	53.7
1988	2.0	0.0	23.5	6.9	32.4
1989	1.5	0.0	40.8	16.2	58.5
1990	2.1	0.0	43.4	19.5	65.0
1991	1.4	0.2	28.6	13.5	43.7
1992	0.7	0.2	28.1	9.2	38.2
1993	1.0	0.1	27.4	11.7	40.2
1994	-	-	-	-	-
1995	0.2	0.1	12.7	5.0	17.9
1996	0.2	d/	10.3	4.8	15.3
1997	0.1	0.1	10.0	2.4	12.5
1998	0.0	0.0	4.5	1.1	5.5
1999[e/]	0.5	0.1	11.5	5.5	17.5
		PRIVATE TRIPS (thousands)			
1984[c/]	8.3	0.2	2.3	36.0	46.8
1985[c/]	15.2	1.5	13.7	19.4	49.8
1986	17.4	1.7	14.8	17.5	51.4
1987	17.9	2.0	9.8	18.6	48.3
1988	14.8	2.8	13.9	5.6	37.1
1989	15.0	1.6	18.7	30.6	65.9
1990	19.5	4.2	25.9	44.8	94.4
1991	14.8	3.3	24.2	27.3	69.6
1992	11.0	2.3	25.6	17.9	56.8
1993	18.4	2.8	23.5	24.2	68.9
1994	-	-	-	-	-
1995	5.3	1.4	9.0	14.2	30.0
1996	9.1	1.3	5.2	7.9	23.5
1997	2.8	0.9	7.3	4.1	15.1
1998	0.0	0.6	3.5	2.6	6.8
1999[e/]	7.6	2.9	7.6	11.8	29.9
		TOTAL TRIPS (thousands)			
1984[c/]	8.6	0.2	13.9	54.0	76.7
1985[c/]	17.2	1.5	55.9	40.1	114.7
1986	19.8	1.7	51.4	36.6	109.5
1987	19.8	2.0	43.9	36.3	102.0
1988	16.8	2.8	37.4	12.5	69.5
1989	16.5	1.6	59.5	46.8	124.4
1990	21.6	4.2	69.3	64.3	159.4
1991	16.2	3.5	52.8	40.8	113.3
1992	11.7	2.5	53.7	27.1	95.0
1993	19.4	2.9	50.9	35.9	109.1
1994	-	-	-	-	-
1995	5.5	1.5	21.7	19.2	47.9
1996	9.3	1.3	15.5	12.7	38.8
1997	2.9	0.9	17.3	6.5	27.6
1998	0.0	0.6	8.0	3.7	12.3
1999[e/]	8.1	2.9	19.1	17.3	47.4

a/ Does not include effort from the late-season state water Area 4B fishery.
b/ Does not include effort from the Columbia River Jetty.
c/ Values for 1984 and 1985 include some Columbia River fishing after closure of the ocean fishery.
d/ Less than 50 fish.
e/ Preliminary.

TABLE IV-14. **Oregon and Washington recreational** salmon, bottomfish, and sturgeon **angler trips** by ocean port area and boat type for the area north of Cape Falcon. (Page 1 of 2)

Year	Columbia River and Buoy 10					Westport			La Push			Neah Bay and Area 4B Add On		
	Charter	Private	Subtotal	Jetty	Total	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total
SALMON EFFORT (thousands)														
1984	NA	NA	-	NA	54.0	11.6	2.3	13.9	0.0	0.2	0.2	0.3	8.3	8.6
1985	NA	NA	-	NA	90.3	42.2	13.7	55.9	0.0	1.5	1.5	2.0	15.2	17.2
1986	NA	NA	-	NA	144.3	36.6	14.8	51.4	0.0	1.7	1.7	2.4	17.4	19.8
1987	39.5	130.0	169.5	9.0	178.5	34.1	9.8	43.9	0.0	2.0	2.0	1.9	17.8	19.7
1988	34.5	154.4	188.9	13.0	201.9	23.5	13.9	37.4	0.0	2.8	2.8	2.0	14.8	16.8
1989	39.9	161.8	201.7	18.6	220.3	40.8	18.7	59.5	0.0	1.6	1.6	2.8	25.5	28.3
1990	32.7	125.5	158.2	11.6	169.8	43.4	25.9	69.3	0.0	4.2	4.2	3.0	30.8	33.8
1991	37.7	170.1	207.8	28.6	236.4	28.6	24.2	52.8	0.2	3.3	3.5	1.9	23.5	25.4
1992	22.3	116.6	138.9	22.3	161.2	28.1	25.6	53.7	0.2	2.3	2.5	1.1	18.6	19.7
1993	20.2	103.3	123.5	18.5	142.0	27.4	23.5	50.9	0.1	2.8	2.9	1.6	25.7	27.3
1994	0.5	6.3	6.8	2.4	9.2	-	-	-	-	-	-	-	-	-
1995	9.0	43.4	52.4	6.0	58.4	12.7	9.0	21.7	0.1	1.4	1.5	0.3	9.2	9.5
1996	7.3	26.8	34.1	5.2	39.3	10.3	5.2	15.5	c/	1.3	1.3	0.3	10.6	10.9
1997	8.4	53.0	61.3	4.7	66.0	10.0	7.3	17.3	0.1	0.9	0.9	0.2	4.6	4.8
1998	3.2	30.7	33.9	3.0	36.8	4.5	3.5	8.0	0.0	0.6	0.6	0.1	6.3	6.4
1999[a/]	8.7	63.9	72.6	4.8	77.4	11.5	7.6	19.1	0.1	2.9	2.9	0.5	7.6	8.1
BOTTOMFISH EFFORT (thousands)[b/]														
1984	2.1	0.1	2.2	-	-	12.4	0.5	12.9	0.0	0.	0.	1.8	12.3	14.1
1985	1.9	0.2	2.1	-	-	15.3	1.0	16.3	0.0	0.1	0.1	3.0	10.6	13.6
1986	1.7	0.2	1.9	-	-	19.6	0.8	20.4	0.0	0.2	0.2	3.5	11.4	14.9
1987	1.7	0.3	2.0	0.5	2.5	21.1	1.2	22.3	0.0	0.5	0.5	5.6	16.0	21.6
1988	2.1	0.2	2.3	0.8	3.1	24.4	1.1	25.5	0.0	0.7	0.7	5.7	14.8	20.5
1989	1.2	0.6	1.8	1.5	3.3	19.3	1.0	20.3	0.0	0.6	0.6	6.8	16.3	23.1
1990	1.4	0.3	1.7	2.4	4.1	21.8	0.8	22.6	0.0	0.8	0.8	6.4	18.1	24.5
1991	1.3	0.4	1.7	1.8	3.5	23.5	1.1	24.6	0.0	0.9	0.9	5.9	18.2	24.1
1992	1.4	0.5	1.9	2.3	4.1	20.5	2.2	22.7	0.0	1.5	1.5	4.8	19.1	23.9
1993	2.2	0.6	2.8	2.6	5.4	21.5	1.8	23.0	0.1	1.1	1.2	5.1	19.2	24.3
1994	2.7	0.7	3.3	2.7	6.0	26.0	1.7	27.7	0.2	1.9	2.1	4.1	15.0	19.1
1995	1.3	0.9	2.3	2.2	4.4	21.1	1.6	22.7	c/	1.6	1.6	4.1	19.2	23.3
1996[d/e/]	1.2	0.5	1.7	1.7	3.4	21.4	1.2	22.6	0.0	1.6	1.6	4.8	21.0	25.8
1997	1.2	0.7	2.0	2.5	4.4	19.2	1.4	20.6	0.0	2.2	2.2	4.9	22.7	27.7
1998	1.8	0.5	2.3	0.9	3.2	21.5	1.3	22.8	0.0	1.2	1.2	5.1	23.9	29.0
1999[a/]	1.0	0.5	1.5	0.5	2.0	17.1	1.2	18.3	0.1	1.0	1.1	4.5	20.3	24.9

TABLE IV-14. **Oregon and Washington recreational** salmon, bottomfish, and sturgeon **angler trips** by ocean port area and boat type for the area north of Cape Falcon. (Page 2 of 2)

Year	Columbia River and Buoy 10					Westport			La Push			Neah Bay and Area 4B Add On		
	Charter	Private	Subtotal	Jetty	Total	Charter	Private	Total	Charter	Private	Total	Charter	Private	Total
STURGEON EFFORT (thousands of trips)[f/]														
1984	1.7	28.4	30.1	-	30.1	-	-	-	-	-	-	-	-	-
1985	5.0	32.9	37.9	-	37.9	-	-	-	-	-	-	-	-	-
1986	5.7	37.7	43.4	-	43.4	-	-	-	-	-	-	-	-	-
1987	6.0	45.9	51.9	-	51.9	-	-	-	-	-	-	-	-	-
1988	6.2	34.4	40.6	-	40.6	-	-	-	-	-	-	-	-	-
1989	4.3	24.3	28.6	-	28.6	-	-	-	-	-	-	-	-	-
1990	3.9	30.9	34.8	-	34.8	-	-	-	-	-	-	-	-	-
1991	3.7	28.7	32.4	-	32.4	-	-	-	-	-	-	-	-	-
1992	5.0	42.3	47.3	-	47.3	-	-	-	-	-	-	-	-	-
1993	6.1	53.2	59.3	-	59.3	-	-	-	-	-	-	-	-	-
1994	7.5	43.9	51.4	-	51.4	-	-	-	-	-	-	-	-	-
1995	7.7	59.5	67.2	-	67.2	-	-	-	-	-	-	-	-	-
1996	11.1	52.8	63.9	-	63.9	-	-	-	-	-	-	-	-	-
1997	12.2	48.4	60.7	-	60.7	-	-	-	-	-	-	-	-	-
1998	14.2	64.3	78.5	-	78.5	-	-	-	-	-	-	-	-	-
1999[a/]	13.2	57.1	70.3	-	70.3									

a/ Preliminary.
b/ Oregon data is a minimum estimate as the jetty is not sampled, and bottomfish sampling of vessels only occurs when the ocean is open for salmon.
c/ Less than 50 fish.
d/ No Oregon bottomfish trips are included.
e/ Includes tuna trips: Ilwaco - 9 charter, 14 private; Westport - 784 charter, 0 private.
f/ Annual sturgeon angler trips for the lower Columbia River from the western tip of Puget Island to mouth.

TABLE IV-15. **Buoy 10 and Area 4B add-on recreational** salmon **angler trips** and **catch** by boat type.[a/] (Page 1 of 2)

	Angler Trips			Chinook Catch			Coho Catch			Pink Catch	
Year	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private
					OREGON BUOY 10[b/]						
1987	3,829	38,131	3,884	1,557	11,556	41	2,244	13,318	203	0	0
1988	7,318	50,992	3,917	1,255	8,525	38	7,658	35,688	979	0	0
1989[c/]	3,882	38,445	4,252	303	3,920	21	2,906	18,792	995	0	0
1990[c/]	917	21,812	4,063	52	1,482	17	343	4,260	581	0	0
1991	3,956	44,370	6,884	321	2,674	26	6,519	54,004	3,003	0	0
1992	2,496	29,610	6,055	246	2,530	33	1,219	10,716	1,842	0	0
1993	684	20,244	6,052	36	1,225	89	264	5,316	1,328	0	0
1994	210	2,732	1,244	-	-	-	34	481	211	0	0
1995	174	8,680	2,538	7	145	0	64	1,366	560	0	0
1996	179	6,122	2,285	59	419	0	66	1,361	532	0	0
1997	1,071	16,207	2,744	273	4,032	0	592	5,411	761	0	0
1998	588	9,949	631	145	2,191	0	59	1,169	31	0	0
1999[d/]	454	19,030	1,370	125	3,834	9	18	3,357	146	0	0
					WASHINGTON BUOY 10						
1987	9,845	63,851	5,054	3,610	25,188	148	5,651	24,607	1,147	0	9
1988	17,839	94,534	8,842	2,847	18,051	54	18,208	78,767	2,117	0	6
1989[c/]	10,708	82,803	8,367	936	10,661	59	7,790	45,624	2,613	3	30
1990[c/]	3,764	41,852	4,003	200	3,361	12	1,380	11,193	631	0	0
1991	11,780	84,867	17,064	1,098	7,422	67	20,208	117,882	5,506	0	63
1992	6,147	60,827	10,346	907	6,796	143	4,415	23,489	1,401	0	0
1993	2,035	46,151	608	290	3,648	0	912	13,090	22	0	16
1994	316	3,561	1,126	-	-	-	101	826	96	0	0
1995	516	12,921	396	37	664	0	246	2,716	103	0	0
1996	352	9,096	0	37	894	0	123	2,455	0	0	0
1997	3,614	30,334	1,755	1,125	7,701	22	2,143	11,290	160	0	0
1998	1,080	16,388	1,362	333	3,075	40	188	1,584	44	0	0
1999[d/]	1,055	27,672	0	185	5,697	0	175	5,165	0	0	0

TABLE IV-15. **Buoy 10 and Area 4B add-on recreational** salmon **angler trips** and **catch** by boat type.[a/] (Page 2 of 2)

	Angler Trips			Chinook Catch			Coho Catch			Pink Catch	
Year	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private	Jetty	Charter	Private
					TOTAL BUOY 10						
1987	13,674	101,982	8,938	5,167	36,744	189	7,895	37,925	1,350	0	9
1988	25,157	145,526	12,759	4,102	26,576	92	25,866	114,455	3,096	0	6
1989[c/]	14,590	120,483	12,619	1,239	14,581	80	10,696	64,416	3,608	3	30
1990[c/]	4,681	63,664	8,066	252	4,843	29	1,723	15,453	12,129	0	0
1991	15,838	129,135	23,948	1,419	10,096	93	26,727	171,886	8,509	0	63
1992	8,643	90,437	16,401	1,153	9,326	176	5,634	34,205	3,243	0	0
1993	2,719	66,395	6,660	326	4,873	89	1,176	18,406	1,350	0	16
1994	526	6,293	2,370	-	-	-	135	1,307	307	0	0
1995	690	21,601	2,934	42	809	0	310	4,082	663	0	0
1996	531	15,218	2,285	96	1,313	0	189	3,816	532	0	0
1997	4,685	46,541	4,499	1,398	11,733	22	2,735	16,701	921	0	0
1998	1,668	26,337	1,993	478	5,266	40	247	2,753	75	0	0
1999[d/]	1,509	46,702	1,370	310	9,531	9	193	8,522	146	0	0
					TOTAL AREA 4B ADD-ON[e/]						
1989	1,238	10,572	-	67	385	-	2,278	17,603	-	71	423
1990	962	11,283	-	57	359	-	1,974	18,312	-	0	0
1991	553	8,684	-	31	349	-	1,064	14,068	-	86	1,457
1992	406	7,589	-	0	33	-	757	10,954	-	0	0
1993	623	7,257	-	16	202	-	908	7,260	-	143	884
1994	-	-	-	-	-	-	-	-	-	0	0
1995	134	3,877	-	0	26	-	169	4,471	-	61	1,539
1996	36	1,511		0	5		61	2,266	-	0	0
1997	136	1,788	-	0	4	-	65	1,429	-	139	412
1998	71	6,296	-	5	98	-	125	7,937	-	0	3
1999[f/]	-	-	-	-	-	-	-	-	-	-	-

a/ Prior to 1987, data on charter and private anglers were combined. Total Buoy 10 catch and effort data prior to 1987 are provided in Table B-21.
b/ Private effort and catch data includes the Clatsop Spit bank fishery.
c/ Does not include the Chinook/Hammond fishery.
d/ Preliminary.
e/ There was no Area 4B add-on fishery prior to 1989.
f/ There was no Area 4B add-on fishery opening in 1999, because the Area 4 ocean quota was not attained.

TABLE IV-16. Estimates of **California coastal community and state personal income** impacts of the troll and recreational ocean salmon fishery for major port areas.[a/] (Page 1 of 1)

Year or Average	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	Coastal Community Total[b/]	State Total
				OCEAN TROLL (thousands of dollars)[c/]			
1976-1980	5,923	16,221	15,979	21,296	9,710	69,129	87,740
1981-1985	2,637	3,181	7,443	14,050	4,788	32,099	39,964
1986	762	2,121	9,715	16,055	10,301	38,954	49,142
1987	2,266	4,451	18,628	29,121	4	54,469	75,882
1988	1,194	3,766	25,912	52,715	12	83,600	119,483
1989	620	1,144	6,888	15,587	6,889	31,129	38,229
1990	111	782	4,099	13,204	8,149	26,345	32,078
1991	17	423	2,379	11,140	5,653	19,614	23,735
1992	2	3	101	6,233	3,203	9,543	11,286
1993	7	43	868	6,640	4,380	11,937	14,484
1994	0	26	321	10,072	3,299	13,719	16,216
1995	13	87	429	13,561	10,605	24,695	30,091
1996	9	289	795	5,590	5,887	12,569	15,738
1997	1	44	113	9,078	6,488	15,723	19,276
1998	4	79	129	4,055	2,054	6,321	7,631
1999[d/]	3	89	131	9,565	3,447	13,236	15,677
				RECREATIONAL (thousands of dollars)			
1976-1980	1,009	1,170	681	10,239	686	13,785	15,463
1981-1985	1,105	1,139	546	9,068	724	12,583	14,163
1986	1,238	1,496	779	10,346	2,218	16,077	18,465
1987	2,478	2,344	917	12,278	2,861	20,879	24,329
1988	2,064	1,655	1,149	12,126	2,479	19,473	22,484
1989	1,577	2,296	1,076	11,574	3,323	19,846	23,102
1990	2,006	1,967	837	9,088	4,008	17,906	21,375
1991	1,236	1,386	1,363	7,203	3,282	14,470	17,264
1992	420	431	606	6,365	2,058	9,880	11,429
1993	731	900	1,010	8,623	2,306	13,571	15,680
1994	452	310	968	10,816	2,520	15,066	17,109
1995	556	630	1,573	13,863	12,280	28,902	34,672
1996	519	684	1,739	10,152	4,154	17,248	20,176
1997	302	615	1,058	11,134	5,575	18,684	21,778
1998	149	324	532	7,736	3,275	12,017	13,860
1999[d/]	266	575	609	8,852	1,864	12,167	13,751

a/ Expressed in 1999 dollars. Per pound and per day estimates of income impacts provided from output of the Fishery Economic Assessment Model. These are the income impacts associated with expenditures in the troll or recreational sectors. There is no differentiation between money new to the area and money which would otherwise have been expended in other sectors. It is assumed that all fish landed at a port is processed in the port area.

b/ Income impacts on the coastal economy. Totals do not include impacts of one coastal community on another.

c/ Excluding pink salmon.

d/ Preliminary.

TABLE IV-17. Estimates of **Oregon coastal community and state personal income** impacts of the troll and recreational ocean salmon fishery for major port areas.[a/] (Page 1 of 1)

Year or Average	Astoria	Tillamook	Newport	Coos Bay	Brookings[b/]	Coastal Community Total[c/]	State Total
OCEAN TROLL (thousands of dollars)[d/]							
1976-1980	3,329	4,285	10,056	15,469	6,434	39,574	53,661
1981-1985	1,082	1,395	3,266	5,754	2,501	13,997	19,023
1986	591	1,549	5,246	8,590	1,800	17,776	24,079
1987	700	3,499	6,967	18,874	3,762	33,802	45,648
1988	304	5,431	13,521	18,147	3,503	40,906	55,067
1989	541	2,605	4,668	9,709	1,928	19,452	26,308
1990	357	1,482	2,020	7,383	775	12,017	16,001
1991	195	1,391	2,013	2,254	90	5,943	8,027
1992	92	568	3,019	1,004	27	4,711	6,353
1993	39	335	1,678	670	98	2,820	3,780
1994	1	125	623	177	182	1,109	1,521
1995	21	298	3,793	1,298	152	5,562	7,486
1996	56	358	3,182	1,079	381	5,055	6,864
1997	9	99	2,735	1,027	203	4,073	5,511
1998	0	191	2,506	876	162	3,735	5,019
1999[e/]	33	108	620	1,116	283	2,158	2,900
RECREATIONAL (thousands of dollars)							
1976-1980	2,845	2,169	4,024	5,334	3,514	17,884	23,152
1981-1985	1,650	1,330	3,178	3,241	2,255	11,653	15,130
1986	1,277	861	3,117	2,296	2,128	9,678	12,603
1987	1,152	1,426	4,539	3,326	2,808	13,251	17,280
1988	365	1,684	5,347	3,660	2,119	13,175	17,163
1989	1,325	1,496	4,760	3,423	2,660	13,664	17,808
1990	1,528	1,598	4,223	3,309	2,024	12,682	16,455
1991	1,348	952	3,114	2,806	1,461	9,682	12,524
1992	790	1,162	2,879	2,666	683	8,180	10,555
1993	1,089	245	924	725	915	3,897	5,045
1994	0	466	4	16	612	1,098	1,479
1995	541	262	71	29	736	1,639	2,167
1996	337	367	217	164	896	1,982	2,640
1997	221	160	190	159	642	1,372	1,825
1998	109	240	93	109	539	1,091	1,460
1999[e/]	401	454	410	337	622	2,224	2,911

a/ Expressed in 1999 dollars. Per pound and per day estimates of income impacts provided by the Fishery Economic Assessment Model. These are the income impacts associated with expenditures in the troll or recreational sectors. There is no differentiation between money new to the area and money which would otherwise have been expended in other sectors. It is assumed that all fish landed at a port is processed in the port area.

b/ On average, between 1976-1991 over 50% of the troll fishery community income impacts for the Brookings port area originated from landings in Brookings and Gold Beach. For 1986-1990 an average of about 40% of the impacts for the Brookings port area originated in landings made through Brookings and Gold Beach. In 1992 and 1993, impacts originating through these two ports averaged less than 18% and 11%, respectively, of the total for the Brookings port area. Since 1994, the average has been 61%. Port Orford is the other port included in the Brookings port area.

c/ Income impacts on the coastal economy. Totals do not include impacts of one coastal community on another.

d/ Excludes pink salmon.

e/ Preliminary.

TABLE IV-18. Estimates of **Washington coastal community and state personal income** impacts of the non-Indian troll and recreational ocean salmon fishery for major port areas.[a/] (Page 1 of 1)

Year or Average	Neah Bay	La Push	Westport	Ilwaco[b/]	Coastal Community Total[c/d/]	Puget Sound	State Total
OCEAN TROLL (thousands of dollars)[e/f/]							
1976-1980	4,806	6,562	14,486	4,660	30,514	6,472	46,334
1981-1985	948	384	3,994	856	6,183	1,386	9,068
1986	381	168	1,254	483	2,286	442	3,371
1987	267	170	3,189	475	4,100	385	5,150
1988	522	146	1,615	305	2,588	2,306	5,803
1989	408	13	1,522	288	2,231	627	3,402
1990	1,042	191	1,593	236	3,063	249	4,086
1991	708	63	1,069	140	1,980	232	2,710
1992	653	204	1,249	46	2,152	299	2,962
1993	444	133	720	10	1,307	174	1,801
1994[g/]	0	0	0	0	0	27	32
1995	127	27	30	0	184	43	310
1996	66	2	65	2	135	36	219
1997	50	1	142	0	193	40	273
1998	73	0	104	0	177	45	269
1999	175	6	248	11	441	211	798
RECREATIONAL (thousands of dollars)							
1976-1980	2,073	1,096	11,899	4,695	19,764	-	26,844
1981-1985	1,895	223	8,258	3,842	14,217	-	19,347
1986	880	65	3,958	2,183	7,086	-	9,603
1987	855	77	3,530	2,107	6,568	-	8,916
1988	745	107	2,715	763	4,331	-	5,789
1989	708	61	4,499	2,406	7,675	-	10,396
1990	934	161	5,024	3,177	9,295	-	12,640
1991	691	144	3,593	2,068	6,497	-	8,813
1992	484	106	3,602	1,385	5,576	-	7,496
1993	793	116	3,454	1,812	6,176	-	8,358
1994	0	0	0	0	0	-	0
1995	221	63	1,526	910	2,720	-	3,682
1996	370	49	1,153	671	2,243	-	3,042
1997	116	40	1,210	341	1,708	-	2,269
1998	0	23	553	182	758	-	1,008
1999[h/]	336	120	1,360	867	2,682	-	3,634

a/ Expressed in 1999 dollars. Per pound and per recreational day estimates of income impacts provided by the Fishery Economic Assessment Model. These are the income impacts associated with expenditures in the troll or recreational sectors. There is no differentiation between money new to the area and money which would otherwise have been expended in other sectors. It is assumed that all fish landed at a port is processed in the port area.

b/ Excludes recreational shorebased effort from the north side of the Columbia River jetty.

c/ Income impacts on the coastal economy. Totals do not include impacts of one coastal community on another.

d/ Includes a very small amount of fish landed in other coastal Washington areas.

e/ Excludes pink salmon.

f/ All commercial values in this table are based on preliminary information available at the start of each year's salmon review.

g/ The fishery was closed north of Cape Falcon. Some commercial catch taken south of Cape Falcon was landed in the Puget Sound area.

h/ Preliminary.

TABLE IV-19. Local **personal income impacts** of the **commercial** salmon gillnet fishery on **Oregon and Washington Columbia River** communities.[a/] (Page 1 of 1)

	Species[b/]	1987-1995	1996	1997	1998	1999[c/]
				OREGON		
Non-Indian	Chinook					
Gillnet	Spring	877	60	134	193	122
	Fall Brights	4,621	167	121	58	153
	Tules	244	63	57	19	14
	Coho	2,408	306	232	278	768
	Chum	1	d/	0	0	1
	TOTAL	9,199	588	536	538	1,058
Treaty	Chinook					
All Gears	Spring	3	0	0	0	0
	Fall Brights	1,944	78	99	82	128
	Tules	76	59	51	16	27
	Coho	15	1	1	d/	6
	TOTAL	2,039	138	151	99	161
				WASHINGTON		
Non-Indian	Chinook					
Gillnet	Spring	506	3	2	-	d/
	Fall	1,837	62	16	52	156
	Coho	986	21	5	1	352
	Chum	2	d/	d/	0	1
	TOTAL	3,331	86	24	53	509
Treaty	Chinook					
All Gears	Spring	13	-	2	d/	d/
	Fall	2,710	629	769	641	813
	Coho	37	d/	2	1	16
	TOTAL	2,761	629	773	642	830
Non-Indian		11,481	682	569	601	1,567
Treaty		4,800	767	924	741	991
Columbia River		16,281	1,449	1,493	1,342	2,558

a/ Expressed in 1999 dollars.
b/ See Table IV-10 footnotes for explanation of species categories.
c/ Preliminary.
d/ Less than $500.

TABLE IV-20. Local personal income impacts of the **Buoy 10 recreational** fishery in **Oregon and Washington** and the **Area 4B add-on** fishery in Washington. (Page 1 of 1)

Year	Total Angler Trips (thousands)	Income Impacts (thousands of dollars)[a/]		
		Oregon	Washington	Total
BUOY 10 (including bank fishing)				
1987	125	2,045	3,704	5,749
1988	183	2,900	5,858	8,758
1989	148	2,078	4,643	6,721
1990	76	1,118	2,192	3,310
1991	169	2,425	5,206	7,631
1992	115	1,662	3,431	5,094
1993	76	1,112	2,058	3,170
1994	9	179	217	396
1995	25	463	580	1,043
1996	18	352	396	748
1997	56	858	1,630	2,488
1998	30	478	811	1,289
1999[b/]	50	855	1,203	2,058
AREA 4B ADD-ON[c/]				
1989	12	-	515	515
1990	12	-	516	516
1991	9	-	382	382
1992	8	-	327	327
1993	8	-	333	333
1994	-	-	-	-
1995	4	-	160	160
1996	2	-	61	61
1997	2	-	81	81
1998	6	-	247	247
1999[b/]	0		0	0

a/ Expressed in 1999 dollars.
b/ Preliminary.
c/ There was no Area 4B add-on fishery prior to 1989.

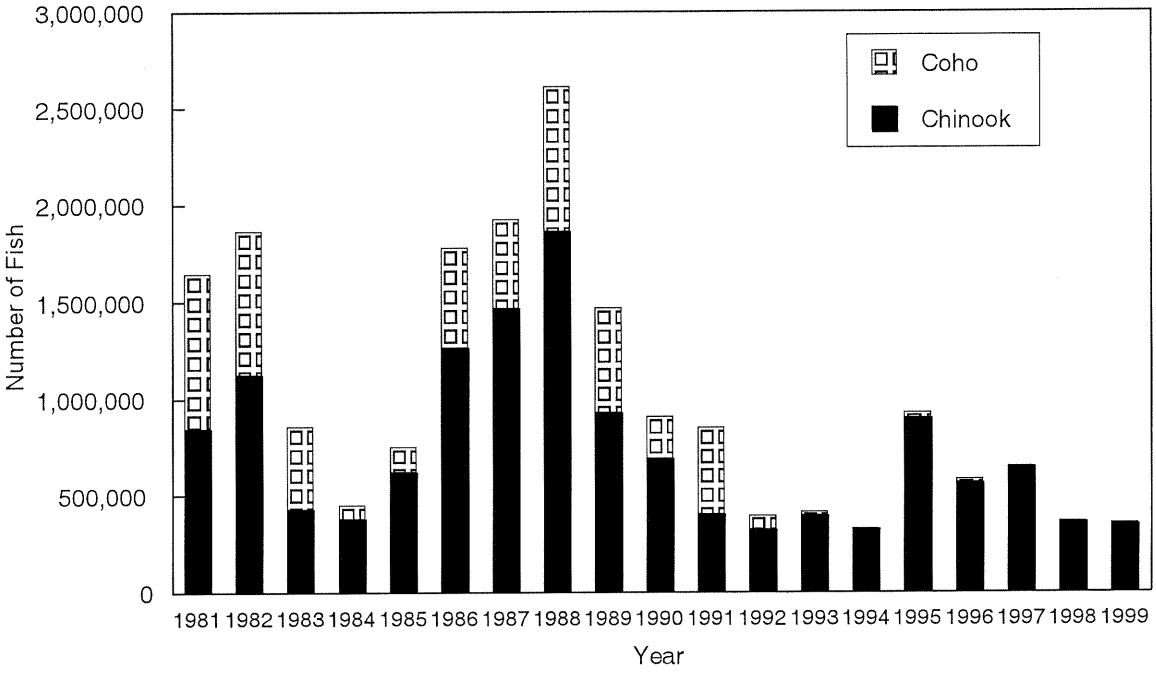

FIGURE IV-1. West Coast non-Indian ocean commercial troll chinook and coho harvest.

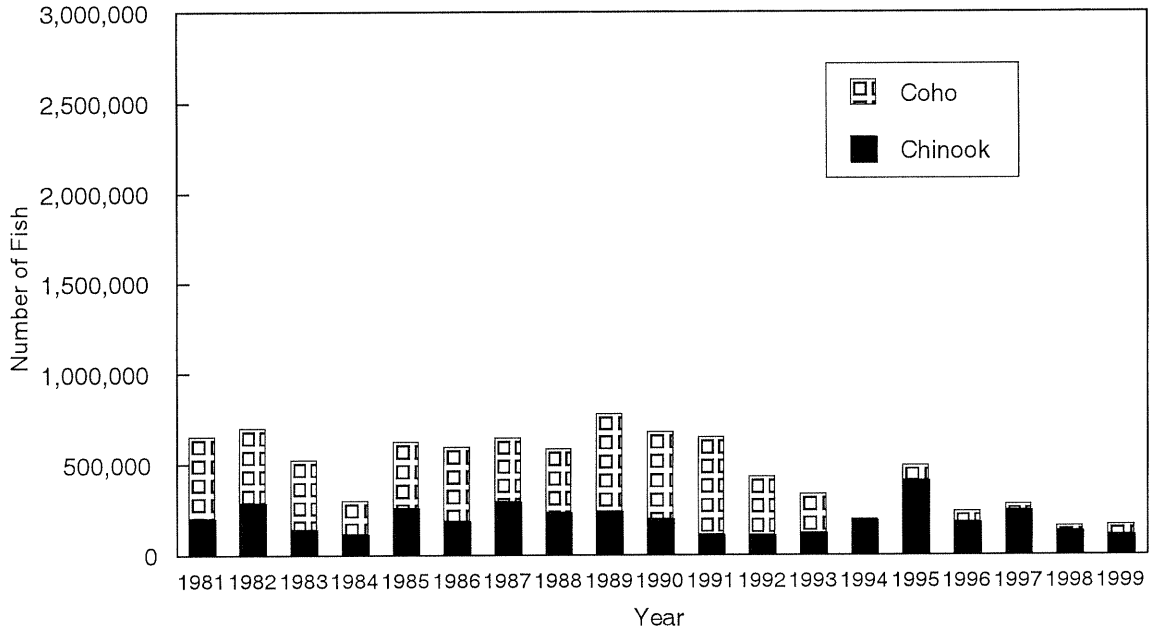

FIGURE IV-2. West Coast recreational ocean chinook and coho harvest.

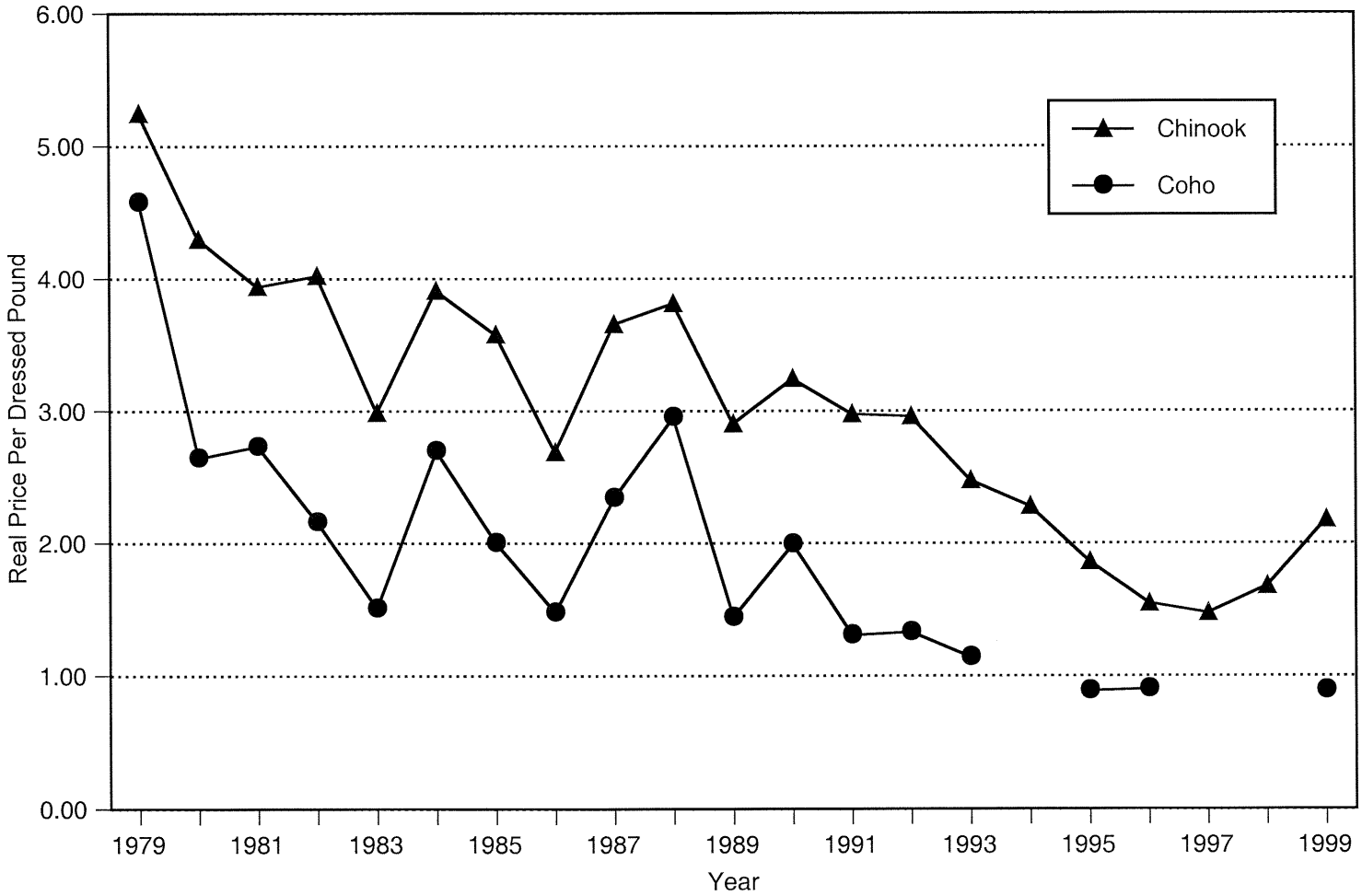

FIGURE IV-3. West Coast non-Indian ocean troll exvessel salmon annual price trends.

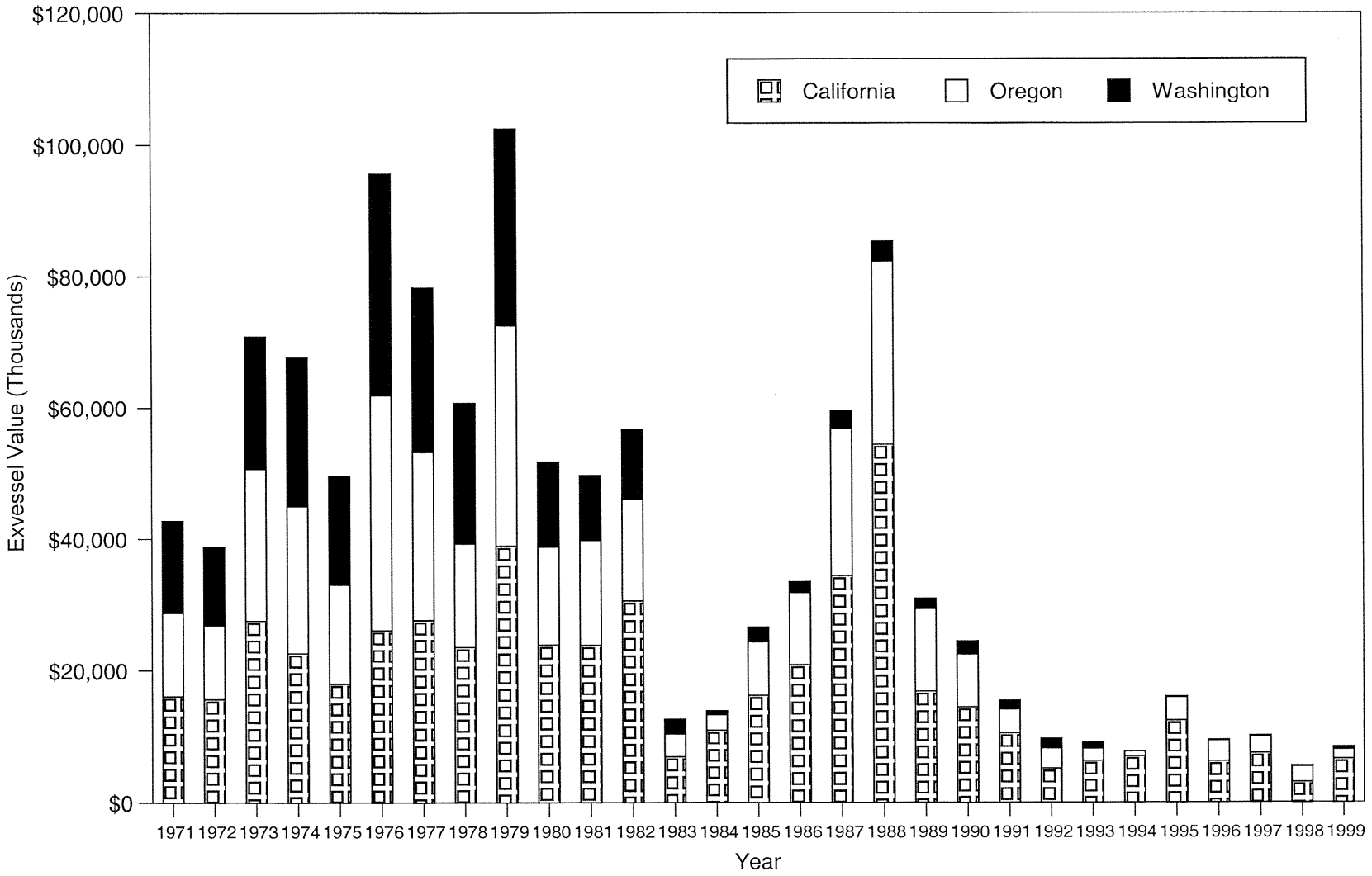

FIGURE IV-4. Exvessel value of troll chinook and coho landings by state of landing (1999 dollars).

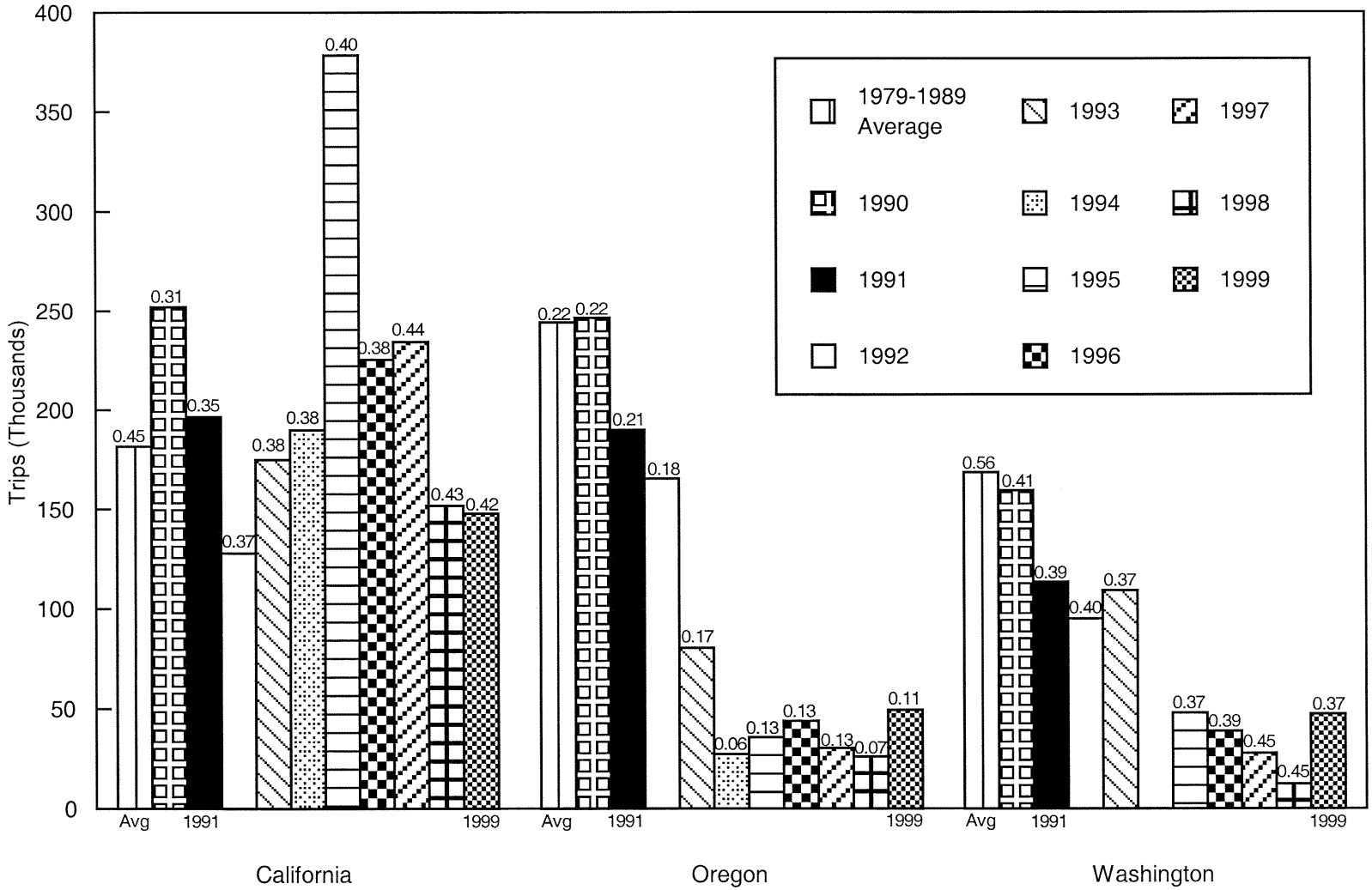

FIGURE IV-5. Total recreational ocean salmon trips by state (with proportion of charter trips shown above each bar).

APPENDIX A
HISTORICAL RECORD OF OCEAN SALMON FISHERY EFFORT AND LANDINGS

LIST OF TABLES

LIST OF TABLES (continued)

TABLE A-1. Summary of **California commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 1 of 2)

Year or Avg.	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	Oregon	Season
			DAYS FISHED (thousands)				
1978-1980[a/]	17.0	18.4	21.9	21.1	16.5	-	95.0
1981-1985	5.9	6.4	13.8	22.1	11.5	-	59.8
1986-1990	0.5	1.6	16.4	25.6	14.4	b/	58.5
1986	1.1	2.6	14.5	19.1	17.4	b/	54.7
1987	0.7	2.0	20.3	24.5	11.0	b/	58.6
1988	0.3	1.5	24.0	35.7	14.2	b/	75.7
1989	0.4	1.2	14.1	26.2	15.5	b/	57.4
1990	0.3	0.7	9.0	22.3	13.9	-	46.2
1991	-	0.6	3.8	18.5	12.3	-	35.3
1992	-	-	-	7.6	12.7	-	20.3
1993	-	-	1.6	12.6	11.7	-	25.9
1994	-	-	0.8	12.4	7.9	-	21.2
1995	-	-	0.9	12.9	12.0	-	25.8
1996	b/	0.4	2.1	8.0	10.6	-	21.1
1997	b/	0.1	0.3	9.5	8.9	-	18.9
1998	b/	0.2	0.3	6.8	5.5	-	12.8
1999[c/]	b/	0.1	0.2	8.8	4.8	-	14.0
			CHINOOK (thousands)				
1976-1980	44.3	166.3	143.9	174.7	89.5	-	618.6
1981-1985	38.8	48.9	110.8	180.0	84.1	-	462.7
1986-1990	12.9	32.3	252.4	351.1	144.8	1.1	794.7
1986	13.8	36.7	272.4	302.3	200.2	0.2	825.6
1987	29.5	54.7	341.2	355.6	91.2	4.0	876.3
1988	14.9	46.4	424.7	642.7	187.8	0.7	1,317.2
1989	5.1	17.5	144.2	255.8	108.0	0.4	530.9
1990	1.4	6.3	79.6	199.1	137.1	-	423.4
1991	-	4.7	35.5	174.8	79.8	-	294.9
1992	-	-	-	66.5	97.0	-	163.4
1993	-	-	19.9	155.0	104.7	-	279.6
1994	-	-	5.2	219.9	70.5	-	295.6
1995	-	-	8.7	357.5	313.1	-	679.3
1996	0.3	8.5	22.9	167.4	181.5	-	380.6
1997	b/	1.4	3.8	253.5	228.7	-	487.4
1998	0.1	2.4	2.9	126.1	95.4	-	226.9
1999[c/]	0.1	2.4	2.3	181.0	78.7	-	264.5

TABLE A-1. Summary of **California commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 2 of 2)

Year or Avg.	Crescent City	Eureka	Fort Bragg	San Francisco	Monterey	Oregon	Season
			COHO (thousands)				
1976-1980	72.1	90.0	51.0	20.8	9.4	-	243.4
1981-1985	16.1	18.9	14.6	7.7	1.4	-	58.7
1986-1990	3.8	6.0	26.0	9.4	1.6	b/	46.8
1986	4.8	4.3	20.8	5.1	1.3	-	36.4
1987	5.6	10.8	25.9	1.2	0.1	0.2	43.7
1988	2.8	10.1	30.9	6.7	0.4	-	51.0
1989	5.8	3.4	25.8	6.5	0.5	-	41.9
1990	-	1.2	26.6	27.4	5.7	-	61.0
1991	-	3.0	4.5	53.3	21.4	-	82.3
1992	-	-	-	0.4	2.1	-	2.5
1993	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-
1998	-	-	-	-	-	-	-
1999 c/	-	-	-	-	-	-	-

a/ Data not available prior to 1978.
b/ Less than 50.
c/ Preliminary.

TABLE A-2. **California commercial troll** salmon fishing **effort** in number of days fished by catch area and month. (Page 1 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				DAYS FISHED (thousands)				
Crescent City[a/]								
1978-1980	b/	2.0	2.8	6.3	5.0	0.8	-	17.0
1981-1985	-	1.1	0.8	1.6	2.0	0.5	-	5.9
1986-1990	-	b/	0.3	0.1	0.2	b/	-	0.5
1986	-	b/	0.2	0.4	0.4	b/	-	1.1
1987	-	b/	0.7	b/	-	b/	-	0.7
1988	-	b/	0.2	-	-	b/	-	0.3
1989	-	b/	0.3	-	0.1	-	-	0.4
1990	-	-	-	-	0.3	-	-	0.3
1991	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	b/	b/	-	b/
1997	-	-	-	-	-	b/	-	b/
1998	-	-	-	-	-	b/	-	b/
1999[c/]	-	-	-	-	-	b/	-	b/
Eureka								
1978-1980	0.2	5.7	4.8	4.1	2.3	1.4	-	18.4
1981-1985	-	1.6	0.9	2.1	1.5	0.3	-	6.4
1986-1990	-	-	0.7	0.1	0.3	0.5	b/	1.6
1986	-	-	0.6	0.5	1.1	0.3	-	2.6
1987	-	-	1.5	-	-	0.5	-	2.0
1988	-	-	0.8	-	-	0.8	-	1.5
1989	-	-	0.6	-	0.1	0.5	0.1	1.2
1990	-	-	-	-	0.4	0.3	b/	0.7
1991	-	-	-	-	-	0.5	0.1	0.6
1992	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-
1996	-	-	-	-	0.1	0.3	-	0.4
1997	-	-	-	-	-	0.1	-	0.1
1998	-	-	-	-	-	0.2	-	0.2
1999c/	-	-	-	-	-	0.1	-	0.1
Fort Bragg								
1978-1980	b/	2.3	3.1	10.0	4.3	2.2	-	21.9
1981-1985	0.1	2.1	2.2	5.5	2.4	1.5	-	13.8
1986-1990	-	2.8	3.9	5.2	3.8	0.8	-	16.4
1986	-	3.4	3.4	4.4	3.1	0.2	-	14.5
1987	-	3.8	4.9	6.8	4.1	0.6	-	20.3
1988	-	4.6	4.9	7.1	5.5	1.8	-	24.0
1989	-	1.1	2.7	4.4	4.9	1.1	-	14.1
1990	-	0.9	3.6	3.0	1.5	0.1	-	9.0
1991	-	-	-	-	3.5	0.3	-	3.8
1992	-	-	-	-	-	-	-	-
1993	-	0.1	-	-	-	1.5	-	1.6
1994	-	-	-	-	-	0.8	-	0.8
1995	-	-	-	-	-	0.9	-	0.9
1996	-	-	-	-	1.3	0.8	-	2.1
1997	-	-	-	-	-	0.3	-	0.3
1998	-	-	-	-	-	0.3	-	0.3
1999c/	-	-	-	-	-	0.2	-	0.2

TABLE A-2. **California commercial troll** salmon fishing **effort** in number of days fished by catch area and month. (Page 2 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				DAYS FISHED (thousands)				
San Francisco								
1978-1980	0.2	5.8	3.5	7.1	2.4	2.0	-	21.1
1981-1985	0.2	3.9	3.0	6.8	5.2	3.0	-	22.1
1986-1990	-	6.5	7.1	5.9	4.1	1.9	-	25.6
1986	-	3.5	4.4	5.9	4.0	1.3	-	19.1
1987	-	6.7	6.4	5.1	4.1	2.3	-	24.5
1988	-	8.1	9.7	9.1	5.5	3.3	-	35.7
1989	-	7.9	7.9	4.0	4.4	2.0	-	26.2
1990	-	6.3	7.1	5.7	2.7	0.5	-	22.3
1991	-	5.2	5.4	3.3	3.2	1.4	-	18.5
1992	-	0.2	-	-	3.9	3.5	-	7.6
1993	-	4.0	1.1	3.1	3.5	0.9	-	12.6
1994	-	3.1	3.2	2.8	2.0	1.4	-	12.4
1995	-	3.4	2.4	3.1	1.8	2.2	-	12.9
1996	-	1.0	2.5	2.2	1.3	1.1	-	8.0
1997	-	2.7	0.3	2.8	2.3	1.4	-	9.5
1998	-	0.7	0.6	2.2	1.7	1.8	-	6.8
1999 c/	0.1	1.2	2.4	3.0	1.7	0.4	-	8.8
Monterey								
1978-1980	0.7	5.3	2.9	4.6	2.2	0.9	-	16.5
1981-1985	0.5	4.2	2.8	2.7	1.0	0.2	-	11.5
1986-1990	-	5.2	4.3	3.4	1.3	0.2	-	14.4
1986	-	7.1	5.4	3.6	1.1	0.3	-	17.4
1987	-	4.4	2.5	3.0	1.1	0.2	-	11.0
1988	-	4.2	4.6	3.7	1.6	0.1	-	14.2
1989	-	5.0	4.3	3.4	2.4	0.3	-	15.5
1990	-	5.5	4.5	3.2	0.6	0.1	-	13.9
1991	-	3.2	5.5	3.1	0.4	0.2	-	12.3
1992	-	5.7	3.3	2.8	0.7	0.1	-	12.7
1993	-	5.2	2.9	2.6	0.9	0.1	-	11.7
1994	-	3.4	1.4	2.6	0.4	0.1	-	7.9
1995	-	5.1	2.8	2.5	1.4	0.2	-	12.0
1996	-	3.7	3.4	3.1	0.3	b/	-	10.6
1997	0.6	3.8	1.7	2.9	b/	b/	-	8.9
1998	-	3.3	1.3	0.8	0.1	b/	-	5.5
1999c/	b/	1.3	2.4	1.0	0.1	b/	-	4.8
Total Statewide								
1978-1980	1.1	21.1	17.1	32.1	16.3	7.3	-	95.0
1981-1985	0.8	12.9	9.5	18.7	12.2	5.6	-	59.8
1986-1990	-	14.5	16.2	14.7	9.7	3.3	b/	58.5
1986	-	14.0	14.0	14.8	9.7	2.2	-	54.7
1987	-	14.9	16.0	14.9	9.3	3.6	-	58.6
1988	-	17.0	20.2	20.0	12.5	6.0	-	75.7
1989	-	14.1	15.8	11.8	11.8	3.9	0.1	57.4
1990	-	12.7	15.2	11.9	5.5	0.9	b/	46.2
1991	-	8.4	10.9	6.3	7.2	2.4	0.1	35.3
1992	-	5.9	3.3	2.8	4.6	3.6	-	20.3
1993	-	9.3	3.9	5.7	4.4	2.6	-	25.9
1994	-	6.5	4.6	5.4	2.4	2.3	-	21.2
1995	-	8.5	5.2	5.6	3.3	3.3	-	25.8
1996	-	4.8	5.9	5.3	3.0	2.2	-	21.1
1997	0.6	6.5	2.0	5.6	2.3	1.8	-	18.9
1998	-	4.0	1.8	3.0	1.8	2.3	-	12.8
1999c/	0.1	2.5	4.8	4.0	1.8	0.7	-	14.0

a/ Includes minor effort off Oregon for fish landed in California.
b/ Less than 50 days.
c/ Preliminary.

TABLE A-3. **California commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month. (Page 1 of 3)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
						CHINOOK (thousands)								**COHO (thousands)**		
Crescent City[a/]																
1976-1980	0.3	14.1	11.0	10.3	6.5	2.0	-	44.3	-	10.0	37.3	20.4	3.5	0.9	-	72.1
1981-1985	-	8.6	5.5	7.1	14.2	3.4	-	38.8	-	2.2	3.1	5.2	5.0	0.5	-	16.1
1986-1990	-	0.4	10.4	1.2	1.5	0.5	-	14.0	-	-	3.5	0.3	b/	b/	-	3.8
1986	-	0.2	4.6	2.8	5.6	0.8	-	14.0	-	-	3.5	1.3	-	-	-	4.8
1987	-	0.8	29.2	3.2	-	0.4	-	33.5	-	-	5.5	0.2	-	0.1	-	5.8
1988	-	0.7	13.8	-	-	1.1	-	15.6	-	-	2.8	-	-	b/	-	2.8
1989	-	0.4	4.4	-	0.6	-	-	5.5	-	-	5.8	-	b/	-	-	5.8
1990	-	-	-	-	1.4	-	-	1.4	-	-	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	0.1	0.2	-	0.3	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	b/	-	b/	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	0.1	-	0.1	-	-	-	-	-	-	-	-
1999[c/]	-	-	-	-	-	0.1	-	0.1	-	-	-	-	-	-	-	-
Eureka																
1976-1980	6.5	77.9	28.6	34.6	13.0	5.7	-	166.3	b/	30.9	39.7	13.7	5.1	0.6	-	90.0
1981-1985	-	20.9	6.0	9.1	10.1	2.7	-	48.9	-	1.3	4.1	8.0	5.3	0.3	-	18.9
1986-1990	-	-	20.9	0.9	4.0	6.3	0.2	32.3	-	-	4.8	0.2	0.1	0.9	0.1	6.0
1986	-	-	15.8	4.3	13.8	2.8	-	36.7	-	-	3.2	0.8	0.2	b/	-	4.3
1987	-	-	50.3	-	-	4.5	-	54.7	-	-	9.6	-	-	1.2	-	10.8
1988	-	-	28.8	-	-	17.6	-	46.4	-	-	8.6	-	-	1.5	-	10.1
1989	-	-	9.8	-	2.0	4.7	0.9	17.5	-	-	2.4	-	0.3	0.4	0.2	3.4
1990	-	-	-	-	4.3	1.9	0.1	6.3	-	-	-	-	0.1	1.2	b/	1.2
1991	-	-	-	-	-	4.3	0.4	4.7	-	-	-	-	-	3.0	0.1	3.0
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	2.5	6.1	-	8.5	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	1.4	-	1.4	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	2.4	-	2.4	-	-	-	-	-	-	-	-
1999[c/]	-	-	-	-	-	2.4	-	2.4	-	-	-	-	-	-	-	-

TABLE A-3. **California commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month. (Page 2 of 3)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
					CHINOOK (thousands)								**COHO (thousands)**			
Fort Bragg																
1976-1980	1.3	24.8	20.9	57.0	26.8	13.0	-	143.9	b/	5.2	28.0	14.5	3.1	0.2	-	51.0
1981-1985	1.5	15.5	21.1	49.0	16.9	6.8	-	110.8	-	0.2	2.7	9.9	1.7	0.2	-	14.6
1986-1990	-	46.9	72.4	91.9	36.2	5.1	-	252.4	-	-	9.1	14.0	2.7	0.2	-	26.0
1986	-	57.0	96.5	90.2	28.1	0.6	-	272.4	-	-	6.9	12.4	1.6	b/	-	20.8
1987	-	71.5	89.4	127.6	49.2	3.4	-	341.2	-	-	9.1	16.6	-	0.2	-	25.9
1988	-	91.5	110.1	157.4	52.2	13.5	-	424.7	-	-	9.0	20.1	1.8	0.1	-	30.9
1989	-	7.4	20.5	64.4	46.3	5.6	-	144.2	-	-	3.9	13.6	7.9	0.3	-	25.8
1990	-	6.8	45.5	19.8	5.0	2.4	-	79.6	-	-	16.6	7.3	2.3	0.4	-	26.6
1991	-	-	-	-	34.3	1.3	-	35.5	-	-	-	-	4.5	-	-	4.5
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	0.4	-	-	-	19.5	-	19.9	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	5.2	-	5.2	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	8.7	-	8.7	-	-	-	-	-	-	-	-
1996	-	-	-	-	14.4	8.5	-	22.9	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	3.8	-	3.8	-	-	-	-	-	-	-	-
1998	-	-	-	-	-	2.9	-	2.9	-	-	-	-	-	-	-	-
1999[c/]	-	-	-	-	-	2.3	-	2.3	-	-	-	-	-	-	-	-
San Francisco																
1976-1980	16.2	53.7	29.7	53.4	12.1	9.6	-	174.7	b/	5.2	10.5	3.6	1.1	0.3	-	20.8
1981-1985	4.7	44.6	25.2	60.6	35.2	9.6	-	180.0	b/	0.2	2.2	4.7	0.5	0.1	-	7.7
1986-1990	-	131.4	111.9	71.2	26.6	10.1	-	351.1	-	-	5.4	3.3	0.7	0.1	-	9.4
1986	-	72.9	119.6	79.8	27.0	3.1	-	302.3	-	-	1.7	3.2	0.1	0.1	-	5.1
1987	-	157.6	110.1	49.8	28.5	9.5	-	355.6	-	-	0.7	0.5	-	-	-	1.2
1988	-	220.7	173.7	175.4	47.1	25.8	-	642.7	-	-	2.8	3.4	0.5	b/	-	6.7
1989	-	121.3	77.8	25.6	20.9	10.3	-	255.8	-	-	3.6	2.1	0.6	0.1	-	6.5
1990	-	84.3	78.5	25.5	9.2	1.5	-	199.1	-	-	18.0	7.2	2.1	0.1	-	27.4
1991	-	58.3	52.2	30.5	28.3	5.5	-	174.8	-	-	33.1	19.7	0.6	-	-	53.3
1992	-	1.8	-	-	38.2	26.5	-	66.5	-	-	-	-	0.4	-	-	0.4
1993	-	60.8	14.8	35.5	40.3	3.6	-	155.0	-	-	-	-	-	-	-	-
1994	-	54.5	69.5	57.0	26.3	12.6	-	219.9	-	-	-	-	-	-	-	-
1995	-	157.0	78.0	84.3	17.0	21.1	-	357.5	-	-	-	-	-	-	-	-
1996	-	22.0	78.0	43.5	12.0	11.9	-	167.4	-	-	-	-	-	-	-	-
1997	-	112.3	14.2	84.2	24.7	17.9	-	253.5	-	-	-	-	-	-	-	-
1998	-	15.2	18.8	62.2	15.3	14.5	-	126.1	-	-	-	-	-	-	-	-
1999[c/]	3.3	16.8	71.1	62.6	23.6	3.7	-	180.1	-	-	-	-	-	-	-	-

TABLE A-3. **California commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month. (Page 3 of 3)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
					CHINOOK (thousands)								**COHO (thousands)**			
Monterey																
1976-1980	9.9	29.5	19.1	18.1	9.4	3.5	-	89.5	b/	3.5	4.0	1.8	0.1	b/	-	9.4
1981-1985	6.1	35.0	16.9	19.4	5.6	1.1	-	84.1	b/	0.1	0.9	0.3	0.1	b/	-	1.4
1986-1990	-	61.5	42.1	30.0	9.0	2.2	-	144.8	-	-	1.0	0.5	0.1	b/	-	1.6
1986	-	93.5	56.7	38.0	10.1	1.9	-	200.2	-	-	0.6	0.6	0.1	b/	-	1.3
1987	-	35.0	22.6	24.8	6.4	2.5	-	91.2	-	-	0.1	0.1	-	b/	-	0.1
1988	-	77.8	56.4	38.2	12.6	2.8	-	187.8	-	-	0.3	b/	b/	-	-	0.4
1989	-	47.0	25.1	22.5	10.6	2.7	-	108.0	-	-	0.2	0.2	0.1	b/	-	0.5
1990	-	54.1	49.9	26.4	5.4	1.3	-	137.1	-	-	3.9	1.7	0.1	b/	-	5.7
1991	-	21.8	34.9	19.1	3.0	1.0	-	79.8	-	-	17.1	4.3	0.1	-	-	21.4
1992	-	49.7	19.0	21.1	4.5	2.6	-	97.0	-	-	1.5	0.5	b/	-	-	2.1
1993	-	49.9	25.5	20.3	8.1	0.9	-	104.7	-	-	-	-	-	-	-	-
1994	-	24.3	11.6	32.2	1.1	1.2	-	70.5	-	-	-	-	-	-	-	-
1995	-	128.4	64.2	105.4	13.9	1.3	-	313.1	-	-	-	-	-	-	-	-
1996	-	75.1	52.3	51.9	2.2	b/	-	181.5	-	-	-	-	-	-	-	-
1997	11.9	86.7	60.4	69.7	-	0.1	-	229.0	-	-	-	-	-	-	-	-
1998	-	61.1	20.6	12.7	0.6	0.5	-	95.4	-	-	-	-	-	-	-	-
1999[c/]	b/	13.8	54.5	8.8	0.5	1.1	-	78.7	-	-	-	-	-	-	-	-
Total Statewide																
1976-1980	34.2	200.0	109.4	173.4	67.9	33.8	-	618.6	b/	54.9	119.5	54.0	12.9	2.0	-	243.4
1981-1985	12.4	124.6	74.7	145.1	82.1	23.7	-	462.7	b/	4.0	13.0	28.2	12.5	1.1	-	58.7
1986-1990	-	240.1	257.8	195.1	77.3	24.1	0.2	794.7	-	-	23.8	18.3	3.6	1.1	0.1	46.8
1986	-	223.6	293.2	215.1	84.5	9.1	-	825.6	-	-	16.0	18.2	2.1	0.1	-	36.4
1987	-	264.9	301.6	205.4	84.1	20.2	-	876.3	-	-	24.9	17.3	-	1.4	-	43.7
1988	-	390.8	382.8	370.9	111.9	60.8	-	1317.2	-	-	23.4	23.6	2.3	1.6	-	51.0
1989	-	176.2	137.6	112.5	80.5	23.3	0.9	530.9	-	-	16.0	15.9	8.9	0.8	0.2	41.9
1990	-	145.2	174.0	71.7	25.4	7.1	0.1	423.4	-	-	38.6	16.3	4.5	1.7	b/	61.0
1991	-	80.1	87.1	49.7	65.6	12.1	0.4	294.9	-	-	50.1	24.0	5.1	3.0	0.1	82.3
1992	-	51.6	19.0	21.1	42.7	29.0	-	163.4	-	-	1.5	0.5	0.5	-	-	2.5
1993	-	111.1	40.4	55.8	48.4	24.0	-	279.6	-	-	-	-	-	-	-	-
1994	-	78.8	81.1	89.2	27.4	19.1	-	295.6	-	-	-	-	-	-	-	-
1995	-	285.5	142.2	189.6	30.9	31.1	-	679.3	-	-	-	-	-	-	-	-
1996	-	97.1	130.3	95.4	31.2	26.6	-	380.6	-	-	-	-	-	-	-	-
1997	11.9	199.1	74.6	153.9	24.7	23.2	-	487.4	-	-	-	-	-	-	-	-
1998	-	76.3	39.4	74.9	15.9	20.4	-	226.9	-	-	-	-	-	-	-	-
1999[c/]	3.3	30.6	125.6	71.5	24.0	9.5	-	264.5	-	-	-	-	-	-	-	-

a/ Includes minor catches made off Oregon and landed in California.
b/ Less than 50 fish.
c/ Preliminary.

TABLE A-4. **California** ocean **recreational** salmon fishing **effort** in angler trips by port and month. (Page 1 of 2)

Year or Avg.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
					ANGLER TRIPS (thousands)						
Crescent City											
1976-1980	-	-	a/	a/	3.7	9.7	5.4	1.2	-	-	20.0
1981-1985	-	-	-	0.6	3.9	11.5	6.6	0.5	-	-	23.1
1986-1990	-	-	-	1.4	11.1	19.3	6.8	1.0	-	-	39.6
1986	-	-	-	1.1	7.3	10.6	6.4	0.2	-	-	25.6
1987	-	-	-	2.0	13.8	22.6	10.7	3.0	-	-	52.1
1988	-	-	-	2.4	13.3	20.7	6.6	0.8	-	-	43.9
1989	-	-	-	1.1	7.4	18.6	6.2	0.3	-	-	33.6
1990	-	-	-	0.6	13.8	23.9	3.8	0.6	-	-	42.7
1991	-	-	-	0.6	8.5	14.0	0.7	1.7	-	-	25.6
1992	-	-	-	-	-	7.2	-	1.8	-	-	9.1
1993	-	-	-	1.0	1.0	6.5	5.8	1.1	-	-	15.4
1994	-	-	-	5.1	2.2	-	1.6	0.9	-	-	9.7
1995	-	-	-	2.8	5.7	-	1.1	2.4	-	-	11.9
1996	-	-	-	1.0	5.1	2.4	2.1	0.8	-	-	11.3
1997	-	-	-	0.9	1.7	1.5	2.2	0.2	-	-	6.6
1998[b/]	-	-	-	0.7	1.5	0.5	0.6	0.1	-	-	3.3
1999	-	-	-	a/	1.5	0.8	3.1	0.4	-	-	5.8
Eureka											
1976-1980	-	-	a/	0.3	5.3	12.6	5.3	0.4	a/	-	23.9
1981-1985	-	-	a/	1.2	4.7	11.7	4.9	0.5	a/	-	23.1
1986-1990	-	-	-	1.6	9.5	18.7	7.1	1.0	-	-	37.9
1986	-	-	-	1.1	7.5	12.7	7.2	0.3	-	-	28.9
1987	-	-	-	1.7	9.5	23.2	9.8	1.9	-	-	46.1
1988	-	-	-	1.5	6.8	17.0	6.1	1.5	-	-	32.8
1989	-	-	-	2.4	11.1	21.4	7.8	0.3	-	-	43.0
1990	-	-	-	1.6	12.5	19.1	4.7	0.8	-	-	38.7
1991	-	-	-	0.3	13.2	13.0	0.3	0.6	a/	-	27.4
1992	-	-	-	-	-	5.8	-	3.3	-	-	9.1
1993	-	-	-	1.6	2.2	6.1	6.0	2.3	-	-	18.3
1994	-	-	-	2.6	1.8	-	1.2	0.8	-	-	6.4
1995	-	-	-	1.4	6.2	-	1.5	3.7	-	-	12.8
1996	-	-	-	2.4	6.5	1.	2.7	1.6	-	-	14.2
1997	-	-	-	2.5	3.4	2.1	4.0	0.4	-	-	12.4
1998[b/]	-	-	-	1.9	1.8	0.6	2.0	0.5	-	-	6.7
1999	-	-	-	0.1	4.1	2.1	5.2	0.4	-	-	12.0
Fort Bragg											
1976-1980	-	-	a/	0.1	1.7	5.6	3.7	0.6	a/	-	11.7
1981-1985	-	-	a/	0.1	2.2	5.0	2.1	0.1	a/	-	9.6
1986-1990	-	a/	0.1	0.7	4.5	7.1	2.5	0.6	a/	-	15.5
1986	-	-	a/	0.2	3.9	6.6	2.6	a/	-	-	13.3
1987	-	a/	0.1	0.2	2.9	7.2	2.4	1.1	-	-	14.0
1988	-	-	0.2	1.5	4.6	8.1	2.8	0.8	-	-	18.0
1989	-	-	0.1	1.4	5.7	6.5	2.8	1.0	a/	-	17.5
1990	-	-	a/	0.2	5.4	7.0	1.8	0.3	-	-	14.6
1991	-	-	a/	0.9	7.0	11.6	3.0	0.1	-	-	22.6
1992	-	a/	0.3	2.2	0.3	6.3	-	1.7	0.4	a/	11.2
1993	a/	0.2	0.4	1.3	2.0	9.4	4.6	1.2	0.1	-	19.3
1994	0.1	0.5	1.2	4.0	8.1	-	4.6	0.9	a/	-	19.4
1995	0.4	0.5	1.6	1.5	13.0	-	9.0	2.6	0.6	-	29.3
1996	a/	0.9	1.9	2.9	12.0	3.0	7.0	2.8	0.7	a/	31.3
1997	-	0.4	1.1	4.0	6.8	3.5	4.1	0.3	-	-	20.2
1998[b/]	-	0.1	-	1.0	2.3	0.5	3.3	1.1	a/	-	8.3
1999	-	0.1	0.2	0.4	1.7	3.2	4.3	0.4	-	-	10.4

TABLE A-4. **California** ocean **recreational** salmon fishing **effort** in angler trips by port and month. (Page 2 of 2)

Year or Avg.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
					ANGLER TRIPS (thousands)						
San Francisco											
1976-1980	8.1	10.3	7.2	8.6	10.4	15.3	15.2	12.5	7.9	2.4	97.9
1981-1985	4.1	5.8	6.0	6.9	10.8	15.0	14.1	9.3	5.6	1.3	78.9
1986-1990	4.8	9.8	12.3	8.9	12.7	18.7	16.2	9.4	4.8	1.3	98.9
1986	1.9	8.2	9.1	8.6	13.5	21.0	17.9	6.6	4.0	0.9	91.7
1987	4.3	9.6	11.3	10.1	10.2	19.5	22.2	12.3	7.2	1.6	108.4
1988	6.5	10.3	12.4	12.1	16.8	22.0	16.8	7.9	4.1	0.8	109.9
1989	6.0	9.3	14.8	7.7	11.5	15.1	14.1	10.6	4.0	1.9	95.0
1990	5.4	11.6	13.7	6.0	11.2	15.6	10.1	9.6	4.8	1.6	89.7
1991	-	4.1	7.1	6.3	12.0	18.6	13.9	5.2	2.9	0.1	70.2
1992	0.8	2.4	2.5	5.9	8.6	16.1	11.8	9.4	4.3	0.2	62.0
1993	0.5	6.6	6.1	7.7	7.4	27.8	17.6	5.5	3.6	-	82.8
1994	1.2	5.7	7.2	7.0	17.8	33.5	18.9	9.7	6.5	-	107.6
1995	-	9.6	10.5	12.3	17.3	51.0	23.7	12.8	4.3	-	141.5
1996	-	19.0	13.2	9.6	12.7	28.5	13.6	5.3	2.4	-	104.2
1997	-	4.7	10.9	16.8	14.0	34.5	21.2	5.5	3.2	0.4	111.2
1998[b/]	-	0.2	7.0	5.8	13.6	23.1	20.8	6.9	3.5	-	81.0
1999[b/]	-	1.4	8.0	3.7	13.0	32.0	17.4	8.8	5.4	-	89.8
Monterey											
1976-1980	1.8	2.2	2.0	1.2	0.9	1.1	0.5	0.2	0.1	a/	10.0
1981-1985	1.0	2.1	2.7	2.0	1.3	2.0	0.8	0.2	0.1	0.1	12.2
1986-1990	3.6	7.2	11.7	4.1	6.7	10.7	4.2	0.6	0.3	0.4	49.4
1986	0.2	5.7	9.3	3.9	5.1	7.3	2.8	1.1	0.8	a/	36.2
1987	4.3	9.3	6.2	3.3	4.7	11.4	7.1	1.2	0.2	a/	47.7
1988	4.7	5.4	6.4	5.5	6.9	9.5	2.3	a/	0.1	a/	40.9
1989	3.9	6.6	20.1	5.1	5.7	8.8	5.3	0.3	a/	a/	55.7
1990	4.7	9.0	16.5	2.5	11.1	16.6	3.4	0.5	0.3	1.8	66.5
1991	-	8.2	11.1	3.9	8.9	14.0	2.7	0.5	1.6	-	50.8
1992	1.2	7.3	7.1	3.5	4.7	6.6	3.2	1.2	1.1	0.6	36.4
1993	0.3	8.3	11.1	6.2	2.9	5.0	2.9	1.4	1.0	-	39.1
1994	1.1	8.0	10.4	5.6	6.7	9.0	2.0	1.7	2.3	-	46.8
1995	-	12.8	38.0	41.6	31.9	46.5	11.7	0.5	-	-	183.1
1996	-	15.2	15.3	9.4	7.0	11.9	5.8	-	-	-	64.5
1997	-	16.4	17.7	9.1	18.3	18.6	3.7	0.2	-	-	84.0
1998[b/]	-	5.9	10.7	11.2	12.2	10.1	1.9	0.3	-	-	52.4
1999[b/]	-	7.8	3.7	2.5	7.5	6.3	1.9	0.3	-	-	30.0
Total Statewide											
1976-1980	9.9	12.5	9.2	10.3	22.0	44.3	30.1	14.8	8.0	2.4	163.5
1981-1985	5.1	7.9	8.8	10.7	23.0	45.3	28.5	10.6	5.7	1.4	147.0
1986-1990	8.4	17.0	24.0	16.7	44.4	74.4	36.8	12.6	5.1	1.7	241.3
1986	2.1	13.9	18.4	15.0	37.3	58.2	36.8	8.2	4.8	0.9	195.6
1987	8.6	18.9	17.6	17.2	41.1	84.0	52.3	19.6	7.3	1.7	268.3
1988	11.2	15.7	19.0	23.0	48.3	77.4	34.7	11.0	4.2	0.8	245.4
1989	9.8	15.9	35.0	17.7	41.4	70.4	36.2	12.5	4.0	1.9	244.9
1990	10.2	20.6	30.3	10.8	54.0	82.1	23.9	11.8	5.1	3.4	252.1
1991	-	12.3	18.2	12.0	49.6	71.2	20.7	8.1	4.5	0.1	196.6
1992	2.0	9.7	9.9	11.5	13.6	41.9	15.1	17.5	5.8	0.8	127.9
1993	0.9	15.0	17.6	17.9	15.5	54.9	36.9	11.4	4.7	-	174.9
1994	2.5	14.2	18.7	24.3	36.6	42.5	28.3	13.9	8.8	-	189.9
1995	0.4	22.9	50.2	59.5	74.0	97.5	47.0	22.0	4.9	-	378.5
1996	a/	35.2	30.3	25.2	43.2	46.8	31.1	10.4	3.1	a/	225.4
1997	-	21.5	29.7	33.3	44.2	60.2	35.3	6.5	3.2	0.4	234.3
1998[b/]	-	6.2	17.7	20.6	31.5	34.8	28.6	8.9	3.5	-	151.8
1999[b/]	-	9.3	11.9	6.7	27.9	44.4	31.9	10.4	5.4	-	148.0

a/ Less than 50 trips.
b/ Preliminary.

TABLE A-5. **California** ocean **recreational** salmon **landings** in numbers of fish by port of landing and month. (Page 1 of 3)

Year or Avg.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
	CHINOOK (thousands)											**COHO (thousands)**										
Crescent City																						
1976-1980	-	-	-	a/	0.5	1.8	1.3	0.1	-	-	3.6	-	-	a/	a/	3.1	6.6	2.0	0.2	-	-	11.9
1981-1985	-	-	-	0.5	1.4	3.1	1.9	0.1	-	-	7.0	-	-	-	a/	1.2	4.4	1.7	0.1	-	-	7.4
1986-1990	-	-	-	0.4	4.6	7.7	1.6	0.3	-	-	14.6	-	-	-	0.1	3.6	8.4	1.6	0.1	-	-	13.8
1986	-	-	-	0.3	1.6	2.6	1.3	a/	-	-	5.8	-	-	-	0.3	2.5	3.6	1.8	-	-	-	8.1
1987	-	-	-	0.3	3.7	4.3	2.3	1.5	-	-	12.1	-	-	-	-	0.9	10.7	2.7	0.6	-	-	14.9
1988	-	-	-	1.0	7.4	7.6	1.2	a/	-	-	17.2	-	-	-	a/	0.6	10.3	1.4	a/	-	-	12.2
1989	-	-	-	0.4	3.6	18.0	3.2	0.1	-	-	25.3	-	-	-	a/	4.9	11.7	1.8	0.1	-	-	18.5
1990	-	-	-	0.1	6.5	6.0	0.2	a/	-	-	12.7	-	-	-	a/	9.0	5.9	0.5	a/	-	-	15.5
1991	-	-	-	a/	1.3	1.9	a/	0.1	-	-	3.4	-	-	-	-	8.8	9.2	0.1	0.2	-	-	18.3
1992	-	-	-	-	-	0.8	-	a/	-	-	0.9	-	-	-	-	-	2.6	-	0.2	-	-	2.8
1993	-	-	-	0.1	a/	0.5	0.4	0.2	-	-	1.3	-	-	-	a/	0.1	3.6	2.7	0.3	-	-	6.7
1994	-	-	-	4.5	1.3	-	0.4	0.1	-	-	6.3	-	-	-	a/	-	-	0.1	a/	-	-	0.1
1995	-	-	-	0.7	3.0	-	0.3	1.6	-	-	5.6	-	-	-	a/	a/	-	a/	a/	-	-	0.1
1996	-	-	-	0.3	2.3	0.8	0.3	0.2	-	-	3.8	-	-	-	-	0.1	-	a/	a/	-	-	0.1
1997	-	-	-	0.3	0.5	0.8	0.8	a/	-	-	2.5	-	-	-	a/	-	0.1	a/	-	-	-	0.1
1998	-	-	-	0.2	0.7	0.1	0.1	a/	-	-	1.1	-	-	-	-	a/	a/	a/	-	-	-	a/
1999[b/]	-	-	-	-	0.1	0.2	0.6	0.1	-	-	1.0	-	-	-	-	a/	a/	a/	-	-	-	a/
Eureka																						
1976-1980	-	-	a/	0.2	1.2	3.7	1.0	0.1	a/	-	6.1	-	-	a/	0.1	4.1	7.1	1.7	0.1	a/	-	13.1
1981-1985	-	-	a/	1.3	2.2	4.9	1.1	0.1	a/	-	9.6	-	-	-	0.2	2.6	5.8	1.7	0.2	-	-	10.4
1986-1990	-	-	-	1.0	4.8	6.7	3.0	0.2	-	-	15.7	-	-	-	0.7	5.5	12.4	2.7	0.3	-	-	21.5
1986	-	-	-	0.5	2.6	3.3	4.1	a/	-	-	10.5	-	-	-	0.1	2.7	4.2	1.6	a/	-	-	8.6
1987	-	-	-	1.1	3.7	6.5	6.5	0.6	-	-	18.4	-	-	-	0.1	3.5	21.3	4.3	0.6	-	-	29.8
1988	-	-	-	0.6	5.2	6.8	0.8	0.3	-	-	13.8	-	-	-	0.7	3.3	12.0	2.0	0.5	-	-	18.3
1989	-	-	-	1.6	7.5	12.2	3.2	0.1	-	-	24.6	-	-	-	1.6	7.5	13.4	3.9	a/	-	-	26.4
1990	-	-	-	0.9	5.1	4.6	0.4	a/	-	-	11.1	-	-	-	0.9	10.6	11.2	1.7	0.2	-	-	24.6
1991	-	-	-	0.1	6.4	2.8	a/	0.3	a/	-	9.5	-	-	-	0.1	12.6	8.7	0.2	0.3	a/	-	21.8
1992	-	-	-	-	-	1.4	-	0.3	-	-	1.7	-	-	-	-	-	2.7	-	0.9	-	-	3.6
1993	-	-	-	0.3	0.2	1.5	1.2	0.4	-	-	3.6	-	-	-	0.6	0.8	3.8	1.8	0.7	-	-	7.6
1994	-	-	-	1.5	1.8	-	0.4	0.1	-	-	3.7	-	-	-	-	a/	-	a/	a/	-	-	a/
1995	-	-	-	0.7	4.0	-	1.3	2.0	-	-	8.1	-	-	-	a/	0.1	-	a/	0.1	-	-	0.2
1996	-	-	-	1.7	3.6	0.2	1.1	0.5	-	-	7.0	-	-	-	-	0.1	a/	a/	a/	-	-	0.2
1997	-	-	-	1.5	1.7	1.2	2.0	0.1	-	-	6.5	-	-	-	a/	a/	a/	0.1	a/	-	-	0.1
1998	-	-	-	0.5	0.5	0.2	0.5	0.1	-	-	1.8	-	-	-	-	a/	a/	a/	-	-	-	a/
1999[b/]	-	-	-	a/	2.1	1.0	1.9	0.1	-	-	5.2	-	-	-	-	a/	a/	a/	-	-	-	0.1

TABLE A-5. **California** ocean **recreational** salmon **landings** in numbers of fish by port of landing and month. (Page 2 of 3)

Year or Avg.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
	CHINOOK (thousands)											**COHO (thousands)**										
Fort Bragg																						
1976-1980	-	-	a/	a/	0.4	1.7	1.2	0.1	a/	-	3.4	-	-	-	0.1	0.6	1.2	0.4	0.1	a/	-	2.4
1981-1985	-	-	a/	a/	0.6	1.6	0.3	a/	a/	-	2.5	-	-	-	-	0.2	0.6	0.1	a/	-	-	0.9
1986-1990	-	a/	0.1	0.4	2.6	3.9	0.7	0.1	a/	-	7.7	-	-	-	a/	0.9	1.9	0.3	0.1	-	-	3.1
1986	-	-	a/	0.2	3.2	6.4	0.8	-	-	-	10.6	-	-	-	a/	0.2	1.1	0.2	a/	-	-	1.6
1987	-	a/	a/	0.3	2.4	5.2	1.1	0.2	-	-	9.2	-	-	-	-	0.7	1.1	0.5	0.2	-	-	2.5
1988	-	-	0.3	1.1	3.5	3.8	0.8	a/	-	-	9.5	-	-	-	0.1	0.2	2.8	0.1	-	-	-	3.2
1989	-	-	0.1	0.2	2.5	2.4	0.6	a/	a/	-	5.8	-	-	-	a/	1.1	2.1	0.4	0.1	-	-	3.7
1990	-	-	a/	0.1	1.6	1.5	0.2	0.1	-	-	3.4	-	-	-	0.1	2.2	2.1	0.1	a/	-	-	4.5
1991	-	-	a/	0.2	1.6	3.6	0.5	a/	-	-	5.9	-	-	-	0.5	7.9	9.6	0.6	a/	-	-	18.6
1992	-	a/	0.1	1.0	0.1	2.4	-	0.7	a/	a/	4.3	-	-	-	0.3	0.2	2.5	-	0.4	a/	-	3.3
1993	a/	a/	0.2	0.3	0.5	2.6	1.9	0.2	a/	-	5.8	-	a/	a/	0.1	0.7	9.4	1.9	0.1	a/	-	12.3
1994	a/	0.2	0.7	3.2	6.9	-	1.9	0.3	a/	-	13.2	-	-	a/	-	0.2	-	a/	-	a/	-	0.2
1995	0.2	0.3	1.0	1.1	20.5	-	4.8	1.0	0.1	-	29.0	-	-	a/	a/	0.3	-	0.1	a/	a/	-	0.5
1996	a/	0.3	1.4	1.9	13.7	1.9	3.2	1.5	0.1	-	24.0	-	-	a/	-	0.2	a/	0.1	a/	-	-	0.3
1997	-	0.1	0.5	1.9	4.2	3.6	1.3	0.1	-	-	11.6	-	-	-	a/	a/	a/	a/	-	-	-	0.1
1998 b/	-	a/	-	0.6	0.5	0.7	2.2	0.7	-	-	4.7	-	-	-	-	-	-	a/	-	-	-	a/
1999 b/	-	a/	a/	a/	0.4	2.1	2.5	0.2	-	-	5.3	-	-	-	-	a/	a/	0.1	-	-	-	0.1
San Francisco																						
1976-1980	5.3	7.8	7.4	5.8	10.9	14.4	8.4	7.3	6.6	1.3	75.2	a/	a/	0.2	1.3	0.9	0.9	0.2	0.1	a/	a/	3.6
1981-1985	5.3	5.8	5.5	7.2	12.3	16.9	16.0	8.5	5.5	1.4	84.5	-	a/	a/	0.1	0.4	0.3	0.1	a/	a/	-	1.1
1986-1990	4.5	11.0	16.9	8.3	12.2	17.2	15.6	7.8	3.9	1.0	98.4	-	a/	a/	0.2	0.3	0.4	0.5	0.1	a/	-	1.5
1986	1.0	12.3	11.4	7.3	13.4	19.7	14.0	4.9	1.7	0.6	86.3	-	a/	-	0.1	0.1	0.1	a/	a/	a/	-	0.4
1987	3.8	7.4	16.8	9.3	9.8	22.4	29.7	12.3	7.1	1.1	119.5	-	-	-	a/	a/	a/	a/	a/	-	-	0.1
1988	5.4	13.7	20.9	15.6	19.0	21.8	9.6	4.8	3.8	0.5	115.1	-	-	a/	0.1	0.1	0.1	0.1	a/	-	-	0.4
1989	7.3	8.2	20.4	4.8	12.3	11.4	11.0	12.2	3.7	2.4	93.7	-	-	0.1	0.2	0.4	a/	0.1	a/	-	-	0.9
1990	5.1	13.3	15.1	4.3	6.6	10.6	13.6	4.9	3.5	0.6	77.6	-	-	0.1	0.4	1.0	1.6	2.3	0.4	0.1	-	5.8
1991	-	3.2	6.1	3.7	6.8	10.0	4.9	1.5	1.0	a/	37.3	-	a/	a/	0.1	4.2	2.8	0.5	0.1	a/	-	7.7
1992	0.1	0.8	0.8	3.9	6.6	13.8	8.9	9.0	3.1	0.1	47.2	a/	a/	a/	0.1	0.1	1.1	0.1	0.1	a/	-	1.6
1993	0.2	4.7	5.3	6.2	6.3	33.1	14.9	4.5	3.5	-	78.7	-	a/	0.1	0.2	0.7	1.8	0.1	a/	a/	-	3.0
1994	0.9	4.1	8.6	7.3	24.7	49.5	20.6	12.7	7.2	-	135.7	-	-	a/	a/	0.1	0.1	a/	a/	a/	-	0.2
1995	-	12.7	14.0	13.6	25.9	59.6	15.7	12.2	2.0	-	155.7	-	-	a/	a/	a/	0.1	a/	a/	-	-	0.2
1996	-	21.4	14.2	6.1	11.2	22.6	4.8	2.9	1.2	-	84.5	-	-	-	a/	a/	a/	a/	-	-	-	0.1
1997	-	3.0	11.0	19.7	15.1	49.0	20.8	2.8	2.4	0.1	124.0	-	-	-	a/	-	0.2	a/	a/-	-	-	0.2
1998 b/	-	0.1	3.7	4.4	12.3	27.4	17.6	3.7	1.8	-	71.0	-	-	-		a/	a/	a/	-	-	-	a/
1999 b/	-	0.7	6.2	1.1	10.7	29.9	11.6	6.2	2.6	-	69.0	-	-	-	a/	0.2	0.1	a/	a/	a/	-	0.3

TABLE A-5. **California** ocean **recreational** salmon **landings** in numbers of fish by port of landing and month. (Page 3 of 3)

Year or Avg.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
	CHINOOK (thousands)											**COHO (thousands)**										
Monterey																						
1976-1980	0.5	0.7	1.3	0.5	0.5	0.4	0.1	a/	a/	a/	4.1	a/	a/	a/	a/	a/	a/	a/	-	-	-	0.1
1981-1985	0.6	1.4	1.7	0.4	0.3	0.6	0.2	a/	a/	a/	5.5	-	-	a/	a/	a/	a/	a/	-	-	-	0.1
1986-1990	1.1	4.3	9.4	1.3	4.1	7.5	1.7	0.2	0.1	0.2	30.1	-	-	a/	a/	0.1	0.1	a/	a/	-	-	0.3
1986	0.1	3.8	12.1	1.3	4.0	5.4	1.2	0.4	0.3	a/	28.6	-	-	-	-	a/	a/	a/	-	-	-	a/
1987	1.7	6.7	2.4	1.4	3.5	12.7	4.5	0.4	0.1	a/	33.3	-	-	-	-	-	a/	-	a/	-	-	a/
1988	1.5	2.4	3.9	1.8	2.9	3.5	0.2	a/	-	a/	16.2	-	-	-	a/	0.2	-	-	-	-	-	0.2
1989	0.6	4.5	22.1	1.5	2.0	4.7	1.8	a/	a/	a/	37.2	-	-	-	-	0.2	a/	a/	-	-	-	0.2
1990	1.6	4.3	6.6	0.7	8.4	11.3	0.8	a/	0.2	1.1	35.1	-	-	0.1	0.1	0.3	0.7	0.1	-	-	-	1.2
1991	-	4.8	6.9	0.9	3.7	6.9	0.4	0.1	1.2	-	24.8	-	-	-	a/	1.0	1.7	0.2	-	a/	-	2.9
1992	0.4	2.6	4.5	1.4	2.8	5.9	1.2	0.2	0.2	0.4	19.5	-	-	-	-	0.2	a/	-	-	-	-	0.2
1993	0.3	5.1	9.5	2.0	0.5	2.7	0.4	a/	0.1	-	20.6	-	-	-	a/	a/	0.1	a/	-	-	-	0.2
1994	0.3	3.0	6.3	1.9	4.1	3.8	1.4	0.8	2.5	-	24.2	-	-	-	-	a/	a/	-	-	-	-	a/
1995	-	14.3	42.9	31.1	27.0	74.1	9.3	0.1	-	-	198.9	-	-	a/	-	a/	a/	a/	-	-	-	a/
1996	-	10.3	16.1	5.2	2.3	7.8	3.2	-	-	-	44.8	-	-	-	-	-	-	-	-	-	-	-
1997	-	16.9	15.4	4.2	26.4	20.0	1.5	0.1	-	-	84.4	-	-	-	-	a/	a/	-	-	-	-	a/
1998	-	2.9	9.4	10.3	11.0	9.0	0.9	0.1	-	-	43.5	-	-	-	-	a/	a/	-	-	-	-	a/
1999[b/]	-	1.0	0.3	0.3	2.3	2.1	1.0	0.1	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-
Total Statewide																						
1976-1980	5.8	8.5	8.7	6.4	13.5	22.0	11.9	7.6	6.7	1.3	92.4	a/	a/	0.2	1.5	8.8	15.8	4.4	0.4	a/	a/	31.2
1981-1985	5.9	7.3	7.2	9.4	17.0	27.0	19.6	8.7	5.6	1.4	109.1	-	a/	a/	0.3	4.5	11.1	3.7	0.3	a/	-	19.9
1986-1990	5.6	15.3	26.4	11.3	28.3	42.9	22.6	8.6	4.1	1.3	166.5	-	a/	0.1	0.9	10.4	23.2	5.1	0.6	a/	-	40.3
1986	1.2	16.1	23.5	9.5	24.7	37.4	21.4	5.3	2.0	0.6	141.6	-	a/	-	0.5	5.5	9.1	3.6	a/	a/	-	18.7
1987	5.5	14.1	19.2	12.4	23.1	51.0	44.1	14.9	7.1	1.1	192.5	-	-	-	0.1	5.1	33.1	7.5	1.5	-	-	47.3
1988	6.8	16.1	25.0	20.1	38.0	43.5	12.7	5.3	3.8	0.5	171.8	-	-	a/	0.9	4.3	25.1	3.5	0.5	-	-	34.4
1989	8.0	12.7	42.6	8.6	27.8	48.7	19.7	12.4	3.7	2.4	186.6	-	-	0.1	1.8	14.1	27.2	6.2	0.2	-	-	49.6
1990	6.7	17.6	21.6	6.1	28.1	34.0	15.2	5.0	3.8	1.7	139.8	-	-	0.1	1.4	23.1	21.6	4.7	0.7	0.1	-	51.6
1991	-	8.0	13.0	4.8	19.9	25.1	5.7	2.0	2.2	a/	80.8	-	a/	a/	0.7	34.5	31.9	1.6	0.5	a/	-	69.3
1992	0.5	3.4	5.4	6.3	9.5	24.3	10.1	10.3	3.3	0.5	73.6	a/	a/	a/	0.4	0.4	9.0	0.1	1.5	a/	-	11.5
1993	0.4	9.9	15.0	8.9	7.6	40.4	18.8	5.4	3.6	-	110.0	-	a/	0.1	0.9	2.4	18.8	6.6	1.1	a/	-	29.8
1994	1.3	7.3	15.7	18.3	38.8	53.3	24.7	14.1	9.7	-	183.2	-	-	a/	a/	0.2	0.1	0.1	a/	a/	-	0.5
1995	0.2	27.3	57.9	47.2	80.3	133.7	31.4	17.0	2.1	-	397.2	-	-	a/	a/	0.5	0.1	0.1	0.1	a/	-	0.9
1996	a/	32.0	31.7	15.2	33.0	33.3	12.6	5.0	1.3	-	164.2	-	-	a/	a/	0.3	0.1	0.2	0.1	-	-	0.6
1997	-	20.1	26.9	27.5	47.9	74.5	26.4	3.1	2.4	0.1	229.0	-	-	-	a/	0.1	0.3	0.1	a/	-	-	0.5
1998	a/	3.0	13.1	16.0	24.9	37.5	21.2	4.6	1.8	a/	122.0	-	-	-	-	a/	a/	a/	-	-	-	0.1
1999[b/]	-	1.7	6.5	1.4	15.7	35.4	17.6	6.7	2.6	-	87.6	-	-	-	a/	0.2	0.2	0.2	a/	a/	-	0.6

a/ Less than 50 fish.
b/ Preliminary.

TABLE A-6. Summary of **Oregon commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 1 of 2)

Year or Average	Columbia River[a/]	Tillamook	Newport	Coos Bay	Brookings	Oregon Subtotal	Alaska	Washington	California	Total
					DAYS FISHED (thousands)					
1976-1980[b/]	2.9	7.3	16.0	21.5	10.3	58.0	0.1	0.7	0.1	58.7
1981-1985	1.1	3.4	6.0	10.0	5.0	25.5	c/	0.3	0.2	26.0
1986-1990	0.7	6.9	8.7	20.3	1.7	38.2	c/	0.1	c/	38.3
1986	1.2	3.7	8.6	15.8	3.2	32.5	0.0	c/	c/	32.5
1987	0.3	7.3	8.7	21.0	2.0	39.3	0.0	0.1	c/	39.5
1988	0.2	10.5	12.5	26.3	1.4	50.8	c/	0.1	0.1	51.1
1989	0.9	7.8	9.3	22.9	1.2	42.3	0.0	c/	c/	42.3
1990	0.7	5.1	4.3	15.6	0.4	26.2	0.0	0.1	c/	26.2
1991	0.7	3.5	5.1	5.6	c/	14.9	0.0	c/	c/	14.9
1992	0.3	2.6	5.8	0.4	-	9.2	0.0	0.1	-	9.2
1993	0.2	1.8	5.9	1.6	-	9.5	0.0	c/	c/	9.5
1994	-	0.5	2.1	0.8	0.3	3.8	0.0	-	c/	3.8
1995	-	1.3	4.7	1.6	0.3	7.9	0.0	0.0	c/	7.9
1996	-	1.4	4.8	1.8	0.5	8.4	0.0	0.0	0.1	8.5
1997	c/	0.7	5.2	1.6	0.4	7.8	0.0	0.0	c/	7.8
1998	0.0	1.0	4.5	1.4	0.2	7.2	0.0	0.0	0.0	7.2
1999[d/]	c/	0.7	1.5	2.6	0.2	5.1	0.0	c/	c/	5.1
					CHINOOK LANDINGS (thousands)					
1976-1980[b/]	15.3	11.2	46.6	85.6	73.9	232.6	0.3	2.8	0.9	236.6
1981-1985	5.6	5.9	27.9	63.5	42.6	145.5	0.4	3.0	2.2	151.1
1986-1990	3.5	26.2	82.9	253.4	28.8	394.9	0.1	1.2	1.4	397.6
1986	6.1	14.1	88.0	240.0	53.7	401.9	0.0	0.4	0.4	402.7
1987	4.6	41.4	87.6	350.4	39.8	523.8	0.0	3.7	1.8	529.3
1988	1.6	32.8	129.0	268.5	31.6	463.5	0.5	1.4	4.6	470.0
1989	2.9	30.4	70.7	232.5	16.8	353.2	-	0.2	0.1	353.5
1990	2.3	12.5	39.3	175.8	2.2	232.1	0.0	0.3	c/	232.4
1991	0.9	9.5	33.5	30.5	0.2	74.6	0.0	c/	0.1	74.8
1992	1.5	7.3	94.7	6.2	-	109.7	0.0	0.8	-	110.5
1993	0.4	6.3	64.2	10.5	-	81.5	0.0	0.0	c/	81.5
1994	-	1.7	18.1	4.0	1.5	25.2	0.0	-	0.1	25.3
1995	-	9.7	174.4	26.6	3.3	214.0	0.0	0.0	0.8	214.8
1996	-	13.1	127.8	25.6	8.6	175.2	0.0	0.0	2.0	177.1
1997	c/	2.4	118.7	24.8	3.6	149.6	0.0	0.0	0.1	149.7
1998	0.0	6.6	94.8	22.1	0.7	125.0	0.0	0.0	0.0	124.2
1999[d/]	c/	2.8	15.8	42.4	1.4	62.4	0.0	1.1	0.1	63.5

TABLE A-6. Summary of **Oregon commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 2 of 2)

Year or Average	Columbia River[a/]	Tillamook	Newport	Coos Bay	Brookings	Oregon Subtotal	Alaska	Washington	California	Total
				COHO LANDINGS (thousands)						
1976-1980[b/]	75.7	131.6	216.8	301.4	66.9	792.3	1.8	9.3	0.3	803.7
1981-1985	21.3	67.5	87.8	114.3	19.8	310.6	0.0	9.6	0.8	321.0
1986-1990	17.1	106.6	135.9	132.5	5.1	397.2	c/	1.7	0.2	399.1
1986	46.1	96.7	192.3	86.2	19.1	440.4	0.0	-	-	440.4
1987	7.4	74.7	83.0	177.0	4.1	346.2	0.0	7.5	0.3	354.0
1988	-	172.3	252.5	196.4	1.3	622.4	c/	-	0.8	623.2
1989	21.1	136.3	137.8	159.5	1.0	455.7	0.0	-	c/	455.7
1990	10.9	53.3	13.8	43.4	-	121.4	0.0	0.9	c/	122.3
1991	26.7	90.2	88.7	101.0	-	306.6	0.0	0.3	0.1	306.9
1992	1.4	7.9	35.0	5.3	-	49.6	0.0	0.1	-	49.8
1993	1.6	-	c/	c/	-	1.7	0.0	c/	-	1.7
1994	-	-	-	-	-	-	0.0	-	-	-
1995	-	-	-	-	-	-	0.0	0.0	-	-
1996	-	-	-	c/	-	-	0.0	0.0	-	-
1997	-	-	-	-	-	-	0.0	-	-	-
1998	-	-	-	-	-	-	0.0	-	-	-
1999[d/]	-	-	-	-	-	-	0.0	0.2	-	0.2

a/ Oregon ports only.
b/ Reported by port of landing 1976-1978 and by area of catch 1979-1980.
c/ Less than 50.
d/ Preliminary.

TABLE A-7. **Oregon commercial troll** salmon **effort** in days fished by area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 1 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				DAYS FISHED (thousands)					
Columbia River									
1976-1980	-	0.2	0.3	1.3	0.8	0.2	0.1	b/	2.9
1981-1985	-	0.4	-	0.3	0.3	b/	b/	-	1.1
1986-1990	-	0.1	b/	b/	0.3	0.1	b/	-	0.7
1986	-	0.3	-	-	0.8	-	-	-	1.2
1987	-	0.1	-	0.2	-	-	-	-	0.3
1988	-	0.1	0.1	-	-	-	-	-	0.2
1989	-	0.1	b/	-	0.6	0.2	-	-	0.9
1990	-	0.1	b/	-	0.2	0.4	b/	-	0.7
1991	-	0.1	b/	-	0.4	0.2	-	-	0.7
1992	-	0.1	0.1	b/	b/	-	-	-	0.3
1993	-	b/	b/	0.1	0.1	0.1	-	-	0.2
1994	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-
1997	-	b/	b/	-	-	-	-	-	b/
1998	-	0.0	0.0	-	-	-	-	-	0.0
1999[c/]	-	0.0	b/	-	-	-	-	-	
Tillamook Area									
1976-1980	-	b/	1.0	3.6	2.4	0.2	0.1	-	7.3
1981-1985	-	0.1	b/	2.0	1.0	0.1	0.1	b/	3.4
1986-1990	-	0.2	0.3	3.0	1.7	1.0	0.7	b/	6.9
1986	-	b/	b/	2.7	0.3	0.5	0.1	b/	3.7
1987	-	0.1	0.3	2.6	2.1	1.2	0.9	-	7.3
1988	-	0.2	0.6	4.5	2.9	1.2	1.2	-	10.5
1989	-	0.5	0.7	3.2	1.5	1.3	0.6	-	7.8
1990	-	0.1	0.1	2.2	1.7	0.6	0.5	-	5.1
1991	-	0.1	0.1	1.7	0.4	0.5	0.7	-	3.5
1992	-	0.1	-	0.2	0.8	0.7	0.7	-	2.6
1993	-	0.1	0.1	0.2	0.2	0.8	0.5	-	1.8
1994	-	b/	0.1	-	-	-	0.4	b/	0.5
1995	-	0.1	0.1	-	0.5	0.3	0.2	-	1.3
1996	-	0.1	0.3	-	0.2	0.5	0.3	-	1.4
1997	b/	0.1	0.1	-	0.1	0.2	0.2	b/	0.7
1998	b/	0.1	0.1	-	0.2	0.3	0.3	b/	1.0
1999[c/]	b/	0.1	b/	0.2	0.1	0.2	0.1	0.0	0.7
Newport Area									
1976-1980	-	0.4	1.8	6.9	5.4	1.1	0.4	-	16.0
1981-1985	-	0.6	0.3	3.0	1.7	0.2	0.2	b/	6.0
1986-1990	-	0.8	1.2	3.8	1.6	0.6	0.6	b/	8.7
1986	-	0.9	0.8	5.5	0.4	0.3	0.7	-	8.6
1987	-	1.0	0.9	3.1	1.6	1.2	0.8	-	8.7
1988	-	0.9	1.1	4.8	4.0	0.7	1.0	-	12.5
1989	-	0.9	1.8	4.1	1.4	0.6	0.4	0.1	9.3
1988	-	0.5	1.4	1.8	0.3	0.2	0.1	-	4.3
1991	-	0.6	2.0	0.9	0.6	0.5	0.4	-	5.1
1992	-	1.4	-	1.1	1.7	0.7	0.9	-	5.8
1993	-	1.4	1.1	1.5	0.8	0.7	0.5	-	5.9
1994	-	0.8	0.8	-	-	0.2	0.3	-	2.1
1995	-	0.6	1.0	-	1.6	0.8	0.7	-	4.7
1996	-	1.0	1.1	-	1.3	0.8	0.5	-	4.8
1997	0.2	1.4	1.3	-	1.3	0.7	0.2	-	5.2
1998	0.7	1.3	1.2	-	1.0	0.2	0.1	-	4.5
1999[c/]	0.1	0.4	0.5	0.3	0.1	b/	0.1	-	1.5

TABLE A-7. **Oregon commercial troll** salmon **effort** in days fished by area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 2 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				DAYS FISHED (thousands)					
Coos Bay Area									
1976-1980	-	0.6	2.7	10.3	6.0	1.6	0.4	b/	21.5
1981-1985	-	0.7	0.7	5.2	2.6	0.6	0.2	b/	10.0
1986-1990	-	2.7	3.0	7.3	4.7	1.5	1.0	0.1	20.3
1986	-	2.1	2.4	5.6	4.2	1.2	0.3	-	15.8
1987	-	1.7	1.7	10.3	3.5	3.1	0.7	-	21.0
1988	-	3.2	4.4	7.7	7.1	1.6	2.3	-	26.3
1989	-	4.5	4.2	6.4	4.9	1.1	1.2	0.7	22.9
1990	-	2.2	2.2	6.4	3.6	0.7	0.4	b/	15.6
1991	-	b/	1.8	1.5	1.0	0.8	0.5	-	5.6
1992	-	0.1	-	0.1	0.2	b/	0.1	-	0.4
1993	-	0.6	0.2	b/	b/	0.4	0.3	0.1	1.6
1994	-	0.1	0.3	-	-	0.1	0.3	0.1	0.8
1995	-	0.2	0.5	-	0.5	0.2	0.2	0.1	1.6
1996	-	0.3	0.5	-	0.3	0.4	0.3	0.1	1.8
1997	0.1	0.5	0.4	-	0.2	0.1	0.2	0.1	1.6
1998[c/]	0.2	0.4	0.4	-	0.2	0.1	0.2	0.1	1.4
1999[c/]	b/	0.2	0.8	0.4	0.7	0.2	0.2	0.1	2.6
Brookings Area									
1976-1980	-	0.2	0.7	3.5	2.6	1.5	1.1	0.7	10.3
1981-1985		0.3	0.2	1.4	1.7	0.4	0.7	0.3	5.0
1986-1990	-	0.3	0.5	0.1	0.4	0.1	0.1	0.1	1.7
1986	-	0.5	0.7	0.6	1.1	-	0.2	0.1	3.2
1987	-	0.5	0.9	-	-	-	0.3	0.3	2.0
1988	-	0.3	0.6	-	-	0.1	0.1	0.3	1.4
1989	-	0.2	0.3	-	0.4	0.3	-	-	1.2
1990	-	b/	-	-	0.4	b/	-	-	0.4
1991	-	-	-	-	-	b/	-	-	b/
1992	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-
1994	-	b/	-	-	0.1	-	0.2	-	0.3
1995	-	b/	-	b/	-	-	0.2	-	0.3
1996	-	0.1	b/	-	0.2	-	0.2	-	0.5
1997	b/	0.1	-	-	b/	-	0.2	-	0.4
1998[c/]	0.0	b/	-	-	b/	-	0.2	-	0.2
1999[c/]	-	b/	-	-	0.1	b/	0.1	-	0.2
South of Cape Falcon									
1976-1980	-	1.2	6.2	24.3	16.3	4.4	2.0	0.7	55.1
1981-1985	-	1.7	1.2	11.6	7.1	1.4	1.2	0.3	24.4
1986-1990	-	4.1	5.1	14.3	8.3	3.2	2.4	0.3	37.5
1986	-	3.6	4.0	14.3	6.0	2.0	1.3	0.1	31.3
1987	-	3.3	3.9	16.1	7.3	5.5	2.7	0.3	39.0
1988	-	4.5	6.6	16.9	14.1	3.6	4.6	0.3	50.6
1989	-	6.2	7.1	13.6	8.2	3.3	2.1	0.8	41.3
1990	-	2.8	3.7	10.4	6.0	1.5	1.0	b/	25.4
1991	-	0.7	3.9	4.1	2.0	1.9	1.6	-	14.2
1992	-	1.6	-	1.5	2.7	1.5	1.7	-	8.9
1993	-	2.1	1.3	1.7	1.0	1.9	1.2	0.1	9.3
1994	-	1.0	1.2	-	0.1	0.3	1.2	0.1	3.8
1995	-	1.0	1.6	b/	2.6	1.3	1.3	0.1	7.9
1996	-	1.5	2.0	-	2.0	1.6	1.2	0.1	8.4
1997	0.4	2.1	1.9	-	1.7	1.0	0.7	0.1	7.8
1998[c/]	0.9	1.8	1.7	-	1.4	0.6	0.8	0.1	7.2
1999[c/]	0.2	0.6	1.4	0.8	1.1	0.5	0.5	0.1	5.1

TABLE A-7. **Oregon commercial troll** salmon **effort** in days fished by area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 3 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				DAYS FISHED (thousands)					
Total All Areas									
1976-1980	-	1.4	6.5	25.6	17.2	4.6	2.1	0.7	58.0
1981-1985	-	2.1	1.2	11.9	7.4	1.4	1.2	0.3	25.5
1986-1990	-	4.2	5.1	14.3	8.6	3.3	2.4	0.3	38.2
1986	-	3.9	4.0	14.3	6.8	2.0	1.3	0.1	32.5
1987	-	3.5	3.9	16.2	7.3	5.5	2.7	0.3	39.3
1988	-	4.6	6.7	16.9	14.1	3.6	4.6	0.3	50.8
1989	-	6.2	7.1	13.6	8.8	3.5	2.1	0.8	42.3
1990	-	2.8	3.7	10.4	6.2	1.9	1.1	b/	26.2
1991	-	0.8	4.0	4.1	2.4	2.0	1.6	-	14.9
1992	-	1.6	0.1	1.5	2.7	1.5	1.7	-	9.2
1993	-	2.1	1.3	1.8	1.0	2.0	1.2	0.1	9.5
1994	-	1.0	1.2	-	0.1	0.3	1.2	0.1	3.8
1995	-	1.0	1.6	b/	2.6	1.3	1.3	0.1	7.9
1996	-	1.5	2.0	-	2.0	1.6	1.2	0.1	8.4
1997	0.4	2.1	1.9	-	1.7	1.0	0.7	0.1	7.8
1998	0.9	1.8	1.7	-	1.4	0.6	0.8	0.1	7.2
1999[c/]	0.2	0.6	1.4	0.8	1.1	0.5	0.5	0.1	5.1

a/ Summary of ODFW fish receiving ticket information. Excludes effort occurring off Alaska, Washington, and California. Days fished data are reported by port of landing prior to 1979 and by area of catch after 1978. Catch and landing areas include the following port areas: Columbia River includes Oregon ports from Astoria through Cannon Beach; Tillamook area includes Nehalem through Pacific City; Newport area includes Depoe Bay through Waldport; Coos Bay area prior to 1968 includes Florence through Bandon and after 1987 includes Florence through Port Orford; Brookings area prior to 1968 includes Port Orford through Brookings and after 1987 includes Gold Beach through Brookings.

b/ Less than 50 days.

c/ Preliminary.

TABLE A-8. **Oregon commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 1 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	June	July	Aug.	Sept.	Oct.	Season
					CHINOOK (thousands)							**COHO (thousands)**			
Columbia River															
1976-1980	-	5.0	4.6	3.1	1.5	0.5	0.6	-	15.3	22.9	34.5	12.9	4.7	0.6	75.7
1981-1985	-	4.7	-	0.5	0.3	b/	b/	-	5.6	-	11.3	9.5	0.5	-	21.3
1986-1990	-	1.8	0.2	0.4	0.5	0.5	b/	-	3.5	-	1.5	11.3	4.3	0.1	17.1
1986	-	4.5	-	-	1.6	-	-	-	6.1	-	-	46.1	-	-	46.1
1987	-	2.3	-	2.2	-	-	-	-	4.6	-	7.4	-	-	-	7.4
1988	-	1.0	0.6	-	-	-	-	-	1.6	-	-	-	-	-	-
1989	-	0.7	0.4	-	0.7	1.1	-	-	2.9	-	-	6.8	14.4	-	21.1
1990	-	0.5	0.1	-	0.4	1.2	0.1	-	2.3	-	-	3.5	7.0	0.3	10.9
1991	-	0.3	b/	-	0.5	0.1	-	-	0.9	-	-	21.6	5.2	-	26.7
1992	-	0.4	0.9	0.1	0.1	-	-	-	1.5	-	0.7	0.8	-	-	1.4
1993	-	0.3	b/	b/	b/	0.1	-	-	0.4	-	0.2	1.2	0.2	-	1.6
1994		-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	-	b/	b/	-	-	-	-	-	b/	-	-	-	-	-	-
1998[c/]	-	0.0	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-
1999[c/]	-	0.0	b/	-	-	-	-	-	b/	-	-	-	-	-	-
Tillamook Area															
1976-1980	-	0.5	3.3	4.1	2.7	0.5	0.2	-	11.2	30.0	67.5	31.7	2.3	0.1	131.6
1981-1985	-	1.5	0.3	2.4	1.2	0.3	0.2	-	5.9	-	55.1	12.1	0.3	-	67.5
1986-1990	-	1.7	3.1	8.3	5.9	4.7	2.5	b/	26.2	-	83.4	22.1	1.1	-	106.6
1986	-	0.2	0.1	2.8	3.1	6.5	1.5	b/	14.1	-	96.7	-	-	-	96.7
1987	-	1.8	1.6	16.1	11.7	6.9	3.3	-	41.4	-	49.6	19.8	5.4	-	74.7
1988	-	0.9	5.7	9.5	8.8	4.2	3.6	-	32.8	-	124.2	48.1	-	-	172.3
1989	-	5.4	7.8	6.8	3.6	4.2	2.6	-	30.4	-	117.1	19.2	-	-	136.3
1990	-	0.4	0.6	6.2	2.3	1.8	1.2	-	12.5	-	29.6	23.7	-	-	53.3
1991	-	0.2	0.2	3.1	1.9	2.1	2.0	-	9.5	-	90.2	-	-	-	90.2
1992	-	0.4	-	0.4	2.2	1.9	2.4	-	7.3	-	0.8	7.1	-	b/	7.9
1993	-	0.5	0.2	0.8	0.6	2.6	1.6	-	6.3	-	-	-	-	-	-
1994	-	0.1	0.3	-	-	-	1.3	b/	1.7	-	-	-	-	-	-
1995	-	0.4	0.8	-	6.6	1.1	0.7	-	9.7	-	-	-	-	-	-
1996	-	0.7	8.6	-	1.1	2.1	0.7	-	13.1	-	-	-	-	-	-
1997	b/	0.2	0.6	-	0.3	0.7	0.4	b/	2.4	-	-	-	-	-	-
1998[c/]	0.2	0.4	0.8	-	2.2	2.2	0.8	b/	6.6	-	-	-	-	-	-
1999[c/]	b/	0.3	0.6	0.2	1.0	0.6	0.2	b/	2.8	-	-	-	-	-	-

TABLE A-8. **Oregon commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 2 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	June	July	Aug.	Sept.	Oct.	Season
						CHINOOK (thousands)						**COHO (thousands)**			
Newport Area															
1976-1980	-	3.6	6.5	12.5	16.4	4.8	2.8	b/	46.6	36.4	110.3	63.5	5.8	0.8	216.8
1981-1985	-	6.3	2.3	11.7	5.1	1.0	1.5	-	27.9	-	60.3	26.7	0.8	-	87.8
1986-1990	-	8.8	14.1	27.8	14.4	6.9	10.9	-	82.9	b/	108.3	26.5	1.0	-	135.9
1986	-	10.2	11.9	30.9	5.5	6.9	22.5	-	88.0	-	192.3	-	-	-	192.3
1987	-	10.5	7.5	24.1	23.7	13.7	8.1	-	87.6	-	59.3	18.5	5.2	-	83.0
1988	-	8.4	15.2	46.7	32.3	8.9	17.5	-	129.0	-	146.3	106.2	-	-	252.5
1989	-	12.4	19.1	20.6	8.3	4.5	5.7	-	70.7	-	129.8	8.0	-	-	137.8
1990	-	2.5	16.5	16.6	2.3	0.6	0.8	-	39.3	0.1	13.7	-	-	-	13.8
1991	-	2.9	7.4	3.4	5.8	7.0	7.0	-	33.5	58.3	30.4	-	-	-	88.7
1992	-	19.6	-	28.5	21.9	8.5	16.2	-	94.7	-	19.0	15.9	-	-	35.0
1993	-	17.1	13.7	11.9	9.4	8.6	3.5	-	64.2	-	-	b/	-	-	b/
1994	-	7.2	7.0	-	-	1.0	2.8	-	18.1	-	-	-	-	-	-
1995	-	8.6	28.0	-	79.4	33.3	25.1	-	174.4	-	-	-	-	-	-
1996	-	22.7	20.6	-	53.6	19.4	11.5	-	127.8	-	-	-	-	-	-
1997	2.4	24.0	26.9	-	38.7	24.0	2.8	-	118.7	-	-	-	-	-	-
1998	16.5	34.1	25.0	-	16.0	2.3	0.9	-	94.8	-	-	-	-	-	-
1999[c/]	0.6	4.5	5.7	3.2	1.0	0.1	0.7	-	15.8	-	-	-	-	-	-
Coos Bay Area															
1976-1980	-	3.1	11.9	30.2	28.9	7.5	3.9	b/	85.6	69.9	176.0	52.1	3.2	0.2	301.4
1981-1985	-	5.5	4.3	29.9	17.2	5.4	1.1	b/	63.5	-	101.9	12.4	b/	-	114.3
1986-1990	-	30.5	28.2	103.6	64.0	17.4	9.2	0.7	253.4	b/	103.6	26.8	2.0	-	132.5
1986	-	18.2	21.3	94.9	83.3	20.6	1.7	-	240.0	-	86.2	-	-	-	86.2
1987	-	17.8	11.4	228.6	47.4	40.4	4.8	-	350.4	b/	146.3	20.5	10.2	-	177.0
1988	-	39.4	47.3	54.2	87.6	14.0	26.0	-	268.5	-	117.1	79.3	-	-	196.4
1989	-	64.8	45.2	42.8	57.7	7.2	11.3	3.4	232.5	-	125.2	34.3	-	-	159.5
1990	-	12.1	15.5	97.3	44.1	4.7	2.1	b/	175.8	b/	43.4	-	-	-	43.4
1991	-	0.1	5.1	9.0	3.9	8.9	3.5	-	30.5	32.8	68.2	c/	-	-	101.0
1992	-	0.6	-	2.6	2.0	0.3	0.6	-	6.2	-	3.2	2.1	-	-	5.3
1993	-	2.7	0.9	0.2	0.4	4.4	1.3	0.7	10.5	-	-	-	-	b/	b/
1994	-	0.4	1.6	-	-	0.2	1.5	0.4	4.0	-	-	-	-	-	-
1995	-	1.6	7.0	-	11.9	4.1	1.6	0.3	26.6	-	-	-	-	-	-
1996	-	2.2	10.1	-	6.1	4.5	1.9	0.8	25.6	b/	-	-	-	-	b/
1997	2.0	6.7	7.9	-	5.5	1.1	1.2	0.5	24.8	-	-	-	-	-	-
1998	3.3	5.2	7.9	-	2.7	0.5	1.7	0.9	22.1	-	-	-	-	-	-
1999[c/]	0.2	1.3	17.2	4.7	15.2	1.1	1.5	1.2	42.4	-	-	-	-	-	-

TABLE A-8. **Oregon commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 3 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	June	July	Aug.	Sept.	Oct.	Season
						CHINOOK (thousands)						**COHO (thousands)**			
Brookings Area															
1976-1980	-	1.8	4.2	21.3	27.1	10.5	6.6	2.4	73.9	10.6	43.1	11.7	1.6	0.1	66.9
1981-1985	-	1.7	1.9	10.4	20.1	3.9	3.5	1.1	42.6	-	12.7	7.1	-	-	19.8
1986-1990	-	5.1	13.4	1.9	5.2	1.7	0.6	0.9	28.8	3.7	1.4	-	-	-	5.1
1986	-	3.7	16.7	9.6	22.1	-	1.0	0.6	53.7	12.0	7.1	-	-	-	19.1
1987	-	8.8	28.0	-	-	-	1.1	1.9	39.8	4.1	-	-	-	-	4.1
1988	-	8.2	20.7	-	-	0.1	0.8	1.9	31.6	1.3	-	-	-	-	1.3
1989	-	4.6	1.9	-	1.9	8.4	-	-	16.8	1.0	-	-	-	-	1.0
1990	-	0.1	-	-	2.1	0.1	-	-	2.2	-	-	-	-	-	-
1991	-	-	-	-	-	0.2	-	-	0.2	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	0.2	-	-	0.2	-	1.0	-	1.5	-	-	-	-	-	-
1995	-	0.3	-	1.7	-	-	1.3	-	3.3	-	-	-	-	-	-
1996	-	2.9	2.2	-	2.7	-	0.8	-	8.6	-	-	-	-	-	-
1997	0.1	2.3	-	-	0.3	-	0.9	-	3.6	-	-	-	-	-	-
1998	0.0	0.1	-	-	0.1	-	0.6	-	0.7	-	-	-	-	-	-
1999[c/]	-	b/	-	-	0.8	0.2	0.4	-	1.4	-	-	-	-	-	-
South of Cape Falcon															
1976-1980	-	9.1	25.9	68.1	75.0	23.3	13.5	2.5	217.3	146.8	396.9	159.0	12.9	1.1	716.7
1981-1985	-	15.1	8.7	54.3	43.6	10.7	6.4	1.1	139.9	-	229.9	58.3	1.2	-	289.3
1986-1990	-	46.1	58.8	141.5	89.6	30.7	23.1	1.6	391.4	3.7	296.8	75.5	4.2	-	380.1
1986	-	32.4	50.0	138.1	114.0	34.0	26.7	0.6	395.8	12.0	382.3	-	-	-	394.3
1987	-	38.9	48.6	268.9	82.7	61.0	17.2	1.9	519.2	4.1	255.1	58.8	20.8	-	338.8
1988	-	56.9	88.8	110.4	128.8	27.2	47.9	1.9	461.8	1.3	387.5	233.6	-	-	622.4
1989	-	87.2	74.1	70.2	71.5	24.2	19.7	3.4	350.3	1.0	372.2	61.4	-	-	434.6
1990	-	15.1	32.6	120.1	50.8	7.1	4.2	b/	229.9	0.1	86.6	23.7	-	-	110.5
1991	-	3.3	12.6	15.5	11.6	18.2	12.4	-	73.7	91.2	188.7	b/	-	-	279.9
1992	-	20.6	-	31.5	26.1	10.7	19.3	-	108.2	-	23.1	25.1	-	b/	48.2
1993	-	20.3	14.7	12.9	10.4	15.6	6.4	0.7	81.1	-	-	b/	-	b/	b/
1994	-	7.9	8.9	-	0.2	1.2	6.6	0.4	25.2	-	-	-	-	-	-
1995	-	10.9	35.8	1.7	97.9	38.5	28.8	0.3	214.0	-	-	-	-	-	-
1996	-	28.5	41.5	-	63.5	26.0	14.9	0.8	175.2	b/	-	-	-	-	b/
1997	4.5	33.3	35.4	-	44.7	25.8	5.4	0.5	149.5	-	-	-	-	-	-
1998	20.0	39.7	33.7	-	21.0	5.0	4.0	0.9	124.2	-	-	-	-	-	-
1999[c/]	0.8	6.1	23.5	8.1	17.9	1.9	2.8	1.3	62.4	-	-	-	-	-	-

TABLE A-8. **Oregon commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month (beginning in 1979, monthly totals are the sum of statistical weeks with closest fit to the calendar month).[a/] (Page 4 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	June	July	Aug.	Sept.	Oct.	Season
						CHINOOK (thousands)						**COHO (thousands)**			
Total All Areas															
1976-1980	-	14.1	30.5	71.2	76.5	23.8	14.0	2.5	232.6	169.7	431.4	171.9	17.6	1.8	792.3
1981-1985	-	19.8	8.7	54.8	43.9	10.7	6.4	1.1	145.5	-	241.2	67.8	1.7	-	310.6
1986-1990	-	47.9	59.0	142.0	90.1	31.2	23.1	1.6	394.9	3.7	298.2	86.8	8.4	0.1	397.2
1986	-	36.9	50.0	138.1	115.6	34.0	26.7	0.6	401.9	12.0	382.3	46.1	-	-	440.4
1987	-	41.2	48.6	271.1	82.7	61.0	17.2	1.9	523.8	4.1	262.5	58.8	20.8	-	346.2
1988	-	57.9	89.5	110.4	128.8	27.2	47.9	1.9	463.5	1.3	387.5	233.6	-	-	622.4
1989	-	87.9	74.5	70.2	72.2	25.4	19.7	3.4	353.2	1.0	372.2	68.2	14.4	-	455.7
1990	-	15.6	32.7	120.1	51.3	8.3	4.2	b/	232.1	0.1	86.6	27.3	7.0	0.3	121.4
1991	-	3.6	12.6	15.5	12.1	18.3	12.4	-	74.6	91.2	188.7	21.6	5.2	-	306.6
1992	-	21.0	0.9	31.6	26.2	10.7	19.3	-	109.7	-	23.7	25.9	-	b/	49.6
1993	-	20.6	14.7	13.0	10.5	15.6	6.4	0.7	81.5	-	0.2	1.2	0.2	b/	1.7
1994	-	7.9	8.9	-	0.2	1.2	6.6	0.4	25.2	-	-	-	-	-	-
1995	-	10.9	35.8	1.7	97.9	38.5	28.8	0.3	214.0	-	-	-	-	-	-
1996	-	28.5	41.5	-	63.5	26.0	14.9	0.8	175.2	b/	-	-	-	-	b/
1997	4.5	33.4	35.4	-	44.7	25.8	5.4	0.5	149.6	-	-	-	-	-	-
1998	20.0	39.7	33.7	-	21.0	5.0	4.0	0.9	124.2	-	-	-	-	-	-
1999[c/]	0.8	6.1	23.5	8.1	17.9	1.9	2.8	1.3	62.4	-	-	-	-	-	-

a/ Excludes harvests off Alaska, Washington, and California that were landed in Oregon. Landings are reported by port of landing prior to 1979 and by area of catch after 1978. Catch and landing areas include the following port areas: Columbia River includes Oregon ports from Astoria through Cannon Beach; Tillamook area includes Nehalem through Pacific City; Newport area includes Depoe Bay through Waldport; Coos Bay area prior to 1988 includes Florence through Bandon and after 1987 includes Florence through Port Orford; Brookings area prior to 1988 includes Port Orford through Brookings and after 1987 includes Gold Beach through Brookings.

b/ Less than 50 fish.

c/ Preliminary.

TABLE A-9. **Oregon** ocean **recreational effort** in salmon angler trips by catch area and month.[a/] (Page 1 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				ANGLER TRIPS (thousands)					
Columbia River									
1976-1980	-	0.9	8.6	17.4	25.3	8.3	0.2	b/	60.7
1981-1985	-	0.2	2.6	11.8	9.9	1.7	-	-	26.2
1986-1990	-	b/	0.9	8.9	7.6	0.3	-	-	17.7
1986	-	-	0.7	12.1	7.7	-	-	-	20.5
1987	-	-	0.6	8.5	8.0	-	-	-	17.1
1988	-	-	-	5.7	-	-	-	-	5.7
1989	-	0.1	1.2	9.2	9.2	-	-	-	19.8
1990	-	-	1.9	8.9	13.2	1.4	-	-	25.5
1991	-	-	1.5	9.0	9.4	1.8	-	-	21.7
1992	-	-	-	9.8	1.8	1.3	-	-	12.9
1993	-	-	-	5.7	7.9	4.3	-	-	17.8
1994	-	-	-	-	-	-	-	-	-
1995	-	-	-	2.3	7.7	1.0	-	-	10.9
1996	-	-	-	1.0	3.8	0.9	-	-	5.6
1997	-	-	-	2.8	0.8	-	-	-	3.6
1998	-	-	-	-	1.8	0.3	-	-	2.1
1999[c/]	-	-	-	2.1	3.7	1.7	-	-	7.4
Tillamook Area									
1976-1980	-	1.0	5.5	14.8	18.5	3.8	0.2	b/	43.8
1981-1985	-	0.3	1.2	14.2	11.6	2.7	0.3	-	30.3
1986-1990	-	0.1	2.0	12.1	10.7	4.1	d/	d/	29.0
1986	-	b/	1.9	13.0	3.1	-	d/	-	17.9
1987	-	-	1.8	12.4	10.9	3.8	d/	-	29.1
1988	-	0.3	2.1	9.6	13.8	7.4	d/	-	33.3
1989	-	0.3	3.0	15.4	9.5	3.1	d/	-	31.3
1990	-	0.1	1.2	9.9	16.3	6.0	d/	-	33.5
1991	-	0.4	4.0	16.6	-	-	d/	-	21.0
1992	-	1.2	3.4	11.7	7.1	2.8	d/	-	26.1
1993	-	0.8	0.2	3.1	1.5	-	d/	-	5.6
1994	-	0.6	0.9	-	-	-	8.7	b/	10.3
1995	-	0.6	0.1	-	-	1.3	1.0	0.8	3.8
1996	-	0.7	0.1	b/	0.5	3.7	3.3	-	8.3
1997	0.0	b/	0.1	0.1	0.3	1.4	1.8	-	3.6
1998	0.0	0.6	0.1	b/	0.3	2.3	2.9	-	6.0
1999[c/]	b/	0.6	0.1	3.4	0.3	3.1	3.5	0.1	11.2
Newport Area									
1976-1980	-	2.7	14.8	37.8	34.8	6.8	0.7	b/	97.7
1981-1985	-	0.5	3.8	29.0	20.8	3.0	-	-	57.1
1986-1990	-	0.8	7.8	37.4	23.3	5.3	-	-	74.6
1986	-	1.4	3.9	38.9	8.0	-	-	-	52.2
1987	-	-	5.2	40.0	23.2	8.6	-	-	76.9
1988	-	1.0	7.1	37.9	34.2	9.4	-	-	89.6
1989	-	0.9	17.2	37.5	22.8	4.3	-	-	82.8
1990	-	0.7	5.5	32.8	28.3	4.1	-	-	71.4
1991	-	0.8	11.8	40.6	-	-	-	-	53.3
1992	-	1.1	7.1	27.9	14.6	2.4	-	-	53.0
1993	-	0.2	0.2	11.6	5.1	-	-	-	17.1
1994	-	0.1	b/	-	-	-	-	-	0.1
1995	-	0.1	0.3	-	-	0.4	0.1	-	0.9
1996	-	0.3	0.2	b/	1.8	0.5	-	-	2.8
1997	b/	0.1	0.2	0.1	1.7	0.3	-	-	2.4
1998	0.0	b/	0.1	0.1	0.9	0.2	b/	-	1.3
1999[c/]	b/	b/	0.1	7.1	0.1	b/	b/	-	7.4

TABLE A-9. **Oregon** ocean **recreational effort** in salmon angler trips by catch area and month.[a/] (Page 2 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				ANGLER TRIPS (thousands)					
Coos Bay Area									
1976-1980	-	5.3	24.1	44.6	29.7	7.0	0.4	b/	111.1
1981-1985	-	1.3	8.0	34.9	16.7	2.8	d/	d/	63.7
1986-1990	-	0.7	8.7	33.1	15.3	3.5	d/	d/	61.4
1986	-	0.8	4.9	33.6	4.3	-	d/	d/	43.6
1987	-	-	3.9	40.6	12.8	5.2	d/	d/	62.5
1988	-	1.4	9.8	33.1	21.0	3.7	d/	d/	69.0
1989	-	0.8	16.2	33.9	13.6	2.1	d/	d/	66.6
1990	-	0.6	8.8	24.3	24.9	6.4	-	-	65.0
1991	-	1.0	17.3	39.4	-	-	-	-	57.7
1992	-	1.4	9.4	28.6	12.8	3.3	d/	-	55.6
1993	-	0.3	0.9	10.1	4.1	-	-	-	15.3
1994	-	0.2	0.2	-	-	-	d/	d/	0.4
1995	-	0.1	0.5	-	-	0.1	d/	d/	0.7
1996	-	0.2	0.6	0.6	1.9	0.7	d/	d/	3.9
1997	b/	0.3	0.5	0.8	2.0	0.4	d/	d/	3.9
1998	0.0	b/	b/	0.3	1.9	0.1	d/	d/	2.4
1999[c/]	0.0	b/	0.6	5.0	1.8	0.2	0.0	d/	7.6
Brookings Area									
1976-1980	-	1.3	11.8	27.8	20.2	6.8	5.6	0.9	74.4
1981-1985	-	1.7	6.3	25.9	15.4	3.4	3.4	0.1	56.2
1986-1990	-	2.2	13.0	24.7	13.1	3.2	2.2	-	58.4
1986	-	3.6	10.4	20.1	13.0	0.6	5.0	-	52.7
1987	-	2.3	10.0	29.0	15.2	7.1	5.9	-	69.4
1988	-	0.8	14.2	25.2	11.3	1.6	-	-	53.1
1989	-	3.1	15.7	26.6	14.6	5.8	-	-	65.8
1990	-	1.4	14.5	22.8	11.5	0.8	-	-	51.1
1991	-	1.1	11.6	17.8	1.9	4.0	-	-	36.4
1992	-	-	-	8.9	-	4.9	3.9	-	17.7
1993	-	1.7	4.7	6.5	8.1	2.8	-	-	23.8
1994	-	6.3	1.3	-	1.4	2.9	4.2	-	16.2
1995	-	2.3	6.2	-	2.0	5.5	3.4	0.0	19.4
1996	-	1.7	5.9	2.2	6.0	3.2	4.3	-	23.3
1997	-	2.5	3.5	2.9	5.5	1.0	1.3	-	16.6
1998	-	1.4	2.2	1.5	4.2	2.0	2.8	-	14.1
1999[c/]	-	0.2	0.9	2.5	6.6	3.3	2.3	-	15.8
South of Cape Falcon									
1976-1980	-	10.3	56.2	125.1	103.2	24.3	7.0	1.0	327.0
1981-1985	-	3.8	19.4	104.0	64.4	11.9	3.7	0.1	207.3
1986-1990	-	3.9	31.5	107.3	62.5	16.0	2.2	d/	223.4
1986	-	5.7	21.2	105.6	28.3	0.6	5.0	d/	166.4
1987	-	2.3	20.9	122.0	62.1	24.7	5.9	d/	237.9
1988	-	3.5	33.2	105.8	80.4	22.1	d/	d/	245.0
1989	-	5.1	52.2	113.3	60.4	15.4	d/	d/	246.4
1990	-	2.8	30.0	89.8	81.1	17.4	d/	-	221.0
1991	-	3.4	44.7	114.4	1.9	4.0	d/	-	168.4
1992	-	3.7	19.9	77.1	34.4	13.4	3.9	-	152.4
1993	-	3.0	6.0	31.3	18.7	2.8	d/	d/	61.8
1994	-	7.2	2.4	-	1.4	2.9	13.0	b/	26.9
1995	-	3.2	7.1	-	2.0	7.4	4.6	0.8	24.9
1996	-	3.0	6.8	2.8	10.2	8.0	7.5	-	38.3
1997	b/	2.9	4.2	3.8	9.5	3.1	3.1	d/	26.6
1998	0.0	2.0	2.4	1.9	7.3	4.6	5.7	d/	23.9
1999[c/]	b/	0.8	1.7	18.1	8.8	6.7	5.8	0.1	42.0

TABLE A-9. **Oregon** ocean **recreational effort** in salmon angler trips by catch area and month.[a/] (Page 3 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				ANGLER TRIPS (thousands)					
Total All Areas									
1976-1980	-	11.2	64.8	142.5	128.5	32.7	7.2	1.0	387.7
1981-1985	-	4.0	22.0	115.8	74.3	13.6	3.7	0.1	233.5
1986-1990	-	3.9	32.4	116.2	70.1	16.3	2.2	d/	241.1
1986	-	5.7	21.9	117.7	36.0	0.6	5.0	d/	187.0
1987	-	2.3	21.5	130.5	70.2	24.7	5.9	d/	255.1
1988	-	3.5	33.2	111.5	80.4	22.1	d/	d/	250.7
1989	-	5.3	53.4	122.6	69.6	15.4	d/	-	266.3
1990	-	2.8	32.0	98.7	94.3	18.8	d/	-	246.6
1991	-	3.4	46.2	123.4	11.3	5.8	d/	-	190.1
1992	-	3.7	19.9	86.9	36.3	14.7	3.9	-	165.3
1993	-	3.0	6.0	37.0	26.5	7.1	d/	d/	79.6
1994	-	7.2	2.4	-	1.4	2.9	13.0	b/	26.9
1995	-	3.2	7.1	2.3	9.6	8.4	4.6	0.8	35.8
1996	-	3.0	6.8	3.8	13.9	8.9	7.5	-	44.0
1997	b/	2.9	4.2	6.7	10.3	3.1	3.1	d/	30.2
1998	0.0	2.0	2.4	1.9	9.1	4.9	5.7	d/	26.0
1999[c/]	b/	0.8	1.7	20.2	12.4	8.4	5.8	0.1	49.4

a/ Monthly totals are the sum of statistical weeks with closest fit to the calendar month. The 1976-1980 effort is from combined salmon/steelhead punch card and sampled port data. Since 1981, data from sampled ports only. Effort since 1979 consists of salmon angler trips only. Data prior to 1979 include combined bottomfish and salmon trips. Columbia River area includes Astoria, Warrenton and Hammond; Tillamook area includes Garibaldi and Pacific City; Newport area includes Depoe Bay and Newport; Coos Bay area includes Florence, Winchester Bay and Coos Bay; Brookings area includes Gold Beach and Brookings.

b/ Less than 50 angler trips.

c/ Preliminary.

d/ Estimates not available in late-season, state water fisheries off Tillamook Bay and Elk River.

TABLE A-10. **Oregon** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 1 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	May	June	July	Aug.	Sept.	Season
					CHINOOK (thousands)							**COHO (thousands)**			
Columbia River															
1976-1980[b/]	-	0.3	3.2	4.1	8.0	1.5	0.1	c/	17.1	0.9	12.9	20.7	21.7	7.1	63.5
1981-1985	-	c/	0.7	2.4	1.9	0.3	-	-	5.4	0.3	3.6	16.5	11.2	2.2	33.8
1986-1990	-	c/	0.1	1.0	1.2	c/	-	-	2.3	-	2.2	16.0	10.6	0.3	29.0
1986	-	-	0.1	1.3	0.7	-	-	-	2.1	-	1.7	23.3	14.1	-	39.1
1987	-	-	0.2	2.0	1.9	-	-	-	4.1	-	0.9	12.5	12.3	-	25.6
1988	-	-	-	0.5	-	-	-	-	0.5	-	-	9.8	-	-	9.8
1989	-	c/	0.2	0.2	1.1	-	-	-	1.5	-	4.9	19.6	9.8	-	34.3
1990	-	-	0.1	0.9	2.2	0.1	-	-	3.3	-	3.5	14.7	16.6	1.3	36.1
1991	-	-	0.1	0.3	0.6	c/	-	-	1.0	-	2.4	16.4	17.2	3.4	39.4
1992	-	-	-	0.3	0.2	c/	-	-	0.5	-	-	17.9	3.0	1.4	22.3
1993	-	-	-	0.2	0.4	0.2	-	-	0.8	-	-	7.1	10.3	3.8	21.2
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	f/	0.1	f/	-	-	0.1	-	-	2.0	9.0	0.8	11.8
1996	-	-	-	f/	f/	f/	-	-	f/	-	-	1.4	4.7	0.9	7.0
1997	-	-	-	0.1	0.1	-	-	-	0.2	-	-	4.5	1.4	-	5.8
1998	-	-	-	-	0.1	c/	-	-	0.1	-	-	-	2.0	0.2	2.2
1999[d/]	-	-	-	0.2	0.6	0.1	-	-	0.9	-	-	2.5	3.4	1.7	7.5
Tillamook Area															
1976-1980[b/]	-	0.1	0.2	0.4	0.7	0.1	c/	c/	1.4	0.3	3.2	6.3	11.4	1.0	22.3
1981-1985	-	c/	c/	0.8	0.6	0.1	c/	-	1.5	0.1	0.5	10.3	8.7	0.6	20.2
1986-1990	-	c/	0.1	0.4	0.8	0.4	e/	e/	1.8	c/	2.0	12.5	8.7	1.5	24.8
1986	-	-	c/	0.2	0.2	-	e/	-	0.5	-	3.4	15.8	5.1	-	24.3
1987	-	-	0.1	0.8	2.0	0.6	e/	-	3.5	-	0.6	10.2	4.9	0.7	16.4
1988	-	c/	0.1	0.3	1.3	1.0	e/	-	2.7	0.1	1.8	8.2	14.2	5.7	29.9
1989	-	c/	0.1	0.3	0.3	0.2	e/	-	0.9	c/	3.4	19.7	7.0	0.1	30.3
1990	-	-	c/	0.5	0.4	0.3	e/	-	1.2	-	0.9	8.8	12.4	0.8	22.9
1991	-	c/	0.3	0.4	-	-	e/	-	0.7	c/	2.5	23.1	-	-	25.7
1992	-	0.1	0.3	0.6	0.3	0.2	e/	-	1.5	0.1	1.8	11.3	6.1	1.4	20.8
1993	-	0.1	c/	0.2	c/	-	e/	-	0.3	c/	c/	0.9	1.4	-	2.3
1994	-	0.1	0.1	-	-	-	2.2	-	2.4	-	-	-	-	-	f/
1995	-	0.1	c/	-	-	0.1	0.3	0.1	0.5	-	-	-	-	f/	f/
1996	-	0.1	c/	c/	0.1	0.7	0.7	-	1.6	-	-	-	f/	f/	f/
1997	0.0	c/	c/	c/	c/	0.2	0.3	e/	0.5	-	-	f/	-	f/	f/
1998	0.0	0.1	c/	0.0	c/	0.5	0.5	e/	1.1	-	-	-	f/	f/	f/
1999[d/]	0.0	0.1	c/	0.2	c/	0.7	0.5	c/	1.6	-	-	1.0	f/	f/	1.0

TABLE A-10. **Oregon** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 2 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	May	June	July	Aug.	Sept.	Season
						CHINOOK (thousands)						**COHO (thousands)**			
Newport Area															
1976-1980[b/]	-	0.1	0.5	0.8	0.8	0.2	c/	c/	2.5	1.3	12.7	25.3	22.8	1.8	64.0
1981-1985	-	c/	0.2	1.5	0.9	0.1	-	-	2.7	0.1	2.1	22.8	19.2	1.8	46.0
1986-1990	-	0.1	0.6	1.6	1.0	0.4	-	-	3.7	0.5	8.3	45.7	24.3	3.8	82.6
1986	-	0.1	0.1	1.9	0.1	-	-	-	2.3	1.5	7.6	57.4	13.9	-	80.4
1987	-	-	0.2	2.4	2.1	1.7	-	-	6.4	-	1.3	43.1	14.5	6.3	65.3
1988	-	0.1	1.6	1.8	1.6	0.2	-	-	5.3	c/	2.8	42.5	44.5	11.0	100.9
1989	-	0.1	0.7	0.5	0.4	c/	-	-	1.8	0.8	24.2	47.4	29.6	0.6	102.5
1990	-	c/	0.3	1.4	0.8	0.2	-	-	2.7	0.2	5.8	37.9	19.0	1.2	64.1
1991	-	0.1	0.4	0.4	-	-	-	-	0.9	0.1	15.2	65.8	-	-	81.1
1992	-	0.1	0.3	2.8	0.9	0.1	-	-	4.1	c/	9.7	34.7	16.9	2.2	63.5
1993	-	c/	0.0	0.3	0.1	-	-	-	0.4	c/	c/	9.4	7.0	-	16.4
1994	-	c/	0.0	-	-	-	-	-	c/	-	-	-	-	-	-
1995	-	c/	c/	-	-	c/	c/	-	0.1	-	-	-	-	f/	f/
1996	-	c/	c/	c/	0.4	0.1	-	-	0.6	-	-	-	f/	f/	f/
1997	0.0	c/	0.1	0.2	0.9	0.1	-	-	1.3	-	-	-	f/	-	f/
1998[d/]	0.0	c/	0.1	0.1	0.2	c/	-	-	0.4	-	-	f/	f/	-	f/
1999[d/]	0.0	c/	c/	0.3	c/	c/	c/	-	0.3	-	-	4.0	-	-	4.0
Coos Bay Area															
1976-1980[b/]	-	0.5	2.1	2.9	3.6	1.2	0.1	c/	10.3	7.5	31.0	44.6	20.7	2.8	106.9
1981-1985	-	c/	0.6	4.1	2.0	0.4	-	-	7.1	1.3	8.2	29.5	13.0	1.4	53.3
1986-1990	-	0.1	1.2	5.0	2.2	0.8	e/	e/	9.3	0.4	9.8	39.9	13.0	1.7	64.8
1986	-	c/	1.0	4.5	0.5	-	e/	e/	6.1	1.1	8.0	48.0	6.1	-	63.2
1987	-	-	0.9	10.7	4.6	2.8	e/	e/	19.0	-	1.0	44.6	6.4	2.1	54.1
1988	-	0.2	1.7	2.8	3.1	0.2	e/	e/	8.1	c/	5.2	45.0	17.7	3.3	71.3
1989	-	0.1	1.8	4.3	0.6	c/	e/	e/	6.7	0.7	22.3	38.5	11.6	c/	73.1
1990	-	c/	0.6	2.8	2.3	0.8	-	-	6.6	c/	12.4	23.5	23.2	3.1	62.2
1991	-	c/	2.1	2.9	-	-	-	-	5.1	0.8	23.4	66.5	-	-	90.8
1992	-	0.1	2.0	1.0	0.3	0.4	e/	-	3.8	0.5	13.1	43.9	15.8	2.7	76.0
1993	-	0.1	c/	0.6	0.4	-	e/	e/	1.1	0.1	0.1	7.6	4.4	-	12.2
1994	-	c/	c/	-	-	-	e/	e/	c/	-	-	-	-	-	-
1995	-	c/	0.2	-	-	c/	c/	-	0.2	-	-	-	-	-	-
1996	-	c/	0.1	0.3	0.3	0.1	e/	e/	0.8	-	-	-	f/	f/	f/
1997	c/	c/	0.1	0.1	0.4	0.1	e/	e/	0.7	-	-	f/	f/	-	f/
1998[d/]	0.0	0.0	c/	c/	0.4	c/	e/	e/	0.5	-	-	-	0.1	-	0.1
1999[d/]	0.0	c/	0.2	0.9	0.4	c/	e/	e/	1.4	-	-	1.1	-	-	1.1

TABLE A-10. **Oregon** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 3 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	May	June	July	Aug.	Sept.	Season
					CHINOOK (thousands)							**COHO (thousands)**			
Brookings Area															
1976-1980[g/]	-	0.1	1.0	2.8	3.4	0.6	0.7	0.1	8.6	0.4	10.6	15.4	5.3	0.5	32.5
1981-1985	-	0.7	1.3	9.2	4.2	0.6	0.5	c/	16.4	0.2	1.9	7.5	2.4	0.1	12.1
1986-1990	-	0.4	5.5	7.2	4.0	1.4	0.3	-	18.8	0.4	3.4	11.4	3.3	0.5	18.9
1986	-	1.1	2.8	3.5	3.9	c/	0.6	-	12.0	1.5	2.6	5.7	2.1	-	12.0
1987	-	0.1	3.8	9.8	5.6	5.9	1.1	-	26.4	c/	0.5	14.0	3.1	1.4	19.0
1988	-	0.1	12.4	6.5	2.6	0.1	-	-	21.7	c/	1.0	12.1	1.8	0.1	15.0
1989	-	0.4	3.6	9.4	6.8	1.0	-	-	21.2	0.2	4.2	20.3	7.5	0.8	33.0
1990	-	0.4	4.6	6.5	1.2	c/	-	-	12.7	0.1	8.4	5.0	1.8	c/	15.3
1991	-	c/	4.1	2.3	0.1	0.3	-	-	6.8	-	10.2	10.6	0.5	0.9	22.2
1992	-	-	-	1.5	-	0.4	0.7	-	2.7	-	-	2.9	-	0.4	3.3
1993	-	1.1	0.2	0.6	1.3	0.5	-	-	3.8	0.1	0.1	1.9	3.4	0.5	6.0
1994	-	1.9	0.1	-	0.3	0.3	1.1	-	3.6	-	-	-	f/	f/	f/
1995	-	0.2	1.6	-	0.5	2.6	0.8	-	5.7	-	f/	-	f/	0.1	0.1
1996	-	0.5	2.7	0.3	2.8	0.6	1.3	-	8.2	-	f/	f/	f/	f/	0.1
1997	-	0.8	0.8	1.0	1.6	0.1	0.7	-	5.1	f/	f/	f/	f/	f/	0.1
1998[d/]	-	0.2	0.3	0.3	0.4	0.2	0.4	-	2.0	-	f/	f/	f/	-	f/
1999[d/]	-	c/	c/	0.9	1.7	0.5	0.3	-	3.5	-	f/	f/	f/	f/	f/
South of Cape Falcon															
1976-1980[h/]	-	0.8	3.8	6.9	8.4	2.0	0.8	0.1	22.8	9.5	57.5	91.6	60.1	6.1	225.7
1981-1985	-	0.7	2.1	15.5	7.7	1.2	0.5	c/	27.7	1.6	12.7	70.2	43.3	3.9	131.6
1986-1990	-	0.5	7.3	14.2	8.1	3.0	0.3	e/	33.6	1.2	23.5	109.5	49.3	7.5	191.1
1986	-	1.2	4.0	10.2	4.7	c/	0.6	e/	20.8	4.1	21.6	126.8	27.3	-	179.8
1987	-	0.1	5.1	23.8	14.3	11.0	1.1	e/	55.4	c/	3.4	111.9	29.0	10.5	154.9
1988	-	0.4	15.8	11.5	8.6	1.6	e/	e/	37.8	0.1	10.9	107.8	78.1	20.1	217.0
1989	-	0.6	6.2	14.5	8.0	1.2	e/	e/	30.6	1.6	54.2	125.9	55.7	1.5	239.0
1990	-	0.4	5.6	11.2	4.7	1.3	e/	-	23.2	0.3	27.5	75.1	56.4	5.2	164.5
1991	-	0.2	6.9	6.0	0.1	0.3	e/	-	13.4	0.9	51.4	166.0	0.5	0.9	219.7
1992	-	0.2	2.5	5.9	1.5	1.2	0.7	-	12.1	0.6	24.7	92.7	38.7	6.8	163.6
1993	-	1.3	0.2	1.7	1.9	0.5	e/	e/	5.6	0.2	0.2	19.9	16.2	0.5	36.9
1994	-	1.9	0.3	-	0.3	0.3	3.3	e/	6.0	-	-	-	f/	f/	f/
1995	-	0.3	1.8	-	0.5	2.8	1.1	0.1	6.6	-	f/	-	f/	0.1	0.1
1996	-	0.7	2.9	0.6	3.5	1.4	2.0	e/	11.2	-	f/	f/	0.1	f/	0.2
1997	c/	0.9	0.9	1.5	2.8	0.5	1.0	e/	7.5	f/	f/	f/	0.1	f/	0.2
1998[d/]	0.0	0.3	0.4	0.5	1.0	0.8	0.9	e/	4.0	-	f/	f/	0.1	f/	0.1
1999[d/]	0.0	0.1	0.3	2.2	2.1	1.2	0.9	0.1	6.8	-	f/	6.0	f/	f/	6.1

TABLE A-10. **Oregon** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 4 of 4)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	May	June	July	Aug.	Sept.	Season
						CHINOOK (thousands)						**COHO (thousands)**			
Total All Areas															
1976-1980[b/]	-	1.1	7.0	11.0	16.4	3.5	0.9	0.1	40.0	10.4	70.4	112.3	81.8	13.2	289.2
1981-1985	-	0.7	2.8	17.9	9.6	1.5	0.5	c/	33.1	1.9	16.2	86.6	54.5	6.1	165.4
1986-1990	-	0.5	7.4	15.2	9.2	3.1	0.3	e/	35.8	1.2	25.7	125.5	59.8	7.7	220.0
1986	-	1.2	4.1	11.5	5.4	c/	0.6	e/	22.8	4.1	23.3	150.1	41.3	-	218.9
1987	-	0.1	5.3	25.8	16.1	11.0	1.1	e/	59.4	c/	4.3	124.4	41.2	10.5	180.5
1988	-	0.4	15.8	12.0	8.6	1.6	e/	e/	38.3	0.1	10.9	117.7	78.1	20.1	226.9
1989	-	0.6	6.4	14.7	9.1	1.2	e/	e/	32.0	1.6	59.1	145.5	65.5	1.5	273.3
1990	-	0.4	5.7	12.2	6.9	1.4	e/	-	26.5	0.3	31.0	89.8	73.0	6.5	200.6
1991	-	0.2	7.0	6.3	0.6	0.3	e/	-	14.4	0.9	53.8	182.4	17.7	4.3	259.1
1992	-	0.2	2.5	6.2	1.7	1.2	0.7	-	12.6	0.6	24.7	110.6	41.7	8.2	185.8
1993	-	1.3	0.2	1.9	2.3	0.7	e/	e/	6.4	0.2	0.2	27.0	26.5	4.3	58.1
1994	-	1.9	0.3	-	0.3	0.3	3.3	e/	6.0	-	-	-	f/	f/	f/
1995	-	0.3	1.8	f/	0.6	2.8	1.1	0.1	6.7	-	f/	2.0	9.0	0.9	11.9
1996	-	0.7	2.9	0.6	3.5	1.5	2.0	-	11.2	-	f/	1.5	4.7	1.0	7.2
1997	c/	0.9	0.9	1.4	3.0	0.5	1.0	e/	7.7	f/	f/	4.5	1.4	f/	6.0
1998	0.0	0.3	0.4	0.5	1.1	0.8	0.9	e/	4.1	-	f/	f/	2.1	0.2	2.3
1999[d/]	0.0	0.1	0.3	2.4	2.7	1.3	0.9	c/	7.7	-	f/	8.5	3.4	1.7	13.6

a/ Monthly totals are the sum of statistical weeks with closest fit to the calendar month. The 1976-1980 catch is from combined salmon/steelhead punch card and sampled port data. Since 1981, data from sampled ports only. Columbia River area includes Astoria, Warrenton, and Hammond; Tillamook area includes Garibaldi and Pacific City; Newport area includes Depoe Bay and Newport; Coos Bay area includes Florence, Winchester Bay, and Coos Bay; Brookings area includes Gold Beach and Brookings.

b/ The 1976-1980 average includes less than 300 coho during Oct. and Nov.

c/ Less than 50 fish.

d/ Preliminary.

e/ Estimates not available due to very low, sporadic effort and catch.

f/ Illegal catch, less than 50 fish.

g/ The 1976-1980 average includes less than 600 coho during Oct. and Nov.

h/ The 1976-1980 average includes less than 900 coho during Oct. and Nov.

i/ The 1976-1980 average includes less than 1,100 coho during Oct. and Nov.

TABLE A-11. Summary of **Washington non-Indian, commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 1 of 2)

Year or Average	Columbia River	Grays Harbor	Quillayute	Cape Flattery[a/]	Washington Subtotal	Oregon	California	Alaska	Total
				DAYS FISHED (thousands)					
1976-1980	9.007	15.023	9.446	9.707	43.184	0.664	0.042	0.970	44.860
1981-1985	1.961	5.194	1.553	3.112	11.819	0.244	0.018	0.025	12.107
1986-1990	0.871	2.619	0.300	0.928	4.719	0.100	0.000	0.003	4.822
1986	1.435	1.611	0.349	0.860	4.255	0.061	0.000	0.015	4.331
1987	0.478	2.234	0.131	0.282	3.125	0.152	0.000	0.000	3.277
1988	0.317	3.700	0.712	1.067	5.796	0.140	0.000	0.002	5.938
1989	0.922	3.221	0.000	0.861	5.004	0.117	0.000	0.000	5.121
1990	1.203	2.331	0.309	1.571	5.414	0.031	0.000	0.000	5.445
1991	0.645	1.759	0.174	2.294	4.872	0.085	0.000	0.033	4.990
1992	0.272	2.570	0.488	1.519	4.849	0.005	0.000	0.010	4.864
1993	0.088	1.909	0.240	1.470	3.707	0.033	0.000	0.000	3.740
1994	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.000	0.030
1995	0.000	0.000	0.070	0.401	0.471	0.022	0.000	0.000	0.493
1996	0.000	0.134	0.018	0.256	0.408	0.067	0.000	0.000	0.475
1997	0.000	0.102	0.120	0.230	0.452	0.046	0.000	0.000	0.498
1998[b/]	0.000	0.006	0.038	0.095	0.139	0.000	0.000	0.000	0.139
1999[b/]	0.001	0.320	0.037	0.372	0.730	0.006	0.000	0.000	0.736
				CHINOOK (thousands)					
1976-1980	23.517	81.083	44.971	33.932	183.503	4.878	0.648	12.666	201.695
1981-1985	9.172	34.995	7.061	10.074	61.303	0.901	0.184	0.203	62.591
1986-1990	5.089	27.284	4.251	9.601	46.225	1.431	0.000	0.001	47.657
1986	11.571	13.628	2.985	4.656	32.840	0.837	0.000	0.006	33.683
1987	5.338	42.182	2.368	4.838	54.726	2.381	0.000	0.000	57.107
1988	3.282	32.782	14.233	21.941[c/]	72.238	1.386	0.000	0.000	73.624
1989	3.160	36.773	0.000	0.282	40.215	2.130	0.000	0.000	42.345
1990	2.095	11.054	1.669	16.286	31.104	0.423	0.000	0.000	31.527
1991	1.372	11.271	0.928	15.238	28.809	0.341	0.000	0.000	29.150
1992	2.730	18.278	5.544	17.076	43.628	0.068	0.000	0.000	43.696
1993	0.056	12.171	1.835	16.010	30.072	0.255	0.000	0.000	30.327
1994	0.000	0.000	0.000	0.000	0.000	0.785	0.000	0.000	0.785
1995	0.000	0.000	0.000	0.003	0.003	1.826	0.000	0.000	1.829
1996	0.000	0.000	0.000	0.000	0.000	1.490	0.000	0.000	1.490
1997	0.000	0.339	2.294	3.785	6.418	1.362	0.000	0.000	7.780
1998[b/]	0.000	0.079	1.690	4.160	5.929	0.000	0.000	0.000	5.929
1999[b/]	0.000	4.144	0.614	12.698	17.456	0.172	0.000	0.000	17.628
				COHO (thousands)					
1976-1980	136.924	207.455	203.328	155.834	703.541	21.460	1.595	15.218	741.814
1981-1985	32.087	50.907	27.216	42.272	152.482	8.260	0.033	0.876	161.651
1986-1990	19.012	12.493	3.311	19.563	54.379	1.501	0.000	0.103	55.983
1986	45.602	2.588	7.806	19.040	75.036	0.346	0.000	0.501	75.883
1987	10.844	34.992	0.350	1.171	47.357	1.425	0.000	0.000	48.782
1988	0.000	0.002	0.000	2.229[d/]	2.231	2.124	0.000	0.016	4.371
1989	16.036	0.020	0.000	41.089	57.145	3.484	0.000	0.000	60.629
1990	22.576	24.862	8.401	34.287	90.126	0.126	0.000	0.000	90.252
1991	16.248	12.393	1.405	24.124[e/]	54.170	2.877	0.000	2.162	59.209
1992	1.084	5.153	3.778	7.664	17.679	0.057	0.000	0.299	18.035
1993	0.538	8.521	1.701	3.163	13.923	0.005	0.000	0.000	13.928
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	4.621	20.805	25.426	0.000	0.000	0.000	25.426
1996	0.000	3.985	0.409	13.077	17.471	0.000	0.000	0.000	17.471
1997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1998[b/]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1999[b/]	0.027	0.618	1.257	1.913	3.815	0.000	0.000	0.000	3.815

TABLE A-11. Summary of **Washington non-Indian, commercial troll** salmon fishing **effort** in days fished and **landings** in numbers of fish by catch area. (Page 2 of 2)

Year or Average	Columbia River	Grays Harbor	Quillayute	Cape Flattery[a/]	Washington Subtotal	Oregon	California	Alaska	Total
				PINK (thousands)					
1976-1980[f/]	3.598	27.218	143.276	238.787	412.878	1.829	0.000	2.380	417.087
1981-1985[f/]	1.272	7.589	22.914	107.620	139.394	0.342	0.001	0.263	140.000
1986-1990[f/]	0.044	0.412	0.364	18.894	19.714	0.019	0.000	0.000	19.733
1987	0.087	0.390	0.728	1.524	2.729	0.012	0.000	0.000	2.741
1989	0.002	0.434	0.000	36.263	36.699	0.026	0.000	0.000	36.725
1991	0.059	0.007	2.574	40.943	43.583	0.027	0.000	0.000	43.610
1993	0.000	0.015	0.030	2.816	2.861	0.000	0.000	0.000	2.861
1995	0.000	0.000	2.715	28.217	30.932	0.000	0.000	0.000	30.932
1997	0.000	0.001	0.000	0.004	0.005	0.000	0.000	0.000	0.005
1999[b/]	0.000	0.002	0.013	0.038	0.053	0.000	0.000	0.000	0.053

a/ Cape Flattery data include effort and landings from Cape Flattery Subarea 4B.
b/ Preliminary.
c/ Includes 300 chinook landed in illegal fishing.
d/ Includes 2,200 coho landed in illegal fishing.
e/ Includes 100 coho landed in illegal fishing.
f/ Odd-year average.

TABLE A-12. **Washington non-Indian troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 1 of 2)

Year or Average	May	June	July	Aug.	Sept.[b/]	Total
			DAYS FISHED (thousands)			
Cape Flattery[c/]						
1976-1980	0.656	0.402	3.064	4.198	1.387	9.707
1981-1985	0.416	0.032	1.329	1.327	0.008	3.112
1986-1990	0.384	0.107	0.066	0.371	0.000	0.928
1986	0.233	0.004	0.316	0.307	0.000	0.860
1987	0.263	0.000	0.012	0.007	0.000	0.282
1988	0.576	0.464	0.003	0.024	0.000	1.067
1989	0.000	0.000	0.000	0.860	0.001	0.861
1990	0.848	0.065	0.001	0.657	0.000	1.571
1991	0.786	0.342	0.001	0.958	0.207	2.294
1992	0.569	0.486	0.290	0.174	0.000	1.519
1993	0.602	0.420	0.302	0.144	0.002	1.470
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.345	0.056	0.401
1996	0.000	0.000	0.108	0.147	0.000	0.255
1997[d/]	0.168	0.062	0.000	0.000	0.000	0.230
1998[d/]	0.087	0.008	0.000	0.000	0.000	0.095
1999[d/]	0.154	0.105	0.084	0.029	0.000	0.372
Quillayute						
1976-1980	0.570	0.541	3.812	3.609	0.914	9.446
1981-1985	0.175	0.015	0.959	0.404	0.000	1.553
1986-1990	0.149	0.066	0.020	0.063	0.003	0.300
1986	0.141	0.009	0.094	0.105	0.000	0.349
1987	0.126	0.000	0.005	0.000	0.000	0.131
1988	0.405	0.307	0.000	0.000	0.000	0.712
1989	0.000	0.000	0.000	0.000	0.000	0.000
1990	0.072	0.013	0.000	0.209	0.015	0.309
1991	0.070	0.039	0.000	0.052	0.013	0.174
1992	0.103	0.170	0.133	0.082	0.000	0.488
1993	0.049	0.047	0.121	0.023	0.000	0.240
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.052	0.018	0.070
1996	0.000	0.000	0.011	0.007	0.000	0.018
1997[d/]	0.054	0.066	0.000	0.000	0.000	0.120
1998[d/]	0.034	0.004	0.000	0.000	0.000	0.038
1999[d/]	0.011	0.000	0.012	0.009	0.005	0.037
Grays Harbor						
1976-1980	2.255	1.320	5.000	4.231	2.218	15.023
1981-1985	2.109	0.200	2.232	0.652	0.000	5.194
1986-1990	1.723	0.491	0.176	0.229	0.000	2.619
1986	1.504	0.002	0.024	0.081	0.000	1.611
1987	1.379	0.000	0.855	0.000	0.000	2.234
1988	2.443	1.255	0.000	0.000	0.002	3.700
1989	2.151	1.068	0.000	0.002	0.000	3.221
1990	1.136	0.131	0.001	1.063	0.000	2.331
1991	0.755	0.603	0.000	0.171	0.230	1.759
1992	1.216	0.583	0.429	0.342	0.000	2.570
1993	0.585	0.470	0.274	0.193	0.387	1.909
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.000	0.000	0.000
1996	0.000	0.000	0.062	0.077	0.000	0.139
1997[d/]	0.072	0.030	0.000	0.000	0.000	0.102
1998[d/]	0.006	0.000	0.000	0.000	0.000	0.006
1999[d/]	0.106	0.126	0.039	0.048	0.001	0.320

TABLE A-12. **Washington non-Indian troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 2 of 2)

Year or Average	May	June	July	Aug.	Sept.[b/]	Total
			DAYS FISHED (thousands)			
Columbia River						
1976-1980	0.695	0.538	3.199	2.907	1.668	9.007
1981-1985	0.566	0.058	0.655	0.553	0.129	1.961
1986-1990	0.197	0.036	0.120	0.287	0.231	0.871
1986	0.482	0.000	0.316	0.637	0.000	1.435
1987	0.194	0.000	0.284	0.000	0.000	0.478
1988	0.189	0.128	0.000	0.000	0.000	0.317
1989	0.098	0.042	0.000	0.302	0.480	0.922
1990	0.021	0.012	0.000	0.495	0.675	1.203
1991	0.135	0.016	0.000	0.438	0.056	0.645
1992	0.146	0.010	0.083	0.033	0.000	0.272
1993	0.003	0.002	0.043	0.009	0.031	0.088
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.000	0.000	0.000
1996	0.000	0.000	0.000	0.000	0.000	0.000
1997	0.000	0.000	0.000	0.000	0.000	0.000
1998[d/]	0.000	0.000	0.000	0.000	0.000	0.000
1999[d/]	0.000	0.000	0.000	0.001	0.000	0.001
Total All Areas						
1976-1980	4.177	2.800	15.075	14.944	6.187	43.183
1981-1985	3.266	0.307	5.175	2.943	0.137	11.819
1986-1990	2.452	0.700	0.382	0.950	0.235	4.719
1986	2.360	0.015	0.750	1.130	0.000	4.255
1987	1.962	0.000	1.156	0.007	0.000	3.125
1988	3.613	2.154	0.003	0.024	0.002	5.796
1989	2.249	1.110	0.000	1.164	0.481	5.004
1990	2.077	0.221	0.002	2.424	0.690	5.414
1991	1.746	1.000	0.001	1.619	0.506	4.872
1992	2.034	1.249	0.935	0.631	0.000	4.849
1993	1.239	0.939	0.740	0.369	0.420	3.707
1994	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.397	0.074	0.471
1996	0.000	0.000	0.181	0.231	0.000	0.412
1997	0.294	0.158	0.000	0.000	0.000	0.452
1998[d/]	0.127	0.012	0.000	0.000	0.000	0.139
1999[d/]	0.271	0.231	0.135	0.087	0.006	0.730

a/ Summary of WDFW fish receiving ticket information by statistical month, excluding Washington landings from Oregon, California and Alaska.

b/ Data for Sept. include any effort after Sept.

c/ Cape Flattery area includes effort and catches from Strait of Juan de Fuca Area 4B.

d/ Preliminary.

TABLE A-13. **Washington non-Indian troll** chinook, coho, and pink salmon **landings** in numbers of fish by catch area and month.[a/] (Page 1 of 3)

Year or Average	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total
	CHINOOK (thousands)						**COHO (thousands)**						**PINKS (thousands in odd years)**					
Cape Flattery[c/]																		
1976-1980	6.781	3.805	12.440	8.782	2.124	33.932	0.000	3.850	66.954	58.596	26.434	155.834	0.044	0.235	42.002	192.168	4.336	238.786
1981-1985	3.293	0.319	5.031	1.423	0.008	10.074	0.000	0.000	26.379	15.852	0.041	42.272	0.113	0.013	12.112	95.105	0.277	107.620
1986-1990	6.525	2.508	0.084	0.480	0.003	9.601	0.000	0.000	1.471	18.088	0.004	19.563	0.000	0.000	0.390	18.503	0.000	18.894
1986	3.459	0.050	0.282	0.865	0.000	4.656	0.000	0.000	6.124	12.916	0.000	19.040						
1987	4.747	0.000	0.081	0.010	0.000	4.838	0.000	0.000	0.848	0.323	0.000	1.171	0.000	0.000	0.781	0.743	0.000	1.524
1988[d/]	10.040	11.602	0.057	0.242	0.000	21.941	0.000	0.000	0.381	1.848	0.000	2.229						
1989	0.000	0.000	0.000	0.268	0.014	0.282	0.000	0.000	0.000	41.070	0.019	41.089	0.000	0.000	0.000	36.263	0.000	36.263
1990	14.381	0.888	0.000	1.017	0.000	16.286	0.000	0.000	0.002	34.285	0.000	34.287						
1991[e/]	8.814	5.470	0.009	0.579	0.366	15.238	0.000	0.000	0.103	18.647	5.374	24.124	0.003	0.016	0.006	40.636	0.282	40.943
1992	9.073	6.191	0.979	0.833	0.000	17.076	0.000	0.000	4.571	3.093	0.000	7.664						
1993	8.566	5.366	1.797	0.281	0.000	16.010	0.000	0.000	2.184	0.979	0.000	3.163	0.014	0.001	0.064	2.726	0.011	2.816
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1995	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.000	0.000	15.593	5.212	20.805	0.000	0.000	0.000	27.429	0.788	28.217
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.516	7.526	0.000	13.042						
1997[f/]	3.236	0.549	0.000	0.000	0.000	3.785	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.000	0.000	0.004
1998[f/]	4.043	0.117	0.000	0.000	0.000	4.160	0.000	0.000	0.000	0.000	0.000	0.000						
1999[f/]	2.808	4.938	3.428	1.524	0.000	12.698	0.000	0.000	0.477	1.436	0.000	1.913	0.000	0.000	0.030	0.008	0.000	0.038
Quillayute																		
1976-1980	6.487	5.777	19.674	10.996	2.038	44.971	0.003	9.374	112.61	63.373	17.961	203.328	0.280	0.432	39.294	102.976	0.292	143.276
1981-1985	1.879	0.154	3.977	1.050	0.000	7.061	0.000	0.000	23.686	3.530	0.000	27.216	0.039	0.000	7.150	15.723	0.002	22.914
1986-1990	2.580	1.345	0.059	0.265	0.002	4.251	0.000	0.000	0.483	2.825	0.003	3.311	0.000	0.000	0.364	0.000	0.000	0.364
1986	1.910	0.085	0.253	0.737	0.000	2.985	0.000	0.000	2.067	5.739	0.000	7.806						
1987	2.328	0.000	0.040	0.000	0.000	2.368	0.000	0.000	0.350	0.000	0.000	0.350	0.000	0.000	0.000	0.728	0.000	0.000
1988	7.753	6.480	0.000	0.000	0.000	14.233	0.000	0.000	0.000	0.000	0.000	0.000						
1989	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1990	0.910	0.158	0.000	0.590	0.011	1.669	0.000	0.000	0.000	8.385	0.016	8.401						
1991	0.414	0.399	0.000	0.104	0.011	0.928	0.000	0.000	0.000	1.154	0.251	1.405	0.000	0.000	0.000	2.566	0.008	2.574
1992	1.543	2.027	1.136	0.838	0.000	5.544	0.000	0.000	2.202	1.576	0.000	3.778						
1993	0.805	0.635	0.332	0.063	0.000	1.835	0.000	0.000	1.344	0.357	0.000	1.701	0.000	0.000	0.020	0.010	0.000	0.030
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	2.773	1.848	4.621	0.000	0.000	0.000	2.631	0.084	2.715
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.245	0.164	0.000	0.409						
1997[f/]	1.037	1.257	0.000	0.000	0.000	2.294	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1998[f/]	1.625	0.065	0.000	0.000	0.000	1.690	0.000	0.000	0.000	0.000	0.000	0.000						
1999[f/]	0.128	0.000	0.336	0.150	0.000	0.614	0.000	0.000	0.035	0.894	0.328	1.257	0.000	0.000	0.000	0.013	0.000	0.013

TABLE A-13. **Washington non-Indian troll** chinook, coho, and pink salmon **landings** in numbers of fish by catch area and month.[a/] (Page 2 of 3)

Year or Average	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total
	CHINOOK (thousands)						**COHO (thousands)**						**PINKS (thousands in odd years)**					
Grays Harbor																		
1976-1980	28.493	15.087	18.923	13.306	5.274	81.083	0.020	13.96	123.24	52.640	17.592	207.455	0.239	0.053	13.298	13.510	0.118	27.217
1981-1985	20.022	2.280	10.497	2.196	0.000	34.995	0.000	0.000	44.294	6.613	0.000	50.907	0.078	0.020	4.976	2.515	0.000	7.589
1986-1990	17.976	5.182	3.537	0.586	0.003	27.284	0.000	0.000	7.086	5.406	0.000	12.493	0.114	0.091	0.195	0.012	0.000	0.412
1986	13.182	0.028	0.046	0.372	0.000	13.628	0.000	0.000	0.440	2.148	0.000	2.588						
1987	24.543	0.000	17.639	0.000	0.000	42.182	0.000	0.000	34.992	0.000	0.000	34.992	0.000	0.000	0.390	0.000	0.000	0.390
1988	22.219	10.550	0.000	0.000	0.013	32.782	0.002	0.000	0.000	0.000	0.000	0.002						
1989	22.220	14.553	0.000	0.000	0.000	36.773	0.000	0.000	0.000	0.020	0.000	0.020	0.229	0.182	0.000	0.023	0.000	0.434
1990	7.714	0.780	0.001	2.559	0.000	11.054	0.000	0.000	0.000	24.862	0.000	24.862						
1991	4.414	6.483	0.000	0.160	0.214	11.271	0.000	0.000	0.000	5.526	6.867	12.393	0.001	0.001	0.000	0.000	0.005	0.007
1992	8.961	4.375	3.130	1.812	0.000	18.278	0.000	0.000	2.716	2.437	0.000	5.153						
1993	4.980	4.622	0.483	0.602	1.484	12.171	0.000	0.000	1.220	2.128	5.173	8.521	0.002	0.000	0.004	0.006	0.003	0.015
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.376	2.699	0.000	4.075						
1997[f/]	0.241	0.098	0.000	0.000	0.000	0.339	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.001
1998[f/]	0.079	0.000	0.000	0.000	0.000	0.079	0.000	0.000	0.000	0.000	0.000	0.000						
1999[f/]	1.255	2.137	0.266	0.486	0.000	4.144	0.000	0.000	0.161	0.448	0.009	0.618	0.000	0.001	0.001	0.000	0.000	0.002
Columbia River																		
1976-1980	7.990	5.095	3.933	3.312	3.187	23.517	0.002	18.97	71.700	28.995	17.249	136.924	0.005	0.005	1.817	1.348	0.423	3.598
1981-1985	6.464	0.758	1.385	0.482	0.084	9.172	0.000	0.000	17.880	11.159	3.048	32.087	0.004	0.000	0.621	0.647	0.001	1.272
1986-1990	2.998	0.541	0.332	0.844	0.375	5.089	0.000	0.000	4.602	9.200	5.210	19.012	0.000	0.000	0.044	0.000	0.000	0.044
1986	8.135	0.000	0.334	3.102	0.000	11.571	0.000	0.000	12.165	33.437	0.000	45.602						
1987	4.014	0.000	1.324	0.000	0.000	5.338	0.000	0.000	10.844	0.000	0.000	10.844	0.000	0.000	0.087	0.000	0.000	0.087
1988	1.662	1.620	0.000	0.000	0.000	3.282	0.000	0.000	0.000	0.000	0.000	0.000						
1989	1.044	0.917	0.000	0.496	0.703	3.160	0.000	0.000	0.000	5.398	10.638	16.036	0.000	0.000	0.000	0.001	0.001	0.002
1990	0.135	0.166	0.000	0.623	1.171	2.095	0.000	0.000	0.000	7.163	15.413	22.576						
1991	0.848	0.066	0.000	0.447	0.011	1.372	0.000	0.000	0.000	14.595	1.653	16.248	0.000	0.000	0.000	0.059	0.000	0.059
1992	2.584	0.038	0.093	0.015	0.000	2.730	0.000	0.000	0.783	0.301	0.000	1.084						
1993	0.008	0.003	0.020	0.007	0.018	0.056	0.000	0.000	0.170	0.161	0.207	0.538	0.000	0.000	0.000	0.000	0.000	0.000
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1995	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1997[f/]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1998[f/]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1999[f/]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.027	0.000	0.000	0.000	0.000	0.000	0.000

TABLE A-13. **Washington non-Indian troll** chinook, coho, and pink salmon **landings** in numbers of fish by catch area and month.[a/] (Page 3 of 3)

Year or Average	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total	May	June	July	Aug.	Sept.[b/]	Total
	CHINOOK (thousands)						**COHO (thousands)**						**PINKS (thousands in odd years)**					
Total All Areas																		
1976-1980	49.751	29.764	54.970	36.395	12.624	183.504	0.026	46.16	374.51	203.60	79.236	703.541	0.568	0.726	96.412	310.003	5.169	412.878
1981-1985	31.659	3.511	20.890	5.151	0.091	61.303	0.000	0.000	112.24	37.153	3.089	152.482	0.234	0.033	24.858	113.990	0.279	139.394
1986-1990	30.079	9.575	4.011	2.176	0.382	46.225	0.000	0.000	13.643	35.519	5.217	54.379	0.114	0.091	0.993	18.515	0.000	19.714
1986	26.686	0.163	0.915	5.076	0.000	32.840	0.000	0.000	20.796	54.240	0.000	75.036						
1987	35.632	0.000	19.084	0.010	0.000	54.726	0.000	0.000	47.034	0.323	0.000	47.357	0.000	0.000	1.986	0.743	0.000	2.729
1988	41.674	30.252	0.057	0.242	0.013	72.238	0.002	0.000	0.381	1.848	0.000	2.231						
1989	23.264	15.470	0.000	0.764	0.717	40.215	0.000	0.000	0.000	46.488	10.657	57.145	0.229	0.182	0.000	36.287	0.001	36.699
1990	23.140	1.992	0.001	4.789	1.182	31.104	0.000	0.000	0.002	74.695	15.429	90.126						
1991	14.490	12.418	0.009	1.290	0.602	28.809	0.000	0.000	0.103	39.922	14.145	54.170	0.004	0.017	0.006	43.261	0.295	43.583
1992	22.161	12.631	5.338	3.498	0.000	43.628	0.000	0.000	10.272	7.407	0.000	17.679						
1993	14.359	10.626	2.632	0.953	1.502	30.072	0.000	0.000	4.918	3.625	5.380	13.923	0.016	0.001	0.088	2.742	0.014	2.861
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000						
1995	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.000	0.000	18.366	7.060	25.426	0.000	0.000	0.000	30.060	0.872	30.932
1996	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7.137	10.389	0.000	17.526						
1997[f/]	4.514	1.904	0.000	0.000	0.000	6.418	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.000	0.000	0.000	0.005
1998[f/]	5.747	0.182	0.000	0.000	0.000	5.929	0.000	0.000	0.000	0.000	0.000	0.000						
1999[f/]	4.191	7.075	4.030	2.160	0.000	17.456	0.000	0.000	0.673	2.805	0.337	3.815	0.000	0.001	0.031	0.021	0.000	0.053

a/ Summary of WDFW fish receiving ticket information by statistical month excluding Washington landings from Oregon, California and Alaska.
b/ Data for Sept. include any catch after Sept.
c/ Cape Flattery area includes effort and catches from Strait of Juan de Fuca Area 4B.
d/ Includes 2,200 coho and 300 chinook landed illegally.
e/ Includes 100 coho landed illegally.
f/ Preliminary.

TABLE A-14. **Treaty Indian commercial troll** salmon fishing **effort** in deliveries by catch area and statistical month. (Page 1 of 2)

Year or Average	Jan. Thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total
					DELIVERIES					
Area 4B										
1979-1980	686	64	94	61	97	37	7	103	353	1,149
1981-1985	1,081	183	85	93	107	33	33	117	500	1,731
1986-1990	593	311	231	157	248	39	2	145	987	1,727
1986	429	146	118	92	48	2	0	65	406	900
1987	715	126	0	100	123	0	6	146	349	1,216
1988	734	590	337	67	169	4	0	144	1,167	2,045
1989	533	328	177	391	258	125	0	279	1,279	2,091
1990	556	367	522	137	644	65	2	92	1,735	2,385
1991	513	117	85	66	332	0	151	91	600	1,355
1992	390	61	231	40	155	0	1	208	487	1,086
1993	575	78	178	133	105	23	0	61	517	1,153
1994	119	41	52	0	0	0	0	8	93	220
1995	81	16	0	0	140	0	0	66	156	303
1996	204	36	83	2	39	16	0	7	176	387
1997	31	39	39	0	60	7	0	3	145	179
1998	17	13	3	0	21	7	0	4	44	65
1999[a/]	24	28	25	0	25	1	0	1	79	104
Cape Flattery										
1976-1980	3	26	98	123	99	22	2	2	369	376
1981-1985	0	17	191	374	609	392	5	0	1,584	1,589
1986-1990	1	102	186	567	527	149	0	0	1,494	1,532
1986	0	52	169	533	129	0	0	0	883	883
1987	0	195	0	721	848	0	0	0	1,764	1,764
1988	3	31	206	548	847	178	0	0	1,810	1,813
1989	0	107	254	662	434	324	0	0	1,781	1,781
1990	0	124	116	369	379	243	0	1	1,231	1,232
1991	0	186	265	610	359	0	0	0	1,420	1,420
1992	0	203	155	274	144	0	0	7	776	783
1993	0	269	213	439	497	457	0	0	1,875	1,875
1994	0	13	85	1	0	0	0	0	99	99
1995	0	21	0	1	406	0	0	0	428	428
1996	1	28	19	0	86	167	0	0	300	301
1997	0	11	90	0	115	30	0	0	246	246
1998	0	45	17	0	22	32	0	0	116	116
1999[a/]	0	50	73	0	72	105	0	0	300	300
Quillayute										
1976-1980	0	14	39	53	42	9	0	0	157	157
1981-1985	0	11	34	100	95	29	0	0	268	268
1986-1990	0	27	64	145	185	42	0	0	450	450
1986	0	12	164	177	52	0	0	0	405	405
1987	0	12	0	92	273	0	0	0	377	377
1988	0	63	50	89	152	15	0	0	369	369
1989	0	18	21	162	129	103	0	0	433	433
1990	0	30	20	207	321	90	0	0	668	668
1991	0	15	15	90	309	0	0	0	429	429
1992	0	0	3	109	119	0	0	0	231	231
1993	0	1	2	58	137	40	0	0	238	238
1994	0	4	16	1	0	0	0	0	21	21
1995	0	0	0	0	14	0	0	0	14	14
1996	0	0	0	0	6	12	0	0	18	18
1997	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0
1999[a/]	0	0	0	0	0	0	0	0	0	0

TABLE A-14. **Treaty Indian commercial troll** salmon fishing **effort** in deliveries by catch area and statistical month. (Page 2 of 2)

Year or Average	Jan. Thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total
					DELIVERIES					
Grays Harbor										
1976-1980	0	1	1	10	11	0	0	0	22	22
1981-1985	0	10	15	37	37	3	0	0	101	101
1986-1990	0	15	48	135	142	32	0	0	344	344
1986	0	9	124	71	0	0	0	0	204	204
1987	0	18	0	84	136	0	0	0	238	238
1988	0	17	31	196	324	74	0	0	642	642
1989	0	24	55	229	67	77	0	0	452	452
1990	0	9	28	95	42	10	0	0	184	184
1991	0	4	22	68	46	0	0	0	140	140
1992	0	3	3	19	4	0	0	0	29	29
1993	0	0	1	74	157	65	0	0	297	297
1994	0	0	12	0	0	0	0	0	12	12
1995	0	0	0	0	104	0	0	0	104	104
1996	0	0	1	0	36	21	0	0	58	58
1997	0	0	1	0	23	6	0	0	30	30
1998	0	4	2	0	6	0	0	0	12	12
1999[a/]	0	0	6	0	4	0	0	0	10	10
Total Treaty Troll										
1976-1980	689	105	232	248	249	68	9	105	901	1,705
1981-1985	1,082	220	325	603	847	456	38	117	2,452	3,689
1986-1990	594	456	478	1,004	1,075	262	2	145	3,275	4,016
1986	429	219	575	873	229	2	0	65	1,898	2,392
1987	715	351	0	997	1,380	0	6	146	2,728	3,595
1988	737	701	624	900	1,492	271	0	144	3,988	4,869
1989	533	477	507	1,444	888	629	0	279	3,945	4,757
1990	556	530	686	808	1,386	408	2	93	3,818	4,469
1991	513	322	387	834	1,046	0	151	91	2,589	3,344
1992	390	267	392	442	422	0	1	215	1,523	2,129
1993	575	348	394	704	896	585	0	61	2,927	3,563
1994	119	58	165	2	0	0	0	8	225	352
1995	81	37	0	1	664	0	0	66	702	849
1996	205	64	103	2	167	216	0	7	552	764
1997	31	50	130	0	198	43	0	3	421	455
1998	17	62	22	0	49	39	0	4	172	193
1999[a/]	24	78	104	0	101	106	0	1	389	414

a/ Preliminary.

TABLE A-15. **Treaty Indian commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and statistical month. (Page 1 of 3)

Year or Average	Jan. Thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total	Jan. thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total
						CHINOOK										**COHO**				
Area 4B																				
1976-1980	8,512	360	640	98	103	26	10	776	1,228	10,525	406	22	499	191	249	148	5	61	1,109	1,582
1981-1985	13,109	1,066	248	94	49	57	151	788	1,514	15,562	42	245	184	825	1,014	222	22	6	2,489	2,560
1986-1990	6,009	2,540	1,746	284	323	63	12	2,677	4,956	13,654	9	0	65	2,150	7,765	813	7	13	10,793	10,821
1986	3,299	1,243	539	86	79	0	0	615	1,947	5,861	6	0	221	2,090	4,704	13	0	8	7,028	7,042
1987	8,410	1,044	0	87	218	0	52	1,530	1,349	11,341	31	1	0	2,136	2,970	0	33	0	5,107	5,171
1988	6,958	5,080	1,903	189	68	2	0	1,265	7,242	15,465	3	0	101	151	4,379	21	0	15	4,652	4,670
1989	4,395	2,409	1,602	580	173	109	0	8,741	4,873	18,009	1	0	0	4,559	3,941	3,085	0	32	11,585	11,618
1990	6,982	2,924	4,685	479	1,075	206	8	1,234	9,369	17,593	2	0	1	1,814	22,833	944	1	8	25,592	25,603
1991	5,203	740	418	97	327	0	147	716	1,582	7,648	8	0	0	987	6,685	0	498	15	7,672	8,193
1992	4,131	664	2,217	37	800	0	0	3,107	3,718	10,956	0	0	0	955	9,265	0	15	18	10,220	10,253
1993	6,498	545	1,250	171	41	12	0	562	2,019	9,079	1	0	0	842	1,161	153	0	0	2,156	2,157
1994	1,116	248	484	0	0	0	0	99	732	1,947	0	0	0	0	0	0	0	0	0	0
1995	1,014	158	0	0	242	0	0	834	400	2,248	0	0	0	0	3,087	0	0	0	3,087	3,087
1996	2,555	437	1,440	120	75	106	0	81	2,178	4,814	0	0	0	0	936	189	0	0	1,125	1,125
1997	439	644	410	0	213	26	0	16	1,293	1,748	0	0	0	0	3,517	279	0	0	3,796	3,796
1998	97	85	23	0	136	21	0	40	265	402	0	0	0	0	434	175	0	0	609	609
1999[a/]	208	389	158	0	132	0	0	15	679	902	0	0	0	0	1,111	17	0	0	1,128	1,128
Cape Flattery																				
1976-1980	4	35	1,159	1,283	208	41	6	9	2,726	2,744	1	57	3,522	1,483	482	255	6	2	5,800	5,809
1981-1985	0	520	1,191	2,405	673	772	54	11	5,561	5,626	0	8	4,647	9,017	16,514	13,404	18	0	43,590	43,608
1986-1990	6	2,601	2,896	3,114	2,651	685	0	0	11,367	11,953	0	3	106	16,829	16,838	7,241	0	0	41,018	41,018
1986	0	1,829	1,239	1,890	250	0	0	0	5,208	5,208	0	0	517	28,025	5,089	0	0	0	33,631	33,631
1987	0	3,869	0	1,443	4,163	0	0	0	9,475	9,475	0	15	0	30,832	21,559	0	0	0	52,406	52,406
1988	32	352	3,774	3,560	4,619	952	0	0	13,257	13,289	0	0	13	3,352	23,668	6,513	0	0	33,546	33,546
1989	0	3,181	4,647	3,841	3,080	529	0	0	15,278	15,278	0	1	0	11,869	13,245	17,247	0	0	42,362	42,362
1990	0	3,773	1,923	4,837	1,143	1,943	0	1	13,619	13,620	0	0	0	10,069	20,627	12,447	0	0	43,143	43,143
1991	0	3,452	4,795	5,495	2,361	0	0	0	16,103	16,103	0	0	0	29,190	14,255	0	0	0	43,445	43,445
1992	0	8,106	3,284	3,616	2,298	0	0	80	17,304	17,384	0	2	3	30,710	16,695	0	0	5	47,410	47,415
1993	0	7,014	4,106	5,024	1,988	2,447	0	0	20,579	20,579	0	1	0	3,476	13,285	24,380	0	0	41,142	41,142
1994	0	104	1,841	1	0	0	0	0	1,946	1,946	0	0	0	0	0	0	0	0	0	0
1995	0	540	0	23	6,926	0	0	0	7,489	7,489	0	0	0	0	24,812	0	0	0	24,812	24,812
1996	6	997	534	0	4,732	3,421	0	0	9,684	9,690	0	0	0	0	2,937	12,054	0	0	14,991	14,991
1997	0	175	7,053	0	3,451	888	0	0	11,567	11,567	0	0	0	0	6,008	3,411	0	0	9,419	9,419
1998	0	5,033	4,358	0	3,333	1,127	0	0	13,851	13,851	0	0	0	0	3,132	3,942	0	0	7,074	7,074
1999[a/]	0	2,146	16,788	0	3,887	3,620	0	0	26,441	26,441	0	0	0	0	11,932	20,210	0	0	32,142	32,142

TABLE A-15. **Treaty Indian commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and statistical month. (Page 2 of 3)

Year or Average	Jan. Thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total	Jan. thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total
						CHINOOK										**COHO**				
Quillayute																				
1976-1980	0	118	243	483	141	27	203	11	1,011	1,225	0	641	3,216	1,184	473	34	1,063	20	5,548	6,631
1981-1985	0	243	321	826	500	212	0	0	2,103	2,103	0	30	2,251	5,294	6,387	2,855	0	0	16,818	16,818
1986-1990	0	1,049	944	2,044	754	259	0	0	5,050	5,050	0	0	2,694	8,430	7,021	2,250	0	0	20,395	20,395
1986	0	613	1,700	1,450	87	0	0	0	3,850	3,850	0	0	13,472	17,409	1,913	0	0	0	32,794	32,794
1987	0	1,240	0	353	1,679	0	0	0	3,272	3,272	0	0	0	8,566	13,729	0	0	0	22,295	22,295
1988	0	1,868	2,136	1,150	427	73	0	0	5,654	5,654	0	0	0	4,536	6,744	2,041	0	0	13,321	13,321
1989	0	824	649	2,502	1,089	724	0	0	5,788	5,788	0	0	0	4,439	3,020	6,455	0	0	13,914	13,914
1990	0	700	234	4,767	488	499	0	0	6,688	6,688	0	0	0	7,200	9,698	2,755	0	0	19,653	19,653
1991	0	189	212	534	1,659	0	0	0	2,594	2,594	0	0	0	4,936	15,520	0	0	0	20,456	20,456
1992	0	0	27	1,041	925	0	0	0	1,993	1,993	0	0	0	8,454	9,371	0	0	0	17,825	17,825
1993	0	19	5	473	404	112	0	0	1,013	1,013	0	0	0	926	5,487	1,005	0	0	7,418	7,418
1994	0	97	1,143	4	0	0	0	0	1,244	1,244	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	18	0	0	0	18	18	0	0	0	0	237	0	0	0	237	237
1996	0	0	0	0	6	44	0	0	50	50	0	0	0	0	105	601	0	0	706	706
1997	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1999[a/]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grays Harbor																				
1976-1980	0	30	25	6	10	0	0	0	71	71	0	0	0	35	58	0	0	0	93	93
1980-1985	0	280	123	308	103	6	0	0	820	820	0	0	353	1,252	557	199	0	0	2,361	2,361
1986-1990	0	715	944	1,309	812	241	0	0	3,832	3,882	0	0	1,391	4,899	4,221	747	0	0	11,258	11,258
1986	0	614	24	390	148	0	0	0	1,176	1,176	0	0	6,956	4,098	0	0	0	0	11,054	11,054
1987	0	2,288	0	298	1,206	0	0	0	3,792	3,792	0	0	0	4,085	5,699	0	0	0	9,784	9,784
1988	0	275	1,943	1,480	1,711	941	0	0	6,350	6,350	0	0	0	3,774	11,445	1,592	0	0	16,811	16,811
1989	0	297	747	3,188	955	220	0	0	5,407	5,407	0	0	0	10,941	3,293	1,803	0	0	16,037	16,037
1990	0	102	1,064	1,187	42	42	0	0	2,437	2,437	0	0	0	1,597	667	339	0	0	2,603	2,603
1991	0	58	565	749	150	0	0	0	1,522	1,522	0	0	0	3,830	1,551	0	0	0	5,381	5,381
1992	0	11	10	30	4	0	0	0	55	55	0	0	0	96	38	0	0	0	134	134
1993	0	0	6	159	1,285	372	0	0	1,822	1,822	0	0	0	1,763	5,526	1,141	0	0	8,430	8,430
1994	0	0	541	0	0	0	0	0	541	541	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	1,580	0	0	0	1,580	1,580	0	0	0	0	2,634	0	0	0	2,634	2,634
1996	0	39	0	304	52	0	0	0	395	395	0	0	0	0	663	1,041	0	0	1,704	1,704
1997	0	0	17	0	926	222	0	0	1,165	1,165	0	0	0	0	1,794	653	0	0	2,447	2,447
1998	0	41	61	0	169	0	0	0	271	271	0	0	0	0	244	0	0	0	244	244
1999[a/]	0	0	153	0	92	0	0	0	245	245	0	0	0	0	171	0	0	0	171	171

TABLE A-15. **Treaty Indian commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and statistical month. (Page 3 of 3)

Year or Average	Jan. Thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total	Jan. thru Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Thru Dec.	Total May Thru Sept.	Year Total
						CHINOOK										**COHO**				
Total Treaty Troll																				
1976-1980	8,515	543	2,067	1,870	462	94	219	796	5,036	14,566	407	720	7,237	2,893	1,261	438	1,075	83	12,550	14,115
1981-1985	13,109	2,109	1,883	3,633	1,326	1,046	205	799	9,998	24,110	42	283	7,435	16,388	24,473	16,680	41	6	65,259	65,347
1986-1990	6,015	6,905	5,762	6,751	4,540	1,248	12	2,677	25,206	33,911	9	3	4,256	32,308	35,845	11,051	7	13	83,464	83,492
1986	3,299	4,299	3,502	3,816	564	0	0	615	12,181	16,095	6	0	21,166	51,622	11,706	13	0	8	84,507	84,521
1987	8,410	8,441	0	2,181	7,266	0	52	1,530	17,888	27,880	31	16	0	45,619	43,957	0	33	0	89,592	89,656
1988	6,990	7,575	9,756	6,379	6,825	1,968	0	1,265	32,503	40,758	3	0	114	11,813	46,236	10,167	0	15	68,330	68,348
1989	4,395	6,711	7,645	10,111	5,297	1,582	0	8,741	31,346	44,482	1	1	0	31,808	23,499	28,590	0	32	83,898	83,931
1990	6,982	7,499	7,906	11,270	2,748	2,690	8	1,235	32,113	40,338	2	0	1	20,680	53,825	16,485	1	8	90,991	91,002
1991	5,203	4,439	5,990	6,875	4,497	0	147	716	21,801	27,867	8	0	0	38,943	38,011	0	498	15	76,954	77,475
1992	4,131	8,781	5,538	4,724	4,027	0	0	3,187	23,070	30,388	0	2	3	40,215	35,369	0	15	23	75,589	75,627
1993	6,498	7,578	5,367	5,827	3,718	2,943	0	562	25,433	32,493	1	1	0	7,007	25,459	26,679	0	0	59,146	59,147
1994	1,116	449	4,009	5	0	0	0	99	4,463	5,678	0	0	0	0	0	0	0	0	0	0
1995	1,014	698	0	23	8,766	0	0	834	9,487	11,335	0	0	0	0	30,770	0	0	0	30,770	30,770
1996	2,561	1,473	1,974	424	4,865	3,571	0	81	12,307	14,949	0	0	0	0	4,641	13,885	0	0	18,526	18,526
1997	439	819	7,480	0	4,590	1,136	0	16	14,025	14,480	0	0	0	0	11,319	4,343	0	0	15,662	15,662
1998	97	5,159	4,442	0	3,638	1,148	0	40	14,387	14,524	0	0	0	0	3,810	4,117	0	0	7,927	7,927
1999[a/]	208	2,535	17,099	0	4,111	3,620	0	15	27,365	27,588	3	0	0	0	13,214	20,227	0	0	33,441	33,444

a/ Preliminary.

TABLE A-16. **Treaty Indian commercial troll** pink salmon **landings** (odd-years only) in numbers of salmon by catch area and statistical month. (Page 1 of 1)

Year or Average	Jan. Through Apr.	May	June	July	Aug.	Sept.	Oct.	Nov. Through Dec.	Total May Through Sept.	Year Total
					PINKS					
Area 4B										
1976-1980	0	2	267	158	648	15	0	0	1,090	1,090
1981-1985	0	23	2	108	698	7	0	0	838	838
1986-1990	0	0	0	1,394	642	142	0	0	2,178	2,178
1989	0	0	0	2,542	664	283	0	0	3,489	3,489
1991	0	0	0	0	74	1,260	0	0	1,334	1,334
1993	0	0	0	55	126	5	0	0	186	186
1995	0	0	0	0	2,317	0	0	0	2,317	2,317
1997	0	0	0	0	696	10	0	0	706	706
1999[a/]	0	0	0	0	475	4	0	0	479	479
Cape Flattery										
1976-1980	0	42	90	632	1,338	5	0	0	2,108	2,108
1981-1985	0	0	94	1,340	6,681	302	0	0	8,417	8,417
1986-1990	0	2	4	6,552	2,891	377	0	0	9,826	9,826
1989	0	0	8	4,417	1,869	754	0	0	7,048	7,048
1991	0	0	2	999	1,643	0	0	0	2,644	2,644
1993	0	0	0	158	1,808	763	0	0	2,729	2,729
1995	0	0	0	0	8,407	0	0	0	8,407	8,407
1997	0	0	0	0	1,061	43	0	0	1,104	1,104
1999[a/]	0	0	0	0	987	97	0	0	1,084	1,084
Quillayute										
1976-1980	0	5	1,192	258	1,032	0	0	0	2,488	2,488
1981-1985	0	7	100	653	384	12	0	0	1,156	1,156
1986-1990	0	3	6	625	666	64	0	0	1,365	1,365
1989	0	6	12	225	107	129	0	0	479	479
1991	0	0	0	75	449	0	0	0	524	524
1993	0	0	0	120	351	31	0	0	502	502
1995	0	0	0	0	32	0	0	0	32	32
1997	0	0	0	0	0	0	0	0	0	0
1999[a/]	0	0	0	0	0	0	0	0	0	0
Grays Harbor										
1976-1980	0	0	0	0	0	0	0	0	0	0
1981-1985	0	1	18	106	6	0	0	0	132	132
1986-1990	0	0	0	419	44	16	0	0	470	470
1989	0	0	0	22	27	16	0	0	65	65
1991	0	0	0	0	4	0	0	0	4	4
1993	0	0	0	20	13	0	0	0	33	33
1995	0	0	0	0	2	0	0	0	2	2
1997	0	0	0	0	0	0	0	0	0	0
1999[a/]	0	0	0	0	0	0	0	0	0	0
Total Treaty Troll										
1976-1980	0	49	1,550	1,048	3,019	20	0	0	5,686	5,686
1981-1985	0	32	214	2,207	7,770	320	0	0	10,543	10,543
1986-1990	0	5	10	8,991	4,244	591	0	0	13,840	13,840
1989	0	6	20	7,206	2,667	1,182	0	0	11,081	11,081
1991	0	0	2	1,074	2,170	1,260	0	0	4,506	4,506
1993	0	0	0	353	2,298	799	0	0	3,450	3,450
1995	0	0	0	0	10,758	0	0	0	10,758	10,758
1997	0	0	0	0	1,757	53	0	0	1,810	1,810
1999[a/]	0	0	0	0	1,462	101	0	0	1,563	1,563

a/ Preliminary.

TABLE A-17. **Washington** ocean **recreational** salmon fishing **effort** in angler trips by port and month.[a/]
(Page 1 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				ANGLER TRIPS (thousands)				
Neah Bay[b/]								
1976-1980	0.6	1.1	4.1	13.0	17.9	7.0	0.5	44.2
1981-1985	0.1	0.4	1.1	9.0	13.4	3.4	0.1	27.5
1986-1990	-	0.2	0.4	14.0	7.3	1.3	-	23.2
1986	-	-	0.4	10.8	7.3	-	-	18.6
1987	-	-	0.6	12.2	6.4	-	-	19.2
1988	-	b/	-	13.5	1.9	0.5	-	15.9
1989	-	0.9	0.9	14.7	6.5	5.4	-	28.3
1990	-	-	b/	18.6	14.5	0.7	-	33.8
1991	-	-	b/	16.2	9.2	b/	-	25.4
1992	0.3	1.0	-	10.4	7.9	0.0	-	19.7
1993	b/	1.1	0.0	11.1	11.2	3.8	-	27.3
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	9.3	0.1	-	9.4
1996	-	-	-	-	9.3	1.5	-	10.9
1997	-	-	-	3.0	1.8	-	-	4.8
1998[c/]	-	-	-	-	6.4	-	-	6.4
1999[c/]	-	-	-	2.5	4.0	1.6	0.1	8.1
La Push								
1976-1980	b/	0.3	1.3	7.9	11.7	3.1	0.3	24.7
1981-1985	-	-	b/	1.1	2.1	0.1	-	3.3
1986-1990	-	b/	b/	1.8	0.6	0.1	-	2.5
1986	-	-	0.1	0.9	0.8	-	-	1.7
1987	-	-	0.1	1.2	0.8	-	-	2.0
1988	-	-	-	2.4	0.3	0.1	-	2.8
1989	-	0.1	0.1	1.5	-	-	-	1.6
1990	-	-	-	2.8	1.1	0.2	-	4.2
1991	-	-	-	3.5	b/	-	-	3.5
1992	-	-	-	1.7	0.5	0.3	b/	2.5
1993	-	-	-	1.6	0.8	0.5	-	2.9
1994	-	-	-	-	-	-	-	-
1995	-	-	-	-	0.9	0.5	-	1.5
1996	-	-	-	-	0.8	0.5	-	1.3
1997	-	-	-	0.9	-	-	-	0.9
1998[c/]	-	-	-	-	0.6	-	-	0.6
1999[c/]	-	-	-	1.0	1.2	0.7	b/	2.9
Westport								
1976-1980	2.3	11.9	37.4	66.5	66.3	23.1	2.8	210.3
1981-1985	-	2.6	16.4	34.2	23.5	2.1	b/	78.8
1986-1990	-	0.3	2.9	30.3	15.5	3.5	b/	52.6
1986	-	-	2.0	30.1	19.3	0.9	0.1	52.4
1987	-	-	2.1	29.7	11.4	0.8	b/	43.9
1988	-	-	-	35.4	1.9	-	b/	37.3
1989	-	1.5	3.4	29.2	23.1	2.7	-	59.9
1990	-	-	7.2	26.8	22.0	13.3	-	69.3
1991	-	-	5.0	35.0	8.9	3.9	-	52.7
1992	-	-	-	22.9	20.7	9.4	0.7	53.7
1993	-	-	-	17.8	19.4	13.7	-	50.9
1994	-	-	-	-	-	-	-	-
1995	-	-	-	4.9	11.6	5.3	-	21.7
1996	-	-	-	4.5	9.6	1.4	-	15.5
1997	-	-	-	8.0	8.1	1.2	-	17.3
1998[c/]	-	-	-	-	7.1	0.9	-	8.0
1999[c/]	-	-	-	5.3	9.4	4.2	0.1	19.1

TABLE A-17. **Washington** ocean **recreational** salmon fishing **effort** in angler trips by port and month.[a/]
(Page 2 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				ANGLER TRIPS (thousands)				
Ilwaco[d/]								
1976-1980								
1981-1985	0.4	4.6	20.8	42.0	62.4	18.7	1.7	150.6
1986-1990	-	0.7	6.1	23.2	20.3	3.3	0.1	53.8
1986	-	-	1.1	19.6	15.9	-	-	36.6
1987	-	-	1.0	17.6	17.7	-	-	36.3
1988	-	-	-	12.2	0.6	b/	-	12.8
1989	-	0.3	0.6	22.3	29.2	-	-	52.4
1990	-	-	3.9	27.0	33.5	3.5	-	67.8
1991	-	-	3.3	26.1	11.3	4.8	-	45.5
1992	-	-	-	25.6	4.5	2.9	-	33.0
1993	-	-	-	12.9	19.7	15.1	-	47.7
1994	-	-	-	-	-	-	-	-
1995	-	-	-	3.8	11.6	6.9	-	22.3
1996	-	-	-	3.3	8.7	3.6	-	15.6
1997[c/]	-	-	-	4.6	2.1	-	-	6.7
1998[c/]	-	-	-	-	4.3	0.4	-	4.7
1999[c/]	-	-	-	4.4	11.1	5.1	b/	20.7
Total All Areas								
1976-1980	3.3	18.0	63.6	129.4	158.3	51.9	5.3	429.8
1981-1985	0.1	3.8	23.6	67.5	59.3	8.8	0.3	163.3
1986-1990	-	0.5	4.7	65.7	42.8	5.6	b/	119.4
1986	-	-	3.6	61.4	43.2	0.9	0.1	109.3
1987	-	-	3.7	60.6	36.3	0.8	b/	101.5
1988	-	b/	-	63.5	4.8	0.7	b/	68.9
1989	-	2.7	5.0	67.7	58.8	8.1	-	142.2
1990	-	-	11.1	75.2	71.1	17.7	-	175.1
1991	-	-	8.3	80.8	29.4	8.7	-	127.2
1992	0.3	1.0	-	60.5	33.7	12.6	0.7	108.9
1993	b/	1.1	0.0	43.4	51.1	33.1	-	128.8
1994	-	-	-	-	-	-	-	-
1995	-	-	-	8.7	33.3	12.8	-	54.8
1996	-	-	-	7.7	28.5	7.0	-	43.2
1997[c/]	-	-	-	16.4	12.1	1.2	-	29.7
1998[c/]	-	-	-	-	18.3	1.4	-	19.7
1999[c/]	-	-	-	13.3	25.7	11.5	0.2	50.8

a/ Summary of effort is by statistical month.
b/ Includes effort from the Washington state waters Area 4B fishery which began in 1989.
c/ Preliminary.
d/ Ilwaco statistics do not include effort reported as occurring inside the Columbia River mouth.

TABLE A-18. **Washington** ocean **recreational** chinook and coho salmon **landings** in numbers of fish by port and month.[a/] (Page 1 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				CHINOOK (thousands)								**COHO (thousands)**				
Neah Bay																
1976-1980	0.377	0.348	1.197	2.438	1.412	0.505	0.058	6.334	0.170	0.537	3.363	11.42	20.652	7.761	0.252	44.158
1981-1985	0.057	0.119	0.249	1.231	0.468	0.091	0.009	2.224	0.016	0.203	0.866	8.395	16.452	3.414	0.090	29.436
1986-1990	0.000	0.024	0.086	2.464	0.347	0.044	0.000	2.964	0.000	0.000	0.171	15.87	11.629	2.068	0.000	29.747
1986	0.000	0.002	0.116	2.595	0.537	0.000	0.000	3.250	0.000	0.000	0.550	10.52	10.687	0.000	0.000	21.759
1987[b/]	0.000	0.000	0.110	2.423	0.066	0.000	0.000	2.599	0.000	0.000	0.218	15.04	10.146	0.000	0.000	25.406
1988	0.000	0.002	0.000	3.537	0.208	0.020	0.000	3.767	0.000	0.000	0.000	12.79	2.593	0.426	0.000	15.809
1989[c/]	0.000	0.114	0.202	1.761	0.304	0.148	0.000	2.529	0.000	0.000	0.071	20.15	11.036	8.855	0.000	40.119
1990[c/]	0.000	0.000	0.000	2.003	0.621	0.050	0.000	2.674	0.000	0.000	0.016	20.88	23.685	1.057	0.000	45.642
1991[c/]	0.000	0.000	0.002	2.363	0.380	0.000	0.000	2.745	0.000	0.000	0.000	23.33	15.131	0.005	0.000	38.475
1992[c/]	0.037	0.081	0.000	0.964	0.033	0.000	0.000	1.115	0.000	0.032	0.000	12.94	11.637	0.083	0.000	24.701
1993[c/]	0.006	0.155	0.022	0.997	0.380	0.124	0.000	1.684	0.000	0.042	0.006	10.67	12.614	3.860	0.000	27.195
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.000	0.136	0.000	0.000	0.136	0.000	0.000	0.000	0.000	12.826	0.017	0.000	12.843
1996	0.000	0.000	0.000	0.000	0.055	0.005	0.000	0.060	0.000	0.000	0.000	0.000	6.634	2.327	0.000	8.961
1997[c/d/]	0.000	0.000	0.000	0.478	0.008	0.000	0.000	0.486	0.000	0.000	0.000	0.000	1.494	0.000	0.000	1.494
1998[d/]	0.000	0.000	0.000	0.000	0.103	0.000	0.000	0.103	0.000	0.000	0.000	0.000	8.062	0.000	0.000	8.062
1999	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.456	2.963	0.951	0.000	5.370
La Push																
1976-1980	0.000	0.008	0.161	0.948	1.318	0.328	0.081	2.844	0.009	0.271	1.671	8.586	15.198	3.103	0.026	28.864
1981-1985	0.000	0.000	0.004	0.132	0.166	0.002	0.000	0.304	0.000	0.000	0.043	0.861	2.786	0.100	0.000	3.791
1986-1990	0.000	0.002	0.006	0.303	0.074	0.006	0.000	0.391	0.000	0.000	0.022	2.129	0.820	0.050	0.000	3.022
1986	0.000	0.000	0.002	0.138	0.199	0.000	0.000	0.339	0.000	0.000	0.078	1.141	0.995	0.000	0.000	2.214
1987[c/]	0.000	0.000	0.017	0.193	0.004	0.000	0.000	0.214	0.000	0.000	0.030	1.478	1.233	0.000	0.000	2.741
1988	0.000	0.000	0.000	0.527	0.034	0.013	0.000	0.574	0.000	0.000	0.000	2.243	0.453	0.071	0.000	2.767
1989	0.000	0.009	0.012	0.205	0.000	0.000	0.000	0.226	0.000	0.000	0.002	2.177	0.000	0.000	0.000	2.179
1990	0.000	0.000	0.000	0.450	0.133	0.017	0.000	0.600	0.000	0.000	0.000	3.608	1.421	0.178	0.000	5.207
1991	0.000	0.000	0.000	0.411	0.000	0.000	0.000	0.411	0.000	0.000	0.000	5.145	0.013	0.000	0.000	5.158
1992	0.000	0.000	0.000	0.126	0.043	0.031	0.002	0.202	0.000	0.000	0.000	1.152	0.447	0.225	0.002	1.826
1993	0.000	0.000	0.000	0.108	0.044	0.054	0.000	0.206	0.000	0.000	0.000	2.000	0.733	0.446	0.000	3.179
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.000	0.007	0.003	0.000	0.010	0.000	0.000	0.000	0.000	1.231	0.660	0.000	1.891
1996	0.000	0.000	0.000	0.000	0.002	0.007	0.000	0.009	0.000	0.000	0.000	0.000	0.802	0.809	0.000	1.611
1997[d/]	0.000	0.000	0.000	0.061	0.000	0.000	0.000	0.061	0.000	0.000	0.000	1.057	0.000	0.000	0.000	1.057
1998[d/]	0.000	0.000	0.000	0.000	0.065	0.000	0.000	0.065	0.000	0.000	0.000	0.000	0.577	0.000	0.000	0.577
1999[d/]	0.000	0.000	0.000	0.396	0.488	0.100	0.000	0.984	0.000	0.000	0.000	0.661	1.318	0.598	0.000	2.577

TABLE A-18. **Washington** ocean **recreational** chinook and coho salmon **landings** in numbers of fish by port and month.[a/] (Page 2 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
					CHINOOK (thousands)								**COHO (thousands)**			
Westport																
1976-1980	1.395	5.479	20.759	18.01	15.844	5.707	0.743	67.945	0.217	12.221	43.808	89.41	63.127	21.910	1.819	232.518
1981-1985	0.000	1.429	13.435	17.39	7.513	0.325	0.003	40.102	0.000	0.491	9.433	27.66	22.997	2.696	0.007	63.290
1986-1990	0.000	0.133	1.231	10.33	4.772	0.921	0.000	17.391	0.000	0.004	1.776	40.12	22.596	4.979	0.018	69.497
1986	0.000	0.000	0.503	7.899	6.887	0.000	0.000	15.289	0.000	0.000	3.096	49.66	29.310	0.943	0.086	83.097
1987	0.000	0.000	2.985	20.49	6.239	0.017	0.000	29.733	0.000	0.000	0.369	27.59	13.473	0.044	0.003	41.479
1988	0.000	0.000	0.000	12.52	0.914	0.000	0.000	13.442	0.000	0.000	0.000	45.93	2.608	0.000	0.000	48.544
1989	0.000	0.667	1.383	3.971	4.419	1.222	0.000	11.662	0.000	0.019	0.012	46.17	38.182	3.880	0.000	88.265
1990	0.000	0.000	1.283	6.780	5.399	3.367	0.000	16.829	0.000	0.000	5.402	31.26	29.407	20.026	0.000	86.102
1991	0.000	0.000	1.911	3.786	1.265	0.209	0.000	7.171	0.000	0.000	6.781	60.61	14.508	6.963	0.000	88.862
1992	0.000	0.000	0.000	7.091	5.979	2.370	0.213	15.653	0.000	0.000	0.000	16.77	25.807	7.234	0.322	50.137
1993	0.000	0.000	0.000	1.357	3.780	3.358	0.000	8.495	0.000	0.000	0.000	16.08	21.274	12.067	0.000	49.422
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.012	0.033	0.046	0.000	0.091	0.000	0.000	0.000	3.216	17.623	8.046	0.000	28.885
1996	0.000	0.000	0.000	0.008	0.008	0.000	0.000	0.016	0.000	0.000	0.000	5.975	14.896	2.202	0.000	23.073
1997	0.000	0.000	0.000	1.199	1.563	0.315	0.000	3.077	0.000	0.000	0.000	5.986	6.745	0.424	0.000	13.155
1998[d/]	0.000	0.000	0.000	0.000	1.477	0.228	0.000	1.705	0.000	0.000	0.000	0.000	6.628	1.066	0.000	7.694
1999[d/]	0.000	0.000	0.000	2.271	3.103	1.191	0.020	6.585	0.000	0.000	0.000	4.060	7.264	1.219	0.052	12.595
Ilwaco[e/]																
1976-1980	0.174	2.500	9.143	7.497	15.789	2.261	0.146	37.510	0.242	5.582	40.398	69.16	65.240	23.882	1.776	206.286
1981-1985	0.000	0.118	2.744	4.545	4.263	0.353	0.008	12.031	0.000	1.082	8.237	36.37	25.272	4.754	0.165	75.883
1986-1990	0.000	0.022	0.186	1.795	3.303	0.030	0.000	5.337	0.000	0.000	2.110	32.86	26.977	0.845	0.000	62.797
1986	0.000	0.000	0.051	0.982	1.192	0.000	0.000	2.225	0.000	0.000	2.156	36.72	28.811	0.000	0.000	67.688
1987	0.000	0.000	0.187	2.845	4.934	0.000	0.000	7.966	0.000	0.000	1.632	26.33	26.336	0.000	0.000	54.304
1988	0.000	0.000	0.000	1.088	0.064	0.004	0.000	1.156	0.000	0.000	0.000	20.83	0.904	0.066	0.000	21.804
1989	0.000	0.111	0.476	0.731	4.123	0.000	0.000	5.441	0.000	0.000	0.024	39.90	42.363	0.000	0.000	82.291
1990	0.000	0.000	0.218	3.327	6.204	0.148	0.000	9.897	0.000	0.000	6.739	40.52	36.471	4.161	0.000	87.898
1991	0.000	0.000	0.171	1.180	0.941	0.052	0.000	2.344	0.000	0.000	5.466	45.79	16.405	7.535	0.000	75.198
1992	0.000	0.000	0.000	0.857	0.466	0.134	0.000	1.457	0.000	0.000	0.000	37.41	6.502	2.979	0.000	46.891
1993	0.000	0.000	0.000	0.738	1.350	0.545	0.000	2.633	0.000	0.000	0.000	15.21	21.062	9.884	0.000	46.159
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.040	0.187	0.045	0.000	0.272	0.000	0.000	0.000	3.984	13.865	6.784	0.000	24.633
1996	0.000	0.000	0.000	0.022	0.040	0.030	0.000	0.092	0.000	0.000	0.000	4.665	10.275	2.848	0.000	17.788
1997[d/]	0.000	0.000	0.000	0.160	0.185	0.000	0.000	0.345	0.000	0.000	0.000	7.337	3.719	0.000	0.000	11.056
1998[d/]	0.000	0.000	0.000	0.000	0.272	0.042	0.000	0.314	0.000	0.000	0.000	0.000	4.025	0.348	0.000	4.373
1999[d/]	0.000	0.000	0.000	0.495	1.507	0.316	0.000	2.318	0.000	0.000	0.000	5.171	9.486	4.906	0.020	19.583

TABLE A-18. **Washington** ocean **recreational** chinook and coho salmon **landings** in numbers of fish by port and month.[a/] (Page 3 of 3)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
					CHINOOK (thousands)								**COHO (thousands)**			
Total All Areas																
1976-1980	1.946	8.334	31.259	28.90	34.363	8.801	1.028	114.63	0.638	18.611	89.239	178.5	164.21	56.656	3.873	511.827
1981-1985	0.057	1.667	16.432	23.30	12.410	0.771	0.020	54.662	0.016	1.776	18.579	73.29	67.507	10.965	0.262	172.400
1986-1990	0.000	0.181	1.509	14.89	8.496	1.001	0.000	26.082	0.000	0.004	4.079	90.99	62.023	7.941	0.018	165.063
1986	0.000	0.002	0.672	11.61	8.815	0.000	0.000	21.103	0.000	0.000	5.880	98.04	69.803	0.943	0.086	174.758
1987	0.000	0.000	3.299	25.95	11.243	0.017	0.000	40.512	0.000	0.000	2.249	70.44	51.188	0.044	0.003	123.930
1988	0.000	0.002	0.000	17.68	1.220	0.037	0.000	18.939	0.000	0.000	0.000	81.80	6.558	0.563	0.000	88.924
1989	0.000	0.901	2.073	6.668	8.846	1.370	0.000	19.858	0.000	0.019	0.109	108.4	91.581	12.735	0.000	212.854
1990	0.000	0.000	1.501	12.56	12.357	3.582	0.000	30.000	0.000	0.000	12.157	96.28	90.984	25.422	0.000	224.849
1991	0.000	0.000	2.084	7.740	2.586	0.261	0.000	12.671	0.000	0.000	12.247	134.8	46.057	14.503	0.000	207.693
1992	0.037	0.081	0.000	9.038	6.521	2.535	0.215	18.427	0.000	0.032	0.000	68.28	44.393	10.521	0.324	123.555
1993	0.006	0.155	0.022	3.200	5.554	4.081	0.000	13.018	0.000	0.042	0.006	43.96	55.683	26.257	0.000	125.955
1994	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1995	0.000	0.000	0.000	0.052	0.363	0.094	0.000	0.509	0.000	0.000	0.000	7.200	45.545	15.507	0.000	68.252
1996	0.000	0.000	0.000	0.030	0.105	0.042	0.000	0.177	0.000	0.000	0.000	10.64	32.607	8.186	0.000	51.433
1997[d/e/]	0.000	0.000	0.000	1.898	1.756	0.315	0.000	3.969	0.000	0.000	0.000	14.38	11.958	0.424	0.000	26.762
1998[d/]	0.000	0.000	0.000	0.000	1.917	0.270	0.000	2.187	0.000	0.000	0.000	0.000	19.292	1.414	0.000	20.706
1999[d/]	0.000	0.000	0.000	3.162	5.098	1.607	0.020	9.887	0.000	0.000	0.000	11.34	21.031	7.674	0.072	40.125

a/ Summary of catch data is by statistical month. Catches do not include estimated mortality that is induced through species restriction or size limit regulation (see Appendix C, Table C-6).
b/ Neah Bay and La Push statistics do not include estimates of 707 chinook killed during chinook nonretention fishery (July 19-Aug. 20).
c/ Includes catch from the Washington state-waters Area 4B fishery.
d/ Preliminary.
e/ Ilwaco statistics do not include catch reported as occurring inside the Columbia River mouth.

TABLE A-19. **Washington** ocean **recreational** pink salmon **landings** (odd years only) in numbers of fish by port and month.[a/] (Page 1 of 1)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
				PINKS (thousands)				
Neah Bay[b/]								
1976-1980	0.009	0.001	0.162	2.021	8.561	0.368	0.012	11.132
1981-1985	0.000	0.006	0.003	0.780	3.423	0.178	0.009	4.399
1986-1990	0.000	0.000	0.003	1.064	0.504	0.101	0.000	1.672
1989	0.000	0.000	0.000	1.443	0.295	0.202	0.000	1.940
1991	0.000	0.000	0.000	0.479	1.543	0.000	0.000	2.022
1993	0.000	0.000	0.000	0.609	1.264	0.371	0.000	2.244
1995	0.000	0.000	0.000	0.000	2.578	0.030	0.000	2.608
1997	0.000	0.000	0.000	0.079	0.498	0.000	0.000	0.577
1999[c/]	0.000	0.000	0.000	0.730	1.165	0.081	0.000	1.976
La Push								
1976-1980	0.000	0.000	0.028	0.430	1.928	0.004	0.000	2.390
1981-1985	0.000	0.000	0.000	0.005	0.207	0.000	0.000	0.213
1986-1990	0.000	0.000	0.000	0.006	0.018	0.000	0.000	0.024
1989	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1991	0.000	0.000	0.000	0.046	0.000	0.000	0.000	0.046
1993	0.000	0.000	0.000	0.046	0.034	0.004	0.000	0.084
1995	0.000	0.000	0.000	0.000	0.078	0.011	0.000	0.089
1997	0.000	0.000	0.000	0.195	0.000	0.000	0.000	0.195
1999[c/]	0.000	0.000	0.000	0.087	0.047	0.000	0.000	0.134
Westport								
1976-1980	0.000	0.172	1.086	6.320	1.549	0.050	0.000	9.176
1981-1985	0.000	0.010	0.060	0.497	0.540	0.003	0.000	1.111
1986-1990	0.000	0.000	0.000	0.106	0.045	0.000	0.000	0.150
1989	0.000	0.000	0.000	0.028	0.045	0.000	0.000	0.073
1991	0.000	0.000	0.000	0.043	0.033	0.004	0.000	0.080
1993	0.000	0.000	0.000	0.033	0.035	0.002	0.000	0.070
1995	0.000	0.000	0.000	0.040	0.051	0.002	0.000	0.093
1997	0.000	0.000	0.000	0.520	0.096	0.022	0.000	0.638
1999[c/]	0.000	0.000	0.000	0.035	0.040	0.000	0.000	0.075
Ilwaco[d/]								
1976-1980	0.000	0.180	0.090	0.467	0.314	0.002	0.000	1.053
1981-1985	0.000	0.001	0.001	0.036	0.155	0.000	0.000	0.193
1986-1990	0.000	0.000	0.000	0.060	0.010	0.000	0.000	0.071
1989	0.000	0.000	0.000	0.011	0.012	0.000	0.000	0.023
1991	0.000	0.000	0.000	0.045	0.021	0.000	0.000	0.066
1993	0.000	0.000	0.000	0.007	0.011	0.000	0.000	0.018
1995	0.000	0.000	0.000	0.004	0.018	0.009	0.000	0.031
1997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1999[c/]	0.000	0.000	0.000	0.000	0.003	0.000	0.000	0.003
Total All Areas								
1976-1980	0.008	0.352	1.365	9.237	12.352	0.424	0.012	23.751
1981-1985	0.000	0.017	0.064	1.318	4.326	0.181	0.009	5.915
1986-1990	0.000	0.000	0.003	1.236	0.578	0.101	0.000	1.918
1989	0.000	0.000	0.000	1.482	0.352	0.202	0.000	2.036
1991	0.000	0.000	0.000	0.613	1.597	0.004	0.000	2.214
1993	0.000	0.000	0.000	0.695	1.344	0.377	0.000	2.416
1995	0.000	0.000	0.000	0.044	2.725	0.052	0.000	2.821
1997	0.000	0.000	0.000	0.794	0.594	0.022	0.000	1.410
1999[c/]	0.000	0.000	0.000	0.852	1.255	0.081	0.000	2.188

a/ Summary of catch data is by statistical month. Catches do not include estimated mortality that is induced through species restriction or size limit regulation (see Appendix C, Table C-6). Averages are odd years only.
b/ Includes catch in the Washington state-waters Area 4B fishery.
c/ Preliminary.
d/ Ilwaco statistics do not include catch reported as occurring inside the Columbia River mouth.

TABLE A-20. **Cape Falcon to U.S.-Mexico border commercial troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 1 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				DAYS FISHED (thousands)					
Cape Falcon to Humbug Mt.									
1978-1980	-	0.9	3.5	14.9	11.5	2.1	1.6	b/	34.4
1981-1985	-	1.4	1.0	10.3	5.4	1.0	0.7	b/	19.9
1986-1990	-	3.8	4.6	14.2	8.0	3.1	2.3	0.2	36.1
1986	-	3.0	3.3	13.8	4.9	2.0	1.2	b/	28.2
1987	-	2.8	3.0	16.1	7.3	5.5	2.5	-	37.3
1988	-	4.2	6.0	17.0	14.1	3.6	4.6	-	49.5
1989	-	6.0	6.8	13.7	7.8	3.0	2.3	0.8	40.3
1990	-	2.7	3.7	10.4	5.6	1.5	1.1	b/	25.1
1991	-	0.7	4.0	4.2	2.0	1.9	1.7	-	14.4
1992	-	1.6	-	1.5	2.7	1.5	1.7	-	8.9
1993	-	2.1	1.3	1.7	1.0	1.9	1.2	0.1	9.3
1994	-	0.9	1.2	-	-	0.3	1.0	0.1	3.5
1995	-	0.9	1.6	-	2.7	1.3	1.1	0.1	7.7
1996	-	1.4	2.0	-	1.8	1.6	1.1	0.1	8.0
1997	0.4	2.0	1.9	-	1.7	1.0	0.6	0.1	7.5
1998	0.9	1.8	1.7	-	1.4	0.6	0.6	0.1	7.0
1999[c/]	0.2	0.6	1.4	0.8	1.0	0.4	0.4	0.1	4.8
Humbug Mt. to Horse Mt. (KMZ)									
1978-1980	0.2	8.0	8.2	12.7	10.0	3.4	1.3	0.7	44.6
1981-1985	-	3.0	1.8	5.0	5.3	1.3	0.7	0.3	17.4
1986-1990	-	0.3	1.5	0.3	0.8	0.6	0.1	0.1	3.8
1986	-	0.5	1.6	1.7	2.6	0.3	0.2	0.1	6.9
1987	-	0.5	3.2	0.9	-	0.5	0.3	0.3	4.8
1988	-	0.3	1.7	0.7	-	0.8	0.1	0.3	3.3
1989	-	0.2	1.2	-	0.6	0.7	0.1	-	2.9
1990	-	b/	-	-	1.1	0.3	b/	-	1.4
1991	-	-	-	-	b/	0.6	0.1	-	0.7
1992	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-
1994	-	b/	-	-	0.1	-	0.2	-	0.3
1995	-	b/	-	b/	-	-	0.2	-	0.3
1996	-	0.1	b/	-	0.5	0.7	0.2	-	1.4
1997	b/	0.1	-	-	b/	0.1	0.2	-	0.4
1998	0.0	b/	-	-	b/	0.2	0.2	-	0.4
1999[c/]	-	b/	-	-	0.1	0.2	0.1	-	0.4
Horse Mt. to U.S.-Mexico Border									
1978-1980	0.9	13.4	9.5	21.7	9.0	5.1	-	-	59.6
1981-1985	0.8	10.2	7.9	15.1	8.7	4.8	b/	-	47.6
1986-1990	-	14.5	15.3	14.5	9.3	2.8	-	-	56.4
1986	-	14.0	13.2	13.9	8.2	1.8	-	-	51.0
1987	-	14.9	13.8	14.9	9.3	3.1	-	-	55.9
1988	-	17.0	19.2	20.0	12.6	5.2	-	-	74.0
1989	-	14.1	14.9	11.8	11.6	3.4	-	-	55.7
1990	-	12.7	15.2	11.9	4.8	0.7	-	-	45.2
1991	-	8.4	10.9	6.3	7.2	1.9	-	-	34.6
1992	-	5.9	3.3	2.8	4.6	3.6	-	-	20.3
1993	-	9.3	3.9	5.7	4.4	2.6	-	-	25.9
1994	-	6.5	4.6	5.4	2.4	2.3	-	-	21.2
1995	-	8.5	5.2	5.6	3.3	3.3	-	-	25.8
1996	-	4.8	5.9	5.3	2.9	1.9	-	-	20.8
1997	0.6	6.5	2.0	5.6	2.3	1.8	-	-	18.8
1998	-	4.0	2.0	2.9	1.8	1.8	-	-	12.5
1999[c/]	0.1	2.5	4.8	4.0	1.8	0.6	-	-	13.9

TABLE A-20. **Cape Falcon to U.S.-Mexico border commercial troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 2 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				DAYS FISHED (thousands)					
Total South of Cape Falcon									
1978-1980	1.1	22.3	21.2	49.4	30.4	10.6	2.9	0.7	138.6
1981-1985	0.8	14.6	10.8	30.5	19.3	7.0	1.4	0.3	84.9
1986-1990	-	18.6	21.3	29.0	18.1	6.5	2.5	0.3	96.3
1986	-	17.6	18.0	29.3	15.7	4.2	1.4	0.1	86.1
1987	-	18.2	19.9	31.9	16.6	9.1	2.8	0.3	98.0
1988	-	21.5	26.9	37.6	26.7	9.7	4.8	0.3	126.8
1989	-	20.3	22.9	25.4	20.0	7.2	2.4	0.8	98.9
1990	-	15.4	18.9	22.3	11.5	2.4	1.1	b/	71.7
1991	-	9.1	14.8	10.5	9.2	4.3	1.8	-	49.7
1992	-	7.5	3.3	4.3	7.3	5.1	1.7	-	29.2
1993	-	11.3	5.2	7.4	5.4	4.5	1.2	0.1	35.2
1994	-	7.5	5.8	5.4	2.4	2.5	1.2	0.1	24.9
1995	-	9.4	6.9	5.6	5.9	4.6	1.3	0.1	33.8
1996	-	6.3	7.9	5.3	5.2	4.2	1.3	0.1	30.3
1997	0.9	8.6	3.9	5.5	4.0	2.8	0.8	0.1	26.4
1998	0.9	5.8	3.7	2.9	2.8	2.3	0.8	0.1	19.3
1999[c/]	0.3	3.1	6.2	4.8	2.9	1.2	0.5	0.1	19.1

a/ The current KMZ boundaries are Humbug Mt. to Horse Mt. These have changed slightly since the early 1980s. Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month.
b/ Less than 50 days.
c/ Preliminary.

TABLE A-21. **Cape Falcon to U.S.-Mexico border commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month.[a/] (Page 1 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
						CHINOOK (thousands)								**COHO (thousands)**				
Cape Falcon to Humbug Mt.																		
1976-1980	-	7.9	18.4	45.9	36.6	12.3	8.5	0.1	129.7	-	-	78.2	289.2	101.8	5.9	0.1	-	475.2
1981-1985	-	13.5	7.0	44.4	23.6	6.9	2.9	b/	98.4	-	b/	-	224.2	52.0	1.4	-	-	277.6
1986-1990	-	41.1	45.7	140.7	84.6	29.3	22.5	0.7	364.7	-	-	b/	296.6	75.7	4.2	-	b/	376.6
1986	-	28.7	33.3	128.7	91.9	34.6	25.7	b/	342.9	-	-	-	375.4	-	0.1	-	-	375.5
1987	-	30.1	20.6	273.0	83.6	61.6	16.1	-	485.0	-	-	b/	256.0	59.3	21.0	-	-	336.3
1988	-	48.7	68.7	110.6	129.1	27.4	47.1	-	431.6	-	-	-	389.3	234.0	-	-	-	623.3
1989	-	83.1	73.2	70.8	69.6	15.9	19.7	3.4	335.7	-	-	-	375.6	61.5	-	-	-	437.1
1990	-	15.0	32.7	120.4	48.8	7.0	4.2	b/	228.1	-	-	0.1	86.7	23.8	-	-	b/	110.6
1991	-	3.3	12.6	15.8	11.7	18.0	12.4	-	73.8	-	-	91.4	191.4	b/	-	-	-	282.7
1992	-	20.6	-	31.5	26.1	10.7	19.3	-	108.3	-	-	-	23.1	25.2	-	b/	-	48.3
1993	-	20.3	14.7	13.2	10.4	15.6	6.4	0.7	81.3	-	-	-	b/	b/	-	b/	-	b/
1994	-	7.7	9.7	-	-	1.2	5.5	0.4	24.5	-	-	-	-	-	-	-	-	-
1995	-	10.6	35.9	-	98.2	38.6	28.9	0.3	212.5	-	-	-	-	-	-	-	-	-
1996	-	25.6	40.5	-	60.8	26.0	14.1	0.8	167.8	-	-	b/	-	-	-	-	-	b/
1997	4.4	31.0	36.2	-	44.4	25.8	5.0	0.5	147.3	-	-	-	-	-	-	-	-	-
1998	20.0	39.7	33.7	-	20.9	5.0	3.4	0.9	123.5	-	-	-	-	-	-	-	-	-
1999[c/]	0.8	6.1	23.5	8.1	17.1	1.8	2.5	1.2	61.0	-	-	-	-	-	-	-	-	-
Humbug Mt. to Horse Mt. (KMZ)																		
1976-1980	3.1	22.5	19.3	32.9	35.1	9.6	7.9	2.0	134.2	b/	21.2	82.2	81.2	20.4	4.1	0.1	b/	209.3
1981-1985	-	31.2	13.4	26.6	44.5	10.1	3.5	1.1	130.4	-	3.5	7.2	25.9	17.4	0.8	-	-	54.8
1986-1990	-	5.5	45.4	3.3	10.9	8.5	0.8	0.9	75.3	-	-	12.1	1.8	0.1	0.9	0.1	-	15.0
1986	-	3.9	37.1	16.7	41.9	3.6	1.0	0.6	104.8	-	-	18.8	9.2	0.2	b/	-	-	28.3
1987	-	9.6	108.8	-	-	4.8	1.1	1.9	126.2	-	-	19.4	-	-	1.3	-	-	20.7
1988	-	8.9	65.2	-	-	18.9	0.8	1.9	95.6	-	-	12.9	-	-	1.5	-	-	14.4
1989	-	5.0	16.2	-	4.6	13.1	0.9	-	39.8	-	-	9.3	-	0.3	0.4	0.2	-	10.2
1990	-	0.1	-	-	7.8	2.0	0.1	-	9.9	-	-	-	-	0.1	1.2	b/	-	1.2
1991	-	-	-	-	b/	4.6	0.4	-	5.0	-	-	-	-	-	3.0	0.1	-	3.1
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	0.2	-	-	0.2	-	1.0	-	1.5	-	-	-	-	-	-	-	-	-
1995	-	0.3	-	1.7	-	-	1.3	-	3.3	-	-	-	-	-	-	-	-	-
1996	-	2.9	2.2	-	5.3	6.2	0.8	-	17.4	-	-	-	-	-	-	-	-	-
1997	0.1	2.3	-	-	0.3	1.4	0.9	-	5.0	-	-	-	-	-	-	-	-	-
1998	-	0.1	-	-	0.1	2.5	0.6	-	3.1	-	-	-	-	-	-	-	-	-
1999[c/]	-	b/	-	-	0.8	2.7	0.4	-	3.9	-	-	-	-	-	-	-	-	-

TABLE A-21. **Cape Falcon to U.S.-Mexico border commercial troll** chinook and coho salmon **landings** in numbers of fish by catch area and month.[a/] (Page 2 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
						CHINOOK (thousands)								**COHO (thousands)**				
Horse Mt. to U.S.-Mexico Border																		
1976-1980	7.6	118.0	68.1	157.3	49.1	28.6	-	-	428.7	b/	2.0	15.4	17.1	3.6	0.5	-	38.4	38.6
1981-1985	12.4	95.4	63.4	129.3	58.5	18.0	b/	-	377.1	b/	0.5	5.8	15.3	2.5	0.3	-	23.7	24.3
1986-1990	-	239.7	226.5	193.5	71.9	17.4	-	-	749.0	-	-	15.5	17.9	3.5	0.3	-	-	37.1
1986	-	223.4	272.8	208.0	65.1	5.5	-	-	774.9	-	-	9.2	16.1	1.8	0.1	-	-	27.2
1987	-	264.1	222.2	202.7	84.1	15.4	-	-	788.5	-	-	9.9	17.2	-	0.2	-	-	27.2
1988	-	390.1	340.2	372.5	113.0	42.1	-	-	1257.8	-	-	12.1	23.9	2.5	0.1	-	-	38.5
1989	-	175.8	123.3	112.5	77.9	18.6	-	-	508.0	-	-	7.8	15.9	8.6	0.5	-	-	32.8
1990	-	145.2	174.0	71.8	19.6	5.2	-	-	415.8	-	-	38.6	16.3	4.4	0.5	-	-	59.8
1991	-	80.1	87.1	49.7	65.6	7.8	-	-	290.2	-	-	50.1	24.0	5.1	-	-	-	79.2
1992	-	51.6	19.0	21.1	42.7	29.0	-	-	163.4	-	-	1.5	0.5	0.5	-	-	-	2.5
1993	-	111.1	40.4	55.8	48.4	24.0	-	-	279.6	-	-	-	-	-	-	-	-	-
1994	-	78.8	81.1	89.3	27.4	19.1	-	-	295.7	-	-	-	-	-	-	-	-	-
1995	-	285.5	143.0	189.7	30.9	31.1	-	-	680.1	-	-	-	-	-	-	-	-	-
1996	-	97.1	130.3	95.4	28.6	20.4	-	-	371.8	-	-	-	-	-	-	-	-	-
1997	11.9	199.0	74.6	154.0	24.9	21.8	-	-	486.2	-	-	-	-	-	-	-	-	-
1998	-	76.3	40.0	74.9	15.9	15.0	-	-	222.1	-	-	-	-	-	-	-	-	-
1999[c/]	3.3	30.6	125.6	71.5	24.0	7.0	-	-	262.0	-	-	-	-	-	-	-	-	-
Total South of Cape Falcon																		
1976-1980	10.7	148.4	105.7	236.1	120.8	50.5	16.4	2.1	692.6	b/	23.2	175.8	387.5	125.9	10.5	0.2	38.4	723.1
1981-1985	12.4	140.1	83.9	200.3	126.5	35.0	6.4	1.1	605.8	b/	4.0	13.0	265.4	71.9	2.4	-	23.7	356.8
1986-1990	-	286.4	317.6	337.5	167.4	55.1	23.3	1.6	1188.9	-	-	27.6	316.3	79.3	5.4	0.1	b/	428.6
1986	-	256.0	343.2	353.4	199.0	43.7	26.7	0.6	1222.6	-	-	28.0	400.7	2.1	0.3	-	-	431.0
1987	-	303.8	351.5	475.7	167.8	81.9	17.2	1.9	1399.7	-	-	29.3	273.2	59.3	22.4	-	-	384.2
1988	-	447.7	474.1	483.1	242.1	88.4	47.9	1.9	1785.0	-	-	25.0	413.1	236.5	1.6	-	-	676.3
1989	-	263.9	212.7	183.3	152.0	47.6	20.6	3.4	883.5	-	-	17.0	391.5	70.4	0.8	0.2	-	480.0
1990	-	160.3	206.6	192.2	76.3	14.2	4.2	b/	653.8	-	-	38.7	103.0	28.2	1.7	b/	b/	171.7
1991	-	83.3	99.7	65.4	77.2	30.5	12.8	-	369.0	-	-	141.5	215.3	5.2	3.0	0.1	-	365.1
1992	-	72.2	19.0	52.6	68.8	39.8	19.3	-	271.7	-	-	1.5	23.6	25.6	-	b/	-	50.7
1993	-	131.4	55.1	69.0	58.8	39.6	6.4	0.7	360.9	-	-	-	b/	b/	-	b/	-	b/
1994	-	86.7	90.8	89.3	27.6	20.3	6.6	0.4	321.7	-	-	-	-	-	-	-	-	-
1995	-	296.4	178.8	191.4	129.1	69.7	30.3	0.3	895.9	-	-	-	-	-	-	-	-	-
1996	-	125.6	173.0	95.4	94.7	52.6	14.9	0.8	557.0	-	-	b/	-	-	-	-	-	b/
1997	16.4	232.3	110.8	154.0	69.6	49.0	5.9	0.5	638.5	-	-	-	-	-	-	-	-	-
1998	19.9	112.2	73.8	73.7	36.5	20.2	4.0	0.9	341.3	-	-	-	-	-	-	-	-	-
1999[c/]	4.1	36.7	149.1	79.6	41.9	5.2	2.9	1.2	326.9	-	-	-	-	-	-	-	-	-

a/ The current KMZ boundaries are Humbug Mt. to Horse Mt. These have changed slightly since the early 1980s. Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month.

b/ Less than 50.

TABLE A-22. **Cape Falcon to U.S.-Mexico border** ocean **recreational** fishing **effort** in salmon angler trips by area and month.[a/] (Page 1 of 2)

Year or Average	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
					ANGLER TRIPS (thousands)						
Cape Falcon to Humbug Mt.											
1976-1980	-	-	-	9.0	44.4	97.2	83.0	17.6	1.4	0.1	252.6
1981-1985	-	-	-	2.1	13.1	78.0	49.0	8.5	0.3	-	151.1
1986-1990	-	-	-	1.7	18.5	82.6	49.3	12.8	-	-	164.9
1986	-	-	-	2.2	10.7	85.4	15.3	-	-	-	113.7
1987	-	-	-	-	10.9	93.0	47.0	17.6	-	-	168.5
1988	-	-	-	2.7	19.0	80.6	69.0	20.5	-	-	191.9
1989	-	-	-	2.0	36.5	86.8	45.8	9.6	-	-	180.7
1990	-	-	-	1.4	15.5	67.0	69.5	16.5	-	-	169.9
1991	-	-	-	2.3	33.1	96.6	-	-	-	-	132.0
1992	-	-	-	3.7	19.9	68.2	34.4	8.5	-	-	134.7
1993	-	-	-	1.4	1.3	24.7	10.6	-	-	-	38.0
1994	-	-	-	0.9	1.1	-	-	-	8.7	b/	10.7
1995	-	-	-	0.8	0.8	-	-	1.9	1.1	0.8	5.5
1996	-	-	-	1.3	0.9	0.6	4.1	4.8	3.3	-	15.0
1997	-	-	b/	0.5	0.8	0.9	4.0	2.1	1.8	-	10.0
1998	-	-	0.0	0.7	0.2	0.4	3.1	2.5	2.9	-	9.7
1999[c/]	-	-	b/	0.7	0.8	15.6	2.2	3.4	3.5	0.1	26.2
Humbug Mt. to Horse Mt. (KMZ)											
1976-1980	-	-	b/	1.6	20.8	50.1	30.9	8.3	5.6	0.9	118.2
1981-1985	-	-	b/	3.5	14.9	49.2	26.9	4.4	3.4	0.1	102.4
1986-1990	-	-	-	5.3	33.5	62.7	27.0	5.1	2.2	-	135.9
1986	-	-	-	5.8	25.2	33.8	26.6	1.1	5.0	-	107.2
1987	-	-	-	6.0	33.3	55.8	35.7	11.9	5.9	-	167.6
1988	-	-	-	4.7	34.2	51.9	24.0	3.9	-	-	129.7
1989	-	-	-	6.5	34.2	66.6	28.6	6.4	-	-	142.4
1990	-	-	-	3.5	40.8	65.8	20.1	2.3	-	-	132.5
1991	-	-	-	2.1	33.3	44.9	2.9	6.3	b/	-	89.5
1992	-	-	-	-	-	21.9	-	10.1	3.9	-	35.8
1993	-	-	-	4.3	7.9	19.2	19.9	6.1	-	-	57.5
1994	-	-	-	14.0	5.3	-	4.2	4.6	4.2	-	32.3
1995	-	-	-	6.5	18.0	-	4.6	11.6	3.4	-	44.1
1996	-	-	-	5.1	17.5	5.6	10.8	5.6	4.3	-	48.8
1997	-	-	-	5.9	8.6	6.5	11.7	1.6	1.3	-	35.6
1998	-	-	-	4.0	5.5	2.6	6.8	2.5	2.8	-	24.1
1999[c/]	-	-	-	0.3	6.6	5.4	14.9	4.1	2.3	-	33.6
Horse Mt. to U.S.-Mexico Border											
1976-1980	9.9	12.5	9.2	9.9	13.0	22.1	19.4	13.2	8.0	2.4	119.6
1981-1985	5.1	7.9	8.8	8.9	14.3	22.0	16.9	9.6	5.6	1.4	100.7
1986-1990	8.4	17.0	24.0	13.7	23.8	36.4	22.9	10.7	5.1	1.7	163.8
1986	2.1	13.9	18.4	12.8	22.5	34.9	23.2	7.7	4.8	0.9	141.1
1987	8.6	18.9	17.6	13.6	17.8	38.1	31.7	14.7	7.3	1.7	170.1
1988	11.2	15.7	19.0	19.1	28.3	39.6	22.0	8.7	4.2	0.8	168.7
1989	9.8	15.9	35.0	14.2	22.9	30.4	22.2	11.9	4.0	1.9	168.3
1990	10.2	20.6	30.3	8.6	27.7	39.2	15.3	10.4	5.1	3.4	170.8
1991	-	12.3	18.2	11.0	27.9	44.2	19.7	5.8	4.4	0.1	143.6
1992	2.0	9.7	9.9	11.5	13.6	28.9	15.1	12.3	5.8	0.8	109.7
1993	0.9	15.0	17.6	15.2	12.3	42.3	25.1	8.1	4.7	-	141.2
1994	2.5	14.2	18.7	16.6	32.6	42.5	25.5	12.3	8.8	-	173.7
1995	0.4	22.9	50.2	55.3	62.2	97.5	44.4	15.9	4.9	-	353.8
1996	b/	35.1	30.4	21.9	31.7	43.4	26.4	8.1	3.1	-	200.1
1997	b/	21.5	29.7	29.9	39.1	56.6	29.1	6.0	3.2	0.4	215.4
1998	b/	6.2	17.7	18.1	28.2	33.7	26.0	8.4	3.5	b/	141.8
1999[c/]	-	9.3	11.9	6.6	22.2	41.5	23.6	9.6	5.4	-	130.8

TABLE A-22. **Cape Falcon to U.S.-Mexico border** ocean **recreational** fishing **effort** in salmon angler trips by area and month.[a/] (Page 2 of 2)

Year or Average	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
					ANGLER TRIPS (thousands)						
Total South of Cape Falcon											
1976-1980	9.9	12.5	9.2	20.6	78.2	169.3	133.3	39.2	14.9	3.4	490.5
1981-1985	5.1	7.9	8.8	14.5	42.4	149.3	92.9	22.5	9.4	1.6	354.3
1986-1990	8.4	17.0	24.0	20.6	75.9	181.7	99.2	28.7	7.3	1.7	464.6
1986	2.1	13.9	18.4	20.7	58.5	154.1	65.2	8.8	9.8	0.9	362.0
1987	8.6	18.9	17.6	19.6	62.0	186.9	114.4	44.3	13.3	1.7	506.2
1988	11.2	15.7	19.0	26.5	81.5	172.2	115.1	33.2	4.2	0.8	490.4
1989	9.8	15.9	35.0	22.8	93.6	183.8	96.6	27.9	4.0	1.9	491.4
1990	10.2	20.6	30.3	13.5	84.0	171.9	105.0	29.2	5.1	3.4	473.2
1991	-	12.3	18.2	15.4	94.3	185.6	22.6	12.1	4.5	0.1	365.0
1992	2.0	9.7	9.9	15.2	33.6	119.0	49.5	30.9	9.6	0.8	280.3
1993	0.9	15.0	17.6	20.9	21.5	86.2	55.6	14.2	4.7	-	236.7
1994	2.5	14.2	18.7	31.5	39.0	42.5	29.7	16.8	21.8	b/	216.8
1995	0.4	22.9	50.2	62.7	81.1	97.5	49.0	29.4	9.5	0.8	403.4
1996	b/	35.1	30.4	28.3	50.1	49.6	41.3	18.5	10.7	0.0	263.8
1997	b/	21.5	29.7	36.3	48.5	64.0	44.8	9.7	6.3	0.4	261.0
1998	b/	6.2	17.7	21.6	33.9	36.6	35.9	13.5	9.2	b/	175.7
1999[c/]	-	9.3	11.9	7.6	29.6	62.5	40.7	17.1	11.2	0.1	193.6

a/ The current KMZ boundaries are Humbug Mt. to Horse Mt. These have changed slightly since the early 1980s. Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month.
b/ Less than 50 trips.
c/ Preliminary.

TABLE A-23. **Cape Falcon to U.S.-Mexico border** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 1 of 2)

Year or Average	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
						CHINOOK (thousands)											**COHO (thousands)**					
Cape Falcon to Humbug Mt.																						
1976-1980	-	-	-	0.7	2.8	4.1	5.1	1.5	0.1	b/	14.2	-	-	-	9.1	46.9	76.2	54.9	5.6	0.4	b/	193.1
1981-1985	-	-	-	b/	0.8	6.3	3.5	0.6	b/	-	11.3	-	-	-	1.4	10.8	62.6	40.9	3.8	-	-	119.5
1986-1990	-	-	-	0.1	1.9	7.1	4.0	1.6	-	-	14.8	-	-	-	0.9	20.2	98.1	46.0	7.0	-	-	172.2
1986	-	-	-	0.1	1.2	6.6	0.8	-	-	-	8.8	-	-	-	2.7	19.0	121.	25.2	-	-	-	167.9
1987	-	-	-	-	1.2	13.9	8.7	5.1	-	-	29.0	-	-	-	-	2.9	98.0	25.8	9.1	-	-	135.8
1988	-	-	-	0.3	3.4	5.0	6.0	1.5	-	-	16.1	-	-	-	0.1	9.9	95.7	76.3	20.0	-	-	202.0
1989	-	-	-	0.2	2.6	5.1	1.3	0.2	-	-	9.4	-	-	-	1.5	50.0	105.	48.2	0.7	-	-	205.9
1990	-	-	-	b/	1.0	4.7	3.5	1.3	-	-	10.5	-	-	-	0.2	19.2	70.1	54.6	5.2	-	-	149.2
1991	-	-	-	0.2	2.8	3.7	-	-	-	-	6.6	-	-	-	0.9	41.2	155.	-	-	-	-	197.5
1992	-	-	-	0.2	2.5	4.4	1.5	0.7	-	-	9.4	-	-	-	0.6	24.7	89.9	38.7	6.4	-	-	160.3
1993	-	-	-	0.2	b/	1.1	0.6	-	-	-	1.8	-	-	-	0.1	0.1	18.0	12.7	-	-	-	30.9
1994	-	-	-	0.1	0.1	-	-	-	2.2	-	2.4	-	-	-	-	-	-	-	-	b/	-	b/
1995	-	-	-	0.1	0.2	-	-	0.2	0.3	0.1	0.9	-	-	-	-	-	-	-	b/	-	-	b/
1996	-	-	-	0.2	0.2	0.3	0.7	0.9	0.7	-	3.0	-	-	-	-	-	-	b/	b/	b/	-	0.1
1997	-	-	0.0	0.1	0.2	0.5	1.2	0.4	0.3	-	2.4	-	-	-	-	-	b/	b/	b/	-	-	b/
1998	-	-	0.0	0.1	0.1	0.2	0.6	0.5	0.5	-	2.0	-	-	-	-	-	-	0.1	b/	b/	-	0.1
1999[c/]	-	-	0.0	0.1	0.2	1.3	0.4	0.7	0.5	b/	3.3	-	-	-	-	-	6.0	b/	b/	b/	-	6.0
Humbug Mt. to Horse Mt. (KMZ)																						
1976-1980	-	-	b/	0.3	2.7	8.2	5.6	0.7	0.7	0.1	18.3	-	-	b/	0.5	17.8	29.1	9.0	0.7	0.4	0.1	57.5
1981-1985	-	-	b/	2.5	4.9	17.2	7.2	0.7	0.5	b/	33.0	-	-	-	0.4	5.7	17.7	5.7	0.4	b/	-	29.8
1986-1990	-	-	-	1.8	14.8	21.5	8.6	2.0	0.3	-	49.1	-	-	-	1.1	12.4	32.3	7.6	0.9	b/	-	54.3
1986	-	-	-	1.8	6.9	9.4	9.3	0.1	0.6	-	28.2	-	-	-	1.9	7.8	13.5	5.5	b/	b/	-	28.7
1987	-	-	-	1.5	11.3	20.6	14.4	8.0	1.1	-	56.9	-	-	-	0.1	4.9	45.9	10.2	2.6	b/	-	63.7
1988	-	-	-	1.7	25.0	20.9	4.7	0.5	-	-	52.7	-	-	-	0.7	4.9	34.3	5.2	0.6	-	-	45.6
1989	-	-	-	2.5	14.7	39.6	13.2	1.2	-	-	71.1	-	-	-	1.8	16.6	45.3	13.2	0.9	-	-	77.9
1990	-	-	-	1.4	16.2	17.1	1.7	0.1	-	-	36.6	-	-	-	1.0	27.9	22.2	4.0	0.3	-	-	55.3
1991	-	-	-	0.1	11.8	7.1	0.1	0.6	b/	-	19.7	-	-	-	0.1	31.6	28.5	0.8	1.4	b/	-	62.3
1992	-	-	-	-	-	3.8	-	0.8	0.7	-	5.3	-	-	-	-	-	8.2	-	1.5	b/	-	9.7
1993	-	-	-	1.5	0.5	2.6	2.9	1.1	-	-	8.7	-	-	-	0.7	0.9	9.4	8.0	1.4	-	-	20.4
1994	-	-	-	7.8	3.2	-	1.1	0.5	1.1	-	13.7	-	-	-	b/	b/	-	0.1	b/	-	-	0.1
1995	-	-	-	1.6	8.6	-	2.1	6.2	0.8	-	19.4	-	-	-	b/	0.2	-	b/	0.2	b/	-	0.4
1996	-	-	-	2.6	8.6	1.3	4.2	1.2	1.3	-	19.1	-	-	-	-	0.2	b/	0.1	0.1	b/	-	0.4
1997	-	-	-	2.6	3.0	3.0	4.4	0.2	0.7	-	13.9	-	-	-	b/	0.1	0.1	0.1	b/	b/	-	0.3
1998	-	-	-	1.0	1.5	0.7	1.0	0.4	0.4	-	4.9	-	-	-	-	b/	b/	0.1	-	b/	-	0.1
1999[c/]	-	-	-	b/	2.3	2.2	4.2	0.6	0.3	-	9.6	-	-	-	-	b/	b/	0.1	b/	-	-	0.2

TABLE A-23. **Cape Falcon to U.S.-Mexico border** ocean **recreational** salmon **landings** in numbers of fish by catch area and month.[a/] (Page 2 of 2)

Year or Average	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
	CHINOOK (thousands)											**COHO (thousands)**										
Horse Mt. to U.S.-Mexico Border																						
1976-1980	5.8	8.5	8.7	6.2	11.8	16.6	9.7	7.4	6.7	1.3	82.8	b/	b/	0.2	1.4	1.6	2.2	0.6	0.1	b/	b/	6.2
1981-1985	5.9	7.3	7.2	7.7	13.3	19.0	16.6	8.5	5.5	1.4	92.5	-	b/	b/	0.1	0.7	0.9	0.3	b/	b/	-	2.1
1986-1990	5.6	15.3	26.4	10.0	19.0	28.6	18.0	8.0	4.1	1.3	136.2	-	b/	0.1	0.2	1.3	2.4	0.8	0.2	b/	-	4.9
1986	1.2	16.1	23.5	8.8	20.6	31.5	16.0	5.2	2.0	0.6	125.4	-	b/	-	0.1	0.3	1.3	0.3	b/	b/	-	2.0
1987	5.5	14.1	19.2	11.0	15.7	40.3	35.3	12.9	7.1	1.1	162.0	-	-	-	b/	0.7	1.1	0.5	0.3	-	-	2.6
1988	6.8	16.1	25.0	18.5	25.3	29.1	10.6	4.9	3.8	0.5	140.8	-	-	b/	0.2	0.5	2.9	0.2	b/	-	-	3.8
1989	8.0	12.7	42.6	6.5	16.7	18.5	13.3	12.2	3.7	2.4	136.7	-	-	0.1	0.2	1.7	2.2	0.5	0.1	-	-	4.8
1990	6.7	17.6	21.6	5.0	16.5	23.4	14.7	5.0	3.8	1.7	116.0	-	-	0.1	0.6	3.5	4.4	2.5	0.4	0.1	-	11.6
1991	-	8.0	13.0	4.8	12.2	20.4	5.7	1.6	2.2	b/	68.0	-	b/	b/	0.6	13.1	14.0	1.3	0.1	b/	-	29.2
1992	0.5	3.4	5.4	6.3	9.5	22.1	10.1	9.9	3.3	0.5	71.0	b/	b/	b/	0.4	0.4	3.6	0.1	0.5	b/	-	5.1
1993	0.4	9.9	15.0	8.5	7.3	38.4	17.2	4.8	3.6	-	105.1	-	b/	0.1	0.3	1.5	11.4	2.0	0.1	b/	-	15.4
1994	1.3	7.3	15.7	12.3	35.7	53.3	23.9	13.9	9.7	-	173.1	-	-	b/	b/	0.2	0.1	b/	b/	b/	-	0.4
1995	0.2	27.3	57.9	45.8	73.4	133.7	29.8	13.4	2.1	-	383.6	-	-	b/	b/	0.3	0.1	0.1	b/	b/	-	0.7
1996	b/	32.0	31.7	13.2	27.2	32.3	11.2	4.4	1.3	-	153.3	-	-	b/	b/	0.2	b/	0.1	b/	-	-	0.4
1997	b/	20.1	26.9	25.7	45.7	72.5	23.6	3.0	2.3	0.1	220.0	-	-	b/	b/	-	0.1	0.1	b/	-	-	0.3
1998	b/	3.0	13.1	15.1	23.7	37.1	20.7	4.4	1.8	b/	119.1	-	-	-	-	b/	b/	b/	-	-	-	b/
1999[c/]	-	1.7	6.5	1.4	13.4	34.1	15.1	6.5	2.6	-	81.4	-	-	-	b/	0.2	0.1	0.1	b/	b/	-	0.5
Total South of Cape Falcon																						
1976-1980	5.8	8.5	8.7	7.2	17.3	28.9	20.4	9.6	7.5	1.4	115.3	b/	b/	0.2	11.0	66.3	107.	64.5	6.5	0.7	0.1	256.8
1981-1985	5.9	7.3	7.2	10.2	19.0	42.5	27.3	9.9	6.1	1.4	136.8	-	b/	b/	1.9	17.2	81.2	47.0	4.2	b/	-	151.5
1986-1990	5.6	15.3	26.4	11.9	35.7	57.2	30.7	11.6	4.4	1.3	200.0	-	b/	0.1	2.2	33.9	132.	54.4	8.0	b/	-	231.4
1986	1.2	16.1	23.5	10.7	28.7	47.6	26.1	5.3	2.6	0.6	162.4	-	b/	-	4.6	27.1	135.	30.9	b/	b/	-	198.6
1987	5.5	14.1	19.2	12.5	28.2	74.8	58.3	26.0	8.3	1.1	247.9	-	-	-	0.1	8.5	145.	36.5	12.0	b/	-	202.1
1988	6.8	16.1	25.0	20.5	53.7	55.0	21.3	6.8	3.8	0.5	209.7	-	-	b/	1.0	15.2	133.	81.7	20.6	-	-	251.4
1989	8.0	12.7	42.6	9.1	34.1	63.2	27.8	13.6	3.7	2.4	217.2	-	-	0.1	3.5	68.3	153.	61.9	1.7	-	-	288.6
1990	6.7	17.6	21.6	6.5	33.7	45.3	19.9	6.3	3.8	1.7	163.1	-	-	0.1	1.7	50.6	96.7	61.1	5.9	0.1	-	216.2
1991	-	8.0	13.0	5.0	26.8	31.1	5.8	2.3	2.2	b/	94.3	-	b/	b/	1.5	85.9	197.	2.1	1.4	b/	-	289.0
1992	0.5	3.4	5.4	6.6	12.0	30.2	11.6	11.5	4.0	0.5	85.6	b/	b/	b/	1.0	25.1	101.	38.9	8.3	0.1	-	175.1
1993	0.4	9.9	15.0	10.2	7.8	42.1	20.7	5.9	3.6	-	115.6	-	b/	0.1	1.0	2.5	38.7	22.8	1.6	b/	-	66.7
1994	1.3	7.3	15.7	20.2	39.1	53.3	25.0	14.4	13.0	-	189.2	-	-	b/	b/	0.2	0.1	0.1	b/	b/	-	0.6
1995	0.2	27.3	57.9	47.5	82.2	133.7	31.9	19.8	3.3	0.1	403.8	-	-	b/	b/	0.5	0.1	0.1	0.2	b/	-	1.1
1996	b/	32.0	31.7	16.0	36.0	33.9	16.0	6.5	3.4	-	175.3	-	-	b/	b/	0.4	0.1	0.2	0.1	b/	-	0.8
1997	b/	20.1	26.9	28.4	48.9	76.0	29.2	3.6	3.3	0.1	236.2	-	-	b/	b/	0.1	0.1	0.2	b/	-	-	0.4
1998	b/	3.0	13.1	16.2	25.3	38.0	22.2	5.3	2.7	b/	125.3	-	-	-	-	b/	b/	0.1	b/	b/	-	0.2
1999[c/]	-	1.7	6.5	1.5	15.9	37.6	19.7	7.8	3.4	b/	95.3	-	-	-	-	0.2	6.1	0.2	b/	b/	-	6.7

a/ The current KMZ boundaries are Humbug Mt. to Horse Mt. These have changed slightly since the early 1980s. Monthly totals for the Oregon data are the sum of statistical weeks with closest fit to the calendar month.

b/ Less than 50 fish.

c/ Preliminary.

TABLE A-24. **U.S.-Canada border to Cape Falcon commercial troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 1 of 3)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season
			DAYS FISHED (thousands)				
U.S.-Canada Border to Leadbetter Pt. - Non-Indian							
1976-1980	3.6	2.3	11.9	12.4	4.5	-	34.8
1981-1985	2.8	0.3	4.7	2.4	b/	-	10.2
1986-1990	2.3	0.7	0.3	0.7	b/	-	3.9
1986	1.9	b/	0.4	0.5	-	-	2.9
1987	1.9	-	0.9	b/	-	-	2.8
1988	3.5	2.1	b/	b/	b/	-	5.6
1989	2.2	1.1	-	0.9	b/	-	4.1
1990	2.1	0.2	b/	1.9	b/	-	4.3
1991	1.6	1.0	b/	1.2	0.5	-	4.2
1992	1.9	1.3	0.9	0.6	-	-	4.6
1993	1.2	0.9	0.7	0.4	0.4	-	3.6
1994	-	-	-	-	-	-	-
1995	-	-	-	0.4	0.1	-	0.5
1996	-	-	0.2	0.2	-	-	0.4
1997	0.3	0.2	-	-	-	-	0.5
1998	0.1	b/	-	-	-	-	0.1
1999[c/]	0.3	0.2	0.1	0.1	b/	-	0.8
U.S.-Canada Border to Leadbetter Pt. - Treaty Indian[d/]							
1976-1980	0.1	0.2	0.2	0.2	0.1	b/	0.9
1981-1985	0.2	0.3	0.6	0.8	0.5	b/	2.5
1986-1990	0.5	0.5	1.0	1.1	0.3	b/	3.3
1986	0.2	0.6	0.9	0.2	b/	-	1.9
1987	0.4	-	1.0	1.4	-	b/	2.7
1988	0.7	0.6	0.9	1.5	0.3	-	4.0
1989	0.5	0.5	1.4	0.9	0.6	-	3.9
1990	0.5	0.7	0.8	1.4	0.4	b/	3.8
1991	0.3	0.4	0.8	1.0	-	0.2	2.6
1992	0.3	0.4	0.4	0.4	-	b/	1.5
1993	0.3	0.4	0.7	0.9	0.6	-	2.9
1994	0.1	0.2	b/	-	-	-	0.2
1995	b/	-	b/	0.7	-	-	0.7
1996	0.1	0.1	b/	0.2	0.2	-	0.6
1997	0.0	0.1	-	0.2	b/	-	0.4
1998	0.1	b/	-	b/	b/	-	0.2
1999[c/]	0.1	0.1	-	0.1	0.1	-	0.4
U.S.-Canada Border to Leadbetter Pt. - Total[d/]							
1976-1980	3.8	2.5	12.2	12.6	4.6	-	35.7
1981-1985	3.0	0.6	5.3	3.2	0.5	-	12.6
1986-1990	2.8	1.1	1.3	1.7	0.3	-	7.2
1986	2.1	0.6	1.3	0.7	b/	-	4.8
1987	2.2	-	1.9	1.4	-	-	5.5
1988	4.2	2.7	0.9	1.5	0.3	-	9.6
1989	2.6	1.6	1.4	1.8	0.6	-	8.1
1990	2.6	0.9	0.8	3.3	0.4	-	8.1
1991	1.9	1.4	0.8	2.2	0.5	-	6.8
1992	2.2	1.7	1.3	1.0	-	-	6.2
1993	1.6	1.3	1.4	1.3	1.0	-	6.5
1994	0.1	0.2	b/	-	-	-	0.2
1995	b/	-	b/	1.1	0.1	-	1.2
1996	0.1	0.1	0.2	0.4	0.2	-	1.0
1997	0.3	0.3	-	0.2	b/	-	0.9
1998	0.2	b/	-	b/	b/	-	0.3
1999[c/]	0.3	0.3	0.1	0.2	0.1	-	1.1

TABLE A-24. **U.S.-Canada border to Cape Falcon commercial troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 2 of 3)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season
			DAYS FISHED (thousands)				
Leadbetter Pt. to Cape Falcon - Non-Indian							
1976-1980	0.9	0.8	4.5	3.7	1.9	0.1	11.9
1981-1985	1.0	0.1	1.0	0.9	0.2	b/	3.1
1986-1990	0.3	0.1	0.2	0.6	0.4	b/	1.5
1986	0.8	-	0.3	1.5	-	-	2.6
1987	0.3	-	0.5	-	-	-	0.8
1988	0.3	0.2	-	-	-	-	0.5
1989	0.2	0.1	-	0.9	0.7	-	1.8
1990	0.1	b/	-	0.7	1.1	b/	1.9
1991	0.2	b/	-	0.8	0.2	-	1.3
1992	0.2	0.1	0.1	0.1	-	-	0.5
1993	b/	b/	0.1	0.1	0.1	-	0.3
1994	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-
1997	0.1	b/	-	-	-	-	0.1
1998	-	-	-	-	-	-	-
1999[c/]	-	b/	-	b/	-	-	b/
U.S.-Canada Border to Cape Falcon - Non-Indian							
1976-1980	3.8	0.3	5.7	3.3	0.2	b/	13.2
1981-1985	2.7	0.7	0.4	1.3	0.4	b/	5.5
1986-1990	2.7	b/	0.8	1.9	-	-	5.4
1986	2.2	-	1.4	b/	-	-	3.6
1987	3.8	2.2	b/	b/	b/	-	6.1
1988	2.3	1.1	-	1.8	0.7	-	6.0
1989	2.2	0.2	b/	2.7	1.1	b/	6.2
1990	1.8	1.0	b/	2.0	0.7	-	5.5
1991	2.1	1.4	1.0	0.7	-	-	5.2
1992	1.3	0.9	0.8	0.4	0.5	-	3.9
1993	-	-	-	-	-	-	-
1994	-	-	-	0.4	0.1	-	0.5
1995	-	-	0.2	0.2	-	-	0.4
1996	0.4	0.2	-	-	-	-	0.6
1997	0.1	b/	-	-	-	-	0.1
1998	-	-	-	-	-	-	-
1999[c/]	0.3	0.2	0.1	0.1	b/	-	0.8
U.S.-Canada Border to Cape Falcon - Treaty Indian[d/]							
1976-1980	0.1	0.2	0.2	0.2	0.1	b/	0.9
1981-1985	0.2	0.3	0.6	0.8	0.5	b/	2.5
1986-1990	0.5	0.5	1.0	1.1	0.3	b/	3.3
1986	0.2	0.6	0.9	0.2	b/	-	1.9
1987	0.4	-	1.0	1.4	-	b/	2.7
1988	0.7	0.6	0.9	1.5	0.3	-	4.0
1989	0.5	0.5	1.4	0.9	0.6	-	3.9
1990	0.5	0.7	0.8	1.4	0.4	b/	3.8
1991	0.3	0.4	0.8	1.0	-	0.2	2.6
1992	0.3	0.4	0.4	0.4	-	b/	1.5
1993	0.3	0.4	0.7	0.9	0.6	-	2.9
1994	0.1	0.2	b/	-	-	-	0.2
1995	b/	-	b/	0.7	-	-	0.7
1996	0.1	0.1	b/	0.2	0.2	-	0.6
1997	0.0	0.1	-	0.2	b/	-	0.4
1998	0.1	b/	-	b/	b/	-	0.2
1999[c/]	0.1	0.1	-	0.1	0.1	-	0.4

TABLE A-24. **U.S.-Canada border to Cape Falcon commercial troll** salmon fishing **effort** in days fished by area and month.[a/] (Page 3 of 3)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season
			DAYS FISHED (thousands)				
U.S.-Canada Border to Cape Falcon - Total[d/]							
1976-1980	4.7	3.4	16.6	16.4	6.5	0.1	47.6
1981-1985	4.0	0.6	6.3	4.1	0.6	b/	15.7
1986-1990	3.1	1.2	1.4	2.4	0.6	b/	8.7
1986	3.0	0.6	1.6	2.2	b/	-	7.3
1987	2.5	-	2.4	1.4	-	-	6.3
1988	4.5	2.9	0.9	1.5	0.3	-	10.1
1989	2.8	1.6	1.4	2.7	1.3	-	9.9
1990	2.7	0.9	0.8	4.0	1.5	b/	10.0
1991	2.2	1.4	0.8	3.1	0.7	-	8.1
1992	2.4	1.8	1.4	1.1	-	-	6.7
1993	1.6	1.3	1.5	1.3	1.1	-	6.9
1994	0.1	0.2	b/	-	-	-	0.2
1995	b/	-	b/	1.1	0.1	-	1.2
1996	0.1	0.1	0.2	0.4	0.2	-	1.0
1997	0.4	0.3	-	0.2	b/	-	1.0
1998	0.2	b/	-	b/	b/	-	0.3
1999[c/]	0.4	0.3	0.1	0.2	0.1	-	1.1

a/ Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data are summarized by statistical month.
b/ Less than 50 days.
c/ Preliminary.
d/ Season totals do not include October treaty troll effort.

TABLE A-25. **U.S.-Canada border to Cape Falcon commercial troll** chinook and coho **landings** in numbers of fish by catch area and month.[a/] (Page 1 of 4)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Oct.	Season
				CHINOOK (thousands)							**COHO (thousands)**			
North of Leadbetter Pt. - Non-Indian														
1976-1980	43.5	24.8	51.3	33.7	9.5	-	162.7	b/	27.2	308.8	177.8	62.1	-	575.9
1981-1985	26.6	2.9	20.8	4.7	b/	b/	55.1	-	-	103.8	26.2	b/	-	130.0
1986-1990	27.8	9.1	4.0	1.3	b/	-	42.3	b/	-	10.5	26.5	b/	-	37.0
1986	18.9	0.2	0.6	2.0	-	-	21.6	-	-	8.6	20.8	-	-	29.4
1987	33.7	-	19.3	b/	-	-	53.1	-	-	43.7	0.3	-	-	44.0
1988[c/]	40.9	29.1	0.1	0.2	b/	-	70.3	b/	-	0.4	1.8	-	-	2.2
1989	22.4	14.6	-	0.3	b/	-	37.2	-	-	-	41.1	b/	-	41.1
1990	23.3	1.8	b/	4.2	b/	-	29.3	-	-	b/	68.4	b/	-	68.4
1991[d/]	13.6	12.4	b/	0.8	0.6	-	27.5	-	-	0.1	25.4	12.7	-	38.2
1992	19.7	13.3	5.2	3.5	-	-	41.7	-	-	9.5	7.2	-	-	16.7
1993	14.4	10.6	2.6	0.9	1.5	-	30.0	-	-	4.8	3.5	5.2	-	13.4
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	b/	-	-	b/	-	-	-	18.4	7.1	-	25.4
1996	-	-	-	-	-	-	-	-	-	7.1	10.4	-	-	17.5
1997	4.5	1.9	-	-	-	-	6.4	-	-	-	-	-	-	-
1998[e/]	5.7	0.2	-	-	-	-	5.9	-	-	-	-	-	-	-
1999	4.2	7.1	4.0	2.2	-	-	17.5	-	-	0.7	3.0	0.3	-	4.0
North of Leadbetter Pt. - Treaty Indian[f/]														
1976-1980	0.5	2.1	1.9	0.5	0.1	0.2	5.0	0.7	7.2	2.9	1.3	0.4	1.1	12.5
1981-1985	2.1	1.9	3.6	1.3	1.0	0.2	10.0	0.3	7.4	16.4	24.5	16.7	b/	65.3
1986-1990	6.9	5.8	6.8	4.5	1.2	b/	25.2	b/	4.3	32.3	35.8	11.1	b/	83.5
1986	4.3	3.5	3.8	0.6	-	-	12.2	-	21.2	51.6	11.7	b/	-	84.5
1987	8.4	-	2.2	7.3	-	0.1	17.9	b/	-	45.6	44.0	-	b/	89.6
1988	7.6	9.8	6.4	6.8	2.0	-	32.5	-	0.1	11.8	46.2	10.2	-	68.3
1989	6.7	7.6	10.1	5.3	1.6	-	31.3	b/	-	31.8	23.5	28.6	-	83.9
1990	7.5	7.9	11.3	2.7	2.7	b/	32.1	-	b/	20.7	53.8	16.5	b/	91.0
1991	4.4	6.0	6.9	4.5	-	0.1	21.8	-	-	38.9	38.0	-	0.5	77.0
1992	8.8	5.5	4.7	4.0	-	-	23.1	b/	b/	40.2	35.4	-	b/	75.6
1993	7.6	5.4	5.8	3.7	2.9	-	25.4	b/	-	7.0	25.5	26.7	-	59.1
1994	0.4	4.0	b/	-	-	-	4.5	-	-	-	-	-	-	-
1995	0.7	-	b/	8.8	-	-	9.5	-	-	-	30.8	-	-	30.8
1996	1.5	2.0	0.4	4.9	3.6	-	12.3	-	-	-	4.6	13.9	-	18.5
1997	0.8	7.5	-	4.6	1.1	-	14.0	-	-	-	11.3	4.3	-	15.7
1998[e/]	5.2	4.4	-	3.6	1.1	-	14.4	-	-	-	3.8	4.1	-	7.9
1999	2.5	17.1	-	4.1	3.6	-	27.4	-	-	-	13.2	20.2	-	33.4

TABLE A-25. **U.S.-Canada border to Cape Falcon commercial troll** chinook and coho **landings** in numbers of fish by catch area and month.[a/] (Page 2 of 4)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Oct.	Season
				CHINOOK (thousands)							**COHO (thousands)**			
North of Leadbetter Pt. - Total[f/]														
1976-1980	44.0	26.9	53.1	34.2	9.6	-	167.8	0.7	34.4	311.7	179.1	62.5	-	588.4
1981-1985	28.7	4.8	24.4	6.1	1.1	b/	65.1	0.3	7.4	120.2	50.6	16.7	-	195.2
1986-1990	34.7	14.9	10.7	5.9	1.3	-	67.5	b/	4.3	42.8	62.3	11.1	-	120.5
1986	23.2	3.7	4.4	2.5	-	-	33.8	-	21.2	60.3	32.5	b/	-	113.9
1987	42.2	-	21.5	7.3	-	-	71.0	b/	-	89.3	44.3	-	-	133.6
1988	48.5	38.9	6.4	7.1	2.0	-	102.8	b/	0.1	12.2	48.1	10.2	-	70.6
1989	29.1	22.2	10.1	5.6	1.6	-	68.6	b/	-	31.8	64.6	28.6	-	125.0
1990	30.8	9.7	11.3	6.9	2.7	-	61.4	-	b/	20.7	122.2	16.5	-	159.4
1991	18.1	18.4	6.9	5.3	0.6	-	49.3	-	-	39.0	63.4	12.7	-	115.2
1992	28.4	18.8	10.0	7.5	-	-	64.8	b/	b/	49.7	42.6	-	-	92.3
1993	21.9	16.0	8.4	4.7	4.4	-	55.4	b/	-	11.8	28.9	31.9	-	72.5
1994	0.4	4.0	b/	-	-	-	4.5	-	-	-	-	-	-	-
1995	0.7	-	b/	8.8	-	-	9.5	-	-	-	49.1	7.1	-	56.2
1996	1.5	2.0	0.4	4.9	3.6	-	12.3	-	-	7.1	15.0	13.9	-	36.1
1997	5.3	9.4	-	4.6	1.1	-	20.4	-	-	-	11.3	4.3	-	15.7
1998[e/]	10.9	4.6	-	3.6	1.1	-	20.3	-	-	-	3.8	4.1	-	7.9
1999[e/]	6.7	24.2	4.0	6.3	3.6	-	44.8	-	-	0.7	16.0	20.6	-	37.2
South of Leadbetter Pt. - Non-Indian														
1976-1980	13.0	9.7	7.1	4.8	3.7	0.6	38.9	b/	41.9	106.2	41.9	21.9	0.6	212.6
1981-1985	11.2	0.8	1.9	0.8	0.1	b/	14.7	-	-	29.2	20.7	3.6	-	53.4
1986-1990	4.8	0.8	0.8	1.4	0.8	b/	8.6	-	-	6.1	20.5	9.5	0.1	36.1
1986	12.6	-	0.3	4.7	-	-	17.7	-	-	12.2	79.5	-	-	91.7
1987	6.3	-	3.5	-	-	-	9.9	-	-	18.2	-	-	-	18.2
1988	2.6	2.3	-	-	-	-	4.9	-	-	-	-	-	-	-
1989	1.7	1.3	-	1.2	1.8	-	6.0	-	-	-	12.1	25.0	-	37.2
1990	0.6	0.2	-	1.1	2.3	0.1	4.3	-	-	-	10.7	22.4	0.3	33.5
1991	1.2	0.1	-	0.9	0.1	-	2.3	-	-	-	36.2	6.8	-	43.0
1992	3.0	1.0	0.2	0.1	-	-	4.2	-	-	1.4	1.1	-	-	2.5
1993	0.3	b/	0.1	b/	0.1	-	0.5	-	-	0.4	1.4	0.4	-	2.2
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1997	b/	b/	-	-	-	-	b/	-	-	-	-	-	-	-
1998[e/]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1999[e/]	-	-	b/	0.2	-	-	0.2	-	-	-	b/	-	-	b/

TABLE A-25. **U.S.-Canada border to Cape Falcon commercial troll** chinook and coho **landings** in numbers of fish by catch area and month.[a/] (Page 3 of 4)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Oct.	Season
				CHINOOK (thousands)							**COHO (thousands)**			
North of Cape Falcon - Non-Indian														
1976-1980	56.5	34.5	58.3	38.5	13.1	0.6	201.6	b/	69.1	415.0	219.7	84.0	0.6	788.5
1981-1985	37.8	3.7	22.7	5.5	0.1	b/	69.8	-	-	133.0	46.8	3.6	-	183.4
1986-1990	32.6	9.9	4.8	2.7	0.8	b/	50.9	b/	-	16.6	47.0	9.5	0.1	73.1
1986	31.6	0.2	0.9	6.7	-	-	39.3	-	-	20.8	100.3	-	-	121.1
1987[c/]	40.1	-	22.9	b/	-	-	63.0	-	-	61.9	0.3	-	-	62.2
1988[c/]	43.5	31.4	0.1	0.2	b/	-	75.2	b/	-	0.4	1.8	-	-	2.2
1989	24.1	15.8	-	1.5	1.9	-	43.3	-	-	-	53.2	25.0	-	78.3
1990	23.9	2.1	b/	5.3	2.4	0.1	33.6	-	-	b/	79.1	22.5	0.3	101.9
1991[d/]	14.8	12.5	b/	1.7	0.7	-	29.8	-	-	0.1	61.5	19.5	-	81.2
1992	22.6	14.3	5.5	3.6	-	-	45.9	-	-	10.9	8.3	-	-	19.2
1993	14.6	10.6	2.7	1.0	1.6	-	30.5	-	-	5.1	4.8	5.6	-	15.6
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	b/	-	-	b/	-	-	-	18.4	7.1	-	25.4
1996	-	-	-	-	-	-	-	-	-	7.1	10.4	-	-	17.5
1997	4.5	1.9	-	-	-	-	6.4	-	-	-	-	-	-	-
1998[e/]	5.7	0.2	-	-	-	-	5.9	-	-	-	-	-	-	-
1999[e/]	4.2	7.1	4.0	2.3	-	-	17.6	-	-	0.7	3.0	0.3	-	4.0
North of Cape Falcon - Treaty Indian[f/]														
1976-1980	0.5	2.1	1.9	0.5	0.1	0.2	5.0	0.7	7.2	2.9	1.3	0.4	1.1	12.5
1981-1985	2.1	1.9	3.6	1.3	1.0	0.2	10.0	0.3	7.4	16.4	24.5	16.7	b/	65.3
1986-1990	6.9	5.8	6.8	4.5	1.2	b/	25.2	b/	4.3	32.3	35.8	11.1	b/	83.5
1986	4.3	3.5	3.8	0.6	-	-	12.2	-	21.2	51.6	11.7	b/	-	84.5
1987	8.4	-	2.2	7.3	-	0.1	17.9	b/	-	45.6	44.0	-	b/	89.6
1988	7.6	9.8	6.4	6.8	2.0	-	32.5	-	0.1	11.8	46.2	10.2	-	68.3
1989	6.7	7.6	10.1	5.3	1.6	-	31.3	b/	-	31.8	23.5	28.6	-	83.9
1990	7.5	7.9	11.3	2.7	2.7	b/	32.1	-	b/	20.7	53.8	16.5	b/	91.0
1991	4.4	6.0	6.9	4.5	-	0.1	21.8	-	-	38.9	38.0	-	0.5	77.0
1992	8.8	5.5	4.7	4.0	-	-	23.1	b/	b/	40.2	35.4	-	b/	75.6
1993	7.6	5.4	5.8	3.7	2.9	-	25.4	b/	-	7.0	25.5	26.7	-	59.1
1994	0.4	4.0	b/	-	-	-	4.5	-	-	-	-	-	-	-
1995	0.7	-	b/	8.8	-	-	9.5	-	-	-	30.8	-	-	30.8
1996	1.5	2.0	0.4	4.9	3.6	-	12.3	-	-	-	4.6	13.9	-	18.5
1997	0.8	7.5	-	4.6	1.1	-	14.0	-	-	-	11.3	4.3	-	15.7
1998[e/]	5.2	4.4	-	3.6	1.1	-	14.4	-	-	-	3.8	4.1	-	7.9
1999[e/]	2.5	17.1	-	4.1	3.6	-	27.4	-	-	-	13.2	20.2	-	33.4

TABLE A-25. **U.S.-Canada border to Cape Falcon commercial troll** chinook and coho **landings** in numbers of fish by catch area and month.[a/] (Page 4 of 4)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Oct.	Season
	CHINOOK (thousands)							**COHO (thousands)**						
North of Cape Falcon - Total Treaty Indian and Non-Indian[f/]														
1976-1980	57.0	36.6	60.2	39.0	13.2	0.6	206.6	0.7	76.3	417.9	221.0	84.5	0.6	801.0
1981-1985	39.9	5.6	26.3	6.8	1.2	b/	79.8	0.3	7.4	149.4	71.3	20.3	-	248.6
1986-1990	39.5	15.7	11.5	7.3	2.1	b/	76.1	b/	4.3	48.9	82.8	20.5	0.1	156.6
1986	35.8	3.7	4.7	7.2	-	-	51.5	-	21.2	72.4	112.0	b/	-	205.6
1987	48.5	-	25.1	7.3	-	-	80.9	b/	-	107.5	44.3	-	-	151.8
1988	51.1	41.2	6.4	7.1	2.0	-	107.7	b/	0.1	12.2	48.1	10.2	-	70.6
1989	30.8	23.5	10.1	6.8	3.4	-	74.6	b/	-	31.8	76.7	53.6	-	162.2
1990	31.4	10.0	11.3	8.0	5.1	0.1	65.8	-	b/	20.7	133.0	38.9	0.3	192.9
1991	19.3	18.5	6.9	6.2	0.7	-	51.6	-	-	39.0	99.6	19.5	-	158.1
1992	31.4	19.8	10.2	7.6	-	-	69.0	b/	b/	51.1	43.7	-	-	94.8
1993	22.2	16.0	8.5	4.7	4.5	-	55.9	b/	-	12.1	30.3	32.3	-	74.7
1994	0.4	4.0	b/	-	-	-	4.5	-	-	-	-	-	-	-
1995	0.7	-	b/	8.8	-	-	9.5	-	-	-	49.1	7.1	-	56.2
1996	1.5	2.0	0.4	4.9	3.6	-	12.3	-	-	7.1	15.0	13.9	-	36.1
1997	5.4	9.4	-	4.6	1.1	-	20.5	-	-	-	11.3	4.3	-	15.7
1998	10.9	4.6	-	3.6	1.1	-	20.3	-	-	-	3.8	4.1	-	7.9
1999[e/]	6.7	24.2	4.0	6.4	3.6	-	45.0	-	-	0.7	16.2	20.6	-	37.4

a/ Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data is summarized by statistical month.
b/ Less than 50 fish.
c/ Includes 300 chinook and 2,200 coho landed illegally.
d/ Includes 100 coho landed illegally.
e/ Preliminary.
f/ Season totals do not include Oct. treaty troll catches.

TABLE A-26. **U.S.-Canada border to Cape Falcon commercial troll** pink salmon **landings** in numbers of fish by catch area and month (odd-year averages).[a/] (Page 1 of 2)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season
			PINKS (thousands)				
North of Leadbetter Pt. - Non-Indian							
1976-1980	0.6	0.7	94.6	308.7	4.7	-	409.3
1981-1985	0.2	b/	24.2	113.3	0.3	-	138.1
1986-1990	0.1	0.1	0.9	18.5	-	-	19.7
1989	0.2	0.2	-	36.3	-	-	36.7
1991	b/	b/	b/	43.2	0.3	-	43.5
1993	b/	b/	0.1	2.7	b/	-	2.9
1995	-	-	-	30.1	0.9	-	30.9
1997	b/	b/	-	-	-	-	b/
1999[c/]	-	b/	b/	b/	-	-	0.1
North of Leadbetter Pt. - Treaty Indian[d/]							
1976-1980	b/	0.8	0.6	1.8	b/	2.4	3.2
1981-1985	b/	0.2	2.3	7.5	0.5	9.6	10.6
1986-1990	b/	b/	9.2	3.9	0.8	11.2	13.9
1989	b/	b/	7.1	2.4	1.6	7.5	11.1
1991	-	b/	1.9	2.8	-	-	4.6
1993	-	b/	0.3	2.1	0.8	-	3.2
1995	-	-	-	11.1	-	-	11.1
1997	-	-	-	1.7	b/	-	1.7
1999[c/]	-	-	-	1.5	0.1	-	1.6
North of Leadbetter Pt. - Total[d/]							
1976-1980	0.6	1.5	95.3	312.7	4.8	-	414.8
1981-1985	0.3	1.0	26.6	120.8	0.8	-	149.6
1986-1990	0.1	0.1	10.1	22.4	0.8	-	33.6
1989	0.2	0.2	7.1	38.7	1.6	-	47.8
1991	b/	b/	1.9	46.0	0.3	-	48.2
1993	b/	b/	0.4	4.8	0.8	-	6.1
1995	-	-	-	41.1	0.9	-	42.0
1997	b/	b/	-	1.7	b/	-	1.7
1999[c/]	-	b/	b/	b/	-	-	0.1
South of Leadbetter Pt. - Non-Indian							
1976-1980	b/	b/	3.0	4.0	1.1	-	8.2
1981-1985	b/	b/	0.8	2.3	b/	-	3.2
1986-1990	-	-	0.1	b/	b/	-	0.1
1989	-	-	-	b/	b/	-	b/
1991	-	-	-	0.2	-	-	0.2
1993	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-
1999[c/]	-	-	-	-	-	-	-
North of Cape Falcon - Non-Indian							
1976-1980	0.6	0.8	97.7	315.0	5.8	-	419.8
1981-1985	0.2	0.8	25.1	115.7	0.3	-	142.2
1986-1990	0.1	0.1	1.1	18.5	b/	-	19.8
1989	0.2	0.2	-	36.3	b/	-	36.7
1991	b/	b/	b/	43.4	0.3	-	43.7
1993	b/	b/	0.1	2.7	b/	-	2.9
1995	-	-	-	30.1	0.9	-	30.9
1997	b/	b/	-	-	-	-	b/
1999[c/]	-	b/	b/	b/	-	-	0.1

TABLE A-26. **U.S.-Canada border to Cape Falcon commercial troll** pink salmon **landings** in numbers of fish by catch area and month (odd-year averages).[a/] (Page 2 of 2)

Year or Average	May	June	July	Aug.	Sept.	Oct.	Season
			PINKS (thousands)				
North of Cape Falcon - Treaty Indian[d/]							
1976-1980	b/	0.8	0.6	1.8	b/	2.4	3.2
1981-1985	b/	0.2	2.3	7.5	0.5	9.6	10.6
1986-1990	b/	b/	9.2	3.9	0.8	11.2	13.9
1989	b/	b/	7.1	2.4	1.6	7.5	11.1
1991	-	b/	1.9	2.8	-	-	4.6
1993	-	b/	0.3	2.1	0.8	-	3.2
1995	-	-	-	11.1	-	-	11.1
1997	-	-	-	1.7	b/	-	1.7
1999[c/]	-	-	-	1.5	0.1	-	1.6
North of Cape Falcon - Total[d/]							
1976-1980	0.6	1.6	98.3	316.7	5.8	-	423.0
1981-1985	0.3	1.0	27.5	123.1	0.8	-	152.7
1986-1990	0.1	0.1	10.2	22.4	0.8	-	33.7
1989	0.2	0.2	7.1	38.7	1.7	-	47.8
1991	b/	b/	1.9	46.2	0.3	-	48.3
1993	b/	b/	0.4	4.8	0.8	-	6.1
1995	-	-	-	41.1	0.9	-	42.0
1997	b/	b/	-	1.7	b/	-	1.7
1999[c/]	-	b/	b/	1.5	0.1	-	1.6

a/ Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data are summarized by statistical month.
b/ Less than 50 fish.
c/ Preliminary.
d/ Season totals do not include Oct. treaty troll catches.

TABLE A-27. **U.S.-Canada border to Cape Falcon** ocean **recreational** fishing **effort** in salmon angler trips by area and month.[a/] (Page 1 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				ANGLER TRIPS (thousands)				
North of Leadbetter Pt.[b/]								
1976-1980	2.9	13.4	42.8	87.4	95.9	33.2	3.6	279.2
1981-1985	0.1	3.1	17.5	44.3	38.9	5.6	0.1	109.6
1986-1990	-	0.5	3.4	46.0	19.6	3.8	c/	73.3
1986	-	-	2.5	41.8	27.3	0.9	0.1	72.6
1987	-	-	2.7	43.1	18.6	0.8	c/	65.2
1988	-	c/	-	51.3	4.2	0.6	c/	56.1
1989	-	2.4	4.4	45.5	22.8	2.7	-	77.7
1990	-	-	7.2	48.2	25.2	14.2	-	94.9
1991	-	-	5.0	54.7	8.9	3.9	-	72.5
1992	0.3	1.0	-	34.9	21.2	9.7	0.7	67.9
1993	c/	1.1	0.0	30.5	27.3	14.2	-	73.2
1994	-	-	-	-	-	-	-	-
1995	-	-	-	4.9	18.0	5.8	-	28.6
1996	-	-	-	4.5	19.8	1.9	-	26.1
1997	-	-	-	11.9	9.9	1.2	-	23.0
1998	-	-	-	-	14.1	0.9	-	15.0
1999[d/]	-	-	-	8.9	14.6	6.4	0.2	30.1
South of Leadbetter Pt.								
1976-1980	0.4	5.5	29.4	59.4	87.7	27.0	1.9	211.3
1981-1985	-	0.9	8.7	35.1	30.2	4.9	0.1	80.0
1986-1990	-	0.1	2.2	28.6	27.3	0.7	-	58.9
1986	-	-	1.8	31.8	23.6	-	-	57.2
1987	-	-	1.6	26.1	25.8	-	-	53.4
1988	-	-	-	17.9	0.6	c/	-	18.5
1989	-	0.4	1.8	31.5	38.5	-	-	72.2
1990	-	-	5.8	35.9	48.1	3.5	-	93.4
1991	-	-	4.8	35.0	20.7	6.6	-	67.1
1992	-	-	-	35.4	6.3	4.2	-	45.9
1993	-	-	-	18.6	27.5	19.3	-	65.5
1994	-	-	-	-	-	-	-	-
1995	-	-	-	6.1	19.2	7.9	-	33.2
1996	-	-	-	5.1	11.6	4.5	-	21.2
1997	-	-	-	7.3	3.0	-	-	10.3
1998	-	-	-	-	6.1	0.7	-	6.8
1999[d/]	-	-	-	6.5	14.8	6.7	c/	28.1

TABLE A-27. **U.S.-Canada border to Cape Falcon** ocean **recreational** fishing **effort** in salmon angler trips by area and month.[a/] (Page 2 of 2)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				ANGLER TRIPS (thousands)				
North of Cape Falcon[b/]								
1976-1980	3.3	18.9	72.2	146.9	183.6	60.2	5.5	490.6
1981-1985	0.1	4.0	26.2	79.4	69.1	10.5	0.3	189.6
1986-1990	-	0.6	5.6	74.6	46.9	4.6	c/	132.2
1986	-	-	4.3	73.6	50.9	0.9	0.1	129.8
1987	-	-	4.3	69.2	44.4	0.8	c/	118.6
1988	-	c/	-	69.1	4.8	0.7	c/	74.6
1989	-	2.8	6.2	77.0	61.3	2.7	-	149.9
1990	-	-	13.0	84.2	73.3	17.7	-	188.2
1991	-	-	9.8	89.8	29.6	10.4	-	139.6
1992	0.3	1.0	-	70.3	27.6	13.8	0.7	113.8
1993	c/	1.1	0.0	49.1	54.9	33.6	-	138.7
1994	-	-	-	-	-	-	-	-
1995	-	-	-	11.0	37.2	13.7	-	61.9
1996	-	-	-	9.6	31.4	6.4	-	47.4
1997	-	-	-	19.2	12.9	1.2	-	33.3
1998	-	-	-	-	20.1	1.6	-	21.7
1999[d/]	-	-	-	15.4	29.4	13.2	0.2	58.2

a/ Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data are summarized by statistical month.
b/ Does not include the late-season Washington state-waters Area 4B fishery.
c/ Less than 50 days.
d/ Preliminary.

TABLE A-28. **U.S.-Canada border to Cape Falcon** ocean **recreational** chinook and coho salmon **landings** in numbers of fish by area and month.[a/] (Page 1 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				CHINOOK (thousands)								**COHO (thousands)**				
North of Leadbetter Pt.[b/]																
1976-1980	1.8	5.8	22.1	21.4	18.6	6.5	0.9	77.1	0.4	13.0	48.8	109.4	99.0	32.8	2.1	305.5
1981-1985	0.1	1.5	13.7	18.8	8.1	0.4	c/	42.6	c/	0.7	10.3	36.9	42.2	6.2	0.1	96.5
1986-1990	-	0.2	1.3	13.1	5.0	0.9	-	20.6	-	c/	2.0	58.1	28.8	5.3	c/	94.2
1986	-	0.2	1.3	13.1	5.0	0.9	-	20.6	-	-	3.7	61.3	41.0	0.9	0.1	107.1
1987	-	-	0.6	10.6	7.6	-	-	18.9	-	-	0.6	44.1	24.9	c/	c/	69.6
1988	-	-	3.1	23.1	6.3	c/	-	32.5	-	-	-	61.0	5.7	0.5	-	67.1
1989	-	c/	-	16.6	1.2	c/	-	17.8	-	c/	0.1	68.5	38.2	3.9	-	110.7
1990	-	0.8	1.6	5.9	4.4	1.2	-	14.0	-	-	5.4	55.8	34.2	21.3	-	116.7
1991	-	-	1.3	9.2	5.7	3.4	-	19.7	-	-	6.8	89.1	14.5	7.0	-	117.4
1992	-	-	1.9	6.6	1.3	0.2	-	9.9	-	c/	-	30.9	26.3	7.5	0.3	65.0
1993	c/	0.1	-	8.2	6.0	2.4	0.2	16.9	-	c/	c/	28.8	30.3	12.5	-	71.6
1994	c/	0.2	c/	2.5	4.1	3.4	-	10.2	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	3.2	27.1	8.7	-	39.0
1996	-	-	-	c/	0.2	c/	-	0.2	-	-	-	6.0	22.3	3.0	-	31.3
1997	-	-	-	c/	0.1	c/	-	0.1	-	-	-	7.0	8.2	0.4	-	15.6
1998[d/]	-	-	-	1.7	1.6	0.3	-	3.6	-	-	-	-	15.3	1.1	-	16.4
1999[d/]	-	-	-	-	1.5	0.2	-	1.8	-	-	-	6.2	11.5	2.8	0.1	20.5
South of Leadbetter Pt.																
1976-1980	0.2	2.8	12.4	11.6	23.8	3.8	0.2	54.6	0.2	6.5	53.3	89.9	86.9	31.0	2.0	269.8
1981-1985	-	0.1	3.5	7.0	6.2	0.6	c/	17.4	-	1.4	11.8	52.8	36.5	7.0	0.2	109.7
1986-1990	-	c/	0.3	2.8	4.5	c/	-	7.6	-	-	4.3	48.9	37.8	0.8	-	91.8
1986	-	-	0.1	2.2	1.9	-	-	4.3	-	-	3.8	60.0	42.9	-	-	106.8
1987	-	-	0.4	4.9	6.8	-	-	12.0	-	-	2.5	38.8	38.6	-	-	80.0
1988	-	-	-	1.6	0.1	c/	-	1.6	-	-	-	30.7	0.9	0.1	-	31.6
1989	-	0.1	0.6	0.9	5.2	-	-	6.9	-	-	4.9	59.5	52.2	-	-	116.6
1990	-	-	0.3	4.3	8.5	0.1	-	13.2	-	-	10.3	55.2	54.4	4.2	-	124.0
1991	-	-	0.3	1.5	1.5	0.1	-	3.3	-	-	7.9	62.2	33.6	10.9	-	114.6
1992	-	-	-	1.2	0.6	0.2	-	2.0	-	-	-	55.3	9.5	4.4	-	69.2
1993	-	-	-	1.0	1.8	0.7	-	3.5	-	-	-	22.3	31.4	13.6	-	67.3
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	0.1	0.3	c/	-	0.4	-	-	-	6.0	22.9	7.6	-	36.4
1996	-	-	-	c/	0.0	c/	-	0.1	-	-	-	7.2	13.9	3.8	-	24.8
1997	-	-	-	0.3	0.2	-	-	0.5	-	-	-	11.8	5.1	-	-	16.9
1998[d/]	-	-	-	-	0.4	0.1	-	0.4	-	-	-	-	6.0	0.5	-	6.5
1999[d/]	-	-	-	0.7	2.1	0.4	-	3.3	-	-	-	7.6	12.8	6.6	c/	27.1

TABLE A-28. **U.S.-Canada border to Cape Falcon** ocean **recreational** chinook and coho salmon **landings** in numbers of fish by area and month.[a/] (Page 2 of 2)

Year or Avg.	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				CHINOOK (thousands)								**COHO (thousands)**				
North of Cape Falcon																
1976-1980	1.9	8.7	34.5	33.0	42.3	10.3	1.1	131.8	0.6	19.5	102.2	199.3	185.9	63.8	4.1	575.4
1981-1985	0.1	1.7	17.2	25.7	14.3	1.1	c/	60.0	c/	2.1	22.1	89.7	78.7	13.2	0.3	206.2
1986-1990	-	0.2	1.6	15.9	9.5	1.0	-	28.2	-	c/	6.3	107.0	66.6	6.2	c/	186.0
1986	-	-	0.8	12.9	9.5	-	-	23.2	-	-	7.6	121.3	83.9	0.9	0.1	213.8
1987	-	-	3.5	28.0	13.1	c/	-	44.6	-	-	3.1	82.9	63.5	c/	c/	149.6
1988	-	c/	-	18.2	1.2	c/	-	19.4	-	-	-	91.6	6.6	0.6	-	98.8
1989	-	0.9	2.2	6.9	9.6	1.2	-	20.9	-	c/	5.0	128.0	90.4	3.9	-	227.3
1990	-	-	1.6	13.5	14.2	3.6	-	32.9	-	-	15.7	111.0	88.6	25.4	-	240.7
1991	-	-	2.2	8.1	2.8	0.3	-	13.3	-	-	14.7	151.3	48.2	17.9	-	232.0
1992	c/	0.1	-	9.3	6.6	2.6	0.2	18.9	-	c/	-	86.2	35.8	11.8	0.3	134.1
1993	c/	0.2	c/	3.4	5.9	4.1	c/	13.6	c/	c/	c/	51.1	61.7	26.2	-	139.0
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	0.1	0.4	0.1	-	0.6	-	-	-	9.2	50.0	16.3	-	75.4
1996	-	-	-	c/	0.1	c/	-	0.2	-	-	-	13.1	36.2	6.8	-	56.1
1997	-	-	-	2.0	1.8	0.3	-	4.1	-	-	-	18.8	13.3	0.4	-	32.5
1998	-	-	-	-	1.9	0.3	-	2.2	-	-	-	-	21.3	1.6	-	22.9
1999[d/]	-	-	-	3.4	5.7	1.7	c/	10.8	-	-	-	13.8	24.4	9.4	0.1	47.7

a/ Monthly totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data are summarized by statistical month.
b/ Does not include the late-season Washington state-waters Area 4B fishery.
c/ Less than 50 fish.
d/ Preliminary.

TABLE A-29. **U.S.-Canada border to Cape Falcon** ocean **recreational** pink salmon **landings** in numbers of fish by area and month (odd year averages).[a/] (Page 1 of 1)

Year or Average	Apr.	May	June	July	Aug.	Sept.	Oct.	Season
				PINKS (thousands)				
North of Leadbetter Pt.[b/]								
1976-1980	c/	0.2	1.3	8.8	12.0	0.4	c/	22.7
1981-1985	-	c/	0.1	1.3	4.2	0.2	c/	5.7
1986-1990	-	-	c/	1.2	0.4	-	-	1.6
1989	-	-	-	1.5	c/	-	-	1.5
1991	-	-	-	0.6	c/	c/	-	0.6
1993	-	-	-	0.7	0.7	c/	-	1.4
1995	-	-	-	c/	1.1	c/	-	1.2
1997	-	-	-	0.7	0.1	c/	-	0.9
1999[d/]	-	0.0	0.0	0.9	1.3	0.1	0.0	2.2
Leadbetter Pt. to Cape Falcon								
1976-1980	-	0.2	0.1	0.5	0.3	c/	-	1.1
1981-1985	-	c/	c/	0.1	0.2	-	-	0.2
1986-1990	-	-	-	0.1	c/	c/	-	0.1
1989	-	-	-	c/	c/	c/	-	c/
1991	-	-	-	0.1	c/	c/	-	0.1
1993	-	-	-	c/	c/	-	-	c/
1995	-	-	-	c/				c/
1997	-	-	-	-	-	-	-	-
1999[d/]	-	-	-	0.0	c/	0.0	-	c/
North of Cape Falcon								
1976-1980	c/	0.4	1.4	9.3	12.4	0.4	c/	23.8
1981-1985	-	c/	0.1	1.3	4.4	0.2	c/	6.0
1986-1990	-	-	c/	1.2	0.4	c/	-	1.7
1989	-	-	-	1.5	0.1	c/	-	1.6
1991	-	-	-	0.6	0.1	c/	-	0.7
1993	-	-	-	0.7	0.7	c/	-	1.4
1995	-	-	-	0.1	1.2	c/	-	1.2
1997	-	-	-	0.7	0.1	c/	-	0.9
1999[d/]	-	-	-	0.9	1.3	0.1	-	2.2

a/ Monthy totals for Oregon data are the sum of statistical weeks with closest fit to the calendar month. Washington data are summarized by statistical month.
b/ Does not include the late-season Washington state-waters Area 4B fishery.
c/ Less than 50 fish.
d/ Preliminary.

APPENDIX B
HISTORICAL RECORD OF ESCAPEMENTS TO INLAND FISHERIES AND SPAWNING AREAS

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF TABLES (continued)

TABLE B-1. **California** Central Valley **natural fall chinook** salmon **spawning escapements** in thousands of fish.[a/] (Page 1 of 1)

	Upper Sacramento River[a/]		Feather River		Yuba River		American River		Lower Sacramento Totals		Sacramento River Totals		San Joaquin River Totals		Central Valley Totals	
Year	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks
1970	64.0	21.0	45.0	13.0	12.0	2.0	26.0	3.0	83.0	18.0	147.0	39.0	30.0	8.0	177.0	47.0
1971	62.6	24.4	34.0	10.0	5.3	0.4	36.0	6.0	75.3	16.4	137.9	40.8	40.0	4.0	177.9	44.8
1972	35.0	20.0	27.0	16.0	4.0	5.0	13.0	4.0	44.0	25.0	79.0	45.0	12.0	2.0	91.0	47.0
1973	48.0	19.0	52.0	13.0	22.0	2.0	77.0	5.0	151.0	20.0	199.0	39.0	6.5	0.7	205.5	39.7
1974	66.0	16.0	54.0	7.0	16.0	1.0	52.0	2.0	122.0	10.0	188.0	26.0	3.7	0.7	191.7	26.7
1975	71.0	25.0	35.0	3.0	5.0	1.0	29.0	3.0	69.0	7.0	140.0	32.0	5.8	0.9	145.8	32.9
1976	79.0	14.0	50.0	6.0	3.3	0.5	22.0	1.0	75.3	7.5	154.3	21.5	3.5	0.5	157.8	22.0
1977	46.8	28.4	36.0	2.0	7.0	2.0	40.0	2.0	83.0	6.0	129.8	34.4	0.6	0.1	130.4	34.5
1978	76.0	10.0	29.0	4.0	6.0	1.0	12.0	1.0	47.0	6.0	123.0	16.0	2.3	0.3	125.3	16.3
1979	77.0	44.0	25.0	3.0	10.0	2.0	36.0	1.0	71.0	6.0	148.0	50.0	4.0	0.5	152.0	50.5
1980	53.0	5.0	30.0	2.0	10.0	2.0	32.0	2.0	72.0	6.0	125.0	11.0	5.0	1.0	130.0	12.0
1981	51.0	35.0	41.0	4.0	12.0	2.0	38.0	5.0	91.0	11.0	142.0	46.0	15.9	8.9	157.9	54.9
1982	37.0	17.0	41.0	7.0	23.5	15.9	29.0	4.0	93.5	26.9	130.5	43.9	14.0	3.0	144.5	46.9
1983	40.6	24.7	19.1	4.5	11.4	2.4	19.0	7.4	49.5	14.3	90.1	39.0	11.1	32.2	101.2	71.2
1984	48.7	27.5	36.2	6.5	7.1	2.6	25.2	2.2	68.5	11.3	117.2	38.8	40.8	16.1	158.0	54.9
1985	107.7	25.3	46.5	3.7	10.1	2.9	44.7	11.4	101.3	18.0	209.0	43.3	72.6	3.5	281.6	46.8
1986	109.5	12.5	41.0	6.4	17.0	2.4	44.9	4.4	102.9	13.2	212.4	25.7	23.2	2.8	235.6	28.5
1987	73.4	41.4	43.6	11.6	15.2	3.5	18.2	3.0	77.0	18.1	150.4	59.5	15.8	9.1	166.2	68.6
1988	125.2	20.0	51.0	3.0	6.7	1.8	14.1	1.8	71.8	6.6	197.0	26.6	20.7	1.2	217.7	27.8
1989	65.9	16.8	31.5	3.5	8.3	1.6	14.7	2.4	54.5	7.5	120.4	24.3	3.2	0.1	123.6	24.4
1990	50.8	6.2	25.0	3.0	3.5	0.5	5.6	1.1	34.1	4.6	84.9	10.8	0.9	0.1	85.8	10.9
1991	33.6	4.7	25.2	2.5	11.4	2.7	16.5	1.7	53.1	6.9	86.7	11.6	0.6	0.2	87.3	11.8
1992	33.0	7.3	19.8	4.3	4.5	1.4	4.9	2.1	29.2	7.8	62.2	15.1	1.1	0.9	63.3	16.0
1993	54.4	6.9	24.3	3.1	5.5	0.8	19.1	3.4	48.9	7.3	103.3	14.2	2.3	0.9	105.6	15.1
1994	50.4	14.5	29.6	6.7	7.0	3.9	25.5	2.2	62.1	12.8	112.5	27.3	5.3	1.6	117.8	28.9
1995	92.8	6.6	56.2	3.4	12.2	1.1	65.0	3.0	133.4	7.5	226.2	14.1	1.5	1.1	227.7	15.2
1996	83.8[b/]	10.4b	46.3	10.2	18.4	4.6	63.0	4.0	127.7	18.8	211.5	29.2	8.4	7.7	219.9	36.9
1997	154.8	20.3	38.2	17.2	19.0	6.8	47.3	4.7	104.5	28.7	259.3	49.0	19.8	0.9	279.1	49.9
1998	60.1	5.3	39.6	3.4	25.7	5.1	43.0	14.3	108.2	22.9	168.3	28.2	12.6[d/]	6.0[d/]	180.9	34.1
1999[c/]	148.3	4.5	31.2	4.7	17.9	5.2	34.9	12.9	83.9	22.8	232.3	27.3	18.9[d/]	0.7[d/]	251.2	28.0

a/ Upper Sacramento River jack estimates based on Red Bluff Diversion Dam samples. All other estimates generally are based on carcass surveys. Upper river estimates also include Tehama Colusa Spawning Channel for 1971 to 1980. Adult and jack numbers generally are based on a 24-inch fork length cut-off (unpublished CDFG data).

b/ Total includes Butte Creek, for which a fall spawner survey was conducted in 1996 and 1998.

c/ Preliminary.

d/ Total jacks are for Mokelumne River only; estimates for adults include jacks from Stanislaus, Tuolumne, and Merced Rivers.

TABLE B-2. **California** Central Valley **hatchery fall chinook** salmon **spawning escapements** in thousands of fish.[a/] (Page 1 of 1)

	Coleman[b/]		Feather River		Nimbus		Sacramento Hatchery Totals		Mokelumne River		Merced River		San Joaquin Hatchery Totals		Central Valley Hatchery Totals	
Year	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks
1970	3.0	0.5	2.4	0.9	7.8	0.8	13.2	2.2	0.3	0.2	0.0	0.0	0.3	0.2	13.5	2.4
1971	1.5	0.5	2.3	1.2	7.9	1.3	11.7	3.0	0.8	0.1	0.2	0.0	1.0	0.1	12.7	3.1
1972	1.6	1.2	1.4	2.2	5.4	1.7	8.4	5.1	0.1	0.3	0.1	0.0	0.2	0.3	8.6	5.4
1973	3.0	0.8	7.2	1.3	10.8	1.7	21.0	3.8	0.3	0.1	0.3	0.1	0.6	0.2	21.6	4.0
1974	1.3	0.3	4.3	1.1	7.3	0.7	12.9	2.1	0.1	0.1	0.9	0.1	1.0	0.2	13.9	2.3
1975	1.8	0.6	4.2	1.1	6.6	0.8	12.6	2.5	0.2	0.2	0.6	0.0	0.8	0.2	13.4	2.7
1976	1.8	0.5	4.3	0.9	4.3	0.9	10.4	2.3	0.0	0.0	0.6	0.0	0.6	0.0	11.0	2.3
1977	4.7	0.5	6.8	2.0	6.4	0.5	17.9	3.0	0.0	0.0	0.4	0.0	0.4	0.0	18.3	3.0
1978	1.1	0.8	3.9	0.9	6.1	2.1	11.1	3.8	0.5	0.0	0.0	0.0	0.5	0.0	11.6	3.8
1979	4.7	3.9	3.6	0.6	7.0	3.2	15.3	7.7	0.5	0.1	0.1	0.1	0.6	0.2	15.9	7.9
1980	8.8	0.7	3.0	0.7	13.5	2.0	25.3	3.4	0.4	0.2	0.2	0.0	0.6	0.2	25.9	3.6
1981	5.7	7.5	7.3	1.0	17.8	2.8	30.8	11.3	0.0	0.0	0.6	0.3	0.6	0.3	31.4	11.6
1982	16.2	3.3	6.4	1.2	8.1	2.8	30.7	7.3	1.8	0.9	0.2	0.0	2.0	0.9	32.7	8.2
1983	5.4	3.4	6.1	1.6	6.4	2.5	17.9	7.5	1.7	2.9	0.2	1.6	1.9	4.5	19.8	12.0
1984	18.7	2.9	8.9	0.4	10.2	2.0	37.8	5.3	0.0	0.0	1.7	0.2	1.7	0.2	39.5	5.5
1985	13.1	3.2	5.6	0.2	7.3	1.8	26.0	5.2	0.2	0.0	1.1	0.1	1.3	0.1	27.3	5.3
1986	11.3	1.2	5.7	2.8	5.6	0.1	22.6	4.1	0.3	0.2	0.5	0.2	0.8	0.4	23.4	4.5
1987	11.3	7.1	6.5	3.6	3.4	2.9	21.2	13.6	0.1	0.5	0.5	0.4	0.6	0.9	21.8	14.5
1988	12.5	1.1	6.2	0.3	8.0	0.7	26.7	2.1	0.1	0.0	0.4	0.0	0.5	0.0	27.2	2.1
1989	10.2	1.8	6.5	1.1	9.2	0.5	25.9	3.4	0.0	0.0	0.1	0.0	0.1	0.0	26.0	3.4
1990	13.5	1.2	4.3	1.9	4.6	0.3	22.4	3.4	0.0	0.0	0.1	0.0	0.1	0.0	22.5	3.4
1991	10.0	0.7	7.9	1.4	6.8	0.4	24.7	2.5	0.0	0.0	0.3	0.1	0.3	0.1	25.0	2.6
1992	6.2	1.0	10.3	6.1	5.1	1.3	21.6	8.4	0.3	0.4	0.1	0.3	0.4	0.7	22.0	9.1
1993	7.1	0.6	9.8	1.6	7.3	3.3	24.2	5.5	1.5	0.6	0.2	0.2	1.7	0.8	25.9	6.3
1994	11.5	7.4	10.1	5.0	7.6	3.3	29.2	15.7	1.2	0.8	0.6	0.3	1.8	1.1	31.0	16.8
1995	24.8	1.9	11.6	0.6	5.2	1.3	41.6	3.8	2.4	0.9	0.3	0.3	2.7	1.2	44.3	5.0
1996	18.8	2.4	6.5	1.6	7.6	0.5	32.9	4.4	1.8	2.1	0.7	0.4	2.5	2.5	35.4	6.9
1997	45.4	6.1	13.4	1.7	5.8	0.3	64.6	8.1	6.3	0.2	0.8	0.1	7.1	0.3	71.7	8.4
1998	42.4	1.9	16.8	1.0	9.9	1.8	69.2	4.8	2.5	0.6	0.4	0.4	2.9	1.0	72.1	5.7
1999[c/]	23.7	3.2	11.1	1.3	6.2	3.6	41.0	8.1	1.6	1.5	0.6	1.0	2.3	2.5	43.3	10.6
GOALS	9.0	7.5	5.0	-	6.0	-	20.0	-	5.0	-	1.0	-	6.0	-	26.0	-

a/ Counts of less than 50 fish are shown as 0.
b/ Fall spawning fish. Some spring run are included.
c/ Preliminary.

TABLE B-3. **Sacramento River late-fall, winter and spring chinook** salmon **spawning escapement** estimates in thousands of fish. (Page 1 of 1)

	Upper Sacramento River[a/]									Grand Totals	
	Late Fall[b/]		Winter[b/]		Spring						
					Tributary[c/]	Sacramento River[d/]		Feather River[d/e/]			
Year or Average	Adults	Jacks	Adults	Jacks	Adults and Jacks[f/]	Adults	Jacks	Adults	Jacks	Adults	Jacks
1971-1975	17.7	1.5	22.9	9.0	5.2	5.3	1.8	0.4	0.0	51.5	12.3
1976-1980	10.4	0.8	13.5	2.6	1.2	8.8	2.8	0.4	0.0	34.3	6.2
1981-1985	7.6	2.0	5.0	1.0	0.9	9.3	4.1	1.4	0.2	24.2	7.3
1986-1990	10.3	1.5	1.2	0.3	1.6	7.7	1.7	3.0	0.3	23.8	3.8
1981	6.3	0.7	18.3	1.7	0.3	12.8	8.2	0.8	0.2	38.5	10.8
1982	4.1	0.8	1.0	0.3	2.7	19.5	4.0	1.8	0.2	29.1	5.3
1983	12.9	2.3	1.4	0.4	0.6	3.3	0.6	1.6	0.1	19.8	3.4
1984	6.5	3.9	0.8	1.9	0.2	3.9	4.2	1.3	0.3	12.7	10.3
1985	8.0	2.2	3.6	0.3	0.7	7.2	3.5	1.6	0.0	21.1	6.0
1986	6.6	0.4	2.0	0.5	2.2	15.4	1.3	1.2	0.2	27.4	2.4
1987	12.6	3.1	1.8	0.2	0.3	7.2	4.0	0.9	0.3	22.8	7.6
1988	15.7	0.9	1.4	0.7	2.2	8.0	1.8	7.2	0.3	34.5	3.7
1989	10.1	1.3	0.5	0.1	1.9	4.6	0.6	4.4	0.7	21.5	2.7
1990	6.6	1.8	0.4	0.0	1.4	3.3	0.6	1.4	0.2	13.1	2.6
1991	7.4	1.2	0.1	0.1	0.9	0.6	0.2	3.3	0.2	12.3	1.7
1992	9.4	1.0	1.1	0.1	1.2	0.4	0.1	1.3	0.2	13.4	1.4
1993	5.0	1.0	0.3	0.1	1.0	0.3	0.1	3.9	3.9	10.5	5.1
1994	5.0	1.0	0.2	0.0	1.7	0.4	0.3	2.8	0.9	10.1	2.2
1995	0.6[g/]	0.1[g/]	1.3	0.1	9.3	0.3	0.0	5.0	0.4	16.5	0.6
1996	1.0[g/]	0.4[g/]	0.6	0.3	2.3	0.2	0.1	5.3	0.7	9.4	1.5
1997	0.4[g/]	0.5[g/]	0.5	0.4	1.4	0.0	0.1	3.0	0.7	5.3	1.7
1998	11.2[h/]	1.6[h/]	1.8	0.8	23.6	0.3	0.2	6.8	0.8	44.7	3.4
1999[i/]	7.5h/	1.2h/	0.9	2.3	6.0	0.2	0.2	3.5	0.2	18.1	3.9

a/ Estimated number of jacks and adults based on sampling at Red Bluff Diversion Dam (unpublished CDFG data). Beginning in 1987 for late-fall and winter and 1994 for fall, estimates have been based on historical run patterns and partial counts at Red Bluff Diversion Dam due to the raising of the dam gates during the last part of fall and late-fall runs and first part of the winter run.

b/ Variable numbers of late-fall and winter run are trapped at Keswick Dam and spawned at Coleman or Livingston Stone Hatcheries.

c/ Natural spawning spring run which are isolated from fall run. Primarily Mill, Deer and Butte Creeks.

d/ Includes fish having characteristics of fall run hybrids. Spawning is not isolated from fall run.

e/ Primarily fish spawned at Feather River Hatchery

f/ No data available for age composition of tributary spring run.

g/ Primarily number of fish spawned at Coleman hatchery. No data are available for natural spawners as gates were raised during time period coinciding with late-fall run.

h/ Data from carcass counts of natural spawners and fish spawned at Coleman hatchery.

i/ Preliminary.

TABLE B-4. Summary of **Klamath River fall chinook** salmon estimates in thousands of adults and jacks. (Page 1 of 2)

Year	Category	Total Inriver Run	Inriver Harvest			Nonlanded Fishery Mortality	Spawning Escapement								
							Klamath River			Trinity River			Total		
			Indian	Sport	Total		Hatchery	Natural	Total	Hatchery	Natural	Total	Hatchery	Natural	Total
1978	Adults	92.8	18.2	1.7	19.9	1.5	6.9	27.4	34.4	6.0	31.1	37.1	13.0	58.5	71.5
	Jacks	22.7	1.8	2.1	3.9	0.2	0.9	11.7	12.7	1.3	4.7	6.0	2.2	16.4	18.7
1979	Adults	51.2	13.7	2.1	15.8	1.1	2.3	22.6	24.9	1.3	8.0	9.4	3.6	30.6	34.3
	Jacks	11.7	1.4	2.2	3.5	0.2	0.3	2.8	3.1	1.0	3.9	4.9	1.2	6.8	8.0
1980	Adults	45.6	12.0	4.5	16.5	1.1	2.4	13.8	16.2	4.1	7.7	11.8	6.5	21.5	28.0
	Jacks	36.8	1.0	5.9	6.9	0.2	0.5	10.1	10.6	2.3	16.8	19.1	2.7	27.0	29.7
1981	Adults	80.1	33.0	6.0	39.0	2.8	2.1	18.5	20.6	2.4	15.3	17.7	4.4	33.9	38.3
	Jacks	28.1	2.5	7.3	9.7	0.3	0.5	10.6	11.1	1.0	5.9	6.9	1.5	16.5	18.1
1982	Adults	66.5	14.5	8.3	22.8	1.3	8.4	22.7	31.0	2.1	9.3	11.3	10.4	32.0	42.4
	Jacks	39.4	1.8	12.5	14.3	0.4	1.8	10.5	12.3	4.2	8.1	12.4	6.1	18.6	24.7
1983	Adults	57.5	7.9	4.2	12.1	0.7	8.4	13.5	21.9	5.5	17.3	22.8	13.9	30.8	44.6
	Jacks	3.8	0.2	0.4	0.5	0.0	0.5	1.7	2.2	0.3	0.9	1.1	0.8	2.5	3.3
1984	Adults	47.1	18.7	3.3	22.0	1.6	5.3	10.4	15.7	2.2	5.7	7.8	7.5	16.1	23.6
	Jacks	8.3	0.5	1.0	1.4	0.1	0.8	1.9	2.6	0.8	3.4	4.2	1.5	5.3	6.8
1985	Adults	64.4	11.6	3.6	15.1	1.0	20.0	16.5	36.4	2.6	9.2	11.8	22.5	25.7	48.2
	Jacks	69.4	1.6	11.2	12.8	0.3	2.2	6.5	8.7	18.2	29.5	47.6	20.3	36.0	56.3
1986	Adults	194.8	25.1	21.0	46.2	2.4	17.1	20.8	37.9	15.8	92.5	108.3	32.9	113.4	146.3
	Jacks	44.5	0.9	9.4	10.3	0.3	1.5	8.5	9.9	3.6	20.5	24.1	5.1	28.9	34.0
1987	Adults	208.8	53.1	20.2	73.3	4.7	15.2	29.8	45.0	13.9	71.9	85.9	29.1	101.7	130.8
	Jacks	19.0	0.4	5.4	5.9	0.1	1.8	2.8	4.6	2.5	5.9	8.4	4.3	8.8	13.1
1988	Adults	191.3	51.7	22.2	73.9	4.6	16.1	34.8	50.9	17.4	44.6	62.0	33.5	79.4	112.8
	Jacks	24.0	0.6	5.4	6.0	0.2	0.6	1.9	2.5	4.8	10.6	15.4	5.4	12.5	17.9
1989	Adults	124.0	45.6	8.8	54.3	3.8	10.9	14.4	25.3	11.1	29.4	40.6	22.0	43.9	65.9
	Jacks	9.1	0.2	2.3	2.5	0.1	0.8	3.0	3.8	0.2	2.5	2.8	1.1	5.5	6.6
1990	Adults	35.8	7.9	3.6	11.5	0.7	6.7	7.9	14.6	1.3	7.7	9.0	8.1	15.6	23.6
	Jacks	4.4	0.2	2.1	2.3	0.1	0.3	1.1	1.4	0.4	0.2	0.6	0.7	1.4	2.0
1991	Adults	32.6	10.2	3.4	13.6	0.9	4.0	6.8	10.8	2.5	4.9	7.3	6.5	11.6	18.1
	Jacks	1.8	0.1	0.7	0.7	0.0	0.1	0.3	0.4	0.2	0.4	0.6	0.3	0.7	1.0
1992	Adults	26.7	5.8	1.0	6.8	0.5	3.6	4.9	8.5	3.8	7.1	10.9	7.4	12.0	19.4
	Jacks	13.7	0.4	4.1	4.5	0.1	3.7	2.6	6.3	0.2	2.6	2.8	3.9	5.1	9.1
1993	Adults	57.1	9.6	3.2	12.8	0.8	20.8	16.0	36.8	0.8	5.9	6.7	21.6	21.9	43.5
	Jacks	7.6	0.2	1.9	2.1	0.1	0.9	1.4	2.2	0.7	2.5	3.2	1.6	3.8	5.4
1994	Adults	61.6	11.7	1.8	13.5	1.0	11.5	21.4	32.9	3.3	10.9	14.2	14.7	32.3	47.1
	Jacks	14.4	0.3	2.6	2.8	0.1	0.8	3.7	4.5	4.4	2.5	6.9	5.2	6.2	11.4

TABLE B-4. Summary of **Klamath River fall chinook** salmon estimates in thousands of adults and jacks. (Page 2 of 2)

Year	Category	Total Inriver Run	Inriver Harvest			Nonlanded Fishery Mortality	Spawning Escapement								
							Klamath River			Trinity River			Total		
			Indian	Sport	Total		Hatchery	Natural	Total	Hatchery	Natural	Total	Hatchery	Natural	Total
1995	Adults	213.7	15.6	6.1	21.7	1.4	13.7	67.9	87.7	15.2	77.9	97.6	28.9	161.7	190.7
	Jacks	22.8	0.6	4.4	5.0	0.1	0.3	8.5	8.8	0.1	9.3	13.1	0.3	17.7	17.7
1996	Adults	175.4	56.5	12.8	69.2	4.8	13.6	38.7	52.3	6.4	42.6	49.1	20.0	81.0	101.0
	Jacks	9.5	0.2	2.3	2.5	0.1	0.5	1.7	2.2	0.2	4.5	4.7	0.8	8.1	8.9
1997	Adults	83.7	12.1	5.7	17.8	1.0	13.3	34.6	47.9	5.4	11.5	16.9	18.7	46.1	64.8
	Jacks	7.9	0.1	2.4	2.4	0.1	0.5	1.4	1.8	0.8	2.8	3.7	1.3	4.2	5.5
1998	Adults	90.5	10.2	7.7	17.9	1.0	14.9	18.0	33.0	14.3	24.5	38.8	29.2	42.5	71.7
	Jacks	4.6	0.1	1.1	1.2	0.0	0.4	0.9	1.3	0.2	2.0	2.2	0.6	2.9	3.5
1999[a/]	Adults	50.9	14.4	2.3	16.7	1.2	9.3	11.6	20.9	5.1	7.1	12.1	14.4	18.4	33.0
	Jacks	19.1	0.5	1.2	1.8	0.1	4.8	5.8	10.6	2.0	4.7	6.7	6.8	10.5	17.3

a/ Preliminary.

TABLE B-5. Estimates of Yurok and Hoopa Valley reservation **Indian gillnet** harvest.[a/] (Page 1 of 3)

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
1977	Total	b/	b/	b/	2,700	27,300	30,000
1978	Total	b/	b/	b/	1,800	18,200	20,000
1979	Total	b/	b/	b/	1,350	13,650	15,000
1980	Total	20	980	1,000	987	12,013	13,000
1981	Estuary	21	1,320	1,341	912	23,097	24,009
	Resighinni	0	16	16	338	4,293	4,631
	Upper Klamath	19	381	400	766	4,112	4,878
	Trinity River	17	1,090	1,107	449	1,531	1,980
	Total	57	2,807	2,864	2,465	33,033	35,498
1982	Estuary	3	172	175	290	4,547	4,837
	Resighinni	11	789	800	368	3,551	3,919
	Upper Klamath	21	1,479	1,500	827	4,873	5,700
	Trinity River	10	715	725	314	1,511	1,825
	Total	45	3,155	3,200	1,799	14,482	16,281
1983	Estuary	1	59	60	12	800	812
	Middle Klamath	3	322	325	32	2,626	2,658
	Upper Klamath	1	129	130	89	3,074	3,163
	Trinity River	5	75	80	30	1,390	1,420
	Total	10	585	595	163	7,890	8,053
1984	Estuary	2	53	55	132	11,878	12,010
	Middle Klamath	8	147	155	81	2,807	2,888
	Upper Klamath	2	47	49	102	2,815	2,917
	Trinity River	0	380	380	140	1,170	1,310
	Total	12	627	639	455	18,670	19,125
1985[c/]	Estuary	29	580	609	132	5,700	5,832
	Middle Klamath	6	184	190	283	1,731	2,014
	Upper Klamath	10	310	320	193	2,194	2,387
	Trinity River	115	1,000	1,115	947	1,941	2,888
	Total	160	2,074	2,234	1,555	11,566	13,121
1986[c/]	Estuary	1	40	41	191	15,286	15,477
	Middle Klamath	3	164	167	176	2,501	2,677
	Upper Klamath	10	488	498	201	1,532	1,733
	Trinity River	81	2,022	2,103	586	4,808	5,394
	Total	95	2,714	2,809	1,154	24,127	25,281
1987	Commercial Estuary	0	0	0	0	29,040	29,040
	Subsistence: Estuary	23	786	809	36	10,938	10,974
	Middle Klamath	5	171	176	30	5,079	5,109
	Upper Klamath	20	689	709	87	3,057	3,144
	Trinity River	122	4,146	4,268	262	4,982	5,244
	Total	176	5,792	5,962	415	53,096	53,511
1988	Commercial Estuary	0	0	0	0	25,782	25,782
	Subsistence: Estuary	8	1,669	1,677	138	11,132	11,270
	Middle Klamath	0	710	710	36	6,252	6,288
	Upper Klamath	0	539	539	137	3,415	3,552
	Trinity River	84	2,727	2,811	267	5,070	5,337
	Total	92	5,645	5,737	578	51,651	52,229
1989	Commercial Estuary	0	206	206	0	27,504	27,504
	Subsistence: Estuary	0	644	644	0	9,626	9,626
	Middle Klamath	0	2,008	2,008	65	3,108	3,173
	Upper Klamath	0	1,887	1,887	55	1,853	1,908
	Trinity River	20	1,978	1,998	71	3,474	3,545
	Total	20	6,723	6,743	191	45,565	45,756

TABLE B-5. Estimates of Yurok and Hoopa Valley reservation **Indian gillnet** harvest.[a/] (Page 2 of 3)

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
1990	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	388	388	13	3,536	3,549
	Middle Klamath	0	521	521	36	1,116	1,152
	Upper Klamath	0	504	504	102	2,331	2,433
	Trinity River	24	865	889	36	811	847
	Total	24	2,278	2,302	187	7,794	7,981
1991	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	70	70	7	3,902	3,909
	Middle Klamath	0	46	46	9	1,765	1,774
	Upper Klamath	3	167	170	16	3,251	3,267
	Trinity River	0	263	263	30	1,310	1,340
	Total	3	546	549	62	10,228	10,290
1992	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	15	15	124	1,152	1,276
	Middle Klamath	0	97	97	52	1,107	1,159
	Upper Klamath	0	284	284	148	2,580	2,728
	Trinity River	0	346	346	42	946	988
	Total	0	742	742	366	5,785	6,151
1993	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	19	19	62	3,017	3,079
	Middle Klamath	0	320	320	33	1,632	1,665
	Upper Klamath	0	211	211	47	3,495	3,542
	Trinity River	0	228	228	33	1,492	1,525
	Total	0	778	778	175	9,636	9,811
1994	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	9	152	161	80	4,341	4,421
	Middle Klamath	14	110	124	4	1,448	1,452
	Upper Klamath	3	239	242	71	3,658	3,729
	Trinity River	0	255	255	94	2,266	2,360
	Total	26	756	782	249	11,713	11,962
1995	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	656	656	117	5,200	5,317
	Middle Klamath	0	1,312	1,312	44	2,415	2,459
	Upper Klamath	0	624	624	47	4,610	4,657
	Trinity River	93	1,175	1,268	268	3,383	3,651
	Total	93	3,767	3,860	476	15,608	16,084
1996	Commercial Estuary	16	3,113	3,129	127	40,020	40,147
	Subsistence: Estuary	1	1,851	1,852	36	9,093	9,129
	Middle Klamath	9	673	682	7	1,570	1,577
	Upper Klamath	3	268	271	12	3,023	3,035
	Trinity River	6	1,182	1,188	8	2,770	2,778
	Total	35	7,087	7,122	190	56,476	56,666
1997	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	0	2,919	2,919	21	5,574	5,595
	Middle Klamath	0	1,102	1,102	3	1,479	1,482
	Upper Klamath	0	1,419	1,419	5	3,796	3,801
	Trinity River	1	1,250	1,251	6	1,238	1,244
	Total	1	6,690	6,691	35	12,087	12,122
1998	Commercial Estuary	-	-	-	-	-	-
	Subsistence: Estuary	2	621	623	16	3,454	3,470
	Middle Klamath	0	937	937	9	1,324	1,333
	Upper Klamath	0	780	780	23	3,874	3,897
	Trinity River	45	426	471	5	1,535	1,540
	Total	47	2,764	2,811	53	10,187	10,240

TABLE B-5. Estimates of Yurok and Hoopa Valley reservation **Indian gillnet** harvest.[a/] (Page 3 of 3)

Year	Area	Chinook Salmon (numbers of fish)					
		Spring Run			Fall Run		
		Jack	Adult	Total	Jack	Adult	Total
1999[d/]	Commercial Estuary	-	-	-	-	2,077	2,077
	Subsistence: Estuary	2	456	458	127	2,315	2,442
	Middle Klamath	0	1,343	1,343	49	2,261	2,310
	Upper Klamath	0	593	593	237	4,784	5,021
	Trinity River	13	776	789	126	3,002	3,128
	Total	15	3,168	3,183	539	14,439	14,978

a/ USFWS estimates for 1977-1982 and for Klamath River portion in 1983-1993. The Fisheries Department of the Hoopa Valley Business Council has monitored the Trinity River fishery since 1982. The Yurok Tribe Fisheries Program monitored the Klamath River portion in 1994 and 1995.
b/ No estimate.
c/ Does not include fall chinook harvested under special ceremonial permit.
d/ Preliminary.

TABLE B-6. **Shasta River fall chinook** salmon **weir counts** or **spawning escapement** estimates.[a/] (Page 1 of 1)

Year	Adults	Jacks	Total	Year	Adults	Jacks	Total
1930	7,280	12,082	19,362	1965	7,136	775	7,911
1931	61,811	20,037	81,848	1966	5,573	451	6,024
1932	30,534	5,058	35,592	1967	10,478	1,836	12,314
1933[b/]	4,700	6,886	11,586	1968	13,039	1,003	14,042
1934	26,614	21,807	48,421	1969	10,576	3,049	13,625
1935	63,711	9,660	73,371	1970	12,693	712	13,405
1936	33,264	14,669	47,933	1971	4,970	1,649	6,619
1937	32,027	1,229	33,256	1972	2,802	839	3,641
1938	6,497	1,118	7,615	1973	4,516	4,902	9,418
1939	8,313	19,670	27,983	1974	7,376	2,729	10,105
1940	50,725	4,431	55,156	1975	11,821	4,211	16,032
1941	7,372	5,860	13,232	1976[c/]	4,154	1,919	6,073
1942	9,342	1,834	11,176	1977	5,478	1,969	7,447
1943	8,048	1,974	10,022	1978	12,024	6,707	18,731
1944	8,604	2,686	11,290	1979	7,111	1,040	8,151
1945	14,905	3,291	18,196	1980	3,762	4,334	8,096
1946	6,949	641	7,590	1981	7,890[d/]	4,330	12,220
1947	298	43	341	1982	6,533	1,922	8,455
1948	31	6	37	1983	3,119	753	3,872
1949	171	21	192	1984	2,362	480	2,842
1950	-- Incomplete Count --			1985	2,897	2,227	5,124
1951	1,565	459	2,024	1986	3,274	683	3,957
1952	1,488	178	1,666	1987	4,299	398	4,697
1953	1,444	161	1,605	1988[e/]	2,586	256	2,842
1954	1,768	857	2,625	1989	1,440	137	1,577
1955	1,620	197	1,817	1990	415	118	533
1956	-- No Count --			1991	716	10	726
1957	1,781	453	2,234	1992	520	66	586
1958	4,694	1,379	6,073	1993	1,341	85	1,426
1959	8,619	1,256	9,875	1994	3,363	1,840	5,203
1960	9,489	1,209	10,698	1995	12,816	695	13,511
1961	5,250	3,514	8,764	1996	1,404	46	1,450
1962	9,907	4,991	14,898	1997	1,677	334	2,011
1963	22,825	9,012	31,837	1998	2,466	76	2,542
1964	30,715	3,648	34,363	1999[f/]	1,292	1,895	3,187

a/ From 1930-1937, 1957-1987 and 1991-1995, the counts were made near the river mouth. From 1938-1955, they were made 6.5 miles upstream from the mouth; considerable spawning occurred downstream from the racks in these years. From 1988-1990, escapements were estimated from mark-recapture data (spawning surveys).

b/ Commercial fishing in lower Klamath River closed by the state after this season.

c/ Gillnetting resumed in lower 20 miles of Klamath River by Hoopa Valley Indian Reservation fishers.

d/ Includes 276 females taken to Iron Gate Hatchery.

e/ Low water conditions appeared to hinder entry into the river this year.

f/ Preliminary.

TABLE B-7. Summary of **California north coast** salmon **spawning** stock surveys. (Page 1 of 1)

Year	Canon Creek, Mad River[a/b/]			Sprowl Creek, Eel River[a/c/]			Tomki Creek, Eel River[d/]
	Number of Surveys	Chinook	Coho	Number of Surveys	Chinook	Coho	Chinook
1963-1964	12	70	55	-	-	-	-
1964-1965	NA	45	0	-	-	-	1,747
1965-1966	-	-	-	-	-	-	-
1966-1967	NA	334	3	3	1,189	6	-
1967-1968	-	-	-	-	-	-	-
1968-1969	-	-	-	-	-	-	-
1969-1970	-	-	-	-	-	-	-
1970-1971	NA	230	0	-	-	-	-
1971-1972	-	-	-	-	-	-	-
1972-1973	-	-	-	-	-	-	-
1973-1974	-	-	-	-	-	-	-
1974-1975	-	-	-	1	247	0	-
1975-1976	-	-	-	1	339	2	367
1976-1977	-	-	-	-	-	-	-
1977-1978	-	-	-	-	-	-	-
1978-1979	-	-	-	2	534	23	-
1979-1980	-	-	-	2	572	0	2,410
1980-1981	-	-	-	1	164	4	317
1981-1982	3	23	0	2	121	0	565
1982-1983	3	68	0	6	169	1	1,741
1983-1984	2	137	0	2	82	0	-
1984-1985[e/]	1	16	0	6	67	13	1,292
1985-1986	10	514	14	6	320	0	3,558
1986-1987[e/]	4	90	3	5	307	13	2,173
1987-1988	4	117	29	3	2,187	4	3,666
1988-1989	2	69	7	3	339	12	556
1989-1990[e/]	4	9	9	5	89	14	0
1990-1991	1	1	3	2	0	0	0
1991-1992	2	8	0	2	135	0	3
1992-1993	2	55	1	2	63	1	15
1993-1994	4	20	0	4	198	53	5
1994-1995	2	32	2	7	128	4	22
1995-1996	4	87	3	3	272	9	69
1996-1997	1	60	0	3	153	7	90
1997-1998	2	53	1	4	206	12	44
1998-1999	2	72	0	4	117	21	65
1999-2000[f/]	7	172	0	7	43	1	35

a/ Numbers reflect peak daily counts of live fish and carcasses with adults and jacks combined. Counts in years of poor visibility are not shown.
b/ Survey area was from mouth to falls (2 miles).
c/ Survey area was the main stem and West Fork (4.5 miles).
d/ Total run size estimate including jacks and adults.
e/ Low flows this season appeared to increase main stem spawning and decrease tributary spawning.
f/ Preliminary.

TABLE B-8. **Peak spawning counts** in index areas for selected **south/local** migrating **Oregon coastal fall chinook** stocks. (Page 1 of 1)

	Pistol River Deep Creek (0.4 mile)		Chetco River Big Emily Creek (1.0 mile)		Winchuck River Bear Creek (0.8 mile)		Index (fish per mile)	
Year	Adults	Jack	Adults	Jacks	Adults	Jacks	Adults	Jacks
1960	1	0	-	-	-	-	-	-
1961	4	1	-	-	-	-	-	-
1962	9	2	-	-	-	-	-	-
1963	7	0	-	-	-	-	-	-
1964	12	0	-	-	30	2	-	-
1965	0	-	-	-	14	0	-	-
1966	82	6	-	-	27	3	-	-
1967	2	1	-	-	31	0	-	-
1968	8	1	-	-	57	2	-	-
1969	-	-	-	-	29	2	-	-
1970	-	-	-	-	-	-	-	-
1971	7	0	303	28	15	0	148	13
1972	7	0	344	11	-	-	251	8
1973	6	2	98	8	46	6	68	7
1974	2	0	100	0	13	0	52	0
1975	2	0	-	-	-	-	-	-
1976	-	-	41	22	0	2	23	13
1977	3	2	-	-	29	1	27	3
1978	-	-	245	36	33	0	154	20
1979	-	-	104	30	17	3	67	18
1980	0	0	107	39	13	0	55	18
1981	14	1	75	21	10	0	45	10
1982	25	1	84	12	13	1	55	6
1983	31	3	38	4	12	1	37	4
1984	11	2	23	4	15	1	22	3
1985	37	2	91	8	13	4	64	6
1986	0[a/]	0[a/]	73	20	12	3	39	10
1987	11	2	23	6	18	2	24	5
1988	27	3	112	25	15	1	70	13
1989	6	2	54	7	4	1	29	5
1990	1	0	26	2	2	1	13	1
1991	3	2	75	5	10	1	40	4
1992	9	0	44	13	16	1	31	6
1993	10	7	69	19	7	2	39	13
1994	29	31	71	8	30	4	59	20
1995	8	4	111	7	18	1	61	5
1996	81	9	79	7	27	5	85	10
1997	17	1	60	5	41	1	41	3
1998	46	11	52	3	19	2	53	7
1999[b/]	58	3	12	0	10	0	36	1

a/ Pistol River was subject to several "slope failures" in 1986 resulting in severe short-term alterations in gravel bars and spawning index areas. Considerable debris and siltation severely limited chinook surveys resulting in "0" counts in Deep Creek index areas through December.

b/ Preliminary.

TABLE B-9. Counts of **natural** and **hatchery spring chinook** salmon at Gold Ray Dam on the **Rogue River** and at Winchester Dam on the north **Umpqua River** in thousands of fish. (Page 1 of 2)

	Gold Ray Dam, Rogue River[a/]				Winchester Dam, Umpqua River[a/]			
Year	Natural	Hatchery	Total	Jacks[b/]	Natural	Hatchery	Total	Jacks[b/]
1942	41.8	-	41.8	6.2	-	-	-	-
1943	36.1	-	36.1	4.5	-	-	-	-
1944	30.6	-	30.6	3.7	-	-	-	-
1945	32.0	-	32.0	5.3	-	-	-	-
1946	28.4	-	28.4	4.6	2.5	-	2.5	0.5
1947	33.6	-	33.6	3.1	3.8	-	3.8	0.8
1948	27.0	-	27.0	2.9	2.5	-	2.5	0.2
1949	18.8	-	18.8	1.8	2.6	-	2.6	0.5
1950	15.5	-	15.5	2.7	2.3	-	2.3	0.3
1951	19.4	-	19.4	4.9	3.6	-	3.6	0.7
1952	15.9	-	15.9	3.8	5.2	0.1	5.3	0.6
1953	31.5	-	31.5	4.2	3.9	0.9	4.8	0.5
1954	24.7	-	24.7	5.2	1.5	1.7	3.2	1.6
1955	15.7	-	15.7	2.8	6.6	1.0	7.6	1.4
1956	28.1	-	28.1	3.9	8.0	1.3	9.3	1.4
1957	17.7	-	17.7	3.0	4.0	1.2	5.2	0.9
1958	15.0	-	15.0	1.9	3.6	0.8	4.4	0.5
1959	14.0	-	14.0	2.6	3.1	0.7	3.8	0.3
1960	24.4	-	24.4	5.5	3.4	0.7	4.1	0.5
1961	31.8	-	31.8	5.4	4.4	0.9	5.3	0.5
1962	31.4	-	31.4	5.3	3.3	0.9	4.2	0.6
1963	40.6	-	40.6	6.9	8.7	2.3	11.0	1.8
1964	37.3	-	37.3	6.2	6.6	2.2	8.8	3.0
1965	47.6	-	47.6	8.1	9.0	2.7	11.7	3.1
1966	31.4	-	31.4	3.5	6.7	0.6	7.3	1.3
1967	14.7	-	14.7	2.4	6.5	2.6	9.1	4.9
1968	19.5	-	19.5	7.5	6.2	3.1	9.3	4.3
1969	59.0	-	59.0	6.7	10.7	9.4	20.1	3.0
1970	45.1	-	45.1	7.4	6.1	6.9	13.0	2.4
1971	28.3	1.1	29.5	6.1	6.0	3.9	9.9	2.6
1972	30.0	0.8	30.8	5.7	7.9	8.5	16.4	7.4
1973	34.7	0.6	35.3	5.0	11.4	8.2	19.7	3.2
1974	16.5	0.5	17.0	3.5	5.8	5.1	10.9	2.2
1975	20.4	1.0	21.5	4.6	5.4	5.2	10.6	3.6
1976	20.4	1.2	21.6	6.9	5.5	5.2	10.7	4.3
1977	14.9	1.5	16.4	3.0	6.8	5.5	12.3	3.5
1978	40.2	7.0	47.2	11.3	5.4	2.8	8.2	2.8
1979	29.3	8.9	38.2	5.8	5.5	4.0	9.5	3.2
1980	24.2	12.7	36.9	8.0	5.7	1.9	7.6	2.1
1981	12.8	4.4	17.2	3.0	4.6	4.1	8.7	2.0
1982	23.2	6.7	29.9	10.1	6.5	2.0	8.5	3.3
1983	9.8	2.7	12.5	4.7	3.0	2.9	5.9	1.8
1984	8.4	4.3	12.7	3.8	4.5	2.4	6.9	1.9
1985	27.8	12.7	40.5	15.0	7.5	6.1	13.5	3.6
1986	40.4	49.1	89.5	30.1	8.3	5.3	13.6	4.4
1987	37.4	44.1	81.6	16.2	8.3	7.2	15.6	3.4
1988	38.8	43.8	82.6	18.4	7.8	3.8	11.6	1.6
1989	7.9	52.4	60.3	6.6	7.6	2.2	9.8	1.7
1990	18.0	6.5	24.6	3.1	5.5	2.0	7.6	1.3
1991	9.3	3.0	12.4	2.4	2.4	1.8	4.2	0.6
1992	2.2	3.6	5.8	1.3	2.5	2.5	5.0	0.9
1993	12.6	13.5	26.1	6.8	3.8	2.1	5.9	1.2
1994	3.6	10.5	14.1	2.6	2.8	2.5	5.3	1.1
1995	20.7	61.2	82.0	6.2	6.2	3.6	9.8	1.9
1996	10.3	26.3	36.6	3.4	4.3	2.2	6.5	1.0
1997	9.6	32.2	41.8	2.8	3.3	2.5	5.8	1.6

TABLE B-9. Counts of **natural** and **hatchery spring chinook** salmon at Gold Ray Dam on the **Rogue River** and at Winchester Dam on the north **Umpqua River** in thousands of fish. (Page 2 of 2)

	Gold Ray Dam, Rogue River[a/]				Winchester Dam, Umpqua River[a/]			
Year	Natural	Hatchery	Total	Jacks[b/]	Natural	Hatchery	Total	Jacks[b/]
1998	3.7	12.3	16.0	2.8	4.0	2.9	7.0	1.5
1999[c/]	6.0	15.0	21.0	1.9	2.8	4.6	7.4	3.1

a/ Jacks included in natural, hatchery, and total counts.
b/ Jacks include all chinook less than 20 inches prior to 1978 and all chinook less than 24 inches beginning in 1978.
c/ Preliminary.

TABLE B-10. Rogue River fall chinook carcass counts. (Page 1 of 1)

Year	Carcass Counts		
	Adults	Jacks	Combined
1977	1,102	1,941	3,043
1978	9,174	1,019	10,193
1979	7,954	187	8,141
1980	2,222	411	2,633
1981	4,404	987	5,391
1982	2,813	708	3,521
1983	1,602	158	1,760
1984	1,997	242	2,239
1985	5,486	2,500	7,986
1986	16,886	3,169	20,055
1987	29,144	2,847	31,991
1988	20,716	886	21,602
1989	7,408	481	7,889
1990	1,868	46	1,914
1991	2,799	157	2,956
1992	2,345	460	2,805
1993	5,447	257	5,704
1994	7,366	529	7,895
1995	3,921	173	4,094
1996	1,702	84	1,786
1997	1,594	108	1,702
1998	2,617	90	2,707
1999[a/]	2,491	156	2,647

a/ Preliminary.

TABLE B-11. Peak counts for far **north migrating Oregon coastal chinook** stocks on selected fall chinook spawning index stream surveys. (Page 1 of 2)

	River Tributaries																			
	Nehalem Humbug (1.0 mile)		Tillamook (1.8 mile)		Nestucca Niagara (0.4 mile)		Siletz Sunshine (1.2 mile)		Yaquina Grant (1.7 mile)		Alsea Buck (1.0 mile)		Siuslaw Lake (0.8 mile)		Coos W.F. Millicoma (0.5 mile)		Coquille Salmon (0.8 mile)		Index Fish Per Mile	
Year	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks
1961	96	8	130	36	65	4	52	11	51	1	38	8	26	22	3	3	10	14	51	12
1962	69	9	95	22	39	8	131	29	32	15	8	5	12	4	2	0	1	0	42	10
1963	96	37	128	22	88	2	63	8	67	13	39	12	27	2	0	2	3	0	56	11
1964	112	14	134	29	45	8	18	7	22	3	22	7	212	35	1	0	9	2	63	11
1965	100	43	93	18	123	2	32	8	44	34	31	14	28	11	2	0	91	49	59	19
1966	95	8	85	25	73	7	36	6	67	15	42	20	111	11	5	1	55	19	62	12
1967	64	2	117	41	55	6	39	3	35	13	12	14	110	31	7	0	17	0	50	12
1968	44	2	81	29	41	2	19	4	32	9	18	12	52	32	0	0	16	4	33	10
1969	29	2	41	13	28	8	7	3	68	20	13	2	140	52	6	2	7	0	37	11
1970	54	3	139	29	39	8	51	9	105	10	43	34	256	76	12	0	36	23	80	21
1971	84	10	35	4	35	1	40	5	78	17	38	8	49	10	21	22	17	5	43	9
1972	71	46	54	12	82	10	27	14	36	12	3	2	88	56	8	12	8	4	41	18
1973	139	28	84	1	61	4	47	0	48	4	20	4	-	-	21	1	18	0	52	5
1974	141	16	45	4	42	0	47	2	93	0	13	0	131	68	16	28	13	7	59	14
1975	72	28	-	-	-	-	-	-	-	-	9	1	106	60	22	4	18	9	55	25
1976	135	39	35	5	0	0	18	12	10	6	1	0	188	74	28	24	0[a/]	0[a/]	49	19
1977	158	12	56	2	14	2	45	2	160	20	13	2	181	60	19	8	7	7	71	13
1978	166	6	62	8	31	3	28	0	175	6	12	0	115	24	42	18	40	3	73	7
1979	168	2	45	2	50	3	98	7	144	78	40	10	128	12	35	24	33	8	81	16
1980	90	3	106	14	64	1	44	2	145	4	46	2	218	16	30	65	74	31	89	16
1981	148	1	94	6	41	1	68	2	185	13	32	3	140	43	4	4	43	8	82	9
1982	70	13	107	15	89	12	40	1	160	18	54	9	206	34	80	2	95	13	90	13
1983	61	4	45	1	60	1	29	3	86	11	25	0	28	0	9	0	43	4	42	3
1984	280	31	101	9	84	6	47	3	195	17	55	2	103	7	0	1	38	6	98	9
1985	257	40	128	14	117	9	90	3	263	59	70	15	268	70	11	2	6	4	132	23
1986	108	8	153	11	161	6	46	5	172	33	54	9	255	68	5	2	46	9	109	16
1987	219	6	255	6	127	1	14	0	173	19	51	1	207	25	19	11	46	4	121	8
1988	155	4	121	8	143	1	97	1	547	35	251	11	538	52	22	6	92	10	214	14
1989	150	2	118	4	104	4	61	3	168	12	72	5	555	34	5	3	27	7	137	8
1990	50	1	122	10	55	2	50	1	139	25	71	6	578	43	12	3	32	1	121	10
1991	43	0	135	10	91	3	58	6	187	17	36	2	701	27	4	1	123	12	150	8
1992	90	4	200	15	76	7	73	1	137	6	66	9	521	32	10	5	92	6	138	9
1993	50	0	46	1	24	1	17	0	136	7	15	1	106	7	113	10	73	2	63	3

TABLE B-11. Peak counts for far **north migrating Oregon coastal chinook** stocks on selected fall chinook spawning index stream surveys. (Page 2 of 2)

	River Tributaries																			
	Nehalem Humbug (1.0 mile)		Tillamook (1.8 mile)		Nestucca Niagara (0.4 mile)		Siletz Sunshine (1.2 mile)		Yaquina Grant (1.7 mile)		Alsea Buck (1.0 mile)		Siuslaw Lake (0.8 mile)		Coos W.F. Millicoma (0.5 mile)		Coquille Salmon (0.8 mile)		Index Fish Per Mile	
Year	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks	Adults	Jacks
1994	83	5	36	1	201	2	113	2	b/	b/	46	4	300	19	73	14	86	6	125	7
1995	57	3	41	4	124	1	41	0	b/	b/	59	4	346	5	43	6	46	1	101	3
1996	86	2	60	0	40	0	122	0	b/	b/	62	2	614	29	92	3	29	3	147	5
1997	162	1	47	1	24	1	60	0	b/	b/	49	3	325	9	12	0	108	3	105	2
1998	93	2	42	1	42	0	83	3	b/	b/	78	0	176	2	29	11	191	7	98	3
1999[c/]	116	3	38	1	60	2	36	3	b/	b/	55	5	478	14	14	7	136	8	124	6

a/ Flows too low to allow spawning.
b/ Survey discontinued; landowner would not allow access.
c/ Preliminary.

TABLE B-12. Estimates of minimum inriver run size, catch, and escapement in thousands of **Columbia River adult spring chinook** destined for areas **below Bonneville Dam.** (Page 1 of 1)

Year or Average	Minimum Inriver Run Size	Lower River Catch[a/]		Tributary Runs							
				Willamette							
		Commercial	Sport	Run Size	Sport Catch	Will. Falls Escapement[b/]	Sandy	Cowlitz[c/]	Lewis[c/]	Kalama	Hatchery Escapement[d/]
1971-1975	84.0	13.8	3.7	53.3	17.0	34.3	NA	11.9	0.2	1.1	20.0
1976	80.7	4.7	3.2	38.8	15.8	21.0	NA	26.6	3.1	4.3	29.9
1977	92.1	6.8	3.1	56.1	14.6	38.5	0.6	20.9	3.3	1.3	30.2
1978	106.9	13.5	5.0	69.2	20.6	45.7	0.7	13.8	3.7	1.0	25.2
1979	68.9	5.5	1.7	43.1	13.9	25.5	0.8	13.4	2.5	1.9	19.2
1980	73.1	0.4	0.8	41.6	10.0	26.4	1.8	23.7	2.3	2.5	28.4
1981	93.9	6.8	3.5	46.6	12.5	28.6	2.8	27.9	3.0	3.3	33.8
1982	110.1	4.6	2.2	70.3	20.6	45.1	1.4	19.3	3.9	8.4	31.1
1983	93.3	7.0	2.4	52.1	17.8	28.7	1.8	21.4	3.7	4.9	27.0
1984	115.6	9.1	1.8	72.9	23.4	42.4	2.3	21.3	6.4	1.8	33.1
1985	83.3	11.5	1.1	55.0	17.6	33.1	1.4	9.9	4.1	0.3	19.2
1986	90.6	8.6	4.4	59.6	18.1	37.3	1.3	7.3	8.3	1.1	19.9
1987	133.2	10.6	2.4	80.9	21.6	52.8	2.4	18.0	16.5	2.4	33.1
1988	145.9	13.2	3.2	101.8	27.0	68.7	2.9	12.3	10.6	1.9	34.9
1989	136.9	12.4	2.5	97.7	26.4	65.9	2.0	8.3	12.0	2.0	35.5
1990	151.2	16.2	9.1	103.5	27.3	69.1	3.5	7.6	9.3	2.0	38.9
1991	130.2	11.7	4.1	90.9	33.9	48.7	3.7	8.9	8.3	2.6	30.2
1992	102.5	5.2	4.1	65.6	16.1	39.7	9.2	10.4	5.6	2.4	29.8
1993	89.7	2.1	1.5	60.7	23.0	29.7	6.4	9.5	6.6	2.9	26.7
1994	60.6	1.6	1.6	46.5	12.9	25.5	3.5	3.1	3.0	1.3	16.6
1995	50.1	0.2	0.0	40.8	16.0	19.3	2.5	2.2	3.7	0.7	15.2
1996	42.3	0.9	0.0	33.2	7.8	20.4	4.1	1.8	1.7	0.6	15.9
1997	46.1	1.9	0.0	34.3	3.6	26.2	5.2	1.9	2.2	0.6	18.1
1998	50.6	0.1	0.0	43.3	4.1	33.1	4.2	1.1	1.6	0.4	23.0
1999[e/]	60.2	0.3	0.0	52.3	7.4	38.9	3.3	1.6	1.7	1.0	26.6

a/ Includes some upriver origin spring chinook through 1980. Beginning in 1981, the lower river catch of lower river spring chinook is based on mark recoveries rather than timing of the catch as in previous years. Since 1986, GSI and VSI techniques have been used for stock composition analysis. Includes Youngs Bay fisheries.

b/ Prior to 1988, the escapement goal at Willamette Falls was 30,000 to 35,000. Beginning in 1988, the goal is dependent on run size under the Willamette Basin Fish Management Plan. Under this plan, the escapement target is 30,000 adults above Willamette Falls at Willamette River run sizes (run entering the Columbia River) of 70,000 or less and increases linearly (500 per each 1,000 of increased run size) to 45,000 at Willamette River run sizes of 100,000 or greater.

c/ Includes hatchery escapement, tributary recreational catch, and natural spawning escapement for 1975 to present. The years 1971-1973 are based on using the 1975-1976 Cowlitz River recreational fishery adult harvest rates.

d/ Includes hatcheries operated by all agencies. Values are included in the totals for the tributary runs.

e/ Preliminary.

TABLE B-13. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult spring chinook** destined for areas **above Bonneville Dam.** (Page 1 of 1)

Year or Average	Inriver Run Size	Lower River Catch[a/]		Bonneville Dam Count	Mainstem		Zone 6 Escapement[b/]	Snake River Escapement[c/]		Upper Columbia River Escapement[d/]	Hatchery Escapement[e/]
		Commercial	Sport		Commercial Treaty Catch	Treaty Ceremonial/ Subsistence		Total	Wild		
1971-1975	167.5	31.4	16.0	120.1	21.3	NA	98.8	28.9	NA	8.2	13.4
1976	63.9	0.0	0.0	63.9	0.4	NA	63.5	15.9	NA	11.5	14.8
1977	138.4	8.6	14.2	115.6	17.0	1.8	96.8	36.2	NA	20.6	20.1
1978	127.0	0.0	0.0	127.0	2.6	4.9	119.5	40.7	NA	21.2	14.4
1979	48.7	0.1	0.0	48.6[f/]	0.5	1.6	46.5	6.8	2.573	7.4	9.3
1980	<53.2	0.1	0.0	<53.1[f/]	g/	1.8	<51.2	5.5	3.478	8.5	11.2
1981	<63.8	0.7	0.2	<62.8[f/]	1.6	1.8	<59.4	13.1	7.941	14.5	15.2
1982	71.3	0.7	0.6	70.0	3.3	2.0	64.7	12.4	7.117	8.7	15.7
1983	57.8	2.4	0.5	54.9	g/	2.5	52.4	9.5	6.181	10.4	16.4
1984	48.7	1.5	0.3	46.9	0.1	3.4	43.4	6.5	3.199	12.1	13.7
1985	86.5	3.0	0.4	83.2	0.1	3.0	80.1	25.2	5.245	24.1	30.6
1986	120.6	1.3	1.3	118.1	0.4	7.1	110.6	31.7	6.895	21.3	37.2
1987	100.2	1.2	0.4	98.6	0.3	6.4	91.9	28.8	7.883	18.5	33.8
1988	97.2	5.3	1.4	90.5	0.2	6.8	83.5	29.5	8.581	13.1	28.1
1989	83.4	1.6	0.5	81.3	0.1	6.6	74.5	13.0	3.029	11.7	23.3
1990	99.5	2.2	3.1	94.2	g/	6.9	87.2	17.3	3.216	12.2	34.9
1991	59.9	1.0	1.5	57.3	g/	3.9	53.5	6.6	2.206	7.7	17.5
1992	90.0	0.4	1.2	88.4	g/	5.7	82.7	21.4	11.285	19.6	30.9
1993	111.8	0.5	0.4	110.8	0.0	7.3	103.6	21.0	6.008	29.3	36.4
1994	21.1	0.5	0.4	20.2	g/	1.1	19.0	3.1	1.416	3.1	7.2
1995	10.2	g/	0.0	10.2	g/	0.6	9.6	1.1	0.745	1.1	4.9
1996	51.5	g/	0.0	51.5	0.0	2.8	48.7	4.2	1.358	2.4	17.8
1997	114.1	g/	g/	114.1	g/	8.3	105.8	33.9	1.434	6.8	29.6
1998[h/]	38.3	0.0	0.0	38.3	g/	2.2	36.1	9.9	5.055	4.1	11.6
1999[h/]	38.6	g/	g/	38.6	g/	2.0	36.6	3.3	1.433	4.1	18.2
GOAL							115.0	35.0	25.0		

a/ Includes some lower river origin spring chinook through 1980. Beginning in 1981, the lower river catch of upriver spring chinook is based on mark recoveries rather than timing of the catch as in previous years. Since 1986, GSI techniques have been used for stock composition analysis. Commercial catch includes estimated miscellaneous fishery related impacts from test fisheries, commercial shad fisheries, and terminal area commercial gillnet fisheries beginning in 1979.
b/ Bonneville Dam count minus Zone 6 mainstem commercial and ceremonial/subsistence treaty Indian harvest.
c/ Count at uppermost Snake River Dam (Little Goose in 1971-1974 and Lower Granite after 1974).
d/ Priest Rapids Dam count.
e/ Includes hatcheries operated by all agencies.
f/ Maximum figure not adjusted for fallback at the dam.
g/ Less than 50 fish.
h/ Preliminary.

TABLE B-14. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult summer chinook** destined for areas above Bonneville Dam. (Page 1 of 1)

Year or Average	Inriver Run Size	Lower River Catch		Bonneville Dam Count	Mainstem		Zone 6 Escapement[b/]	Snake River Escapement[c/]		Upper Columbia River Escapement[d/]
		Commercial[a/]	Sport		Commercial Treaty Catch	Treaty Ceremonial/ Subsistence		Total	Wild	
1971-1975	47.8	1.1	1.4	45.4	2.1	NA	43.3	13.4	13.429	14.6
1976	26.7	0.0	0.0	26.7	<0.1	NA	26.7	7.0	6.965	17.2
1977	34.3	0.2	0.0	34.1	<0.1	0.8	33.3	7.7	7.710	16.3
1978	38.7	0.2	0.0	38.5	0.1	0.8	37.6	11.6	11.649	19.2
1979	28.0	0.3	0.0	27.7	f/	1.0	26.8	2.7	2.712	20.3
1980	27.0	f/	0.0	27.0	0.1	1.1	25.8	2.7	2.688	16.0
1981	22.4	f/	0.0	22.4	f/	1.3	21.0	3.3	3.326	11.6
1982	20.4	0.2	0.0	20.1	f/	1.3	18.8	4.2	3.529	8.8
1983	18.2	0.2	0.0	18.0	0.0	0.3	17.7	3.9	3.233	8.5
1984	22.5	f/	0.0	22.4	0.1	0.3	22.0	5.4	4.200	16.2
1985	24.3	0.1	0.0	24.2	1.3	0.1	22.8	5.1	3.196	15.9
1986	26.4	0.2	f/	26.2	0.7	0.4	25.1	6.2	3.934	16.2
1987	33.3	0.3	f/	33.0	1.4	0.3	31.3	5.9	2.414	14.1
1988	31.5	0.2	f/	31.3	1.5	f/	29.8	6.1	2.263	13.4
1989	28.8	f/	f/	28.8	0.0	0.1	28.7	3.2	2.350	19.7
1990	25.0	f/	f/	25.0	0.0	0.1	24.9	5.1	3.378	15.6
1991	18.9	f/	f/	18.9	0.0	0.2	18.7	3.8	2.814	14.8
1992	15.1	0.1	f/	15.1	0.0	0.1	15.0	3.0	1.148	8.5
1993	22.2	0.2	f/	22.0	0.0	0.4	21.7	7.9	3.959	16.4
1994	17.7	f/	f/	17.6	0.0	0.2	17.4	0.8	0.305	14.9
1995	15.0	f/	f/	15.0	0.0	0.4	14.6	0.7	0.371	12.2
1996	16.1	f/	f/	16.0	0.0	0.5	15.5	2.6	2.129	10.9
1997	28.0	f/	f/	27.9	0.0	0.3	27.6	10.7	6.458	13.1
1998[e/]	21.5	f/	0.1	21.4	0.0	0.4	21.1	4.4	3.371	14.0
1999[e/]	26.2	f/	0.1	26.2	2.0	0.4	25.7	3.4	1.843	22.0
GOAL							80.0-90.0			

a/ Includes estimated miscellaneous fishery related impacts from test fisheries, commercial shad fisheries, and terminal area commercial gillnet fisheries beginning in 1979.
b/ Bonneville Dam count minus Zone 6 mainstem commercial and ceremonial/subsistence treaty Indian harvest.
c/ Count at uppermost Snake River Dam (Little Goose in 1971-1974 and Lower Granite after 1974).
d/ Priest Rapids Dam count.
e/ Preliminary.
f/ Less than 50 fish.

TABLE B-15. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult SCH stock fall chinook.**[a/] (Page 1 of 1)

Year or Average	Inriver Run Size	Bonneville Dam Count	Harvest			Escapement	
			Treaty Commercial and Subsistence[b/]	Non-Indian			
				Commercial	Sport	Natural	Hatchery[c/]
1971-1975	105.7	67.6	29.0	37.9	0.3	2.9	17.0
1976	182.2	142.1	65.6	40.0	0.2	3.1	24.6
1977	107.7	66.1	19.4	41.5	0.1	1.3	21.5
1978	99.7	76.2	25.5	23.4	0.2	2.4	18.0
1979	95.2	72.8	28.8	22.3	0.1	1.9	18.8
1980	97.8	57.8	23.4	31.8	0.1	2.6	27.0
1981	86.3	75.6	33.1	3.4	0.0	1.5	25.1
1982	120.7	80.7	48.9	35.7	0.3	2.5	29.4
1983	28.9	24.6	7.9	3.6	0.1	1.0	10.1
1984	47.5	38.1	19.2	5.9	2.3	0.7	9.6
1985	33.2	29.9	14.1	0.1	0.2	0.5	5.6
1986	16.6	8.7	5.7	4.1	0.4	0.9	4.1
1987	9.1	4.5	1.7	1.6	1.2	1.3	2.7
1988	12.0	6.0	2.9	3.2	0.3	1.6	3.7
1989	26.8	18.3	12.7	4.6	1.8	2.7	4.3
1990	18.9	13.5	7.4	1.1	0.4	1.0	8.2
1991	52.4	41.6	21.0	4.3	3.3	1.3	12.4
1992	29.5	24.7	9.7	1.0	1.5	1.3	8.8
1993	16.8	13.4	5.1	0.9	1.0	1.4	7.9
1994	18.5	15.8	5.0	0.0	0.2	1.9	10.3
1995	33.8	32.3	16.0	0.0	0.4	1.4	9.1
1996	33.1	30.3	21.1	1.7	0.9	1.3	7.7
1997[d/]	27.4	23.3	10.3	0.0	3.0	3.2	8.7
1998	19.5	17.1	4.8	0.0	1.4	2.7	5.4
1999[e/]	51.7	46.8	21.9	0.5	4.4	3.4	14.6
GOAL							7.0[d/]

a/ Based on Columbia River fall chinook database, WDFW, unpublished.
b/ Includes select area fisheries.
c/ Does not include strays to hatcheries below Bonneville Dam. Includes fall chinook tules trapped at Bonneville Dam, 1986-1994 and 1998.
d/ Preliminary.
e/ Escapement goal was changed rom 8,200 to 7,000 fish in 1994.

TABLE B-16.[a/] Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult LRH stock fall chinook.** (Page 1 of 1)

Year or Average	Inriver Run Size	Harvest			Escapement	
		Treaty Commercial	Non-Indian			
			Commercial[b/]	Sport[c/]	Natural	Hatchery[d/]
1971-1975	175.9	0.0	78.1	5.4	49.2	43.2
1976	171.0	0.0	63.3	5.3	50.8	51.6
1977	165.1	0.0	74.5	3.9	44.5	42.2
1978	166.5	0.0	58.3	5.8	43.2	59.2
1979	118.7	0.0	43.9	4.0	25.3	45.5
1980	105.6	0.1	57.0	2.9	20.9	24.6
1981	94.9	1.0	21.5	2.9	26.5	42.5
1982	139.5	1.0	47.3	3.9	44.0	42.6
1983	88.1	0.8	14.9	1.5	33.7	36.5
1984	102.4	1.4	26.7	8.8	32.0	27.4
1985	111.0	0.1	17.6	5.3	52.4	35.2
1986	154.8	0.7	75.3	10.8	26.5	41.3
1987	344.1	0.6	179.8	32.6	49.6	80.5
1988	309.9	1.8	178.4	22.0	53.0	53.8
1989	130.9	0.0	31.0	15.3	45.1	39.3
1990	60.0	0.2	4.4	6.4	19.4	29.2
1991	62.7	0.4	7.0	8.3	19.0	27.7
1992	62.6	0.2	2.7	8.6	24.2	26.5
1993	52.3	0.2	4.0	6.0	19.6	22.0
1994	53.6	0.0	0.0	0.2	22.6	30.6
1995	46.3	0.4	0.0	1.8	13.8	30.3
1996	75.5	0.4	3.9	4.6	23.9	42.7
1997	57.4	0.0	2.4	5.4	22.7	24.7
1998	44.3	0.0	0.8	4.5	14.9	23.6
1999[e/]	41.1	0.0	2.9	6.1	11.8	20.2

a/ Based on Columbia River fall chinook database, WDFW, unpublished.
b/ Includes select area fisheries.
c/ Includes tributary catches.
d/ Does not include strays to hatcheries above Bonneville Dam or fish trapped at Bonneville Dam.
e/ Preliminary.

TABLE B-17. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult LRW stock fall chinook**. (Page 1 of 1)

Year or Average	Inriver Run Size	Harvest			Escapement	
		Treaty Commercial	Non-Indian			
			Commercial	Sport[a/]	Natural	Hatchery
1971-1975	59.7	0.0	27.9	2.1	29.4	0.1
1976	14.9	0.0	6.1	0.6	8.2	0.0
1977	29.8	0.0	14.4	1.1	14.2	0.1
1978	18.5	0.0	7.1	1.1	10.1	0.2
1979	32.8	0.0	12.6	2.0	17.9	0.3
1980	38.8	0.1	18.4	1.3	18.2	0.6
1981	25.0	0.0	1.4	1.1	21.5	0.9
1982	13.0	0.0	1.2	1.0	10.4	0.3
1983	16.8	0.0	0.6	1.5	14.1	0.6
1984	13.3	0.0	2.9	1.7	8.5	0.2
1985	13.3	0.0	3.6	1.3	7.9	0.4
1986	24.5	0.0	10.1	2.0	12.2	0.0
1987	37.9	0.2	16.4	3.6	17.5	0.2
1988	41.7	0.1	19.3	3.4	18.7	0.2
1989	38.6	0.0	6.7	4.9	26.7	0.3
1990	20.3	0.0	0.9	2.4	16.8	0.2
1991	19.9	0.0	6.4	2.1	11.2	0.0
1992	12.5	0.0	2.3	2.3	7.9	0.0
1993	13.4	0.0	1.6	2.8	8.9	0.1
1994	12.2	0.0	0.3	0.9	10.9	0.0
1995	16.0	0.0	0.0	4.0	11.8	0.1
1996	14.6	0.0	0.3	0.2	13.9	0.1
1997	12.3	0.0	0.0	1.8	11.2	0.0
1998	7.0	0.0	0.0	0.4	6.6	0.0
1999[b/]	3.9	0.0	0.3	0.0	3.7	0.0
GOAL					5.7	

a/ Includes tributary catches.
b/ Preliminary.

TABLE B-18. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult URB stock fall chinook** destined for areas above McNary Dam and the Deschutes River.[a/] (Page 1 of 1)

Year or Average	Inriver Run Size	Bonneville Dam Count	Harvest			Escapement					
			Treaty Commercial and Subsistence	Non-Indian				McNary Dam Count	Ice Harbor Dam Count	Total Lower Granite Count	Wild Snake River Lower Granite Count[c/]
				Commercial	Sport[b/]	Natural	Hatchery				
1971-1975	110.5	80.4	35.1	29.3	3.1	36.8	2.6	39.5	5.6	-	-
1976	115.1	86.6	55.9	28.0	2.1	27.7	1.1	28.8	1.1	0.470	0.470
1977	95.1	65.9	29.0	28.8	0.7	37.0	2.0	37.6	1.2	0.600	0.600
1978	85.3	68.7	32.6	16.3	0.7	25.2	2.1	27.3	1.1	0.640	0.640
1979	89.2	71.2	32.5	17.7	0.5	28.7	2.5	31.2	1.2	0.500	0.500
1980	76.8	69.4	10.8	5.1	0.9	28.8	2.2	29.9	1.2	0.450	0.450
1981	66.6	62.8	14.2	2.4	0.7	23.9	3.0	21.1	0.8	0.340	0.340
1982	79.0	71.8	7.0	4.5	0.2	34.1	3.7	31.1	1.6	0.720	0.720
1983	86.1	78.0	18.1	4.3	0.7	48.3	5.9	48.7	1.8	0.540	0.428
1984	131.4	101.4	35.1	23.7	4.4	47.3	13.9	61.0	1.7	0.640	0.324
1985	196.4	156.6	59.1	34.5	9.1	76.7	14.0	93.3	2.0	0.691	0.438
1986	281.5	214.1	95.8	58.9	11.0	95.8	17.2	113.3	3.1	0.784	0.449
1987	420.7	304.0	125.0	104.3	18.1	126.4	24.8	154.1	6.8	0.951	0.253
1988	339.9	249.7	127.7	79.9	16.6	98.9	11.5	114.7	3.8	0.627	0.368
1989	261.1	211.9	101.0	42.8	12.8	82.8	7.9	96.5	4.6	0.706	0.295
1990	153.4	132.0	60.8	20.8	4.9	48.8	4.8	57.6	3.5	0.385	0.078
1991	102.7	87.3	26.0	13.7	5.9	38.9	3.6	46.6	4.5	0.630	0.318
1992	81.0	74.0	13.9	5.6	4.0	38.8	9.1	51.2	4.6	0.855	0.549
1993	102.9	95.5	20.3	5.3	5.3	49.8	9.9	54.9	2.8	1.170	0.742
1994	132.9	132.8	24.1	0.0	4.8	68.5	14.2	85.9	2.1	0.791	0.406
1995	106.5	105.6	18.7	0.0	5.4	58.5	10.2	68.2	2.8	1.067	0.350
1996	143.2	135.5	29.8	3.7	8.9	59.6	15.9	73.9	3.8	1.308	0.639
1997	161.7	152.9	42.7	1.4	11.5	68.9	13.1	67.1	2.7	1.451	0.797
1998	141.5	137.5	42.4	2.3	8.1	60.5	14.0	63.8	4.2	1.909	0.306
1999[d/]	165.8	157.5	40.4	1.6	7.5	NA	23.1	78.4	6.5	3.400	NA
GOAL								40.0[e/]			

a/ Based on Columbia River fall chinook data base, WDFW, unpublished data. Does not include hatchery URB chinook which were reared and released below McNary Dam.

b/ Includes tributary and mainstem catches.

c/ Adjusted for stray hatchery fish.

d/ Preliminary.

e/ FMP goal. In 1990-1993, the CRFMP parties managed for an escapement of 45,000 at McNary Dam to account for increased hatchery brood stock needs and concern for the Snake River wild fall chinook stock in 1991-1993. In 1994 and 1995, inriver fisheries were based on allowable adult wild Snake River fall chinook impacts rather than a McNary Dam escapement goal.

TABLE B-19. Estimates of inriver run size, catch, and escapement in thousands of **Columbia River adult MCB stock fall chinook** destined for areas below McNary Dam, not including the Deschutes River.[a/] (Page 1 of 1)

			Harvest				
				Non-Indian		Escapement	
Year	Inriver Run Size	Bonneville Dam Count	Treaty Commercial and Subsistence	Commercial	Sport[b/]	Natural	Hatchery
1982	8.8	4.8	2.0	0.7	0.0	0.0	2.9
1983	14.4	8.1	2.7	1.1	0.1	0.0	4.9
1984	11.8	5.1	1.6	3.2	0.2	0.0	3.2
1985	6.1	1.7	1.2	1.7	0.1	0.0	2.8
1986	17.4	8.4	5.9	6.5	0.4	0.3	2.3
1987	57.0	26.1	16.0	24.4	1.4	4.7	6.5
1988	78.0	30.9	21.9	37.9	2.8	5.9	8.5
1989	93.3	32.0	21.9	46.2	3.7	5.0	14.1
1990	59.1	26.5	15.4	17.7	3.1	4.8	14.6
1991	35.9	18.3	6.0	9.1	1.1	4.0	10.3
1992	31.1	16.8	5.1	5.5	1.8	5.8	9.6
1993	27.4	16.7	6.8	4.8	1.4	3.1	7.9
1994	33.7	21.5	4.4	1.2	0.9	10.5	11.4
1995	34.1	23.5	6.2	0.1	2.8	5.6	14.0
1996	59.7	38.1	11.9	5.3	3.4	14.0	15.9
1997	58.9	36.6	11.3	3.3	4.8	13.8	15.8
1998	36.5	29.9	7.8	3.0	6.1	13.1	8.8
1999[c/]	49.1	37.9	14.4	1.6	3.5	15.7	6.3

a/ Based on Columbia River fall chinook database, WDFW, unpublished data. Does not include URB chinook destined for areas above McNary Dam or the Deschutes River.
b/ Includes tributary and mainstem catches.
c/ Preliminary.

TABLE B-20. Estimates of minimum inriver run size, catch, and escapement in thousands of adult **coho** entering the Columbia River.[a/] (Page 1 of 1)

Year or Average	Minimum Inriver Run Size	Below Bonneville Dam					Above Bonneville Dam			
		Lower River Catch[b/]			Lower River Escapement					
			Recreational							
		Commercial	Buoy 10	Mainstem	Hatchery[d/]	Tributary Dam Counts[e/]	Bonneville Dam Counts[c/]	Mainstem Commercial Treaty Catch	Zone 6 Escapement[f/]	Hatchery Escapement
1971-1975	373.4	199.4	-	11.8	117.1	9.5	35.6	9.1	26.6	11.6
1976	337.0	168.4	-	11.1	117.3	3.5	36.7	4.0	32.7	14.4
1977	93.8	39.0	-	6.2	37.1	2.2	9.3	1.0	8.3	2.0
1978	307.1	132.7	-	9.7	131.4	2.9	30.3	3.7	26.6	7.8
1979	275.1	127.6	-	12.3	101.2	4.4	29.6	3.9	25.7	7.5
1980	301.6	150.1	-	11.2	122.2	5.1	13.0	0.3	12.7	3.4
1981	170.3	59.8	-	7.7	77.9	2.8	21.9	1.8	20.1	9.2
1982	453.1	201.7	18.9	17.6	154.1	5.0	55.8	4.3	51.5	32.4
1983	100.5	7.1	3.6	5.2	73.6	2.5	13.6	0.2	13.4	2.2
1984	414.2	201.5	74.4	15.6	101.6	4.2	25.5	1.6	23.9	7.1
1985	366.2	190.0	25.4	10.5	94.2	7.5	38.6	5.2	33.4	11.5
1986	1,527.8	981.0	120.4	24.9	284.1	8.9	129.0	16.8	112.2	29.4
1987	307.6	165.2	47.2	6.9	66.1	4.2	20.3	2.3	18.0	8.6
1988	664.8	361.4	143.4	12.3	113.6	6.9	30.0	5.1	24.8	4.9
1989	701.6	387.3	78.7	18.5	183.3	6.4	32.3	2.5	29.8	11.4
1990	196.1	66.2	18.4	10.1	87.8	2.0	11.6	1.0	10.6	3.0
1991	934.3	407.5	207.5	31.6	223.3	5.5	58.9	6.7	53.7	18.0
1992	210.9	54.1	43.1	9.0	85.1	5.2	14.4	1.0	14.4	5.2
1993	113.9	35.6	20.9	6.9	39.1	0.8	10.6	0.9	9.3	1.7
1994	168.9	60.7	1.8	5.7	77.7	4.1	20.3	1.0	19.3	3.9
1995	74.0	21.4	5.0	2.9	31.5	2.9	10.4	0.3	10.1	1.5
1996	111.3	26.0	4.5	4.1	60.1	0.6	15.7	0.1	15.6	1.4
1997	145.9	19.4	20.4	9.3	69.8	2.8	24.2	0.6	23.3	4.4
1998	161.8	23.0	3.2	10.8	76.9	1.3	46.6	0.2	44.7	11.3
1999[g/]	259.9	80.2	8.9	18.2	110.6	1.0	41.0	1.7	39.3	10.0

a/ These numbers match OPI databases. Adjustments were made to the escapement figures and catches.
b/ Includes some upriver origin coho. Mainstem recreational catches listed in this table include tributary catches and catches in the Chinook/Hammond area of 3,200 in 1989 and 1,200 in 1991.
c/ Includes additional small adults counted as jacks for 1983-1984 and 1986-1989.
d/ Includes hatcheries operated by all agencies.
e/ Willamette Falls, Clackamas River (North Fork Dam) and Sandy River (Marmot Dam).
f/ Bonneville Dam count minus Zone 6 mainstem commercial treaty Indian harvest.
g/ Preliminary.

TABLE B-21. Estimated **catch and effort** in the **Buoy 10** fishery.[a/] (Page 1 of 1)

Year	Angler Trips	Catch		Catch Per Trip
		Chinook	Coho	
1982	17,336	723	18,857	1.13
1983	7,128	604	3,574	0.59
1984	67,365	12,177	74,370	1.28
1985	32,156	2,655	25,387	0.87
1986	102,190	15,600	120,422	1.33
1987	124,594	42,100	47,170	0.72
1988	186,051	30,770	143,417	0.94
1989[b/]	160,692	16,884	85,110	0.63
1990[c/]	79,636	5,179	18,429	0.30
1991[d/]	171,680	11,647	208,638	1.28
1992	115,481	10,655	43,082	0.47
1993	75,774	5,288	20,932	0.35
1994[e/]	9,253	0	1,795	0.19
1995[f/]	25,186	853	5,026	0.23
1996[g/]	18,034	1,409	4,537	0.33
1997	55,725	13,153	20,357	0.60
1998[h/]	29,998	5,784	3,175	0.30
1999	49,581	9,850	8,861	0.38

a/ Prior to 1982, Buoy 10 area catches were not estimated separately and are included in the Columbia River marine area (Cape Falcon to Leadbetter Pt.) recreational catches. Estimates include bank anglers fishing from Clatsop Spit in Oregon and from the north jetty in Washington. Effort and catch for the North Jetty fishery applied to the ocean quota for the Columbia River area until the ocean fishery closed.

b/ Includes catch and effort data for the Chinook/Hammond fishery occurring during weeks 32 and 33. A total of 7,922 angler trips produced catches of 492 chinook and 3,195 coho and a catch rate of 0.47 fish per trip. Catches in this fishery were counted against the Buoy 10 quota.

c/ Includes catch and effort data for the Chinook/Hammond fishery occurring during weeks 31 and 32. A total of 3,225 angler trips produced catches of 54 chinook and 28 coho and a catch rate of 0.03 fish per trip.

d/ Includes catch and effort data for the Chinook/Hammond fishery occurring during weeks 31 and 32. A total of 2,759 angler trips produced catches of 39 chinook and 1,151 coho and a catch rate of 0.43 fish per trip.

e/ Buoy 10 fishery did not open until September 17 and the fishery was closed to the retention of chinook through October 7.

f/ Buoy 10 fishery was closed to the retention of chinook through September 4. Over 246 chinook were caught illegally.

g/ Buoy 10 fishery was closed to the retention of chinook through August 29.

h/ Buoy 10 fishery was open August 8-23. Retention of non-adipose fin-clipped coho was prohibited.

TABLE B-22. **Willapa Bay fall chinook** terminal run size, catch, and spawning escapement in numbers of fish. (Page 1 of 1)

Year or Average	Non-local Stocks Gillnet Catch[a/]	Terminal Catch		Spawning Escapement		Terminal Run Size[b/]
		Gillnet	Sport[c/]	Natural[d/]	Hatchery	
		CHINOOK (thousands)				
1976-1980	8.1	14.7	0.4	3.2	5.6	23.9
1981-1985	0.9	7.4	0.6	3.4	6.1	17.5
1986-1990	2.4	18.2	1.6	13.2	14.6	47.6
1981	3.2	13.7	0.3	2.8	4.2	21.0
1982	0.7	8.8	0.6	2.7	4.6	16.7
1983	0.1	2.3	0.9	3.1	6.2	12.5
1984	0.4	3.7	0.2	5.4	9.5	18.7
1985	0.2	8.6	0.9	3.2	6.1	18.8
1986	0.5	7.1	1.0	3.0	7.7	18.8
1987	0.5	7.6	1.2	5.9	21.7	36.4
1988	5.6	33.0	2.6	18.0	17.4	71.0
1989	3.6	24.6	2.0	26.4	17.6	70.4
1990	1.9	18.9	1.1	12.5	8.7	41.2
1991	1.7	25.6	1.9	7.5	11.5	46.2
1992	1.2	36.7	2.2	13.1	12.2	64.1
1993	0.6	31.2	4.8	6.3	12.5	54.9
1994	0.0	21.9	2.8	4.8	11.1	40.6
1995	0.0	25.5	2.9	10.2	10.4	49.0
1996	0.0	37.1	2.0	6.3	7.7	53.1
1997	0.0	12.3	2.4	11.0	6.0	32.2
1998[e/]	0.0	6.8	2.2	7.1	4.7	20.8
1999[e/]	0.0	0.3	NA	NA	4.9	NA
GOAL				4.4	8.2	

a/ Non-local gillnet is catch in Area 2G prior to Aug. 16.
b/ Does not include non-local stocks catch.
c/ Adults. Sport catch since 1991 includes marine areas within Willapa Bay (e.g., Washaway Beach).
d/ Includes hatchery strays to natural spawning areas. Escapement estimates after 1984 are based on revised spawning habitat estimates.
e/ Preliminary.

TABLE B-23. **Willapa Bay coho** terminal run size, catch, and spawning escapement in numbers of fish. (Page 1 of 1)

Year or Average	Gillnet	Sport[a/]	Natural[b/]	Hatchery[c/]	Terminal Run Size[d/]
			COHO (thousands)		
1976-1980	15.0	1.5	4.8	12.2	33.6
1981-1985	39.0	2.2	2.1	26.6	69.9
1986-1990	69.6	2.6	e/	36.1	108.3
1981	30.0	0.7	7.5	22.9	61.1
1982	70.0	3.6	2.1	33.4	109.1
1983	9.0	2.1	1.1	18.6	30.8
1984	50.7	2.9	e/	33.4	87.0
1985	35.3	1.5	e/	24.9	61.7
1986	118.6	5.7	e/	73.5	197.8
1987	63.8	2.0	e/	21.8	87.6
1988	49.4	2.4	e/	30.3	82.1
1989	68.4	1.7	e/	31.0	101.1
1990	48.0	1.2	e/	23.7	72.9
1991	95.5	6.3	e/	62.3	164.2
1992	10.8	2.0	e/	15.4	28.1
1993	19.8	1.9	e/	12.4	34.1
1994	11.7	2.3	e/	15.6	29.6
1995	33.6	1.7	e/	30.1	65.4
1996	38.3	2.3[f/]	30.2	48.9	89.5
1997	1.5	0.8	6.7	6.5	15.6
1998[g/]	13.1	0.9	15.7	6.4	36.1
1999[g/]	5.5	NA	NA	18.2	NA
GOAL			Hatchery Production		

a/ Adults. Sport catch since 1991 includes marine areas within Willapa Bay (e.g., Washaway Beach).
b/ Natural spawning escapement estimates in 1996, 1997, and 1998 include adult fish released upstream of hatchery racks.
c/ Hatchery rack number includes fish put upstream.
d/ Does not include natural spawning escapement after 1983.
e/ Estimates of natural spawning escapement were not made 1984 - 1995.
f/ Marine catch estimate not included, data not yet available.
g/ Preliminary.

TABLE B-24. **Grays Harbor chinook** terminal run size, catch, and spawning escapement in numbers of fish. (Page 1 of 2)

Year or Average	Early Non-local Catch	Terminal Catch				Spawning Escapement		Terminal Run Size[d/]
		Gillnet Non-Indian	Gillnet Treaty	Chehalis Tribal Gillnet	Sport[a/]	Natural[b/]	Hatchery[c/]	
				SPRING CHINOOK (thousands)				
1976-1980	-	-	-	0.6	e/	0.6	-	1.2
1981-1985	-	-	-	0.1	e/	0.9	-	1.0
1986-1990	-	-	-	0.2	e/	2.0	-	2.2
1981	-	-	-	0.3	e/	0.6	-	0.9
1982	-	-	-	0.1		0.6	-	0.7
1983	-	-	-	0.1	-	0.8	-	0.9
1984	-	-	-	-	e/	1.1	-	1.1
1985	-	-	-	-	e/	1.2	-	1.2
1986	-	-	-	e/	e/	2.0	-	2.0
1987	-	-	e/	0.2	e/	0.9	-	1.1
1988	-	-	-	0.1	e/	3.5	-	3.6
1989	-	-	e/	0.3	e/	2.1	-	2.4
1990	-	-	-	0.1	e/	1.5	-	1.6
1991	-	-	-	0.2	e/	1.3	-	1.5
1992	-	-	-	e/	e/	1.7	-	1.7
1993	-	-	-	0.1	e/	1.3	-	1.4
1994	-	-	-	0.1		1.4	-	1.5
1995	-	-	-	0.1	-	2.1	-	2.2
1996	-	-	f/	0.1	e/	4.5[g/]	-	4.6
1997	-	-	f/	0.2	0.2	4.4[g/]	-	4.8
1998[h/]	-	-	f/	0.2	0.1	2.3	-	2.6
1999[h/]	-	-	f/	0.2	NA	NA	-	NA
GOAL						1.4		

TABLE B-24. **Grays Harbor chinook** terminal run size, catch, and spawning escapement in numbers of fish. (Page 2 of 2)

Year or Average	Early Non-local Catch	Terminal Catch				Spawning Escapement		Terminal Run Size[d/]
		Gillnet Non-Indian	Gillnet Treaty	Chehalis Tribal Gillnet	Sport[a/]	Natural[b/]	Hatchery[c/]	
				FALL CHINOOK (thousands)				
1976-1980	4.4	1.8	3.1	1.0	1.1	6.5	0.3	13.9
1981-1985	0.6	0.8	3.5	0.5	0.3	9.8	0.8	15.7
1986-1990	0.4	4.6	10.4	0.6	1.5	20.7	0.9	38.7
1981	1.6	0.6	3.5	0.7	0.2	7.6	0.8	13.4
1982	0.6	3.1	4.6	0.7	0.2	5.6	0.4	14.6
1983	0.1	0.1	3.3	0.3	0.1	5.5	0.6	9.9
1984	0.5	0.2	0.9	0.3	0.4	21.0	0.9	23.7
1985	0.1	0.1	5.3	0.3	0.6	9.5	1.1	16.9
1986	0.2	2.2	5.4	0.3	0.4	13.7	1.3	23.3
1987	0.3	3.1	9.7	0.2	0.8[i/]	18.8	2.0	34.6[i/]
1988	0.7	3.5	4.9	0.8	2.0[i/]	28.2	0.3	39.7[i/]
1989	0.4	8.0	18.5	1.0	2.1[i/]	25.7	0.7	56.0[i/]
1990	0.3	6.3	13.5	0.6	2.0[i/]	17.0	0.5	39.8[i/]
1991	0.2	6.0	8.0	0.6	3.7[i/]	14.4	0.5	33.2[i/]
1992	0.2[e/]	5.6	6.6	0.9	2.1[i/]	16.9	1.1	33.2[i/]
1993		5.8	8.8	1.6	3.5[i/]	13.3	0.9	33.9[i/]
1994	-	3.7	7.9	0.7	3.6[i/]	14.3	0.8	31.0[i/]
1995	-	5.1	7.4	0.7[e/]	5.4[i/]	12.7	0.4	31.8[i/]
1996	-	1.4	7.1		5.7[i/]	20.2	0.7	35.2[i/]
1997	-	2.7	6.6	0.3	2.7	18.2	0.4	30.9
1998[h/]	-	0.2	4.1[j/]	0.0	1.1	12.5	0.5	23.2
1999[h/]	-	0.1	1.9	0.0	NA	NA	0.8	NA
GOAL						14.6		

a/ Age-3 and older.
b/ Age-3 and older, including hatchery fish spawning naturally.
c/ Includes naturally spawning fish taken for broodstock.
d/ Minimum estimate due to incomplete estimates of river recreational catch. Not including non-local catch.
e/ Less than 50 fish.
f/ WDFW does not include July catches in spring chinook total while the Quinault Indian Nation does. For 1996, the WDFW estimate of spring chinook catch is 12; the Quinault estimate is 151. For 1997, WDFW estimate is 38; the Quinault estimate is 72. For 1998, the Quinault catch is 17. For 1999, the Quinault catch is 3.
g/ WDFW is not able to differentiate spawning time and believes this includes fall chinook.
h/ Preliminary.
i/ Recreational catch estimates by WDFW reflect application of punch card bias correction factor of 0.833. Quinault Indian Nation does not believe this factor is appropriate for this fishery. Unadjusted catch estimates are 1,000 for 1987; 2,400 for 1988; 2,500 for 1989; 2,400 for 1990; 4,500 for 1991; 2,600 for 1992; 4,200 for 1993; 4,300 for 1994; 6,500 for 1995 and 6,800 for 1996; terminal run sizes would be adjusted accordingly.
j/ Ceremonial and subsistence catch is about 75% of the reported catch of last opener. Therefore, the expanded catch would be equal to 4,970.

TABLE B-25. **Grays Harbor coho** terminal run size, catch, and spawning escapement estimates in numbers of fish. (Page 1 of 1)

Year or Average	Gillnet Catch: Non-Indian	Gillnet Catch: Treaty	Gillnet Catch: Chehalis River Tribal	Sport Catch (Adults)	Spawning Escapement: Natural[a/]	Spawning Escapement: Hatchery[a/]	Terminal Run Size
			COHO (thousands)				
1976-1980	5.2	9.8	3.5	2.5	29.5	9.4	59.9
1981-1985	5.2	15.6	2.9	4.9	36.7	14.4	79.7
1986-1990	7.7	30.1	1.8	5.3	44.8	26.4	116.2
1981	3.0	24.8	3.2	0.9	13.0	19.9	64.7
1982	17.4	26.0	6.0	3.9	18.1	10.1	81.7
1983	1.8	11.5	0.8	1.8	25.3	12.2	54.0
1984	3.2	6.6	3.4	16.3	105.2	24.4	159.1
1985	0.5	9.2	0.9	1.4	22.0	5.2	39.2
1986	12.5	36.6	1.9	6.2[b/]	36.9	33.9	128.0
1987	17.3	30.6	3.5	3.2[b/]	23.0	11.7	89.4
1988	3.5	20.1	0.5	5.7[b/]	61.9	39.4	131.1
1989	1.3	23.3	1.7	4.8[b/]	56.7	25.4	113.3
1990	4.0	40.0	1.5	6.7[b/]	45.6	21.7	119.3
1991	47.8	68.9	8.1	23.8[b/]	64.3	76.1	289.0
1992	0.7	14.1	1.1	4.3[b/]	32.9	8.7	61.8
1993	4.4	15.9	1.3	6.4[b/]	25.5	14.1	67.6
1994	0.7	8.6	0.9	1.8[b/]	12.4	14.4	38.8
1995	9.5	38.4	2.1	9.7[b/]	47.4	35.4	142.5
1996	10.1	51.8	2.9	5.8[b/]	63.6	46.6	180.7
1997	0.1	5.4	0.1	1.5	22.4	11.6	41.3
1998[c/]	0.7	13.4	0.4	2.1	35.6	13.9	66.7
1999[c/]	1.7	12.1	0.8	NA	NA	23.9	NA
GOAL					35.4		

a/ "Natural" includes hatchery fish spawning in wild. "Hatchery" includes wild fish taken for broodstock.

b/ Beginning in 1987, estimates provided by WDFW for recreational catch reflect punch card bias correction factor. Quinault Indian Nation does not believe this factor is appropriate. Unadjusted estimates are 3,900 for 1987; 6,800 for 1988; 5,800 for 1989; 8,000 for 1990; 28,600 for 1991; 5,100 for 1992; 7,600 for 1993; 2,100 for 1994; 11,700 for 1995; and 2,142 for 1996. Terminal run sizes would be adjusted accordingly.

c/ Preliminary.

TABLE B-26. Treaty **Indian gillnet** catch of chinook, chum, and sockeye salmon in the Quinault River in numbers of fish. (Page 1 of 1)

Year	Spring/Summer Chinook[a/]	Fall Chinook[a/]	Chum	Sockeye
1976-1980	149	4,320	7,960	17,560
1981-1985	114	5,100	4,720	12,600
1986-1990	338	8,822	4,686	11,218
1991-1995	98	6,293	2,505	9,523
1976	52	3,200	7,400	14,800
1977	51	600	3,600	30,500
1978	163	6,900	13,700	21,000
1979	299	6,500	3,200	4,700
1980	178	4,400	11,900	16,800
1981	148	5,300	4,500	21,700
1982	146	5,500	7,400	15,300
1983	45	4,400	3,700	400
1984	118	5,500	4,300	900
1985	115	4,800	3,700	24,700
1986	115	6,700	7,100	1,900
1987	346	12,220	3,486	24,347
1988	437	9,801	8,623	18,186
1989	530	10,108	2,563	2,691
1990	260	5,282	1,660	8,965
1991	109	6,304	2,565	5,566
1992	142	7,512	2,566	8,801
1993	126	6,695	5,259	32,077
1994	85	6,878	1,449	963
1995	26	4,076	687	207
1996	41	5,221	594	1,244
1997	19	2,625	1,033	2,532
1998	75	6,124	4,700	3,440
1999[b/]	10	4,839	583	73

a/ Preliminary. Stock separation under review.
b/ Preliminary.

TABLE B-27. Estimated inriver run size, catch and escapement for **Quinault River coho** in thousands of fish.
(Page 1 of 1)

Year or Average	Terminal Catch[a/]			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport	Natural	Hatchery	Natural	Hatchery	Total
1977-1980	9,750	NA	NA	3,425	2,875	8,475	7,475	15,950
1981-1985	10,700	NA	NA	4,220	6,300	7,800	13,420	21,220
1986-1990	13,777	NA	NA	3,177	4,239	7,101	13,206	20,307
1991-1995	7,963	NA	NA	4,319	8,046	6,205	13,472	19,678
1977	1,900	-	-	1,500	300	3,000	600	3,600
1978	6,900	-	-	2,500	1,600	6,600	4,200	10,800
1979	17,800	-	-	7,200	4,700	18,000	11,700	29,700
1980	12,400	-	-	2,500	4,900	6,300	13,400	19,700
1981	10,400	-	-	2,200	7,300	4,500	15,400	19,900
1982	11,000	-	-	7,200	4,900	14,400	8,700	23,100
1983	3,700	-	-	7,000	6,400	9,000	8,100	17,100
1984	21,100	-	-	3,200	9,800	7,800	26,200	34,000
1985	7,300	-	-	1,500	3,100	3,300	8,700	12,000
1986	24,382	-	-	4,780	4,907	11,483	21,332	32,815
1987	13,987	-	-	2,167	1,431	8,419	8,801	17,220
1988	12,757	-	-	1,194	6,156	2,282	16,582	18,864
1989	8,989	-	-	4,443	3,964	7,993	8,526	16,519
1990	8,770	-	-	3,301	4,738	5,329	10,787	16,116
1991	21,506	-	-	9,250	22,531	13,166	38,517	51,683
1992	5,214	-	-	4,617	4,855	6,682	7,771	14,453
1993	6,020	-	-	1,940	5,688	3,077	10,057	13,134
1994	1,564	-	-	820	1,299	1,278	2,047	3,325
1995	5,513	-	-	4,969	5,858	6,824	8,970	15,794
1996	10,087	-	-	6,024	9,524	9,330	16,111	25,441
1997	365	-	-	3,150	1,054	3,339	1,118	4,457
1998	5,941	-	-	3,764	3,158	7,142	5,581	12,723
1999[b/]	15,490	-	-	5,571	15,579	8,693	27,572	36,265
GOAL							Hatchery Production	

a/ Ceremonial, subsistence, and recretaional catch negligable. Includes dip-in fish destined for other river systems.
b/ Preliminary.

TABLE B-28. Estimated inriver run size, catch, and escapement of Queets River spring/summer chinook. (Page 1 of 1)

	Terminal Catch			Escapement		Terminial Run Size		
Year	Gillnet	Ceremonial & Subsistence	River Sport[a/]	Natural[b/]	Hatchery	Natural	Hatchery	Total
1976-1980	267	18	53	851	24	1,176	37	1,213
1981-1985	243	20	27	890	31	1,164	44	1,209
1986-1990	646	46	67	1,527	0	2,287	0	2,287
1991-1995	64	5	10	610	0	689	0	688
1976	160	11	61	505	0	737	0	737
1977	364	25	34	732	0	1,155	0	1,155
1978	229	16	51	1,110	0	1,406	0	1,406
1979	475	31	60	870	118	1,369	185	1,554
1980	108	8	59	1,038	0	1,213	0	1,213
1981	299	20	22	988	0	1,329	0	1,329
1982	495	35	6	781	119	1,244	180	1,424
1983	104	9	20	1,044	38	1,173	42	1,215
1984	150	18	63	958	0	1,189	0	1,189
1985	165	19	25	677	0	886	0	886
1986	201	22	45	925	0	1,193	0	1,193
1987	858	59	28	598	0	1,543	0	1,543
1988	391	34	77	1,765	0	2,267	0	2,267
1989	1,181	76	129	2,568	0	3,954	0	3,954
1990	601	41	58	1,780	0	2,480	0	2,480
1991	112	9	10	630	0	761	0	761
1992	104	11	15	375	0	505	0	505
1993	46	3	26	713	0	788	0	788
1994	21	1	0	705	0	727	0	725
1995	35	2	0	625	0	662	0	662
1996	43	3	69	776	0	891	0	891
1997	72	10	71	540	0	693	0	693
1998	18	27	0	492	0	537	0	537
1999[c/]	12	41	NA	373	0	426	0	426
GOAL				700[d/]				

a/ Sport catch of adults.
b/ Natural escapement includes hatchery strays.
c/ Preliminary.
d/ Minimum. Terminal run managed at 30% exploitation rate.

TABLE B-29. Estimated inriver run size, catch, and escapement of Queets River fall chinook. (Page 1 of 1)

	Terminal Catch			Escapement		Terminal Run Size		
Year	Gillnet	Ceremonial & Subsistence	River Sport [a/]	Natural [b/]	Hatchery	Natural	Hatchery	Total
1976-1980	1,540	100	36	2,820	0	4,320	0	4,320
1981-1985	2,104	20	135	3,720	360	5,691	591	6,282
1986-1990	2,428	20	214	8,298	619	10,677	861	11,538
1991-1995	1,848	20	109	3,849	407	5,511	708	6,219
1976	1,300	NA	20	1,200	0	2,500	0	2,500
1977	2,000	NA	20	3,600	0	5,500	0	5,500
1978	900	NA	100	2,200	0	3,100	0	3,100
1979	900	100	20	3,900	0	4,700	0	4,700
1980	2,600	NA	20	3,200	0	5,800	0	5,800
1981	3,800	NA	100	4,300	100	8,000	200	8,200
1982	2,300	NA	200	4,100	200	6,200	400	6,600
1983	1,300	20	200	2,600	300	3,800	600	4,400
1984	1,600	20	100	3,900	600	5,300	1,000	6,300
1985	1,518	20	74	3,702	598	5,153	757	5,910
1986	965	20	194	7,805	239	8,890	290	9,180
1987	3,851	20	175	6,504	203	10,045	593	10,638
1988	2,556	20	333	8,390	1,254	11,000	1,505	12,505
1989	2,519	20	200	8,689	785	11,154	1,059	12,213
1990	2,247	20	169	10,103	616	12,297	858	13,155
1991	1,511	20	116	4,486	459	5,888	705	6,593
1992	1,693	20	106	4,695	366	6,338	542	6,880
1993	1,787	20	253	3,383	230	5,107	560	5,667
1994	2,441	20	18	3,805	578	5,866	988	6,854
1995	1,809	20	52	2,876	401	4,355	746	5,101
1996	1,308	20	238	3,440	927	4,692	1,234	5,926
1997	1,708	20	210	2,458	564	4,103	842	4,945
1998	804	20	348	3,913	83	4,956	206	5,162
1999[c/]	939	20	232	NA	NA	NA	NA	NA
GOAL				2,500 [d/]				

a/ River sport catch of 3-year olds and older.
b/ Includes fish taken for hatchery brood stock.
c/ Preliminary.
d/ Minimum. Terminal run managed at 40% exploitation rate.

TABLE B-30. Estimated inriver run size, catch, and escapement for Queets River coho (Page 1 of 1).

	Terminal Catch [a/]			Escapement		Terminal Run Size		
Year	Gillnet	Ceremonial & Subsistence	River Sport [b/]	Natural [c/]	Hatchery	Natural [c/]	Hatchery	Total
1976-1980	2,440	60	140	3,460	1,000	5,100	1,640	6,740
1981-1985	2,385	20	104	5,457	2,654	6,414	3,794	10,208
1986-1990	8,453	18	241	4,824	4,636	6,357	11,142	17,499
1991-1995	4,420	50	312	5,019	4,114	5,888	7,802	13,690
1976	2,900	NA	100	1,200	100	4,100	300	4,400
1977	1,000	NA	100	1,900	300	2,600	500	3,100
1978	2,400	NA	100	2,700	600	4,100	900	5,000
1979	2,700	100	200	6,800	1,600	8,700	2,100	10,800
1980	3,200	20	200	4,700	2,400	6,000	4,400	10,400
1981	4,200	NA	200	4,800	2,400	6,100	4,500	10,600
1982	1,610	NA	100	7,000	4,500	7,800	5,400	13,200
1983	1,017	20	20	2,282	1,100	2,438	1,800	4,238
1984	1,314	20	20	9,200	4,042	9,748	4,400	14,148
1985	3,782	20	180	4,001	1,228	5,984	2,868	8,852
1986	9,885	20	49	5,160	3,654	5,826	11,441	17,267
1987	12,413	20	140	4,747	2,401	8,892	9,774	18,666
1988	5,400	20	255	4,288	8,644	4,530	13,659	18,189
1989	5,900	20	247	4,501	2,565	5,416	7,697	13,113
1990	8,667	10	514	5,422	5,916	7,120	13,138	20,258
1991	10,342	20	709	6,525	4,129	8,574	12,441	21,015
1992	2,049	20	363	6,266	2,324	6,999	3,921	10,920
1993	3,896	150	367	5,020	8,146	5,350	12,145	17,495
1994	1,611	30	18	1,105	2,996	1,242	4,398	5,640
1995	4,203	30	103	6,181	2,977	7,273	6,105	13,378
1996	16,035	30	279	8,993	8,763	10,717	22,963	33,680
1997	3,087	30	106	1,851	2,256	2,077	5,237	7,314
1998	7,379	30	135	4,102	4,917	4,576	11,924	16,500
1999[d/]	3,972	300	302	3,577	7,878	3,765	11,882	15,647
GOAL				5,800-14,500				

a/ Includes dip-in fish from other river systems.
b/ Recreeational catch of adults (coho over 20 inches).
c/ Natural escapement and run sizes estimates include fish taken for hatchery brood stock.
d/ Preliminary.

TABLE B-31. Estimated inriver run size, catch, and escapement for **Hoh River spring/summer chinook** in numbers of fish. (Page 1 of 1)

Year or Average	Terminal Catch			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[a/]	Natural[b/]	Hatchery	Natural	Hatchery	Total
1976-1980	640	52	84	1,040	0	1,835	0	1,835
1981-1985	448	30	124	1,431	50	1,944	128	2,073
1986-1990	1,072	33	328	2,829	34	4,052	257	4,309
1991-1995	432	22	286	1,268	0	1,971	164	2,135
1976	500	20	100	600	0	1,300	0	1,300
1977	900	20	20	1,000	0	2,000	0	2,000
1978	1,000	100	100	1,400	0	2,472	0	2,472
1979	700	100	100	1,400	0	2,326	0	2,326
1980	100	20	100	800	0	1,079	0	1,079
1981	432	63	20	1,498	22	2,005	47	2,052
1982	569	15	100	1,553	87	2,125	202	2,327
1983	458	36	100	1,696	67	2,233	131	2,364
1984	444	21	300	1,430	50	2,005	139	2,144
1985	336	15	100	978	22	1,353	123	1,476
1986	554	15	138	1,248	0	1,912	43	1,955
1987	676	38	227	1,710	0	2,480	171	2,651
1988	1,008	38	341	2,605	10	3,712	294	4,006
1989	1,735	38	565	4,697	119	6,863	334	7,197
1990	1,387	38	371	3,886	40	5,294	442	5,736
1991	600	13	155	1,078	0	1,693	153	1,846
1992	445	26	84	1,018	0	1,406	167	1,573
1993	509	25	373	1,411	0	2,077	242	2,319
1994	378	20	419	1,699	0	2,361	155	2,516
1995	230	25	397	1,132	0	1,657	102	1,759
1996	471	40	400	1,371	16	2,190	98	2,280
1997	416	57	350	1,826	0	2,728	53	2,781
1998	294	20	307	1,287	0	1,880	28	1,908
1999[c/]	155	20	100	1,000	0	1,207	68	1,275
GOAL				900[d/]				

a/ Recreational catch of adults (at least 24 inches total length).
b/ Includes fish taken for hatchery brood stock.
c/ Preliminary.
d/ Minimum. Terminal run managed at 31% harvest rate.

TABLE B-32. Estimated inriver run size, catch, and escapement for **Hoh River fall chinook** in numbers of fish. (Page 1 of 1)

Year or Average	Terminal Catch			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[a/]	Natural[b/]	Hatchery	Natural	Hatchery	Total
1976-1980	760	36	37	2,080	0	2,960	0	2,960
1981-1985	849	36	59	2,745	16	3,684	80	3,764
1986-1990	1,979	32	200	4,500	20	6,800	88	6,888
1991-1995	871	27	220	2,774	3	3,843	65	3,908
1976	500	20	45	2,500	0	3,100	0	3,100
1977	1,600	20	40	2,100	0	3,800	0	3,800
1978	800	100	51	1,900	0	2,900	0	2,900
1979	400	20	28	1,700	0	2,200	0	2,200
1980	500	20	21	2,200	0	2,800	0	2,800
1981	800	20	0	3,100	0	4,000	0	4,000
1982	1,200	20	12	4,500	20	5,800	100	5,900
1983	500	20	134	2,500	20	3,300	100	3,400
1984	800	20	118	1,900	20	2,600	100	2,700
1985	946	100	30	1,725	20	2,720	100	2,820
1986	900	20	178	4,981	20	6,000	100	6,100
1987	1,800	20	299	4,006	20	6,147	89	6,236
1988	2,600	20	188	4,128	20	6,873	100	6,973
1989	2,700	50	187	5,148	20	8,682	100	8,782
1990	1,893	50	149	4,236	20	6,298	50	6,348
1991	1,076	15	113	1,420	13	2,611	13	2,624
1992	940	30	181	4,003	0	5,136	18	5,154
1993	1,148	30	399	2,280	0	3,766	91	3,857
1994	687	30	228	3,967	0	4,806	179	4,985
1995	502	30	180	2,202	0	2,898	22	2,920
1996	836	30	151	3,022	0	3,944	100	4,044
1997	1,114	35	159	1,773	0	3,059	22	3,081
1998	846	30	249	4,257	0	5,369	13	5,382
1999[c/]	596	30	250	2,000	0	2,855	21	2,876
GOAL				1,200[d/]				

a/ River recreational catch of adults (three-year olds and older).
b/ Includes fish taken for hatchery brood stock.
c/ Preliminary.
d/ Minimum. Terminal run managed at 40% harvest rate through 1996; for 1997 and 1998, fishing regimes were designed to target a range near 40%.

TABLE B-33. Estimated inriver run size, catch, and escapement for **Hoh River coho** in numbers of fish. (Page 1 of 1)

Year or Average	Terminal Catch[a/]			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[b/]	Natural[c/]	Hatchery	Natural	Hatchery	Total
1976-1980	1,960	74	28	2,700	39	4,683	259	4,942
1981-1985	1,604	48	22	3,371	92	4,655	452	5,107
1986-1990	2,507	30	162	3,145	238	5,218	760	5,979
1991-1995	801	26	167	3,078	122	3,815	379	4,194
1976	1,800	50	44	2,300	0	4,200	0	4,200
1977	1,000	30	6	2,400	0	3,400	0	3,400
1978	2,800	125	20	2,100	0	5,100	0	5,100
1979	2,900	100	47	5,000	93	8,200	593	8,793
1980	1,300	65	23	1,700	100	2,515	700	3,215
1981	2,073	40	7	1,900	100	3,245	875	4,120
1982	2,000	100	6	3,600	100	5,351	319	5,670
1983	152	10	9	1,735	260	1,810	346	2,156
1984	351	46	9	7,400	0	7,690	116	7,806
1985	3,444	43	79	2,218	0	5,178	606	5,784
1986	2,800	42	385	4,270	0	6,400	795	7,195
1987	3,917	50	239	3,516	46	7,165	557	7,722
1988	350	20	39	2,350	611	2,639	731	3,370
1989	2,350	20	106	3,497	351	5,428	720	6,148
1990	3,119	20	42	2,094	184	4,460	999	5,459
1991	1,254	20	276	4,129	14	5,370	323	5,693
1992	1,420	30	107	4,045	594	5,007	1,189	6,196
1993	709	30	90	1,345	0	1,874	300	2,174
1994	144	20	123	1,161	0	1,404	44	1,448
1995	478	30	241	4,710	0	5,419	40	5,459
1996	972	50	102	4,858	0	5,836	146	5,982
1997[d/]	85	25	4	1,386	0	1,449	51	1,500
1998	650	20	281	4,931	0	5,683	118	5,801
1999[e/]	1,708	25	279	4,900	0	6,559	350	6,909
GOAL				2,000 to 5,000				

a/ Includes dip-in fish from other systems.
b/ Recreational catch of adults (coho over 20 inches).
c/ Natural escapement and run size estimates include fish taken for hatchery brood stock.
d/ Recreational fishermen were limited to chinook only. Release of adult coho required.
e/ Preliminary.

TABLE B-34. Estimated inriver run size, catch, and escapement for **Quillayute River spring/summer chinook** in numbers of fish. (Page 1 of 1)

Year or Average	Terminal Catch			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[a/]	Natural[b/]	Hatchery	Natural	Hatchery[c/]	Total
1976-1980	2,520	20	380	2,080	800	3,020	2,780	5,800
1981-1985	700	20	124	920	260	1,580	480	2,060
1986-1990	1,657	22	256	1,278	1,003	2,094	2,096	4,191
1991-1995	894	25	264	1,113	827	1,319	1,804	3,123
1976	2,400	20	800	1,300	1,800	1,700	4,600	6,300
1977	3,200	20	400	3,800	900	5,300	3,000	8,300
1978	3,400	20	400	2,300	700	2,700	4,100	6,800
1979	2,600	20	200	2,100	200	3,900	1,200	5,100
1980	1,000	20	100	900	400	1,500	1,000	2,500
1981	1,000	20	100	800	300	1,700	600	2,300
1982	1,700	20	100	1,200	100	2,700	500	3,200
1983	400	20	100	1,400	200	1,800	400	2,200
1984	300	20	300	600	400	1,000	500	1,500
1985	100	20	20	600	300	700	400	1,100
1986	400	20	70	600	300	1,000	400	1,400
1987	1,800	20	100	600	1,500	1,600	2,200	3,800
1988	2,100	20	509	1,300	1,200	2,600	2,600	5,200
1989	2,255	25	300	2,407	1,150	3,445	2,702	6,147
1990	1,731	25	300	1,483	867	1,826	2,580	4,406
1991	1,271	25	300	1,190	781	1,507	2,060	3,567
1992	918	25	300	1,008	1,540	1,291	2,500	3,791
1993	1,237	25	367	1,292	866	1,531	2,256	3,787
1994	570	25	79	974	537	998	1,187	2,185
1995	472	25	341	1,333	412	1,501	1,082	2,583
1996	136	50	257	1,170	226	1,351	436	1,787
1997[d/]	106	50	100	900	198	1,051	303	1,354
1998[d/]	199	50	150	1,553	247	1,896	303	2,199
1999[d/]	368	50	287	1,561	250	1,672	907	2,579
GOAL				1,200[e/]				

a/ Recreational catch of adults (coho over 20 inches).
b/ Natural escapement includes hatchery strays.
c/ Hatchery escapement and terminal run size exclude hatchery strays.
d/ Preliminary.
e/ WDFW goal for summer chinook only. Includes jacks.

TABLE B-35. Estimated inriver run size, catch, and escapement for **Quillayute River fall chinook** in numbers of fish. (Page 1 of 1)

Year or Average	Terminal Catch			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[a/]	Natural[b/]	Hatchery[c/]	Natural	Hatchery[c/]	Total
1976-1980	2,640	20	220	4,220	144	6,540	640	7,180
1981-1985	2,075	50	131	6,282	77	8,219	305	8,525
1986-1990	5,475	50	640	12,238	112	18,079	379	18,459
1991-1995	713	50	258	5,341	11	6,343	29	6,372
1976	2,300	20	300	2,500	100	4,700	400	5,100
1977	5,400	20	100	3,300	200	7,600	1,400	9,000
1978	1,500	20	300	4,700	300	6,200	500	6,700
1979	2,700	20	200	3,900	100	6,600	200	6,800
1980	1,300	20	200	6,700	20	7,600	700	8,300
1981	1,328	50	109	5,963	127	7,102	428	7,530
1982	2,765	50	97	7,107	76	9,651	330	9,981
1983	2,539	50	120	3,069	83	5,530	296	5,826
1984	1,384	50	124	9,128	80	10,447	330	10,777
1985	2,360	50	204	6,145	20	8,367	142	8,509
1986	2,990	50	800	10,006	94	13,529	257	13,786
1987	7,996	50	700	12,352	172	20,663	453	21,116
1988	6,241	50	1,000	15,168	171	22,166	502	22,668
1989	7,288	50	300	9,951	108	17,102	586	17,688
1990	2,860	50	400	13,711	14	16,937	98	17,035
1991	951	50	400	6,292	13	7,655	51	7,706
1992	1,208	50	300	6,342	14	7,850	62	7,912
1993	407	50	26	5,254	28	5,735	30	5,765
1994	448	50	262	4,932	0	5,692	0	5,692
1995	552	50	300	5,532	0	6,434	0	6,434
1996	1,245	100	500	7,316	0	9,161	0	9,161
1997[d/]	262	50	200	5,405	0	5,917	0	5,917
1998[d/]	758	100	469	6,350	0	7,677	0	7,677
1999[d/]	1,094	100	464	3,924	0	5,582	0	5,582
GOAL				3,000[e/]				

a/ River recreational catch of 3-year olds and older.
b/ Includes fish taken for hatchery brood stock and hatchery strays.
c/ Hatchery escapement and terminal run size exclude hatchery strays.
d/ Preliminary.
e/ Minimum. Terminal run managed at 40% harvest rate.

TABLE B-36. Estimated inriver run size, catch, and escapement for **Quillayute River coho** stocks in numbers of fish. (Page 1 of 2)

Year or Average	Terminal Catch[a/]			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[b/]	Natural[c/]	Hatchery[d/]	Natural[c/]	Hatchery[d/]	Total
				SUMMER COHO				
1976-1980	5,038	53	266	1,192	4,565	1,960	9,153	11,113
1981-1985	4,062	50	172	946	2,635	2,177	5,748	7,925
1986-1990	3,204	50	214	723	4,033	1,616	6,628	8,244
1991-1995	1,286	50	181	830	6,413	1,050	7,709	8,759
1976	499	20	43	1,200	1,239	1,477	1,524	3,001
1977	1,304	20	39	1,000	1,847	1,479	2,731	4,210
1978	837	20	137	1,500	1,000	2,087	1,407	3,494
1979	10,563	100	580	1,460	9,720	2,928	19,495	22,423
1980	11,985	120	530	800	9,018	1,830	20,623	22,453
1981	2,104	30	114	800	500	2,366	1,479	3,845
1982	11,712	100	193	900	3,667	3,266	13,306	16,572
1983	391	20	159	784	4,010	877	4,487	5,364
1984	4,022	50	303	1,573	4,000	2,808	7,140	9,948
1985	2,082	50	91	674	1,000	1,569	2,328	3,897
1986	5,745	50	235	700	8,932	1,138	14,524	15,662
1987	7,520	50	500	600	895	3,839	5,726	9,565
1988	1,404	50	133	900	1,912	1,408	2,991	4,399
1989	797	50	100	950	3,631	1,168	4,464	5,632
1990	554	50	100	465	4,795	527	5,437	5,964
1991	2,661	50	300	1,001	9,913	1,278	12,647	13,925
1992	1,254	50	376	921	15,238	1,016	16,818	17,834
1993	396	50	63	256	1,654	324	2,095	2,419
1994	974	50	51	683	1,643	999	2,402	3,401
1995	1,144	50	29	1,288	3,619	1,609	4,521	6,130
1996	2,552	50	189	574	3,400	977	5,788	6,765
1997[d/]	70	50	100	792	1,509	851	1,620	2,471
1998[d/]	1,310	50	63	1,000	1,645	1,541	2,527	4,068
1999[d/]	945	50	191	921	7,298	1,312	8,093	9,405
GOAL				Hatchery Production				

TABLE B-36. Estimated inriver run size, catch, and escapement for **Quillayute River coho** stocks in numbers of fish. (Page 2 of 2)

Year or Average	Terminal Catch[a/]			Escapement		Terminal Run Size		
	Gillnet	Ceremonial & Subsistence	River Sport[b/]	Natural[c/]	Hatchery[d/]	Natural[c/]	Hatchery[d/]	Total
				FALL COHO				
1976-1980	5,985	53	70	9,002	2,435	13,971	3,574	17,545
1981-1985	3,789	49	119	7,464	2,102	10,974	2,549	13,523
1986-1990	5,794	100	324	8,766	1,771	14,120	2,634	16,754
1991-1995	3,599	100	327	6,791	4,736	9,310	6,242	15,553
1976	8,527	75	109	3,900	391	11,817	1,185	13,002
1977	2,809	30	18	3,526	109	6,297	195	6,492
1978	4,187	45	86	10,344	3,473	13,577	4,558	18,135
1979	7,384	60	101	20,224	4,984	26,277	6,476	32,753
1980	7,018	53	36	7,017	3,220	11,889	5,455	17,344
1981	3,734	50	119	6,268	624	9,818	977	10,795
1982	5,420	48	207	10,400	2,140	15,107	3,108	18,215
1983	674	48	69	2,660	675	3,291	835	4,126
1984	595	50	61	10,508	6,633	10,941	6,906	17,847
1985	8,520	50	141	7,484	438	15,713	920	16,633
1986	6,408	100	421	10,687	1,062	16,990	1,688	18,678
1987	13,849	100	400	11,416	751	23,781	2,735	26,516
1988	2,240	100	100	7,218	2,149	9,105	2,702	11,807
1989	2,492	100	400	8,995	3,591	11,208	4,370	15,578
1990	3,980	100	300	5,512	1,300	9,516	1,676	11,192
1991	2,078	100	600	9,532	7,168	10,891	8,587	19,478
1992	7,069	100	322	8,170	3,858	13,533	5,986	19,519
1993	1,318	100	60	4,165	3,746	4,704	4,685	9,389
1994	2,143	100	307	4,882	3,090	6,400	4,122	10,522
1995	5,386	100	991	10,035	5,819	14,209	8,122	22,331
1996	7,742	100	1,333	11,009	11,515	18,771	12,927	31,698
1997[d/]	436	50	50[e/]	4,623	2,645	4,924	2,880	7,804
1998[d/]	4,543	50	565	15,000	12,834	30,715	21,809	52,524
1999[d/]	22,378	50	1,323	NA	NA	NA	NA	NA
GOAL				6,300-15,800				

a/ Includes dip-in fish from other systems.
b/ Recreational catch of adults (coho over 20 inches).
c/ Natural escapement and run size estimates include fish taken for hatchery brood stock.
d/ Hatchery escapement and terminal run size exclude hatchery strays.
e/ Regulations required nonretention of coho.

TABLE B-37. Puget Sound **commercial net and troll** fishery salmon catches.[a/] (Page 1 of 1)

Year or Average	Fishery	Chinook	Coho	Pink	Chum	Sockeye
			THOUSANDS OF FISH			
1971-1975	Non-Indian	103.9	523.6	1,942.9[b/]	331.1	2,159.0
	Treaty Indian	54.0	224.7	114.4[b/]	78.2	37.8
	Total	157.9	748.3	2,057.3[b/]	409.3	2,196.8
1976-1980	Non-Indian	103.5	413.4	2,626.1[b/]	408.0	1,095.6
	Treaty Indian	126.1	488.5	464.4[b/]	294.9	277.8
	Total	229.6	901.9	3,090.5[b/]	702.9	1,373.4
1981-1985	Non-Indian	71.1	344.1	1,917.1[b/]	368.7	924.6
	Treaty Indian	144.4	606.6	1,377.8[b/]	388.0	912.6
	Total	215.5	950.7	3,294.9[b/]	756.7	1,837.2
1986-1990	Non-Indian	57.6	470.5	1,273.6[b/]	540.9	965.4
	Treaty Indian	177.0	811.6	1,475.1[b/]	661.8	1,034.9
	Total	234.6	1,282.1	2,748.8[b/]	1,202.6	2,000.2
1986	Non-Indian	73.5	493.5	0.0	505.7	1,394.0
	Treaty Indian	150.4	863.6	0.1	650.1	1,357.4
	Total	223.9	1,357.1	0.1	1,155.8	2,751.3
1987	Non-Indian	57.3	664.0	963.3	597.3	974.7
	Treaty Indian	155.8	1,118.2	1,106.4	704.3	971.3
	Total	213.1	1,782.2	2,069.8	1,301.6	1,946.1
1988	Non-Indian	50.4	459.8	0.0	706.3	348.0
	Treaty Indian	181.1	777.7	0.1	862.4	501.4
	Total	231.4	1,237.5	0.1	1,568.7	849.4
1989	Non-Indian	54.1	344.4	1,583.9	368.1	1,127.8
	Treaty Indian	199.8	621.1	1,843.8	518.4	1,124.0
	Total	253.9	965.4	3,427.7	886.5	2,251.7
1990	Non-Indian	52.5	390.9	0.0	526.9	982.4
	Treaty Indian	197.7	676.9	0.3	573.6	1,184.4
	Total	250.2	1,067.7	0.3	1,100.5	2,166.7
1991	Non-Indian	21.6	196.4	1,578.4	476.8	983.4
	Treaty Indian	121.6	401.8	1,710.0	545.0	844.7
	Total	143.3	598.2	3,288.5	1,021.8	1,828.1
1992	Non-Indian	19.5	98.9	0.1	617.6	316.1
	Treaty Indian	94.0	300.0	0.1	763.6	292.1
	Total	113.5	398.9	0.2	1,381.2	608.2
1993	Non-Indian	18.1	27.7	974.9	588.6	1,328.5
	Treaty Indian	64.2	162.0	1,117.2	539.4	1,364.5
	Total	82.3	189.7	2,092.1	1,128.0	2,693.0
1994	Non-Indian	19.8	20.0	<50	579.9	878.4
	Treaty Indian	61.5	427.8	1.7	772.4	956.1
	Total	81.3	447.8	1.7	1,352.3	1,834.5
1995	Non-Indian	6.7	24.5	1,366.9	373.9	170.6
	Treaty Indian	74.1	278.3	1,340.4	382.0	243.7
	Total	80.8	302.7	2,707.3	755.9	414.3
1996	Non-Indian	9.2	20.0	0.0	530.5	50.5
	Treaty Indian	69.0	145.3	0.0	261.5	286.1
	Total	78.2	165.3	0.0	792.1	336.6
1997	Non-Indian	21.6	9.6	868.9	234.9	681.7
	Treaty Indian	58.0	142.4	985.2	186.3	660.6
	Total	79.6	152.0	1,854.1	421.2	1,342.3
1998[c/]	Non-Indian	12.4	12.5	0.4	505.3	229.3
	Treaty Indian	43.6	149.1	0.5	320.1	309.7
	Total	56.0	161.6	0.9	825.4	539.0
1999[c/]	Non-Indian	9.5	11.9	1.1	133.4	0.0
	Treaty Indian	78.2	102.3	51.4	116.4	20.5
	Total	87.7	114.2	52.5	249.8	20.5

a/ Data do not reflect treaty Indian allocations. Includes U.S. and Canadian-origin salmon and fish caught in test fisheries.
b/ Odd-year average.
c/ Preliminary.

TABLE B-38. Summary of Puget Sound **marine recreational** salmon catches.[a/] (Page 1 of 1)

Year or Average	Chinook	Coho	Pink
	THOUSANDS OF FISH		
1971-1975	225.6	119.3	14.8[b/]
1976-1980	252.4	200.2	47.0[b/]
1981-1985	160.2	197.6	24.8[b/]
1986-1990	128.5	248.3	39.9[b/]
1976	307.2	223.9	0.2
1977	196.1	177.3	24.4
1978	228.7	223.6	0.1
1979	285.7	258.2	69.6
1980	244.5	118.2	0.2
1981	164.4	177.4	25.5
1982	120.2	209.7	0.0
1983	194.5	274.1	16.5
1984	174.6	140.7	0.1
1985	147.3	186.2	28.0
1986	170.0	261.0	0.0
1987[c/]	102.9	247.5	30.9
1988[c/]	108.3	195.0	d/
1989[c/]	135.7	220.6	48.8
1990[c/]	125.5	317.2	d/
1991[c/]	90.6	252.4	44.9
1992[c/]	97.7	189.4	0.4
1993[c/]	80.2	136.0	67.6
1994	48.2	31.7	d/
1995	67.7	74.3	100.5
1996	70.7	85.4	d/
1997	58.5	130.2	28.5
1998[e/]	26.1	89.5	0.2

a/ WDFW Statistical Areas 5 through 13, which include the Strait of Juan de Fuca, San Juan Islands, and inner Puget Sound.
b/ Odd years only.
c/ Punch card estimates adjusted for results of 1987-1990 WDFW/tribal sports emphasis study.
d/ Less than 50 fish.
e/ Preliminary.

TABLE B-39. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound chinook stocks.[a/] (Page 1 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				ALL CHINOOK (thousands)					
Strait of Juan de Fuca									
1981-1985	0.1	0.1	0.2	0.8	1.4	2.3	0.9	1.6	2.4
1986-1990	0.1	0.4	0.6	1.3	4.5	5.8	1.4	5.0	6.4
1981	0.0	0.1	0.2	0.4	0.9	1.3	0.5	1.0	1.5
1982	0.1	0.3	0.4	0.9	2.2	3.1	1.0	2.5	3.5
1983	0.1	0.1	0.2	0.7	1.6	2.3	0.8	1.7	2.5
1984	0.1	0.0	0.1	1.4	1.1	2.5	1.4	1.1	2.6
1985	0.0	0.1	0.1	0.6	1.5	2.1	0.6	1.5	2.2
1986	0.1	0.2	0.2	1.3	2.7	4.0	1.4	2.8	4.2
1987	0.1	0.5	0.6	1.3	5.2	6.5	1.4	5.7	7.1
1988	0.3	0.9	1.2	2.1	6.6	8.7	2.4	7.5	9.9
1989	0.1	0.3	0.3	1.1	5.2	6.3	1.2	5.5	6.7
1990	0.1	0.4	0.5	0.6	3.1	3.7	0.7	3.5	4.1
1991	0.1	0.3	0.4	1.0	3.5	4.5	1.1	3.8	4.9
1992	0.0	0.2	0.2	0.1	4.5	4.6	0.1	4.7	4.8
1993	0.0	0.1	0.1	0.2	2.3	2.5	0.2	2.4	2.6
1994	0.0	0.1	0.1	0.4	1.6	2.0	0.4	1.7	2.1
1995	0.0	0.0	0.0	0.1	2.8	2.9	0.1	2.8	2.9
1996	0.0	d/	d/	0.2	3.1	3.3	0.2	3.1	3.3
1997	0.0	0.0	0.0	0.3	3.4	3.7	0.3	3.5	3.8
1998[e/]	0.0	0.0	0.0	1.7	1.9	3.6	1.7	1.9	3.6
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL						5.3			
Nooksack-Samish									
1981-1985	54.0	33.5	87.5	16.1	6.5	22.6	70.1	40.1	110.1
1986-1990	38.0	26.3	64.3	10.7	4.1	14.9	48.8	30.4	79.2
1981	48.1	28.2	76.3	10.2	3.6	13.8	58.4	31.7	90.1
1982	54.6	36.1	90.7	15.0	5.6	20.6	69.6	41.7	111.3
1983	33.0	22.3	55.3	19.7	7.4	27.1	52.8	29.7	82.4
1984	69.7	33.7	103.4	18.8	9.6	28.4	88.5	43.2	131.7
1985	64.4	47.5	111.9	16.7	6.5	23.2	81.1	54.0	135.1
1986	50.3	42.9	93.2	10.7	5.3	16.0	60.9	48.3	109.2
1987	31.4	23.2	54.6	5.8	2.7	8.6	37.2	26.0	63.2
1988	19.4	19.6	39.0	5.2	2.7	8.0	24.7	22.4	47.0
1989	43.7	9.1	52.7	18.0	1.9	20.0	61.7	11.0	72.7
1990	45.5	36.5	81.9	13.9	7.9	21.8	59.4	44.4	103.7
1991	27.1	3.3	30.4	9.6	0.7	10.3	36.7	4.0	40.7
1992	15.9	1.6	17.6	8.4	0.5	9.0	24.3	2.2	26.5
1993	18.2	1.6	19.9	12.1	1.0	13.1	30.3	2.6	32.9
1994	18.2	2.6	20.8	6.4	0.9	7.3	24.6	3.6	28.1
1995	12.5	1.2	13.7	8.1	0.5	8.6	20.6	1.7	22.3
1996	17.5	1.9	19.4	9.0	0.9	10.0	26.6	2.9	29.4
1997	14.7	7.0	21.8	8.0	4.3	12.4	22.8	11.4	34.2
1998[e/]	13.4	7.9	21.2	5.1	3.1	8.3	18.5	11.0	29.5
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				8.7					

TABLE B-39. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound chinook stocks.[a/] (Page 2 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				ALL CHINOOK (thousands)					
Skagit									
1981-1985	0.6	9.2	9.8	0.8	11.5	12.3	1.4	20.7	22.1
1986-1990	0.2	4.1	4.3	0.8	12.7	13.6	1.1	16.8	17.9
1981	0.7	13.1	13.7	0.4	8.7	9.1	1.1	21.7	22.8
1982	1.1	13.7	14.8	0.8	10.4	11.3	2.0	24.1	26.1
1983	0.6	6.7	7.3	0.8	9.1	9.9	1.4	15.8	17.2
1984	0.3	2.8	3.1	1.6	13.2	14.8	1.9	16.0	17.9
1985	0.1	9.7	9.9	0.2	16.3	16.5	0.4	26.0	26.4
1986	0.2	4.5	4.7	0.8	18.1	18.9	1.0	22.6	23.6
1987	0.1	4.0	4.1	0.3	9.6	10.0	0.4	13.6	14.0
1988	0.4	3.4	3.8	1.3	12.0	13.2	1.7	15.3	17.0
1989	0.4	6.3	6.6	0.4	6.8	7.2	0.8	13.0	13.8
1990	0.2	2.2	2.3	1.3	17.2	18.5	1.5	19.4	20.8
1991	0.4	2.6	2.9	0.9	6.0	6.9	1.3	8.6	9.9
1992	0.5	1.6	2.1	2.2	7.7	9.9	2.7	9.3	12.0
1993	0.2	1.0	1.2	1.2	5.9	7.1	1.4	7.0	8.3
1994	0.3	0.4	0.7	4.0	6.2	10.3	4.3	6.6	10.9
1995	0.8	2.4	3.2	2.5	7.2	9.6	3.3	9.6	12.9
1996	d/	0.2	0.2	1.2	12.0	13.2	1.2	12.2	13.5
1997	0.0	1.2	1.2	0.0	5.0	5.0	0.0	6.2	6.2
1998[e/]	0.0	0.3	0.3	0.1	14.6	14.7	0.1	14.9	15.0
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					14.9				
Hood Canal									
1981-1985	4.9	3.6	8.6	3.8	2.0	5.8	8.7	5.7	14.4
1986-1990	10.5	4.9	15.4	6.2	2.0	8.2	16.7	6.9	23.7
1981	8.4	2.3	10.6	3.0	0.3	3.2	11.3	2.6	13.9
1982	3.5	2.5	6.0	5.0	0.4	5.4	8.5	2.9	11.4
1983	1.8	2.7	4.6	2.0	1.8	3.8	3.8	4.5	8.3
1984	5.7	4.3	10.0	4.8	2.5	7.3	10.5	6.8	17.2
1985	5.1	6.4	11.6	4.2	5.2	9.5	9.4	11.7	21.0
1986	8.8	6.5	15.4	4.7	2.8	7.5	13.6	9.3	22.9
1987	12.1	6.3	18.4	6.6	2.3	8.8	18.7	8.6	27.3
1988	11.8	4.8	16.6	10.3	2.9	13.2	22.1	7.7	29.8
1989	12.9	5.1	18.0	6.1	1.4	7.5	19.0	6.5	25.5
1990	6.9	1.9	8.7	3.4	0.7	4.1	10.3	2.6	12.9
1991	8.0	3.8	11.8	5.6	1.8	7.5	13.6	5.6	19.2
1992	0.3	0.6	0.8	1.2	0.9	2.2	1.5	1.5	3.0
1993	0.6	0.5	1.0	2.6	1.2	3.8	3.2	1.6	4.8
1994	0.2	0.2	0.4	2.4	1.1	3.4	2.6	1.3	3.8
1995	0.2	0.0	0.2	7.2	2.0	9.2	7.4	2.0	9.4
1996	d/	d/	d/	7.1	1.0	8.1	7.1	1.0	8.2
1997	0.1	0.0	0.1	7.3	0.5	7.8	7.4	0.5	7.9
1998[e/]	1.0	0.1	1.1	13.4	1.8	15.2	14.4	1.9	16.3
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				3.4					

TABLE B-39. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound chinook stocks.[a/] (Page 3 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				ALL CHINOOK (thousands)					
Stillaguamish-Snohomish									
1981-1985	3.9	6.9	10.8	2.0	4.9	6.9	5.9	11.8	17.7
1986-1990	3.4	4.2	7.6	1.1	5.2	6.4	4.5	9.4	14.0
1981	8.5	8.8	17.3	3.7	4.0	7.7	12.2	12.8	25.0
1982	2.9	7.2	10.2	2.3	5.2	7.5	5.3	12.4	17.6
1983	2.6	7.1	9.6	1.2	4.9	6.1	3.7	12.0	15.7
1984	3.3	5.6	8.9	1.4	4.1	5.5	4.7	9.7	14.4
1985	2.1	5.8	7.9	1.4	6.3	7.7	3.5	12.1	15.6
1986	5.5	5.4	10.9	0.9	5.8	6.7	6.4	11.2	17.6
1987	1.3	2.9	4.3	1.2	6.0	7.2	2.5	8.9	11.5
1988	2.6	3.7	6.3	1.1	5.2	6.4	3.7	9.0	12.7
1989	4.4	4.0	8.4	1.5	3.9	5.4	5.9	7.9	13.8
1990	3.1	5.1	8.2	1.0	5.1	6.0	4.1	10.2	14.3
1991	2.6	3.6	6.2	0.6	4.4	5.0	3.1	8.0	11.1
1992	1.8	2.2	3.9	1.0	3.5	4.5	2.7	5.7	8.4
1993	2.2	2.1	4.3	1.9	4.9	6.9	4.1	7.0	11.2
1994	3.3	1.7	5.0	3.9	4.6	8.5	7.2	6.3	13.5
1995	6.2	2.8	9.0	3.9	4.5	8.4	10.1	7.3	17.4
1996	7.5	4.0	11.5	5.7	6.2	11.9	13.1	10.2	23.4
1997	8.7	0.1	8.8	2.6	5.5	8.1	11.3	5.6	16.9
1998[e/]	7.2	0.1	7.3	1.1	7.9	9.0	8.3	7.9	16.2
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					7.3				
South Puget Sound									
1981-1985	23.1	11.2	34.4	23.3	10.2	33.5	46.5	21.4	67.9
1986-1990	22.8	23.0	45.8	33.6	21.6	55.3	56.4	44.6	101.0
1981	23.9	4.6	28.5	26.1	8.6	34.7	50.0	13.2	63.2
1982	14.1	7.2	21.3	19.1	8.8	27.8	33.2	16.0	49.2
1983	24.2	18.7	42.9	21.8	11.3	33.1	45.9	30.1	76.0
1984	28.8	13.7	42.5	27.8	11.9	39.7	56.5	25.7	82.2
1985	24.7	11.9	36.6	22.0	10.3	32.3	46.6	22.3	68.9
1986	15.1	9.7	24.8	23.8	13.2	37.0	38.8	22.9	61.8
1987	18.9	22.3	41.2	29.7	23.3	53.0	48.7	45.6	94.2
1988	23.4	27.6	51.0	26.9	18.6	45.6	50.3	46.2	96.5
1989	25.0	24.6	49.5	47.4	24.9	72.3	72.4	49.5	121.9
1990	31.7	30.6	62.3	40.3	28.1	68.4	72.0	58.8	130.8
1991	17.0	14.1	31.1	22.4	17.7	40.0	39.4	31.8	71.1
1992	16.3	12.1	28.5	18.3	12.8	31.1	34.6	24.9	59.5
1993	16.3	10.4	26.7	20.4	9.4	29.8	36.8	19.8	56.5
1994	20.0	16.0	35.9	28.9	14.0	42.9	48.9	29.9	78.8
1995	23.5	14.3	37.8	51.0	20.2	71.2	74.5	34.5	109.0
1996	18.8	11.4	30.2	39.5	24.3	63.8	58.3	35.8	94.1
1997	10.2	4.3	14.5	36.3	16.3	52.7	46.5	20.6	67.1
1998[e/]	11.7	7.1	18.7	42.5	20.2	62.7	54.2	27.3	81.5
1999[e/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL						34.9			

a/ Includes treaty Indian and non-Indian net commercial catches during the adult accounting period. Source: Puget Sound run reconstruction model.

b/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries.

c/ Includes estimated off-station returns.

d/ Less than 50.

e/ Preliminary.

TABLE B-40. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound coho stocks.[a/] (Page 1 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				COHO (thousands)					
Strait of Juan de Fuca									
1981-1985	17.4	3.4	20.8	9.0	5.1	14.1	26.4	8.5	34.9
1986-1990	6.3	2.6	8.8	3.0	6.0	9.0	9.2	8.6	17.8
1981	11.7	1.5	13.3	16.0	3.2	19.2	27.7	4.7	32.5
1982	37.7	11.0	48.7	11.5	10.1	21.6	49.2	21.1	70.3
1983	20.7	2.7	23.4	6.7	4.4	11.1	27.4	7.1	34.5
1984	6.1	0.8	6.9	3.6	5.3	8.9	9.7	6.1	15.8
1985	10.9	1.1	12.0	7.1	2.6	9.7	18.0	3.7	21.7
1986	5.9	3.4	9.3	4.4	10.3	14.7	10.3	13.7	24.0
1987	10.2	4.8	15.1	2.7	5.8	8.5	13.0	10.6	23.6
1988	3.9	1.3	5.1	2.4	4.2	6.6	6.2	5.5	11.7
1989	7.0	2.1	9.1	2.5	6.6	9.1	9.5	8.7	18.2
1990	4.3	1.3	5.7.	2.7	3.3	6.0	7.1	4.6	11.7
1991	2.7	1.0	3.7	2.7	4.1	6.8	5.4	5.1	10.6
1992	2.4	0.3	2.7	3.5	6.1	9.5	5.9	6.4	12.3
1993	0.3	0.1	0.3	4.0	3.3	7.4	4.3	3.4	7.7
1994	1.4	0.3	1.7	2.3	2.4	4.6	3.7	2.6	6.3
1995	1.0	2.3	3.4	7.2	5.7	12.9	8.2	8.0	16.3
1996	4.3	0.1	4.3	7.5	2.4	10.0	11.8	2.5	14.3
1997[d/]	1.0	0.1	1.0	13.9	5.8	19.7	14.9	5.9	20.7
1998[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL						14.8			
Nooksack-Samish									
1981-1985	131.0	18.9	149.9	24.4	7.2	31.6	155.4	26.1	181.5
1986-1990	146.9	22.8	169.7	21.1	7.4	28.5	168.0	30.2	198.2
1981	91.4	14.1	105.5	34.3	7.5	41.8	125.7	21.6	147.3
1982	160.4	15.3	175.7	22.0	4.4	26.4	182.4	19.7	202.1
1983	133.7	26.2	159.8	15.2	8.9	24.1	148.9	35.1	183.9
1984	118.9	18.9	137.8	18.6	9.5	28.1	137.5	28.4	165.9
1985	150.4	20.0	170.5	32.0	5.7	37.7	182.4	25.7	208.2
1986	172.3	17.6	189.9	22.0	6.7	28.7	194.4	24.3	218.7
1987	187.0	49.4	236.5	33.3	12.6	45.9	220.4	62.0	282.4
1988	158.0	15.4	173.4	21.2	6.9	28.1	179.2	22.3	201.5
1989	106.0	12.6	118.6	15.8	3.6	19.4	121.8	16.2	138.0
1990	111.0	19.1	130.1	13.1	7.3	20.4	124.1	26.4	150.5
1991	51.9	18.8	70.7	9.7	11.5	21.2	61.6	30.3	91.9
1992	61.5	9.4	70.9	19.6	8.4	28.0	81.1	17.8	98.9
1993	40.5	15.7	56.2	23.0	10.8	33.8	63.6	26.5	90.0
1994	43.9	20.5	64.4	12.1	13.8	25.9	56.0	34.3	90.3
1995	44.5	11.7	56.2	12.0	7.1	19.1	56.5	18.8	75.3
1996	51.0	1.6	52.5	38.2	2.0	40.3	89.2	3.6	92.8
1997	13.0	2.4	15.4	34.4	6.7	41.1	47.4	9.1	56.5
1998[d/]	17.9	7.5	25.3	21.1	10.3	31.4	39.0	17.8	56.7
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				17.9					

TABLE B-40. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound coho stocks.[a/] (Page 2 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				COHO (thousands)					
Skagit									
1981-1985	9.2	11.6	20.8	21.7	19.8	41.5	30.9	31.4	62.3
1986-1990	6.4	13.8	20.2	13.9	25.8	39.7	20.3	39.6	59.9
1981	18.1	6.4	24.5	42.1	15.0	57.1	60.2	21.4	81.6
1982	12.0	23.0	35.0	4.7	9.0	13.7	16.7	32.0	48.7
1983	4.9	11.1	15.9	10.6	24.0	34.6	15.5	35.1	50.5
1984	5.6	4.2	9.9	44.1	33.0	77.1	49.7	37.2	87.0
1985	5.3	13.3	18.6	7.2	18.0	25.2	12.5	31.3	43.8
1986	9.8	28.4	38.2	15.4	45.0	60.4	25.2	73.4	98.6
1987	7.5	8.2	15.7	30.0	33.0	63.0	37.5	41.2	78.7
1988	5.9	10.9	16.8	10.3	19.0	29.3	16.2	29.9	46.1
1989	4.2	10.6	14.8	6.8	17.0	23.8	11.0	27.6	38.6
1990	4.9	10.9	15.7	6.7	15.0	21.7	11.6	25.9	37.5
1991	1.8	4.0	5.8	3.5	7.8	11.3	5.3	11.8	17.1
1992	3.1	2.0	5.1	11.6	7.5	19.1	14.7	9.5	24.2
1993	0.7	1.1	1.9	8.8	13.4	22.2	9.5	14.5	24.0
1994	1.2	1.4	2.6	24.9	29.1	54.0	26.1	30.5	56.6
1995	1.4	2.8	4.2	6.6	13.4	20.0	8.0	16.2	24.2
1996	0.7	0.4	1.2	18.0	8.3	26.2	18.7	8.7	27.4
1997	2.4	7.6	10.0	3.1	32.6	35.7[e/]	5.5	40.2	45.7
1998[d/]	7.2	6.4	13.6	7.9	76.8	84.7	15.1	83.2	98.3
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					30.0				
Hood Canal									
1981-1985	40.5	24.3	64.8	19.0	23.6	42.6	59.5	47.9	107.4
1986-1990	45.2	23.5	68.7	14.7	18.3	33.0	59.9	41.8	101.8
1981	29.9	13.2	43.1	36.6	23.8	60.4	66.5	37.0	103.5
1982	59.2	41.2	100.4	13.8	28.3	42.1	73.0	69.5	142.5
1983	38.2	23.2	61.4	11.3	13.9	25.2	49.5	37.1	86.6
1984	41.5	20.5	62.0	25.4	37.0	62.4	66.9	57.5	124.4
1985	33.7	23.6	57.3	8.0	14.9	22.9	41.7	38.5	80.2
1986	72.8	42.3	115.1	24.8	39.9	64.7	97.5	82.2	179.7
1987	79.1	53.7	132.8	10.1	18.0	28.1	89.3	71.7	160.9
1988	9.2	3.9	13.1	9.5	11.6	21.1	18.7	15.5	34.2
1989	29.1	10.2	39.4	18.6	15.3	33.9	47.8	25.5	73.3
1990	35.9	7.4	43.3	10.5	6.8	17.3	46.4	14.2	60.7
1991	21.6	2.8	24.4	6.4	12.5	18.9	28.0	15.3	43.2
1992	3.7	0.7	4.4	5.4	19.2	24.6	9.1	19.9	29.0
1993	3.2	0.8	4.0	12.3	15.9	28.2	15.5	16.7	32.2
1994	31.5	0.9	32.3	24.8	56.1	80.9	56.2	57.0	113.2
1995	9.5	0.8	10.3	25.2	40.3	65.5	34.7	41.1	75.8
1996	4.2	0.2	4.4	27.3	37.1	64.3	31.5	37.3	68.7
1997	7.1	4.0	11.1	41.5	96.4	137.9	48.6	100.4	149.0
1998[d/]	8.3	16.9	25.2	12.4	101.0	113.4	20.7	117.9	138.6
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					21.5				

TABLE B-40. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound coho stocks.[a/] (Page 3 of 3)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				COHO (thousands)					
Stillaguamish-Snohomish									
1981-1985	22.4	56.5	79.0	12.9	88.0	100.9	35.4	144.5	179.9
1986-1990	61.9	94.8	156.7	26.1	110.4	136.5	88.0	205.2	293.2
1981	38.6	64.8	103.5	11.9	46.0	57.9	50.5	110.8	161.4
1982	19.9	41.8	61.7	3.7	65.0	68.7	23.6	106.8	130.4
1983	9.2	54.6	63.8	9.0	160.0	169.0	18.2	214.6	232.8
1984	9.7	35.6	45.3	25.9	89.0	114.9	35.6	124.6	160.2
1985	34.8	85.7	120.5	14.2	80.0	94.2	49.0	165.7	214.7
1986	36.3	113.6	149.9	26.2	140.0	166.2	62.5	253.6	316.0
1987	93.4	126.5	219.9	34.0	105.0	139.0	127.4	231.5	358.8
1988	51.0	74.3	125.3	25.0	96.0	121.0	76.1	170.3	246.3
1989	55.5	67.5	123.0	25.5	99.0	124.5	81.0	166.5	247.5
1990	73.2	92.3	165.4	20.0	112.0	132.0	93.1	204.3	297.4
1991	60.3	56.3	116.6	19.2	45.0	64.2	79.5	101.3	180.9
1992	42.8	36.8	79.6	26.4	97.5	123.9	69.2	134.3	203.4
1993	23.7	10.9	34.5	15.2	62.8	78.0	38.8	73.7	112.5
1994	48.1	32.7	80.8	24.8	182.6	207.4	72.9	215.3	288.2
1995	34.0	15.6	49.6	32.3	109.7	142.0	66.3	125.3	191.6
1996	23.5	7.3	30.8	23.6	59.2	82.8	47.1	66.5	113.6
1997	15.8	17.8	33.6	25.0	69.1	94.1	40.8	86.9	127.7
1998[d/]	NA	NA	NA	18.7	177.0	195.7	37.7	191.8	229.5
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					87.0				
South Puget Sound									
1981-1985	354.8	154.9	509.7	76.6	38.7	115.2	431.4	193.6	624.9
1986-1990	527.7	224.5	752.2	69.2	29.7	98.9	569.9	254.2	851.0
1981	245.1	65.0	310.1	73.3	34.0	107.3	318.4	99.0	417.4
1982	419.2	160.5	579.8	87.4	51.2	138.6	506.6	211.7	718.4
1983	401.3	132.3	533.6	93.5	31.1	124.6	494.8	163.4	658.2
1984	367.3	138.9	506.2	80.0	37.4	117.4	447.3	176.3	623.6
1985	341.0	277.7	618.7	48.6	39.6	88.2	389.6	317.3	706.9
1986	547.8	180.2	728.0	72.0	26.9	98.9	619.8	207.1	826.9
1987	706.0	359.4	1065.4	85.2	42.6	127.8	791.2	402.0	1193.2
1988	553.4	267.0	820.3	80.6	37.4	118.0	634.0	304.3	938.3
1989	421.3	110.8	532.1	57.3	14.5	71.8	478.6	125.3	603.9
1990	410.0	205.1	615.1	50.8	27.0	77.8	460.8	232.1	692.9
1991	223.0	78.1	301.1	54.7	15.0	69.7	277.7	93.1	370.8
1992	162.1	51.5	213.6	102.7	16.0	118.7	264.8	67.5	332.3
1993	66.6	9.4	76.0	101.2	18.4	119.6	167.8	27.8	195.6
1994	168.6	102.1	270.7	122.9	39.0	161.8	291.4	141.1	432.5
1995	115.6	50.6	166.2	103.5	32.4	135.9	219.1	83.0	302.1
1996	56.4	13.6	70.0	107.5	22.0	129.5	163.9	35.6	199.5
1997	111.4	3.0	114.4	53.1	50.0	103.1	164.5	53.0	217.5
1998[d/]	78.1	5.0	83.1	30.4	22.0	52.4	108.5	27.0	135.5
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				52.0					

a/ Includes treaty Indian and non-Indian net commercial catches during the adult accounting period. Source: Preliminary estimates of 1998 Puget Sound coho escapements, Aug. 24, 1999 Bill Tweit.

b/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries. Computed by adding average (1992-1996) pre-terminal HR to TRS for 1997 and 1998.

c/ Includes estimated off-station returns.

d/ Preliminary.

e/ Calculated using different method than 1981-1996 estimates.

TABLE B-41. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound pink stocks.[a/] (Page 1 of 2)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				PINK (thousands)					
Strait of Juan de Fuca									
1981-1985	0.0	2.1	2.1	0.0	4.3	4.3	0.0	6.4	6.4
1986-1990	0.0	7.4	7.4	0.0	6.4	6.5	0.1	13.8	13.9
1981	0.0	1.7	1.7	0.0	3.1	3.1	0.0	4.8	4.8
1983	0.0	1.1	1.1	0.0	5.1	5.1	0.0	6.2	6.2
1985	0.0	3.5	3.5	0.0	4.8	4.8	0.0	8.3	8.3
1987	0.1	2.4	2.5	0.0	2.0	2.0	0.1	4.3	4.4
1989	0.0	12.3	12.3	0.0	10.9	10.9	0.0	23.3	23.3
1991	0.0	32.1	32.1	0.0	9.9	9.9	0.0	42.0	42.0
1993	0.0	2.4	2.4	0.0	1.7	1.7	0.0	4.1	4.1
1995	0.0	0.0	0.0	0.0	8.3	8.3	0.0	8.3	8.3
1997	0.1	6.0	6.1	0.1	5.0	5.0	0.1	11.0	11.1
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				Not Agreed Upon					
Nooksack-Samish									
1981-1985	0.0	29.4	29.4	0.0	32.7	32.7	0.0	62.1	62.1
1986-1990	0.8	114.8	115.6	0.6	87.1	87.7	1.4	201.9	203.3
1981	0.0	35.3	35.3	0.0	15.0	15.0	0.0	50.3	50.3
1983	0.0	25.8	25.8	0.0	60.0	60.0	0.0	85.8	85.8
1985	0.0	27.1	27.1	0.0	23.0	23.0	0.0	50.1	50.1
1987	0.0	49.9	49.9	0.0	36.6	36.6	0.0	86.5	86.5
1989	1.6	179.7	181.3	1.2	137.6	138.8	2.8	317.3	320.1
1991	0.0	93.5	93.5	0.0	24.0	24.0	0.0	117.5	117.5
1993	0.0	83.6	83.6	0.0	56.5	56.5	0.0	140.1	140.1
1995	0.0	6.6	6.6	0.0	207.1	207.1	0.6	213.7	213.7
1997	0.0	34.2	34.2	0.0	26.0	26.0	0.0	60.2	60.2
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					50.0				
Skagit									
1981-1985	0.1	121.9	122.0	0.1	426.7	426.8	0.3	548.5	548.8
1986-1990	0.5	463.2	463.6	0.8	496.7	497.4	1.2	959.8	961.0
1981	0.4	133.4	133.7	0.3	100.0	100.3	0.6	233.4	234.0
1983	0.0	8.0	8.0	0.1	470.0	470.1	0.1	478.0	478.2
1985	0.0	224.2	224.2	0.0	710.0	710.0	0.0	934.2	934.2
1987	0.9	351.3	352.2	1.5	592.0	593.5	2.4	943.3	945.7
1989	0.0	575.0	575.0	0.0	401.3	401.3	0.0	976.3	976.3
1991	0.0	144.7	144.7	0.0	351.0	351.0	0.0	495.7	495.7
1993	0.0	145.5	145.5	0.0	530.0	530.0	0.0	675.5	675.5
1995	0.0	857.0	857.0	0.0	527.4	527.4	0.0	1,384.4	1,384.4
1997	0.0	46.6	46.6	0.0	60.0	60.0	0.0	106.6	106.6
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					330.0				

TABLE B-41. Puget Sound **commercial net** fishery catches and spawning escapements in numbers of fish for hatchery and natural Puget Sound pink stocks.[a/] (Page 2 of 2)

Year or Average	Commercial Net Catches			Spawning Escapement			Puget Sound Run Size[b/]		
	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total	Hatchery[c/]	Wild	Total
				PINK (thousands)					
Hood Canal									
1981-1985	0.1	1.1	1.2	1.2	32.0	33.1	1.3	33.1	34.4
1986-1990	4.1	11.0	15.1	5.3	61.6	66.9	9.3	72.6	81.9
1981	0.2	0.6	0.9	1.6	6.6	8.1	1.8	7.2	9.0
1983	0.0	0.2	0.3	0.5	25.2	25.7	0.5	25.4	26.0
1985	0.1	2.4	2.6	1.5	64.1	65.6	1.6	66.5	68.1
1987	1.2	2.2	3.4	8.1	62.2	70.3	9.2	64.4	73.6
1989	7.0	19.8	26.8	2.5	61.0	63.5	9.5	80.8	90.3
1991	0.8	1.5	2.3	3.3	118.5	121.8	4.1	119.9	124.0
1993	0.0	0.1	0.1	11.5	35.4	46.9	11.5	35.5	47.0
1995	1.9	0.0	1.9	24.6	31.3	55.9	26.5	31.3	57.8
1997[d/]	0.0	0.0	0.0	21.5	8.4	29.9	21.5	8.4	29.9
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL				Not Agreed Upon					
Stillaguamish-Snohomish									
1981-1985	0.1	86.1	86.2	0.2	311.4	311.6	0.3	397.5	397.7
1986-1990	0.4	199.4	199.8	0.2	210.8	211.0	0.6	410.2	410.7
1981	0.0	38.7	38.7	0.1	108.0	108.1	0.1	146.7	146.8
1983	0.0	48.9	48.9	0.3	324.1	324.4	0.3	373.0	373.3
1985	0.1	170.8	171.0	0.2	502.0	502.2	0.3	672.8	673.2
1987	0.7	84.9	85.6	0.4	271.0	271.4	1.1	355.9	357.0
1989	0.0	313.9	313.9	0.0	150.5	150.5	0.0	464.4	464.5
1991	0.1	50.6	50.7	0.4	260.0	260.4	0.5	310.6	311.2
1993	7.0	2.9	9.9	0.1	210.0	210.1	7.1	212.9	220.0
1995	46.6	6.5	51.0	0.0	309.6	309.6	44.6	316.1	360.6
1997[d/]	31.1	3.3	34.4	0.0	192.1	192.1	31.1	195.4	226.5
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL - Stillaguamish					155.0				
GOAL - Snohomish					120.0				
South Puget Sound									
1981-1985	1.1	22.6	23.8	0.3	19.7	20.0	1.4	42.3	43.7
1986-1990	0.7	97.0	97.6	0.2	52.1	52.3	0.9	149.1	149.9
1981	2.6	18.6	21.1	0.8	12.1	12.9	3.4	30.7	34.0
1983	0.6	15.3	15.9	0.1	12.2	12.3	0.8	27.5	28.3
1985	0.2	34.0	34.2	0.0	34.7	34.7	0.2	68.7	68.9
1987	0.0	64.1	64.1	0.0	42.2	42.2	0.0	106.3	106.3
1989	1.3	129.9	131.2	0.5	62.0	62.4	1.7	191.8	193.6
1991	2.4	64.8	67.2	0.3	16.0	16.3	2.7	80.8	83.5
1993[e/]	0.1	19.0	19.0	0.0	10.6	10.6	0.1	29.6	29.6
1995	0.0	4.5	4.5	0.1	17.9	18.0	0.1	22.4	22.5
1997[d/]	0.0	3.8	3.8	0.0	3.0	3.0	0.0	6.8	6.8
1999[d/]	NA	NA	NA	NA	NA	NA	NA	NA	NA
GOAL					25.0				

a/ Includes treaty Indian and non-Indian net commercial catches during the adult accounting period. Source: Puget Sound run reconstruction model.
b/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries.
c/ Includes estimated off-station returns.
d/ Preliminary.
e/ Nisqually escapement estimate incomplete in 1993.

TABLE B-42. Puget Sound spring chinook spawning escapement estimates in numbers of adult fish.
(Page 1 of 1)

	Stock						
Year	Skagit Hatchery	Skagit Natural	NF Nooksack Natural[a/]	NF Nooksack Hatchery	SF Nooksack Hatchery/ Natural	White River Hatchery[b/]	Quilcene Hatchery
1981	9	1,250	NA	NA	NA	197	NA
1982	33	965	NA	NA	NA	43	NA
1983	14	710	NA	NA	NA	49	NA
1984	6	747	13	183	188	51	NA
1985	12	3,249	74	62	445	60	149
1986	27	1,978	65	42	170	192	197
1987	21	1979	52	285	248	261	115
1988	120	2,064	131	837	233	631	119
1989	298	1,515	87	470	606	438	120
1990	307	1,592	3	109	142	517	76
1991	386	1,411	31	278	365	430	23
1992	249	1,001	143	1,016	103	1,156	20
1993	1,574	788	129	1,364	235	1,029	27
1994	881	899	13	549	118	1,227	10
1995	984	2,010	66	769	290	1,822	16
1996	856	1,728	156	1,070	203	1,972	12
1997	823	581	180	1,667	180	1,655	16
1998	364	1,050	157	1,280	336	1,173	5
1999	4,571	471	911	4,019	213	2,789	4
GOAL		3,000					

a/ Natural escapement estimates based on carcass counts which are conservative. Redd counts have been made in 2 years and escapement estimates from redd counts are 3 to 4 times higher than the carcass counts.

b/ This estimate includes adult chinook returns to Hupp Springs, White River Hatchery and to the Buckley Trap.

APPENDIX C
HISTORICAL RECORD OF OCEAN SALMON FISHERY REGULATIONS AND A CHRONOLOGY OF 1999 EVENTS

LIST OF TABLES

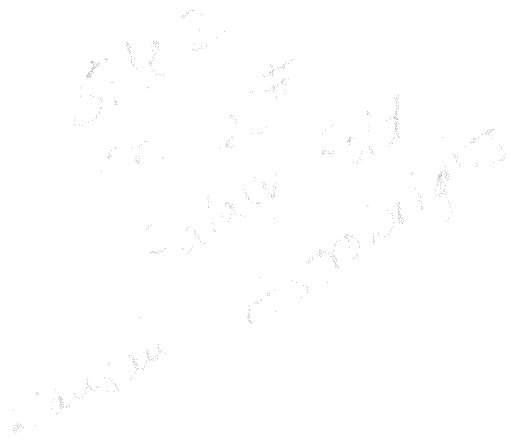

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TABLE C-1. Summary of actual **California troll** salmon seasons in state and federal (EEZ) waters. (Page 1 of 4)

Year/Area/Species[a/]	Season Dates	Days	Area, Minimum Size, Gear and Other Restrictions[b/]
1971-1978			
Statewide			
All except coho	Apr. 15-May 14	30	
All	May 15-Sept. 30	139	
1979 Statewide			
All except coho	Apr. 15-May 14	30	State waters.
All except coho	May 1-23	23	EEZ.
All	May 15-Sept. 30	139	State waters.
All	May 24-June 15; July 1-Sept. 30	115	EEZ.
1980 Statewide			
All except coho	May 1-15	15	
All	May 16-31; July 1-Sept. 30	108	Closed north of Cape Vizcaino July 1-15, except open in state waters July 4-12.
1981 Statewide			
All except coho	May 1-15	15	
All	June 1-30	30	State waters.
All	May 16-31; July 1-Sept. 30	108	
1982 Statewide			
All except coho	May 1-15	15	Open in state waters south of Pt. Arena Apr. 22-30 (approval of 1982 federal regulations was delayed).
All	May 16-June 15; July 1-Sept. 30	123	Closed north of Pt. Arena June 9-15.
1983 Oregon-California Border to Cape Vizcaino			
All except coho	May 16-31	16	
All	June 1-15; July 1-Aug. 31	77	Klamath River mouth 12 mi square closed in Aug.
All	June 17-27	11	State waters.
Cape Vizcaino to Pt. Arena			
All except coho	May 1-31	31	
All	June 1-15; July 1-Sept. 30	107	
South of Pt. Arena			
All except coho	Apr. 22-May 31	40	
All	June 1-15; July 1-Sept. 30	107	
1984 Oregon-California Border to Pt. Delgada			
All except coho	May 16-June 6; July 16-Aug. 22	60	Klamath River mouth 12 mi square closed in Aug.
All	Aug. 16-22	7	State waters opened by California Legislature; Klamath River mouth 12 mi square closed.
Pt. Delgada to Pt. Arena			
All except coho	May 1-Sept. 30	153	
All	Aug. 16-Sept. 30	46	State waters opened by California Legislature.
South of Pt. Arena			
All except coho	May 1-31	31	
All	June 1-Sept. 30	122	
1985 Oregon-California Border to Pt. Delgada			
All except coho	Closed		
South of Pt. Delgada			
All except coho	May 1-31	31	
All	June 1-Sept. 30	122	
1986 Oregon-California Border to Pt. Delgada			
All	June 16-19; 23-26; June 30-July 5; July 17-24	22	Klamath River mouth 12 mi square closed; no more than 2 coho per chinook.
All except coho	July 25-Aug. 26	33	Klamath River mouth 12 mi square closed.
All	Sept. 8-30	23	Open from south jetty of Humboldt Bay to Punta Gorda 0-6 mi.
South of Pt. Delgada			
All except coho	May 1-31; Aug. 21-Sept. 30	72	
All	June 1-Aug. 20	81	

TABLE C-1. Summary of actual **California troll** salmon seasons in state and federal (EEZ) waters. (Page 2 of 4)

Year/Area/Species[a/]	Season Dates	Days	Area, Minimum Size, Gear and Other Restrictions[b/]
1987 Oregon-California Border to Pt. Delgada			
All	June 1-3; 7-10; 14-25	19	Klamath River mouth 12 mi square closed; 2 coho, then no more than 1 coho per chinook.
All	Sept. 8-30	23	Open from Trinidad Head to Punta Gorda 0-6 mi.
Pt. Delgada to Pt. Arena			
All except coho	May 1-31	31	
All	June 1-3; 7-10; June 14-July 21	45	
All except coho	July 22-Sept. 30	71	
South of Pt. Arena			
All except coho	May 1-31; July 22-Sept. 30	102	
All	June 1-July 21	51	
1988 Oregon-California Border to Horse Mt.			
All	June 5-7	3	Klamath River mouth 12 mi square closed.
All	Sept. 1-8	8	Open from Trinidad Head to Punta Gorda 0-6 mi.
Horse Mt. to Pt. Arena			
All except coho	May 1-31; Aug. 20-Sept. 30	73	In May north of Cape Vizcaino: open 0-3 mi under state imposed 8,000 chinook quota; closed in EEZ.
All	June 5-8; 12-15; 19-22; 26-29; July 3-6; 10-13; July 17-Aug. 19	58	
South of Pt. Arena			
All except coho	May 1-31; Aug. 20-Sept. 30	42	
All	June 1-Aug. 19	80	
1989 Oregon-California Border to Punta Gorda			
All	June 5-8	4	Klamath River mouth 12 mi square closed.
All except coho	Aug. 18-20; 22-31	13	Klamath River mouth 12 mi square closed.
All	Sept. 15-Oct. 31	47	Open from Trinidad Head to Punta Gorda 0-6 mi.
Horse Mt. to Pt. Arena			
All except coho	May 1-17	17	
All	June 5-17; July 2-14; July 29-Sept. 30	90	
South of Pt. Arena			
All except coho	May 1-31	31	
All	June 1-Sept. 30	122	
1990 Oregon-California Border to Punta Gorda			
All except coho	Aug. 1-6; 8-31;	30	Klamath River mouth 12 mi square closed.
All	Sept. 3-Oct. 31	59	Open from Trinidad Head to Punta Gorda 0-6 mi.
Horse Mt. to Pt. Arena			
All except coho	May 1-29; Sept. 22-30	38	
All	June 6-11; 20-25; July 4-9; 18-23; Aug. 1-Sept. 21	76	
South of Pt. Arena			
All except coho	May 1-31; Sept. 22-30	40	
All	June 1-Sept. 21	113	
1991 Oregon-California Border to Punta Gorda			
All	Sept.1-Oct. 31	61	Open from Trinidad Head to Punta Gorda 0-6 mi.
Horse Mt. to Pt. Arena			
All	Aug. 1-2; 12-27;	18	
All except coho	Aug. 3-11; Aug. 28-Sept. 30	43	
Pt. Arena to Pt. San Pedro			
All except coho	May 1-31; July 12-15; Aug. 3-11; Aug. 28-Sept. 30	78	
All	June 8-12; June 26-July 2; July 11; Aug. 1-2; Aug. 12-27;	31	
South of Pt. San Pedro			
All except coho	May 1-31; July 12-31; Aug. 3-11; Aug. 28-Sept. 30	60	
All	June 1-July 11; Aug. 1-2; Aug. 12-27	59	

TABLE C-1. Summary of actual **California troll** salmon seasons in state and federal (EEZ) waters. (Page 3 of 4)

Year/Area/Species[a/]	Season Dates	Days	Area, Minimum Size, Gear and Other Restrictions[b/]
1992 Oregon-California Border to Horse Mt.			
	Closed		
Horse Mt. to Pt. Arena			
	Closed		
Pt. Arena to Pt. San Pedro			
All except coho	May 1-10; Aug. 8-Sept. 30	64	May 1-10, open only south of Pt. Reyes.
All	Aug. 1-7	7	
South of Pt. San Pedro			
All except coho	May 1-31; Aug. 8-Sept. 30	85	
All	June 1-Aug. 7	68	
1993 Oregon-California Border to Horse Mt.			
	Closed		
Horse Mt. to Pt. Arena			
All except coho	May 1-6; Sept. 1-30	36	May 1-6, open only 0-3 mi.
Pt. Arena to Pt. San Pedro			
All except coho	May 1-31; July 26-Aug. 31; Sept. 6-30	93	
South of Pt. San Pedro			
All except coho	May 1-Aug. 31; Sept. 6-30	148	
1994 Oregon-California Border to Horse Mt.			
	Closed		
Horse Mt. to Pt. Arena			
All except coho	Sept. 1-30	30	
Pt. Arena to Pt. Reyes			
All except coho	Aug. 1-Sept. 30	61	
Pt. Reyes to Pt. San Pedro			
All except coho	June 15-Sept. 30	108	
South of Pt. San Pedro			
All except coho	May 1-June 11; July 1-Sept. 30	134	
1995 Oregon-California Border to Horse Mt.			
	Closed		
Horse Mt. to Pt. Arena			
All except coho	Sept. 1-30	30	
Pt. Arena to Pt. Reyes			
All except coho	July 5-Sept. 30	88	
Pt. Reyes to Pt. San Pedro			
All except coho	May 24-July 4; July 19-Sept. 30	86	
South of Pt. San Pedro			
All except coho	May 1-June 15; July 19-Sept. 30	120	
1996 Oregon-California Border to Humboldt South Jetty			
All except coho	Aug. 15-22	8	No more than 4 spreads per line; minimum size limit 27 in; 30 fish daily landing limit; Klamath River mouth 12 mi square closed.
All except coho	Sept. 1-14	14	No more than 4 spreads per line; minimum size limit 27 in; 30 fish daily landing limit; Klamath River mouth 12 mi square closed.
Horse Mt. to Pt. Arena			
All except coho	Aug.1-Sept.30	61	Minimum size limit 27 in.
Pt. Arena to Pt. Reyes			
All except coho	June 1-30; Aug 1-Sept.15	76	Minimum size limit 26 in thru 6/30 and 27 in thereafter.
Bodega Head to Pt. San Pedro			
All except coho	Sept. 16-30	15	Minimum size limit 27 in.
Pt. San Pedro to U.S.-Mexico Border			
All except coho	May 1-June 30; July 3-Sept. 15	136	Minimum size limit 26 in thru 6/30 and 27 in thereafter.

TABLE C-1. Summary of actual **California troll** salmon seasons in state and federal (EEZ) waters. (Page 4 of 4)

Year/Area/Species[a/]	Season Dates	Days	Area, Minimum Size, Gear and Other Restrictions[b/]
1997 Oregon-California Border to Humboldt South Jetty			
All except coho	Sept. 1-30	30	Landing limit 30 fish per day; all fish must be landed in the area; Klamath River mouth 12 mi square closed.
Horse Mt. to Pt. Arena			
All except coho	Sept.1-30	30	
Pt. Arena to Pt. Reyes			
All except coho	July 16-Sept. 30	77	
Pt. Reyes to Pt. San Pedro			
All except coho	July 1-Sept. 30	92	
Pt. San Pedro to U.S.-Mexico Border			
All except coho	May 1-31; June 23-July 18; Sept. 1-30	87	
Pt. Lopez to Pt. Mugu			
All except coho	Apr. 15-22	8	All fish must be landed within the area.
1998 Oregon-California Border to Humboldt South Jetty			
All except coho	Sept. 1-30 (6,000 chinook quota)	30	Landing limit 30 fish per day; all fish must be landed in the area; Klamath River mouth 12 mi square closed.
Horse Mt. to Pt. Arena			
All except coho	Sept.1-30	30	
Pt. Arena to Pt. Reyes			
All except coho	Aug. 1-Sept. 30	61	
Fort Ross to Pt. Reyes			
All except coho	July 5-31	27	Quota of 3,000 chinook; open 0-6 nautical miles; landing limit of 30 fish per day within the area.
Pt. Reyes to Pt. San Pedro			
All except coho	July 1-Sept. 30	92	
Pt. San Pedro to Pt. Sur			
All except coho	May 1-31; June 16-Sept. 30	138	
Pt. Sur to U.S.-Mexico Border			
All except coho	May 1-Sept. 30	153	
1999 Oregon-California Border to Humboldt South Jetty			
All except coho	Sept. 1-30 (7,000 chinook quota)	30	Landing limit 30 fish per day; all fish must be landed in the area; Klamath River mouth 12 mi square closed.
Horse Mt. to Pt. Arena			
All except coho	Sept.1-30	30	
Pt. Arena to Pt. Reyes			
All except coho	July 17-Sept. 30	76	Minimum size limit 27 in.
Fort Ross to Pt. Reyes			
All except coho	July 1-12	12	Quota of 2,500 chinook; open 0-6 nautical miles; landing limit 30 fish per day within the area.
Pt. Reyes to Pt. San Pedro			
All except coho	July 1-Sept. 30	92	Minimum size limit 27 in.
Pt. San Pedro to U.S.-Mexico Border			
All except coho	May 1-Aug. 21; Sept. 1-30	143	Minimum size limit 27 in. after June 30.
Pillar Pt. to Pigeon Pt.			
All except coho	Apr. 14-16	3	Test fishery. Landing limit 30 fish per day in the area.
Pt. Piedras Blancas to Pt. Conception			
All except coho	April 14-16; 21-23; 26-28	9	Test fishery. Same as above, except beginning Apr. 21 a landing limit of 90 fish per open period.
Pt. Conception to Pt. Pitas			
All except coho	April 14-16; 21-23; 26-28	9	Test fishery. Same as above.

a/ Major ports located as follows: Oregon-California border to Horse Mt. includes Crescent City and Eureka; Horse Mt. to Pt. Arena includes Shelter Cove and Fort Bragg; Pt. Arena to Pt. Reyes includes Bodega Bay; Pt. Reyes to Pt. San Pedro includes San Francisco and Half Moon Bay; South of Pt. San Pedro includes Santa Cruz, Monterey and Morro Bay.

b/ Unless otherwise noted: (1) minimum sizes (total length) are chinook 26 in., coho 22 in; (2) single barbless hooks required and (3) no more than 6 lines per vessel.

TABLE C-2. Summary of actual **California recreational** ocean salmon regulations. (Page 1 of 3)

Year	Area	Season	Bag Limit	Minimum Size Limit (inches) All Salmon
1977	North of Tomales Pt.	All Year	3	22[a/]
	South of Tomales Pt.	Feb. 12-Nov. 13	3	22[a/]
1978	North of Tomales Pt.	All Year	3	22[a/]
	South of Tomales Pt.	Feb. 18-Nov. 12	3	22[a/]
1979	Statewide	Feb. 17-Oct. 14	2	22[a/]
1980	Statewide	Feb. 17-Oct. 13	2	22[a/]
1981	Statewide	Feb. 14-Nov. 15	2	22[a/]
1982	Statewide	Feb. 13-Nov. 14	2	22[a/]
1983	Statewide	Feb. 12-Nov. 13	2	22[a/]
1984[b/]	North of Cape Vizcaino[c/]	Feb. 18-June 15; July 1-Nov. 18	2	20
	South of Cape Vizcaino	Feb. 18-Nov. 18	2	20
1985[b/]	Statewide[d/]	Feb. 16-Nov. 17	2	20
1986[b/]	North of Pt. Delgada[c/]	Feb. 16-Mar. 28; May 24-Sept. 7	2[e/f/]	20
	South of Pt. Delgada	Feb. 15-Nov. 16	2	20
1987[g/]	North of Pt. Delgada[c/]	May 23-Sept. 13	2[f/]	20
	South of Pt. Delgada	Feb. 14-Nov. 15	2	20
1988[g/]	North of Horse Mt.[c/]	May 28-Sept. 11 Sept. 12-30[h/]	2[f/] 2[f/]	20 20
	South of Horse Mt.	Feb. 13-Nov. 13	2	20
1989[g/]	North of Horse Mt.[c/]	May 1-Sept. 30	2[f/]	20
	South of Horse Mt.	Feb. 18-Nov. 12	2	20
1990[g/]	North of Horse Mt.	May 1-Sept. 9 Sept. 10-Oct. 31[h/]	2[f/i/] 2[f/]	20 20
	South of Horse Mt.[j/]	Feb. 17-Nov. 18	2	20
1991[g/]	North of Horse Mt.[c/]	May 25-July 28[k/] Aug. 31-Sept. 30[l/] Oct. 1-31[h/]	2[f/m/] 2[f/m/] 2[f/]	20 20 20
	Horse Mt. to Pt. Arena	Feb. 16-Nov. 17	2	20
	South of Pt. Arena[n/]	Mar. 2-Nov. 3	2	20
1992[g/]	North of Horse Mt.	July 6-8; July 13-15; July 20; Sept. 1-7	1	20
	Horse Mt. to Pt. Arena	Feb. 15-May 31; June 30-July 16; Sept 1-Nov. 15	2	20
	Pt. Arena to Pt. San Pedro[o/]	Feb. 29-May 31; June 30-Nov. 1 June 1-29[p/]	2 2	20 20
	South of Pt. San Pedro	Feb. 29-Nov. 1	2	20
1993[g/]	North of Horse Mt.[c/]	May 1-June 19; July 14-Aug. 28[q/] Sept. 1-6	1 1	20 20
	Horse Mt. to Pt. Arena	Feb. 13-Nov. 14	2	20
	South of Pt. Arena[r/]	Feb. 27-Oct. 31	2[s/]	20
1994[g/]	North of Horse Mt.[c/t/]	May 1-June 7; Aug. 27-31; Sept. 1-5	2	20
	Horse Mt. to Pt. Arena[u/]	Feb. 12-June 30; Aug. 1-Nov. 13	2	20
	South of Pt. Arena[u/v/]	Feb. 26-Oct. 30	2	20

TABLE C-2. Summary of actual **California recreational** ocean salmon regulations. (Page 2 of 3)

Year	Area	Season	Bag Limit	Minimum Size Limit (inches) All Salmon
1995[g/]	North of Horse Mt.[c/t]	May 17-July 1; Aug. 16-18[q/]	1[f/]	20
		Sept. 1-9	1	20
	Horse Mt. to Pt. Arena[u/]	Feb. 18-June 30; Aug. 1-Nov. 12	2	20
	South of Pt. Arena[u/v/]	Mar. 4-Oct. 29	2	20
1996[g/]	North of Horse Mt.[c/t/w/]	May 12-July 7; Aug. 18-Sept. 21	1	20
	Horse Mt. to Pt. Arena[t/w/x/]	Feb. 17-July 7; Aug. 1-Nov.17	2	24
	Pt. Arena to Pt. San Pedro[t/v/w/]	Mar. 2-Oct. 14[y/]	2	24[z/]
	South of Pt. San Pedro[t/w/]	Mar. 2-Aug. 25[y/]	2	24[z/]
1997[g/]	North of Horse Mt.[c/t/w/]	May 24-30; June 17-July 6; Aug. 12-Sept. 14	1	20
	Horse Mt. to Pt. Arena[t/w/x/]	Feb. 15-July 6; Aug. 1-Nov.16	2	24
	Pt. Arena to Pigeon Pt.[t/v/w/x/]	Mar. 29-Nov. 2	2	24[aa/]
	South of Pigeon Pt.[t/w/x/]	Mar. 15-Oct. 19	2	24
1998[g/]	North of Horse Mt.[c/t/w/]	May 23-June 10; June 21-July 5; Aug. 11-Sept. 13	1	20
	Horse Mt. to Pt. Arena[t/w/x/]	Feb. 14-July 5; Aug. 1-Nov.15	2	24
	Pt. Arena to Pigeon Pt.[t/v/w/x/]	Mar. 28-Nov. 1	2	24[aa/]
	South of Pigeon Pt.[t/w/x/]	Mar. 14-Sept. 7	2	24
1999[g/]	North of Horse Mt.[c/t/w/]	May 29-July 4; July 29-Sept. 14	1	20
	Horse Mt. to Pt. Arena[t/w/x/]	Feb. 13-July 4; July 25-Nov.14	2	24
	Pt. Arena to Pigeon Pt.[t/v/w/x/]	Mar. 27-Oct. 31	2	24[aa/]
	South of Pigeon Pt.[t/w/x/]	Mar. 14-Sept. 6	2	24[aa/]

a/ Except that 1 salmon per day could be less than 22 inches, but not less than 20 inches.
b/ Only single-point barbless hooks.
c/ The 12-mile square off the Klamath River mouth closed during the month of Aug.
d/ Closed to salmon fishing north of Pt. Delgada on Mondays and Tuesdays, July 19-Aug. 31 by action of the California Fish and Game Commission; 12-mile square closed off Klamath River mouth Aug. 1-31.
e/ Prior to June 23, not more than 1 coho and 1 chinook.
f/ Beginning in May, not more than 6 salmon in any 7 consecutive days.
g/ Only single-point barbless hooks north of Pt. Conception. In 1993, only one rod could be used per angler north of Pt. Conception (see footnote w for similar restriction on the number of rods in 1996-1998).
h/ Open only from Trinidad Head to Punta Gorda inside 6 miles.
i/ Only 1 could be a chinook, June 30-Aug. 15.
j/ A control zone near the mouth of San Francisco Bay closed Mar. 1-Apr. 30 and Nov. 1-18.
k/ Closed Tuesdays and Wednesdays each week.
l/ Closed Monday through Thursday each week except open Monday, Sept. 2.
m/ Only 1 could be a chinook.
n/ A control zone near the mouth of San Francisco Bay closed Mar. 2-31.
o/ A control zone (at the mouth of San Francisco Bay) closed Feb. 29-Apr. 3.
p/ Open inside conservation zone near the mouth of San Francisco Bay.
q/ Open Wednesday through Saturday only.
r/ Control zone at the mouth of San Francisco Bay closed Feb. 27-Apr. 2.
s/ Sept. 1 through end of season only 1 fish of the 2-fish bag limit could be 26 inches or longer.
t/ All salmon except coho.
u/ All salmon through Apr. 30, then all salmon except coho.
v/ Control zone at mouth of San Francisco Bay closed from opening of season through Mar. 31.
w/ All persons fishing for salmon, and all persons fishing from a boat with salmon on board, may use no more than one rod per angler north of Point Conception.

x/ The following special gear restrictions were in effect to reduce hook-and-release mortality from mooching between Horse Mt. and Pt. Conception.
- 1996: July 1-Nov. 17 - when fishing with bait and 1 pound or less of weight, the size, number and spacing of hooks are restricted.
- 1997: May 1-Sept. 1 - when fishing with bait and 1 pound or less of weight, the size, number and spacing of hooks are restricted and circle hooks were required beginning Sept. 2.
- 1998 When fishing by any means other than trolling, the number and spacing of hooks are restricted and circle hooks required, except circle hooks are not required when fishing with artificial lures without bait.
- 1998: Same as 1998.

y/ Closed in federal waters July 2-14 to reduce impacts on Sacramento winter chinook to account for a delay in increasing the size limit within state waters during this same time.

z/ After July 1, minimum size limit 26 inches; except the 24 inch limit remained in effect within state waters thru July 14.

aa/ Except no minimum size limit at the following times and locations:
- 1997, Pt. Reyes to Pigeon Pt. - July 1-Sept. 1
- 1998, Pt. Arena to Pigeon Pt. - July 1-Sept. 7
- 1999, South of Pt. Arena - Aug. 1-Sept. 6.

TABLE C-3. Summary of actual **Oregon troll** salmon seasons in state and federal (EEZ) waters. (Page 1 of 6)

Year	Area	Seasons		Number of Days		Minimum Size Limit	
		All-Salmon-Except-Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1979	North of Cape Falcon	May 1-31	July 1-24; Aug. 4-31[a/]	31	52	28	16
	Cape Falcon to OR/CA Border	May 1-31; Sept. 4-Oct. 31	July 1-Sept. 3[b/]	89	65	26	16
	Cape Blanco to Humbug Mt. and Goat Island to OR/CA Border	Nov. 1-30[c/]	-	30	-	26	-
1980	North of Cape Falcon	May 1-31	July 15-Sept. 8	31	56	28	16
	Cape Falcon to Cape Blanco	May 1-31; June 16-30; Sept. 9-Oct. 31	July 15-Sept. 8	99	56	26	16
	Cape Blanco to OR/CA Border	May 1-31; Sept. 9-Oct. 31	July 15-Sept. 8	84	56	26	16
	Cape Blanco to Humbug Mt. and Goat Island to OR/CA Border	Nov. 1-30[c/]	-	30	-	26	-
1981	North of Cape Falcon	May 1-31	July 15-Aug. 21[d/e/]	31	38	28	16
	Cape Falcon to OR/CA Border	May 1-31; Aug. 22-Sept. 8;[f/] Sept. 9-Oct. 31	July 1-Aug. 21[e/]	102	52	26	16
	Cape Blanco to Humbug Mt. and Goat Island to OR/CA Border	Nov. 1-30[c/]	-	30	-	26	-
1982	North of Cape Falcon	May 1-31	July 1-8	31	8	28	16
	Cape Falcon to Cape Blanco	May 1-June 15; July 13-Oct. 31	July 1-12	157	12	26	16
	Cape Blanco to OR/CA Border	May 1-June 8; July 13-Oct. 31	July 1-12	150	12	26	16
	Cape Blanco to Humbug Mt. and Goat Island to OR/CA Border	Nov. 1-30[c/]	-	30	-	26	-
1983	North of Cape Falcon	May 1-31	July 1-31;[g/] Aug. 10-Sept. 8[h/]	31	61	28	16
	Cape Falcon to Cape Kiwanda	May 1-31	Aug. 1-Sept. 4	103	35	26	16
	Cape Kiwanda to Heceta Head	May 1-31; June 1-15; Sept. 5-Oct. 31	July 1-25; Aug. 1-Sept. 4	103	60	26	16
	Heceta Head to Cape Blanco	May 1-31; June 1-15; July 26-Oct. 31[i/]	July 1-25	144	25	26	16
	Cape Blanco to OR/CA Border	May 16-31; June 1-15; July 26-Sept. 15;[j/] Oct. 1-31	July 1-25	114	25	26	16
	Cape Blanco to Humbug Mt.	Nov. 1-30[c/]	-	30	-	26	-
1984	North of Cape Falcon	May 1-7	-	7	-	28	-
	Columbia River to Cape Falcon	-	Aug. 4-6	-	3	28	16
	Cape Falcon to Cape Blanco	May 1-June 15; July 1-Sept. 21[k/]	-	129	-	26	-
	Manhattan Beach to Pyramid Rock	Oct. 1-31[c/]	-	31	-	26	-
	Cape Blanco to OR/CA Border	May 16-June 6; July 16-Aug. 22	-	60	-	26	-
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 30[c/]	-	61	-	26	-

TABLE C-3. Summary of actual **Oregon troll** salmon seasons in state and federal (EEZ) waters. (Page 2 of 6)

Year	Area	Seasons		Number of Days		Minimum Size Limit	
		All-Salmon-Except-Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1985	North of Cape Falcon	May 1-14; May 21-31	Aug. 21	25	1	28	16
	Cape Falcon to Cape Blanco	May 1-June 30; July 27-Oct. 31	July 1-26[l/]	158	26	26	16
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 30[c/]	-	61	-	26	-
	Tower Rock to Cape Blanco	Nov. 1-30[c/]	-	30	-	26	-
1986	North of Cape Falcon	May 1-10; 14-17; 24-27; 30-31	Aug. 2-3; Aug. 7-9	20	5	28	16
	Cape Falcon to Cape Perpetua	May 1-June 30; July 25-Oct. 31	July 1-20; July 23-24[m/]	160	22	26	16
	Cape Perpetua to Cape Blanco	May 1-June 30; July 25-Oct. 31	July 1-20; July 23-24[n/]	160	22	26	16
	Twin Rocks to Pyramid Rock	Nov. 1-15	-	15	-	26	-
	Sisters Rocks to Chetco Pt.[o/]	May 1-June 6	-	37	-	26	-
	Cape Blanco to OR/CA Border	July 25-Aug. 26	June 16-19; 23-26; June 30-July 5; July 17-24[p/]	24	22	26	22
	Sisters Rocks to Mack Arch	Aug. 29	-	1	-	26	-
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 26	-	57	-	26	-
1987	North of Cape Falcon	May 1-10; May 14-15	July 25-26	12	2	28	16
	Cape Falcon to Cascade Head	May 1-July 14; Sept. 16-Oct. 31	July 15-28; Aug. 1-Sept. 15[q/r/]	121	60	26	16
	Cascade Head to Cape Perpetua	May 1-July 14; Sept. 16-Oct. 31	July 15-28;[q/] Aug. 1-Sept. 15[r/s/]	121	60	26	16
	Cape Perpetua to Cape Blanco	May 1-June 30; Sept. 16-Oct. 31[t/]	July 1-28; Aug. 1-Sept. 15[r/u/]	107	74	26	16
	Sisters Rocks to Chetco Pt.[o/]	May 1-14	-	14	-	26	-
	Cape Blanco to OR/CA Border	-	June 1-3; June 7-10; June 14-25[l/]	-	19	26	22
	Cape Blanco to Humbug Mt.[c/]	Oct. 1-Nov. 30	-	61	-	26	-
1988	North of Cape Falcon	May 1-June 14	-	45	-	28	-
	Cape Falcon to Cascade Head	May 1-June 30; Aug. 20-Oct. 31	July 1-Aug. 19	134	50	26	16
	Cascade Head to Cape Arago	May 1-June 30; Aug. 20-Oct. 31	July 1-13; July 16-Aug. 19[t/]	134	48	26	16
	Cape Arago to Orford Reef Red Buoy	May 1-June 30; Aug. 20-31; Sept. 16-Oct. 31	July 16-Aug. 19	119	35	26	16
	Sisters Rocks to Chetco Pt.[o/]	May 1-4	-	4	-	26	-
	Orford Reef Red Buoy to OR/CA Border	-	June 5-7	-	3	26	22
	Sisters Rocks to Mack Arch[o/]	Sept. 1-14	-	14	-	26	-
	Orford Reef Red Buoy to Humbug Mt.[c/]	Oct. 1-31	-	31	-	26	-
	Cape Blanco to Humbug Mt.[c/]	Nov. 1-30	-	30	-	26	-

TABLE C-3. Summary of actual **Oregon troll** salmon seasons in state and federal (EEZ) waters. (Page 3 of 6)

Year	Area	Seasons		Number of Days		Minimum Size Limit	
		All-Salmon-Except-Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1989	North of Cape Falcon	May 1-June 8; June 13-15	Aug. 21; Aug. 24-Sept. 10[v/w/]	42	19	28	16
	Cape Falcon to Cascade Head	May 1-July 11; Aug. 18-Oct. 31	July 12-14; July 18-Aug. 17[x/]	147	34	26	16
	Cascade Head to Cape Arago	May 1-June 23; Aug. 18-Oct. 31	July 1-14; July 18-Aug. 17[y/]	129	45	26	16
	Cape Arago to Orford Reef Red Buoy	May 1-June 23; Sept. 1-Oct. 31	July 1-14; Aug. 1-Aug. 17[y/]	115	31	26	16
	Orford Reef Red Buoy to Humbug Mt.[c/]	Oct. 1-31	-	31	-	26	-
	Cape Blanco to Humbug Mt.[c/]	Nov. 1-30	-	30	-	26	-
	Humbug Mt. to OR/CA Border	Aug. 18-20; Aug. 22-31[z/]	June 5-8[z/]	13	4	26	22
	Sisters Rocks to House Rock[o/]	May 1-2	-	2	-	26	-
	Sisters Rocks to Mack Arch[o/]	Sept. 1-14	-	14	-	26	-
1990	North of Cape Falcon	May 1-14; 18-27; May 31-June 2; June 8-11; June 14	Aug. 18-21; 25-26; Aug. 30-Sept. 14; Sept. 18-19; Sept. 22-Oct. 15[aa/]	32	48	28	16
	Cape Falcon to Cascade Head	May 1-June 25; July 4-15; Sept. 1-Oct. 31	July 16-Aug. 31[bb/]	129	47	26	16
	Cascade Head to Cape Arago	May 1-June 25; Aug. 1-Oct. 31	July 4-31[cc/]	148	28	26	16
	43°30'00"N to Cape Arago[c/]	-	Nov. 1-14[dd/]	-	14	26	16
	Cape Arago to Humbug Mt.	May 1-June 25; Aug. 1-6; Aug. 15-Oct. 31	July 4-9; July 18-23[cc/]	140	12	26	16
	Sisters Rocks to House Rock[o/]	May 1-24	-	24	-	26	-
	Sisters Rocks to OR/CA Border	Aug. 1-6; Aug. 8-31	-	30	-	26	-
	Sisters Rocks to Mack Arch[o/]	Sept. 3-16	-	14	-	26	-
1991	North of Cape Falcon	May 1-June 15	Aug. 10-11[ee/]; Sept. 1-2[ff/]	46	4	28	16
	Cape Falcon to Cascade Head	May 1-June 30;[gg/] July 15-23; Aug. 1-Oct. 31	July 1-14	162	14	26	16
	Cascade Head to Florence South Jetty	May 1-June 23;[gg/] July 12-23; Aug. 1-Oct. 31	June 24-July 11	158	18	26	16
	Florence South Jetty to Cape Arago	July 12-14; Aug. 1-9	June 24-July 11	12	18	26	16
	Florence South Jetty to Humbug Mt.	Sept. 1-Oct. 31	-	61	-	26	-
	Sisters Rocks to Mack Arch	Sept. 1-15[c/]	-	15	-	26	-
1992	North of Cape Falcon	May 1-June 15	July 20-21; 25-27; July 31-Aug. 2; Aug. 6-8; 12-14; Aug. 20-22[gg/hh/ii/]	46	17	28	16
	Cape Falcon to Cascade Head	May 1-31;[gg/] Sept. 1-Oct. 31	July 22-Aug. 21;[p/] Aug. 22-31[jj/]	92	41	26	16
	Cascade Head to Florence South Jetty	May 1-31;[gg/] Aug. 8-Oct. 31	July 22-Aug. 7[p/]	116	17	26	16
	Cape Blanco to Humbug Mt.	Oct. 24-26[c/]	-	3	-	26	-

TABLE C-3. Summary of actual **Oregon troll** salmon seasons in state and federal (EEZ) waters. (Page 4 of 6)

Year	Area	Seasons		Number of Days		Minimum Size Limit	
		All-Salmon-Except-Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1993	North of Cape Falcon	May 1-June 15	July 14-17; 21-24; 28-31; Aug. 4-6; 27-28; Sept. 1-4; 9-12; 16-19[kk/]	46	29	28	16
	Cape Falcon to Florence South Jetty	May 1-Oct. 31[gg/]	-	184	-	26	-
	Florence South Jetty to Cape Arago	May 1-June 30; Sept. 1-Oct. 31[gg/]	-	122	-	26	-
	Cape Arago to Humbug Mt.	May 1-31; Sept. 1-Oct. 31[gg/]	-	92	-	26	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[c/]	-	30	-	26	-
1994	North of Cape Falcon	-	-	-	-	-	-
	Cape Falcon to Cascade Head	May 1-June 30; Oct. 1-31[gg/]	-	92	-	26	-
	Twin Rocks to Pyramid Rock	Nov. 1-15[c/gg/]	-	15	-	26	-
	Cascade Head to Florence South Jetty	May 1-June 30; Sept. 1-Oct. 31[gg/]	-	122	-	26	-
	Florence South Jetty to Humbug Mt.	May 1-June 30; Sept. 1-Oct. 31[gg/]	-	122	-	26	-
	Cape Blanco to Humbug Mt.	Nov. 1-7[c/gg/]	-	7	-	26	-
	Sisters Rocks to House Rock	May 1-2; 5-6; 10-11; 14-15; 18-31[o/gg/]	-	22	-	26	-
	Sisters Rocks to Mack Arch	Aug. 8-31[o/gg/]	-	24	-	26	-
	Goat Island to Red Pt.	Oct. 10-25; 30-31[c/z/gg/]	-	18	-	26	-
1995	North of Cape Falcon	-	-	-	-	-	-
	Cape Falcon to Cape Arago	May 1-June 30; Aug. 1-Oct. 31[gg/ll/]	-	153	-	26	-
	Cape Arago to Humbug Mt.	May 1-June 30; Sept. 1-Oct. 31[gg/]	-	122	-	26	-
	Cape Blanco to Humbug Mt.	Nov. 1-7[mm/nn/]	-	7	-	26	-
	Sisters Rocks to House Rock	May 1-2; 5-6; 10-11; 14-15; 18-31[oo/]	-	22	-	26	-
	Sisters Rocks to Mack Arch	July 24-25[oo/]	-	2	-	26	-
	Goat Isl. to 42°01'20" N	Oct. 10-20[pp/nn/]	-	11	-	26	-
1996	North of Cape Falcon	-	-	-	-	-	-
	Cape Falcon to Cape Arago	May 1-Jun. 30; Aug. 7-Oct. 31[gg/qq/]	-	147	-	26	-
	Cape Arago to OR/CA Border	May 1-4; May 8-11; May 15-June 4[gg/]	-	29	-	26	-
	Cape Arago to Humbug Mtn.	Aug. 7-Oct. 31[gg/]	-	86	-	26	-
	Cape Blanco to Humbug Mtn.	Nov. 1-30[mm/nn/]	-	30	-	26	-
	Sisters Rocks to Mack Arch	Aug. 3-4; 7-8; 11-12; 15-31[rr/]	-	23	-	26	-
	Goat Island to 42°01'20"N	Oct. 14-31[nn/pp/]	-	18	-	26	-

TABLE C-3. Summary of actual **Oregon troll** salmon seasons in state and federal (EEZ) waters. (Page 5 of 6)

Year	Area	Seasons		Number of Days		Minimum Size Limit	
		All-Salmon-Except-Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1997	North of Cape Falcon	May 1-June 15	-	46	-	28	-
	Cape Falcon to Cape Arago	Apr. 15-June 27; Aug. 1-31; Sept. 4-Oct. 31[gg/qq/]	-	163	-	26	-
	Twin Rocks to Pyramid Rock	Nov. 1-15[c/gg/]	-	15	-	26	-
	Cape Arago to OR/CA Border	Apr. 15- May 28	-	44	-	26	-
	Cape Arago to Humbug Mtn.	Aug. 1-Oct. 31[gg/]	-	92	-	26	-
	Cape Blanco to Humbug Mtn.	Nov. 1-30[mm/nn/]	-	30	-	26	-
	Sisters Rocks to Mack Arch	Aug. 1-2; 5-6; 9-10; 13-31[rr/]	-	25	-	26	-
	Goat Island to 42°01'20"N	Oct. 13-25; 29-30[nn/pp/]	-	15	-	26	-
1998	North of Cape Falcon	May 1-12; 20-23; June 2-4	-	19	-	28	-
	Cape Falcon to Heceta Banks (43°58'00")	Apr. 15-June 30; Aug. 1-28; Sept. 1-Oct. 31[gg/qq/]	-	166	-	26	-
	Twin Rocks to Pyramid Rock	Nov. 1-15[c/gg/]	-	15	-	26	-
	Heceta Banks (43°58'00") to Humbug Mt.	Apr. 15-June 30; Aug. 1-26; Sept. 1-Oct 31[gg/]	-	164	-	26	-
	Humbug Mtn. to OR/CA Border	Apr. 15-May 31[gg/]	-	47	-	26	-
	Cape Blanco to Humbug Mtn.	Nov. 1-30[mm/nn/]	-	30	-	26	-
	Sisters Rocks to Mack Arch	Aug. 1-2; 5-6; 9-10; 13-31[rr/]	-	25	-	26	-
	Goat Island to 42°01'20"N	Oct. 15-31[nn/pp/]	-	17	-	26	-
1999	North of Cape Falcon	May 1-June 15	-	46	-	28	-
	Cape Falcon to Humbug Mt.	Apr. 1-July 17; Aug. 1-29; Sept. 1-Oct. 31[gg/qq/]	-	198	-	26	-
	Twin Rocks to Pyramid Rock	Nov. 1-15[c/gg/]	-	15	-	26	-
	Cape Blanco to Humbug Mtn.	Nov. 1-Dec. 15[mm/nn/]	-	45	-	26	-
	Humbug Mtn. to OR/CA Border	May 1-31[gg/]	-	31	-	26	-
	Sisters Rocks to Mack Arch	Aug. 1-31[rr/]	-	31	-	26	-
	Goat Island to 42°01'20"N	Oct. 15-31[nn/pp/]	-	17	-	26	-
	South of House Rock	Sept. 1-30[ss/]	-	30	-	26	-

a/ Closed early in response to court order to meet Columbia River fall chinook treaty Indian obligations.
b/ Closed in Oregon waters Sept. 3 for coho. EEZ closed on Sept. 15.
c/ State waters only.
d/ Special lottery-selected, 10-boat only experimental troll fishery off Columbia River mouth out to 12 miles for coho only from Sept. 20-Oct. 9.
e/ State waters open until Aug. 24.
f/ From Aug. 25 in state waters, Cape Falcon to Cape Sebastian, whole bait or $\geq$5 inch plugs.
g/ Incidental coho allowance $\leq$33 percent per trip; 20,000 coho total. Conservation zone closure off Columbia River mouth, May 1-31 and July 1-31.
h/ Limited to area of Columbia River (south jetty) to Cape Falcon out to 10 miles only.
i/ From July 26-31, chinook fishing allowed from Cape Perpetua south.

j/ From Sept. 1-15, fishery limited to 12 by 24 mile area off Rogue River mouth.
k/ Sept. 1-21 state waters only.
l/ At least 1 chinook must be possessed or landed for each coho possessed or landed.
m/ A single daily possession or landing of 50 coho is permitted without chinook restrictions. Over 50 coho, at least 1 chinook must be possessed or landed for each 2 coho possessed or landed.
n/ July 1-20, at least 1 chinook must be possessed or landed for each 2 coho possessed or landed. July 23-24, see footnote m/.
o/ Open from 0 to 6 nautical miles only.
p/ At least 1 chinook must be possessed or landed for each 2 coho possessed or landed during the all salmon season.
q/ July 15-Aug. 28, a single daily possession limit of 100 coho is permitted without chinook restrictions. Over 100 coho, at least 1 chinook must be possessed or landed for each 2 coho possessed or landed.
r/ Aug. 29-Sept. 15, no more than 200 coho may be possessed or landed without chinook restrictions. Over 200 coho, at least 1 chinook must be possessed or landed for each 2 coho possessed or landed.
s/ Aug. 1-28, at least 1 chinook must be possessed or landed for each 2 coho possessed or landed, except that 1 coho may be possessed or landed without having chinook.
t/ Sept. 16-18 closed to all commercial salmon fishing from Cape Arago to Cape Blanco.
u/ One chinook must be possessed or landed for each 2 coho possessed or landed, except that the first 2 coho may be landed without a chinook.
v/ Open from Columbia River to Cape Falcon on Aug. 21, open area extended north to Leadbetter Pt. from Aug. 24-Sept. 10.
w/ A single daily limit of 40 coho and 4 chinook in effect Aug. 21 and Aug. 24-27. Daily landing limit of 40 coho and 8 chinook in effect from Aug. 28-Sept. 10.
x/ A single daily landing of 50 coho in effect from July 18-Aug. 13. From Aug. 14-17, at least 1 chinook must be landed for each 2 coho landed, except that a single daily landing of 2 coho without any chinook is permitted.
y/ A single daily landing of 50 coho plus 3 coho for each chinook landed in effect from July 1-14. For the remainder of the season, at least 1 chinook must be landed for each 2 coho landed, except that a single daily landing of 2 coho without any chinook is permitted.
z/ A single daily landing of 20 chinook was permitted.
aa/ Vessel landing limits of not more than 20 chinook and 200 coho for Aug. 18-21 opening and not more than 200 coho for Aug. 25-26 opening. Single daily landing limits of 50 coho during Aug. 30-Sept. 24 and 100 coho after Sept. 25.
bb/ Single daily landing limit per vessel of 50 coho without landing chinook. Above 50 coho, at least 1 chinook must be landed for each coho.
cc/ At least 1 chinook must be landed for each coho landed, except 1 coho may be landed without having chinook.
dd/ Special test fishery restricted to 10 lottery selected vessels.
ee/ Open period restriction of not more than 100 coho per vessel.
ff/ Open period restriction of not more than 75 coho per vessel.
gg/ Gear restriction of not more than 4 spreads per line. In 1991 this restriction applied only in June. In 1992 the restriction applied in May and June. Beginning in 1993, the restriction applied to the entire season.
hh/ Open period restriction of not more than 30 coho per vessel from July 20-21 and not more than 44 coho per vessel for each of the remaining open periods.
ii/ Gear restricted to 6 inch plugs or larger.
jj/ Single daily landing limit of 25 coho without landing chinook. Above 25 coho, at least 1 chinook must be landed for each 2 coho.
kk/ Gear restriction of not more than 4 spreads per line for all open periods. From July 14 through Aug. 6, gear restriction of plugs and/or whole bait 6 inches or larger. Coho landing restriction per open period as follows: not more than 50 per period from July 14 through Aug. 6; not more than 35 coho per period from Aug. 27-28; and not more than 70 per period from Sept. 1-19.
ll/ Closed at mouth of Tillamook Bay in June, Aug. and Sept.; open only 0-3 miles north of Cape Lookout in Sept.
mm/ No more than 4 spreads per line. Open 0-3 miles. Landings restricted to Port Orford.
nn/ Chinook only.
oo/ No more than 4 spreads per line. Open 0-6 nautical miles in May and 0-4 nautical miles in July. Landings restricted to Port Orford, Gold Beach and Brookings. Closed within 1 mile of Rogue River mouth.
pp/ No more than 4 spreads per line. Open 0-3 miles. Single daily landing limit of 20 chinook into the port of Brookings.
qq/ Closed at mouth of Tillamook Bay: 1996 - June 1 through Sept. 15; 1997 - April 15 through Sept. 15; 1998 - April 15 through April 30 and June 1 through Sept. 15; 1999 - April 1 through 30 and June 1 through Sept. 15.
rr/ No more than 4 spreads per line. Open 0-4 miles. Landings restricted to Port Orford, Gold Beach, and Brookings. Closed within 1 mile of Rogue River mouth.
ss/ No more than 4 spreads per line. All fish must be landed between House Rock and Humboldt south jetty under a limit of 30 fish per day.

TABLE C-4. Summary of actual **Oregon recreational** ocean salmon seasons, size limits and bag limits in state and federal (EEZ) waters. (Page 1 of 5)

Year	Area	Season[a/]	Days	Bag Limit	Minimum Size Limit (inches) Chinook	Coho
1980	North of Cape Falcon	May 10-July 15	67	3	24	16
		July 16-Sept. 1	48	2	24	16
		Sept. 2-14[b/]	13	2[c/]	24	-
	South of Cape Falcon	May 10-July 15	67	3	22	16
		July 16-Sept. 1	48	2	22	16
		Sept. 2-14[b/]	13	2	22	16
		Sept. 15-Oct. 31	60	2[d/]	22	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/]	22	-
	Goat Island to OR/CA Border	Nov. 1-30[b/]	30	2[c/]	22	-
1981	North of Cape Falcon	May 23-Aug. 26	108	2	24	16
		Aug. 27-Sept. 7[b/]	12	2	24	16
	South of Cape Falcon	May 15-Aug. 13	115	2	22	16
		Aug. 14-26	13	3	22	16
		Aug. 27-Sept. 20[b/]	25	3	22	16
	South of Cape Blanco	Sept. 21-Oct. 31	41	2[c/]	22	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/]	22	-
	Goat Island to OR/CA Border	Nov. 1-30[b/]	30	2[c/]	22	-
1982	Leadbetter Pt. to Cape Falcon	June 12-July 24	43	2	24	16
	Columbia River South Jetty to Cape Falcon	July 25-Aug. 1[b/]	8	2[e/]	24	16
	Cape Falcon to Cape Blanco	May 29-July 21	54	2[f/]	None	None
		July 22-Aug. 1[b/]	11	2[f/]	None	None
		Aug. 2-Oct. 31	91	2[c/f/]	None	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/f/]	None	-
	Goat Island to OR/CA Border	Nov. 1-30[b/]	30	2[c/f/]	None	-
1983	Klipsan Beach to Cape Falcon	June 18-July 29[g/h/]	42	2	24	16
		July 30-Aug. 15	17	2	24	16
	Columbia River South Jetty to Cape Falcon	Aug. 16-Sept. 11[h/i/]	44	2	24	16
	Cape Falcon to Cape Blanco	June 18-Sept. 18	93	2[f/]	None	None
	Twin Rocks to Pyramid Rock	Sept. 19-Oct. 31[b/]	43	2[c/]	24	-
	South of Cape Blanco	May 28-Sept. 18	114	2[f/]	None	None
		Sept. 19-Oct. 31	43	2[c/f/]	None	None
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/f/]	None	-
1984	Columbia River South Jetty to Cape Falcon	July 28-Aug. 8[h/i/j/]	12	2[k/]	None	16
	Cape Falcon to Cape Blanco	July 9-Aug. 7	30	2	20	20
		Aug. 25-Sept. 3[b/]	10	1	20	20
	Manhattan Beach to Pyramid Rock	Sept. 15-21[b/]	7	2[c/]	20	-
	South of Cape Blanco	July 9-Aug. 7	30	2	20	20
		Aug. 8-24	17	2[c/]	20	-
		Aug. 25-Sept. 3[b/l/]	10	2[e/]	20	20
		Sept. 4-Oct. 31	58	2[c/]	20	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/]	20	-
1985	Leadbetter Pt. to Cape Falcon	June 30-Aug. 22[h/j/m/]	40	2	24	16
	Cape Falcon to Cape Blanco	July 1-Sept. 2	64	2[f/n/]	None	None
	Twin Rocks to Pyramid Rock	Sept. 15-Oct. 31[b/]	47	2[c/n/]	None	-
	South of Cape Blanco	May 25-31; July 1-Sept. 2	71	2[f/n/]	None	None
		Sept. 3-Oct. 31	59	2[c/f/n/]	None	-
	Tower Rock to Humbug Mt.	Oct. 1-Nov. 30[b/]	61	2[c/n/]	None	-

TABLE C-4. Summary of actual **Oregon recreational** ocean salmon seasons, size limits and bag limits in state and federal (EEZ) waters. (Page 2 of 5)

Year	Area	Season[a/]	Days	Bag Limit	Minimum Size Limit (inches) Chinook	Coho
1986	Columbia River South Jetty to Cape Falcon	June 29-Aug. 19[f/m/]	37	2	24	16
	Cape Falcon to Cape Blanco	May 24-26; June 28-July 26	32	2[f/n/]	None	None
		July 27-Aug. 13[o/]	9	2[f/p/]	None	None
	Twin Rocks to Pyramid Rock	Sept. 15-Nov. 15[b/]	62	2[c/n/]	None	-
	South of Cape Blanco	May 24-June 22	30	2[q/n/]	20	20
		June 23-Sept. 7	77	2[n/]	20	20
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 26[b/]	57	2[c/n/]	20	-
	Bird Isl. to OR/CA Bdr. East of 124°20'W	Oct. 1-31[b/]	31	2[c/n/]	20	-
1987	North of Cape Falcon	June 29-Aug. 19[h/j/m/r/]	39	2	24	16
	Cape Falcon to Cape Blanco	June 13-Sept. 13	93	2[f/n/]	None	None
	Twin Rocks to Pyramid Rock	Sept. 15-Oct. 31[b/]	46	2[f/n/]	None	-
	South of Cape Blanco	May 23-Sept. 13	114	2[n/]	20	20
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 30[b/]	61	2[c/n/]	20	-
	Bird Isl. to OR/CA Bdr. East of 124°20'W	Oct. 1-31[b/]	31	2[c/n/]	20	-
1988	Klipsan Beach to Cape Falcon	July 11-24[h/m/s/]	10	2[t/]	24	16
	Cape Falcon to Orford Reef Red Buoy	May 1-27[b/u/]	27	2[n/]	20	16
		May 28-Sept. 11	107	2[n/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 12-Oct. 31[b/]	50	2[c/n/]	None	-
	South of Orford Reef Red Buoy	May 28-July 9	43	2[n/]	20	20
		July 10-Sept. 11	64	1[n/]	20	20
	Orford Reef Red Buoy to Humbug Mt.	Oct. 1-31[b/]	31	2[c/n/]	None	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	2[c/n/]	None	-
1989	North of Cape Falcon	May 28-June 12[h/v/]	10	2[c/]	24	-
	Leadbetter Pt. to Cape Falcon	June 26-Aug. 17[h/m/]	39	2	24	16
	Cape Falcon to Orford Reef Red Buoy	May 1-26[u/]	26	2[n/]	20	16
		May 27-July 27	62	2[n/]	20	16
		July 28-Aug. 20[m/]	16	2[n/]	20	16
		Sept. 2-4	3	2[n/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 16-Oct. 31[b/]	46	2[c/n/]	24	-
	South of Orford Reef Red Buoy	May 1-Sept. 30	153	2[n/]	20	20
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 30[b/]	61	2[c/n/]	20	-
1990	Leadbetter Pt. to Cape Falcon	June 24-Aug. 30[h/m/]	50	2	24	16
	Cape Falcon to Humbug Mt.	May 1-27[u/]	27	2[n/]	20	16
		May 28-June 22;	26	2[n/]	20	16
		June 30-July 31;	32	2[n/]	20	16
		Aug. 8-Sept. 16	98	2[n/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 17-Oct. 31[b/]	45	2[c/n/]	None	-
	South of Humbug Mt.	May 1-Sept. 9	132	2[w/n/]	20	20
1991	North of Cape Falcon	June 24-Aug. 12[h/m/]	36	2	24	16
		Sept. 15-18; Sept. 26[x/]	5	2	24	16
	Cape Falcon to Humbug Mt.	May 1-26[u/]	26	2[n/]	20	16
		May 27-July 28	62	2[n/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 16-Oct. 31[b/]	47	2[c/n/]	None	-
	South of Humbug Mt.	May 25-July 28[y/]	47	2[t/n/]	20	20
		Aug. 31-Sept. 2	3	2[t/n/]	20	20
		Sept. 6-29[z/]	12	2	20	20

TABLE C-4. Summary of actual **Oregon recreational** ocean salmon seasons, size limits and bag limits in state and federal (EEZ) waters. (Page 3 of 5)

Year	Area	Season[a/]	Days	Bag Limit	Minimum Size Limit (inches) Chinook	Coho
1992	North of Cape Falcon	June 29-July 30[b/h/m/]	24	2[aa/]	24	16
		Aug. 2-6[h/m/]	5	2[aa/]	24	16
		Sept. 14-17; Sept. 27[h/]	5	2[aa/]	24	16
	Cape Falcon to Heceta Head	May 3-June 11[m/u/]	30	2[aa/bb/]	20	16
		June 14-Sept. 10[m/]	65	2[aa/bb/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 16-Oct. 31[b/]	46	2[c/n/bb/]	None	-
	Heceta Head to Humbug Mt.	May 3-June 11[m/u/]	30	2[aa/bb/]	20	16
		June 14-July 2[m/]	15	2[aa/bb/]	20	16
		July 5-Aug. 31[m/cc/]	42	2[aa/bb/]	-	16
		Sept. 1-Sept. 10[m/]	8	2[aa/bb/]	20	16
	Cape Blanco to Humbug Mt.	Oct. 24-26[b/]	3	1[c/aa/bb/]	20	-
	South of Humbug Mt.	July 6-20[dd/]	7	1	20	20
		Sept. 1-7	7	1	20	20
	Goat Island to Red Pt.	Oct. 15-26[b/]	12	1[c/n/]	20	-
1993	North of Cape Falcon	July 5-Sept. 9[h/m/]	49	2[aa/]	24	16
		Sept. 12-23[h/]	12	2[aa/]	24	16
	Cape Falcon to Humbug Mt.	May 1-June 6[m/u/]	37	2[p/ff/]	20	16
		July 13-Aug. 10[ee/]	13	2[p/ff/]	20	16
	Twin Rocks to Pyramid Rock	Sept. 16-Oct. 31[b/]	46	2[c/n/ff/]	None	-
	Cape Blanco to Humbug Mt.	Oct. 1 - Nov. 30[b/]	61	1[c/n/ff/]	20	-
	South of Humbug Mt.	May 5-June 19[gg/]	28	1[n/]	20	20
		July 14-Aug. 28[gg/]	28	1[n/]	20	20
		Sept. 1-6	6	1[n/]	20	20
1994	North of Cape Falcon	-	-	-	-	-
	Cape Falcon to Humbug Mt.	May 1-June 5[u/]	36	2[c/p/ff/]	20	-
	Twin Rocks to Pyramid Rock	June 6-19 and Oct. 1-Nov. 15[b/]	60	2[c/p/ff/]	20	-
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 7[b/]	38	1[d/aa/]	20	-
	South of Humbug Mt.	May 1-June 7; Aug. 27-31; Sept. 1-5	48	2[c/n/]	20	-
	Goat Island to Red Pt.	Oct. 10-20[b/]	11	1[d/aa/]	20	-
1995	North of Cape Falcon	July 24-Sept. 5; Sept. 10-11[m/]	37	2[aa/cc/hh/]	-	16
	Cape Falcon to Humbug Mt.	May 1-June 30	61	2[c/ii/]	20	-
	Twin Rocks to Pyramid Rock	Sept. 16-Nov. 15[b/]	61	2[d/ii/]	20	-
	Cape Foulweather to Seal Rock	Sept. 16-Oct. 31[b/]	46	2[d/ii/]	20	-
	3 Miles North of North Coos Bay Jetty to Cape Arago	Sept. 16-Oct. 31[b/]	46	2[d/ii/]	20	-
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 7[b/]	38	2[d/aa/ii]	20	-
	South of Humbug Mt.	May 17-July 1; Aug. 16-18[gg/]	31	1[c/]	20	-
		Sept. 1-9	9	1[c/n/]	20	-
	Goat Isl. to 42°01'20" N	Oct. 10-15; 21-22[b/]	8	1[d/aa/]	20	-
1996	North of Cape Falcon	July 22-Sept. 26[m/]	49	2[aa/cc/]	-	16
	Cape Falcon to Humbug Mt.	May 1-July 7; Aug. 16-Sep. 30	114	2[c/n/jj/]	20	-
	Twin Rocks to Pyramid Rock	Oct. 1-31[b/]	31	2[aa/d/jj]	20	-
	Cape Blanco to Humbug Mt.	Oct. 1-Nov. 30[b/]	61	1[d/aa/]	20	-
	South of Humbug Mt.	May 12-July 7; Aug. 18-Sept. 21	92	1[c/aa/]	20	-
	Goat Isl. to 42°01'20"	Oct. 5-13[b/]	9	1[d/aa/]	20	-

TABLE C-4. Summary of actual **Oregon recreational** ocean salmon seasons, size limits and bag limits in state and federal (EEZ) waters. (Page 4 of 5)

Year	Area	Season[a/]	Days	Bag Limit	Minimum Size Limit (inches) Chinook	Coho
1997	North of Cape Falcon	July 21-Aug. 7[m/]	14	2[aa/]	24	16
	Cape Falcon to Humbug Mt.	Apr. 15-July 6; Aug. 1-Oct. 31	175	2[c/n/kk/]	20	-
	Twin Rocks to Pyramid Rock	Aug. 1-Nov. 15[b/]	107	2[aa/d/kk/]	20	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	1[d/aa/]	20	-
	South of Humbug Mt.	May 24-30; June 17-July 6; Aug. 12-Sept. 14	61	1[c/aa/]	20	-
	Goat Isl. to 42°01'20"	Oct. 4-12[b/]	9	1[d/aa/]	20	-
1998	North of Cape Falcon	Aug. 3-9; Sept. 3[m/]	6	2[ll/]	24	16
	Cape Falcon to Humbug Mt.	Apr. 15-July 5; Aug. 1-Oct. 31	174	2[c/n/mm/]	20	-
	Twin Rocks to Pyramid Rock	Aug. 1-Nov. 15[b/]	107	2[aa/d/mm/]	20	-
	Cape Blanco to Humbug Mt.	Nov. 1-30[b/]	30	1[d/aa/]	20	-
	South of Humbug Mt.	May 23-June 10; June 21-July 5; Aug. 11-Sept. 13	68	1[c/aa/]	20	-
	Goat Isl. to 42°01'20"	Oct. 5-14[b/]	10	1[d/aa/]	20	-
1999	North of Cape Falcon	July 19-Sept. 30[nn/]	62	2[ll/]	24	16
	Cape Falcon to Humbug Mt.	Apr. 1-July 9; July 10-11; 14-15; 18-19; 22-23; 26-27; 30-31; Aug. 1-Oct. 31	219	2[n/mm/oo/]	20	16
	Twin Rocks to Pyramid Rock	Aug. 1-Nov. 15[b/]	107	2[d/aa/mm/]	20	-
	Cape Blanco to Humbug Mt.	Nov. 1-Dec. 15[b/]	45	1[d/aa/]	20	-
	South of Humbug Mt.	May 29-July 4; July 29-Sept. 15;	85	1[c/aa/]	20	-
	Goat Isl. to 42°01'20"	Oct. 2-11[b/]	10	1[d/pp/]	20	-

a/ Dates are inclusive.
b/ Open in state waters only.
c/ Open for all-salmon-except-coho.
d/ Open for chinook only.
e/ Only 1 coho allowed in bag limit.
f/ Must retain the first 2 salmon caught.
g/ Open inside of 6 miles from Cape Falcon north to 46°06'00" and inside of 3 miles from 46°06'00" to the south jetty of the Columbia River.
h/ Mouth of the Columbia River is closed.
i/ Open inside of 10 miles from Cape Falcon north to the Lightship Buoy then on a line to the south jetty of the Columbia River.
j/ Closed inside 3 miles from Leadbetter Pt. to Klipsan Beach and 0 to 200 miles from Klipsan Beach to Red Buoy Line.
k/ Open for all-salmon-except-chinook.
l/ Federal waters (3 to 200 miles) open for all-salmon-except-coho.
m/ Open Sunday through Thursday only.
n/ No more than 6 fish in 7 consecutive days.
o/ Open Tuesday through Saturday only.
p/ No more than 2 fish in 7 consecutive days.
q/ Only 1 coho and 2 chinook allowed in bag limit.
r/ Closed inside of 3 miles between Cape Falcon and Columbia River (Red Buoy Line).
s/ Open inside of 3 miles from Cape Falcon to the Red Buoy Line and inside of 5 miles from North Head to Klipsan Beach.
t/ Only 1 chinook allowed in bag limit.
u/ Open only inside the 27 fathom curve.
v/ Open Sundays and Mondays only.
w/ Only 1 chinook allowed in bag limit of 2 salmon from June 30-Aug. 15.
x/ Open from Red Buoy Line south to Cape Falcon.
y/ Open Thursday through Monday only.
z/ All-salmon fishery with 1 chinook allowed and open on Fridays, Saturdays and Sundays only.
aa/ No more than 4 fish in 7 consecutive days.
bb/ No more than 20 fish per year.
cc/ Open for all salmon except chinook.
dd/ Open Monday through Wednesday only.
ee/ Open Sunday through Tuesday only.
ff/ No more than 10 fish per year.
gg/ Open Wednesday through Saturday only.

TABLE C-4. Summary of actual **Oregon recreational** ocean salmon seasons, size limits and bag limits in state and federal (EEZ) waters. (Page 5 of 5)

hh/ Closed inside 3 miles.

ii/ No more than 6 fish in 7 consecutive days, except no more than 4 fish in 7 consecutive days in Sept. 16-Nov. 15 fishery between Twin Rocks and Pyramid Rock. Gear limited to artificial plugs or whole bait, no less than 6 inches long; no more than 2 hooks; nonpainted weights; all attractors prohibited (clear divers are legal). Plug cut bait allowed between Twin Rocks and Pyramid Rock Sept. 16-Nov. 15. Closed in Tillamook Bay mouth control zone June 1-30 and Sept. 16-30.

jj/ Legal gear was limited to artificial lures, plugs or bait no less than 6 inches long (excluding hooks and swivels) with no more than 2 single-point, single-shank, barbless hooks; flashers and divers prohibited.

kk/ Legal gear was limited to artificial lures, plugs or bait no less than 6 inches long (excluding hooks and swivels) with no more than 2 single-point, single-shank, barbless hooks. Divers were prohibited. Flashers were prohibited until May 1 and then could only be used with downriggers. Flashers were totally prohibited inside state waters between Twin Rocks and Pyramid Rock beginning August 1.

ll/ No more than 1 chinook and all coho must have a healed adipose fin clip; no more than 4 fish per calendar week (Sun.-Sat.).

mm/ Legal gear was limited to artificial lures or plugs of any size or bait no less than 6 inches long (excluding hooks and swivels) with no more than 2 single-point, single shank, barbless hooks. Divers were prohibited. Flashers were prohibited except for use with downriggers. Flashers were totally prohibited inside state waters between Twin Rocks and Pyramid Rock beginning Aug. 1.

nn/ Open Sunday through Thursday, except open 7 days per week beginning Sept. 3.

oo/ Open for all salmon except coho from Apr. 1 through July 9 and Aug. 1 through Oct. 31. From July 10-31, all salmon except all retained coho must have a healed adipose fin clip.

pp/ No more than 4 fish per season.

TABLE C-5. Summary of actual **Washington non-Indian troll** salmon fishing seasons. (Page 1 of 3)

Year	Area	Seasons		Number of Days		Size Limit[a/]	
		All Salmon Except Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1971-1975	Statewide	Apr. 15-June 14	June 15-Oct. 31	61	139	26	16[b/]
1976	Statewide	May 1-June 14	June 15-22; July 1-Oct. 31	45	131	26	16[b/]
1977	North of Pt. Grenville	May 1-June 14	July 1-Sept. 15	45	77	28[c/]	16[b/]
	South of Pt. Grenville	May 1-June 14	July 1-Oct. 9	45	101	28[c/]	16
1978	North of Pt. Grenville	May 1-June 14	July 1-Sept. 15	45	77	28	16
	South of Pt. Grenville	May 1-June 14	July 1-Oct. 31	45	123	28	16
1979	Statewide	May 1-31	July 1-24; Aug. 4-31[d/]	31	52	28	16
1980	North of Leadbetter Pt.	May 1-31	July 15-Aug. 25	31	42	28	16
	South of Leadbetter Pt.	May 1-31	July 15-Sept. 8	31	56	28	16
1981	Statewide	May 1-31	July 15-Aug. 21	31	38	28	16
1982	North of Leadbetter Pt.	May 1-31	July 15-30	31	16	28	16
	South of Leadbetter Pt.	May 1-31	July 1-8	31	8	28	16
1983	Statewide	May 1-31	July 1-31[e/]	31	31	28	16
1984	Statewide	May 1-7	-	8	-	28	-
	North of Cape Alava	-	Aug. 4-6	-	3	-	16
1985	Statewide	May 1-14; May 21-31	-	25	-	28	-
	Cape Alava to Leadbetter Pt.	-	July 15-18	-	4	28	16
	Carroll Island to U.S.-Canada Border	Aug. 3-31[f/]	-	-	29	28	-
1986	Statewide	May 1-10; 14-17; 24-27;30-31	-	20	-	28	-
	Carroll Island to U.S.-Canada Border	-	Aug. 2-3; 8-9	-	4	28	16
	South of Leadbetter Pt.	-	Aug. 2-3; 7-9	-	5	28	16
1987	Statewide	May 1-10; May 14-15	-	12	-	28	-
	Cape Alava to Cape Falcon	-	July 25-26	-	2	28	16
1988	Statewide	May 1-June 14	No Fishery	45	0	28	-
1989	South of Queets River	May 1-June 8; June 13-15	-	42	-	28	16
	Carroll Island to U.S.-Canada Border	-	Aug. 7-10; Aug. 10-18	-	7	28	16
	Columbia River Red Buoy Line to Cape Falcon	-	Aug. 21[g/]	-	1	28	16
	Leadbetter Pt. to Cape Falcon	-	Aug. 24-Sept. 10[g/]	-	18	28	16
1990	Statewide	May 1-14; 18-27; May 31-June 2; June 8-11; June 14	-	32	-	28	-
		-	Aug. 18-21; 25-26[h/]	-	6	28	16
	South of Leadbetter Pt.	-	Aug. 30-Sept. 14; Sept. 18-19; Sept. 22-Oct. 15[i/]	-	42	28	16
	Cape Alava to South End of Destruction Island	-	Sept. 15-16; Sept. 19-Oct. 31[j/]	-	45	28	16

TABLE C-5. Summary of actual **Washington non-Indian troll** salmon fishing seasons. (Page 2 of 3)

Year	Area	Seasons		Number of Days		Size Limit[a/]	
		All Salmon Except Coho	All Salmon	All Except Coho	All Salmon	Chinook	Coho
1991	Statewide	May 1-June 15		46	-	28	-
	Carroll Island to U.S.-Canada Border	-	Aug. 16-19; 23-26; Aug. 30-Sept. 2; Sept. 6-9; Sept. 13-15[k/]	-	19	28	16
	Copalis Head to Cape Falcon	-	Sept. 1-2[l/]	-	2	28	16
	Leadbetter Pt. to Cape Falcon	-	Aug. 10-11[m/]	-	2	28	16
1992	Statewide	May 1-June 15	-	46	-	2	16
			July 20-21;[n/] July 25-27; July 31-Aug. 2; Aug. 6-8; Aug. 12-14; Aug. 20-22	-	17	28	16
1993	Statewide	May 1-June 15	-	46	-	28	-
	Statewide	-	July 14-17; 21-24; 28-31; August 4-6[p/]	-	15	28	16
	Carroll Island to U.S.-Canada Border	Aug. 8-25[o/]	-	18[o/]	-	-	-
	Queets River to Cape Falcon, OR	-	Aug. 27-28; Sept. 1-4; 9-12; Sept. 16-19[q/]	-	14	28	16
1994	Statewide	-	-	-	-	-	-
1995	Carroll Island to U.S.-Canada Border	-	Aug. 5-8; 12-15; 19-22; 26-29; Sept. 2-3[r/]	-	18[r/]	-	16
1996	Leadbetter Pt. to U.S.-Canada Border	-	July 26-28; Aug. 2-4; 9-11, 16-18; 23-24[s/]	-	14[s/]	-	16
1997	U.S.-Canada Border to Cape Falcon	May 1-June 15	-	46	-	28	-
1998	U.S.-Canada Border to Cape Falcon	May 1-12; 20-23; June 2-4[t/]	-	19	-	28	-
1999	U.S.-Canada Border to Cape Falcon	May 1-June 15	-	46	-	28	-
	Cape Flattery to Cape Alava	-	July 10-13; 17-20; 24-27; 31; Aug. 1-3;[u/]	-	16[u/]	28	16
	Cape Alava to Leadbetter Pt.	-	July 10-13; 17-20; 24-27; 31; Aug. 1-3; Aug. 14-17; Sept. 5-13; 22-30[u/v/]	-	38	28	16

a/ Inches total length.
b/ Effective annually beginning on Aug. 1.
c/ Only partial compliance in 1977.
d/ U.S. District Court ordered 10-day closure of all-species season July 25-Aug. 3.
e/ No more than 1 coho could be retained for every 2 chinook retained. North of Carroll Island it was illegal to retain sockeye or pink salmon except during a special season to take only sockeye and pink salmon from Aug. 7-20. Gear in this special Aug. fishery was restricted to bare, blued hooks and flashers.
f/ Pink and chinook salmon only, gear restricted to barbless, bare, blued hooks and flashers. Effective Aug. 22, state landing restriction of not more than 1 chinook per 20 pinks.
g/ Daily landing limit of 40 coho and 4 chinook.
h/ Landing limit of 200 coho and 20 chinook per open period. Chinook restriction dropped Aug. 25-26.
i/ Daily landing limit of 50 coho. Increased to 100 on Sept. 25.
j/ Allowed 15 vessels, which were drawn at random by WDF, to participate in the limited participation fishery.
k/ Landing limit of 80 coho per 4-day open period. Gear restricted to barbless, bare, blued or pink hooks and flashers or pink hoochies of 3 inches or less.
l/ Landing limit of 75 coho per 2-day open period.
m/ Landing limits of 100 coho per 2-day open period.

TABLE C-5. Summary of actual **Washington non-Indian troll** salmon fishing seasons. (Page 3 of 3)

n/ Gear restricted to 6 inch or larger plugs only and no more than 4 spreads per line during the entire all-salmon season. Landing limit of 30 coho per 2-day open period through July 21. Landing limit changed to 44 coho per 3-day open period starting July 25.
o/ All-salmon-except chinook or coho salmon. Gear restricted to flashers with barbless, bared blue hooks only.
p/ Gear restricted to plugs or whole bait 6 inches or longer and no more than 4 spreads per line. Possession limit of 50 coho per 4-day open period.
q/ Possession limit of 35 coho Aug. 27-28, then modified to 70 coho for remaining periods. Fishery restricted to area south of Leadbetter Pt. for Sept. 16-19.
r/ All except chinook. Possession and landing limit per opening: 80 coho August 5-8; 200 coho August 12-15; 375 coho for remaining 3 openings.
s/ All except chinook. Season to follow a cycle of 3 days open/4 days closed, no more than 75 coho per open period for July 26-28 opening; 200 coho for remaining openings.
t/ Chinook landing limit per vessel per opening: 75 (May 20-23) and 50 (June 2-4).
u/ Vessels must land and deliver fish within 24 hours of any closure. July 10-30: no more than 4 spreads per line; gear restricted to plugs 6 inches or longer; flashers without hooks may be used if installed below the 2nd spread from the top and will not count as a spread; no more than 1 flasher per line; each vessel may possess, land and deliver no more than 100 coho per open period.
v/ All salmon except chinook from Sept. 5-30.

TABLE C-6. Summary of actual **Washington recreational** ocean salmon regulations.[a/] (Page 1 of 4)

Year	Season	Days	Bag	Minimum Size Limit (Inches) Chinook	Coho
1971-1973	Apr. 15-Oct. 31	200	3	20	20
1974	Apr. 13-Oct. 31	202	3	20	20
1975	Apr. 12-Oct. 31	203	3	20	20
1976	May 1-Oct. 31	184	3	24	16
1977	Apr. 30-Oct. 9	163	3	24	16
1978	Apr. 29-Oct. 31	186	3	24	16
1979	May 12-Sept. 3	115	2+1[b/]	24	16
1980	May 10-Aug. 25 North	108	3/2[c/]	24	16
	May 10-Sept. 1 South	115	3/2[c/]	24	16
1981	May 23-Aug. 26	96	2+1[d/]	24	20
1982[e/]	May 29-June 11 (Chinook Only)	14	2	24	-
	June 12-Aug. 19 North	69	2	24	16
	June 12-July 25 South	44	2	24	16
1983	May 8-June 17 (Chinook Only)[f/]	21	2	24	-
	June 18-July 29[g/]	42	2	24	16
	July 1-29[h/]	29	2	24	16
	July 30-Aug. 15[i/]	17	2	24	16
	July 30-Sept. 11[j/]	44	2	24	16
	Aug. 16-Sept. 11[k/]	27	2	24	16
1984	May 26-28 (Chinook Only)[f/]	3	2	24	-
	June 25-July 27 (Chinook Only)[l/]	33	1	34	-
	July 28-Aug. 8 (Coho Only)[m/]	12	2	-	16
	July 28-Aug. 15[n/]	19	1	24	16
1985	June 30-Aug.22[o/]	40	2	24	16
	June 30-Sept. 1[p/]	46	2/1[o/]	24	16
	June 30-Sept. 8[q/]	51	2	24	16
1986	June 29-Aug. 14[r/]	35	2	24	16
	June 29-Aug. 18[s/]	37	2	24	16
1987	June 28-Aug. 20[t/]	40	2/1[s/]	24	16
	June 28-Aug. 6[u/]	30	2[t/]	24	16
	June 28-Aug. 20[v/]	40	2	24	16
1988	July 3-Aug. 2, Aug. 19, Sept. 2[w/]	25	2/1[v/]	24	16
	July 3-31, Aug. 18[x/]	22	2/1[w/]	24	16
	July 11-24[y/]	10	2/1[x/]	24	16
1989	May 28-June 12[z/]	6	2	24	-
	July 2-26[aa/]	19	2	24	16
	June 26-Aug. 30[bb/]	48	2	24	16
	June 26-Aug. 17[cc/]	39	2	24	16
1990	July 2-Aug. 12, Sept. 8-9[dd/]	32	2	24	16
	July 2-Sept. 3, Sept. 8-9[ee/]	48	2	24	16
	June 18-Sept. 20[ff/]	75	2	24	16
	June 24-Aug. 30, Sept. 8-9[gg/]	52	2	24	16
1991	July 1-24[hh/]	17.5	2	24	16
	July 1-30[ii/]	22	2	24	16
	June 24-Aug. 12, Sept. 3-4[jj/]	38	2	24	16
	June 24-Aug. 12[kk/]	36	2	24	16
	Sept. 15-18, Sept. 26[ll/]	5	2	24	16
1992	May 1-31[mm/]	31	2	24	16
	July 6-22[nn/]	13	2	24	16
	July 13-Aug. 20[oo/]	29	1	24	16
	Aug. 23-Oct. 1[pp/]	30	2	24	16
	July 6-Oct. 1[qq/]	64	2	24	16
	June 29-Aug. 6	29	2	24	16
	Sept. 14-17, Sept. 27[qq/]	5	2	24	16

TABLE C-6. Summary of actual **Washington recreational** ocean salmon regulations.[a/] (Page 2 of 4)

Year	Season	Days	Bag	Minimum Size Limit (Inches) Chinook	Coho
1993	May 1-31[rr/]	31	2	24	16
	July 12-Aug. 22[ss/]	30	2	24	16
	July 5-Sept. 23[tt/]	59	2	24	16
	July 5-Sept. 23[uu/]	59	2	24	16
	July 5-Sept. 9[vv/]	49	2	24	16
	Sept. 12-23[ww/]	12	2	24	16
1994	Closed	0	-	-	-
1995	Aug. 1-4[xx/]	4	2	-	16
	Aug. 1-Sept. 10[yy/]	29	2	-	16
	July 24-Sept. 17[zz/]	40	2	-	16
	July 24-Sept. 5; Sept. 10-17[aaa/]	38	2	-	16
1996	Aug. 5-31[xx/]	27	1	-	16
	Aug. 5-Sept. 26[bbb/]	53	2	-	16
	July 22-Sept. 5[zz/]	34	2	-	16
	July 22-Sept. 26[aaa/]	49	2	-	16
1997	July 21-23[ccc/]	3	2	24	-
	July 21-Aug. 3[ddd/]	14	2	24	16
	July 21-Sept. 4[eee/]	34	2	24	16
	July 21-Aug. 7[fff/]	14	2	24	16
1998	Aug. 3-19[ggg/]	17	2	-	16
	Aug. 3-9[ddd/]	7	2	24	16
	Aug. 3-16; Sept. 3[hhh/]	11	2	24	16
	Aug. 3-9; Sept. 3[iii/]	6	2	24	16
1999	July 19-Sept. 30[ccc/ ddd/]	74	2	-	16
	July 19-Sept. 30[jjj/]	74	2	24	16
	July 19-Sept. 30[jjj/]	62	2	24	16
	July 19-Sept. 30[iii/]	62	2	24	16

a/ All dates inclusive; minimum size measured as total length; no minimum size for species other than chinook and coho.
b/ Bag limit only 2 chinook/coho; third salmon confined to other 3 species to take advantage of large pink abundance.
c/ Seasons differed in 1980 north and south of Leadbetter Pt.; initial 3-fish bag limit reduced to 2 fish on July 16.
d/ Bag limit only 2 chinook/coho; north of Queets River a third salmon of other species allowed (Neah Bay/La Push).
e/ Seasons differing north and south of Leadbetter Pt.; some Ilwaco and Chinook based effort continued through Aug. 1 inside Oregon state waters and from Aug. 16-Sept. 30 inside Buoy 10 to the Astoria/Megler Bridge. The Aug. 25-Sept. 30 period was restricted to coho only, with barbless hooks required after Aug. 31. The easterly portion of Neah Bay (inside Koitlah Pt.) remained open after Aug. 19.
f/ Queets River to Klipsan Beach inside 6 miles.
g/ Queets River to North Head inside 6 miles and south jetty of the Columbia River to Cape Falcon inside a line approximately due south of the south jetty.
h/ U.S.-Canada border to Queets River inside 3 miles.
i/ Klipsan Beach to Cape Falcon.
j/ U.S.-Canada border to Queets River and Pt. Brown to Klipsan Beach. Ocean waters north of Leadbetter Pt. and west of the Bonilla/Tatoosh Line closed Sept. 6 in anticipation of quota achievement.
k/ South jetty of the Columbia River to Cape Falcon inside special fishery zone 1.
l/ Limited area adjacent to Neah Bay; size limit changed to 24 inches July 17.
m/ Cape Shoalwater to Klipsan Beach (also off Oregon from the south jetty of the Columbia River to Cape Falcon inside the special fishery zone).
n/ Leadbetter Pt. to Cape Falcon. Waters from Leadbetter Pt. to Klipsan Beach closed inside 3 miles. From 0 to 200 miles between Klipsan Beach and Red Buoy Line of Columbia River closed. Fishing allowed Sunday through Thursday only.
o/ U.S.-Canada border to Queets River. Bag limit 2 salmon only 1 of which may be a chinook. Effective July 24, fishing closed inside a line approximately 1 mile offshore from Sekiu River to the Umatilla Reef Light. Bag limit changed to not allow retention of chinook salmon, effective Aug. 15. Fishing allowed Sunday through Thursday only.
p/ Queets River to Leadbetter Pt., except closed inside 3 miles through Aug. 29. Fishing allowed Sunday through Thursday only through Aug. 29. Fishing closed by state regulations Sept. 3-6 and reopened Sept. 7 and Sept. 8.
q/ U.S.-Canada border to Queets River. Fishing allowed Sunday through Thursday only.
r/ Queets River to Klipsan Beach. Fishing allowed Sunday through Thursday only. Closed inside 3 miles June 29-Aug. 7.
s/ U.S.-Canada border to Queets River. Fishing allowed Sunday through Thursday only. Bag limit 2 salmon, only 1 of which may be a chinook. Inseason (July 12) closure of waters beyond 1 mile of coastline between Sekiu River and Tatoosh Island, and closure (July 15) of waters beyond 5 miles of coastline between Duncan Rock and Cape Alava. No retention of chinook July 19-Aug. 20 (noon).

t/ Queets River to Leadbetter Pt. Fishing allowed Sunday through Thursday only. Closed to fishing inside 3 miles throughout entire season; additional area closure 3 to 6 miles from coastline between Pt. Brown and Cape Shoalwater July 5-25; additional area closure 6 to 10 miles from coastline between Pt. Brown and Cape Shoalwater July 8-25; adjusted area closure July 26 season end 3 to 6 miles from Grays Harbor buoy to Leadbetter Pt. and 0 to 200 miles north of Grays Harbor Buoy to Queets River. Bag limit changes from 2 salmon, all species to 2 salmon only 1 of which may be a chinook.

u/ Leadbetter Pt. to Cape Falcon, Oregon. Fishing allowed Sunday through Thursday only. Closed 0 to 3 miles from Leadbetter Pt. to Klipsan Beach; closed 0 to 200 miles from Klipsan Beach to Red Buoy Line of the Columbia River; closed 0 to 3 miles from the Red Buoy Line to Cape Falcon June 28-Aug. 8.

v/ U.S.-Canada border to Queets River. Fishing allowed Sunday through Thursday only. Bag limit initially 2 salmon, but only 1 chinook; changed to 2 fish, all species beginning July 24. Fishery reopened Aug. 19 and Sept. 2 to harvest quota shortfall.

w/ Queets River to Klipsan Beach. Southern boundary changed to Leadbetter Pt. prior to season opening date. Fishing allowed Sunday through Thursday only. Bag limit initially 2 salmon, but only 1 chinook; changed to 2 fish, all species beginning July 24. Fishery reopened Aug. 18 to harvest quota shortfall.

x/ Klipsan Beach to Cape Falcon. Fishing allowed Sunday through Thursday only.

y/ U.S.-Canada border to Cape Falcon. Fishing allowed Sunday through Monday only. 2 fish, all-salmon-except-coho.

z/ U.S.-Canada border to Queets River. Fishing allowed Sunday through Thursday only. 2 fish.

aa/ Queets River to Leadbetter Pt. Fishing allowed Sunday through Thursday only. 2 fish.

bb/ Leadbetter Pt. to Cape Falcon. Fishing allowed Sunday through Thursday only. 2 fish.

cc/ U.S.-Canada border to Cape Alava. Fishing allowed Sunday through Thursday only. 2 fish.

dd/ Cape Alava to Queets River. Fishing allowed Sunday through Thursday only. 2 fish.

ee/ Queets River to Leadbetter Pt. Fishing allowed Sunday through Thursday only through Aug. 30. Open 7 days per week starting Aug. 31. 2 fish.

ff/ Leadbetter Pt. to Cape Falcon. Fishing allowed Sunday through Thursday only. 2 fish.

gg/ U.S.-Canada to Cape Alava. Fishing allowed Sunday through Thursday only. 2 fish.

hh/ Cape Alava to Queets River. Fishing allowed Sunday through Thursday only. 2 fish.

ii/ Queets River to Leadbetter Point. Fishing allowed Sunday through Thursday. 2 fish.

jj/ Leadbetter Point to Cape Flacon. Fishing allowed Sunday through Thursday. 2 fish.

kk/ South of the Red Buoy Line to Cape Falcon. Fishing allowed 7 days per week. 2 fish.

ll/ U.S.-Canada border to Cape Alava. East of Bonilla-Tatoosh Line only. All-salmon-except-coho. 2 fish.

mm/ U.S.-Canada border to Cape Alava. Open 0 to 1/2 mile from shore only. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

nn/ Cape Alava to Queets River. Open 0 to 6 miles from shore only through July 30. Fishing allowed Sunday through Thursday. 1 fish. No more than 4 fish in 7 consecutive days.

oo/ Cape Alava to Queets River. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

pp/ Queets River to Leadbetter Pt. Open 0 to 6 miles from shore only through July 30. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

qq/ Leadbetter Pt. to Cape Falcon. Open 0 to 3 miles from shore only through July 30. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

rr/ U.S.-Canada border to Cape alava. East of Bonilla-Tatoosh line only. All-salmon except coho. 2 fish.

ss/ U.S.-Canada border to Cape Alava. Fishing allowed Sunday through Thursday. 2 fish. No more than 6 fish in 7 consecutive days.

tt/ Cape Alava to Queets River. Fishing allowed Sunday through Thursday. 2 fish. No more than 6 fish in 7 consecutive days.

uu/ Queets River to Leadbetter Pt. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

vv/ Leadbetter Pt. to Cape Falcon. Fishing allowed Sunday through Thursday. 2 fish. No more than 4 fish in 7 consecutive days.

ww/ Leadbetter Pt. to Cape Falcon. 2 fish. No more than 4 fish in 7 consecutive days.

xx/ U.S.-Canada border to Cape Alava. All salmon except chinook. Closed 0-3 miles of shore south of Skagway Rock.

yy/ Cape Alava to Queets River. All except chinook. Open Sunday through Thursday only. Closed 0-3 miles.

zz/ Queets River to Leadbetter Pt. All except chinook. Sunday through Thursday only. Closed 0-3 miles. No more than 4 fish in 7 consecutive days.

aaa/ Leadbetter Pt. to Cape Falcon. All salmon except chinook. Sunday through Thursday only. Closed 0-3 miles and in Columbia River mouth control zone. No more than 4 fish in 7 consecutive days.

bbb/ Cape Alava to Queets River. All except chinook. Closed 0-3 miles.

ccc/ U.S.-Canada border to Cape Alava. All salmon except coho (7 days per week). In 1999, all retained coho must have a healed adipose fin clip.

ddd/ Cape Alava to Queets River. All salmon (7 days per week). In 1999, all retained coho must have a healed adipose fin clip.

eee/ Queets River to Leadbetter Pt. All salmon (Sun. thru Thurs.). Daily bag limit 2 fish; except from July 21-Aug. 12, daily bag limit 2 fish, no more than 1 chinook. No more than 4 fish in 7 consecutive days. Closed 0-3 miles from shore from July 21-Aug. 12.

fff/ Leadbetter Pt. to Cape Falcon. All salmon (Sun. thru Thurs.). No more than 4 fish in 7 consecutive days. Closed 0-3 miles offshore north of Columbia Control Zone and closed within the Zone.

ggg/ State managed Area 4B add-on fishery in place of ocean opening as agreed to by ports. All except chinook.

hhh/ Queets River to Leadbetter Pt. All salmon (Sun. thru Thurs.). Daily bag limit 2 fish but no more than 1 chinook. No more than 4 fish per calendar week (Sun.-Sat.). Closed 0-3 miles from shore, except Sept. 3.

iii/ Leadbetter Pt. to Cape Falcon:
1998 - all salmon (Sun. thru Thurs.). Daily bag limit 2 fish except no more than 1 chinook and all coho must have a healed adipose fin clip. No more than 4 fish per calendar week (Sun.-Sat.). Closed in Columbia Control Zone.
1999 - same as 1998 except no more than 6 fish per calendar week and season open 7 days per week starting Sept. 3.

jjj/ Queets River to Leadbetter Pt. All salmon (Sun. thru Thurs., except 7 days per week beginning Sept. 3). Daily bag limit 2 fish but no more than 1 chinook and only coho with a healed adipose fin clip can be retained. No more than 6 fish per calendar week (Sun.-Sat.). Closed 0-3 miles from shore beginning Aug. 22.

TABLE C-7. Summary of actual **treaty Indian ocean and Area 4B troll** regulations. (Page 1 of 5)

Year	Species	Season	Days	Minimum Size, Area, Gear, and Other Restrictions[a/]
				QUINAULT, QUILEUTE AND HOH TRIBES
Statistical Areas 2 and 3 (Ocean Waters 3-200 miles)				
1977-1981	All	May 1-Oct. 31	184	Chinook 28 in., coho 16 in.; except chinook 26 in. during 1977.
1982	All	May 1-Sept. 7	129	Chinook 26 in., coho 16 in. Six-mi. radius closed at mouths of Hoh and Queets rivers when Area 4A closed to non-Indian salmon fishing.
1983	All	May 1-Sept. 15	137	Chinook 26 in., coho 16 in.
1984	All except coho	May 1-June 30	61	Chinook 26 in. Barbless hooks.
	All	July 1-Aug. 16	47	Chinook 26 in., coho 16 in. Barbless hooks.
1985	All except coho	May 1-22	22	Chinook 26 in. [b/].
	All	June 15-July 22; Aug. 1-10; Sept. 1-4	52	Chinook 26 in., except 28 in. June 15-30; coho 16 in. b/. Landing ratio of at least 1 chinook/10 coho June 15-July 22 and 1 chinook/13 coho Aug. 1-10.
	Pink	Aug. 16-31	16	b/.
1986	All except coho	May 1-31	31	Chinook 26 in. b/.
	All	June 1-Aug. 8	69	Chinook 26 in., coho 16 in. b/. Landing ratio of at least 1 chinook/20 coho July 11-Aug. 8; 2-mile radius closed at Quinault River mouth; Quinault fishery closed on July 18.
1987	All except coho	May 1-26	26	Chinook 26 in. b/.
	All	July 19-Aug. 9; Aug. 17-26	32	Chinook 26 in., coho 16 in. b/. Chinook to coho landing ratios 1:19 July 19-31; 1:10 Aug. 1-9 and 5:1 Aug. 17-26 (Quileute and Hoh rescinded Aug. 26).
1988	All except coho	May 1-July 9	70	Chinook 26 in. b/.
	All	July 10-19; July 20-Aug. 21; Sept. 1-3	46	Chinook 26 in., coho 16. b/. Landing ratio of at least 1 chinook/2 coho July 10-19.
1989	All except coho	May 1-June 30	61	Chinook 26 in. b/.
	All	July 15-Aug. 8; Aug. 30-Sept. 5	32	Chinook 26 in., coho 16 in. b/.
1990	All except coho	May 1-June 30	61	Chinook 26 in. b/.
	All	July 10-27; Aug. 12-31; Sept. 4-7	42	Chinook 26 in., coho 16 in. b/. Landing ratio of at least 1 chinook/15 coho Aug. 12-31.
1991	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	July 7-19; Aug. 3-8; 10-13 and 19	24	Chinook 24 in., coho 16. Barbless hooks. Part day fishery on Aug. 19.
1992	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	July 15-21; Aug. 1-5	12	Chinook 24 in., coho 16. Barbless hooks.
1993	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
		July 1-Sept. 23	85	Chinook 24 in., coho 16. Barbless hooks.
1994	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
1995	All except coho	May 1-31	31	Chinook 24 in. Barbless hooks.
	All	Aug. 1-24	24	Chinook 24 in., coho 16 in. Barbless hooks.
1996	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 5-Aug. 13; Sept. 1-11	20	Chinook 24 in., coho 16 in. Barbless hooks.
1997	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 4-29;	26	Chinook 24 in., coho 16 in. Barbless hooks.
	All	Sept. 3-7 (Quinault only)	5	Chinook 24 in., coho 16 in. Barbless hooks.

TABLE C-7. Summary of actual **treaty Indian ocean and Area 4B troll** regulations. (Page 2 of 5)

Year	Species	Season	Days	Minimum Size, Area, Gear, and Other Restrictions[a/]
1998	All except coho	May 1-June 6	37	Chinook 24 in. Barbless hooks.
	All	Aug. 3-Sept 4	33	Chinook 24 in., coho 16 in. Barbless hooks.
	All	Sept. 8-12 (Quinault only)	5	Chinook 24 in., coho 16 in. Barbless hooks.
1999	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 1-Sept 15	46	Chinook 24 in., coho 16 in. Barbless hooks.
				MAKAH TRIBE
Statistical Areas 3N, 4 and 4A (Ocean Waters 3-200 miles)				
1977-1983	All	May 1-Oct. 31	184	Chinook: 26 in. during 1977; 28 in. during 1978-1979; 24 in. during 1980-1983. Coho: 16 in., except in 1983 changed to 20 in. May 11-June 5 and 22 in. June 6-July 25.
1984	All except coho	May 1-June 30	61	Chinook 24 in.; barbless hooks.
	All	July 1-Aug. 18	49	Chinook 24 in., coho 16 in.; barbless hooks.
1985	All except coho	May 1-20	20	Chinook 24 in. b/.
	All	June 15-30; July 1-20; Aug. 1-10; Sept. 1-4; 10-11	52	Chinook 28 in. except 24 in. from July 1-20, coho 20 in. b/. Landing ratio of at least 1 chinook/13 coho Aug. 1-10.
	Pink	Aug. 15-31	17	b/.
1986	All except coho	May 1-31	31	Chinook 26 in. b/.
	All	June 1-Aug. 8	69	Chinook 26 in. Coho 20 in. b/. Landing ratio of at least 1 chinook/20 coho July 13-Aug. 8.
1987	All except coho	May 1-26	26	Chinook 26 in. b/.
	All	July 19-Aug. 9; Aug. 17-26	32	Chinook 26 in., coho 16 in. b/. Chinook to coho landing ratios 1:19 July 19-31; 1:10 Aug. 1-9 and 5:1 Aug. 17-25.
1988	All except coho	May 1-July 9	70	Chinook 26 in. b/.
	All	July 10-Aug. 21; Sept. 1-3	46	Chinook 26 in., coho 16 in. b/. Landing ratio of at least 1 chinook/2 coho July 10-19.
1989	All except coho	May 1-June 30	61	Chinook 26 in. b/.
	All	July 15-Aug. 8; Aug. 30-Sept. 5	32	Chinook 26 in., coho 16 in. b/.
1990	All except coho	May 1-June 30	61	Chinook 26 in. b/.
	All	July 10-27; Aug. 12-31; Sept. 4-7	42	Chinook 26 in., coho 16 in. b/. Landing ratio of at least 1 chinook/15 coho Aug. 12-31.
1991	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	July 7-19; Aug. 3-8; 10-13 and 19	24	Chinook 24 in., coho 16. Barbless hooks. Part day fishery on Aug. 19.
1992	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	July 15-21; Aug. 1-5	12	Chinook 24 in., coho 16. Barbless hooks.
1993	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	July 1-Sept. 30	92	Chinook 24 in., coho 16. Barbless hooks.
1994	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
1995	All except coho	May 1-31	31	Chinook 24 in. Barbless hooks.
	All	Aug. 1-24	24	Chinook 24 in., coho 16 in. Barbless hooks.
1996	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 5-13; Sept.1-11	20	Chinook 24 in., coho 16 in. Barbless hooks.
1997	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 4-31; Sept. 3-6	32	Chinook 24 in., coho 16 in. Barbless hooks.
1998	All except coho	May 1-June 6	37	Chinook 24 in. Barbless hooks.
	All	Aug. 3-21; Sept. 1-4; 6-9; 11-12; 14-15[c/]	28	Chinook 24 in., coho 16 in. Barbless hooks.

TABLE C-7. Summary of actual **treaty Indian ocean and Area 4B troll** regulations. (Page 3 of 5)

Year	Species	Season	Days	Minimum Size, Area, Gear, and Other Restrictions[a/]
1999	All except coho	May 1-June 30	61	Chinook 24 in. Barbless hooks.
	All	Aug. 1-6; Aug. 10- Sept. 15	43	Chinook 24 in., coho 16 in. Barbless hooks.
Statisical Area 4B (Inside Waters) Makah Fishery				
1977-1981	All	Jan. 1-Dec. 31	365	Chinook 22 in., coho 20 in.; except May 1-Sept. 15 chinook 24 in., coho 16 in.
1982	All	Jan. 1-Dec. 31	365	Chinook 22 in., coho 20 in.; except May 1-Sept. 15 chinook 24 in., coho 16 in. Maximum 30 in. chinook size limit Apr. 15-June 15 to protect Puget Sound spring chinook.
1983	All	Jan. 1-Dec. 31	365	Chinook 22 in. except 24 in. May 1-Sept. 15. Coho 20 in. except 16 in. May 1-10 and July 26-Sept. 15.; 22 in. June 6-July 25. Maximum 30 in. chinook size limit Apr. 15-June 15 to protect Puget Sound spring chinook.
1984	All	Jan. 1-Dec. 31	366	Chinook 22 in., coho 20 in.; except chinook 24 in., coho 16 in. May 1-Sept. 15. Maximum 30 in. chinook size limit Apr. 15-June 15 to protect Puget Sound spring chinook.
1985	Chinook	May 1-20	20	Chinook 24 in.
	All	June 15-July 20; Aug. 1-10; Sept. 1-4; Sept. 10-11; Oct. 1-31	83	Chinook 28 in. except 24 in. July 1-20; 22 in. Oct. 1-31. Coho 20 in. Maximum 30 in. chinook size limit Apr. 15-June 15. Landing ratios of at least 1 chinook/13 coho Aug. 1-10 and at least 1 chinook/20 coho Sept. 10-11.
	Pink	Aug. 15-31	17	
	Coho	Sept. 7-10; Sept. 11-30	24	Ceremonial and subsistence fishery.
1986	All	Jan. 1-Apr. 30; June 1-Aug. 9; Nov. 1-Dec. 31	251	Chinook 24 in. prior to May; 26 in. June 1-Aug. 9; 22 in. Nov. 1-Dec. 31. Coho 16 in. prior to May and 20 in. thereafter. Landing ratio of at least 1 chinook/10 coho on Aug. 9.
	Chinook	May 1-31	31	Chinook 26 in.
	Coho	Aug. 10-12	3	Coho 20 in.
1987	All	Jan. 1-Apr. 30; July 19-Aug. 9; Aug. 17-26; Nov. 1-Dec. 31	213	Chinook 22 in., coho 20 in.; except chinook 26 in., coho 16 in. May-Sept. Landing ratios of at least 1 chinook: per 19 coho in July; per 10 coho Aug. 1-9 and per 5 coho Aug. 17-25.
	Chinook	May 1-26	26	Chinook 26 in.
1988	All	Jan. 1-Apr. 30; July 10-Aug. 21; Sept. 1-3; Nov. 1-Dec. 31	228	Chinook 22 in. prior to Apr. 15 and after Sept. 30; 24 in. Apr. 15-30; 26 in. May-Sept. Coho 20 in. prior to Apr. 15 and after Sept. 30; 22 in. Apr. 15-30; 16 in. July-Sept. Landing ratio of at least 1 chinook/2 coho July 10-19.
	Chinook	May 1-July 9	70	Chinook 26 in.
1989	All	Jan. 1-Apr. 30; July 15-Aug. 8; Aug. 30-Sept. 5; Nov. 1-Dec. 23	205	Chinook 24 in. except 26 in. May-Sept. Coho 22 in. except 16 in. July-Sept.
	Chinook	May 1-June 30	61	Chinook 26 in.
1990	All	Jan. 1-Apr. 30; July 10-27; Aug. 12-31; Sept. 4-7; Nov. 1-Dec. 31	223	Chinook 24 in. prior to May and 26 in. after May. Coho 22 in. except 16 in. July-Sept. Landing ratio of at least 1 chinook/15 coho in Aug.
	Chinook	May 1-June 30	61	Chinook 26 in.
1991	All	Jan. 1-Apr. 30; July 7-19; Aug. 3-8; Aug. 10-13; Aug. 19; Oct. 7-Dec. 31	230	Chinook 24 in., coho 22 in. except 16 in. July-Sept. Part day fishery on Aug. 19.
	Chinook	May 1-June 30	61	Chinook 24 in.
1992	All	Jan. 1-Apr. 30; July 15-21; Aug. 1-5; Nov. 1-Dec. 1-31	194	Chinook 22 in. except 24 in. July and Aug. Coho 22 in. except 16 in. July and Aug.
	Chinook	May 1-June 30	61	Chinook 24 in.
1993	All	Jan. 1-Apr. 15; July 1-Oct. 31	228	Chinook 22 in., coho 22 in. except 16 in. July-Oct.
	Chinook	May 1-June 30; Nov. 1-Dec. 31	122	Chinook 24 in. May-June, 22 in. Nov. -Dec.

TABLE C-7. Summary of actual **treaty Indian ocean and Area 4B troll** regulations. (Page 4 of 5)

Year	Species	Season	Days	Minimum Size, Area, Gear, and Other Restrictions[a/]
1994	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 15-Dec. 31	213	Chinook 22 in. except 24 in. May-June.
1995	Chinook	Jan. 1-Apr. 15; May 1-31; Nov. 1-30	166	Chinook 22 in. except 24 in. in May.
	All	Aug. 1-24; Dec. 1-31	55	Chinook 22 in. except 24 in. in Aug. Coho 16 in.
1996	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	197	Chinook 22 in. except 24 in. May-June.
	All	Aug. 5-13; Sept. 1-11; Dec. 1-31	51	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1997	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	Chinook 22 in. except 24 in. May-June.
	All	Aug. 4-31; Sept. 3-6; Dec. 1-31	63	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1998	Chinook	Jan 1-Apr. 15; May 1-June 6; Nov. 1-30[c/]	172	Chinook 22 in. except 24 in. May-June.
	All	Aug. 3-21; Sept. 1-4; 6-9; 11-12; 14-15; Dec 1-31	59	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1999	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	Chinook 22 in. except 24 in. May-June.
	All	Aug. 1-Sept. 15; Dec. 1-31	77	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
				S'KLALLAM TRIBES
Statistical Area 4B (Inside Waters)				
1977-1979	All	Jan. 1-Dec. 20	354	Chinook 24 in., coho 16 in.; except chinook 26 in. during 1979.
1980	All	Jan. 1-Dec. 31	366	Chinook 28 in.; coho 20 in., except 16 in. early June to first week in Sept.
1981	All	Jan. 1-Dec. 31	365	Chinook 20 in. except 28 in. early May to first week in Sept. Coho 20 in. except 16 in. early June to first week in Sept.
1982	All	Jan. 1-Dec. 31	365	Chinook 22 in. except 24 in. early May to first week in Sept. Coho 20 in. except 16 in. early June to first week in Sept. Maximum 30 in. chinook size limit Apr. 15-June 15 to protect Puget Sound spring chinook.
1983	All	Jan. 1-Apr. 14; June 16-Dec. 31	303	Chinook 22 in., coho 20 in; except June 16 to first week in Sept. chinook 24 in., coho 16 in. Apr. 15-June 15 closure to protect Puget Sound spring chinook.
1984	All	Jan. 1-Apr. 14; June 17-Dec. 31	303	Chinook 22 in. except 24 in. June 17-Sept. 3. Coho 16 in.
1985	All	Jan. 1-Dec. 31	365	Chinook 22 in. Coho 16 in. Maximum 30 in. chinook size limit Apr. 14-June 15.
1986	All	Jan 1-Aug. 8; Oct. 1-Dec. 31	312	Chinook 22 in. except 30 in. Apr. 14-June 15. Coho 16 in. Closed within 600 ft. of stream mouths.
1987	All	Jan 1-Aug. 31; Sept. 27-Oct. 6; Nov. 29-Dec. 31	286	Chinook 22 in. except 24 in. after Apr. 11; maximum size limit 30 in. Apr. 12-June 15. Coho 16 in.
	Chinook	Nov. 1-28	28	Chinook 24 in.
1988	All	Jan 1-Sept. 3; Nov. 1-Dec. 31	307	Chinook 24 in. except 22 in. after Sept. Coho 16 in. except 20 in. May-Sept.
1989	All	Jan. 1-Sept. 6; Nov. 1-Dec. 31	310	Chinook 24 in., coho 16 in.
1990	All	Jan. 1-Sept. 7; Nov. 1-Dec. 31	311	Chinook 24 in., coho 16 in.
1991	All	Jan. 1-Apr. 30; July 1-Aug. 13; Nov. 1-Dec. 31	225	Chinook 24 in., coho 16 in.
	Chinook	May 1-June 30	61	Chinook 24 in.

TABLE C-7. Summary of actual **treaty Indian ocean and Area 4B troll** regulations. (Page 5 of 5)

Year	Species	Season	Days	Minimum Size, Area, Gear, and Other Restrictions[a/]
1992	All	Jan. 1-Apr. 30; July 1-Aug. 6; Nov. 1-30; Dec. 7-31	213	Chinook 22 in. except 24 in. July-Aug. Coho 16 in.
	Chinook	May 1-June 30	61	Chinook 24 in.
1993	All	Jan. 1-Apr. 15; July 1-Sept. 30; Nov. 1-Dec. 31	258	Chinook 22 in. except 24 in. July-Sept. Coho 16 in.
	Chinook	May 1-June 30	61	Chinook 24 in.
1994	All	Jan. 1-Apr. 15; Nov. 15-Dec. 31	152	Chinook 22 in., coho 16 in.
	Chinook	May 1-June 30	61	Chinook 24 in.
1995	Chinook	Jan. 1-Apr. 15; May 1-31; Nov. 1-30	166	Chinook 22 in. except 24 in. in May.
	All	Aug. 1-24; Dec. 1-31	55	Chinook 22 in. except 24 in. in Aug. Coho 16 in.
1996	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	197	Chinook 22 in. except 24 in. May-June.
	All	Aug. 5-13; Sept. 1-11; Dec. 1-31	51	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1997	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	Chinook 22 in. except 24 in. May-June.
	All	Aug. 4-29; Sept. 3-7; Dec. 1-31	62	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1998	Chinook	Jan. 1-Apr. 15; May 1-June 6; Nov. 1-30	172	Chinook 22 in. except 24 in. May-June.
	All	Aug. 3-Sept. 4; Dec. 1-31	64	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.
1999	Chinook	Jan. 1-Apr. 15; May 1-June 30; Nov. 1-30	196	Chinook 22 in. except 24 in. May-June.
	All	Aug. 1-Sept. 15; Dec. 1-31	77	Chinook 22 in. except 24 in. Aug.-Sept. Coho 16 in.

a/ Ceremonial and subsistence harvest restrictions for ocean fisheries are as follows. Makah Tribe: none. Quinault, Quileute and Hoh tribes: 1983-1988, no more than 2 chinook between 24-26 in. per day; beginning in 1989, no restriction on chinook less than 24 in., but no more than 2 chinook longer than 24 in. per day. Beginning in 1985, restrictions on fishing lines have been: no more than 8 fixed lines per boat for Quinault, Quileute and Hoh tribes; no more than 8 fixed lines per boat or no more than 4 hand-held lines per person for the Makah Tribe. Beginning in 1985, the following closure has been in effect for Quinault, Quileute and Hoh fisheries: the area within a 6-mile radius of the mouths of the Hoh, Queets and Quillayute rivers is closed.

b/ Barbless hooks required except on whole bait and plugs.

c/ The specific openings after Sept. 4 were: noon on Sept. 6 through noon on Sept. 9; 6 a.m. on Sept. 11 through noon on Sept. 12; and noon on Sept. 14 through midnight on September 15.

TABLE C-8. Council preseason adopted catch quotas for ocean fisheries north of Cape Falcon and critical stocks driving management in thousands of fish. (Page 1 of 1)

	Chinook				Coho			
Year	Critical Stocks	Treaty Troll	Non-Indian Troll	Sport	Critical Stocks	Treaty Troll	Non-Indian Troll	Sport
1979	None	-	-	-	None	-	-	-
1980	None	-	-	-	Washington Coastal Coho	-	-	-
1981	None	-	-	-	Hoh and Skagit[a/]	-	372	248
1982	None	-	-	-	Washington Coastal Coho	-	293	215
1983	Columbia River Hatchery and Depressed Upriver Stocks	-	114	88	Queets and Skagit[b/]	-	164	318
1984	LRH and SCH	8.3	16.7	10.3	Grays Harbor	38.5	24.8	50.2
1985	SCH	10.5	47.5[c/]	37.2	Skagit	75	91.5	198.4
1986	SCH	12.5	51	37.1	Quillayute and Queets	86	140.6	207.5
1987	SCH	15.8	58.2[d/]	44.6	Skagit	86	141.2	200.9
1988	Columbia River Upriver Stocks	60	73.7	29.8	Washington Coastal and Puget Sound	68	0.0[e/]	100
1989	Columbia River Upriver Stocks	32	47.5	47.5	Queets and Skagit	77	75	225
1990	Columbia River LRH	31.2	37.5	37.5	Queets and Skagit	90	105	245
1991	Columbia River LRH	33	40	40	Hood Canal and Skagit	80	87	233
1992	Columbia River tules and Snake River falls	33	47	33	Hood Canal and Stillaguamish	68	19	141
1993	Columbia River tules and Snake River falls	33	35	25	Skagit	90	47.5	202.5
1994	Columbia River LRH and Snake River falls	16.4	0	0	Washington Coastal and Puget Sound	0	0	0
1995	Columbia River LRH and Snake River falls	12	0	0	Washington Coastal and Puget Sound	30	25	75
1996	Columbia River LRH and Snake River falls	11	0	0	Washington Coastal and Puget Sound	30	20.8	62.2
1997	Snake River Falls	15	11.5	5.2	Washington Coastal and Puget Sound	12.4	0	32.3[f/]
1998	Columbia River LRH	15	6.5	3.5	Washington Coastal and OCN	10	0	16
1999	Columbia River LRW (Lewis River)	30	28.5	21.5	Queets, Strait of Juan de Fuca, and OCN	38.5	20	110

a/ Although the Skagit River escapement goal would not be achieved, management was based on meeting WDFW's escapement goal for Hoh River coho and allocation based on aggregation to Washington coastal tribes.
b/ The Council management regime was not expected to meet equitable adjustment requirements for Skagit River coho.
c/ Plus 7,430 hooking mortality for pink fishery.
d/ Plus 3,250 hooking mortality for pink fishery.
e/ Hooking mortality of 2,800 coho for June 1-15 fishery not included.
f/ Plus 1,200 hook-and-release mortality for the Neah Bay all-salmon-except-coho fishery.

TABLE C-9. Sequence of events in ocean salmon fishery management, 1999.[a/] (page 1 of 6)

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES

Jan. 11	Council distributes Draft Amendment 14 to the Pacific Coast Salmon Plan for public review. This amendment updates the environmental impact statement, responds to directives in the Sustainable Fisheries Act (e.g., essential fish habitat, optimum yield, overfishing criteria, and bycatch data), clarifies stock management objectives, makes minor modifications to recreational harvest allocation north of Cape Falcon, provides for selective fisheries for marked hatchery fish, and makes other editorial improvements.
Jan. 13	Council submits *Amendment 13 to the Pacific Coast Salmon Plan* (management of Oregon coastal natural coho) to National Marine Fisheries Service (NMFS) for implementation.
Feb. 1-4	Council holds four public hearings for Amendment 14, one in each of the three Pacific Coast states and one in Idaho.
Mar. 1	NMFS provides the Council with a letter outlining the 1999 management guidance for stocks listed under the Endangered Species Act (ESA).
Mar. 12	Council adopts Amendment 14 for implementation by NMFS and three troll and three recreational ocean salmon fishery management options for public review. NMFS inseason conference number one (at the Council meeting) results in two Council recommendations which are implemented by NMFS, (1) open the commercial and recreational fisheries off Oregon from Cape Falcon to Humbug Mt. on April 1 for all salmon except coho and (2) open three commercial test fisheries off California in Apr. south of Pillar Pt. for all salmon except coho to gather fishery impact data on Sacramento River winter and spring chinook. Each fishery is under a separate quota and the season opens Apr. 14 through 16, 21 through 23, and 28, unless closed earlier upon achievement of the quota.
Mar. 17-18	North of Cape Falcon Salmon Forum meets in Portland, Oregon to initiate consideration of recommendations for treaty Indian and non-Indian salmon management options.
Mar. 23	NMFS announces new listings under the ESA of four evolutionarily significant units (ESUs) of chinook salmon. The chinook ESUs are Puget Sound (threatened), lower Columbia River (threatened), upper Willamette River (threatened), and upper Columbia River spring (endangered). The effective date of the listings is delayed by two months. Since Council fisheries have little impact on these ESUs, no new requirements are proposed for Council fisheries as a result of the listings. NMFS deferred, for six months, its decision on listing chinook ESUs for Central Valley spring and fall runs, southern Oregon-California coastal, and Snake River fall (considering inclusion of Deschutes River fall chinook salmon within the Snake River fall chinook ESU).
Mar. 29-30	Council holds public hearings on proposed 1999 management options in four locations within the three Pacific coast states. In addition, the state of California holds an additional hearing in Moss Landing.
Mar. 31-Apr. 1	North of Cape Falcon Salmon Forum meets in Olympia, Washington to further consider recommendations for treaty Indian and non-Indian salmon management options.
Apr. 9	Council adopts final ocean salmon fishery management recommendations for approval and implementation by the U.S. Secretary of Commerce. The proposed measures include an expanded use of selective fisheries and comply with the salmon fishery management plan (FMP) and the current biological opinions for listed species. An emergency rule is not required for implementation.
Apr. 19	NMFS inseason conference number two deals with the April commercial test fisheries off California and results in the following modifications, (1) a final closure on Apr. 16 of the test fishery from Pillar Pt. to Pigeon Pt. to avoid exceeding the 3,000 chinook quota and (2) for the remaining two test fisheries: rescind the daily landing requirement, allow up to 90 chinook per open period (3 days), and open the fisheries continuously from Apr. 26-28.
May 1	Ocean salmon seasons implemented as recommended by the Council and published in the *Federal Register* on May 5 (64 FR 24078).

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES (continued)

May 14	NMFS issues a final rule (64 FR 26328) to implement Amendment 13 (management of Oregon coastal natural coho).
July 12	NMFS inseason conference number three closes the all-salmon-except-coho commercial test fishery between Fort Ross and Pt. Reyes as the landings have exceeded the 2,500 chinook quota.
July 16	NMFS inseason conference number four considers transfer of the unharvested chinook from the May/June harvest guideline of the non-Indian, all-salmon-except-coho troll fishery north of Cape Falcon to the July-Sept. commercial season north of Leadbetter Pt. Approximately 11,100 chinook of the 24,000 chinook guideline were harvested in the May/June season. To prevent any increase in impacts (over that resulting from the preseason process) on lower Columbia River wild and Snake River fall chinook, and to preserve inside outside sharing agreements, NMFS allows transfer of 2,500 chinook to the late season fishery.
July 29	NMFS inseason conference number five removes gear restrictions and the coho landing restriction from the all-salmon troll fishery north of Leadbetter Pt. The restrictions were designed to reduce the rate of coho harvest. However, projections indicate the chinook quota (7,000) will be reached long before the coho quota (20,000). Therefore, there is no need to, (1) limit the number of spreads per line, (2) allow only plugs greater than 6 inches long, nor (3) limit coho landings to 100 coho per opening.
Aug. 5	NMFS inseason conference number six considers alternative regulations for the all-salmon, non-Indian troll fishery north of Leadbetter Pt. that will allow harvest of more coho while completing harvest of the chinook quota. To provide more time to consider alternatives, NMFS closes the next scheduled 4-day opening of the fishery (Aug. 7-10) and will reconvene a conference on Aug. 9 to determine the appropriate regulation change.
Aug. 9	NMFS inseason conference number seven considers four alternatives for managing the remainder of the north of Leadbetter Pt., non-Indian, all-salmon troll season to harvest a greater proportion of the coho quota. Due to higher chinook harvest in the northern area, NMFS agrees with state recommendations to close the fishery north of Cape Alava. The remaining area between Cape Alava and Leadbetter Pt. will proceed as scheduled (Aug. 14 through 17) with no special gear restrictions and no coho landing limit. On Aug. 19, a conference will be convened to consider further appropriate action.
Aug. 19	NMFS inseason conference number eight considers adjustments to the all-salmon, non-Indian troll fishery north of Leadbetter Pt. Late arriving Oregon landings data from previous openings indicate the 7,000 chinook quota has been exceeded by about 200 fish while about 15,000 coho still remain in the quota. Based on this information, the troll fishery is closed for the season (last open day was Aug. 17) and will not reopen unless unharvestable chinook quota from the recreational fishery is available and appropriate to transfer to the troll fishery prior to Sept. 30. An Aug. 25 conference is scheduled to consider adjustments in the recreational fisheries north of Cape Falcon.
Aug. 25	NMFS inseason conference number nine considers adjustments to the recreational fisheries north of Cape Falcon. Projections indicate the recreational season will end with a significant amount of the coho and chinook quotas unharvested, even if fishing is increased to 7 days per week south of the Queets River (already open 7 days per week north of the Queets River). Lack of effort and poor weather appear to be a part of the low harvest rate. NMFS agrees with Salmon Advisory Subpanel and state recommendations to allow fishing 7 days per week in the Westport and Columbia River areas beginning Sept. 3, 1999 (i.e., the season runs continuously beginning Aug. 29).
Sept. 2	NMFS inseason conference number 10 considers adjustments to the recreational and non-Indian commercial fishery quotas north of Cape Falcon. Projections indicate La Push will exceed its recreational subarea coho quota on Sept. 6. With about 15,000 coho unharvested in the commercial fishery at the time the chinook quota was taken, the states and advisors recommend a trade of 2,000 coho to La Push from the commercial quota for 1,000 chinook to the commercial fishery from the overall recreational quota. NMFS implements the trade and reopens the non-Indian commercial fishery from Cape Alava to Leadbetter Pt. for nine days (Sept. 5 through Sept. 13) in an all-species-

GENERAL MANAGEMENT ACTIONS AND INSEASON CONFERENCES (continued)

	except-chinook fishery with no special restrictions or landing limits. The STT projects commercial coho harvest at less than 7,000 fish and a nonretention mortality of about 200 chinook..
Sept. 21	NMFS inseason conference number 11 reviews the results of the Sept. 5-13 opening of the Cape Alava to Leadbetter Pt. non-Indian commercial fishery which landed 337 coho. With several thousand coho remaining in the quota and sufficient chinook for hook-and-release mortality, NMFS reopens the all-salmon-except-chinook fishery from Sept. 22-30 with no special restrictions.

NON-INDIAN COMMERCIAL TROLL SEASONS

Apr. 1	Cape Falcon to Humbug Mt., Oregon, all-salmon-except-coho fishery opens through July 17. The fishery will reopen Aug. 1 through 29 and Sept. 1 through October 31.
Apr. 14-16	First opening of three, all-salmon-except-coho test fisheries off California, (1) Pillar Pt. to Pigeon Pt. under a quota of 3,000 chinook, (2) Pt. Piedras Blancas to Pt. Conception under a 2,500 chinook quota, and (3) Pt. Conception to Pt. Pitas under a 2,500 chinook quota.
Apr. 16	Pillar Pt. to Pigeon Pt., all-salmon-except-coho test fishery closes for the season to avoid exceeding its 3,000 chinook quota.
Apr. 21-23	Second opening of two all-salmon-except-coho test fisheries from Pt. Piedras Blancas to Pt. Conception and Pt. Conception to Pt. Pitas under modified landing limits (see inseason conference number 2).
Apr. 26-28	Final opening of the all-salmon-except-coho test fisheries from Pt. Piedras Blancas to Pt. Conception and Pt. Conception to Pt. Pitas (see inseason conference number 2).
May 1	U.S.-Canada border to Cape Falcon, all-salmon-except-coho fishery opens through the earlier of June 15 or a 24,000 chinook guideline.
May 1	Humbug Mt. to Oregon-California border, all-salmon-except-coho fishery opens through May 31.
May 1	Pt. San Pedro to U.S.-Mexico border, all-salmon-except-coho fishery opens through Aug. 21. The fishery will reopen Sept. 1 through 30.
May 31	Humbug Mt. to Oregon-California border all-salmon-except-coho fishery closes.
Jun. 15	U.S.-Canada border to Cape Falcon, all-salmon-except-coho fishery closes as scheduled (approximately 13,000 chinook of the 24,000 chinook guideline remain unharvested).
July 1	Pt. Reyes to Pt. San Pedro, all-salmon-except-coho fishery opens through Sept. 30.
July 1	Fort Ross to Pt. Reyes, all-salmon-except-coho test fishery within 6 nm opens through the earlier of July 14 or a 2,500 chinook quota.
July 10	Cape Flattery to Cape Alava west of 125°05'00"W longitude and Cape Alava to Leadbetter Pt., all-salmon fishery opens under a quota of 7,000 chinook (4,500 in the preseason guideline plus 2,500 transferred from the May/June season) and 20,000 coho. The fishery proceeds on a cycle of 4 days open and 3 days closed.
July 12	Fort Ross to Pt. Reyes, all-salmon-except-coho test fishery within 6 nm closes as the 2,500 chinook quota is projected to have been exceeded.
July 17	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes. The fishery will reopen Aug. 1.
	Pt. Arena to Pt. Reyes, all-salmon-except-coho fishery opens through Sept. 30.
Aug. 1	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery reopens. The fishery will close Aug. 29 and reopen Sept. 1 through Oct. 31.

NON-INDIAN COMMERCIAL TROLL SEASONS (continued)

Aug. 1	Sisters Rocks to Mack Arch, all-salmon-except-coho fishery opens within 4 nm of shore under a 2,500 chinook quota. The fishery is scheduled to run continuously until the earlier of Aug. 31 or the quota.
Aug. 7-10	Cape Flattery to Cape Alava west of 125°05'00" W longitude and Cape Alava to Leadbetter Pt., all-salmon fishery remains closed during its normally scheduled 4-day opening to allow consideration of alternative regulations for the remaining season. The alternatives consider how to increase harvest of coho while completing harvest of the chinook quota. The next scheduled opening is Aug. 14 through 17.
Aug. 14	The all-salmon season north of Leadbetter Pt. reopens north to Cape Alava with no special gear restrictions or coho landing limit. The northern area from Cape Alava to Cape Flattery remains closed to reduce the rate of chinook harvest. The fishery will continue on a cycle of 4 days open and 3 days closed until the earliest of Sept. 30 or achievement of the chinook or coho quota.
Aug. 17	Cape Alava to Leadbetter Pt. all-salmon fishery closes for the season unless it is later determined that uncatchable chinook in the recreational quota are available and can be transferred to the troll fishery.
Aug. 22	South of Pt. San Pedro, all-salmon-except-coho fishery closes. The fishery will reopen Sept. 1 through 30.
Aug. 29	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes for 2 days.
Aug. 31	Sisters Rocks to Mack Arch, all-salmon-except-coho fishery within 4 nm of shore closes as scheduled.
Sept. 1	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery reopens through Oct. 31.
	House Rock to Humboldt south jetty, all-salmon-except-coho fishery opens under a quota of 7,000 chinook of which no more than 1,000 chinook may be landed in Brookings.
	Horse Mt. to Pt. Arena and Pt. San Pedro to the U.S.-Mexico border, all-salmon-except-coho fisheries reopen through Sept. 30.
Sept. 5	Cape Alava to Leadbetter Pt. fishery reopens through Sept. 13 for all-salmon-except-chinook after a transfer of 1,000 chinook from the recreational quota to provide for hook-and-release mortality.
Sept. 13	Cape Alava to Leadbetter Pt., all-salmon-except-chinook fishery closes.
Sept. 22	Cape Alava to Leadbetter Pt., all-salmon-except-chinook fishery reopens.
Sept. 30	Cape Alava to Leadbetter Pt., all-salmon-except-chinook fishery closes for the season.
	House Rock to Humboldt south jetty, all-salmon-except-coho fishery closes as scheduled.
	Horse Mt. to the U.S.-Mexico border, all-salmon-except-coho fisheries close for the season.
Oct. 15	Goat Island to 42°01'20" N latitude (Chetco River area), chinook only fishery inside Oregon territorial waters opens through the earlier of achieving a 1,000 chinook quota or Oct. 31.
Oct. 31	Cape Falcon to Humbug Mt., all-salmon-except-coho fishery closes for the season.
	Goat Island to 42°01'20" N latitude (Chetco River area), chinook only fishery inside Oregon territorial waters closes as scheduled.
Nov. 1	Oregon State territorial waters, chinook only fisheries open from (1) Twin Rocks to Pyramid Rock (Tillamook Bay mouth) and (2) Cape Blanco to Humbug Mt. (Elk River area). All landings in the Elk River fishery must be landed in Port Orford.

NON-INDIAN COMMERCIAL TROLL SEASONS (continued)

Nov. 15	Twin Rocks to Pyramid Rock (Tillamook Bay mouth), chinook only fishery inside Oregon territorial waters closes for the season.
Dec. 15	Cape Blanco to Humbug Mt. (Elk River area), chinook only fishery inside Oregon territorial waters closes for the season.

TREATY INDIAN COMMERCIAL TROLL SEASONS

May 1	All-salmon-except-coho fisheries open through the earlier of June 30 or an overall 20,000 chinook quota for the May-June season (any remainder of the quota is not transferable to the Aug.-Sept. season).
June 30	All-salmon-except-coho fisheries close as scheduled.
Aug. 1	All-salmon fisheries open.
Aug. 7	Makah Tribe closes Area 4 to limit chinook catch and help assure access to the coho quota.
Aug. 9	Makah Tribe reopens Area 4
Sept. 15	All-salmon fisheries close for the season as scheduled.

RECREATIONAL SEASONS

Feb. 13	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery opens. The fishery closes July 4 and reopens July 25 through Nov. 14.
Mar. 13	Pigeon Point to the U.S.-Mexico border, all-salmon-except-coho fishery opens through Sept. 6.
Mar. 27	Point Arena to Pigeon Point, all-salmon-except-coho fishery opens through Oct. 31.
Apr. 1	Cape Falcon to Humbug Mountain, all-salmon-except-coho fishery opens. The fishery becomes selective for marked hatchery coho beginning July 10 and the special gear restrictions are rescinded during the selective fishery.
May 29	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery opens for 37 days with a daily-bag-limit of one fish. The fishery closes July 4 and will reopen July 29 through Sept. 14.
July 4	Humbug Mt. to Horse Mt., all-salmon-except-coho closes. The fishery will reopen July 29 and continue through Sept. 14.
	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes. The fishery will reopen July 25 and continue through Nov. 14.
July 10	Cape Falcon to Humbug Mountain, all-salmon selective coho fishery opens under a quota of 15,000 adipose clipped coho. Only coho with a healed adipose fin clip may be retained. The fishery proceeds on a schedule of 2 days open and 2 days closed through the earlier of July 31 or the coho quota. There are no special gear restrictions other than the requirement to use barbless hooks.
July 19	Fisheries open north of Cape Falcon. All fisheries are selective for marked hatchery coho (adipose fin clip). North of Cape Alava (Neah Bay), the fishery is for all salmon except chinook (7 days per week). Between Cape Alava and Queets River (La Push), the fishery opens for all-salmon (7 days per week). From Queets River to Cape Falcon (Westport and Columbia River Area), the fisheries open for all-salmon (Sun. through Thurs.). The fisheries will close the earliest of Sept. 30, achievement of the coho subarea quotas, or achievement of the overall chinook quota.
July 25	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery reopens through Nov. 14.
July 29	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery reopens through Sept. 14.

TABLE C-9. Sequence of events in ocean salmon fishery management, 1999.[a/] (page 6 of 6)

RECREATIONAL SEASONS (continued)

July 31	Cape Falcon to Humbug Mountain, all-salmon selective coho fishery closes.
Aug. 1	Cape Falcon to Humbug Mountain, all-salmon-except-coho fishery reopens with special gear restrictions to reduce impacts on coho. The fishery will close for the season Oct. 31.
Sept. 3	Westport and Columbia River area fisheries (Queets River to Cape Falcon) are expanded from 5 to 7 days per week.
Sept. 6	Pigeon Pt. to U.S.-Mexico border, all-salmon-except-coho fishery closes for the season.
Sept. 14	Humbug Mt. to Horse Mt., all-salmon-except-coho fishery closes for the season.
Sept. 30	U.S.-Canada border to Cape Falcon fisheries close for the season.
Oct. 2	Goat Island to 42°01'20" N latitude (Chetco River area), chinook only fishery inside Oregon territorial waters opens under a one chinook bag limit.
Oct. 11	Goat Island to 42°01'20" N latitude (Chetco River area), chinook only fishery inside Oregon territorial waters closes for the season.
Oct. 31	Except for the area inside Oregon territorial waters around the mouth of Tillamook Bay, Cape Falcon to Humbug Mt. and Pt. Arena to Pigeon Pt., all-salmon-except-coho fisheries close for the season.
Nov. 1	Twin Rocks to Pyramid Rock (Tillamook Bay mouth) and Cape Blanco to Humbug Mt. (Elk River area), chinook only fisheries inside Oregon territorial waters open.
Nov. 14	Horse Mt. to Pt. Arena, all-salmon-except-coho fishery closes for the season.
Nov. 15	Twin Rocks to Pyramid Rock (Tillamook Bay mouth), chinook only fishery inside Oregon territorial waters closes for the season.
Dec. 15	Cape Blanco to Humbug Mt. (Elk River area), chinook only fishery inside Oregon territorial waters closes for the season.

a/ Unless stated otherwise, season openings or modifications of restrictions are effective at 0001 hours of the listed date. Closures are effective at midnight. Some events occurring after October 15 are subject to change, depending on achievement of quotas or other inseason management actions.

APPENDIX D
HISTORICAL ECONOMIC DATA

LIST OF TABLES

LIST OF TABLES (continued)

TABLE D-1. **California** monthly **troll** chinook and coho **average dressed weights** (pounds) by area of landing. (Page 1 of 3)

Year	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Season[a/]
					CHINOOK							**COHO**		
Crescent City														
1976-1980	9.1	8.5	8.6	9.1	9.8	8.9	-	8.9	3.9	4.3	6.4	7.1	7.1	5.0
1981-1985	-	8.5	8.1	9.1	9.4	9.1	-	8.9	3.9	4.5	5.6	6.7	6.9	5.5
1986-1990	-	10.0	9.1	9.7	8.8	9.2	-	9.2	-	5.0	5.1	4.5	5.6	5.0
1981	-	8.9	9.7	8.8	9.4	9.1	-	9.2	3.9	4.4	6.0	6.8	7.1	5.6
1982	-	8.0	8.8	9.9	9.7	9.3	-	9.4	3.9	4.9	5.9	6.5	6.5	5.9
1983	-	6.8	7.6	7.6	7.2	-	-	7.5	-	4.4	4.3	4.5	-	4.4
1984	-	7.1	7.2	7.9	8.4	-	-	7.9	-	-	-	7.7	-	7.7
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	9.1	8.3	9.5	8.6	9.1	-	8.7	-	4.7	5.0	-	-	4.8
1987	-	10.2	8.8	9.9	-	10.2	-	8.9	-	5.3	5.5	-	5.5	5.4
1988	-	9.0	9.1	-	-	9.0	-	9.1	-	5.4	-	-	5.6	5.4
1989	-	11.7	12.2	-	9.2	-	-	11.8	-	4.6	-	4.5	-	4.6
1990	-	-	-	-	9.7	-	-	9.7	-	-	-	-	-	-
1991	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	8.3	10.6	-	9.6	-	-	-	-	-	-
1997	-	-	-	-	-	10.0	-	10.0	-	-	-	-	-	-
1998[b/]	-	-	-	-	-	9.0	-	8.9	-	-	-	-	-	-
1999[b/]	-	-	-	-	-	11.0	-	11.0	-	-	-	-	-	-
Eureka														
1976-1980	7.8	8.1	8.4	8.6	9.8	9.5	-	8.4	3.1	4.3	6.2	7.1	6.8	4.3
1981-1985	-	7.6	8.3	9.3	9.7	9.6	-	8.6	3.8	4.5	5.6	6.4	6.6	5.4
1986-1990	-	-	8.8	10.1	10.5	9.2	11.8	9.2	-	5.3	5.6	5.3	6.1	5.5
1981	-	7.6	8.9	9.5	9.4	10.0	-	8.5	3.7	4.6	5.9	6.7	6.7	5.7
1982	-	7.8	9.4	9.6	10.9	9.2	-	9.0	5.1	5.3	5.8	6.6	6.4	5.9
1983	-	7.2	7.6	8.0	7.9	-	-	7.6	5.0	4.3	4.3	5.0	-	4.4
1984	-	7.2	7.0	8.7	8.4	-	-	7.9	-	-	7.6	6.6	-	6.8
1985	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1986	-	-	8.1	10.1	10.8	10.9	-	9.6	-	5.1	5.6	5.9	6.9	5.2
1987	-	-	8.9	-	-	8.2	-	8.8	-	5.2	-	-	6.5	5.3
1988	-	-	8.7	-	-	9.1	-	8.8	-	5.6	-	-	6.1	5.7
1989	-	-	10.3	-	9.9	9.6	9.5	10.0	-	4.7	-	4.9	6.3	4.9
1990	-	-	-	-	9.9	8.4	9.7	9.5	-	-	-	5.7	5.3	5.3
1991	-	-	-	-	-	9.5	17.7	10.1	-	-	-	-	6.2	6.2
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	11.9	10.3	-	10.7	-	-	-	-	-	-
1997	-	-	-	-	-	10.0	-	10.0	-	-	-	-	-	-
1998[b/]	-	-	-	-	-	8.9	-	8.9	-	-	-	-	-	-
1999[b/]	-	-	-	-	-	11.0	-	11.0	-	-	-	-	-	-

TABLE D-1. **California** monthly **troll** chinook and coho **average dressed weights** (pounds) by area of landing. (Page 2 of 3)

Year	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Season[a/]
					CHINOOK							**COHO**		
Fort Bragg														
1976-1980	9.1	8.6	9.4	10.8	10.2	10.5	-	10.1	3.9	4.9	6.7	6.9	7.6	5.4
1981-1985	7.6	9.5	10.6	10.1	11.3	10.3	-	10.3	3.8	5.2	6.4	6.3	7.6	6.2
1986-1990	-	9.2	9.9	9.4	10.1	10.4	-	9.6	-	5.3	5.9	6.2	6.1	5.7
1981	-	8.5	10.5	9.6	9.8	10.5	-	9.7	3.7	5.0	6.1	6.2	7.5	5.8
1982	7.6	9.7	10.8	10.0	11.6	9.9	-	10.1	4.2	6.2	6.1	6.5	7.1	6.2
1983	-	7.1	7.6	7.7	8.4	8.2	-	7.7	6.0	4.2	4.7	5.3	5.5	4.6
1984	-	7.1	10.0	8.8	8.9	9.7	-	9.0	-	7.4	7.3	7.8	8.6	7.4
1985	-	12.5	13.0	11.7	12.9	12.0	-	12.3	-	7.1	7.5	7.3	7.6	7.4
1986	-	8.6	8.4	7.9	9.2	9.3	-	8.4	-	4.9	5.9	6.4	6.1	5.6
1987	-	9.2	10.2	9.6	9.7	10.2	-	9.7	-	5.7	5.8	-	6.4	5.8
1988	-	9.6	10.8	10.1	11.5	10.5	-	10.3	-	5.9	6.6	7.3	6.8	6.4
1989	-	9.7	12.0	9.8	9.3	10.9	-	10.0	-	5.3	5.6	6.0	5.4	5.7
1990	-	9.4	9.5	9.0	10.9	9.5	-	9.4	-	4.8	5.1	6.0	6.4	5.0
1991	-	-	-	-	10.5	9.5	-	10.5	-	-	-	6.4	-	6.4
1992	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1993	-	8.2	-	-	-	9.4	-	9.4	-	-	-	-	-	-
1994	-	-	-	-	-	11.0	-	11.0	-	-	-	-	-	-
1995	-	-	-	-	-	11.7	-	11.7	-	-	-	-	-	-
1996	-	-	-	-	11.0	11.7	-	11.2	-	-	-	-	-	-
1997	-	-	-	-	-	9.3	-	9.3	-	-	-	-	-	-
1998[b/]	-	-	-	-	-	12.2	-	12.2	-	-	-	-	-	-
1999[b/]	-	-	-	-	-	12.2	-	12.2	-	-	-	-	-	-
San Francisco														
1976-1980	8.5	8.9	9.9	10.8	11.4	11.6	-	9.9	4.2	5.0	6.8	6.8	7.7	5.2
1981-1985	7.5	9.0	10.3	10.6	10.4	10.5	-	10.0	4.5	6.5	7.4	6.7	7.5	7.0
1986-1990	-	9.4	10.5	11.0	12.5	12.1	-	10.4	-	5.3	6.0	6.5	6.1	5.6
1981	-	8.6	9.8	11.3	11.3	9.9	-	10.4	4.0	6.7	7.0	5.6	10.2	6.4
1982	7.5	9.0	10.1	10.4	11.0	11.2	-	9.9	4.4	5.6	6.6	7.2	7.9	6.2
1983	6.1	6.3	6.9	7.5	8.5	8.3	-	7.1	5.5	3.8	4.6	5.1	4.3	4.6
1984	-	8.0	8.5	9.2	8.8	8.6	-	8.9	-	6.9	7.9	7.6	8.7	7.6
1985	-	10.9	11.8	14.2	12.9	12.4	-	12.2	-	6.6	7.4	7.4	7.9	6.9
1986	-	8.3	8.8	9.4	11.0	13.6	-	9.1	-	5.4	6.2	6.6	5.5	6.0
1987	-	10.1	11.4	11.3	12.3	11.5	-	10.9	-	5.7	5.9	-	-	5.8
1988	-	9.5	11.9	11.7	13.5	12.5	-	11.2	-	6.4	7.2	7.6	7.1	6.9
1989	-	9.1	10.0	11.7	11.9	11.2	-	10.0	-	5.7	5.9	6.1	5.8	5.8
1990	-	9.1	9.1	10.5	13.5	11.9	-	9.5	-	5.0	5.4	6.4	6.5	5.2
1991	-	9.4	10.4	10.8	11.8	10.8	-	10.4	-	5.3	5.9	6.4	-	5.6
1992	-	8.2	-	-	11.0	12.4	-	11.5	-	-	-	4.8	-	4.8
1993	-	7.7	7.8	9.8	9.7	11.3	-	8.8	-	-	-	-	-	-
1994	-	9.1	10.1	10.5	10.4	11.7	-	10.1	-	-	-	-	-	-
1995	-	8.4	8.8	9.8	13.5	12.8	-	9.3	-	-	-	-	-	-
1996	-	9.4	9.4	10.8	12.5	12.9	-	10.3	-	-	-	-	-	-
1997	-	10.0	10.2	11.1	12.4	12.3	-	10.7	-	-	-	-	-	-
1998[b/]	-	7.1	7.5	8.0	10.8	11.7	-	8.6	-	-	-	-	-	-
1999[b/]	10.0	12.0	12.4	13.9	14.1	13.6	-	13.1	-	-	-	-	-	-

TABLE D-1. **California** monthly **troll** chinook and coho **average dressed weights** (pounds) by area of landing. (Page 3 of 3)

Year	Apr.	May	June	July	Aug.	Sept.	Oct.	Season	May	June	July	Aug.	Sept.	Season[a/]
					CHINOOK							**COHO**		
Monterey														
1976-1980	8.5	9.3	9.2	10.9	13.2	10.0	-	9.9	4.4	4.9	6.7	7.2	5.6	5.1
1981-1985	8.2	8.1	8.9	9.4	10.7	11.4	-	8.8	5.8	6.1	7.2	7.5	7.6	6.4
1986-1990	-	10.0	11.1	12.3	12.9	11.8	-	11.0	-	5.3	6.5	6.6	6.1	5.8
1981	-	7.2	9.3	8.5	11.8	8.7	-	8.0	5.0	4.0	6.9	5.5	10.0	5.7
1982	8.3	9.1	10.1	10.8	10.8	11.9	-	9.7	6.7	5.5	5.8	8.7	10.4	6.9
1983	6.3	6.4	7.0	7.9	8.4	9.5	-	7.1	4.4	3.9	5.0	5.9	5.3	4.2
1984	-	7.8	8.3	9.8	9.5	8.6	-	8.4	-	6.7	7.9	10.7	-	7.0
1985	-	12.5	13.5	15.0	14.8	12.3	-	13.1	-	5.9	6.9	7.4	7.5	6.5
1986	-	8.8	9.7	10.1	11.5	11.0	-	9.4	-	5.0	7.4	6.8	8.0	6.3
1987	-	11.6	12.3	12.3	11.1	11.4	-	11.9	-	5.6	5.6	-	5.2	5.6
1988	-	10.1	12.5	15.0	16.6	12.5	-	12.3	-	5.8	5.1	6.1	-	5.8
1989	-	11.1	11.9	12.4	12.4	12.1	-	11.7	-	6.1	5.8	6.7	6.2	6.1
1990	-	9.8	10.2	11.3	9.7	11.8	-	10.3	-	5.3	6.4	6.3	6.3	5.6
1991	-	9.7	14.2	13.0	12.1	13.0	-	12.6	-	5.2	6.0	6.6	-	5.4
1992	-	8.6	9.3	9.1	9.9	9.7	-	9.0	-	4.3	5.2	4.4	-	4.5
1993	-	8.7	9.2	11.0	10.7	10.9	-	9.4	-	-	-	-	-	-
1994	-	10.9	11.6	12.5	12.8	10.0	-	11.8	-	-	-	-	-	-
1995	-	9.2	10.2	11.0	12.9	12.0	-	10.2	-	-	-	-	-	-
1996	-	10.4	11.3	12.6	11.7	11.2	-	11.3	-	-	-	-	-	-
1997	10.6	10.6	10.5	11.9	-	10.0	-	10.9	-	-	-	-	-	-
1998[b/]	-	7.5	7.3	7.5	10.8	7.9	-	7.4	-	-	-	-	-	-
1999[b/]	11.5	13.6	13.2	15.9	11.8	10.8	-	13.5	-	-	-	-	-	-
Total Statewide														
1976-1980	8.4	8.6	9.1	10.3	10.7	10.5	-	9.5	3.5	4.5	6.5	7.0	7.1	4.9
1981-1985	7.9	8.6	9.8	10.1	10.3	10.2	-	9.6	3.9	5.1	6.2	6.5	7.0	5.9
1986-1990	-	9.5	10.2	10.5	11.2	10.9	11.8	10.2	-	5.2	6.0	6.2	6.0	5.6
1981	-	8.0	10.1	10.3	10.0	9.7	-	9.4	3.8	4.6	6.0	6.7	7.1	5.7
1982	7.9	8.8	10.0	10.2	10.7	10.4	-	9.7	4.9	5.4	6.0	6.6	6.8	6.0
1983	6.2	6.5	7.4	7.7	8.3	8.4	-	7.3	5.0	4.3	4.4	5.0	4.8	4.4
1984	-	7.5	8.5	9.1	8.8	9.3	-	8.7	-	6.8	7.7	7.2	8.6	7.4
1985	-	11.6	12.4	12.7	13.0	12.2	-	12.3	-	7.0	7.5	7.3	7.6	7.3
1986	-	8.6	8.8	8.9	10.3	11.6	-	9.0	-	5.0	6.0	6.4	6.1	5.5
1987	-	10.1	10.4	10.3	10.7	10.5	-	10.3	-	5.4	5.8	-	6.4	5.6
1988	-	9.7	11.3	11.3	12.9	11.0	-	11.0	-	5.8	6.6	7.4	6.2	6.3
1989	-	9.7	10.7	10.7	10.4	10.9	9.5	10.3	-	5.1	5.7	5.9	5.9	5.5
1990	-	9.4	9.5	10.4	11.3	10.1	9.7	9.7	-	4.9	5.4	6.2	5.6	5.1
1991	-	9.5	11.9	11.6	11.2	10.4	17.7	11.0	-	5.3	5.9	6.4	6.2	5.6
1992	-	8.6	9.3	9.1	10.9	12.1	-	10.0	-	4.3	5.2	4.8	-	4.5
1993	-	8.2	8.7	10.2	9.9	9.7	-	9.1	-	-	-	-	-	-
1994	-	9.7	10.3	11.2	10.5	11.4	-	10.5	-	-	-	-	-	-
1995	-	8.8	9.5	10.5	13.2	12.4	-	9.8	-	-	-	-	-	-
1996	-	10.2	10.2	11.8	11.7	11.9	-	10.8	-	-	-	-	-	-
1997	10.6	10.3	10.4	11.5	12.4	11.7	-	10.8	-	-	-	-	-	-
1998[b/]	-	7.4	7.4	7.9	10.7	11.4	-	8.1	-	-	-	-	-	-
1999[b/]	10.0	13.0	12.8	14.2	14.1	11.4	-	13.0	-	-	-	-	-	-

a/ Season average includes minor catches for Oct. where appropriate.
b/ Preliminary.

TABLE D-2. **Oregon** monthly **troll** chinook and coho salmon **average dressed weights** (pounds). (Page 1 of 1)

Year or Average	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Season
				CHINOOK					
1971-1975	-	9.4	10.8	10.4	10.1	9.2	11.0	16.3	10.2
1976	-	10.2	10.3	10.8	10.5	9.7	10.6	11.7	10.4
1977	-	8.8	10.5	10.5	10.0	9.4	11.0	14.1	10.2
1978	-	9.6	9.8	9.9	9.2	9.5	12.0	18.5	9.9
1979	-	11.9	9.9	11.0	10.2	10.9	9.0	16.3	10.5
1980	-	10.7	10.5	10.6	10.3	9.8	9.9	16.4	10.4
1981	-	9.2	9.1	10.7	9.8	8.6	10.5	14.4	9.8
1982	-	9.4	10.4	10.4	10.0	8.8	9.8	12.9	10.1
1983	-	8.8	8.0	7.9	7.8	8.8	10.1	11.7	8.2
1984	-	8.6	8.5	8.5	8.2	9.2	16.6	15.4	8.5
1985	-	9.1	9.3	10.0	9.0	8.6	10.6	19.3	9.4
1986	-	9.4	8.7	8.5	8.0	7.8	7.5	13.1	8.4
1987	-	9.3	9.7	10.2	9.4	8.4	10.8	14.2	9.8
1988	-	8.6	9.5	9.5	9.3	10.0	9.3	14.6	10.1
1989	-	9.8	9.4	10.5	9.6	10.9	10.5	16.8	10.0
1990	-	9.4	10.0	9.4	8.7	9.6	13.8	10.5	9.4
1991	-	10.4	9.9	9.7	8.3	8.9	10.4	-	9.3
1992	-	9.7	10.3	8.7	8.5	9.7	9.9	-	9.2
1993	-	9.5	8.9	9.5	8.2	9.2	10.9	12.5	9.3
1994	-	10.6	10.6	8.7	13.0	9.6	13.3	15.6	11.3
1995	-	9.5	9.3	9.5	9.1	8.7	8.9	8.9	9.0
1996	-	9.8	11.3	12.3	11.2	10.5	10.2	11.1	10.9
1997	11.8	11.3	11.0	11.9	9.3	9.1	12.4	15.8	10.3
1998[a/]	11.1	10.8	11.5	12.7	10.8	10.0	14.4	15.6	11.2
1999[a/]	9.1	10.8	11.7	11.1	10.2	11.8	15.7	16.3	11.3
				COHO					
1971-1975	-	-	5.1	6.1	7.0	7.2	7.9	-	6.2
1976	-	-	4.1	5.0	5.8	5.7	6.2	-	5.0
1977	-	-	4.6	6.0	7.1	6.6	7.6	-	5.9
1978	-	-	4.4	4.5	5.1	4.9	5.2	-	4.5
1979	-	-	-	6.3	6.8	6.2	-	-	6.4
1980	-	-	-	5.5	5.9	6.1	-	-	5.7
1981	-	-	-	4.8	6.0	-	-	-	5.4
1982	-	-	-	5.2	5.6	-	-	-	5.2
1983	-	-	-	3.4	3.8	3.6	-	-	3.4
1984	-	-	-	-	5.1	-	-	-	5.1
1985	-	-	-	5.7	5.9	-	-	-	5.8
1986	-	-	4.3	4.4	3.9	-	-	-	4.3
1987	-	-	5.0	5.3	5.6	5.9	-	-	5.4
1988	-	-	5.2	5.1	5.9	-	-	-	5.4
1989	-	-	4.6	4.3	4.7	4.7	-	-	4.4
1990	-	-	-	5.1	5.3	5.5	7.2	-	5.2
1991	-	-	4.2	4.8	5.1	4.8	-	-	4.6
1992	-	-	-	4.0	4.2	-	-	-	4.2
1993	-	-	-	3.3	5.2	6.0	-	-	5.4
1994	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	-	-	-	-	-
1996	-	-	-	-	-	-	-	-	-
1997	-	-	-	-	-	-	-	-	-
1998[a/]	-	-	-	-	-	-	-	-	-
1999[a/]	-	-	-	-	-	-	-	-	-

a/ Preliminary.

TABLE D-3. **Washington** monthly **troll** chinook and coho salmon **average dressed weights** (pounds).[a/b/] (Page 1 of 2)

	May		June		July		Aug.		Sept.		Oct.		Season[c/]	
Year	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian
						CHINOOK								
1980	10.9	12.0	12.6	-	12.5	13.2	14.2	13.5	10.9	13.1	6.7	-	7.3	13.0
1981	7.3	10.2	9.8	-	10.4	12.8	11.0	13.0	8.1	-	5.7	-	6.7	11.4
1982	8.9	9.7	8.0	-	10.2	12.9	8.4	14.0	5.9	13.6	5.5	-	7.0	11.2
1983	7.1	9.9	8.5	-	9.6	11.8	7.8	12.3	7.2	11.7	5.1	-	6.1	10.5
1984	6.6	9.1	8.8	-	8.1	-	8.6	10.7	8.0	-	4.4	-	5.3	9.4
1985	6.5	9.7	8.9	-	9.8	11.5	10.8	11.1	9.5	-	4.9	-	6.9	10.4
1986	8.3	10.1	7.3	-	8.8	-	8.3	10.3	5.9	-	4.5	-	6.0	10.2
1987	8.2	9.0	6.0	-	10.1	10.6	10.0	-	6.1	-	-	-	6.3	9.5
1988	8.2	10.3	9.6	11.1	10.1	-	9.8	-	8.4	-	5.1	-	7.0	10.6
1989	8.8	10.1	7.7	10.1	9.0	-	9.3	13.2	7.8	12.6	5.1	-	7.1	10.6
1990	7.0	8.0	9.7	12.0	10.1	13.6	8.2	12.7	6.0	11.7	6.2	12.6	7.0	11.1
1991	7.4	10.1	7.9	10.9	8.9	-	8.7	12.7	4.3	12.0	7.9	-	6.5	10.6
1992	6.4	11.3	7.3	12.3	8.3	12.1	8.4	11.5	7.5	-	4.8	-	6.1	11.6
1993	6.3	10.7	7.3	10.8	8.5	12.0	8.3	11.4	8.4	12.1	8.5	-	7.0	11.0
1994	9.6	-	9.9	9.3[d/]	11.9	-	-	-	-	-	-	-	8.1	9.3[d/]
1995	5.7	-	6.7	-	6.0	-	7.7	9.1[d/]	6.2	9.4[d/]	4.2	8.3[d/]	6.9	8.4[d/]
1996	5.8	-	6.2	12.9[d/]	-	12.6[d/]	7.8	-	6.7	-	-	-	6.9	12.4[d/]
1997	7.3	10.4	6.7	10.9	-	-	8.4	-	9.3	-	-	-	7.4	10.6
1998	11.1	11.4	11.7	12.9	7.4	-	11.0	-	8.2	-	-	-	10.8	11.4
1999	7.1	11.0	8.8	11.1	-	11.9	7.7	11.0	5.6	-		-	8.1	11.2

TABLE D-3. **Washington** monthly **troll** chinook and coho salmon **average dressed weights** (pounds).[a/b/] (Page 2 of 2)

	May		June		July		Aug.		Sept.		Oct.		Season[c/]	
Year	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian	Treaty Indian	Non-Indian
							COHO							
1980	2.5	-	3.4	-	4.3	4.8	5.7	6.0	6.9	5.7	-	-	3.7	5.2
1981	1.7	-	2.9	-	3.9	4.2	4.7	4.7	5.9	5.9	-	5.8	4.5	4.3
1982	2.2	-	3.5	-	4.2	4.7	5.3	4.1	6.5	4.9	-	-	5.3	5.0
1983	3.0	-	3.4	-	3.6	5.0	4.0	4.0	4.8	-	-	-	4.1	4.2
1984	-	-	-	-	3.1	-	5.0	4.5	5.1	-	6.5	-	4.2	4.5
1985	-	-	3.1	-	4.4	4.5	5.5	5.8	5.7	-	-	-	5.0	4.6
1986	-	-	3.0	-	3.5	-	3.9	4.2	-	-	5.8	-	3.4	4.1
1987	-	-	-	-	3.9	4.3	4.3	-	4.6	-	4.6	-	4.1	4.3
1988	-	-	2.6	-	4.1	-	3.9	-	4.4	-	5.0	-	4.0	-
1989	-	-	-	-	4.0	-	4.2	3.8	4.6	4.9	5.0	-	4.3	3.9
1990	-	-	2.9	-	4.6	5.5	4.8	5.2	5.8	6.0	6.2	7.0	4.8	5.6
1991	-	-	-	-	4.1	-	4.8	5.0	3.9	5.6	6.0	-	4.4	5.1
1992	-	-	2.7	-	3.5	3.8	3.4	4.5	2.9	-	3.9	-	3.5	4.1
1993	-	-	-	-	3.4	3.6	4.6	5.0	4.9	5.8	5.7	-	4.6	4.8
1994	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1995	-	-	-	-	3.8	-	4.6	4.2	3.9	4.7	8.0	-	4.6	4.4
1996	-	-	-	-	-	3.8	3.5	4.0	5.3	-	-	-	5.0	4.0
1997	-	-	-	-	-	-	3.4	-	3.9	-	-	-	3.6	-
1998	-	-	-	-	-	-	5.0	-	5.8	-	-	-	5.4	-
1999		-		-	5.0	4.6	5.0	5.7		5.9		-	5.0	5.5

a/ Split between treaty Indian and non-Indian beginning in 1979. Treaty Indian statistics include landings from Puget Sound.
b/ All values in this table are based on preliminary information available at the start of each year's review.
c/ Season totals include additional winter treaty Indian troll.
d/ The fishery for chinook was closed north of Cape Falcon, however chinook were caught off Oregon and landed in Washington.

TABLE D-4. **California troll** combined chinook and coho salmon **landings** in dressed weight, value of landings and **number of registered vessels** making commercial salmon landings.[a/] (Page 1 of 1)

Year	Dressed Pounds Landed (thousands)	Nominal Exvessel Value ($ thousands)	Vessels Landing Salmon	Vessels with Permits	Nominal Average Exvessel Value/Vessel (dollars)	Real Average Exvessel Value/Vessel (1999 dollars)
1960	6,221	3,339	1,365	-	2,446	11,408
1961	8,638	4,698	1,615	-	2,909	13,416
1962	6,673	4,023	1,563	-	2,574	11,710
1963	7,849	3,959	1,611	-	2,457	11,055
1964	9,481	5,013	1,774	-	2,826	12,524
1965	9,674	4,989	2,001	-	2,493	10,847
1966	9,447	4,845	1,929	-	2,512	10,621
1967	7,402	3,945	2,137	-	1,846	7,573
1968	6,952	4,014	2,249	-	1,785	7,018
1969	6,151	3,843	2,125	-	1,808	6,784
1970	6,629	5,101	2,065	-	2,470	8,798
1971	8,117	4,757	2,221	-	2,142	7,248
1972	6,423	4,830	2,392	-	2,019	6,546
1973	9,669	8,991	2,848	-	3,157	9,681
1974	8,749	8,013	3,185	-	2,516	7,101
1975	6,925	6,972	3,150	-	2,213	5,720
1976	7,788	10,707	3,526	-	3,037	7,403
1977	5,920	12,074	3,797	-	3,180	7,277
1978	6,788	11,001	4,919	-	2,236	4,786
1979	8,746	19,659	4,593	-	4,280	8,473
1980	6,017	13,149	4,738	-	2,775	5,046
1981	6,012	14,322	4,102	-	3,491	5,809
1982	8,000	19,489	4,013	5,964	4,856	7,618
1983	2,411	4,608	3,223	4,617	1,430	2,154
1984	2,970	7,562	2,569	4,180	2,944	4,277
1985	4,600	11,515	2,308	3,869	4,989	7,029
1986	7,598	15,112	2,582	3,753	5,853	8,070
1987	9,293	25,623	2,442	3,533	10,493	14,063
1988	14,750	41,927	2,571	3,493	16,308	21,145
1989	5,720	13,485	2,534	3,464	5,322	6,644
1990	4,436	12,056	2,115	3,372	5,700	6,849
1991	3,697	9,047	1,769	3,242	5,114	5,944
1992	1,643	4,505	1,085	2,974	4,152	4,724
1993	2,537	5,707	1,240	2,740	4,602	5,099
1994	3,103	6,437	1,024	2,470	6,286	6,821
1995	6,633	11,693	1,104	2,333	10,591	11,253
1996	4,113	5,984	985	2,222	6,075	6,338
1997	5,248	7,288	835	2,069	8,728	8,957
1998	1,847	3,060	670	1,905	4,567	4,632
1999[b/]	3,483	6,594	645	1,798	10,223	10,223

a/ Derived from vessel registrations and fish landing tickets.
b/ Preliminary.

TABLE D-5. **Oregon troll** combined chinook and coho salmon **landings** in dressed weight, value of landings and number of registered vessels making commercial salmon landings.[a/] (Page 1 of 1)

Year	Dressed Pounds Landed (thousands)	Nominal Exvessel Value ($ thousands)	Vessels Landing Salmon	Vessels with Permits	Nominal Average Exvessel Value/Vessel (dollars)	Real Average Exvessel Value/Vessel (1999 dollars)
1974	-	7,937	2,253	-	3,523	9,944
1975	-	5,808	2,304	-	2,521	6,514
1976	10,983	14,868	2,770	-	5,368	12,922
1977	6,209	11,484	3,108	-	3,695	8,248
1978	4,673	7,340	3,158	-	2,324	4,974
1979	7,166	16,989	3,114	-	5,456	10,800
1980	4,362	8,185	3,875[b/]	4,314	2,112	3,840
1981	4,897	9,573	3,615	3,926	2,648	4,406
1982	5,060	9,895	3,269	3,646	3,027	4,748
1983	1,753	2,296	2,951	3,439	778	1,172
1984	621	1,595	771[c/]	3,203	2,069	3,037
1985	2,514	5,774	2,050[d/]	2,993	2,817	3,968
1986	5,275	7,954	2,288	2,739	3,476	4,793
1987	7,098	16,763	2,111	2,626	7,941	10,643
1988	7,723	21,536	2,061	2,597	10,449	13,549
1989	5,528	10,025	1,937	2,569	5,176	6,462
1990	2,815	6,641	1,557	2,528	4,265	5,125
1991	2,106	3,120	1,217	2,044[e/]	2,564	2,980
1992	1,219	2,712	649	2,111	4,179	4,754
1993	770	1,671	612	1,814	2,735	3,025
1994	287	690	371	1,569	1,859	2,018
1995	1,941	3,294	476	1,465	6,920	7,353
1996	1,926	3,007	455	1,377	6,609	6,895
1997	1,542	2,469	433	1,295	5,702	5,852
1998	1,398	2,297	373	1,201	6,159	6,247
1999[f/]	722	1,401	328	1,089	4,271	4,271

a/ Derived from vessel registrations and fish landing tickets.

b/ The establishment of a restricted vessel permit system drew a number of historically active vessels back into the fishery in 1980.

c/ Vessels were not required to land one salmon in 1984 to be eligible for a permit in 1985. The Oregon Fish and Wildlife Commission waived this requirement because of the elimination of the coho fishery south of Cape Falcon.

d/ Vessels traditionally landing salmon south of Cape Blanco and north of Cape Falcon were not required to land one salmon in 1985 to be eligible for a permit in 1986. The Oregon Fish and Wildlife Commission waived this requirement because of the complete salmon closure south of Cape Blanco and a limited one-day coho season between the Columbia River and Cape Blanco.

e/ Legislation passed during the 1991 season of the Oregon Legislature **waived** the requirement that troll permit holders must buy a 1991 permit to be able to renew for 1992. This was a **one-time** exemption for 1991 only.

f/ Preliminary.

TABLE D-6. **Washington non-Indian troll** combined chinook and coho salmon **landings** in dressed weight, value of landings and number of registered vessels making commercial salmon landings.[a/] (Page 1 of 1)

Year	Dressed Pounds Landed (thousands)	Nominal Exvessel Value ($ thousands)	Vessels Landing Salmon	Vessels with Permits	Nominal Average Exvessel Value/Vessel (dollars)	Real Average Exvessel Value/Vessel (1999 dollars)
1978	4,746	10,025	3,041	3,291	3,297	7,055
1979	5,262	15,091	2,778	3,068	5,432	10,754
1980	3,398	7,114	2,626	2,797	2,709	4,925
1981	2,678	5,921	2,439	2,603	2,428	4,039
1982	2,671	6,730	2,253	2,512	2,987	4,685
1983	653	1,465	2,045	2,328[b/]	716	1,079
1984	197	410	381	2,071[c/]	1,076	1,564
1985	964	1,601	1,259	1,650[c/]	1,272	1,792
1986	659	1,175	1,252	1,531	938	1,294
1987	758	1,960	883	1,401	2,220	2,974
1988	798	2,337	650	1,337	3,596	4,662
1989	696	1,230	883	1,306	1,393	1,739
1990	850	1,648	897	1,170	1,837	2,207
1991	612	1,126	811	1,013	1,388	1,614
1992	583	1,299	604	806	2,151	2,447
1993	398	795	474	668	1,677	1,858
1994	7[d/]	e/	1	7[f/]	e/	e/
1995	126	91	96	435[g/]	948	1,007
1996	87	85	90	333	924	964
1997	81	126	51	324[h/]	2,450	2,514
1998	82	123	23	299[i/]	5,345	5,421
1999	220	396	57	214	6,947	6,947

a/ Derived from vessel registrations and fish landing tickets. All values in this table are based on preliminary information available at the start of each year's salmon review.
b/ 312 licenses and delivery permits purchased by buyback program.
c/ 118 licenses and delivery permits purchased by buyback program.
d/ Chinook were caught off Oregon and landed in Puget Sound.
e/ Value information is not provided in order to preserve confidentiality.
f/ Vessels were not required to purchase a permit in 1994 to maintain their eligibility for a permit in 1995.
g/ 190 licenses and delivery permits purchased by buyback program.
h/ 72 licenses and delivery permits purchased by buyback program at the end of 1996 and early 1997.
i/ 100 licenses and delivery permits purchased by buyback program at the end of 1997 and early 1998.

TABLE D-7. **California** salmon **troll boat-size catch** statistics in pounds of dressed salmon.[a/] (Page 1 of 2)

Year	Vessels: Length Category (feet)	Vessels: Number[c/]	Vessels: Percentage	Catch[b/]: Average Per Boat (pounds)	Catch[b/]: Total (pounds)	Catch[b/]: % of Total
1999[d/]	≤20	35	5	1,083	37,919	1
	21-25	120	19	2,162	259,476	7
	26-30	87	13	3,226	280,696	8
	31-35	128	20	4,674	598,230	17
	36-40	135	22	6,808	919,049	27
	41-45	65	10	9,541	620,144	18
	46-50	54	8	9,435	590,505	17
	51-55	14	2	9,064	126,892	4
	>56	7	1	7,124	49,871	1
	Unknown	0	-	-	-	-
	TOTAL	645		5,400	3,482,782	
1998	≤20	45	7	934	42,044	2
	21-25	154	23	1,406	216,593	12
	26-30	101	15	2,277	229,951	12
	31-35	119	18	2,604	309,870	17
	36-40	129	19	4,040	521,184	28
	41-45	64	10	4,514	288,916	16
	46-50	40	6	4,648	190,579	10
	51-55	11	2	3,256	35,821	2
	>56	6	1	4,048	12,105	1
	Unknown	0	-	-	-	-
	TOTAL	670		2,757	1,847,102	
1997	≤20	54	6	1,482	80,022	2
	21-25	197	24	2,791	549,756	10
	26-30	126	15	4,462	562,213	11
	31-35	144	17	6,358	915,510	17
	36-40	157	19	8,500	1,334,555	25
	41-45	78	9	11,281	879,913	17
	46-50	54	6	13,156	710,418	14
	51-55	13	2	11,806	153,476	3
	>56	12	1	11,118	61,929	1
	Unknown	0	-	-	-	-
	TOTAL	835		6,285	5,247,792	
1996	≤20	66	7	1,500	99,021	2
	21-25	221	22	1,793	396,205	10
	26-30	163	16	2,648	431,620	11
	31-35	161	16	4,315	694,793	17
	36-40	176	18	5,945	1,046,274	25
	41-45	97	10	7,311	709,120	17
	46-50	73	7	7,984	582,826	14
	51-55	14	2	7,751	108,511	3
	>56	14	2	5,508	45,032	1
	Unknown	0	-	-	-	
	TOTAL	985		4,176	4,113,403	
1995	≤20	88	7	1,478	130,074	2
	21-25	295	25	2,905	856,987	13
	26-30	188	16	4,542	853,887	13
	31-35	176	15	6,636	1,167,899	18
	36-40	210	18	8,147	1,710,765	26
	41-45	105	9	8,748	918,546	14
	46-50	82	7	8,480	695,374	10
	51-55	21	2	10,708	224,861	3
	>56	14	1	10,724	75,068	1
	Unknown	0	-	-	-	-
	TOTAL	1,179		5,626	6,633,463	

TABLE D-7. **California** salmon **troll boat-size catch** statistics in pounds of dressed salmon.[a/] (Page 2 of 2)

Year	Vessels: Length Category (feet)	Vessels: Number[c/]	Vessels: Percentage	Catch[b/]: Average Per Boat (pounds)	Catch[b/]: Total (pounds)	Catch[b/]: % of Total
1994	≤20	78	8	584	45,530	1
	21-25	254	25	1,425	362,007	12
	26-30	170	17	2,085	354,515	11
	31-35	151	15	3,340	504,287	16
	36-40	188	18	4,719	887,232	29
	41-45	94	9	5,878	552,514	18
	46-50	69	7	4,001	276,100	9
	51-55	13	1	8,541	111,033	4
	>56	7	1	1,704	9,887	e/
	Unknown	0	-	-	-	-
	TOTAL	1,024		3,030	3,103,104	
1993	≤20	101	8	447	45,103	2
	21-25	321	26	1,028	330,110	13
	26-30	218	18	1,538	335,333	13
	31-35	167	13	2,467	411,989	16
	36-40	216	17	3,103	670,209	26
	41-45	103	8	3,859	397,525	16
	46-50	78	6	3,050	237,930	9
	51-55	22	2	4,205	92,500	4
	>56	14	1	1,156	16,185	1
	Unknown	0	-	-	-	-
	TOTAL	1,240		2,046	2,536,884	
1992	≤20	98	9	347	33,962	2
	21-25	279	26	838	233,894	14
	26-30	190	18	1,178	223,847	14
	31-35	158	15	1,535	242,532	15
	36-40	180	17	2,579	464,288	28
	41-45	87	8	2,842	247,249	15
	46-50	64	6	1,720	110,058	7
	51-55	19	2	3,719	70,668	4
	>56	10	1	2,194	16,906	1
	Unknown	0	-	-	-	-
	TOTAL	1,085		1,515	1,643,403	
1991	≤20	196	11	540	105,895	3
	21-25	427	24	944	403,026	11
	26-30	300	17	1,489	446,841	12
	31-35	219	12	2,284	500,112	14
	36-40	309	17	3,194	987,011	27
	41-45	148	8	4,315	638,649	17
	46-50	118	7	3,814	450,025	12
	51-55	27	2	4,852	130,991	4
	56-60	13	1	1,514	19,681	1
	>60	9	1	1,594	14,349	e/
	Unknown	3	e/	226	677	e/
	TOTAL	1,769		24,766	3,697,257	

a/ Derived from vessel registrations and fish landing tickets.
b/ Excludes pink salmon landings.
c/ Number of boats includes only those recording pounds greater than 0.
d/ Preliminary.
e/ Less than 0.5%.

TABLE D-8. **Oregon** salmon **troll boat-size catch** statistics in pounds of dressed salmon. (Page 1 of 2)

Year	Vessels: Length Category (Feet)	Vessels: Number[b/]	Vessels: Percentage	Catch[a/]: Average Per Boat (pounds)	Catch[a/]: Total (pounds)	Catch[a/]: Percent of Total
1999[c/]	<20	6	2	1,131	6,783	1
	20-29	68	21	1,205	81,964	11
	30-39	140	43	2,517	352,355	49
	40-49	93	28	2,499	232,418	32
	≥50	21	6	2,298	48,263	7
	TOTAL	328		2,201	721,783	
1998	<20	5	1	1,536	7,679	1
	20-29	65	17	1,036	67,332	5
	30-39	163	44	3,673	598,702	43
	40-49	110	30	5,395	593,433	43
	≥50	30	8	4,351	130,537	9
	TOTAL	373		3,747	1,397,683	
1997	<20	5	1	1,149	5,743	d/
	20-29	98	23	838	82,089	5
	30-39	185	43	3,976	735,478	48
	40-49	114	26	5,401	615,756	40
	≥50	31	7	3,322	102,982	7
	TOTAL	433		2,937	1,542,048	
1996	<20	6	1	2,088	12,530	1
	20-29	117	26	1,009	118,069	6
	30-39	186	41	5,010	931,895	48
	40-49	115	25	6,466	743,584	39
	≥50	32	7	3,720	119,048	6
	TOTAL	456		4,222	1,925,126	
1995	<20	8	2	1,561	12,486	1
	20-29	142	30	1,190	168,999	9
	30-39	185	39	4,573	845,647	44
	40-49	111	23	6,884	764,118	39
	≥50	30	6	4,995	149,846	8
	TOTAL	476		4,078	1,941,096	
1994	<20	7	2	968	6,776	2
	20-29	114	31	435	49,573	17
	30-39	153	41	824	126,188	44
	40-49	85	23	1,080	91,834	32
	≥50	12	3	1,032	12,382	4
	TOTAL	371		773	286,753	
1993	<20	10	2	662	6,619	1
	20-29	206	34	558	115,029	15
	30-39	236	39	1,549	365,597	48
	40-49	128	21	1,888	241,663	31
	≥50	32	5	1,282	41,029	5
	TOTAL	612		1,258	769,937	
1992	<20	7	1	706	4,945	d/
	20-29	242	37	849	205,466	17
	30-39	245	38	2,384	584,162	48
	40-49	134	21	2,911	390,040	32
	≥50	21	3	1,630	34,231	3
	TOTAL	649		1,878	1,218,844	

TABLE D-8. **Oregon** salmon **troll boat-size catch** statistics in pounds of dressed salmon. (Page 2 of 2)

Year	Vessels: Length Category (Feet)	Vessels: Number[b/]	Vessels: Percentage	Catch[a/]: Average Per Boat (pounds)	Catch[a/]: Total (pounds)	Catch[a/]: Percent of Total
1991	<20	22	2	622	13,672	1
	20-29	568	47	1,266	719,071	34
	30-39	365	30	2,138	780,386	37
	40-49	209	17	2,468	515,790	24
	≥50	53	4	1,583	84,279	4
	TOTAL	1217		1,736	2,113,198	

a/ Excludes pink salmon landings.
b/ Number of boats includes only those recording pounds greater than 0.
c/ Preliminary.
d/ Less than 0.5%.

TABLE D-9. **Washington non-Indian** salmon **troll boat-size** catch statistics in pounds of dressed salmon.[a/] (Page 1 of 1)

Year	Vessels: Length Category (Feet)	Vessels: Number[c/]	Vessels: Percentage	Catch[b/]: Average Per Boat (pounds)	Catch[b/]: Total (pounds)	Catch[b/]: % of Total
1999	≤25	5	9	2,511	12,557	6
	26-36	14	25	3,731	52,237	24
	>36	35	61	4,333	151,638	69
	Unknown	3	5	1,220	3,661	2
	TOTAL	57		3,861	220,093	
1998	≤25	3	13	545	1,634	2
	26-36	6	26	2,842	17,050	21
	>36	13	57	4,799	62,385	76
	Unknown	1	4	522	522	1
	TOTAL	23		3,547	81,591	
1997	≤25	7	14	322	2,253	3
	26-36	16	31	1,468	23,491	29
	>36	26	51	2,096	54,500	67
	Unknown	2	4	352	703	1
	TOTAL	51		1,587	80,947	
1996	≤25	39	43	709	27,664	31
	26-36	24	27	868	20,826	23
	>36	20	22	1,372	27,440	31
	Unknown	7	8	1,861	13,029	15
	TOTAL	90		988	88,959	
1995	≤25	45	47	1,864	83,901	36
	26-36	30	31	2,936	88,083	38
	>36	17	18	2,950	50,144	22
	Unknown	4	4	2,351	9,403	4
	TOTAL	96		2,412	231,531	
1994	≤25	0	-	-	-	-
	26-36	0	-	-	-	-
	>36	1	100	7,263[d/]	7,263	100
	Unknown	0	-	-	-	-
	TOTAL	1		7,263	7,263	
1993	≤25	174	37	235	40,879	10
	26-36	134	28	627	84,005	21
	>36	145	31	1,832	265,684	65
	Unknown	21	4	924	19,406	5
	TOTAL	474		904	409,974	
1992	≤25	241	40	276	66,617	11
	26-36	167	28	727	121,416	21
	>36	170	28	2,176	369,833	64
	Unknown	26	4	956	24,848	4
	TOTAL	604		4,135	582,714	
1991	≤25	292	36	426	124,397	16
	26-36	204	25	729	148,643	19
	>36	212	26	1,859	394,075	51
	Unknown	103	13	1,006	103,637	14
	TOTAL	811		950	770,752	

a/ All values in this table are based on preliminary information available at the start of each year's review.
b/ Excludes pink salmon landings.
c/ Number of boats includes only those recording pounds greater than 0.
d/ The fishery was closed north of Cape Falcon, however, chinook were caught off Oregon and landed in Puget Sound.

TABLE D-10. Preliminary **California** salmon **landings (in pounds of dressed salmon) and exvessel values** by vessel size categories and ports from Crescent City to Morro Bay South, 1999. (Page 1 of 2)

Port	Vessel Length (feet)	Number of Deliveries	Total Dressed Pounds Landed	Total Exvessel Value (dollars)	% Total Exvessel Value Landed In Port
Crescent City	<26	a/	a/	a/	a/
	26-36	a/	a/	a/	a/
	>36	a/	a/	a/	a/
	Unknown	-			
Trinidad	<26	-	-	-	-
	26-36	-	-	-	-
	>36	-	-	-	-
	Unknown	-	-	-	-
Eureka	<26	28	4,371	9,628	18
	26-36	32	5,461	11,810	22
	>36	75	14,569	32,083	60
	Unknown	-			
Shelter Cove	<26	a/	a/	a/	a/
	26-36	-	-	-	
	>36	-	-	-	
	Unknown	-			
Fort Bragg	<26	32	4,199	10,597	13
	26-36	22	6,235	20,001	25
	>36	55	17,404	48,829	62
	Unknown	-			
Mendocino	<26	-	-	-	-
	26-36	-	-	-	-
	>36	-	-	-	-
	Unknown	-	-	-	-
Bodega Bay	<26	628	82,659	174,676	20
	26-36	532	15,030	293,578	34
	>36	435	217,886	401,807	46
	Unknown	-			
San Francisco	<26	181	28,442	61,972	3
	26-36	360	218,464	421,840	20
	>36	858	869,713	1,625,494	77
	Unknown	-			
Half Moon Bay	<26	292	61,978	131,738	8
	26-36	553	223,535	464,565	29
	>36	872	510,179	1,010,062	63
	Unknown	-			
Santa Cruz	<26	73	15,441	30,311	7
	26-36	187	44,215	87,066	19
	>36	224	183,822	344,451	74
	Unknown	-			

TABLE D-10. Preliminary **California** salmon **landings (in pounds of dressed salmon) and exvessel values** by vessel size categories and ports from Crescent City to Morro Bay South, 1999. (Page 2 of 2)

Port	Vessel Length (feet)	Number of Deliveries	Total Dressed Pounds Landed	Total Exvessel Value (dollars)	% Total Exvessel Value Landed In Port
Moss Landing	<26	495	54,711	97,253	9
	26-36	426	160,274	268,096	25
	>36	518	439,273	702,523	66
	Unknown	-			
Monterey	<26	368	46,258	90,155	34
	26-36	363	63,116	121,261	45
	>36	147	29,680	56,291	21
	Unknown	-			
Morro Bay South	<26	37	2,751	6,895	9
	26-36	112	10,917	29,356	39
	>36	36	15,470	38,846	52
	Unknown				

a/ Value not provided to preserve confidentiality.

TABLE D-11. Preliminary **Washington non-Indian troll** salmon **landings** (in pounds of dressed salmon) and **exvessel value** by vessel size categories and port areas, 1999.[a/] (Page 1 of 1)

Port	Vessel Length (Feet)	Number of Boats	Boat Days Fished	Total Dressed Pounds Landed	Total Exvessel Value (dollars)	% Total Exvessel Value Landed by Port (dollars)
Neah Bay	≤25	b/	b/	b/	b/	b/
	26-36	b/	b/	b/	b/	b/
	>36	7	43	55,505	100,108	85
	Unknown	0	0	0	0	
	TOTAL	10	64	68,265	117,364	
La Push	≤25	0	0	0	0	0
	26-36	0	0	0	0	0
	>36	1	3	1,669	2,855	76
	Unknown	1	8	988	903	24
	TOTAL	2	11	2,657	3,758	
Grays Harbor	≤25	2	46	5,713	9,592	7
	26-36	8	59	14,672	24,193	19
	>36	16	79	50,258	95,673	74
	Unknown	1	1	29	75	0
	TOTAL	27	185	70,672	129,533	
Columbia River Ports	≤25	0	0	0	0	0
	26-36	1	10	3,779	7,659	83
	>36	1	2	749	1,529	17
	Unknown	0	0	0	0	0
	TOTAL	2	12	4,528	9,251	
Puget Sound	≤25	2	6	1,436	1,520	1
	26-36	3	13	26,410	38,604	33
	>36	11	38	43,457	72,582	61
	Unknown	1	6	2,668	5,569	5
	TOTAL	17	63	73,971	118,275	

a/ Preliminary.
b/ Values not provided to preserve confidentiality.

TABLE D-12. **California number of vessels** landing 50% and 90% of total pounds of salmon troll catch each year. (Page 1 of 1)

		50% of Pounds Landed		90% of Pounds Landed	
Year	Total Vessels	Number of Vessels	% of Fleet	Number of Vessels	% of Fleet
1978	4,919	542	11.0	2,024	41.1
1979	4,594	373	8.1	1,641	35.7
1980	4,738	431	9.1	1,733	36.6
1981	4,102	395	9.6	1,599	39.0
1982	4,013	438	10.9	1,602	40.0
1983	3,223	353	11.0	1,268	39.4
1984	2,569	213	8.3	918	35.7
1985	2,308	241	10.4	898	38.9
1986	2,582	302	11.8	1,151	45.1
1987	2,442	320	13.2	1,080	44.5
1988	2,571	409	15.9	1,285	50.0
1989	2,534	363	14.3	1,244	49.1
1990	2,115	295	14.0	976	46.2
1991	1,769	224	12.7	791	44.7
1992	1,085	131	12.1	485	44.7
1993	1,240	163	13.1	554	44.7
1994	1,024	141	13.8	459	44.8
1995	1,179	190	16.1	581	49.3
1996	985	128	13.0	434	44.1
1997	835	117	14.0	377	45.2
1998	670	90	13.4	325	48.5
1999[a/]	645	101	15.7	308	47.8

a/ Preliminary.

TABLE D-13. **Oregon number of vessels** landing 50% and 90% of **total pounds** of salmon troll catch each year.[a/] (Page 1 of 1)

		50% of Pounds Landed		90% of Pounds Landed	
Year	Total Vessels	Number of Vessels	% of Fleet	Number of Vessels	% of Fleet
1974	1,914	326	17.0	1,032	53.9
1975	1,979	329	16.6	1,054	53.3
1976	2,770	453	16.4	1,460	52.7
1977	3,108	473	15.2	1,597	51.4
1978	3,157	446	14.1	1,576	49.9
1979	3,114	423	13.6	1,449	46.5
1980	3,875	372	9.6	1,375	35.5
1981	3,615	420	11.6	1,391	38.5
1982	3,269	359	11.0	1,249	38.2
1983	2,951	294	10.0	1,082	36.7
1984	771	88	11.4	333	43.2
1985	2,050	132	6.4	514	25.1
1986	2,284	238	10.4	851	37.3
1987	2,111	292	13.8	928	44.0
1988	2,061	337	16.4	1,069	51.9
1989	1,937	303	15.6	959	49.5
1990	1,557	221	14.2	709	45.5
1991	1,217	206	16.9	651	53.5
1992	649	87	13.4	286	44.1
1993	612	67	10.9	235	38.4
1994	371	43	11.6	152	41.0
1995	476	52	10.9	184	38.7
1996	456	62	13.6	202	44.3
1997	433	60	13.9	184	42.5
1998	373	51	13.7	165	44.2
1999[b/]	328	47	14.3	150	45.7

a/ Includes licensed (permitted for 1980 on) and properly identified vessels only. Total poundage on which the numbers are based is not equal to total aggregate troll landings because of landings by unlicenced or misidentified vessels. Percentages of total pounds not credited to licensed (permitted) vessels were 1974-19%, 1975 - 19%, 1976 - 9.4%, 1977 - 8%, 1978 - 1.4%, 1979 - 0.2%, 1980 - 1.7%, 1981 - 0.11% and 1982-1999 - less than 0.05%.

b/ Preliminary.

TABLE D-14. **Washington number of vessels** landing 50% and 90% **(by numbers of fish)** of non-Indian troll salmon catch.[a/] (Page 1 of 1)

		50% of Fish Landed		90% of Fish Landed	
Year	Total Vessels	Number of Vessels	% of Fleet	Number of Vessels	% of Fleet
1978	3,041	223	7.3	1,040	34.2
1979	2,778	253	9.1	946	34.1
1980	2,626	206	7.8	883	33.6
1981	2,439	214	8.8	810	33.2
1982	2,253	181	8.0	703	31.2
1983	2,056	75	3.6	409	19.9
1984	374	55	14.7	180	48.1
1985	1,259	104	8.3	443	35.2
1986	1,252	100	8.0	387	30.9
1987	883	97	11.0	385	43.6
1988	650	51	7.8	239	36.8
1989	883	70	7.9	268	30.4
1990	897	111	12.4	373	41.6
1991	811	84	10.4	344	42.4
1992	604	59	9.8	193	32.0
1993	474	47	9.9	162	34.2
1994	1	NA	NA	NA	NA
1995	96	13	13.5	41	42.7
1996	90	14	15.6	45	50.0
1997	51	7	13.7	23	45.1
1998	23	5	21.7	12	52.2
1999	57	10	17.5	32	56.1

a/ All values in this table are based on preliminary information available at the start of each year's review.

TABLE D-15. Preliminary **California, Oregon, and Washington troll fleet** by home state and salmon landings, 1999. (Page 1 of 1)

Home State	Number of Vessels	Percent	Landings (Pounds)	Percent	Total Value (Dollars)	Percent
			CALIFORNIA			
California	536	83.1	3,079,804	88.4	5,913,431	93.3
Oregon	27	4.2	221,698	6.4	374,824	3.7
Washington	8	1.2	92,567	2.7	151,347	1.5
Unknown/Other	74	11.5	88,713	2.5	154,439	1.5
TOTAL	645		3,482,782		6,594,041	
			OREGON			
Oregon	286	87.2	597,772	82.8	NA	NA
California	3	0.9	14,915	2.1	NA	NA
Washington	38	11.6	108,140	15.0	NA	NA
Unknown/Other	1	0.3	956	0.1	NA	NA
TOTAL	328		721,783			
			WASHINGTON			
Washington	54	95	216,432	98	367,357	98
Oregon	0	0	0	0	0	0
California	0	0	0	0	0	0
Unknown/Other	3	5	3,661	2	6,410	2
TOTAL	57		220,093		373,767	

TABLE D-16. **Vessels landing** salmon in **California** by vessel skipper's state of residence and length. (Page 1 of 1)

	Home State[a/]															
	California (length)				Oregon (length)				Washington (length)				Total (length)			Grand
Year	<26	26-36	>36	Subtotal	<26	26-36	>36	Subtotal	<26	26-36	>36	Subtotal	<26	26-36	>36	Total[b/]
1978	2,325	1,165	1,006	4,496	97	176	262	535	5	16	85	106	2,462	1,365	1,378	5,205
1979	2,243	1,152	980	4,375	68	158	210	436	3	20	59	82	2,338	1,338	1,266	4,942
1980	2,069	1,248	1,138	4,455	97	163	228	488	6	25	90	121	2,189	1,447	1,478	5,114
1981	1,611	1,052	865	3,528	64	126	204	394	2	11	66	79	1,717	1,224	1,159	4,100
1982[c/]	1,535	1,051	873	3,459	59	117	196	372	2	16	64	82	1,631	1,223	1,157	4,011
1983	1,223	891	733	2,847	41	82	125	248	0	13	34	47	1,292	1,020	909	3,221
1984	909	805	620	2,334	25	47	84	156	2	10	34	46	951	871	745	2,567
1985	769	731	630	2,130	6	23	66	95	2	7	15	24	795	784	726	2,305
1986	866	815	658	2,339	22	60	98	180	1	8	27	36	898	891	790	2,579
1987	831	759	641	2,231	11	42	85	138	2	4	34	40	854	816	769	2,439
1988	834	788	670	2,292	12	42	92	146	1	7	35	43	895	855	817	2,567
1989	865	771	652	2,288	11	46	94	151	4	4	42	50	880	821	788	2,489
1990	744	653	553	1,950	6	31	63	100	2	5	20	27	752	689	636	2,077
1991	615	548	465	1,628	3	34	57	94	2	6	13	21	620	588	535	1,743
1992	374	369	304	1,047	2	12	10	24	0	2	1	3	376	383	315	1,074
1993	414	422	347	1,183	2	11	22	35	0	3	4	7	421	440	379	1,240
1994	323	341	286	950	4	18	24	46	0	3	9	12	327	362	319	1,024
1995	372	395	326	1,093	4	21	38	63	0	2	8	10	376	418	372	1,179
1996	275	340	283	898	3	9	27	39	0	4	17	21	278	353	327	985
1997	245	297	242	784	1	8	19	28	1	1	4	6	250	314	271	835
1998	192	239	200	631	0	5	11	16	2	2	3	7	198	254	218	670
1999[d/]	52	241	243	536	0	6	21	27	1	0	7	8	93	248	304	645

a/ "Home state" refers to the declared state of residence of vessel skipper, who, in most cases, is also the vessel owner.
b/ Includes vessels with home states other than California, Oregon and Washington and vessels of unknown length.
c/ Length category for 1982 is ≥36.
d/ Preliminary.

TABLE D-17. Percentages of **vessels landing** troll salmon in **Oregon** by license holder's state of residence. (Page 1 of 1)

Year	Oregon	California	Washington	Other/Unknown
1977	83.8	6.9	8.7	0.6
1978	83.6	5.9	10.0	0.5
1979	82.5	6.5	10.3	0.7
1980	80.4	8.5	9.6	1.5
1981	81.2	7.4	9.9	1.6
1982	82.1	6.3	10.2	1.4
1983	85.0	3.9	10.1	1.0
1984	85.2	2.9	11.0	0.9
1985	86.9	4.0	8.0	1.1
1986	84.5	5.2	9.1	1.2
1987	81.7	6.8	10.2	1.2
1988	78.7	6.4	13.5	1.3
1989	80.0	5.6	12.9	1.4
1990	81.1	6.7	10.7	1.5
1991	83.8	2.5	12.1	1.6
1992	83.4	3.4	12.5	0.8
1993	85.8	2.5	11.1	0.6
1994	86.5	1.1	12.1	0.3
1995	85.5	2.7	10.7	1.1
1996	83.5	2.0	13.8	0.7
1997	85.0	1.2	12.5	1.4
1998	82.3	0.8	16.6	0.3
1999[a/]	87.2	0.9	11.6	0.3

a/ Preliminary.

TABLE D-18. Percentages of **vessels landing non-Indian** troll salmon in **Washington** by license holder's state of residence.[a/] (Page 1 of 1)

Year	Washington	Oregon	California	Alaska	Other/Unknown
1978	90.8	4.6	0.3	0.2	4.1
1979	90.9	3.8	0.3	0.3	4.7
1980	93.7	3.6	0.3	0.3	2.1
1981	92.6	3.0	0.4	0.2	3.8
1982	92.6	4.1	0.6	0.0	2.8
1983	92.7	2.8	0.2	0.1	4.2
1984	94.8	1.6	0.0	0.0	3.7
1985	92.7	3.3	0.2	0.2	3.6
1986	93.1	1.7	0.0	0.1	5.1
1987	90.4	1.3	0.0	b/	8.0
1988	88.0	1.8	0.2	1.5	8.5
1989	92.2	0.9	0.0	1.0	5.9
1990	92.7	0.7	0.0	b/	6.5
1991	85.8	0.7	0.0	0.0	13.5
1992	92.7	2.0	0.7	0.3	4.3
1993	93.3	0.8	0.8	0.0	5.1
1994[c/]	100.0	0.0	0.0	0.0	0.0
1995	95.8	0.0	0.0	0.0	4.2
1996	93.3	0.0	0.0	0.0	6.7
1997	96.1	0.0	0.0	0.0	3.9
1998	95.7	0.0	0.0	0.0	4.3
1999	94.7	0.0	0.0	0.0	5.3

a/ All values in this table are based on preliminary information available at the start of each year's review.
b/ Less than 0.5%.
c/ The fishery was closed north of Cape Falcon, however, Chinook were caught off Oregon and landed in Washington.

TABLE D-19. Number of **California charter boats** participating in the ocean **recreational** salmon fishery, by port area and activity level. (Page 1 of 1)

Year	Activity Level[a/]	Port Area: Monterey	San Francisco	Fort Bragg	Eureka	Crescent City	Unknown[b/]	Total
1987	Active	20	62	6	4	4	0	96
	Casual	11	30	1	6	1	4	53
	TOTAL	31	92	7	10	5	4	149
1988	Active	19	58	8	6	3	1	95
	Casual	13	24	4	5	1	24	71
	TOTAL	32	82	12	11	4	25	166
1989	Active	16	53	5	11	1	3	89
	Casual	31	35	18	5	0	4	93
	TOTAL	47	88	23	16	1	7	182
1990	Active	19	50	7	8	4	5	93
	Casual	26	30	3	5	0	3	67
	TOTAL	45	80	10	13	4	8	160
1991	Active	18	42	7	7	3	1	78
	Casual	71	29	1	2	1	4	108
	TOTAL	89	71	8	9	4	5	186
1992	Active	11	33	4	0	0	1	49
	Casual	42	37	4	4	2	2	91
	TOTAL	53	70	8	4	2	3	140
1993	Active	13	36	2	2	2	11	66
	Casual	37	14	3	3	0	4	61
	TOTAL	50	50	5	5	2	15	127
1994	Active	12	34	3	0	1	10	60
	Casual	17	18	3	3	1	0	42
	TOTAL	29	52	6	3	2	10	102
1995	Active	40	47	5	1	0	0	93
	Casual	51	15	0	3	1	1	71
	TOTAL	91	62	5	4	0	0	164
1996	Active	19	46	8	2	0	0	75
	Casual	27	18	3	2	1	0	51
	TOTAL	46	64	11	4	1	0	126
1997	Active	27	44	7	4	0	0	82
	Casual	18	15	2	3	0	0	38
	TOTAL	45	59	9	7	0	0	120
1998	Active	41	19	6	1	0	0	67
	Casual	16	38	2	3	0	0	59
	TOTAL	57	57	8	4	0	0	126
1999	Active							
	Casual							
	TOTAL	NA	NA	NA	NA	NA	NA	NA

a/ Active vessels landed over 100 salmon; casual vessels landed one to 100 salmon.
b/ Unknown vessels did not report port of landing or landed in two or more port areas during the season.

TABLE D-20. Number of **charter boats** licensed in **Oregon**. (Page 1 of 1)

Year	Total Number Licensed Charter Boats[a/]	Licensed By Oregon Residents	Licensed By Washington Residents	Licensed By Residents of Other States
1980	194	192	2	0
1981	248	213	34	1
1982	253	212	40	1
1983	255	206	47	2
1984	218	185	31	2
1985	226	198	25	3
1986	247	216	26	5
1987	254	226	23	5
1988	313	266	42	5
1989	322	273	44	5
1990[b/]	170	157	9	4
1991	171	161	7	3
1992	157	150	4	3
1993	148	144	2	2
1994	145	137	6	2
1995	134	NA	NA	NA
1996	127	121	6	0
1997	122	119	3	0
1998	129	125	4	0
1999[c/]	137	133	4	0

a/ Legislation which created the license expired in 1987. Fees were between $25 and $100 from 1980-1987. License was reinstituted by rule in 1988 and 1989 with a $10 fee.

b/ In 1990, responsibility for licensing of charter vessels was transferred to the Marine Board and fees for Oregon residents were increased from $10 to between $50 and $100.

c/ Preliminary.

TABLE D-21. Number of salmon **charter boats** licensed in **Washington** (including Puget Sound). (Page 1 of 1)

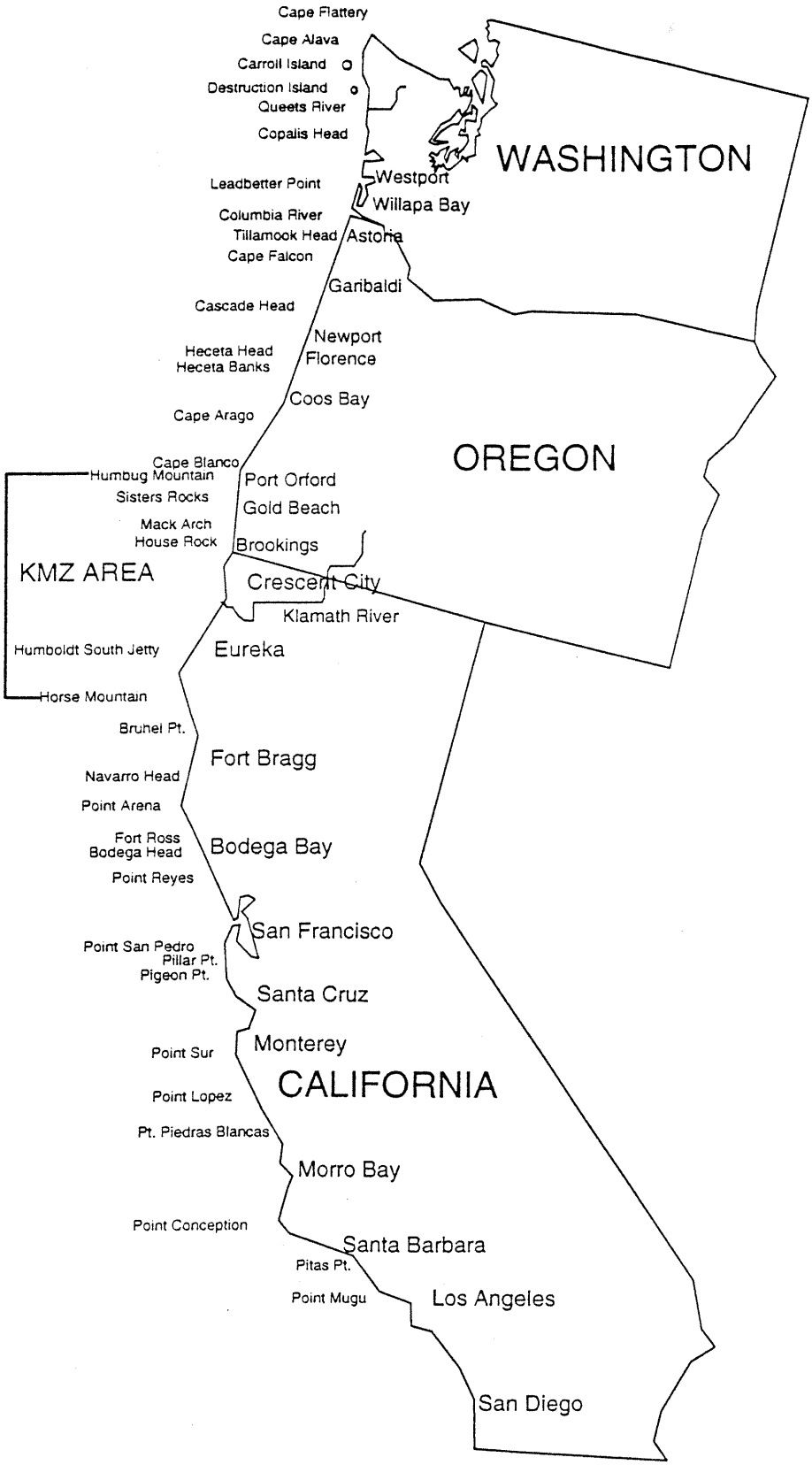
Year	Number of Licenses Issued	Licensed by Washington Residents	Licensed by Residents of Other States	Buyback
1975	404	351	53	-
1976	427	362	65	-
1977[a/]	569	NA	NA	-
1978	535	483	52	-
1979	516	473	43	-
1980	510	465	45	16
1981	478	443	35	3
1982	415	387	28	25
1983	375	354	21	19
1984	334	313	21	21
1985	288	268	20	19
1986	308	286	22	15
1987	280	269	11	-
1988	281	268	13	-
1989	276	263	13	-
1990	273	258	15	-
1991	267	251	16	-
1992	269	252	17	-
1993	265	250	15	-
1994	260	245	15	-
1995	231	217	14	23
1996	210	199	9	18
1997	210	197	13	0
1998	198	188	10	20
1999[b/]	180	172	8	0

a/ First year moratorium in effect.
b/ Preliminary.

TABLE D-22. Price index.[a/] (Page 1 of 1)

Year	Price Index
1960	21.4
1961	21.7
1962	22.0
1963	22.2
1964	22.6
1965	23.0
1966	23.6
1967	24.4
1968	25.4
1969	26.7
1970	28.1
1971	29.6
1972	30.8
1973	32.6
1974	35.4
1975	38.7
1976	41.0
1977	43.7
1978	46.7
1979	50.5
1980	55.0
1981	60.1
1982	63.8
1983	66.4
1984	68.8
1985	71.0
1986	72.5
1987	74.6
1988	77.1
1989	80.1
1990	83.2
1991	86.0
1992	87.9
1993	90.3
1994	92.2
1995	94.1
1996	95.9
1997	97.4
1998	98.6
1999[b/]	100.0

a/ Based on gross domestic product implicit price deflator.
b/ Preliminary estimate of annual change based on the second and third quarters of the year.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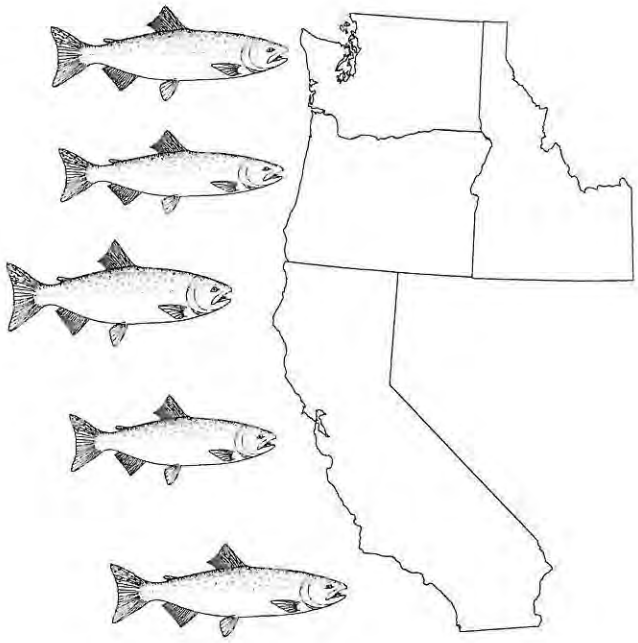
Cape Alava
Carroll Island
Destruction Island
Queets River
Copalis Head
WASHINGTON
Leadbetter Point
Westport
Willapa Bay
Columbia River
Tillamook Head
Astoria
Cape Falcon
Garibaldi
Cascade Head
Newport
Heceta Head
Heceta Banks
Florence
Coos Bay
Cape Arago
OREGON
Cape Blanco
Humbug Mountain
Port Orford
Sisters Rocks
Gold Beach
Mack Arch
House Rock
Brookings
KMZ AREA
Crescent City
Klamath River
Humboldt South Jetty
Eureka
Horse Mountain
Brunel Pt.
Fort Bragg
Navarro Head
Point Arena
Fort Ross
Bodega Head
Bodega Bay
Point Reyes
San Francisco
Point San Pedro
Pillar Pt.
Pigeon Pt.
Santa Cruz
Monterey
Point Sur
CALIFORNIA
Point Lopez
Pt. Piedras Blancas
Morro Bay
Point Conception
Santa Barbara
Pitas Pt.
Point Mugu
Los Angeles
San Diego

PRESEASON REPORT I

STOCK ABUNDANCE ANALYSIS FOR 2000 OCEAN SALMON FISHERIES



PREPARED BY THE
SALMON TECHNICAL TEAM

Pacific Fishery Management Council
2130 SW Fifth Avenue, Suite 224
Portland, Oregon 97201

(503) 326-6352
www.pcouncil.org

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ACKNOWLEDGEMENTS

SALMON TECHNICAL TEAM

Mr. Doug Milward, Chair
Washington Department of Fish and Wildlife, Olympia, WA

Mr. Allen Grover
California Department of Fish and Game, Healdsburg, CA

Dr. Robert Kope
National Marine Fisheries Service, Seattle, WA

Mr. Curt Melcher
Oregon Department of Fish and Wildlife, Portland, OR

Mr. Michael Mohr
National Marine Fisheries Service, Tiburon, CA

Dr. Gary Morishima
Indian Tribes, Mercer Island, WA

Mr. Dell Simmons
National Marine Fisheries Service, Lacey, WA

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COUNCIL STAFF

Dr. John Coon
Ms. Kerry Aden
Ms. Renee Heyden
Ms. Sandra Krause

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LIST OF ACRONYMS AND ABBREVIATIONS

CDFG	California Department of Fish and Game
Council	Pacific Fishery Management Council
CRTAC	Columbia River Technical Advisory Committee
CVI	Central Valley index
CWT	coded-wire tag
ESA	Endangered Species Act
FMP	fishery management plan
FRAM	Fishery Regulation Assessment Model
GSI	genetic stock identification
HRM	Harvest Rate Model
KMZ	Klamath management zone (ocean zone between Humbug Mountain and Horse Mountain where management emphasis is on Klamath River fall chinook)
KOHM	Klamath Ocean Harvest Model
KRTAT	Klamath River Technical Advisory Team
LRH	lower Columbia River hatchery (tule fall chinook returning to hatcheries below Bonneville Dam)
LRW	lower Columbia River wild (bright fall chinook spawning naturally below Bonneville Dam)
MCB	mid-Columbia River brights (bright hatchery fall chinook released in the mid-Columbia River)
MSY	maximum sustainable yield
NA	not available
NMFS	National Marine Fisheries Service
OCN	Oregon coastal natural (coho)
OCNL	Oregon coastal natural (coho) lake component
OCNR	Oregon coastal natural (coho) river component
ODFW	Oregon Department of Fish and Wildlife
OPI	Oregon production index (coho salmon stock index south of Leadbetter Point)
OPIH	Oregon production index area hatchery (adult coho)
OPITT	Oregon Production Index Technical Team
PRIH	Oregon coastal private hatchery (adult coho)
PSC	Pacific Salmon Commission
SCH	Spring Creek Hatchery (tule fall chinook returning to Spring Creek Hatchery)
SRS	Stratified random sampling
SSC	Scientific and Statistical Committee
STEP	Salmon Trout Enhancement Program (Oregon)
STT	Salmon Technical Team (formerly the Salmon Plan Development Team)
TAC	total allowable catch
URB	upper river brights (naturally spawning bright fall chinook normally migrating past McNary Dam)
USFWS	U.S. Fish and Wildlife Service
VSI	visual stock identification
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife

INTRODUCTION

This is the second report in an annual series of four reports prepared by the Salmon Technical Team (STT) of the Pacific Fishery Management Council (Council) to document and help guide salmon fishery management off the coasts of Washington, Oregon, and California. This report will be formally reviewed at the Council's March meeting. The third and fourth reports in this series will be developed at the close of the March and April Council meetings, respectively. They will analyze the impacts of the Council's proposed and final ocean salmon fishery management recommendations for 2000.

This report provides year 2000 salmon stock abundance projections and an analysis of the impacts of 1999 regulations, or regulatory procedures, on the projected 2000 abundance. The report focuses on chinook and coho stocks that have been important in determining Council fisheries in recent years and on stocks listed under the Endangered Species Act which have established jeopardy standards.

Chapter I provides a summary of stock abundance projections. Chapters II and III provide detailed stock-by-stock analyses of abundance and a description of prediction methodology and accuracy of past abundance predictions for chinook and coho salmon, respectively. Chapter IV summarizes abundance information for pink salmon. Four appendices provide supplementary information as follows: Appendix A provides a summary of Council stock management goals; Appendix B contains pertinent data for Oregon production index (OPI) area coho; Appendix C provides historical salmon catch data for the Cape Flattery and Strait of Juan de Fuca areas; and Appendix D contains the Council's current harvest allocation schedules.

The STT notes that differences between preseason and postseason estimates are caused by a number of factors, including: (1) inaccuracies in abundance forecasts for these and other stocks which are exploited by mixed stock fisheries, (2) deviations of actual catches and fishery patterns from preseason expectations, (3) anomalies in stock distribution and migration patterns, and (4) for the Puget Sound coho stocks, differences in assessment methodologies (postseason estimates are based on run reconstruction assumptions which differ substantially from those represented in the Fishery Regulatory Assessment Model).

CHAPTER I
ABUNDANCE PROJECTIONS AND CONCERNS

ABUNDANCE PROJECTIONS

Abundance expectations in 2000 are summarized for key chinook and coho salmon stocks in Tables I-1 and I-2, respectively. Information on pink salmon abundance, which is only significant in odd-numbered years, is contained in Chapter IV. Overall Council salmon management goals, as developed for Amendment 14, are presented in Appendix A, Table A-1. The Council expects Amendment 14 to be implemented during the 2000 salmon season.

In addition to the key stocks with abundance projections listed in Tables I-1 and I-2, Council management decisions for the 2000 ocean salmon fishing seasons may be constrained by other stocks listed under the Endangered Species Act (ESA) which do not have abundance projections. These include Sacramento River winter, Central Valley spring, California coastal, and Snake River fall chinook; and central California and southern Oregon/northern California coho.

SALMON TECHNICAL TEAM CONCERNS

The ability of state and tribal comanagers to reach agreement on preseason abundance forecasts is critical to enable the Salmon Technical Team (STT) to prepare reports necessary to initiate the annual Council planning process in a timely manner. The lack of agreement places the STT in the position of reanalyzing the bases of competing forecasts de-novo, with neither access to all available information nor the time to undertake a reasonable analysis. Since it is not feasible for the STT to generate a separate forecast of its own, when abundance forecasts differ significantly, multiple model analyses must be performed. This can greatly increase the STT's workload and the difficulty of presenting abundance forecasts and modeling results in a form that is readily comprehensible to the public.

TABLE I-1. Preliminary preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Area, Type of Prediction and/or Stock or Stock Grouping	Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction and Source
California Central Valley (Index) Sacramento and San Joaquin Basins, Fall, Late Fall and Spring Run	790.4	847.7 (644.3)	1,051.0 (629.1)	849.0 (1,059.1)	533.0 (742.2)	654.0 (1,313.4)	Linear regression analysis of inriver age-2 jacks on CVI of the following year. California Department of Fish and Game.
Klamath River (Ocean Abundance) Fall Run, Age-3 and -4 Fish	205.9	105.4 (113.0)	124.8 (125.9)	155.4 (138.9)	454.7 (283.8)	172.1 (481.4)	Linear regression analysis of age-specific ocean abundance estimates on inriver runs of same cohort; 1979-1992 broods. Klamath River Technical Team.
Oregon Coast							
North and South/Local Migrating	---------- Preseason Estimates Not Made ----------						None.
Columbia River (Ocean Escapement)							
Upriver Spring	134.0	24.6 (38.6)	36.2 (38.3)	67.8 (114.1)	37.2 (51.5)	12.0 (10.2)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Willamette Spring	58.5	46.0 (52.6)	32.8 (43.5)	27.4 (34.5)	38.7 (33.4)	48.5 (39.1)	Age-specific linear regressions of cohort returns in previous run years. ODFW staff.
Sandy Spring	3.8	4.3 (3.3)	3.9 (4.2)	3.8 (5.2)	3.3 (4.1)	4.3 (2.5)	Recent year average. ODFW staff.
Cowlitz Spring	2.0	2.1 (1.6)	1.5 (1.1)	1.4 (1.9)	1.9 (1.8)	1.4 (2.2)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Kalama Spring	1.4	0.3 (1.0)	0.5 (0.4)	0.7 (0.6)	0.6 (0.6)	0.5 (0.7)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Lewis Spring	2.6	1.5 (1.7)	0.9 (1.6)	2.4 (2.2)	1.9 (1.7)	2.7 (3.7)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Upriver Summer	33.3	16.5 (26.2)	17.3 (21.5)	16.7 (28.0)	16.8 (16.1)	9.6 (15.0)	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
URB Fall	171.1	147.5 (166.7)	150.8 (142.3)	166.4 (164.9)	88.9 (143.2)	110.3 (106.5)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
SCH Fall	21.9	65.8 (49.3)	14.2 (20.2)	21.9 (27.4)	27.6 (33.1)	17.5 (33.8)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
LRW Fall	3.5	2.6 (3.3)	8.1 (7.3)	7.5 (12.3)	8.8 (14.6)	12.4 (16.0)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
LRH Fall	23.7	34.8 (37.4)	19.2 (45.3)	54.2 (57.4)	37.7 (75.5)	35.8 (46.4)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
MCB Fall	50.6	38.3 (49.9)	47.8 (36.8)	72.1 (59.7)	40.8 (59.7)	26.5 (34.2)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
Washington Coast (Ocean Escapement)							
Willapa Bay Natural	4.2	4.2	-	-	-	-	
Willapa Bay Hatchery	18.9	15.5	64.5	49.0 (54.0)	34.6 (48.8)	- (41.8)	Mean return per release by age class.
Other Coastal Stocks	---------- Not Available ----------						Washington Department of Fish and Wildlife and tribes.

TABLE I-1. Preliminary preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Area, Type of Prediction and/or Stock or Stock Grouping		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction and Source
Puget Sound[a/]								Washington Department of Fish and Wildlife and tribes.
Nooksack/Samish	Hatchery	19.0	27.0	28.0	34.0	27.0	38.5 (22.2)	brood release times average return-at-age/release.
East Sound Bay	Hatchery	5.0	2.2	0.5	1.2	1.7	3.5 (0.1)	Average 1994-1996 run size.
Skagit	Natural	7.3	7.6	6.6	6.4	7.1	5.0 (9.6)	1987-1991average return at age and 1989-1997 return/spawner.
	Hatchery	0.0	0.0	0.0	0.1	1.0	1.6 (3.3)	1994 brood release times average return per release.
Stillaguamish	Natural	1.5	1.5	1.6	1.6	1.3	1.8 (1.4)	Estimate based on spawner -recruit information
Snohomish	Natural	6.0	5.6	5.6	5.2	4.2	4.3 (5.9)	Average of 1996-1999 run size.
	Hatchery	2.0	7.8	6.5	7.7	6.7	2.2 (6.0)	Lbs released times average return per lb release.
Tulalip	Hatchery	5.0	4.5	2.5	4.0	2.7	2.3 (4.1)	1995 brood release times average return per release.
South Puget Sound	Natural	17.5	14.4	21.8	18.2	19.0	21.7 (34.5)	Average return/spawner times 1996 run size times 1996 escapement for Puyallup. Average 1994-1998 run size for Nisqually.
	Hatchery	65.4	70.1	67.8	65.1[b/]	51.9	49.6 (74.5)	Average return at age times cohort release for Green, McAllister, and 10E. Mean run size for Nisqually and Coulter Creek. Mean return time number released for Puyallup and Chambers Creek Average of 2 different methods for the Deschutes River: (1) mean return/ fingerling release times 1996 brood fingerling releases and (2) mean return per lb released times 1996 brood lbs released. Average of 2 different methods for Carr Inlet: (1) 1980-1998 average run size and (2) average return/lb released times 1996 brood lbs released.
Hood Canal	Natural and Hatchery	17.4	14.0	6.7	2.7	9.0	3.9 (9.0)	Hatchery lbs released times 1995-1999 average return, and 1995-1998 natural run reconstruction contributions.
Strait of Juan de Fuca	Natural	3.4	0.9	0.9	0.8	0.9	0.9 (0.9)	1988-1997 mean return at age for Hoko. 1993-1998 mean run size for Elwha.
	Hatchery	0.8	1.9	1.7	2.2	2.8	3.0 (1.9)	BY 1985-1995 expanded CWT returns.

a/ Forecast is Puget Sound run size available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries. Postseason estimates not available for 1996.
b/ The Muckleshoot Tribe's Green River Hatchery chinook forecast is 10,857 based on the 1990-1995 average hatchery return to Area 10A. This results in a South Sound hatchery estimate of 58,000 fish.

TABLE I-2. Preliminary, preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction
OPI Area (Total Abundance) (California and Oregon Coasts and Columbia River)		727.9	620.6 (371.9)	165.8 (233.1)	463.8 (239.7)	372.8 (286.6)	369.8 (214.6)	Sum of stock component estimates.
OPI Public Hatchery		671.4	559.2 (319.6)	118.4 (203.6)	376.1 (215.3)	309.2 (182.6)	301.5 (145.6)	Multiple linear regression of OPI public hatchery jacks to adults adjusted for Columbia River delayed smolt release, data base 1970-1999 SRS accounting. Public hatchery prediction is partitioned into Columbia River early and late, and coastal stocks based on the percent of jacks observed and recent year average stock specific maturation rates.
Columbia River Early		326.3	325.5 (174.9)	63.8 (126.4)	206.9 (129.8)	142.2 (98.0)	196.8 (74.4)	
Columbia River Late		278.0	140.9 (120.7)	24.9 (47.3)	86.5 (53.7)	114.4 (30.8)	61.3 (22.5)	
Coastal		67.1	92.8 (24.0)	29.7 (29.9)	82.7 (31.8)	52.7 (53.8)	43.4 (48.7)	
OCN		55.9	60.7 (51.9)	47.2 (29.2)	86.4 (24.1)	63.2 (102.9)	60.0 (65.5)	For river production, relates ocean recruits (SRS Accounting) to upwelling, sea surface temperature; data base 1970-1999. Most recent 3-year average abundance for lake production.
STEP		0.6	0.7 (0.4)	0.2 (0.3)	1.3 (0.3)	0.4 (1.2)	8.3 (0.5)	Smolt production with 1998 smolt to adult survival rates adjusted by changes in OPI public hatchery jacks per smolt between 1999 and 1998 release years.
Washington Coast								
Willapa	Natural	9.9	8.3	3.3	-	-	-	Marine survival estimate from Bingham Creek jack returns applied to estimate smolt production
	Hatchery	19.6	40.5	20.8	72.5	72.1	50.4	Ratio of 1998 jack return to 1991-1997 average applied to average survival/release.
Grays Harbor	Natural	47.8	57.7	30.1	26.1	121.4	103.4	1995 brood escapement times average return per spawner, adjusted by smolt production estimates and jack return rate.
	Hatchery	75.8	30.4	25.6	104.3	95.7	108.1	Smolt releases times expected marine survivals based on jack return rates.
Quinault	Natural	4.4	7.3	6.5	2.0	4.9	10.3	1991-1995 brood year average ocean recruits per spawner, adjusted for expected reduced survival.
	Hatchery	7.4	8.2	3.9	5.1	14.0	11.6	1992-1995 average adult survival rate applied to release.
Queets	Natural	2.7	4.3	4.2	4.3	8.3	12.1	1992-1995 brood year average survival rate to ocean recruit, for CWT and unmarked smolts applied to 1997 brood smolt production.
	Hatchery	11.8	13.8	4.6	16.9	28.1	21.9	1992-1995 brood year average survival rate to ocean recruit applied to smolt release. Includes supplementation releases, using same method.
Hoh	Natural	3.5	3.2	3.4	2.8	4.2	6.8	Average Queets smolts per square mile multiplied by 299 square miles of Hoh River watershed and recent year marine survivals for Bingham Creek and Queets.

TABLE I-2. Preliminary, preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction
Quillayute Fall Run	Natural	8.7	14.5	8.0	8.9	13.0	13.1	Average recruits per spawner multiplied by the 1997 spawner escapement.
	Hatchery	13.9	9.4	4.4	9.1	13.9	7.6	Mean ocean recruits per release, multiplied by releases.
Quillayute Summer Run	Natural	1.6	1.2	1.3	1.6	0.9	3.1	Recent average ocean recruits multiplied by actual brood year escapement.
	Hatchery	5.4	3.5	1.8	3.6	5.1	2.1	Average ocean recruits per release, multiplied by the number of smolts released.
WA Coast Total	Natural	78.6	96.5	56.8	45.7	152.7	148.8	
	Hatchery	133.9	105.8	61.1	211.5	228.9	201.7	
Puget Sound[a/]								b/
Strait	Natural	18.0	14.7	16.8	6.5	10.7	11.4	
	Hatchery	13.6	37.7	28.3	29.7	38.2	40.5	
Nooksack-Samish	Natural	14.9	13.8	30.8	28.0	55.8	42.6	
	Hatchery	65.5	95.0	119.1	223.3	328.9	280.5	
Skagit	Natural	30.2	75.7	55.0	70.9	44.8	64.7	
	Hatchery	10.3	10.9	12.9	22.1	45.2	41.2	
Stillaguamish	Natural	17.7	35.7	47.8	36.0	51.6	70.3	
Snohomish	Natural	53.0	141.6	165.3	186.6	338.1	358.3	
	Hatchery	62.1	87.8	47.1	184.6	212.9	228.0	
South Sound	Natural	11.7	19.4	57.2	135.0	142.5	127.1	
	Hatchery	121.8	372.1	408.7	674.1	659.9	488.1	
Hood Canal	Natural	c/	65.1	108.0	78.4	25.1	36.4	
	Hatchery	38.5	96.8	95.2	66.3	59.6	58.9	
Puget Sound Total	Natural	c/	366.0	480.9	541.4	668.6	710.8	
	Hatchery	311.8	700.3	711.3	1,200.1	1,344.7	1,137.2	

a/ Run sizes scaled to FRAM base period (1979-1981) catch and escapement.

b/ A variety of methods were used for 1999, primarily based on smolt production and survival. See text in Chapter III and "1999 Puget Sound Coho Salmon Forecast Methodology" report for details.

c/ A range of 34,300 to 79,400 for Hood Canal (see Chapter III for details). With this range, the total natural production range is 179,800 to 224,900 fish

CHAPTER II
CHINOOK SALMON ASSESSMENT

SACRAMENTO RIVER FALL CHINOOK SALMON

Predictor Description

The Council's framework amendment sets the escapement goal for Sacramento River fall chinook as a range from 122,000 to 180,000 adults. The fall stock comprises over 90% of the escapement of all chinook stocks that use Central Valley streams and hatcheries. The Central Valley index (CVI), which provides an annual index of abundance for the combined Central Valley chinook stocks, is the sum of ocean fishery chinook harvests in the area south of Point Arena plus the Central Valley adult chinook spawning escapement (Table II-1). The CVI harvest index is the ocean harvest landed south of Point Arena as a percent of the CVI.

Until 1989, the Salmon Technical Team (STT) based its projection of the CVI on recent CVI levels (with general consideration given for brood year natural escapements), hatchery releases, and the previous year jack runs. Beginning in 1989 and continuing through 1991, the CVI definition was modified to exclude spawning escapements of Sacramento River winter chinook and several possible predictors were examined, including weight and number of juveniles in hatchery releases and previous year jack returns. As a result of the analyses, since 1991, the STT has treated the regression between the Central Valley jack estimate for the previous year and the subsequent CVI as the best predictor of the forthcoming CVI (Figure II-1).

Predictor Performance

For the 1985-1999 period, the CVI preseason forecast has ranged from 0.50 to 1.67 times the postseason CVI estimate (Table II-2).

The 1999 CVI projection of 847,700 fish was based on the jack to CVI relationship from 1989 to 1998. The postseason estimate for the 1999 CVI was 644,300 fish, approximately 24% lower than the preseason projection (Table II-2). The postseason estimate of 52% for the CVI harvest index was 12% lower than the preseason projection of 59% (Table II-1).

2000 Stock Status

The CVI projection for 2000, based on the jack to CVI relationship of the most recent ten years of data (1990-1999), is 790,400 adult chinook (Figure II-1), 93% of the 1999 projection.

Evaluation of 1999 Regulations on 2000 Stock Abundance

The CVI harvest index has varied significantly since it was first calculated in 1970. After reaching its lowest level in 1985 (51%), the index rose to 78% in 1988 and ranged between 71% and 78% over the 1989-1995 period (Table II-1). The CVI harvest index fell to approximately 65% in 1996 and 1997, and to approximately 53% in 1998 and 1999. This decline in the CVI harvest index accompanied the reduction in fishing effort south of Point Arena between 1996 and 1999.

A repeat of 1999 regulations would be expected to result in a CVI harvest index similar to that observed in 1999 (52%). Applying the complement of this fraction (1 - 0.52) to the 2000 CVI projection of 790,400 fish and multiplying that quantity by the typical percentage of Central Valley chinook spawners that are fall run fish (approximately 90%), yields a projected 2000 adult escapement of 341,500 Sacramento River fall chinook, above the upper end of the escapement goal range (Figure II-2).

TABLE II-1. Indices of annual abundance and ocean fishery impacts on California Central Valley chinook in thousands of fish. (Page 1 of 1)

Year	Ocean Chinook Landings South of Pt. Arena			Hatchery and Natural Escapements of Central Valley Adults			CVI Abundance (Ocean Landings + Escapement)	CVI Harvest Index (%)[b/]
	Troll	Sport	Total	Fall	Other[a/]	Total		
1970	226.8	111.1	337.9	190.5	55.6[c/]	246.1	584.0	58
1971	150.7	166.3	317.0	190.6	62.0	252.6	569.6	56
1972	229.8	187.6	417.4	99.6	46.1	145.7	563.1	74
1973	422.5	180.9	603.4	227.1	27.1	254.2	857.6	70
1974	282.7	141.6	424.3	205.6	35.7	241.3	665.6	64
1975	234.4	92.7	327.1	159.2	47.6	206.8	533.9	61
1976	237.9	68.6	306.4	168.8	43.8	212.6	519.0	59
1977	263.8	76.6	340.4	148.7	42.8	191.5	531.9	64
1978	291.0	65.9	356.9	136.9	17.1	154.0	510.9	70
1979	234.1	108.5	342.6	167.9	11.3	179.2	521.8	66
1980	294.3	77.1	371.4	155.9	31.6	187.5	558.9	66
1981	289.9	73.8	363.7	189.3	18.8	208.1	571.8	64
1982	418.4	122.5	540.9	177.2	38.3	215.5	756.4	72
1983	178.2	53.0	231.2	121.0	12.8	133.8	365.0	63
1984	221.7	78.7	300.3	197.5	17.0	214.5	514.8	58
1985	212.3	121.8	334.1	308.9	18.1	327.0	661.1	51
1986	502.5	114.8	617.3	259.0	33.2	292.2	909.5	68
1987	446.8	152.8	599.7	188.0	25.5	213.5	813.2	74
1988	830.5	130.4	960.9	244.9	28.0	272.9	1,233.8	78
1989	363.8	130.9	494.7	149.6	17.9	167.5	662.2	75
1990	336.2	112.7	448.9	108.3	13.6	121.9	570.8	79
1991	254.6	62.1	316.7	112.3	15.3	127.6	444.3	71
1992	163.5	66.7	230.2	85.3	8.2	93.5	323.7	71
1993	259.7	99.3	359.0	131.5	10.4	141.9	500.9	72
1994	290.4	159.9	450.3	148.8	6.8	155.6	605.9	74
1995	670.6	354.6	1,025.2	272.0	16.2	288.2	1,313.4	78
1996	348.9	129.3	478.2	255.3	8.7	264.0	742.2	64
1997	482.5	208.4	690.9	350.8	17.4	368.2	1,059.1	65
1998	221.5	114.5	336.0	253.0	40.1	293.1	629.1	53
1999[d/]	258.8	76.1	334.9	294.5	14.9[e/]	309.4	644.3	52

a/ Spring run of the current calendar year and late fall and winter runs of the following calendar year.
b/ Ocean harvest landed south of Pt. Arena as a percent of the CVI.
c/ Percent of adults in 1970 spring run assumed the same as 1971 (72%, 5,500 total).
d/ Preliminary.
e/ Late-fall and winter contributions unknown - respective averages of 1995-1999 escapement used.

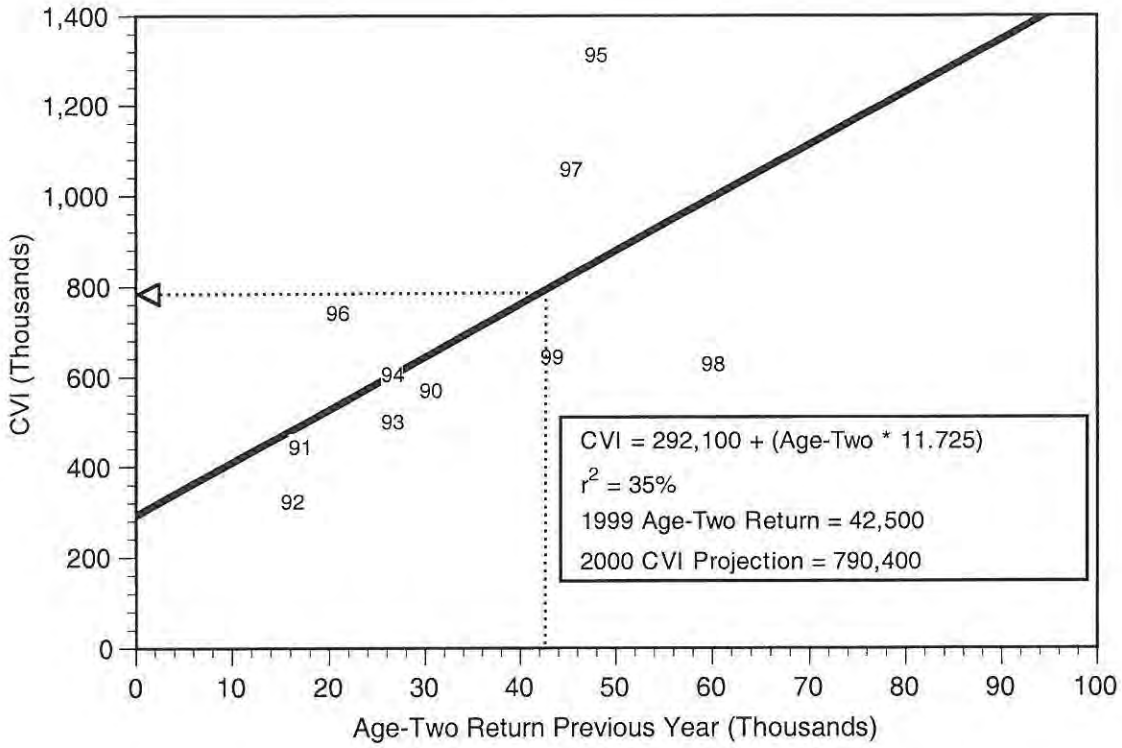

FIGURE II-1. Linear regression of CVI on inriver age-two Central Valley chinook of the previous year, 1990-1999. Years shown are CVI year.

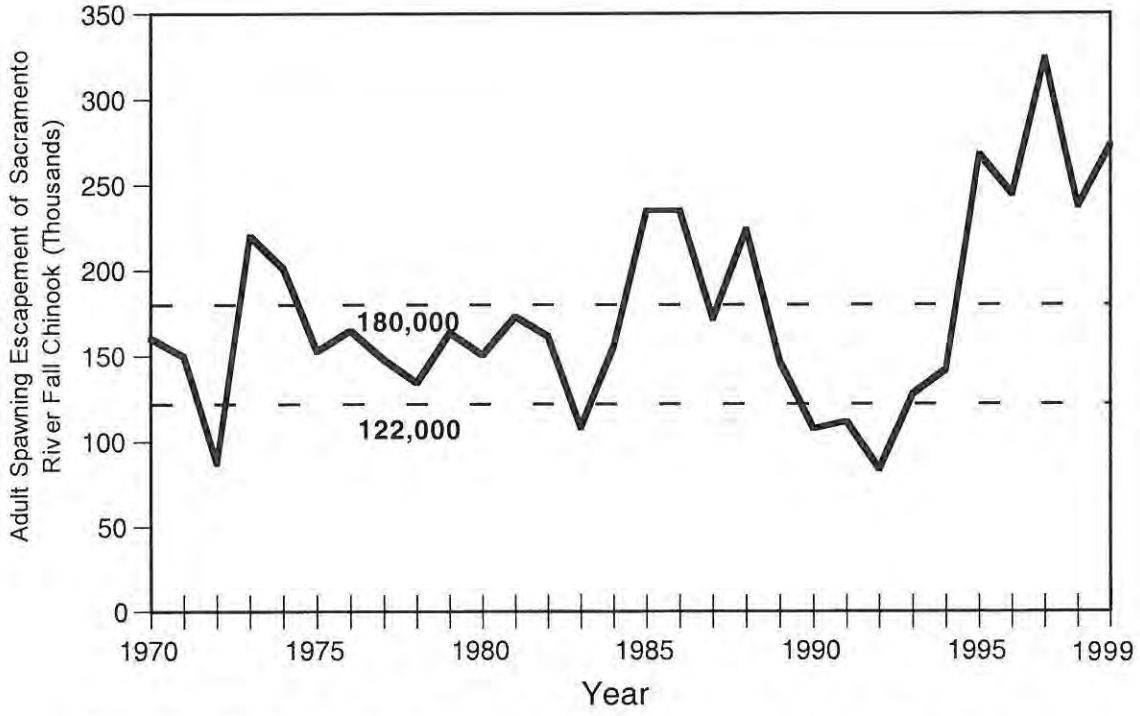

FIGURE II-2. Spawning escapements of adult Sacramento River fall chinook, 1970-1999, and the goal range for the stock of 122,000 to 180,000 adult fish (1999 estimate is preliminary).

TABLE II-2. Comparisons of preseason and postseason estimates for the CVI in thousands of fish. (Page 1 of 1)

Year or Average	Preseason	Postseason	Preseason/Postseason
1985	524.8	661.1	0.79
1986	546.5	909.5	0.60
1987	592.9	813.2	0.73
1988	707.1	1,233.8	0.57
1989	625-885	662.2	0.94-1.34
1990	500-900	570.7	0.88-1.58
1991	466.0	444.3	1.05
1992	452.0	323.7	1.40
1993	501.0	500.9	1.00
1994	503.0	605.9	0.83
1995	654.0	1,313.4	0.50
1996	533.0	742.2	0.72
1997	849.0	1,059.1	0.80
1998	1,051.0	629.1	1.67
1999	847.7	644.3	1.32

KLAMATH RIVER FALL CHINOOK

Predictor Description

For Klamath River fall chinook, linear regressions relate the preseason ocean abundance estimates of age-three and age-four fish to the previous year's river run size estimates of age-two and age-three fish, respectively (Table II-3). The ocean abundance estimates were derived from a cohort analysis of coded-wire tag (CWT) information (brood years 1979-1995). The y-intercept of the regressions was constrained to zero, which gives the biologically reasonable expectation that a river run size of zero predicts an ocean abundance of zero for the same cohort the following spring. The Klamath River regression models have been updated each year using the revised data points for age-three and age-four fish and the river run sizes of age-two and age-three fish of the previous year.

Ocean fisheries harvest small numbers of age-two and age-five Klamath River fall chinook. The abundance of age-two fish was not projected, because no precursor to age-two fish of that brood is available. The preseason ocean abundance of age-five fish was estimated by a product rather than a regression as follows: the 1999 age-four river run size was divided by the average age-four maturity rate, 0.937, to estimate the age-four ocean population from which the river run was derived, that quantity was then multiplied by the complement of the maturity rate and by an assumed over-winter survival rate of 0.80 to estimate the number of fish in this cohort that will carry over as age-five fish in 2000.

Predictor Performance

Since 1985, the preseason ocean abundance projections for age-three fish have ranged from 29% to 214% of the postseason abundance estimates (Table II-4). The age-four preseason projections for these same years ranged from 58% to 301% of the postseason estimates. For years of low stock abundance, particularly 1991-1994, the regression models generally have overpredicted ocean stock size. The 1999 age-three preseason prediction was 48% of the postseason estimate, while the age-four prediction was 261% of the postseason estimate (Table II-4).

Management of Klamath River fall chinook harvest since 1986 has attempted to achieve specific harvest rates on fully-vulnerable age-four and age-five fish in ocean and river fisheries (Table II-5). The Council has used a combination of quotas and time/area restrictions in ocean fisheries in an attempt to meet the harvest rate goal set each year. Since 1992, fisheries have been managed to achieve 50/50 allocation between tribal and non-tribal fisheries. River fisheries have been managed on the basis of adult chinook quotas (tribal net fishing) and partial quotas that trigger area closures (recreational fishing).

The Council's framework plan goal for Klamath River fall chinook (Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 67% , with a minimum escapement of 35,000 natural spawning adults. The amendment allows for any ocean and inriver allocation that meets the spawner reduction rate goal if it also meets the minimum escapement floor. Given the preseason estimate, the regulations adopted in 1999 by the Secretary of Commerce were expected to provide an inriver escapement of 47,900 adults, with 35,000 spawning in natural areas, and an age-four ocean harvest rate of 12%. Based on postseason estimates, the 1999 age-4 ocean harvest rate was 11% (Table II-6). The postseason estimate of the 1999 ocean abundance is 88,900 age-3 fish and 24,100 age-4 fish, contrasting with their preseason forecasts of 42,400 age-3 fish and 63,000 age-4 fish. The 1999 inriver spawning escapement was 33,000 adults, of which 18,600 spawned in natural areas. The low number of natural spawners represents a serious overprediction by the model.

2000 Stock Status

The year 2000 projected ocean abundance of Klamath River fall chinook salmon is 174,800 age-3 fish (Figure II-3) and 31,100 age-4 fish (Figure II-4).

In the absence of ocean and river fisheries in 2000, the projected stock abundance, in conjunction with the average maturity rates observed for the 1979-1994 broods (38.2%, 93.7%, and 100% for age-three, age-

TABLE II-3. Estimated number of fall chinook salmon by age entering the Klamath River in thousands of fish, including estimates of ocean harvest rates and ocean abundance.[a/] (Page 1 of 1)

	River Run					Ocean Harvest Rate		Ocean Abundance		
Calendar Year	Age-2	Age-3	Age-4	Age-5	Total Adults	Age-3	Age-4	Age-3	Age-4	Total
1981	28.1	64.0	14.3	1.8	80.1	0.42	0.66	246.6	45.6	292.2
1982	39.4	30.0	33.9	2.6	66.5	0.57	0.65	344.5	106.7	451.2
1983	3.8	35.8	20.7	0.9	57.5	0.28	0.70	103.8	84.9	188.7
1984	8.3	29.6	15.2	2.3	47.1	0.14	0.43	103.0	29.1	132.1
1985	69.4	30.7	32.7	0.9	64.4	0.25	0.29	138.0	46.0	184.0
1986	44.5	167.9	26.9	0.1	194.8	0.30	0.52	604.1	56.1	660.2
1987	19.0	120.7	88.0	b/	208.7	0.36	0.53	415.4	192.9	608.4
1988	24.0	136.5	53.5	1.2	191.3	0.37	0.45	612.2	108.7	720.9
1989	9.1	15.2	105.6	3.2	124.0	0.21	0.44	129.7	190.0	319.7
1990	4.4	9.1	26.6	0.2	35.8	0.61	0.61	113.3	68.7	182.0
1991	1.8	14.4	18.1	0.1	32.6	0.10	0.21	43.9	24.8	68.7
1992	13.7	7.3	18.3	1.0	26.7	0.02	0.04	20.8	20.0	40.8
1993	7.6	48.5	8.1	0.6	57.1	0.11	0.11	97.7	10.4	108.1
1994	14.4	35.6	25.0	1.0	61.6	0.05	0.07	68.7	30.3	99.1
1995	22.8	194.1	17.2	2.4	213.7	0.10	0.21	458.0	23.4	481.1
1996	9.5	38.5	136.6	0.3	175.4	0.08	0.17	112.1	171.5	283.8
1997	8.0	34.9	44.2	4.6	83.7	0.09	0.10	87.5	51.4	138.9
1998	4.7	58.9	30.0	1.7	90.5	0.02 c/	0.11	90.4[c/]	35.5[c/]	126.0
1999	19.1	29.4	20.2	1.3	50.9	d/	0.11c/	88.9[e/]	24.1	113.0

a/ Ocean harvest rate and ocean abundance of age-3 fish in 1981 and age-4 fish in 1981 and 1982 from CDFG; all others from KRTAT.
b/ Fewer than 50 fish.
c/ Preliminary: incomplete cohort data (age-5 data unavailable).
d/ Not estimated: incomplete cohort data (age-4 and age-5 data unavailable).
e/ Preliminary: incomplete cohort data (age-4 and age-5 data unavailable).

TABLE II-4. Comparisons of preseason and postseason ocean abundance estimates for age-three and age-four Klamath River fall chinook. (Page 1 of 1)

Age	Season	Preseason Estimate	Postseason Estimate	Pre/Postseason
3	1985	56,500	138,000	0.41
	1986	213,000[a/]	604,100	0.35
	1987	255,900	415,400	0.62
	1988	185,400	612,200	0.30
	1989	225,300	129,700	1.74
	1990	239,500	113,300	2.11
	1991	88,100	43,900	2.01
	1992	25,000	20,800	1.20
	1993	147,200	97,700	1.51
	1994	69,000	68,700	1.00
	1995	134,500	458,000	0.29
	1996	239,900	112,100	2.14
	1997	112,300	87,500	1.28
	1998	88,000	90,400[b/]	0.97
	1999	42,400	88,900[b/]	0.48
4	1985	45,500	46,000	0.99
	1986	53,000	56,100	0.94
	1987	164,900	192,900	0.85
	1988	149,100	108,700	1.37
	1989	172,400	190,000	0.91
	1990	40,100	68,700	0.58
	1991	35,700	24,800	1.44
	1992	35,800	20,000	1.79
	1993	31,300	10,400	3.01
	1994	68,900	30,300	2.27
	1995	37,600	23,400	1.61
	1996	214,800	171,700	1.25
	1997	43,100	51,400	0.84
	1998	36,800	35,500	1.04
	1999	63,000	24,100[b/]	2.61

a/ A 75% jack count adjustment was applied, because (1) most of the jacks were in the Trinity River and (2) the basin jack count was outside the data base.

b/ Preliminary (incomplete cohort data).

TABLE II-5. Summary of management objectives and performance for Klamath River fall chinook. (Page 1 of 1)

	Preseason Stock Abundance Projection		Postseason Stock Abundance Estimate		Preseason Harvest Rate Target on Age-four Fish[a/]		Actual Harvest Rate on Age-four Fish[b/]		Adult Numerical Preseason Harvest Target		Adult Actual Numerical Harvest	
Year	Age-3	Age-4	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	213,000	53,000	604,100	56,100	0.35	0.50	0.52	0.74	72,000	37, 700	224,200	46,200
1987	255,900	164,900	415,400	192,900	0.35	0.53	0.53	0.56	121,200	78,200	260,900	73,300
1988	185,400	149,100	612,200	108,700	0.39	0.53	0.45	0.84	114,100	65,400	288,300	73,900
1989	225,300	172,400	129,700	190,000	0.38	0.49	0.44	0.46	128,100	67,600	114,000	54,300
1990	239,500	40,100	113,300	68,700	0.38	0.49	0.61	0.31	85,100	31,200	115,700	11,400
1991	88,100	35,700	43,900	24,800	0.16	0.28	0.21	0.44	16,700	12,800	9,700	13,100
1992	25,000	35,800	20,800	20,000	0.08	0.15	0.04	0.27	4,200	4,200	1,600	6,200
1993	147,200	31,300	97,700	10,400	0.15	0.43	0.11	0.49	20,100	22,500	12,400	13,200
1994	69,000	68,900	68,700	30,300	0.09	0.20	0.07	0.30	10,400	14,300	6,000	13,500
1995	134,500	37,600	458,000	23,400	0.09	0.32	0.21	0.21	13,500	18,500	54,300	20,100
1996	239,900	214,800	112,100	171,700	0.21	0.66	0.17	0.39	88,400	129,100	38,700	68,800
1997	112,300	43,100	87,500	51,400	0.12	0.43	0.10	0.26	17,600	26,500	13,800	17,800
1998	88,000	36,800	90,400	35,500	0.09	0.29	0.11	0.30	10,200	14,800	5,400	17,900
1999[c/]	42,400	63,000	88,900	24,100	0.12	0.28	0.11	0.45	12,300	18,100	7,400	16,700

a/ Ocean harvest rate target expressed as fraction of ocean stock projection. River harvest rate target expressed as fraction of fish projected to enter the river.
b/ Ocean harvest rate expressed as fraction of ocean stock abundance. River harvest rate expressed as fraction of fish entering the river.
c/ Preliminary.

TABLE II-6. Harvest levels and rates of age-three and age-four Klamath River fall chinook (biological years are defined as September 1 through August 31 for ocean fisheries). (Page 1 of 2)

	Ocean Fisheries							River Fisheries[a/]		
	KMZ			North of	South of		Ocean			
Year	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
HARVEST LEVELS (numbers of fish)										
Age Three										
1986	30,040	3,759	33,799	58,086	103,129	161,214	195,013	8,100	18,100	26,200
1987	24,826	6,032	30,858	43,453	84,487	127,940	158,798	11,400	11,400	22,800
1988	29,739	7,625	37,364	44,685	156,167	200,852	238,216	12,500	15,600	28,100
1989	735	5,307	6,042	12,206	10,342	22,547	28,589	2,700	900	3,600
1990	1,324	8,741	10,065	42,998	20,131	63,129	73,194	1,300	1,400	2,700
1991	0	1,457	1,457	840	2,174	3,014	4,471	2,118	1,719	3,837
1992	0	0	0	520	0	520	520	97	834	931
1993	0	1,077	1,077	1,034	9,216	10,249	11,326	5,426	3,411	8,837
1994	56	282	339	0	3,585	3,585	3,924	4,541	971	5,512
1995	0	1,712	1,712	21,428	26,151	47,579	49,291	11,839	4,129	15,968
1996	73	255	327	109	8,912	9,022	9,349	12,234	3,845	16,079
1997	0	1,310	1,310	2,292	4,584	6,875	8,185	2,166	2,736	4,902
1998[b/]	0	150	150	399	922	1,321	1,471	2,231	5,782	8,013
1999[b/]	0	0	0	2,778	1,852	4,630	4,630	4,887	1,735	6,622
Age Four										
1986	3,588	532	4,119	12,145	12,876	25,022	29,141	17,000	2,900	19,900
1987	13,784	2,992	16,777	48,526	36,751	85,276	102,053	41,000	8,500	49,500
1988	5,958	2,919	8,876	12,371	27,704	40,076	48,952	38,600	6,200	44,800
1989	12,359	13,10	25,461	33,928	24,217	58,145	83,606	41,000	7,700	48,700
1990	1,118	2,842	3,960	29,414	8,655	38,069	42,029	6,000	2,200	8,200
1991	73	656	728	747	3,715	4,462	5,190	7,569	1,187	8,756
1992	47	47	94	688	78	766	860	4,360	437	4,797
1993	0	0	0	230	884	1,114	1,114	3,786	164	3,950
1994	0	591	591	473	1,032	1,505	2,096	6,664	813	7,477
1995	0	176	176	1,843	2,779	4,622	4,797	2,957	377	3,334
1996	757	1,147	1,904	6,904	19,715	26,619	28,523	43,540	9,042	52,582
1997	303	682	986	1,630	2,389	4,019	5,005	8,734	2,585	11,319
1998[b/]	0	123	123	3,718	0	3,718	3,841	7,163	1,821	8,984
1999[b/]	25	450	476	1,439	813	2,252	2,728	8,679	488	9,167
HARVEST RATE										
Age Three										
1986	0.05	0.01	0.06	0.10	0.17	0.27	0.32	0.05	0.11	0.16
1987	0.06	0.01	0.07	0.10	0.20	0.31	0.38	0.09	0.09	0.19
1988	0.05	0.01	0.06	0.07	0.26	0.33	0.39	0.09	0.11	0.21
1989	0.01	0.04	0.05	0.09	0.08	0.17	0.22	0.18	0.06	0.24
1990	0.01	0.08	0.09	0.38	0.18	0.56	0.65	0.14	0.15	0.30
1991	0.00	0.03	0.03	0.02	0.05	0.07	0.10	0.21	0.17	0.37
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.01	0.12	0.13
1993	0.00	0.01	0.01	0.01	0.09	0.10	0.12	0.11	0.07	0.18
1994	0.00	0.00	0.00	0.00	0.05	0.05	0.06	0.13	0.03	0.15
1995	0.00	0.00	0.00	0.05	0.06	0.10	0.11	0.06	0.02	0.09
1996	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.32	0.10	0.42
1997	0.00	0.01	0.01	0.03	0.05	0.08	0.09	0.06	0.08	0.14
1998[b/]	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.10	0.14
1999[b/]	0.00	0.00	0.00	0.03	0.02	0.05	0.05	0.17	0.06	0.23

TABLE II-6. Harvest levels and rates of age-three and age-four Klamath River fall chinook (biological years are defined as September 1 through August 31 for ocean fisheries). (Page 1 of 2)

	Ocean Fisheries							River Fisheries[a/]		
	KMZ			North of	South of		Ocean			
Year	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
HARVEST RATE (continued)										
Age Four										
1986	0.06	0.01	0.07	0.22	0.23	0.45	0.52	0.63	0.11	0.74
1987	0.07	0.02	0.09	0.25	0.19	0.44	0.53	0.47	0.10	0.56
1988	0.05	0.03	0.08	0.11	0.25	0.37	0.45	0.72	0.12	0.84
1989	0.07	0.07	0.13	0.18	0.13	0.31	0.44	0.39	0.07	0.46
1990	0.02	0.04	0.06	0.43	0.13	0.55	0.61	0.23	0.08	0.31
1991	0.00	0.03	0.03	0.03	0.15	0.18	0.21	0.38	0.06	0.44
1992	0.00	0.00	0.00	0.03	0.00	0.04	0.04	0.25	0.02	0.27
1993	0.00	0.00	0.00	0.02	0.09	0.11	0.11	0.47	0.02	0.49
1994	0.00	0.02	0.02	0.02	0.03	0.05	0.07	0.27	0.03	0.30
1995	0.00	0.01	0.01	0.08	0.12	0.20	0.21	0.18	0.02	0.21
1996	0.00	0.01	0.01	0.04	0.11	0.16	0.17	0.32	0.07	0.39
1997	0.01	0.01	0.02	0.03	0.05	0.08	0.10	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.10	0.00	0.10	0.11	0.24	0.06	0.30
1999[b/]	0.00	0.02	0.02	0.06	0.03	0.09	0.11	0.43	0.02	0.45

a/ Net fishery estimates provided by Yurok and Hoopa Tribes. Sport fishery estimates provided by CDFG.
b/ Preliminary data (incomplete cohort)

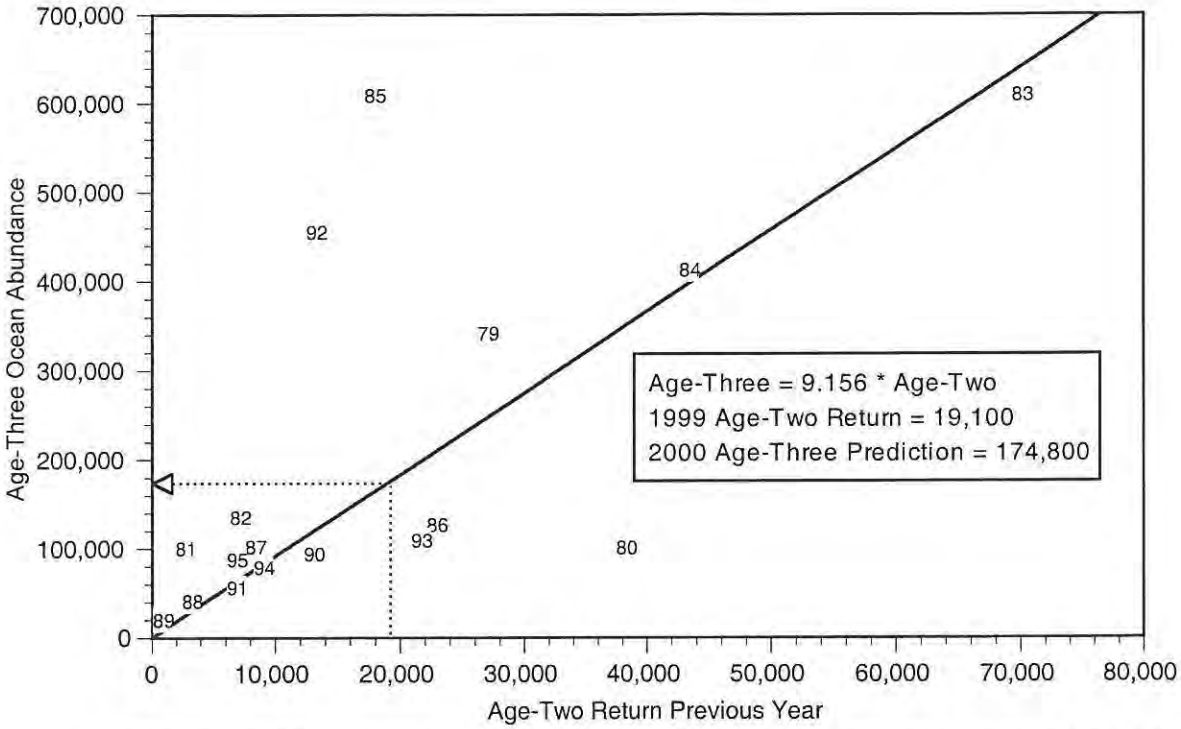

FIGURE II-3. Linear regression of age-three ocean abundance on inriver age-two Klamath River fall chinook of the same cohort, 1979-1995 broods (years shown are brood years).

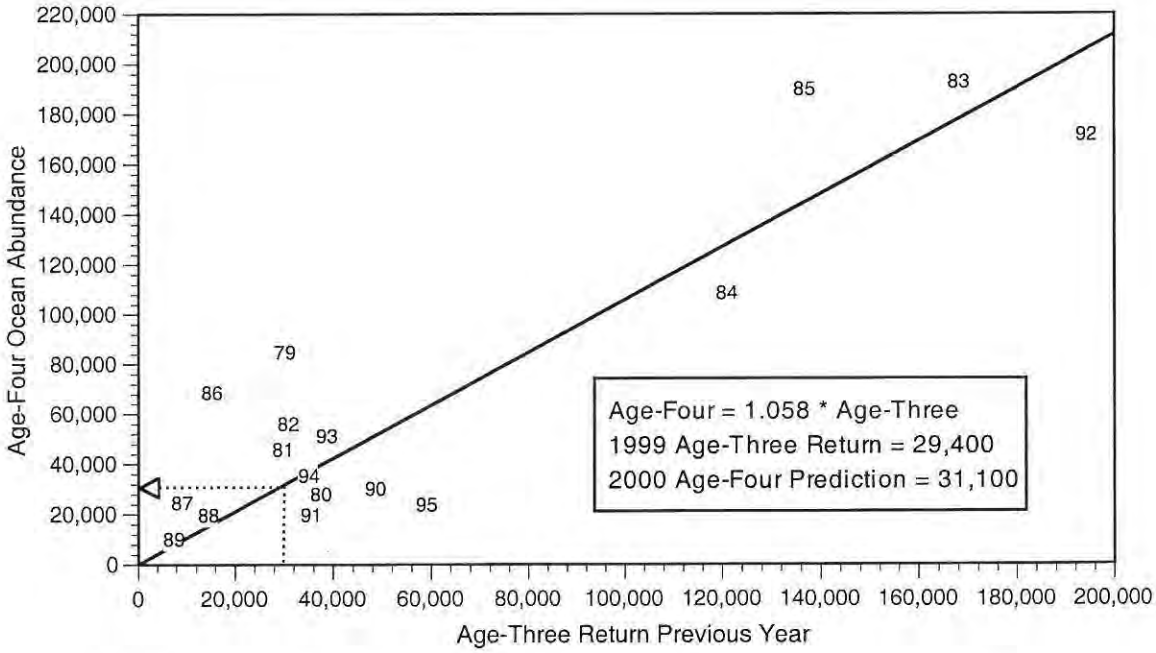

FIGURE II-4. Linear regression of age-four ocean abundance on inriver age-three Klamath River fall chinook of the same cohort, 1979-1995 broods (years shown are brood years).

four, and age-five fish, respectively), would produce a 2000 spawning population of 97,000 adults. Assuming the five-year natural spawner average (70%), 67,900 of these fish would be expected to spawn in natural areas. In 1999, 56% of the adults returning to the river spawned in natural areas.

Late-season ocean fisheries in 1999 (September-November) were estimated to have harvested zero age-three, 22 age-four, and 20 age-five Klamath River fall chinook (in summer equivalent units). This harvest should be deducted from the ocean fishery's allocation in determining the 2000 allowable ocean harvest.

Evaluation of 1999 Regulations on 2000 Stock Abundance

The Klamath Ocean Harvest Model (KOHM) has not yet been updated to evaluate 2000 ocean fishery options. The KOHM was developed for use in evaluating 1988 fishery options and has been updated each year thereafter. When the model is calibrated for 2000, it will be calibrated to the average 1986-1990 fishery observations and expected 2000 stock strengths for Klamath, Central Valley, and Rogue River fall chinook. A precise evaluation of the 1999 regulations coupled with the 2000 stock predictions is not possible at this time. However, the Harvest Rate Model (HRM) developed by the KRTAT provides an approximate evaluation based on the following assumptions:

1. A maximum spawner reduction rate of 67%.
2. A natural spawner floor of 35,000 adults.
3. A 50% harvest share for the tribes.
4. An allocation of 15% of the nontribal harvest to the river recreational fishery.

Under these assumptions, the HRM projects a spawning population of approximately 50,000 adults, of which 35,000 would be expected to spawn in natural areas. The total harvest projected by the HRM under this scenario would be 55,200 adults (tribes 27,600; in-river sport 4,100; ocean troll/sport 23,500), with age-four ocean and river harvest rates of 15.1% and 52.8%, respectively. These projections are provided for comparative purposes only; the Council does not use the HRM to model Klamath River fall chinook fisheries.

OTHER CALIFORNIA COASTAL CHINOOK STOCKS

Other California streams that contribute to ocean fisheries include the Smith, Little, Mad, Eel, and Mattole Rivers, and Redwood Creek. All of these streams support fall stocks and are believed to contribute to ocean fisheries off the California and Oregon coasts. Current information is insufficient to forecast ocean abundance levels for these stocks.

OREGON COASTAL CHINOOK STOCKS

Oregon coastal chinook stocks are categorized into two major subgroups based on ocean migration patterns. Although their ocean harvest distributions somewhat overlap, they have been labeled as either north or south/local migrating.

Oregon Coastal North Migrating Chinook

North migrating chinook stocks include stocks north of and including the Elk River, with the exception of Umpqua River spring chinook. Based on CWT analysis, the populations from ten major north Oregon coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in Pacific Salmon Commission (PSC) ocean fisheries off British Columbia and southeast Alaska and to a much lesser degree in Council area fisheries off Washington and Oregon, primarily in terminal area fisheries. CWT analysis indicates that populations from five major mid-Oregon coast (MOC) systems from the Coos through the Elk Rivers are harvested primarily in ocean fisheries off British Columbia, Washington, and Oregon, with minor contributions to California fisheries.

Predictor Description and 2000 Stock Status

Specific techniques have not been developed to make quantitative abundance predictions for these stocks for use in annual development of Council area fishery regulations. Qualitative expectations are based on parental year spawner escapement and recently developed hatchery indicator stocks for use in the PSC management process.

Natural spawner escapement is assessed yearly from the Nehalem through Coquille Rivers. Peak spawning counts of adults are obtained from standard index areas on these rivers and monitored to assess stock trends (*Review of 1999 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3). Natural fall chinook stocks from the Nehalem River on the north Oregon coast south to the Elk River near Humbug Mountain dominate production from this subgroup. Also present in lesser numbers are naturally-produced spring chinook stocks from several rivers and hatchery fall and/or spring chinook produced in the Trask, Nestucca, Salmon, Alsea, and Elk Rivers.

North Oregon Coast (NOC)

Since 1986, the Salmon River Hatchery production has been coded-wire-tagged and used as an indicator stock for the NOC stock component. Because these fish are mostly harvested in PSC fisheries, the STT has not reviewed the procedure by which this indicator stock is used in estimating annual stock status. Based on this indicator stock and compared with index abundances since 1986, the STT is informed that expectations in 2000 are for an average abundance.

Mid-Oregon Coast (MOC)

Since 1992, the Elk River Hatchery production has been coded-wire-tagged for use as an indicator stock for the MOC stock component. Forecasts of abundance assume that river returns of younger age classes of a brood reflect abundance of the remaining, as yet immature, ocean residents of the brood. Age-specific ocean escapements for 1999 are not currently available. The STT has not undertaken a review of the methods used by state staff in preparing these abundance forecasts.

Based on the density index of total spawners, the generalized expectation for ocean coastal north migrating (NOC & MOC) stocks in 2000 is for average abundance. The density of adult spawners per mile observed since 1985 are a primary indicator that these stocks are generally healthy.

South/Local Migrating Chinook

South/local migrating chinook stocks include Rogue River spring and fall chinook and fall chinook from smaller rivers south of the Elk River. These stocks are important contributors to ocean fisheries off Oregon and northern California. Another central Oregon stock, Umpqua River spring chinook, contributes primarily to ocean fisheries off Oregon and California and to a lesser degree, off Washington, British Columbia, and southeast Alaska.

Predictor Description and 2000 Stock Status

Quantitative abundance predictions are not made for these stocks, although an abundance index for Rogue River fall chinook has been developed. General trends in stock abundance for southern Oregon coastal chinook stocks are assessed through escapement indices (*Review of 1999 Ocean Salmon Fisheries,* Chapter II, Table II-4 and Figures II-3 and II-4).

Natural fall chinook stocks from river systems south of the Elk River and spring chinook stocks from the Rogue and Umpqua Rivers dominate production from this subgroup. Also present in lesser numbers are hatchery fall chinook with the majority of releases occurring in the Chetco River. Substantial releases of hatchery spring chinook occur in both the Rogue and Umpqua Rivers.

Umpqua River and Rogue River Spring Chinook

Umpqua and Rogue Rivers spring chinook contribute to ocean fisheries primarily as age-three fish. Mature chinook enter the rivers primarily during April and May and generally prior to annual fisheries. Quantitative abundance predictions are not made for these stocks.

Rogue River Fall Chinook

Rogue River fall chinook contribute to ocean fisheries principally as age-three through age-five fish. Mature fish enter the river each year from mid-July through October, with the peak run occurring during August and September.

Annual predictions of Rogue River fall chinook are used for the purposes of ocean impact modeling and, specifically, for use in assessing allowable Klamath Management Zone (KMZ) area harvest. A Rogue River fall chinook ocean abundance index has been developed based on carcass counts, ocean exploitation rates and cohort reconstruction methods. Linear regression analysis is used to relate the Rogue River fall chinook ocean abundance index for age-three, age-four, and age-five fish to inriver carcass counts of age-two, age-three and age-four fish, respectively, of the previous year. The inriver age composition estimates are based on scale sampling of carcasses. Ocean exploitation rates are based on Klamath River fall chinook CWT analysis since 1979 because Rogue River fall chinook ocean exploitation rate information is not available. The ocean harvest distribution and age composition of both Rogue and Klamath fall chinook are similar. The Rogue River fall chinook ocean abundance index for 2000 was unavailable when this report went to press, but is expected to be similar to the 1999 index of 4,000 chinook, and still below the long-term average (Table II-7).]

Other Stocks

Information is insufficient to forecast the abundance of fall chinook from other smaller rivers south of the Elk River. These stocks are minor contributors to general season mixed stock ocean fisheries.

Evaluation of 1999 Regulations on 2000 Stock Abundance

Given the 1999 regulations and the projected 2000 Oregon coastal chinook stock abundance, it is expected that the aggregate Oregon coastal chinook goal of 150,000 to 200,000 naturally spawning adults will be met.

CHINOOK STOCKS NORTH OF CAPE FALCON

Columbia River Fall Chinook

Predictor Description and Past Performance

Columbia River fall chinook stocks typically form the largest contributing stock group to Council chinook fisheries north of Cape Falcon. Abundance of these stocks is a major factor in determining impacts of fisheries on weak natural stocks critical to Council area management. Abundance predictions are made for five distinct fall stock units characterized as being of primarily hatchery or primarily natural production and originating above or below Bonneville Dam. The upriver brights (URB) and lower Columbia River wild (LRW) are primarily naturally produced stocks. The lower Columbia River hatchery (LRH) tule, Spring Creek Hatchery (SCH) tule, and mid-Columbia River brights (MCB) are primarily hatchery produced stocks. The tule stocks generally mature at an earlier age than the natural fall stocks and do not migrate as far north.

Preseason estimates of Columbia River fall chinook stock abundance, used by the STT to assess the Council's adopted fishery regulations, are based on age and stock-specific forecasts of annual ocean escapement (return to the Columbia River). These forecasts are developed by the technical staffs of the Columbia River management agencies. Columbia River return forecast methodologies used for Council management are generally identical to those used for planning Columbia River fall season fisheries,

TABLE II-7. Rogue River fall chinook inriver run and ocean population indices. (Page 1 of 1)

Return Year	Inriver Run Index in Thousands of Fish[a/]					Ocean Impact Rate (percentage) by Age[b/]		Ocean Population Index in Thousands of Fish[c/]			
	Age-2	Age-3	Age-4	Age-5	Total[d/]	Age-3	Age-4-5	Age-3	Age-4	Age-5	Total
1977	1.9	0.8	0.3	0.0	3.0	40	60	13.7	1.5	0.1	15.3
1978	1.0	6.1	2.3	0.1	9.5	40	60	72.7	6.0	0.3	78.9
1979	0.2	1.0	6.5	0.0	7.7	36	68	16.6	30.0	0.1	46.7
1980	0.4	0.2	0.9	0.6	2.2	43	75	9.3	7.8	2.5	19.5
1981	1.0	3.1	0.9	0.3	5.2	42	66	13.6	4.0	0.8	18.5
1982	0.7	1.3	1.3	0.1	3.4	57	65	13.3	3.9	0.4	17.5
1983	0.2	0.6	0.9	0.0	1.7	28	70	7.7	3.5	0.1	11.3
1984	0.2	0.8	1.1	0.1	2.2	14	43	10.8	4.0	0.1	14.9
1985	2.5	1.3	3.5	0.6	7.9	25	29	13.6	6.8	0.9	21.3
1986	3.2	12.8	2.4	0.5	18.9	30	52	102.1	7.1	1.1	110.3
1987	2.8	8.5	19.8	0.4	31.5	36	53	88.3	46.9	0.8	136.1
1988	0.9	3.2	16.5	1.0	21.6	37	45	21.7	38.4	1.8	61.9
1989	0.5	1.3	4.0	2.1	7.8	21	44	10.4	8.4	3.7	22.4
1990	0.0	0.3	1.4	0.2	1.9	61	61	11.1	5.5	0.6	17.2
1991	0.2	0.4	1.9	0.5	2.9	10	21	3.8	3.2	0.6	7.7
1992	0.5	0.3	1.5	0.5	2.8	2	4	4.1	2.3	0.5	6.9
1993	0.3	3.5	1.5	0.5	5.7	11	11	17.2	2.9	0.6	20.7
1994	0.5	0.8	5.8	0.9	7.9	5	7	3.2	9.4	0.9	13.6
1995	0.2	0.6	1.4	2.0	4.1	10	21	4.3	1.9	2.5	8.6
1996	0.1	0.4	1.8	0.1	2.3	8	17	2.6	2.6	0.1	5.3
1997	0.1	0.3	1.0	0.3	1.7	9	10	2.0[e/]	1.6	0.3	3.9
1998	0.1	0.5	2.6	0.3	3.4	2	11	3.3[e/]	4.0[e/]	0.3	7.6
1999	-	-	-	-	-	-	11	0.6	2.7	0.8	4.0
2000	-	-	-	-	-	-	-	NA	NA	NA	NA

a/ Index based on carcass counts in spawning survey index areas. Carcass counts in 1978, 1979 and 1980 adjusted for prespawning mortality. Carcass counts in 1996 adjusted for high river flows during latter part of survey season. Age composition developed from carcass scale sampling.

b/ Exploitation rates since 1979 are based on Klamath River fall chinook cohort analysis.

c/ Based on cohort reconstruction methods. Index values for 1999 predicted from regression equations; postseason estimates are not available.

d/ Excludes age-six fish.

e/ Preliminary; complete cohort not available. Used mean maturity rate to derive estimate.

although minor updates to Council estimates of inriver run size may occur prior to finalization of the inriver fishery plans.

The 2000 return of each fall chinook stock group is estimated using relationships between successive age groups within a brood year. The data base for these relationships was constructed by combining age-specific estimates of escapement and inriver fishery catches for years since 1964, although only the more recent broods (1975-1994) are used in most current predictions. Fall chinook stock identification in the Columbia River mixed stock fisheries is determined by sampling catch and escapement for such factors as CWT recovery and visual stock identification (VSI). Age composition estimates are based on CWT data and scale reading of fishery and escapement samples, where available. These stock and age data for Columbia River fall chinook are the basis for the return data presented in the *Review of 1999 Ocean Salmon Fisheries* (Appendix B, Tables B-15 through B-19). The 1999 returns for the five fall chinook stocks listed in this report will differ somewhat from those provided in the *Review of 1999 Ocean Salmon Fisheries* since ocean escapement estimates were updated after that report was printed.

Performance of the preliminary river return estimation methodology can be assessed, in part, by examining the differences between preseason and postseason estimates (Table II-8). The 1990 -1999 average March preliminary preseason estimates as a percentage of the postseason estimates for the URB, LRW, LRH, and SCH, and MCB stock estimates are 86%, 92%, 98%, and 1.04%,and 1.05% respectively. The return of tule stocks has generally been underpredicted in recent years. The return of SCH adults was overpredicted in 1999, but has been underpredicted the previous four years, the LRH return has been underpredicted the past six years.

Inaccuracies of ocean escapement estimates developed for the March Council meeting are partly a result of the lack of assessment of variable ocean fishery impacts on these stocks. March estimates of the inriver run size abundance for Columbia River fall chinook stocks are based on age-specific and stock-specific cohort relationships for a database impacted by the historic marine fisheries during the last 20 years. The STT combines the initial inriver run size (ocean escapements) with expected Council area fishery harvest levels and stock distribution patterns to produce adjusted ocean escapement estimates based on the proposed ocean fishing regulations. These revised estimates are available at the end of the Council preseason planning process in April (Table II-8) and should provide a more accurate prediction of ocean escapement.

2000 Stock Status

The preliminary forecast for 2000 URB fall chinook ocean escapement is 171,100 adults, similar to the 1999 return of 166,700 adults. No preseason estimate of Snake River wild fall chinook ocean escapement for 1999 is currently available. However, the Columbia River technical staffs are expected to develop a run size estimate for this critical ESA listed stock during the March or April Council meeting process.

Ocean escapement of LRW fall chinook in 2000 is forecast at 3,500 adults, almost identical to the record low 1999 observed return of 3,300 adults. The forecast is 61% of the spawning escapement goal of 5,700 into the North Lewis River, Washington.

The preliminary forecast for 2000 ocean escapement of LRH fall chinook is for a return of 23,700 adults, a record low return. Recent reductions in LRH production, especially in Oregon as a result of Mitchell Act funding cuts, have decreased the ocean escapement needed to meet hatchery brood stock requirements. The March forecast return is about equal to the estimated ocean escapement of adults needed to meet broodstock requirements.

Ocean escapement of SCH fall chinook in 2000 is projected to be 21,900 adults, only 44% of the 1999 actual return of 49,300 adults and below the recent 5 year average.

The preliminary forecast for the 2000 ocean escapement of MCB fall chinook is 50,600 adults, close to the 1999 observed return of 49,900 adults. The MCB chinook are primarily returns from hatchery releases of

TABLE II-8. Predicted and postseason returns of Columbia River adult fall chinook in thousands of fish. (Page 1 of 2)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
URB	1984	90.1	93.0	131.4	0.69	0.71
	1985	159.1	159.1	196.4	0.81	0.81
	1986	285.9	286.1	281.5	1.02	1.02
	1987	436.4	436.4	420.7	1.04	1.04
	1988	450.7	446.5	339.9	1.33	1.31
	1989	234.0	231.8	261.3	0.90	0.89
	1990	127.2	126.9	153.6	0.83	0.83
	1991	88.8	88.9	103.3	0.86	0.86
	1992	68.4	66.3	81.0	0.84	0.82
	1993	84.5	82.7	102.9	0.82	0.80
	1994	85.4	94.7	132.8	0.64	0.71
	1995	110.3	125.0	106.5	1.04	1.17
	1996	88.9	94.1	143.2	0.62	0.66
	1997	166.4	158.0	164.9	1.01	0.96
	1998	150.8	141.8	142.3	1.06	1.00
	1999	147.5	102.1	166.7	0.88	0.61
				1984-1999 average:	0.90	0.89
				1990-1999 average:	0.86	0.84
LRW	1984	16.7	NA	13.3	1.26	NA
	1985	12.9	NA	13.3	0.97	NA
	1986	15.7	NA	24.5	0.64	NA
	1987	29.2	NA	37.9	0.77	NA
	1988	43.3	42.1	41.7	1.04	1.01
	1989	27.3	26.9	38.6	0.71	0.70
	1990	23.7	23.4	20.3	1.17	1.15
	1991	12.7	12.7	19.8	0.64	0.64
	1992	17.4	16.7	12.5	1.39	1.34
	1993	12.5	11.9	13.3	0.94	0.89
	1994	14.7	13.2	12.2	1.20	1.08
	1995	12.4	11.5	16.0	0.78	0.72
	1996	8.8	8.1	14.6	0.60	0.55
	1997	7.5	7.2	12.3	0.61	0.59
	1998	8.1	7.0	7.3	1.11	0.96
	1999	2.6	2.5	3.3	0.79	0.76
				1984-1999 average:	0.91	0.87
				1990-1999 average:	0.92	0.87
LRH	1984	70.4	89.0	102.4	0.69	0.87
	1985	81.5	86.7	111.0	0.73	0.78
	1986	171.6	173.9	154.8	1.11	1.12
	1987	294.9	298.7	344.1	0.86	0.87
	1988	267.7	246.5	309.9	0.86	0.80
	1989	104.9	97.5	130.9	0.80	0.74
	1990	68.5	65.5	60.0	1.14	1.09
	1991	71.4	73.1	62.7	1.14	1.17
	1992	113.2	121.5	62.6	1.81	1.94
	1993	79.3	77.7	52.3	1.52	1.49
	1994	36.1	46.5	53.6	0.67	0.87
	1995	35.8	42.4	46.4	0.77	0.91
	1996	37.7	48.3	75.5	0.50	0.64
	1997	54.2	68.7	57.4	0.94	1.20
	1998	19.2	22.5	45.3	0.42	0.50
	1999	34.8	38.2	37.4	0.93	1.02
				1984-1999 average:	0.93	1.00
				1990-1999 average:	0.98	1.08

TABLE II-8. Predicted and postseason returns of Columbia River adult fall chinook in thousands of fish. (Page 2 of 2)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
SCH	1984	21.3	27.0	47.5	0.45	0.57
	1985	34.9	37.1	33.2	1.05	1.12
	1986	16.0	16.2	16.6	0.96	0.98
	1987	9.1	9.2	9.1	1.00	1.01
	1988	6.5	5.9	12.0	0.54	0.49
	1989	29.5	23.0	26.8	1.10	0.86
	1990	27.3	23.7	18.9	1.44	1.25
	1991	56.3	61.4	52.4	1.07	1.17
	1992	40.9	41.3	29.5	1.39	1.40
	1993	19.9	18.2	16.8	1.18	1.08
	1994	20.2	28.9	18.5	1.09	1.56
	1995	17.5	22.5	33.8	0.52	0.67
	1996	27.6	35.2	33.1	0.83	1.06
	1997	21.9	25.7	27.4	0.80	0.94
	1998	14.2	14.2	20.2	0.70	0.70
	1999	65.8	61.0	49.3	1.33	1.24
				1984-1999 average:	0.97	1.01
				1990-1999 average:	1.04	1.11
MCB	1990	69.5	69.3	59.1	1.18	1.17
	1991	48.4	48.5	35.9	1.35	1.35
	1992	42.5	40.7	31.1	1.37	1.31
	1993	33.0	32.3	27.4	1.20	1.18
	1994	23.9	26.7	33.7	0.71	0.79
	1995	26.5	30.1	34.2	0.77	0.88
	1996	40.8	43.2	59.7	0.68	0.72
	1997	72.1	61.9	59.7	1.21	1.04
	1998	47.8	44.9	36.8	1.30	1.22
	1999	38.3	27.7	49.9	0.77	0.56
				1990-1999 average:	1.05	1.02

a/ March preseason forecasts are ocean escapements based on terminal run size and stock-specific cohort relationships affected by the historical "normal" ocean fisheries during the brood year data base time period (generally 1978-1994).

b/ STT modeled forecasts adjust March preseason forecasts for Council-adopted ocean regulations each year and should provide a more accurate estimate of expected ocean escapement.

bright fall chinook stock in the area below McNary Dam, although some natural spawning in tributaries in the area between Bonneville and McNary dams also occurs.

Washington Coastal Chinook

Predictor Description and Past Performance

Preseason abundance estimates for many Washington coastal chinook stocks are not available for consideration in Council preseason fishery management planning. Since Council fisheries have only a minor impact on the ocean escapement of Washington coastal stocks, they also have not been included in the preseason fishery impact assessment reports prepared by the STT.

2000 Stock Status

Preseason forecasts for most Washington coastal chinook stocks are not available at this time. Willapa Bay hatchery fall chinook are forecast at 18,900 adults, 27% above the 1999 preseason projection. Willapa Bay natural fall chinook are forecast at 4,200 adults, 26% above the 1999 forecast.

Puget Sound Chinook

Expectations for Puget Sound run size of the various stock management units of this region are listed in Table I-1. A comparison of preseason and postseason forecasts for recent years is detailed in Table II-9. The STT has not undertaken a review of the methods employed by state and tribal staffs in preparing these abundance forecasts. Methodologies for estimates are described in the annual Puget Sound management reports (starting in 1993, reports are available by Puget Sound management unit, not by individual species). Forecasts for Puget Sound stocks generally assume production is dominated by age-four adults. Puget Sound chinook were listed as threatened under the ESA in March 1999.

2000 Stock Status

Spring Chinook

Spring chinook originating in Puget Sound are expected to remain depressed. Runs in the Nooksack, Skagit, White, and Dungeness Rivers are of continuing concern.

Summer/Fall Chinook

Preliminary information for Puget Sound summer/fall stocks indicates that the total 2000 return is expected to be similar to the 1999 preseason forecast. Changes in the abundance of individual stocks from various production areas are detailed in Table I-1.

The total return from Puget Sound hatchery production is forecasted to be about the same as 1999 (4% above the 1999 predicted level). However, expected returns from north Puget Sound facilities are forecasted to be 31% less than 1999 returns, while returns from south Puget Sound facilities are expected to be 20% greater than in 1999.

The total return of natural Puget Sound summer/fall stocks is expected to be about the same as in 1999. Returns to the Skagit River are forecast to be similar to 1999 and the escapement goal is not expected to be attained. Returns to the Stillaguamish and Snohomish rivers are also expected to similar to the 1999 preseason forecasts. Returns to the Strait of Juan de Fuca are forecast to be the same as the 1999 level, and returns to south Puget Sound are forecast to be down about 24% compared to 1999 level. Natural stocks from Puget Sound have experienced poor survival in recent years, resulting in depressed production and escapements. Only four natural Puget Sound summer/fall chinook stocks have met escapement goals at least once in the last five years (Hoko, Snohomish, Green, and Nisqually). However, two of these stocks (Green and Niqually) have significant numbers of hatchery chinook that stray into natural spawning areas and are counted as natural fish.

TABLE II-9. Comparison of preseason and postseason forecasts of Puget Sound run size for summer/fall chinook. Postseason estimates for 1998 are preliminary.[a/] (Page 1 of 1)

Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
	Nooksack-Samish - Hatchery and Natural			**East Sound Bay - Hatchery**			**Skagit - Hatchery**			**Skagit - Natural**		
1993	50.4	32.9	1.53	3.2	3.8	0.84	1.0	1.4	0.71	14.0	7.0	2.00
1994	46.6	28.1	1.66	3.2	0.8	4.00	1.3	4.3	0.30	8.4	6.6	1.27
1995	38.5	22.2	1.73	3.5	0.2	17.50	1.6	3.3	0.48	5.0	9.6	0.52
1996	27.0	29.4	0.92	1.7	0.7	2.43	1.0	1.2	0.83	7.1	12.2	0.58
1997	34.0	34.2	0.99	1.2	1.2	1.00	0.1	0.0	-	6.4	6.2	1.03
1998	28.5	29.5	0.97	0.5	0.3	1.67	0.0	0.1	-	6.4	14.9	0.43
	Stillaguamish - Natural			**Snohomish - Hatchery**			**Snohomish - Natural**			**Tulalip - Hatchery**		
1993	14.0	7.0	2.00	1.6	2.7	0.59	4.9	5.7	0.86	2.8	1.4	2.00
1994	8.4	6.6	1.27	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.9	1.47
1995	5.0	9.6	0.52	2.2	6.0	0.37	4.3	5.9	0.73	2.3	4.1	0.56
1996	7.1	12.2	0.58	6.7	9.2	0.73	4.2	8.0	0.53	2.7	4.0	0.68
1997	6.4	1.2	5.33	7.7	2.7	2.85	5.2	4.4	1.18	4.0	8.6	0.47
1998	1.6	1.6	1.00	6.5	1.1	5.91	5.6	6.4	0.88	2.5	7.2	0.35
	South Puget Sound - Hatchery			**South Puget Sound - Natural**			**Hood Canal - Hatchery and Natural**					
1993	61.8	36.8	1.68	26.5	19.8	1.34	11.7	4.8	2.44			
1994	52.7	46.2	1.14	18.0	29.9	0.60	11.5	3.8	3.03			
1995	49.6	74.5	0.67	21.7	34.5	0.63	3.9	9.4	0.41			
1996	51.9	57.6	0.90	19.0	35.8	0.53	9.0	8.2	1.10			
1997	65.1	46.5	1.40	18.2	20.6	0.88	2.7	7.9	0.34			
1998	67.8	54.2	1.25	21.8	27.3	0.80	6.7	16.3	0.41			
	Strait of Juan de Fuca - Hatchery			**Strait of Juan de Fuca - Natural**								
1993	0.7	0.2	3.50	3.1	2.4	1.29						
1994	3.9	1.6	2.44	1.0	0.5	2.00						
1995	3.0	0.1	30.00	0.9	2.7	0.33						
1996	2.8	0.2	14.00	0.9	3.1	0.29						
1997	2.2	0.3	7.33	0.8	3.5	0.23						
1998	0.8	1.7	0.47	1.7	1.9	0.89						

a/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries.

Evaluation of 1999 Regulations on 2000 Stock Abundance North of Cape Falcon

A detailed assessment of 2000 projected ocean fishery impacts with 1999 regulations for north of Cape Falcon chinook stocks has not been completed. The chinook model used for impact assessment in 1999 is currently being modified to include recent data on ocean fishery impacts and abundance forecasts. The updating procedure for the chinook model used for impact assessment incorporates adjustments due to variable impacts by ocean fisheries. It will not be ready for use in 2000 until the March Council meeting.

Council fisheries north of Cape Falcon have a very minor impact on most stocks that originate in Washington coastal and Puget Sound Rivers since they have northerly marine distribution patterns. The stocks that are major contributors to Council fisheries north of Cape Falcon include Columbia River fall hatchery tules, which normally account for more than half the total catch, Puget Sound summer/fall, lower Columbia River spring, and California and Oregon coastal chinook stocks.

CHAPTER III
COHO SALMON ASSESSMENTS

COLUMBIA RIVER AND OREGON COASTAL COHO (OREGON PRODUCTION INDEX AREA)

The majority of the coho harvested in the Oregon production index (OPI) area originate from stocks produced in rivers located within the OPI area (Leadbetter Point, Washington, to the U.S.-Mexico border). These stocks include hatchery and natural production from the Columbia River, Oregon coast, and northern California.

The Council adopted revised abundance estimation predictors in 1987, for use starting in 1988, which were expected to more accurately predict the abundance of individual stock components originating in the OPI area. These stock components are: (1) public hatchery (OPIH), (2) Oregon coastal natural river (OCNR), (3) Oregon coastal natural lake (OCNL), (4) private hatchery (PRIH), and (5) hatchery smolt production from the Oregon coastal Salmon Trout Enhancement Program (STEP).

A stratified random sampling (SRS) study, implemented in 1990, indicated an overestimation of annual OCN spawner escapement. Because OPI area ocean impacts are proportioned to the various OPI stocks based on ocean escapements, a reduction in OCN spawner escapement indicates that traditional OCN abundances are overestimated, while traditional abundance estimates for other OPI area stocks are underestimated. Starting in 1992, the Council adopted an abundance adjustment procedure for use in assessing fishery impacts. This procedural change, based on improved estimates of OCN spawner escapements, adjusted traditional index abundances of the various OPI area stocks. In attempting to achieve targeted exploitation rates and spawner escapement goals, the various OPI area stock abundance index predictions have been scaled in the Fishery Regulation Assessment Model (FRAM) to reflect the results of the ongoing OCN spawner study and are referred to as SRS abundances. In 1998, based on eight years of SRS abundance estimates, the historic OPI data set was rescaled to reflect the adjusted OCN abundance estimates.

Beginning in 1999, with the availability of a long term data set in SRS values, all five OPI area stock abundances were projected in SRS accounting. Direct comparisons of 2000 abundance forecasts with recent year SRS abundance projections, both preseason and postseason, are reported in Table III-1. For comparative purposes, OPI area stock abundance projections using index values for 1985-1998 are reported in Appendix B, Table B-1. To facilitate fishery modeling with the coho FRAM, abundance estimates are converted from SRS values into index values using the relationship between the two historic data sets. All fishery impacts and escapements from the coho FRAM are converted to and reported in SRS values.

Public Hatchery Coho

OPI area public hatchery coho smolt production occurs primarily in Columbia River facilities and net pens. Several facilities located in Oregon coastal rivers and in the Klamath River, California, collectively produce lesser amounts of coho as well. OPI area smolt releases are reported by geographic area since 1960 in Appendix B, Table B-2.

Predictor Description

Since 1988, the adult abundance of the OPIH index stock has been predicted using a linear multiple regression that relates OPI hatchery adults to the Columbia River, coastal Oregon, and Klamath River jack returns from the same cohort (previous year jack counts), and the proportion of Columbia River smolts from the same cohort with delayed release rearing strategy. All jack counts were adjusted for misidentified small adults (mostly Columbia River returns).

TABLE III-1. Preliminary 1992-1999 preseason and postseason coho stock SRS abundance estimates for OPI area stocks in thousands of fish.[a/]

Stock	Year	Preseason	Postseason	Preseason/Postseason
OPIH	1992	479.2	540.3	0.89
	1993	589.4	261.7	2.25
	1994	147.5	203.9	0.72
	1995	301.5	145.6	2.07
	1996	309.2	182.6	1.69
	1997	376.1	215.3	1.75
	1998	118.4	203.6	0.58
	1999	559.2	319.6	1.75
OCN	1992	77.1	90.1	0.86
	1993	82.2	98.9	0.83
	1994	49.3	45.2	1.09
	1995	60	68.5	0.88
	1996	63.2	86.1	0.73
	1997	86.4	27.8	3.11
	1998	47.2	29.2	1.62
	1999	60.7	51.9	1.17
STEP	1992	2.1	1.2	1.75
	1993	5.5	3.5	1.57
	1994	0.8	1.8	0.44
	1995	8.3	0.5	16.60
	1996	0.4	1.2	0.33
	1997	1.3	0.3	4.33
	1998	0.2	0.3	0.67
	1999	0.7	0.4	1.75

a/ Forecasts represent SRS accounting to assess fishery impacts. See text for explanation.

Specifically, the OPIH stock predictor uses the dependent variables of Columbia River jacks adjusted for small adults (Jack CR), Oregon coastal and Klamath River Basin jacks adjusted for small adults (Jack OC), and a correction term for delayed smolts released from Columbia River hatcheries (Jack CR * [SmD/SmCR]) to predict public hatchery stock abundance.

For the 2000 abundance prediction, the data base includes 1970-1999 recruits, excluding the El Niño adult impact year of 1983. It also includes 1969-1998 jack returns, excluding 1982, also due to El Niño influence. The model, with coefficients, is:

$$OPIH(t) = b*\text{Jack CR}(t-1)+c*\text{Jack OC}(t-1)+d*\text{Jack CR}(t-1)*[\text{SmD}(t-1)/\text{SmCR}(t-1)]$$

Where:

b	=	19.447560
c	=	20.504542
d	=	31.296147
adjusted r^2	=	0.96

The OPIH stock data set, and a definition of the above terms, are presented in Appendix B, Table B-3.

Predictor Performance

Recent year OPIH stock preseason abundance predictions, adjusted to SRS accounting, are compared with postseason estimates in Table III-1. The 1999 preseason abundance prediction of 559,200 OPIH coho was 175% of the preliminary postseason estimate of 319,600 coho.

Since 1983 the OPIH predictor has performed poorly, due principally to high interannual variability in the jack to adult ratios.

2000 Stock Status

Using the appropriate values from Table B-3, the OPIH abundance prediction for 1999 is 671,400. The 2000 forecast is 120% of the 1999 preseason prediction of coho and 210% of the 1999 postseason estimate (Table III-1).

Oregon Coastal Natural Coho

The OCN stock is composed of natural production from OCNR and OCNL systems, which are predicted independently.

Predictor Description

Oregon Coastal Natural Rivers

From 1988-1993, the abundance of OCNR index coho was predicted using a modified Ricker spawner-recruit model. The predictor related OCNR recruits to the parent brood stock size incorporating an adjustment for ocean survival based on OPI hatchery smolt to jack survival the previous year. Due to a tendency to overpredict abundances, the data base in the predictor was shortened from 1970-1991 to 1980-1991 starting with 1992 predictions.

Because of concern that the adopted OCNR model does not adequately incorporate environmental variability, an alternative model was used for predicting 1994 and 1995 index abundances. The model related ocean upwelling, sea surface temperatures, and year to predict OCNR index coho abundance.

For 1996-1998, the environmental based model, without the year component, was used in predicting OCNR stock abundances. In addition, the predictions were in SRS rather than traditional index accounting.

Specifically, the OCNR environment-based predictor uses annual deviation from the mean April-June Bakun upwelling index at 42° N latitude (UpAnom), and annual deviation from the mean January sea surface temperature at Charleston, Oregon (JanAnom), to predict OCNR abundance.

For 1999 and 2000, the environmental based model with the year component, was used for predicting OCNR stock abundances. The 1999 OCNR abundance prediction data base includes 1971-1999 recruits, 1970-1999 upwelling, and 1971-2000 sea surface temperatures. The model, with coefficients, is:

$$\ln(\text{Recruits}(t)) = a+b*\text{UpAnom}(t-1)+c*\text{JanAnom}(t)+d*\text{Year}(t)$$

Where:

a	=	143.85875
b	=	0.001323
c	=	-0.143231
d	=	-0.070137
adjusted r^2	=	0.77

The OCNR stock data set, and a definition of the above terms, are presented in Appendix B, Table B-4.

Oregon Coastal Natural Lakes

Since 1988, the abundance of OCNL index coho has been predicted using the most recent three-year average adult stock abundance. OCNL coho production occurs from three lake systems (Ten Mile, Siltcoos, and Tahkenitch lake systems). Production from these systems has declined substantially from the levels observed during 1950-1980 but has been relatively stable.

Predictor Performance

Recent-year OCN stock preseason SRS abundance predictions are compared to postseason estimates in Table III-1. The 1999 preseason abundance prediction of 60,700 OCN coho was 117% of the preliminary postseason estimate of 51,900 coho.

2000 Stock Status

The 2000 preseason prediction for OCN (river and lake systems combined) is 55,900 coho, 92% of the 1999 preseason prediction of 60,700 coho and 108% of the 1999 postseason estimate (Table III-1). The 2000 preseason SRS prediction for OCNR and OCNL components are 43,900 and 12,000 coho, respectively.

Private Hatchery Coho

There have not been any Oregon coastal PRIH coho smolt releases since 1990. Thus, there was no recruitment for 1992-2000 of the PRIH coho stock.

Salmon Trout Enhancement Hatchery Coho Smolt Program

Predictor Description

Since 1988, preseason abundance predictions for Oregon coastal STEP index coho smolt production facilities have been based on the Council-approved procedure. This procedure evaluates: (1) smolt releases by facility, (2) smolt to adult survival based on the previous year's survival by facility, and (3) survival adjustments based on changes in OPI smolt to jack survival the previous year.

Predictor Performance

Recent-year STEP preseason abundance predictions are compared to postseason estimates in Table III-1. The 1999 preseason abundance prediction of 700 coho was 175% of the preliminary postseason estimate of 400 coho.

2000 Stock Status

The 2000 preseason STEP index abundance prediction is 600 coho, which equates to 600 coho. The 2000 prediction is similar to the 1999 preseason prediction of 700 coho (Table III-1).

Oregon Production Index Area Summary of 2000 Stock Status

The 2000 combined OPI area stock abundance is predicted to be 727,900 coho, which is 117% of the 1999 preseason prediction of 620,600 coho and 196% of the 1999 postseason estimate of 371,900 coho. The 2000 OPI area predictions can be compared to historical abundances in Table III-2 and Figure III-1.

WASHINGTON COASTAL AND PUGET SOUND COHO STOCKS

Predictor Description and Past Performance

A variety of preseason abundance estimators currently are employed for Washington coastal and Puget Sound coho stocks (Table I-2).

In previous years, initial estimates of abundance for some Puget Sound and Washington coastal stocks, prepared by state and tribal staffs for use by the STT in Council preseason planning, represented terminal run sizes assuming an average ocean or preterminal area fishery impact rate. Forecasts of ocean escapement for each stock were adjusted according to the approximate level of harvest expected in Council and other fisheries (e.g., West Coast Vancouver Island [WCVI] troll) and average stock distribution patterns by time and area. These adjustments were made with the use of the FRAM, a stock-fishery impact assessment model which has been employed by the STT and other management entities in planning since 1980. This year is the second year the run predictions were provided in terms of ocean recruits. This eliminates the need to expand the runs from a terminal run to an estimate of ocean abundance.

For the 1999 season, allowable ocean fishery impacts in the area north of Cape Falcon were determined by the depressed status of Oregon and Washington coastal natural coho stocks and also Columbia River hatchery stocks. A comparison of expected preseason and postseason abundance estimates for these stocks in recent years is presented in Tables III-3 and III-4. Postseason estimates of 1999 stock abundances for some of these stocks are not available at this time.

The comparison of preseason and postseason estimates of returns to terminal areas reflects annual errors in abundance estimates, deviations in ocean fisheries from preseason expectations, and variations in ocean distributions of stocks as described in the introduction. Fishery impact levels anticipated preseason may be quite different than those which actually occur. Postseason reconstructions of total fishery impacts and abundance estimates have not been completed for the 1999 season.

2000 Stock Status

Willapa Bay

This year (2000) is the first year hatchery and wild coho forecasts are estimated independently. The 2000 Willapa Bay hatchery total ocean coho stock abundance forecast is 19,634 adults, approximately 50% of the 1999 preseason forecast. The prediction is based upon the recent three year mean per release without adjustment based on jack abundance. The estimate of natural coho for 2000 is 9,900 adults. This prediction is based on assumed smolt production estimate (170,000) and an estimated marine survival (6%).

TABLE III-2. Oregon production index (OPI) coho harvest , spawning and abundance estimates by SRS accounting in thousands of fish.[a/] (Page 1 of 1)

	Ocean Fisheries[b/]		Oregon and California Coastal Returns						
Year	Troll	Sport	Hatcheries and Freshwater Harvest[c/]	OCN Spawners[d/]	Private Hatcheries	Columbia River Returns	Abundance	Ocean Exploitation Rate (%) Based on OPI Abundance[e/]	OCN Exploitation Rate (%) Based on Postseason FRAM
1970	1,463.7	499.0	80.3	71.7	-	895.3	3,010.0	65	-
1971	2,543.5	715.8	53.8	94.8	-	544.5	3,952.4	83	-
1972	1,275.6	560.3	29.9	34.1	-	277.8	2,177.7	84	-
1973	1,320.3	443.2	42.2	55.4	-	291.3	2,152.4	82	-
1974	2,095.1	668.6	49.5	34.5	-	460.8	3,308.5	84	-
1975	1,079.2	463.7	19.2	40.4	-	292.5	1,895.0	81	-
1976	2,936.1	977.7	62.6	40.7	-	337.0	4,354.1	90	-
1977	664.4	412.1	21.4	19.5	4.2	93.8	1,202.7	89	-
1978	1,104.2	524.6	12.6	19.8	12.3	307.1	1,946.1	83	-
1979	1,056.6	334.4	27.4	45.0	49.2	275.1	1,697.6	79	-
1980	506.9	526.4	32.1	30.3	38.7	301.6	1,350.9	73	-
1981	830.9	339.9	34.1	32.6	117.8	170.3	1,255.8	81	-
1982	740.9	300.4	37.1	76.2	184.7	453.1	1,474.2	62	-
1983	429.6	275.0	18.2	22.7	133.9	100.5	710.8	79	-
1984	95.8	174.2	51.2	74.4	115.4	414.2	808.1	32	-
1985	166.4	280.4	45.4	73.9	332.0	366.2	856.3	43	-
1986	643.5	320.6	81.8	70.0	453.7	1,527.8	2,556.0	34	-
1987	469.1	296.2	45.3	30.1	119.3	307.6	962.2	60	-
1988	844.7	297.2	62.4	56.8	116.1	664.8	1,807.9	57	-
1989	646.9	425.5	62.3	46.4	46.9	701.6	1,839.9	55	-
1990	277.6	357.1	30.6	20.9	35.6	196.1	917.9	69	-
1991	450.6	469.9	84.0	36.4	35.1	934.3	2,010.2	45	-
1992	67.5	256.5	52.6	39.3	-	210.9	627.2	51	-
1993	13.2	140.8	41.5	54.5	-	113.9	363.8	42	-
1994	2.7	3.0	31.8	43.7	-	168.9	251.1	2	7
1995	5.4	43.5	39.3	52.4	-	74.0	214.6	23	12
1996	7.0	31.8	49.6	73.0	-	111.3	278.0	14	8
1997	5.5	22.4	26.3	22.7	-	145.9	222.8	12	12
1998	3.5	11.5	27.3	30.9	-	159.4	232.6	6	8
1999[f/]	3.6	42.0	19.5	46.9	-	259.9	371.9	12	NA

a/ The OPI includes ocean and inside harvest impacts and escapement to streams and lakes south of Leadbetter Point, Washington.

b/ Includes estimated nonretention mortality: troll fishery--hook-and-release mortality for 1982-1999 and drop-off mortality for all years; sport fishery--hook and release mortality for 1994-1999 and drop-off mortality for all years.

c/ Includes returns from STEP smolt releases.

d/ Spawners returning to rivers have historically been estimated by a nonrandom standard index. Beginning in 1990, returns have also been estimated with a stratified random sampling (SRS) method. The SRS method indicates that actual total natural spawners are less than those projected by the standard index.

e/ Ocean fishery impacts on private hatchery stock and returns to private hatcheries are excluded in calculating the OPI area stock aggregate ocean exploitation rate index. Because of uncertainties in estimates of OCN coho spawners, the Oregon production exploitation rate index does not represent a true exploitation rate on OPI coho.

f/ Preliminary.

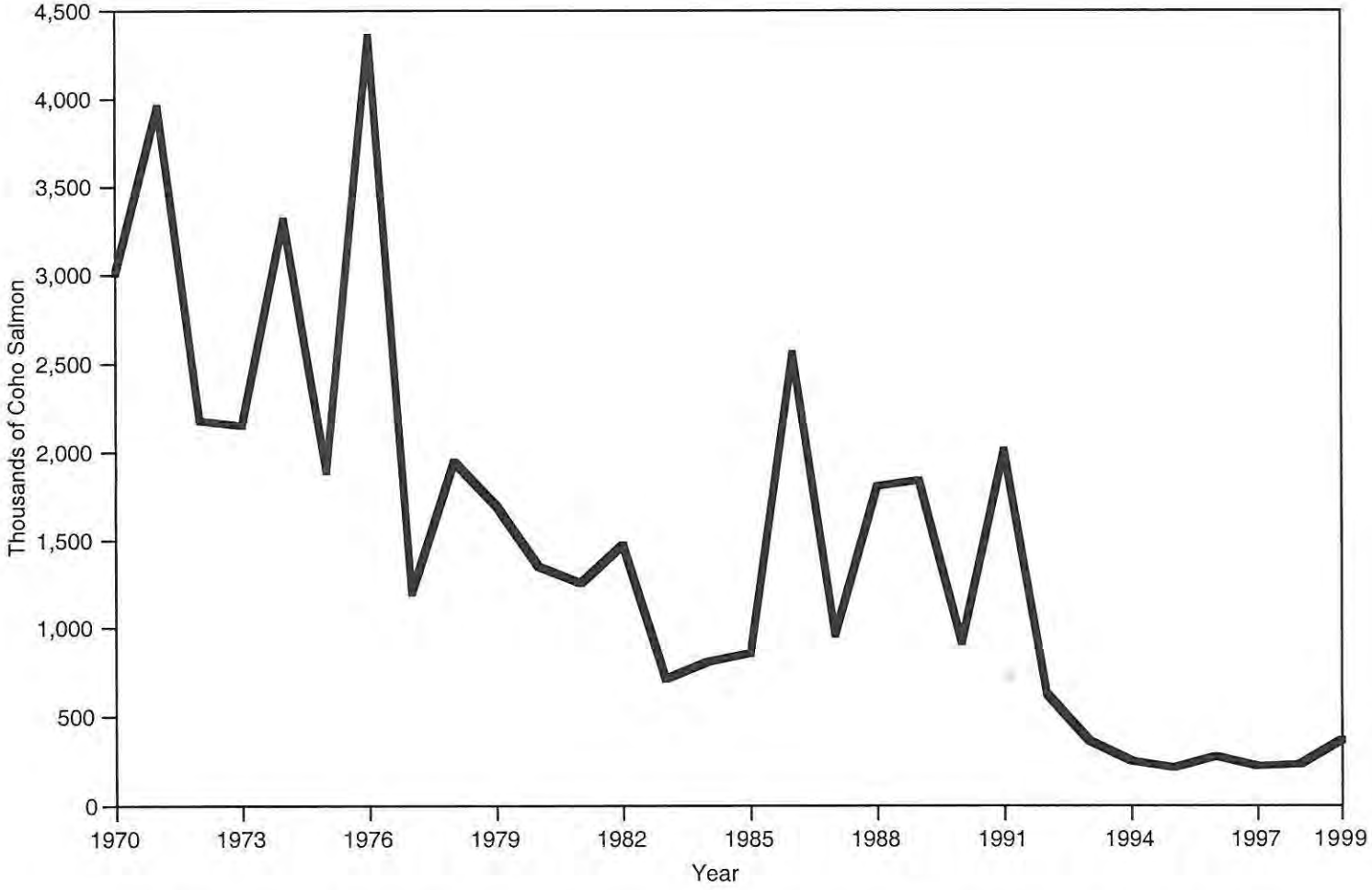

FIGURE III-1. Oregon production area coho salmon abundance estimates by SRS accounting methods, 1970-1999.

TABLE III-3. Preseason and postseason ocean escapements for selected **Washington coastal** adult natural coho stocks in thousands of fish. The 1999 postseason estimates are preliminary. (Page 1 of 1)

Year	Hoh River Fall			Queets River Fall			Grays Harbor[a/]		
	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	2.7	7.7	0.35	5.2	9.7	0.54	28.7	103.8	NA
1985	6.6	5.2	1.27	11.3	6.0	1.88	56.4	25.1	NA
1986	3.9	6.4	0.61	5.2	5.8	0.90	51.6	33.3	NA
1987	5.5	7.2	0.76	9.0	8.9	1.01	103.3	55.7	NA
1988	2.0	2.6	0.77	4.7	4.5	1.04	26.4	56.7	0.47
1989	5.7	5.4	1.06	6.2	5.5	1.13	43.0	60.9	0.71
1990	5.1	4.5	1.13	5.9	6.9	0.86	48.3	67.5	0.72
1991	3.4	5.4	0.63	7.9	8.6	0.92	138.0	118.4	1.17
1992	4.9	5.0	0.98	5.6	7.0	0.80	48.4	44.7	1.08
1993	4.8	1.9	2.53	6.5	5.4	1.20	84.7	40.2	2.11
1994	3.0	1.4	2.14	3.6	1.2	3.00	31.3	15.5	2.02
1995	4.4	5.4	0.81	7.2	7.3	0.99	64.4	69.5	0.93
1996	3.0	5.8	0.52	5.4	8.3	0.65	82.7	101.0	0.82
1997	1.6	1.4	1.14	2.4	2.0	1.20	14.8	25.4	0.58
1998	3.2	6.2	0.52	4.5	6.5	0.69	27.1	33.6	0.81
1999	2.8	6.6	0.42	3.7	3.8	0.97	50.3	NA	NA

a/ The source of the postseason return estimates is Washington Department of Fish and Wildlife.

TABLE III-4. Preseason and postseason ocean escapements for selected **Puget Sound** adult natural coho stocks in thousands of fish. The 1999 postseason estimates are preliminary. (Page 1 of 1)

	Skagit River			Stillaguamish River			Hood Canal			Quillayute River Fall		
Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	29.6	37.2	0.80	NA	26.9	NA	NA	57.5	NA	7.0	10.9	0.64
1985	26.1	31.3	0.83	NA	34.4	NA	NA	38.5	NA	19.2	15.7	1.22
1986	43.5	73.4	0.59	37.0	49.9	0.74	NA	82.2	NA	6.1	17.0	0.36
1987	33.0	41.2	0.80	29.7	46.3	0.64	NA	71.7	NA	11.7	23.8	0.49
1988	29.6	29.9	0.99	24.5	35.4	0.69	18.2	15.5	1.17	10.4	9.1	1.14
1989	31.2	27.6	1.13	24.5	13.5	1.81	36.8	25.5	1.44	14.5	11.2	1.29
1990	37.6	26.3	1.43	30.8	34.1	0.90	43.9	14.2	3.09	15.2	9.5	1.60
1991	40.8	11.8	3.46	32.9	11.3	2.91	17.6	15.3	1.15	8.8	10.9	0.81
1992	35.7	9.5	3.76	18.7	18.0	1.04	10.1	19.9	0.51	12.5	13.5	0.93
1993	28.1	14.5	1.94	24.5	10.6	2.31	39.5	16.7	2.37	7.6	4.7	1.62
1994	17.9	30.5	0.59	10.2	30.3	0.34	13.5	57.1	0.24	7.0	6.4	1.09
1995	30.0	16.2	1.85	32.7	20.4	1.60	19.3	41.1	0.47	8.5	14.2	0.60
1996	26.7	8.7	3.07	29.8	10.1	2.95	15.4	37.3	0.41	9.2	18.7	0.49
1997	34.2	40.1	0.85	15.7	12.9	1.22	38.1	100.4	0.38	5.1	4.9	1.04
1998	41.1	83.2	0.49	37.7	NA	NA	87.3	117.9	0.74	7.4	15.5	0.48
1999	53.4	NA	NA	27.3	NA	NA	45.2	NA	NA	12.8	NA	NA

Grays Harbor

Preseason predictions of abundance are made for natural fish throughout the system and for hatchery fish returning to three freshwater rearing complexes and two saltwater net pen sites. The estimate of Grays Harbor natural stock abundance for 2000 is 47,800 ocean recruits. The estimate of hatchery stock ocean abundance is 75,800 adults.

The hatchery forecast was derived by multiplying smolt releases by the 1991-1998 average survival rate. The staffs of the Washington Department of Fish and Wildlife (WDFW) and the Quinault Indian Nation (QIN) have reached agreement on 2000 forecasts for wild coho returning to Grays Harbor. The agreed forecast represents the mean of QIN and WDFW estimates of terminal returns per spawner expanded to December age-2 fish for modeling purposes.

Quinault River

The forecast for the Quinault natural coho ocean run size is 4,400 fish, a reduction of 39% from the 1999 projected level. This estimate represents the 1997 brood year escapement (3,200) multiplied by the 1992-1995 brood year average ocean recruits per spawner, adjusted by a factor reflecting anticipated reduced survival (0.529).

The Quinault hatchery coho ocean run size forecast is 7,400 fish, a decrease of 9% compared to the 1999 forecast level. The forecast is derived from the mean 1992-1995 brood year observed marine survival rates (0.0136) and 1997 brood year smolt releases (548,600).

Queets River

The Queets natural coho ocean run size is forecast at 2,700 fish, a decrease of 38% from the 1999 forecast level. This forecast represents the estimated smolt production from natural spawning (73,600) multiplied by the 1992-1995 brood year average observed ocean survival rate (0.0319 for tagged fish, 0.0380 for untagged fish).

Forecast ocean abundance of supplemental production from smolt releases is 800 fish, a 74% decrease from the 1999 forecast. This forecast is based on releases (55,400) multiplied by the 1992-1995 brood year average observed marine survival rate.

The Queets hatchery coho ocean run size forecast is 11,000 fish, a slight increase compared to the 1999 forecast level. This forecast is based on the smolt release of 679,000 multiplied by the 1992-1995 brood year average observed marine survival rate (0.0161).

Hoh River

The Hoh River natural coho ocean run size is forecast at 3,500 fish, an increase of 9% compared to the 1999 forecast. This forecast is based on estimated smolt production per spawner (based on Queets) and the average of recent year ocean survival rates for the Bingham Creek and Queets wild coho.

No hatchery production is projected for the Hoh system for 1999.

Quillayute River

The Quillayute River summer natural and hatchery coho ocean recruits are forecast at 1,600 and 5,400 fish, respectively. The natural component run size is based on average ocean recruits per spawner and brood year escapements. The hatchery component run forecast is based on average ocean recruits per release multiplied by the number of smolts released. The 2000 forecast abundance of natural summer coho is 33% above the 1999 forecast while the hatchery forecast is 54% above the 1999 forecast level.

The Quillayute River fall natural and hatchery coho ocean run sizes are forecast at 8,700 and 13,900 fish, respectively. The forecast of the natural component run size is based on the average recruits per spawner, multiplied by the 1997 spawning escapement. The hatchery production forecast is based on average ocean recruits per release multiplied by the number of smolts released. The 2000 forecast abundance of natural and hatchery components are 40% below and 54% above the 1999 forecast levels.

Puget Sound

The expectation for total abundance of natural and hatchery Puget Sound coho stocks combined is 50% to 54% below the 1999 preseason forecast level. Abundance of natural stocks is expected to be 39% to 51% below 1999 forecast levels, while the abundance of hatchery stocks is expected to be 55% below the 1999 preseason forecast.

A variety of methods were used for the 2000 Puget Sound coho forecast. For all hatchery predictions a new cohort (landed catch plus escapement) database for return years 1986-1991 was used to estimate historic survival rates. The average survival for these years times the smolts released yielded the predicted December age-two cohort size. Because these years did not reflect the poor survivals observed in more recent years, an adjustment to the predictions were made, lowering the estimates. The survival rate for 1986-1991 was scaled by the ratio of the Puget Sound average December age-two recruit survival from 1996-1999 (2.5%) to the 1986-1991 average (10.05%). The exceptions are the deep South Sound facilities (Minter, Nisqually, South Sound pens), which were scaled by 20% of the ratio of the 1999 average (1.8%) to the 1986-1991 average. This reduction served to bring the forecasted 2000 marine survival rates into the same region as the estimated 1999 marine survival rates (0.5% or less). The Strait of Juan de Fuca facilities (Elwha and Dungeness) use the mid point of the hatchery survival rates for Hood Canal and Quillayute.

Generally, the forecasts for wild stocks were the estimated number of wild smolts multiplied by recent average marine survival rates. The forecasts for south Puget Sound were derived as described in the following paragraphs.

Due to extreme low survival of Deschutes coho, rates were selected which declined (from north to south): 3% for the Lake Washington, Green River and East Kitsap production areas; 2% for the Puyallup and Nisqually Rivers and South Puget Sound; and 1% for the Deschutes River. For the Stillaguamish and Snohomish Rivers, a rate of 6% was selected, lower than the average of the last two brood years (1995-1996) estimated at Sunset Falls (7.2%). The STT was presented with two different forecasts for Hood Canal coho. The WDFW forecast is as follows:

b*c*d = 34,300 ocean recruits (45,600 *December age 2 fish*)
where:

- a = an estimate of smolt production obtained from trapping studies on four tributaries to Hood Canal (25,220);
- b = a ratio between "a" and the production potential of the same tributaries as derived from 1977 WDF Technical Report 28 (42.6%);
- c = an estimate of the total smolt production potential from Hood Canal from 1977 WDF Technical Report 28 (1,006,577); and
- d = an assumed ocean survival of 8%.

The Point No Point Treaty Council forecast is 105,800 December Age 2 fish. This forecast is derived by multiplying the 1990 and 1992 through 1995 brood year average ratio between the December age-2 run size, as estimated from a terminal run reconstruction program (5.046), and the smolt production estimate from Big Beef Creek (20,967). The STT has not examined the relative merits of either forecast in depth in deference to allowing discussions between state and tribal co-managers to continue. The STT has made two model runs, one with each forecast, to provide an indication of the potential significance of the difference between the two forecasts.

For the rivers entering the Strait of Juan de Fuca, the coastal marine survival rate of 6% was applied to the smolt estimate producing a December age-2 forecast of 18,000. For the north Sound systems (Nooksack

through the Skagit River) a rate of 8% was selected, down from the average marine survival rate (11.8%) for the four odd-numbered brood years measured thus far at the Baker River. The Skagit forecast is adjusted to account for underestimates of escapements during the base years of 1979-1981.

Detailed descriptions of these methodologies are available in the 2000 Puget Sound Coho Salmon Forecast Methodology report available through WDFW and the Northwest Indian Fisheries Commission.

SELECTIVE FISHERY CONSIDERATIONS

As the region has moved forward with mass marking of hatchery coho salmon stocks, selective fishing options are an important consideration for fishery managers. Table III-5 summarizes estimates of mass mark rates for coho stocks from Southern British Columbia to the Oregon coast, based on preseason abundance forecasts. Agencies have released coho mass marked with adipose clips from the 1997 brood, making these fish available to 2000 fisheries.

EVALUATION OF 1999 REGULATIONS ON 2000 STOCK ABUNDANCE

Oregon Production Index Area

Ocean fisheries were modeled based on 1999 regulations, an expected WCVI coho mortality of 50,000 fish, and 2000 preseason abundance predictions. Under this scenario, the expected exploitation rate on OCN coho is 9.1%. The expected OCN spawner escapement is 48,400 adults. Escapements and fishery impacts for OCN and Rogue/Klamath coho were estimated using the FRAM (Tables III-6 and III-7).

Based on parent escapement levels and observed OPI smolt-to-jack survival for 1997 brood OPI smolts, the total allowable OCN coho exploitation rate for 2000 fisheries is no greater than 15% under Amendment 13 (see Appendix A, Tables A-2 and A-3).

Ocean escapements into the Columbia River in 2000 would be sufficient to provide for treaty Indian obligations, inside non-Indian fisheries, and meet hatchery requirements under 1999 ocean fishing regulations.

North of the Oregon Production Index Area

Ocean escapement expectations for selected naturally-spawning coho stocks, given 2000 preseason abundance forecasts and preseason projections for 1999 fishing patterns, are presented in Table III-6. The expected escapements assume projections for 1999 catch levels, season structure, and regulations for all Council area ocean fisheries, U.S. inside water fisheries (e.g., Puget Sound), and Canadian fisheries (e.g., WCVI troll). Escapements and fishery impacts were estimated using FRAM, the fishery impact model used by the STT for the 1999 preseason assessment, updated with 2000 abundance forecasts. More detailed fishery management goals for Council area coho stocks are listed in Appendix A, Table A-1.

Ocean escapements for most natural coho stocks north of the OPI index area would be expected to be below their spawning escapement goals under 1999 regulations. Impacts of inside fisheries would ultimately determine levels of anticipated spawning escapements. For 2000, fisheries directed at pink salmon would be expected to impact Puget Sound coho stocks to a lesser degree than fishing patterns for 1999.

Ocean escapement expectations for 2000 vary substantially by stock compared to 1999 with Puget Sound stocks showing a considerable difference. The biggest variation among the North coastal stocks is shown by the Queets.

TABLE III-5. Mass marking of 1997 brood coho available to 2000 Council fisheries. All stocks were marked with an adipose fin clip. (Page 1 of 1)

Region	Ocean Recruits		Percent Mass Marked
	Wild	Hatchery	
PUGET SOUND STOCKS:			
Nooksack-Samish & 7/7A Independent	14.9	65.5	11.3%
Skagit	30.2	10.3	21.4%
Stillaguamish	17.7	0	0.0%
Snohomish	53.0	62.1	21.8%
South Puget Sound Normal	11.7	101.2	76.2%
South Puget Sound Delayed	0	20.6	92.3%
Hood Canal: WDFW Estimate	34.3	38.5	44.5%
Pt. No Pt. Estimate	79.4	53.2	33.6%
Strait of Juan de Fuca & Area 9	13.5	13.7	35.6%
Puget Sound Total: WDFW Estimate	175.3	311.9	48.1%
Pt. No Pt. Estimate	220.4	326.6	42.9%
WASHINGTON COASTAL STOCKS:			
Makah	0	11.7	26.2%
North Coast Independent Tributaries	5.0	0	0.0%
Quillayute Summer	1.6	5.4	73.3%
Quillayute Fall	8.7	13.9	52.6%
Hoh	3.5	0	0.0%
Queets	2.7	11.7	13.6%
Quinault	4.4	7.4	9.2%
Grays Harbor	35.8	56.9	57.9%
Willapa Bay	9.9	19.6	61.3%
Washington Coastal Total	71.6	126.6	47.9%
COLUMBIA RIVER STOCKS:			
Columbia River Early	0	326.3	89.6%
Columbia River Late	0	278.0	98.5%
Columbia River Total	0	604.3	93.7%
OREGON COASTAL	55.9	67.7	48.8%
SOUTHERN BRITISH COLUMBIA STOCKS:[a/]			
West Coast Vancouver Island	183.8	17.4	7.2%
Southeast Vancouver Island	13.5	23.8	12.0%
Quinsam	158.0	28.0	8.8%
Puntledge	23.6	9.7	22.3%
Big Qualicum	29.9	29.2	47.1%
Capilano	2.7	15.8	85.4%
Fraser	67.7	117.8	54.4%
Southern British Columbia Total	479.2	241.7	26.0%

a/ For this assessment, we used 1999 abundances adjusted for known 2000 mark rates. Estimates of 2000 run sizes will be available the first week in March.

TABLE III-6. Estimated year 2000 ocean escapements for critical natural and Columbia River hatchery coho stocks based on preliminary 2000 preseason abundance forecasts and 1999 Council regulations compared to predicted 1999 preseason escapements.[a/] (Page 1 of 1)

Stock	Ocean Escapement Estimates Under 1999 Regulations[b/]			
	2000 Preseason Abundance		1999 Preseason Abundance[c/]	2000 Spawning Escapement Goal[d/]
	COHO (thousands)			
	WDFW[e/]	Pt. No Pt.		
Natural Coho Stocks				
Skagit	18.2	18.5	53.4	30.0
Stillaguamish	12.6	12.8	27.3	17.0
Snohomish	37.8	38.3	108.1	70.0
Hood Canal	22.3	52.9	45.2	21.5
Strait of Juan de Fuca	9.5	9.6	8.8	12.8
Quillayute Fall	7.4	7.5	12.8	6.3-15.8
Hoh	3.0	3.0	2.8	2.0-5.0
Queets	2.2	2.3	3.7	5.8-14.5
Grays Harbor	40.6	40.8	50.3	35.4
OCN	48.9 (9.1%)	49.0 (9.0%)	52.8 (8.7%)	≤15%[f/]
Hatchery Stocks				
Columbia Early	215.0	215.7	200.3	22.5
Columbia Late	166.0	167.1	78.1	16.3

a/ Quota levels include harvest and hooking mortality estimates used in planning the Council's 1999 ocean fisheries and a coho catch for the Canadian troll fishery off the West Coast of Vancouver Island (WCVI).

b/ Ocean escapement is generally the estimated number of coho escaping ocean fisheries and entering freshwater. For Puget Sound stocks, ocean escapement is the estimated number of coho entering Area 4B which are available for U.S. net fisheries in Puget Sound and spawning escapement after impacts associated with the Canadian and Puget Sound troll and recreational fisheries have been deducted. For the OCN coho stock, this value represents the estimated spawner escapement in SRS accounting. For Columbia River hatchery stocks, ocean escapement represents the number of coho after the Buoy 10 fishery.

c/ Based on a Canadian catch of 50,000 coho off of WCVI.

d/ Spawning escapement goals are not directly comparable to ocean escapement, because inside fishery harvest is not considered.

e/ Differing ocean escapement estimates result from differing WDFW and Point No Point Treaty Council projections for Hood Canal coho.

f/ From 1994-1997 the long-term goal (under Amendment 11) was 42 adults per mile on standard index surveys. Beginning in 1998, the goal was modified by the Endangered Species Act requirements and follows Amendment 13. For 2000, the conservation objective is to allow a combined freshwater and marine harvest exploitation rate no greater than 15%, based on low parent escapement and medium marine survival.

TABLE III-7. Comparison of Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho harvest mortality and exploitation rates by fishery under Council-adopted 1999 regulations and preliminary 2000 preseason abundance (based on WDFW estimates for Hood Canal coho). (Page 1 of 1)

	Harvest Mortality and Exploitation Rate			
	OCN		RK	
Fishery	Number	Percent	Number	Percent
SOUTHEAST ALASKA	16	0.03	0	0.00
BRITISH COLUMBIA	137	0.26	0	0.00
PUGET SOUND/STRAITS	347	0.66	0	0.00
NORTH OF CAPE FALCON				
Treaty Indian Troll	249	0.47	0	0.00
Recreational	336	0.64	9	0.05
Non-Indian Troll	354	0.67	0	0.00
SOUTH OF CAPE FALCON				
Recreational:				
Cape Falcon to Humbug Mt.	370	0.70	13	0.07
Humbug Mt. to Horse Mt. (KMZ)	440	0.83	512	2.87
Fort Bragg	253	0.48	238	1.34
South of Pt. Arena	514	0.97	94	0.53
Troll:				
Cape Falcon to Humbug Mt.	768	1.46	14	0.08
Humbug Mt. to Horse Mt. (KMZ)	91	0.17	108	0.61
Fort Bragg	8	0.02	16	0.09
South of Pt. Arena	345	0.65	59	0.33
BUOY 10	65	0.12	15	0.08
ESTUARY/FRESHWATER	489	0.93	---	---
TOTAL	4,782	9.06	1,078	6.05

CHAPTER IV
FRASER RIVER AND PUGET SOUND PINK SALMON ASSESSMENTS

Two major stocks comprise the pink salmon population available to Council ocean fisheries during odd-numbered years. Table IV-1 provides a summary of recent run sizes.

The more abundant of the two runs originates from the Fraser River in British Columbia. Average run size for the period 1977-1999 (odd numbered years only) is approximately 13.2 million, ranging from 3.6 million in 1999 to 19 million in 1985. Fraser River pink salmon forecasts have been based on the relationship of fry index values and sea surface salinity at the time of juvenile emigration.

The ocean abundance of Puget Sound pink salmon stocks has averaged 2.3 million during the period 1977-1997 (odd numbered years only), ranging from 0.5 million in 1981 to 3.7 million in 1989. Forecasts of abundance are based on cyclic relationships of adult production and parent spawner abundance.

Fraser River and Puget Sound pink runs occur in significant numbers only in odd-numbered years.

TABLE IV-1. Actual run sizes (odd numbered years 1977-1999) for Fraser River and Puget Sound pink salmon in millions of salmon.

Year	Puget Sound[a/]	Fraser River[b/]
1977	0.86	8.21
1979	1.31	14.40
1981	0.48	18.68
1983	1.00	15.35
1985	3.01	19.04
1987	2.59	7.17
1989	3.70	16.67
1991	2.28	16.67
1993[c/]	2.75	17.43
1995[d/]	3.43	12.50
1997[d/]	4.41	8.20
1999	NA	3.56

a/ For 1977-1983, the number in this column represents the Puget Sound run size after Canadian and U.S. ocean fisheries. Numbers after 1983 represent total Puget Sound run size.

b/ Total run size.

c/ Preliminary estimate. Area 4B run size adjusted for an average 1989-1991 interception rate of 24.6 percent.

d/ Preliminary estimate. Likely to be adjusted when GSI bias-correction methodologies are finalized.

60th Galaxy Gold side 1

APPENDIX A
SUMMARY OF COUNCIL STOCK MANAGEMENT GOALS

LIST OF TABLES

60#
Galaxy Gold
Seed 2

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
CALIFORNIA CENTRAL VALLEY - All fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin Rivers and their tributaries. Management of this stock complex is based primarily on Sacramento River fall chinook, which includes a large hatchery component, and natural Sacramento River winter chinook which are listed as endangered. The San Joaquin system has been severely degraded by water development projects and pollution. Natural populations of spring chinook there have been extirpated and remaining spawning areas are utilized primarily by fall chinook which have comprised <10% of the total Central Valley fall run.			
Sacramento River Fall	122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).	Yes.	High abundance, large hatchery component. Single largest contributor to ocean fisheries off California, a significant contributor off southern and central Oregon, and present north into British Columbia. Primary impact south of Pt. Arena; considerable overlap with coastal and Klamath River fall chinook between Pt. Arena and Horse Mt.
Sacramento River Spring Threatened	NMFS jeopardy standard/recovery plan (not established at time of printing). No defined objective for ocean management prior to listing.	Indirectly. MSY criteria undefined. Assessment of ocean distribution and fishery impacts needed for ESA determination and to aid management. Present level of ocean fishery impacts limited by measures constraining harvest on Sacramento River winter and Klamath River fall chinook.	Severely depressed. Minor contributor to ocean fisheries off California, also known to occur off Oregon. Ocean fishery impacts primarily incidental to harvest of Sacramento River fall chinook and may be lower due to differences in run timing. MSY undefined but substantially reduced from historic levels by man-caused loss and deterioration of freshwater habitat.
Sacramento River Winter Endangered (1994)	NMFS jeopardy standard/recovery plan. Since 1996, an annual preseason objective of a 31% increase in the adult spawner replacement rate (equivalent to a 1.77 replacement rate) relative to the observed 1989-1993 mean rate of 1.35. Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim rebuilding program.	Depressed and listed, recent increase. Minor contributor to ocean fisheries south of Pt. Arena. Ocean fishery impacts incidental to harvest of Sacramento River fall chinook. Primary impact south of Pt. Arena.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 2 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
NORTHERN CALIFORNIA COAST - All fall and spring stocks of California streams north of the entrance to San Francisco Bay. Management of this stock complex is based primarily on meeting spawning escapements for natural fall chinook. Limited data is available except for the Klamath River. An assessment and monitoring program is under consideration by CDFG for stocks originating from the Smith, Eel, Mattole and Mad Rivers which might provide a more thorough management basis for the future. Significant water diversion problems in several drainages. In the Klamath River Basin, there is significant hatchery production of fall chinook and less so of spring chinook, resulting primarily from mitigation programs for dams constructed in both Upper Klamath and Trinity Rivers.			
Eel, Mattole, Mad, and Smith Rivers (Fall and Spring) Eel, Mattole and Mad River stocks - Threatened (1999)	Undefined. Indices of spawning abundance limited to one tributary of the Mad River and two tributaries of the Eel River. NMFS jeopardy standard/recovery plan for Eel, Mattole, and Mad River stocks not established at time of printing.	Indirectly. Data insufficient to define MSY criteria. CDFG developing an assessment and monitoring program. Conservation achieved by objective for Klamath River fall chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.	Depressed. Limited management data. Believed to occur in ocean fisheries off northern California and southern Oregon. Ocean fishery impacts incidental to fisheries for Sacramento and Klamath Rivers fall chinook. No preseason or postseason abundance estimates available.
Klamath River Fall (Klamath and Trinity Rivers)	33-34% of potential adult natural spawners, but no fewer than 35,000 naturally spawning adults in any one year. Brood escapement rate must average 33-34% over the long-term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Objective designed to allow a wide range of spawner escapements from which to develop an MSY objective or proxy while protecting the stock during prolonged periods of reduced productivity. Adopted 1988 based on Hubbell and Boydstun (1985); KRTT (1986); PFMC (1988); minor technical modifications in 1989 and 1996 (Table I-1). Natural spawners to maximize recruitment are estimated at 41,000 to 106,000 adults (Hubbell and Boydstun 1985).	Yes. A conservation alert or overfishing concern will be based on a failure to meet the 35,000 floor.	Abundance variable from high to depressed. Major contributor to ocean fisheries from Humbug Mt., OR to Horse Mt., CA (the KMZ) and to Klamath River tribal and recreational fisheries. Significant contributor to ocean fisheries from central Oregon to central California. Coastwide impacts are considered in meeting allocation requirements for Indian tribes with federally recognized fishing rights and the inland fishery. Specific management measures for this stock generally are implemented from Pigeon Pt., California to Florence, Oregon.
Klamath River Spring (Klamath and Trinity Rivers)	Undefined.	Indirectly. MSY criteria undefined. Productive potential protected by the objective for Klamath River fall chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.	Depressed. Believed to occur in ocean fisheries off northern California and southern Oregon (based on Trinity River Hatchery fish). Impacts incidental to ocean fisheries for Sacramento and Klamath Rivers fall chinook.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 3 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- CHINOOK ---	
OREGON COAST - All fall and spring stocks from Oregon streams south of the Columbia River. No preseason abundance estimates available. Management based primarily on an aggregate objective of 150,000 to 200,000 natural adult spawners (attainment of objective based on a postseason estimate of 60-90 natural adult spawners per mile in nine standard index streams). This objective is based on optimal escapement estimates for individual coastal rivers at habitat capacity (Thompson 1977). Lower end of the objective range is nearly twice the estimated MSY spawning escapement of 79,000 fall chinook adults based on stock recruit analysis (McGie 1982). Significant hatchery production also exists within the coastal streams.			
Southern Oregon (Aggregate of fall and spring stocks in all streams south of Elk River; Rogue River fall stock is used to indicate relative abundance and ocean contribution rates)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile. Conservation also ensured by the objective for Klamath River fall chinook which includes a large inside allocation component that reduces ocean fishery exploitation rate in areas inhabited by these fish.	Medium to low abundance. Data limited except for Rogue River fall stock. Stocks migrate southerly or remain local and fall chinook contribute to ocean fisheries off northern California and Oregon, less so for spring stocks.
Central and Northern Oregon (Aggregate of fall and spring stocks in all streams from the Elk River to just south of the Columbia River)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile.	Variable between high and medium abundance. Stocks migrate northward and contribute to ocean fisheries off British Columbia and SE Alaska and to a lesser degree off Washington and Oregon.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 4 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- CHINOOK ---	
COLUMBIA RIVER BASIN - All pertinent fall, summer, and spring stocks of the Columbia River and its tributaries. Stocks within this complex are noted by area of origin: lower river (below Bonneville Dam), mid-river (Bonneville to McNary Dams), and upper river (above McNary Dam). Spawner escapement goals for these stocks are set through procedures of the U.S. District Court in U.S. v. Oregon and subsequent court orders. These goals are set forth in the Columbia River Fishery Management Plan and are recognized in the Council's conservation objectives. Annual inside fishery management planning activities are conducted within the Columbia River Compact and other state and tribal management forums. The Columbia River Compact, initially established by Oregon and Washington to jointly administer commercial fisheries within the Columbia River, takes into account the impacts from other state and tribal fisheries (e.g., recreational, ceremonial, subsistence, etc.) authorized under the Columbia River Fish Management Plan. The majority of ocean chinook harvest north of Cape Falcon is provided by Columbia River salmon stocks, primarily hatchery production of tule fall chinook from the Bonneville Pool (Spring Creek) and lower river hatcheries, smaller numbers of upper river bright hatchery and natural fall chinook, and some lower river hatchery spring chinook (Cowlitz). Hatchery objectives are based on long-range production programs and/or mitigation requirements associated with displaced natural stocks. Threatened Snake River fall chinook, which suffer from severe dam passage mortalities and extreme loss of freshwater habitat, are of prime concern in limiting ocean exploitation rates in all ocean fisheries north of Pigeon Pt., California. These limits act to provide considerable protection to other weak natural stocks subject to ocean fishery impacts.			
North Lewis River Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.	No. Listed stock. ESA jeopardy standard provides interim rebuilding program. Base period Council-area ocean fishery impacts around 7%.	Medium to low abundance. Present in ocean fisheries north of Cape Falcon to SE Alaska.
Lower River Hatchery Fall	15,400 adults to meet egg-take goal or as determined by management entities.	No (hatchery exception).	Medium to low abundance. Major contributor to ocean fisheries north of Cape Falcon to central British Columbia.
Lower River Hatchery (Spring)	2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.	No (hatchery exception).	Medium to low abundance. Present in ocean fisheries north of Cape Falcon to SE Alaska.
Upper Willamette (Spring) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). Willamette River Management Plan provides an MSY proxy of 30,000 to 45,000 hatchery and natural adults over Willamette River falls, depending on run size.	No. Listed stock. ESA jeopardy standard provides interim rebuilding program. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding.	Low abundance. Present in fisheries north of Cape Falcon to SE Alaska.
Mid-River Bright Hatchery (Fall)	None for ocean fishery management.	No (hatchery exception).	Medium to high abundance. Contributor to ocean fisheries off Washington, British Columbia, and southeast Alaska. Primarily produced at Bonneville Hatchery.
Spring Creek Hatchery (Fall)	7,000 adults to meet hatchery egg-take goal.	No (hatchery exception).	Low abundance. Significant contributor to ocean fisheries north of Cape Falcon to southern British Columbia.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 5 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
COLUMBIA RIVER BASIN (continued)			
Klickitat, Warm Springs, John Day, and Yakima Rivers (Spring)	Hold ocean fishery impacts at or below base period (<1%) and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state and tribal management entities considering separate conservation objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding. Major habitat restoration addressing water withdrawals and dam passage and blockages is necessary for rebuilding.	Long-term depressed abundance. No significance to ocean fisheries, infrequent occurrence in fisheries north of Cape Falcon to Alaska.
Snake River Fall Threatened (1992)	NMFS jeopardy/recovery standard. Since 1995, Council has met a standard of limiting its fisheries so that the total exploitation rate on age-3 and age-4 Lyons Ferry Hatchery fall chinook (representing Snake River fall chinook) for all ocean fisheries (including Canada) has been ≤70% of the 1988-1993 average adult equivalent exploitation rate. Prior to listing, managed within objectives for upper Columbia River bright fall chinook.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim rebuilding program. Recovering historic abundance unlikely as dams block former primary spawning area.	Present in ocean fisheries from central California to southeast Alaska with greatest contribution to Canadian fisheries. Primary impacts in Council fisheries north of Cape Falcon, but also extending to Pigeon Pt., CA.
Snake River Spring/Summer Threatened (1992)	Not applicable for ocean fisheries.	No. Listed stock. Base period Council-area ocean fishery impacts rare (unmeasurable). Dam passage mortality must be reduced to allow stock recovery.	Depressed, recent trend downward. Rare occurrence in ocean fisheries from Washington to SE Alaska.
Upper River Bright (Fall)	40,000 natural bright adults above McNary Dam (MSY proxy adopted in 1984 based on CRFMP. The management goal has been increased to 45,000 by Columbia River managers in recent years.	Limited. Base period Council-area ocean fishery exploitation rate <4% prevents effective Council fishery management and rebuilding.	High to medium abundance. Significant contributor to ocean fisheries off Canada and to a lesser extent Washington and Oregon. Primary impact area north of Cape Falcon.
Upper River Summer	Hold ocean fishery impacts at or below base period (<2%); recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate <2% prevents effective Council fishery management and rebuilding. Dam passage mortalities must be reduced to allow rebuilding.	Long-term depressed abundance. Present in ocean fisheries north of Cape Falcon to southeast Alaska.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 6 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
COLUMBIA RIVER BASIN (continued)			
Upper River Spring Endangered (1999)	None applicable to ocean fisheries. Ensure ocean fishery impacts remain rare and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state/tribal management entities considering separate objectives for these stocks).	No. Listed stock. Base period Council-area ocean fishery impacts rare (not measurable), making Council management and rebuilding ineffective. Reduce dam passage mortalities to allow rebuilding.	Long-term depressed abundance. Captive broodstock programs started in 1997. No significance to ocean fisheries. Rare occurrence in ocean fisheries north of Cape Falcon to Canada.
WASHINGTON COAST - All pertinent fall, summer and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of the Elwha River). This stock complex consists of several natural stocks, generally of small to medium sized populations, and some hatchery production (Willapa Bay and the Quinault River). Stocks in this complex tend to range further north than most Columbia River stocks and, while present in fisheries from Cape Falcon to SE Alaska, are not significantly impacted by Council-area ocean fisheries. Preseason abundance estimates are generally not available for Council management. These stocks qualify as **exceptions** to the Council's overfishing criteria due to very low fishery impacts. Spawning escapement goals for stocks managed within this complex, established in U.S. District Court by WDFW and the treaty tribes, are recognized in the Council's conservation objectives below. Objectives for Grays Harbor and the north coast river systems have been established pursuant to the U.S. District Court order in Hoh v. Baldrige. However, annual natural spawning escapement targets may vary from the conservation objectives below if agreed to by WDFW and the treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders. After agreement is reached on the annual targets, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for treaty allocation and inside, non-Indian fishery needs.			
Willapa Bay Fall (natural)	Undetermined.	Limited (exploitation rate exception).	
Willapa Bay Fall (hatchery)	8,200 adult return to hatchery.	No (hatchery exception).	
Grays Harbor Fall	14,600 natural adult spawners--MSP based on full seeding of spawning and rearing habitat (WDF 1979).	Limited (exploitation rate exception).	
Grays Harbor Spring	1,400 natural adult spawners.	"	
Quinault Fall	Hatchery production.	No (hatchery exception).	
Queets Fall	Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).	Limited (exploitation rate exception).	
Queets Spring/Summer	Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.	"	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 7 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
WASHINGTON COAST (continued)			
Hoh Fall	Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).	"	
Hoh Spring/Summer	Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.	"	
Quillayute Fall	Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).	"	
Quillayute Spring/Summer	1,200 natural adult spawners for summer component (MSY).	"	
Hoko Summer/Fall (Western Strait of Juan de Fuca)	850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults used for supplementation program.	"	
PUGET SOUND - All fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). This stock complex consists of numerous natural chinook stocks of small to medium sized populations and significant hatchery production. Puget Sound stocks contribute to fisheries off British Columbia and are present into SE Alaska, but are impacted to a minor degree by Council-area ocean fisheries. Base period, Council-area ocean fishery exploitation rates (adult equivalent) of 2% or less are below a management threshold which allows effective Council management of these stocks and they qualify as **exceptions** to the Council's overfishing criteria. The stocks within this complex and their respective conservation objectives, established in U.S. District Court by WDFW and the Treaty tribes, are recognized below. The conservation objectives for stocks managed primarily for natural production were developed by a State/Tribal Management Plan Development Team following the Boldt Decision and were based on "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The objectives were estimated for the average spawning escapements during periods that were thought to represent spawner abundances that provided maximum production (Ames and Phinney 1977). The objectives for stocks managed for artificial production are based on hatchery escapement needs. Annual management targets (expected hatchery plus natural escapement) for specific rivers or regions of origin may vary from the conservation objectives by following fixed procedures established in U.S. District Court as outlined in "Memorandum Adopting Salmon Management Plan" (U.S. v. Washington, 626 F. Supp. 1405 [1985]).			
Eastern Strait of Juan de Fuca Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 3,825 natural and hatchery adult spawners--2,900 for the Elwha River (Ames and Phinney 1977) and 925 for the Dungeness River (Smith and Sele 1994).	Limited (exploitation rate exception).	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 8 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
PUGET SOUND (continued)			
Skokomish Summer/Fall (Hood Canal) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,650 natural adult spawners (Ames and Phinney 1977).	"	
Nooksack Spring (early) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners.	"	
Skagit Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 14,850 natural adult spawners (Ames and Phinney 1977).	"	
Skagit Spring Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 3,000 natural adult spawners based on mean escapement 1959-1968.	"	
Stillaguamish Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners (Ames and Phinney 1977).	"	
Snohomish Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 5,250 natural adult spawners (Ames and Phinney 1977).	"	
Cedar River Summer/Fall (Lake Washington) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,200 natural adult spawners (Hage *et al.* 1994).	"	
White River Spring Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,000 natural adult spawners.	"	
Green River Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 5,750 natural adult spawners (Ames and Phinney 1977).	"	
Nisqually River Summer/Fall (South Puget Sound) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 900 natural adult spawners.	"	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 9 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
SOUTHERN BRITISH COLUMBIA - Fall and spring stocks of British Columbia coastal streams and the Fraser River. Management based primarily on natural and hatchery fall chinook. Base period, Council-area ocean fishery exploitation rates (adult equivalent) on the coastal stocks of 1% or less are below a management threshold which allows effective Council management of these stocks and they qualify as **exceptions** to the Council's overfishing criteria.			
Coastal Stocks	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority and would also be an exploitation rate exception.	Medium abundance. Major contributors to ocean fisheries off British Columbia; significant contributors north into SE Alaska and present off northern Washington.
Fraser River	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority.	Medium abundance. Major contributors to ocean fisheries off British Columbia; contributors off northern Washington; and present north into SE Alaska.
		- - - COHO - - -	
OREGON PRODUCTION INDEX AREA - All Washington, Oregon, and California natural and hatchery coho stocks from streams south of Leadbetter Pt. Significant production from Columbia River and Oregon coastal hatcheries provide harvest in ocean fisheries throughout the Council management area. Ocean fisheries are usually limited primarily to meet natural escapement objectives. Treaty Indian obligations, nontreaty harvest opportunity, and hatchery requirements must also be factored in for the Columbia River stocks. Both natural and hatchery components have been severely depressed for several yeas due to a combination of previously high fishery impacts, major losses or degradation of freshwater habitat, and long-term marine conditions unfavorable to coho survival.			
Central California Coast Threatened (1996)	NMFS jeopardy standard/recovery plan. Since 1998, no retention of coho in commercial and recreational fisheries off California in conjunction with total marine fishery impacts of no more than 13% on Rogue/Klamath hatchery coho (surrogate stock). Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim protection of productive capacity. Recovery limited by deterioration of significant portions of freshwater habitat, distribution at southern edge of coho range, and ongoing unfavorable marine conditions.	Very minor component of OPI area fisheries, limited potential for significant contribution to ocean and inland fisheries. Current impacts incidental in ocean fisheries off California. Development of monitoring and assessment program considered for Ten Mile River, Noyo River, Gualala River, Lagunitas Creek, and Scott Creek. Rogue/Klamath coho are believed to have a similar, but more northerly distribution.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 10 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX (continued)			
Northern California Threatened (1997)	NMFS jeopardy standard/recovery plan. Since 1998, total marine fishery impacts limited to no more than 13% on Rogue/Klamath hatchery coho (surrogate stock) and no retention of coho in California ocean fisheries. Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim protection of productive capacity. Recovery may last more than 10 years even with no fishery impacts due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Depressed and listed. Very minor natural component of OPI area fisheries, potential for minor contribution to ocean fisheries off California and southern Oregon, and inland California fisheries. Current impacts incidental in ocean and inland fisheries (total non-retention south of Cape Falcon since 1994). CDFG considering monitoring to provide data for the Smith, Trinity, Eel, Mattole, and Klamath Rivers.
Oregon Coastal Natural Comprised of Southern, South-Central, North-Central, and Northern Oregon stocks. Threatened (1997 and 1998)	NMFS jeopardy standard/recovery plan consistent with Council's objective under Amendment 13 and the Oregon Plan: For each of the 4 component stocks, a rebuilding and data collection program with an allowable marine and freshwater exploitation rate of no more than 13% to 35%, depending on parent escapement and ocean survival trends (adopted 1997). For a detailed description of the objective, see Section 3.3.2. Prior PFMC objectives contained in PFMC (1984 and 1993).	No. Listed stock, rebuilding program initiated in 1998. The annual conservation objective should allow component stocks to rebuild when environmental conditions are favorable. Recovery for some components may last more than 10 years even with no fishery impacts due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Depressed and listed. Major natural component of OPI area which, when abundant, contributes to ocean fisheries off California, Oregon, and Washington south of Leadbetter Pt., and freshwater fisheries in Oregon coastal streams. Current impacts primarily incidental in ocean fisheries under a total nonretention regulation south of Cape Falcon since 1994.
Columbia River Late (Hatchery)	Hatchery rack return goal of 17,200 adults.	No (hatchery exception).	Major component of ocean fisheries north of Cape Falcon. When abundant, significant contributors to ocean fisheries off Oregon north into Canada and Columbia River fisheries.
Columbia River Early (Hatchery)	Hatchery rack return goal of 18,800 adults.	No (hatchery exception).	Major component of OPI area fisheries. When abundant, significant contributors to ocean fisheries off California and north to Leadbetter Pt., WA and to Columbia River fisheries. Current ocean fishery impacts from very limited retention fisheries north of Cape Falcon and incidental hook-and-release mortality in fisheries south of Cape Falcon.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 11 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX (continued)			
Columbia River (Natural)	Undefined. Management is in a transitional phase pending completion of a critical review that may establish an explicit objective.	Not presently. See management information.	Extinct above the Dalles Dam, very rare below. Lower river coho are a candidate species under the ESA with an ongoing effort to determine if a reproducing population can be found and rebuilt.
WASHINGTON COASTAL - All pertinent natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western Strait of Juan de Fuca (West of the Elwha River). Management goals for Grays Harbor and Olympic Peninsula coho stocks include achieving natural spawning escapement objectives and treaty allocation requirements, although Grays Harbor also contains a significant amount of hatchery production. The conservation objectives for these stocks are based on MSY spawner escapements established pursuant to the U.S. District Court order in Hoh v. Baldrige. Annual natural spawning escapement targets and total escapement objectives are established by the Washington Department of Fish and Wildlife and treaty tribes under the provisions of U.S. v. Washington and subsequent U.S. District Court orders. After agreement to annual targets is reached by the parties in this litigation, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for providing treaty allocation requirements and inside, non-Indian fishery needs. The conservation objectives for the Queets, Hoh and Quillayute Rivers were developed as ranges intended to bracket the current best estimates of MSY escapement. The range of each objective reflects the degree of uncertainty inherent by using the high estimate of recruits-per-spawner and low estimate of carrying capacity for the lower bound, and the low estimate of recruits-per-spawner with the high estimate of smolt carrying capacity for the upper end of the range. The ranges were subsequently adjusted upward for risk aversion and again for habitat considerations by 26% to 184% (Lestelle et al. 1984).			
Willapa Bay (Hatchery)	Meet WDFW program objectives.	No (hatchery exception).	Minor component of ocean fisheries off northern Oregon north into Canada. Significant contributor to inside commercial net and recreational fisheries. WDFW critically reviewing current management to determine if objectives for natural stocks are warranted.
Grays Harbor	35,400 natural adult spawners (MSP based on WDF [1979]) or annual target agreed to by WDFW and the Quinault Indian Nation .	Yes. Conservation alert or overfishing concern based on fewer than 35,400 natural spawners.	Medium to high abundance. Minor contributor to ocean fisheries off Oregon and north into Canada. Significant contributor to Washington inside tribal fishery, minor contributor to inside recreational fishery.
Quinault (Hatchery)	Meet hatchery program objectives and provide escapement to utilize production potential for naturally spawning fish.	No (hatchery exception).	Contributor to ocean fisheries off Washington and north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 12 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
WASHINGTON COAST (continued)			
Queets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quinault Indian Nation.	Yes. Conservation alert or overfishing concern based on fewer than 5,800 natural spawners.	Small population. Low to depressed abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.
Hoh	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and Hoh Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 2,000 natural spawners.	Small population. Medium to low abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Quillayute Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quillayute Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 6,300 natural spawners.	Small population. Depressed abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Quillayute Summer (Hatchery)	Meet hatchery program objectives.	No (hatchery exception).	Low to depressed abundance. Early river entry timing. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Western Strait of Juan de Fuca (Sekiu, Hoko, Clallam, Pysht, East and West, and Lyre Rivers and Miscellaneous streams west of the Elwha River)	MSP objective of 9,720 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to through fixed procedures established in U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 9,720 natural spawners.	Small population. Low to depressed abundance. Little information on ocean distribution. A new annual objective of stepped exploitation rates is under consideration by WDFW and the tribes.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 13 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- COHO ---	
PUGET SOUND - All pertinent natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). The Puget Sound Salmon Management Plan defines management objectives and long term goals for these stocks as developed by representatives from federal, state and tribal agencies. Conservation objectives for specific stocks are currently based on either MSP principles for stocks managed primarily for natural production or upon hatchery escapement needs for stocks managed for artificial production. However, a transition to exploitation rate management is currently under consideration by the involved managers. Annual escapement targets for these coho stocks are developed through procedures established in U.S. District Court. Puget Sound management procedures are outlined in a "Memorandum Adopting Salmon Management Plan" (U.S. v. Washington, 626 F. Supp. 1405 [1985]). The original conservation objectives were developed by a State/Tribal Management Plan Development Team following the Boldt Decision with the goal for natural spawning stocks defined as "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The methodology used to develop the objectives was based on assessment of the quantity and quality of rearing habitat and the number of adult spawners required to fully seed the habitat (Zillges 1977). Some objectives have subsequently been modified in 1983 by the U.S. District Court Fisheries Advisory Board (Clark 1983 and PSSSRG 1997) and later determinations of the WDFW/Tribal Technical Committee.			
Eastern Strait of Juan de Fuca (Streams east of Salt Creek through Chimacum Creek))	MSP objective of 3,130 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to in fixed procedures set by U.S. District Court. The Elwha and Dungeness Rivers are not included in this objective, but are managed on a harvest rate basis.	Yes. Conservation alert or overfishing concern based on fewer than 3,130 natural spawners.	Small population. Low to depressed abundance. Little information on ocean distribution. A new annual objective of stepped exploitation rates is under consideration by WDFW and the tribes.
Hood Canal	MSP objective of 21,500 natural adult spawners (Clark 1983 modified since 1994 by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 21,500 natural spawners.	Low to medium abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective utilizing stepped exploitation rates is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal.
Skagit	MSP objective of 30,000 natural adult spawners (Zillges 1977 and Clark 1983) or annual target agreed to in fixed procedures set by U.S. District Court. (The spawner assessment methodology is currently being revised and may result in an objective significantly different from 30,000.)	Yes. Conservation alert or overfishing concern based on fewer than 30,000 natural spawners.	Low to depressed abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 14 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- COHO ---	
PUGET SOUND (continued)			
Stillaguamish	MSP objective of 17,000 natural adult spawners (Zillges 1977) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 17,000 natural spawners.	Medium to low abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal..
Snohomish	MSP objective of 70,000 natural adult spawners (Zillges 1977 as modified by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 70,000 natural spawners.	High to medium abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new annual objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal..
South Puget Sound (Hatchery)	Hatchery rack return goal of 52,000 adults. Natural production goals under development.	No (hatchery exception).	High abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor off British Columbia, in Puget Sound, and inside tribal fisheries.
SOUTHERN BRITISH COLUMBIA COAST - Stocks of southern British Columbia coastal streams (including Vancouver Island) and the Fraser River.			
Coastal Stocks	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Medium to low abundance. Major contributors to ocean fisheries off British Columbia; significant contributors north into SE Alaska and present off northern Washington.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Medium to low abundance. Major contributors to ocean fisheries off British Columbia.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 15 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - PINK (odd-numbered years) - - -		
The Fraser River Panel of the Pacific Salmon Commission (PSC) manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48° N latitude to meet Fraser River natural spawning escapement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ which is not in the Fraser River Panel Area (U.S.) waters consistent with Fraser River Panel management intent. Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing ocean pink harvest within fixed constraints of coho and chinook harvest ceilings and providing for treaty allocation requirements.			
Puget Sound	900,000 natural spawners or consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel)	No. Minor impacts in Council fisheries and not under Council management authority.	High abundance. Contributors to ocean fisheries off British Columbia and in Puget Sound. Present south into Oregon. Rare off California.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel)	No. Minor impacts in Council fisheies and not under Council management authority.	High to medium abundance. Major contributors to ocean fisheries off British Columbia; present into SE Alaska and off Washington and northern Oregon. Rare off California.

a/ This table may be updated periodically by formal amendments to the FMP or comprehensive technical reviews which result in modified conservation objectives or the development of rebuilding programs in response to overfishing concerns. In addition, any stock listed under the ESA and its jeopardy standard or recovery plan will immediately be incorporated in the table.

TABLE A-2. Allowable fishery impact rate criteria for OCN coho stock components.

PARENT SPAWNER STATUS		MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt) Low (<0.0009)	Medium (0.0009 to 0.0034)	High (>0.0034)
		Allowable Total Fishery Impact Rate		
High:	Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1	≤15%	≤30%[a/]	≤35%[a/]
Medium:	Parent spawners achieved Level #1 or greater rebuilding criteria	≤15%	≤20%[a/]	≤25%[a/]
Low:	Parent spawners less than Level #1 rebuilding criteria	≤15% ≤10-13%[b/]	≤15%	≤15%

Rebuilding Criteria	OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Total
Full Seeding at Low Marine Survival:	21,700	55,000	50,000	5,400	132,100
Level #2 (75% of full seeding):	16,400	41,300	37,500	4,100	99,300
Level #1 (50% of full seeding):	10,900	27,500	25,000	2,700	66,100
38% of Level #1 (19% of full seeding):	4,100	10,500	9,500	1,000	25,100

Stock Component (Boundaries)	Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)				
Northern: (Necanicum River to Neskowin Creek)	Nehalem	Tillamook	Nestucca	Ocean Tribs.	
	17,500	2,000	1,800	400	
North-Central: (Salmon River to Siuslaw River)	Siletz	Yaquina	Alsea	Siuslaw	Ocean Tribs.
	4,300	7,100	15,100	22,800	5,700
South-Central: (Siltcoos River to Sixes River)	Umpqua	Coos	Coquille	Coastal Lakes	
	29,400	7,200	5,400	8,000	
Southern: (Elk River to Winchuck River)	Rogue				
	5,400				

a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding: (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component and (2) no coho-directed harvest impacts will be allowed within that particular basin.

b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.

TABLE A-3. Maximum allowable fishery impact rate for OCN coho under Amendment 13 based on parent escapement levels by stock component and marine survival category.

Fishery Year (t)	Parent Escapement Year (t-3)	Estimated OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Hatchery Jack Survival Rate (t-1)	Marine Survival Category	Maximum allowable Fishery Impact Rate
1998	1995	4,000	13,600	34,800	4,200	0.04%	Low	10-13%
1999	1996	3,300	18,100	51,500	5,400	0.10%	Med	15%
2000	1997	2,100	2,800	17,700	8,300	0.13%	Med	15%
2001	1998	2,600	3,300	25,200	2,200	-	-	-
2002	1999	8,300	11,500	27,000	2,400	-	-	-

TABLE A-4. Estimated coho salmon natural spawner abundance (SRS accounting) in Oregon coastal basins for each OCN coho management component. Estimates adjusted for visual observation bias by multiplying estimate by 1.33 . (Page 1 of 1)

Component and Basin	Miles	Adjusted SRS Natural Coho Spawner Estimates										
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[a/]	1990-1999 Mean
NORTHERN:												
Nehalem	386	1,552	3,975	1,268	2,265	2,369	1,564	1,057	1,173	1,190	3,410	1,982
Tillamook	249	265	3,000	261	860	924	275	661	388	271	2,119	902
Nestucca	167	189	728	684	401	313	1,811	519	271	169	2,117	720
Direct Ocean Tributaries	97	191	1,579	209	983	485	319	1,043	314	946	698	677
TOTAL	899	2,197	9,282	2,422	4,509	4,091	3,969	3,280	2,146	2,576	8,344	4,282
NORTH CENTRAL:												
Siletz	118	441	984	2,447	400	1,200	607	763	336	394	1,203	878
Yaquina	109	381	380	633	549	2,448	5,668	5,127	384	365	2,248	1,818
Alsea	221	1,189	1,561	7,029	1,071	1,279	681	1,637	680	213	1,923	1,726
Siuslaw	514	2,685	3,740	3,440	4,428	3,044	6,089	7,625	668	1,089	2,617	3,543
Direct Ocean Tributaries	201	895	67	1,821	1,331	1,743	573	2,975	775	1,222	3,522	1,492
TOTAL	1,163	5,591	6,732	15,370	7,779	9,714	13,618	18,127	2,843	3,283	11,513	9,457
SOUTH CENTRAL:												
Umpqua	1,083	3,737	3,600	2,152	9,311	4,485	11,020	9,749	2,233	8,426	6,471	6,118
Coos	208	2,273	3,813	15,625	15,284	14,583	10,447	12,128	1,127	3,167	4,976	8,342
Coquille	331	2,712	5,651	2,116	7,384	5,035	2,116	16,169	5,720	2,466	3,044	5,241
Coastal Lakes	-	4,393	7,251	1,986	10,145	5,841	11,216	13,493	8,603	11,107	12,710	8,675
TOTAL	1,622	13,115	20,315	21,879	42,124	29,944	34,799	51,539	17,683	25,166	27,201	28,377
SOUTH:												
Rogue[b/]	-	2,796	765	1,935	174	5,303	4,221	5,386	8,282	2,249	2,370	3,348
COASTWIDE	-	23,699	37,094	41,606	54,586	49,052	56,607	78,332	30,954	33,274	49,247	45,445

a/ Estimates for 1999 are preliminary, but have been adjusted for the presence of hatchery fish.
b/ Mark recapture estimate based on seining at Huntley Park in the lower Rogue River.

60th Galaxy Gold side 1

APPENDIX B
OREGON PRODUCTION INDEX DATA

LIST OF TABLES

60#
Celery Gold
side 2

TABLE B-1. Preliminary preseason and postseason coho stock **index** abundance estimates for OPI area stocks in thousands of fish, 1985-1998.[a] (Page 1 of 2)

Stock	Year	Preseason	Postseason	Preseason/ Postseason
OPIH	1985	476.6	657.4	0.73
	1986	1,544.9	2,381.7	0.65
	1987	565.4	817.1	0.69
	1988	1,591.0	1,556.4	1.02
	1989	1,381.5	1,620.0	0.85
	1990	909.6	594.2	1.53
	1991	1,215.4	1,802.9	0.67
	1992	385.3	472.8	0.81
	1993	479.2	222.8	2.15
	1994	98.3	202.7	0.49
	1995	218.0	134.8	1.62
	1996	245.5	174.3	1.41
	1997	289.2	191.7	1.51
	1998	71.8	200.7	0.36
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
Total OCN				
	1986	304.0	291.4	1.04
	1987	476.0	197.1	2.42
	1988	480.3	352.9	1.36
	1989	446.2	315.5	1.41
	1990	321.0	283.9	1.13
	1991	421.9	255.5	1.65
	1992	265.7	256.6	1.04
	1993	283.3	251.9	1.12
	1994	140.9	134.1	1.05
	1995	219.0	159.0	1.38
	1996	181.3	236.5	0.77
	1997	247.9	77.3	3.21
	1998	133.8	61.1	2.19
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
OCNR	1985	296.0	303.4	0.98
	1986	285.6	273.4	1.04
	1987	458.0	187.1	2.45
	1988	464.3	340.2	1.36
	1989	430.0	305.1	1.41
	1990	307.5	271.9	1.13
	1991	409.2	241.8	1.69
	1992	255.0	252.9	1.01
	1993	273.9	236.8	1.16
	1994	134.4	128.1	1.05
	1995	211.1	145.5	1.45
	1996	169.7	221.5	0.77
	1997	236.3	67.6	3.50
	1998	121.5	47.3	2.57
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				

TABLE B-1. Preliminary preseason and postseason coho stock **index** abundance estimates for OPI area stocks in thousands of fish, 1985-1998.[a/] (Page 2 of 2)

Stock	Year	Preseason	Postseason	Preseason/ Postseason
OCNL	1985	6.6[b/]	12.6[c/]	0.52
	1986	18.4[b/]	18.0[c/]	1.02
	1987	18.0	10.0	1.80
	1988	16.0	12.7	1.26
	1989	16.2	10.5	1.54
	1990	13.5	12.0	1.13
	1991	12.7	13.8	0.92
	1992	10.7	3.7	2.89
	1993	9.4	15.1	0.62
	1994	6.5	6.0	1.08
	1995	7.9	13.6	0.58
	1996	11.6	15.1	0.77
	1997	11.6	9.7	1.20
	1998	12.3	12.2	1.01
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
PRIH	1985	96.8	424.4	0.23
	1986	285.5	584.9	0.49
	1987	465.6	300.1	1.55
	1988	302.5	229.0	1.32
	1989	206.4	104.8	1.97
	1990	142.8	124.3	1.15
	1991	37.1	60.4[d/]	0.61
No PRIH returns after 1991				
STEP	1985	-	-	-
	1986	-	-	-
	1987	6.1	0.5	13.48
	1988	0.4	2.6	0.15
	1989	5.2	2.5	2.12
	1990	3.5	4.3	0.81
	1991	6.9	8.6	0.80
	1992	1.7	1.1	1.62
	1993	4.5	3.0	1.50
	1994	0.5	1.8	0.28
	1995	6.0	0.5	12.00
	1996	0.3	1.1	0.27
	1997	1.0	0.3	3.33
	1998	0.2	0.3	0.67
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				

a/ Estimates for 1988-1995 use the Council-adopted revised abundance procedure developed in 1987, except for the OCNR predictor which was revised in 1992 and was based on an alternative environmental predictor during 1994-1998. Also, the OPIH predictor was fit through zero in 1994 and 1995.

b/ This estimate is for the Ten Mile Lake system only.

c/ Includes postseason estimate for the Ten Mile, Siltcoos and Tahkenitch lake systems.

d/ Estimated harvest occurring outside the OPI area is not available.

TABLE B-2. Millions of coho smolts released annually into the OPI area by geographic area and rearing agency.[a/] (Page 1 of 1)

	Columbia River						Oregon Coast						
		Washington						Private Aquaculture					Total
Year	Oregon	Toutle[b/]	Cowlitz[c/]	Combined	Federal	Total	ODFW[d/]	Yearlings	Zeros	Combined	Total	California	OPI
1960	2.2	-	-	2.5	1.7	6.4	1.0	-	-	-	1.0	0.0	7.4
1961	4.6	-	-	6.3	4.2	15.1	1.4	-	-	-	1.4	0.1	16.6
1962	6.7	-	-	5.5	2.3	14.5	2.5	-	-	-	2.5	0.4	17.4
1963	6.5	-	-	8.0	7.9	22.4	2.7	-	-	-	2.7	0.5	25.6
1964	6.9	-	-	6.5	4.6	18.0	2.3	-	-	-	2.3	0.5	20.8
1965	6.4	-	-	7.8	6.4	20.6	2.1	-	-	-	2.1	1.1	23.8
1966	6.0	-	-	12.1	6.5	24.6	2.1	-	-	-	2.1	0.7	27.4
1967	7.0	-	-	8.5	8.6	24.1	2.4	-	-	-	2.4	1.3	27.8
1968	5.5	-	-	6.6	7.2	19.3	3.2	-	-	-	3.2	1.8	24.3
1969	6.3	10.5	5.2	15.7	5.6	27.6	3.4	-	-	-	3.4	1.4	32.4
1970	5.2	9.8	4.6	14.4	4.4	24.0	3.4	-	-	-	3.4	1.4	28.8
1971	7.2	13.5	3.1	16.6	4.5	28.2	4.1	-	-	-	4.1	1.0	33.3
1972	6.9	13.6	5.2	18.8	4.2	29.9	3.8	-	-	-	3.8	1.6	35.3
1973	6.3	11.1	5.9	17.0	5.2	28.5	3.9	-	-	-	3.9	1.2	33.6
1974	6.9	9.5	7.2	16.7	4.3	27.9	4.1	-	0.1	0.1	4.2	0.6	32.7
1975	6.6	5.9	12.4	18.3	4.1	29.0	3.4	-	0.1	0.1	3.5	1.6	34.1
1976	8.2	5.6	10.9	16.5	4.2	28.9	4.0	0.7	1.4	2.1	6.1	0.6	35.6
1977	8.4	6.4	10.6	17.0	6.0	31.4	3.2	1.1	1.3	2.4	5.6	0.9	37.9
1978	9.1	10.2	8.0	18.2	5.3	32.6	4.0	0.3	9.6	9.9	13.9	0.5	47.0
1979	8.8	8.2	9.1	17.3	2.8	28.9	4.5	0.9	4.9	5.8	10.3	0.8	40.0
1980	5.5	5.9[e/]	11.7	17.6	5.0	28.1	3.4	4.1	10.7	14.8	18.2	0.8	47.1
1981	5.9	8.6[e/]	14.2	22.8	3.7	32.5	3.9	6.6	17.3	23.9	27.8	0.9	61.2
1982	5.6	4.0	14.9	18.9	3.3	27.8	4.3	3.2	19.9	23.1	27.4	0.6	55.8
1983	6.2	2.4	15.0	17.4	3.4	27.0	3.0	1.3	14.8	16.1	19.1	0.9	47.0
1984	8.9	2.5	14.2	16.7	3.6	29.3	4.5	1.4	9.5	10.9	15.4	0.7	45.4
1985	9.1	3.9	13.8	17.7	2.0	28.8	3.8	4.2	4.4	8.6	12.5	0.2	41.5
1986	9.1	3.8	15.3	19.1	4.7	32.9	4.8	3.1	5.5	8.6	13.4	1.8	48.1
1987	6.8	3.3	15.4	18.7	3.3	28.8	4.9	0.5	4.1	4.6	9.5	1.3	39.6
1988	6.2	2.8	16.1	18.9	4.5	29.5	5.3	1.1	3.7	4.8	10.1	1.2	40.8
1989	6.6	2.5	17.0	19.5	3.5	29.6	5.0	2.0	8.0	10.0	15.0	1.3	45.9
1990	8.0	3.3	14.3	17.6	4.7	30.3	5.7	2.8	2.8	5.6	11.3	1.2	42.8
1991	10.4	3.7	15.3	19.0	5.9	35.3	5.3	0.0	0.0	0.0	5.3	1.5	42.1
1992	11.5	4.3	14.3	18.6	2.7	32.8	6.2	0.0	0.0	0.0	6.2	0.7	39.7
1993	11.1	4.3	14.8	19.1	4.2	34.4	4.3	0.0	0.0	0.0	4.3	0.8	39.5
1994	9.1	2.5	12.0	14.5	3.0	26.6	5.0	0.0	0.0	0.0	5.0	0.6	32.3
1995	7.1	3.4	12.9	16.3	1.7	25.2	3.7	0.0	0.0	0.0	3.7	0.7	29.5
1996	8.4	3.4	12.9	16.3	3.4	28.0	3.3	0.0	0.0	0.0	3.3	0.3	31.6
1997	6.1	3.2	7.8	11.0	3.9	21.0	2.9	0.0	0.0	0.0	2.9	0.7	24.6
1998[f/]	6.1	5.8	11.4	17.2	3.6	26.8	1.7	0.0	0.0	0.0	1.7	0.6	29.1
1999[f/]	6.9	3.1	11.5	14.6	3.8	25.3	1.1	0.0	0.0	0.0	1.1	0.7	27.1

a/ A coho smolt is here defined as 30 fish per pound or larger and released in February or later.
b/ All releases are of early run (Toutle River) stock.
c/ All releases are of late run (Cowlitz River) stock.
d/ Beginning in 1989, does not include minor releases from STEP projects.
e/ Excludes 3.5 million assumed lost at Toutle Hatchery on May 18, 1980, during the eruption of Mt. Saint Helens.
f/ Preliminary.

TABLE B-3. Data set used in predicting 2000 Oregon production index hatchery (OPIH) adult coho with SRS[a/] accounting. Adults and jacks shown in thousands of fish and smolts in millions of fish. (Page 1 of 1)

Year (t)	Adult OPIH (t)	Jack CR (t-1)	Jack OC (t-1)	Sm CR (t-1)	Sm D (t-1)
1970	2,765.1	148.6	13.6	27.6	0.0
1971	3,365.0	172.8	6.6	24.0	0.0
1972	1,924.8	100.8	2.9	28.3	0.0
1973	1,817.0	85.7	5.7	29.9	1.8
1974	3,071.1	132.1	12.1	28.5	2.9
1975	1,652.8	75.1	1.1	27.8	1.8
1976	3,885.3	146.2	25.3	29.0	2.0
1977	987.5	46.2	7.5	28.9	0.2
1978	1,824.1	99.2	4.0	31.4	0.0
1979	1,476.7	64.1	8.4	32.6	5.0
1980	1,224.0	51.6	6.0	28.9	6.7
1981	1,064.5	40.6	8.1	28.1	5.6
1982	1,266.8	55.0	6.3	32.4	6.8
1983[b/]	595.7	61.0	7.2	27.7	5.0
1984	689.4	28.1	3.6	27.0	5.1
1985	717.5	18.2	7.8	29.2	9.1
1986	2,435.8	64.7	12.9	28.8	12.2
1987	880.1	24.1	8.7	32.9	9.0
1988	1,666.1	72.2	12.9	28.8	7.7
1989	1,721.4	55.0	5.8	29.5	7.2
1990	718.4	37.1	9.6	29.6	8.5
1991	1,874.8	60.8	7.9	30.3	7.1
1992	540.8	19.9	5.7	35.3	6.0
1993	261.7	19.7	7.5	32.8	5.5
1994	202.4	3.8	1.3	34.4	6.0
1995	147.2	9.1	2.7	26.6	3.1
1996	184.5	14.1	3.2	25.2	4.2
1997	200.6	15.8	4.6	28.0	3.4
1998	200.2	6.8	3.0	21.0	2.5
1999	319.6	21.7	5.5	26.8	3.0
2000[c/]	671.4	30.7	3.5	27.1	4.1

a/ Adult OPIH = Harvest impacts plus escapement for public hatchery stocks originating in the Columbia River, Oregon coastal rivers and the Klamath River, California.
Jack CR = Columbia River jack returns corrected for small adults.
Jack OC = Oregon coastal and California hatchery jack returns corrected for small adults.
Sm CR = Columbia River smolt release.
Sm D = Columbia River delayed smolt releases.

b/ Data not used in the analysis due to El Niño impacts.

c/ Preseason predicted adults.

TABLE B-4. Data set used in predicting 2000 Oregon coastal natural river (OCNR) coho recruits with SRS accounting. Recruits shown in thousands of fish. (Page 1 of 1)

Year	Recruits to Ocean SRS	Ln SRS (Recruits)	JanAnom[a/]	UpAnom (t-1)[a/]
1971	416.3	6.03141	-1.504	30.08
1972	185.5	5.22305	-1.704	10.08
1973	235.0	5.45959	-0.604	23.08
1974	196.4	5.28015	-0.804	47.08
1975	208.4	5.33946	-0.604	48.08
1976	451.7	6.11302	-1.004	65.08
1977	161.3	5.08327	-0.204	32.08
1978	111.7	4.71582	1.396	17.08
1979	188.8	5.24069	-1.404	-2.92
1980	108.3	4.68491	0.596	17.08
1981	174.5	5.16192	1.896	-1.92
1982	185.7	5.22413	-0.104	-8.92
1983	97.1	4.57574	1.196	14.08
1984	94.8	4.55177	0.696	-24.92
1985	124.9	4.82751	-0.004	-24.92
1986	97.9	4.58395	0.096	-24.92
1987	70.8	4.25986	0.596	-39.92
1988	124.6	4.82511	-0.104	-21.92
1989	103.8	4.64247	-0.604	-43.92
1990	60.4	4.10099	-0.004	-21.92
1991	70.1	4.24992	-1.104	-37.92
1992	87.4	4.4705	0.096	43.08
1993	81.1	4.39568	0.196	7.08
1994	39.2	3.66868	1.096	-50.92
1995	53.8	3.98527	0.596	-3.92
1996	70.1	4.24992	1.296	-1.92
1997	16.3	2.79117	0.596	9.08
1998	17.2	2.84491	2.096	-24.92
1999	37.8	3.87330	-0.504	18.08
2000[b/]	43.9	3.63231	-0.104	84.08

a/ JanAnom = The annual deviation from mean (1971-2000) January sea surface temperature (degrees Centigrade) at Charleston, Oregon.
UpAnom = Annual deviation from mean (1970-1999) April-June Bakun upwelling index at 42° N latitude.

b/ Preseason adult prediction.

APPENDIX C
CAPE FLATTERY AND STRAIT OF JUAN DE FUCA HISTORICAL CHINOOK SALMON CATCHES

LIST OF TABLES

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Galaxy
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side 2

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 1 of 4)

	Treaty Indian			Non-Indian				
Area and Year	Troll	Net	Total	Troll	Net	Sport[a/]	Total	Grand Total
				CHINOOK LANDINGS				
Areas 4 and 4A								
1979	408	3	411	26,549	0	3,058	29,607	30,018
1980	2,386	1,211	3,597	22,252	0	2,836	25,088	28,685
1981	3,666	209	3,875	17,267	0	3,207	20,474	24,349
1982	12,713	267	12,980	16,509	0	3,180	19,689	32,669
1983	2,899	62	2,961	9,547	0	2,452	11,999	14,960
1984	2,086	0	2,086	2,326	0	229	2,555	4,641
1985	6,765	493	7,258	4,414	0	2,052	6,466	13,724
1986	5,208	87	5,295	4,656	0	3,248	7,904	13,199
1987	9,475	3,681	13,156	4,838	0	2,599	7,437	20,593
1988	13,289	2,991	16,280	21,941	-	3,767	25,708	41,988
1989	15,278	780	16,058	282	-	2,077	2,359	18,417
1990	13,620	30	13,650	16,286	-	2,258	18,544	32,194
1991	16,103	235	16,338	15,238	-	2,465	17,703	34,041
1992	17,384	9	17,393	17,076	-	1,082	18,158	35,551
1993	20,579	24	20,603	16,115	-	1,466	17,581	38,184
1994	1,946	4	1,950	-	-	-	-	1,950
1995	7,489	2	7,491	3	-	110	113	7,604
1996	9,690	13	9,703	0	-	55	55	9,758
1997[b/]	11,567	2	11,569	3,785	-	478	4,263	15,832
1998[b/]	13,851	0	13,851	4,160	-	-	4,160	18,011
1999[b/]	26,441	4	26,445	12,698	-	-	12,698	39,143
Area 4B								
1979	8,436	2,391	10,827	214	1,402	-	1,616	12,443
1980	10,694	4,561	15,255	0	368	-	368	15,623
1981	15,950	4,820	20,770	2	542	-	544	21,314
1982	19,605	6,411	26,016	293	1,699	-	1,992	28,008
1983	20,102	7,273	27,375	8	264	-	272	27,647
1984	14,627	1,478	16,105	3	18	-	21	16,126
1985	7,524	3,673	11,197	2	279	-	281	11,478
1986	5,861	6,484	12,345	0	39	-	39	12,384
1987	11,341	3,987	15,328	-	5	-	5	15,333
1988	15,465	1,966	17,431	-	0	-	0	17,431
1989	18,009	1,932	19,941	-	0	452	452	20,393
1990	17,593	775	18,368	-	0	416	416	18,784
1991	7,648	214	7,862	-	0	380	380	8,242
1992	10,956	43	10,999	-	0	33	33	11,032
1993	9,079	752	9,831	-	0	218	218	10,049
1994	1,947	22	1,969	-	-	-	-	1,969
1995	2,248	272	2,520	-	-	26	26	2,546
1996	4,814	130	4,944	-	-	5	5	4,949
1997[b/]	1,748	118	1,866	-	-	8	8	1,874
1998[b/]	402	1	403	-	-	103	103	506
1999[b/]	902	7	909	-	-	-	-	909

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 2 of 4)

Area and Year	Treaty Indian			Non-Indian				Grand Total
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	
CHINOOK LANDINGS								
Area 5								
1979	140	6,971	7,111	43	3,400	30,914	34,357	41,468
1980	64	6,305	6,369	0	737	20,591	21,328	27,697
1981	81	12,842	12,923	1	2,774	17,145	19,920	32,843
1982	76	15,780	15,856	9	2,566	12,538	15,113	30,969
1983	176	8,263	8,439	7	551	16,839	17,397	25,836
1984	1,413	8,879	10,292	9	399	11,993	12,401	22,693
1985	4,065	7,892	11,957	18	612	18,382	19,012	30,969
1986	15,008	9,599	24,607	0	85	36,146	36,231	60,838
1987	17,360	4,624	21,984	-	37	21,528	21,565	43,549
1988	32,660	5,458	38,118	-	51	22,645	22,696	60,814
1989	40,027	7,155	47,182	-	1	34,934	34,935	82,117
1990	28,105	4,005	32,110	-	4	37,752	37,756	69,866
1991	23,625	2,787	26,412	-	35	29,682	29,717	56,129
1992	15,005	851	15,856	-	0	24,385	24,385	40,241
1993	1,763	649	2,412	-	0	19,014	19,014	21,426
1994	1,512	5,836	7,348	-	-	487	487	7,835
1995	4,297	4,537	8,834	-	-	2,718	2,718	11,552
1996	7,087	472	7,559	-	-	4,393	4,393	11,952
1997[b/]	345	374	719	-	-	9,892	9,892	10,611
1998[b/]	169	828	997	-	-	836	836	1,833
1999[b/]	225	704	929	-	-	NA	NA	NA
Area 6C								
1979	3	170	173	0	107	49,688	49,795	49,968
1980	22	80	102	0	46	47,187	47,233	47,335
1981	1,243	245	1,488	8	74	34,207	34,289	35,777
1982	211	314	525	29	72	17,304	17,405	17,930
1983	614	520	1,134	2	13	41,221	41,236	42,370
1984	527	1,739	2,266	15	43	36,010	36,068	38,334
1985	1,568	1,086	2,654	11	142	25,885	26,038	28,692
1986	10,553	1,094	11,647	0	0	32,452	32,452	44,099
1987	17,539	2,063	19,602	-	6	31,216	31,222	50,824
1988	8,606	2,076	10,682	-	80	16,637	16,717	27,399
1989	12,088	828	12,916	-	1	17,098	17,099	30,015
1990	10,336	382	10,718	-	0	12,735	12,735	23,453
1991	7,222	301	7,523	-	0	9,605	9,605	17,128
1992	9,025	47	9,072	-	0	13,705	13,705	22,777
1993	1,196	0	1,196	-	0	13,202	13,202	14,398
1994	605	6	611	-	-	1,174	1,174	1,785
1995	148	1	149	-	-	3,631	3,631	3,780
1996	34	2	36	-	-	2,838	2,838	2,874
1997[b/]	29	0	29	-	-	2,317	2,317	2,346
1998[b/]	195	6	201	-	-	1,323	1,323	1,524
1999[b/]	4	0	4			NA	NA	NA

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 3 of 4)

Area and Year	Treaty Indian			Non-Indian				Grand Total
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	
COHO LANDINGS								
Areas 4 and 4A								
1979	1,522	36	1,558	143,469	0	25,884	169,353	170,911
1980	19,488	44	19,532	69,133	0	25,274	94,407	113,939
1981	15,578	44	15,622	94,514	0	25,868	120,382	136,004
1982	92,170	78	92,248	84,171	0	39,521	123,692	215,940
1983	28,196	18	28,214	2,353	0	51,826	54,179	82,393
1984	30,534	0	30,534	16,441	0	6,371	22,812	53,346
1985	51,564	18	51,582	44	0	23,594	23,638	75,220
1986	33,631	160	33,791	19,026	0	21,759	40,785	74,576
1987	52,406	49	52,455	1,171	0	25,406	26,577	79,032
1988	33,546	80	33,626	2,229	-	15,809	18,038	51,664
1989	42,362	174	42,536	41,089	-	20,237	61,326	103,862
1990	43,143	0	43,143	34,285	-	25,356	59,641	102,784
1991	43,445	50	43,495	24,124	-	23,343	47,467	90,962
1992	47,415	35	47,450	7,664	-	12,990	20,654	68,104
1993	41,142	20	41,162	3,163	-	19,027	22,190	63,352
1994	0	0	0	-	-	-	-	-
1995	24,812	0	24,812	20,805	-	8,203	29,008	53,820
1996	14,991	2	14,993	13,042	-	6,634	19,676	34,669
1997	9,419	0	9,419	-	-	0	0	9,419
1998[b/]	7,074	0	7,074	-	-	0	0	7,074
1999[b/]	32,142	8	32,150	1,913	-	5,370	7,283	39,433
Area 4B								
1979	3,062	12,465	15,527	2,003	10,335	-	12,338	27,865
1980	251	1,843	2,094	1	1,810	-	1,811	3,905
1981	2,976	2,763	5,739	3	810	-	813	6,552
1982	4,179	29,025	33,204	13,776	12,257	-	26,033	59,237
1983	3,616	7,580	11,196	8	1,131	-	1,139	12,335
1984	1,454	12,800	14,254	0	25	-	25	14,279
1985	573	17,024	17,597	50	1,359	-	1,409	19,006
1986	7,042	10,624	17,666	14	721	-	735	18,401
1987	5,171	3,956	9,127	-	14	-	14	9,141
1988	4,670	268	4,938	-	3	-	3	4,941
1989	11,618	13,819	25,437	-	0	19,882	19,882	45,319
1990	25,603	5,211	30,814	-	29	20,286	20,315	51,129
1991	8,193	1,222	9,415	-	0	15,132	15,132	24,547
1992	10,253	49	10,302	-	0	11,711	11,711	22,013
1993	2,157	939	3,096	-	0	8,168	8,168	11,264
1994	0	5	5	-	-	-	-	5
1995	3,087	884	3,971	-	-	4,640	4,640	8,611
1996	1,125	19	1,144	-	-	2,327	2,327	3,471
1997	3,796	30	3,826	-	-	1,494	1,494	5,320
1998[b/]	609	47	656	-	-	8,062	8,062	8,718
1999[b/]	1,131	4	1,135	-	-	-	-	1,135

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 4 of 4)

Area and Year	Treaty Indian			Non-Indian				
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	Grand Total
COHO LANDINGS								
Area 5								
1979	222	52,431	52,653	193	25,549	76,876	102,618	155,271
1980	6	40,988	40,994	0	4,190	18,746	22,936	63,930
1981	75	51,297	51,372	54	5,205	33,045	38,304	89,676
1982	110	81,909	82,019	109	9,509	54,728	64,346	146,365
1983	217	32,725	32,942	161	1,655	40,598	42,414	75,356
1984	556	33,695	34,251	36	1,251	27,270	28,557	62,808
1985	1,304	67,810	69,114	541	3,328	72,065	75,934	145,048
1986	4,459	60,436	64,895	18	332	102,727	103,077	167,972
1987	3,085	57,579	60,664	-	332	80,101	80,433	141,097
1988	430	18,691	19,121	-	390	85,164	85,554	104,675
1989	1,101	48,947	50,048	-	2	112,235	112,237	162,285
1990	1,663	25,848	27,511	-	306	185,118	185,424	212,935
1991	4,680	32,865	37,545	-	715	166,936	167,651	205,196
1992	1,119	5,159	6,278	-	0	84,457	84,457	90,735
1993	88	3,351	3,439	-	0	42,571	42,571	46,010
1994	0	14,168	14,168	-	-	31	31	14,199
1995	124	13,447	13,571	-	-	35,271	35,271	48,842
1996	195	1,532	1,727	-	-	29,446	29,446	31,173
1997[b/]	0	898	898	-	-	37,012	37,012	37,910
1998[b/]	37	1,049	1,086	-	-	23,640	23,640	24,726
1999[b/]	0	1,378	1,378	-	-	826	826	2,204
Area 6C								
1979	0	900	900	0	521	13,730	14,251	15,151
1980	0	433	433	0	308	5,405	5,713	6,146
1981	76	885	961	27	197	19,412	19,636	20,597
1982	679	1,556	2,235	674	269	16,467	17,410	19,645
1983	129	269	398	17	69	31,167	31,253	31,651
1984	67	400	467	30	36	31,213	31,279	31,746
1985	86	1,128	1,214	82	543	16,861	17,486	18,700
1986	214	469	683	0	0	39,024	39,024	39,707
1987	656	1,307	1,963	-	19	45,614	45,633	47,596
1988	127	1,910	2,037	-	296	30,791	31,087	33,124
1989	255	1,093	1,348	-	22	33,592	33,614	34,962
1990	269	519	788	-	0	42,080	42,080	42,868
1991	326	2,381	2,707	-	1	25,081	25,082	27,789
1992	238	155	393	-	0	17,136	17,136	17,529
1993	22	16	38	-	0	13,309	13,309	13,347
1994	1	27	28	-	-	9	9	37
1995	39	24	63	-	-	6,987	6,987	7,050
1996	0	31	31	-	-	15,122	15,122	15,153
1997[b/]	0	0	0	-	-	16,600	16,600	16,600
1998[b/]	80	20	100	-	-	5,304	5,304	5,404
1999[b/]	0	0	0	-	-	NA	NA	NA

a/ Recreational catches for Area 4B are included in Areas 4 and 4A catches for ocean opening and represent total catches from the port of Neah Bay. Any fisheries open only in Area 4B (i.e., the late-season state-water fisheries) is reported as Area 4B catch. Recreational catches for Areas 5 and 6C represent catches for the Sekiu and eastern Strait areas (punch card Areas 5 and 6), respectively.

b/ Preliminary.

TABLE C-2. Comparative Strait of Juan de Fuca treaty Indian troll commercial chinook catches during the early part (October through January) of the winter season. (Page 1 of 1)

	Area			
Year	4B	5	6C	Total (Oct.-Jan.)
1989-1990	9,410	35,668	9,893	54,971
1990-1991	1,597	18,829	7,833	28,259
1991-1992	1,025	18,950	7,370	27,345
1992-1993	3,843	4,612	661	9,116
1983-1994	970	1,847	999	3,816
1994-1995	323	488	58	869
1995-1996	1,470	1,050	14	2,534
1996-1997	196	2,232	0	2,428
1997-1998[a/]	16	57	29	102
1998-1999[a/]	218	0	0	218
1999-2000[a/]	30	0	0	30

a/ Preliminary.

60# Galaxy Gold Side 1

APPENDIX D
SALMON HARVEST ALLOCATION SCHEDULES

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60#
Galaxy Gold
side 2

HARVEST ALLOCATION -- SECTION 5.3 OF AMENDMENT 14[1/]

5.3 ALLOCATION

> *"Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."*
> *Magnuson-Stevens Act, National Standard 4*

Harvest allocation is required when the number of fish is not adequate to satisfy the perceived needs of the various fishing industry groups and communities, to divide the catch between (non-Indian) ocean and inside fisheries and among ocean fisheries, and to provide treaty Indian fishing opportunity. In allocating the resource between ocean and inside fisheries, the Council considers both inriver harvest and spawner escapement needs. The magnitude of inriver harvest is determined by the states in a variety of ways, depending upon the management area. Some levels of inriver harvests are designed to accommodate federally recognized inriver Indian fishing rights, while others are established to allow for non-Indian harvests of historic magnitudes. Several fora exist to assist this process on an annual basis. The North of Cape Falcon Forum, a state and tribal sponsored forum, convenes the pertinent parties during the Council's preseason process to determine allocation and conservation recommendations for fisheries north of Cape Falcon. The Klamath Fishery Management Council fulfills much the same roll with regard to Klamath River salmon stocks. The individual states also convene fishery industry meetings to coordinate their input to the Council.

5.3.1 Commercial (Non-Tribal) and Recreational Fisheries North of Cape Falcon

5.3.1.1 Goal, Objectives, and Priorities

Harvest allocations will be made from a total allowable ocean harvest which is maximized to the largest extent possible but still consistent with treaty obligations, state fishery needs and spawning escapement requirements, including jeopardy standards for stocks listed under the ESA. The Council shall make every effort to establish seasons and gear requirements which provide troll and recreational fleets a reasonable opportunity to catch the available harvest. These may include single-species directed fisheries with landing restrictions for other species.

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows:

- Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily and area closures and restrictions on gear and daily limits.
- Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

The priorities listed below will be used to help guide establishment of the final harvest allocation while meeting the overall commercial and recreational fishery objectives.

At total allowable harvest levels up to 300,000 coho and 100,000 chinook:

- Provide coho to the recreational fishery for a late June through early September all-species season. Provide chinook to allow (1) access to coho and, if possible, (2) a minimal chinook-only fishery prior to

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1/ Amendment 14 is expected to be implemented during the 2000 salmon fishing season.

the all-species season. Adjust days per week and/or institute area restrictions to stabilize season duration.

- Provide chinook to the troll fishery for a May and early June chinook season and provide coho to (1) meet coho hooking mortality in June where needed and (2) access a pink salmon fishery in odd years. Attempt to ensure that part of the chinook season will occur after June 1.

At total allowable harvest levels above 300,000 coho and above 100,000 chinook:

- Relax any restrictions in the recreational all-species fishery and/or extend the all-species season beyond Labor Day as coho quota allows. Provide chinook to the recreational fishery for a Memorial Day through late June chinook-only fishery. Adjust days per week to ensure continuity with the all-species season.

- Provide coho for an all-salmon troll season in late summer and/or access to a pink fishery. Leave adequate chinook from the May through June season to allow access to coho.

5.3.1.2 Allocation Schedule Between Gear Types

Initial commercial and recreational allocation will be determined by the schedule of percentages of total allowable harvest as follows:

TABLE 5-1. Initial commercial/recreational harvest allocation schedule north of Cape Falcon.

Coho			Chinook		
Harvest (thousands of fish)	Percentage[a/]		Harvest (thousands of fish)	Percentage[a/]	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ The allocation must be calculated in additive steps when the harvest level exceeds the initial tier.

This allocation schedule should, on average, allow for meeting the specific fishery allocation priorities described above. The initial allocation may be modified annually by preseason and inseason trades to better achieve (1) the commercial and recreational fishery objectives and (2) the specific fishery allocation priorities. The final preseason allocation adopted by the Council will be expressed in terms of quotas which are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch.

To provide flexibility to meet the dynamic nature of the fisheries and to assure achievement of the allocation objectives and fishery priorities, deviations from the allocation schedule will be allowed as provided below and as described in Section 6.5.3.2 for certain selective fisheries.

1. Preseason species trades (chinook and coho) which vary from the allocation schedule may be made by the Council based upon the recommendation of the pertinent recreational and commercial SAS representatives north of Cape Falcon. The Council will compare the socioeconomic impacts of any such recommendation to those of the standard allocation schedule before adopting the allocation which best meets FMP management objectives.

2. Inseason transfers, including species trades of chinook and coho, may be permitted in either direction between recreational and commercial fishery quotas to allow for uncatchable fish in one fishery to be reallocated to the other. Fish will be deemed "uncatchable" by a respective commercial or recreational fishery only after considering all possible annual management actions to allow for their harvest which meet framework harvest management objectives, including single species or exclusive registration

fisheries. Implementation of inseason transfers will require (a) consultation with the pertinent recreational and commercial SAS members and the STT and (b) a clear establishment of available fish and impacts from the transfer.

3. An exchange ratio of four coho to one chinook shall be considered a desirable guideline for preseason trades. Deviations from this guideline should be clearly justified. Inseason trades and transfers may vary to meet overall fishery objectives. (The exchange ratio of four coho to one chinook approximately equalizes the species trade in terms of average ex-vessel values of the two salmon species in the commercial fishery. It also represents an average species catch ratio in the recreational fishery.)

4. Any increase or decrease in the recreational or commercial total allowable catch (TAC), resulting from an inseason restructuring of a fishery or other inseason management action, does not require reallocation of the overall north of Cape Falcon non-Indian TAC.

5. The commercial TACs of chinook and coho derived during the preseason allocation process may be varied by major subareas (i.e., north of Leadbetter Point and south of Leadbetter Point) if there is a need to do so to decrease impacts on weak stocks. Deviations in each major subarea will generally not exceed 50% of the TAC of each species that would have been established without a geographic deviation in the distribution of the TAC. Deviation of more than 50% will be based on a conservation need to protect the weak stocks and will provide larger overall harvest for the entire fishery north of Cape Falcon than would have been possible without the deviation. In addition, the actual harvest of coho may deviate from the initial allocation as provided in Section 6.5.3.2 for certain selective fisheries.

6. The recreational TACs of chinook and coho derived during the preseason allocation process will be distributed among four major recreational port areas as described in the coho and chinook distribution sections below. Additionally, based on the recommendations of the SAS members representing the ocean sport fishery north of Cape Falcon, the Council will include criteria in its preseason salmon management recommendations to guide any inseason transfer of coho among the recreational subareas to meet recreational season duration objectives. Inseason redistributions of quotas within the recreational fishery or the distribution of allowable coho catch transfers from the commercial fishery may deviate from the preseason distribution. The Council may also deviate from subarea quotas to (1) meet recreational season objectives based on agreement of representatives of the affected ports and (2) in accordance with Section 6.5.3.2 with regard to certain selective fisheries.

5.3.1.3 Recreational Subarea Allocations

Coho

The north of Cape Falcon preseason recreational TAC of coho will be distributed to provide 50% to the area north of Leadbetter Point and 50% to the area south of Leadbetter Point. The distribution of the allocation north of Leadbetter point will vary, depending on the existence and magnitude of an inside fishery in Area 4B which is served by Neah Bay.

In years with no Area 4B fishery, the distribution of coho north of Leadbetter Point (50% of the total recreational TAC) will be divided to provide 74% to the area between Leadbetter Point and the Queets River (Westport), 5.2% to the area between Queets River and Cape Flattery (La Push), and 20.8% to the area north of the Queets River (Neah Bay). In years when there is an Area 4B (Neah Bay) fishery under state management, the allocation percentages north of Leadbetter Point will be modified to maintain more equitable fishing opportunity among the ports by decreasing the ocean harvest share for Neah Bay. This will be accomplished by adding 25% of the numerical value of the Area 4B fishery to the recreational TAC north of Leadbetter Point prior to calculating the shares for Westport and La Push. The increase to Westport and La Push will be subtracted from the Neah Bay ocean share to maintain the same total harvest allocation north of Leadbetter Point. Table 5-2 displays the resulting percentage allocation of the total recreational coho catch north of Cape Falcon among the four recreational port areas (each port area allocation will be rounded to the nearest hundred fish, with the largest quotas rounded downward if necessary to sum to the TAC).

TABLE 5-2. Percentage allocation of total allowable coho harvest among the four recreational port areas north of Cape Falcon.

Port Area	Without Area 4B Add-on	With Area 4B Add-on	
Columbia River	50.0%	50.0%	
Westport	37.0%	37.0%	plus 17.3% of the Area 4B add-on
La Push	2.6%	2.6%	plus 1.2% of the Area 4B add-on
Neah Bay	10.4%	10.4%	minus 18.5% of the Area 4B add-on

Example distributions of the recreational coho TAC north of Leadbetter Point would be as follows:

Sport TAC North of Cape Falcon	Without Area 4B Add-On				With Area 4B Add-On [a/]					
								Neah Bay		
	Columbia River	Westport	La Push	Neah Bay	Columbia River	Westport	La Push	Ocean	Add-on	Total
50,000	25,000	18,500	1,300	5,200	25,000	19,900	1,400	3,700	8,000	11,700
150,000	75,000	55,500	3,900	15,600	75,000	57,600	4,000	13,600	12,000	25,400
300,000	150,000	111,000	7,800	31,200	150,000	114,500	8,000	27,500	20,000	47,500

a/ The add-on levels are merely examples. The actual numbers in any year would depend on the particular mix of stock abundances and season determinations.

Chinook

Subarea distributions of chinook will be managed as guidelines and shall be calculated by the STT with the primary objective of achieving all-species fisheries without imposing chinook restrictions (i.e., area closures or bag limit reductions). Chinook in excess of all-species fisheries needs may be utilized by directed chinook fisheries north of Cape Falcon or by negotiating a chinook/coho trade with another fishery participant group.

Inseason management actions may be taken by NMFS Regional Director to assure that the primary objective of the chinook harvest guidelines for each of the three recreational subareas north of Cape Falcon are met. Such actions might include: closure from 0 to 3, or 0 to 6, or 3 to 200, or 5 to 200 nautical miles from shore; closure from a point extending due west from Tatoosh Island for 5 miles, then south to a point due west of Umatilla Reef Buoy, then due east to shore; closure from North Head at the Columbia River mouth north to Leadbetter Point; change species which may be landed; or other actions as prescribed in the annual regulations.

5.3.2 Commercial and Recreational Fisheries South of Cape Falcon (Old Section 8.1.2)

The allocation of allowable ocean harvest of coho salmon south of Cape Falcon has been developed to provide a more stable recreational season and increased economic benefits of the ocean salmon fisheries at varying stock abundance levels. When coupled with various recreational harvest reduction measures or the timely transfer of unused recreational allocation to the commercial fishery, the allocation schedule is designed to help secure recreational seasons extending at least from Memorial Day through Labor Day, assist in maintaining commercial markets even at relatively low stock sizes, and fully utilize available harvest. Total ocean catch of coho south of Cape Falcon will be treated as a quota to be allocated between troll and recreational fisheries as provided in Table 5-3.

(Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be accomplished during the Council's preseason process.)

TABLE 5-3. Allocation of allowable ocean harvest of coho salmon (thousands of fish) south of Cape Falcon.[a/]

Total Allowable Ocean Harvest	Recreational Allocation		Commercial Allocation	
	Number	Percentage	Number	Percentage
≤100	≤100[b/c/]	100[b/]	b/	b/
200	167[b/c/]	84[b/]	33[b/]	17[b/]
300	200	67	100	33
350	217	62	133	38
400	224	56	176	44
500	238	48	262	52
600	252	42	348	58
700	266	38	434	62
800	280	35	520	65
900	290	32	610	68
1,000	300	30	700	70
1,100	310	28	790	72
1,200	320	27	880	73
1,300	330	25	970	75
1,400	340	24	1,060	76
1,500	350	23	1,150	77
1,600	360	23	1,240	78
1,700	370	22	1,330	78
1,800	380	21	1,420	79
1,900	390	21	1,510	79
2,000	400	20	1,600	80
2,500	450	18	2,050	82
3,000	500	17	2,500	83

a/ The allocation schedule is based on the following formula: first 150,000 coho to the recreational base (this amount may be reduced as provided in footnote b); over 150,000 to 350,000 fish, share at 2:1, 0.667 to troll and 0.333 to recreational; over 350,000 to 800,000 the recreational share is 217,000 plus 14% of the available fish over 350,000; above 800,000 the recreational share is 280,000 plus 10% of the available fish over 800,000.
Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow general coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be determined in the Council's preseason process. Deviations from the allocation may also be allowed to meet jeopardy standards for ESA listed stocks (e.g., the 1998 biological opinion for California coastal coho requires no retention of coho in fisheries off California).

b/ If the commercial allocation is insufficient to meet the projected hook-and-release mortality associated with the commercial all-salmon-except-coho season, the recreational allocation will be reduced by the number needed to eliminate the deficit.

c/ When the recreational allocation is 167,000 coho or less, special allocation provisions apply to the recreational harvest distribution by geographic area (unless superseded by requirements to meet a jeopardy standard for ESA listed stocks); see text of FMP as modified by Amendment 11 allocation provisions.

The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while

still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

The allocation schedule is also designed to assure there are sufficient coho allocated to the troll fishery at low stock levels to ensure a full chinook troll fishery. This hooking mortality allowance will have first priority within the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for the estimated incidental coho mortality will be deducted from the recreational share. At higher stock sizes, directed coho harvest will be allocated to the troll fishery after hooking mortality needs for chinook troll fishing have been satisfied.

The allowable harvest south of Cape Falcon may be further partitioned into subareas to meet management objectives of the FMP. Allowable harvests for subareas south of Cape Falcon will be determined by an annual blend of management considerations including:

1. abundance of contributing stocks
2. allocation considerations of concern to the Council
3. relative abundance in the fishery between chinook and coho
4. escapement goals
5. maximizing harvest potential

Troll coho quotas may be developed for subareas south of Cape Falcon consistent with the above criteria. California recreational catches of coho, including projections of the total catch to the end of the season, would be included in the recreational allocation south of Cape Falcon, but the area south of the Oregon-California border would not close when the allocation is met; except as provided below when the recreational allocation is at 167,000 or fewer fish.

When the south of Cape Falcon recreational allocation is equal to or less than 167,000 coho:

1. The recreational fisheries will be divided into two major subareas, as listed in #2 below, with independent quotas (i.e., if one quota is not achieved or is exceeded, the underage or overage will not be added to or deducted from the other quota; except as provided under #3 below).

2. The two major recreational subareas will be managed within the constraints of the following impact quotas, expressed as a percentage of the total recreational allocation (percentages based on avoiding large deviations from the historical harvest shares):

   a. Central Oregon (Cape Falcon to Humbug Mountain) - 70%

   b. South of Humbug Mountain - 30%

      In addition,

      (1) Horse Mountain to Point Arena will be managed for an impact guideline of 3 percent of the south of Cape Falcon recreational allocation, and

      (2) there will be no coho harvest constraints south of Point Arena. However, the projected harvest in this area (which averaged 1,800 coho from 1986-1990) will be included in the south of Humbug Mountain impact quota.

3. Coho quota transfers can occur on a one-for-one basis between subareas if chinook constraints preclude access to coho.

SELECTIVE FISHERY GUIDELINES -- SECTION 6.5 OF AMENDMENT 14

6.5 SEASONS AND QUOTAS

* * * * * * *

6.5.3 Species-Specific and Other Selective Fisheries

6.5.3.1 Guidelines

In addition to the all-species and single or limited species seasons established for the commercial and recreational fisheries, other species-limited fisheries, such as "ratio" fisheries and fisheries selective for marked or hatchery fish, may be adopted by the Council during the preseason regulatory process. In adopting such a fishery, the Council will consider the following guidelines:

1. Harvestable fish of the target species are available.

2. Harvest impacts on incidental species will not exceed allowable levels determined in the management plan.

3. Proven, documented, selective gear exists (if not, only an experimental fishery should be considered).

4. Significant wastage of incidental species will not occur or a written economic analysis demonstrates the landed value of the target species exceeds the potential landed value of the wasted species.

5. The species specific or ratio fishery will occur in an acceptable time and area where wastage can be minimized and target stocks are maximally available.

6. Implementation of selective fisheries for marked or hatchery fish must be in accordance with U.S. v. Washington stipulation and order concerning co-management and mass marking (Case No. 9213, Subproceeding No. 96-3) and any subsequent stipulations or orders of the U.S. District Court, and consistent with international objectives under the Pacific Salmon Treaty (e.g., to ensure the integrity of the coded-wire tag program).

6.5.3.2 Selective Fisheries Which May Change Allocation Percentages North of Cape Falcon

As a tool to increase management flexibility to respond to changing harvest opportunities, the Council may implement deviations from the specified port area allocations and/or gear allocations to increase harvest opportunity through fisheries that are selective for marked salmon stocks (e.g., marked hatchery salmon). The benefits of any selective fishery will vary from year to year and fishery to fishery depending on stock abundance, the mix of marked and unmarked fish, projected hook-and-release mortality rates, and public acceptance. These factors should be considered on an annual and case-by-case basis when utilizing selective fisheries. The deviations for selective fisheries are subordinate to the allocation priorities in Section 5.3.1.1 and may be allowed under the following management constraints:

1. Selective fisheries will first be considered during the months of August and/or September. However, the Council may consider selective fisheries at other times, depending on year to year circumstances identified in the preceding paragraph.

2. The total impacts within each port area or gear group on the critical natural stocks of management concern are not greater than those under the original allocation without the selective fisheries.
3. Other allocation objectives (i.e., treaty Indian, or ocean and inside allocations) are satisfied during negotiations in the North of Cape Falcon Forum.

4. The selective fishery is assessed against the guidelines in Section 6.5.3.1.

5. Selective fishery proposals need to be made in a timely manner in order to allow sufficient time for analysis and public comment on the proposal before the Council finalizes its fishery recommendations.

If the Council chooses to deviate from the specified port and/or gear allocations, the process for establishing a selective fishery would be as follows:

1. Allocate the TAC among the gear groups and port areas according to the basic FMP allocation process described in Section 5.3.1 without the selective fishery.

2. Each gear group or port area may utilize the critical natural stock impacts allocated to its portion of the TAC to access additional harvestable, marked fish, over and above the harvest share established in step one, within the limits of the management constraints listed in the preceding paragraph.

Inside Back Cover
65# Sab X Gold

ACKNOWLEDGEMENTS

SALMON TECHNICAL TEAM

Mr. Doug Milward, Chair
Washington Department of Fish and Wildlife, Olympia, WA

Mr. Allen Grover
California Department of Fish and Game, Healdsburg, CA

Dr. Robert Kope
National Marine Fisheries Service, Seattle, WA

Mr. Curt Melcher
Oregon Department of Fish and Wildlife, Portland, OR

Mr. Michael Mohr
National Marine Fisheries Service, Tiburon, CA

Dr. Gary Morishima
Indian Tribes, Mercer Island, WA

Mr. Dell Simmons
National Marine Fisheries Service, Lacey, WA

The Salmon Technical Team received assistance from numerous agency and tribal personnel in completing this report. Special thanks are due to **Ms. Cindy LeFleur**, **Ms. Wendy Beeghley**, **Mr. Scott Barrow**, **Mr. Stuart Ellis**, **Dr. Lloyd Goldwasser**, **Ms. Melodie L. Palmer-Zwahlen**, and **Mr. Larrie LaVoy** .

COUNCIL STAFF

Dr. John Coon
Ms. Kerry Aden
Ms. Renee Heyden
Ms. Sandra Krause

A report of the Pacific Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award Number NA07FC0026.

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LIST OF ACRONYMS AND ABBREVIATIONS

CDFG	California Department of Fish and Game
Council	Pacific Fishery Management Council
CRTAC	Columbia River Technical Advisory Committee
CVI	Central Valley index
CWT	coded-wire tag
ESA	Endangered Species Act
FMP	fishery management plan
FRAM	Fishery Regulation Assessment Model
GSI	genetic stock identification
HRM	Harvest Rate Model
KMZ	Klamath management zone (ocean zone between Humbug Mountain and Horse Mountain where management emphasis is on Klamath River fall chinook)
KOHM	Klamath Ocean Harvest Model
KRTAT	Klamath River Technical Advisory Team
LRH	lower Columbia River hatchery (tule fall chinook returning to hatcheries below Bonneville Dam)
LRW	lower Columbia River wild (bright fall chinook spawning naturally below Bonneville Dam)
MCB	mid-Columbia River brights (bright hatchery fall chinook released in the mid-Columbia River)
MSY	maximum sustainable yield
NA	not available
NMFS	National Marine Fisheries Service
OCN	Oregon coastal natural (coho)
OCNL	Oregon coastal natural (coho) lake component
OCNR	Oregon coastal natural (coho) river component
ODFW	Oregon Department of Fish and Wildlife
OPI	Oregon production index (coho salmon stock index south of Leadbetter Point)
OPIH	Oregon production index area hatchery (adult coho)
OPITT	Oregon Production Index Technical Team
PRIH	Oregon coastal private hatchery (adult coho)
PSC	Pacific Salmon Commission
SCH	Spring Creek Hatchery (tule fall chinook returning to Spring Creek Hatchery)
SRS	Stratified random sampling
SSC	Scientific and Statistical Committee
STEP	Salmon Trout Enhancement Program (Oregon)
STT	Salmon Technical Team (formerly the Salmon Plan Development Team)
TAC	total allowable catch
URB	upper river brights (naturally spawning bright fall chinook normally migrating past McNary Dam)
USFWS	U.S. Fish and Wildlife Service
VSI	visual stock identification
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife

INTRODUCTION

This is the second report in an annual series of four reports prepared by the Salmon Technical Team (STT) of the Pacific Fishery Management Council (Council) to document and help guide salmon fishery management off the coasts of Washington, Oregon, and California. This report will be formally reviewed at the Council's March meeting. The third and fourth reports in this series will be developed at the close of the March and April Council meetings, respectively. They will analyze the impacts of the Council's proposed and final ocean salmon fishery management recommendations for 2000.

This report provides year 2000 salmon stock abundance projections and an analysis of the impacts of 1999 regulations, or regulatory procedures, on the projected 2000 abundance. The report focuses on chinook and coho stocks that have been important in determining Council fisheries in recent years and on stocks listed under the Endangered Species Act which have established jeopardy standards.

Chapter I provides a summary of stock abundance projections. Chapters II and III provide detailed stock-by-stock analyses of abundance and a description of prediction methodology and accuracy of past abundance predictions for chinook and coho salmon, respectively. Chapter IV summarizes abundance information for pink salmon. Four appendices provide supplementary information as follows: Appendix A provides a summary of Council stock management goals; Appendix B contains pertinent data for Oregon production index (OPI) area coho; Appendix C provides historical salmon catch data for the Cape Flattery and Strait of Juan de Fuca areas; and Appendix D contains the Council's current harvest allocation schedules.

The STT notes that differences between preseason and postseason estimates are caused by a number of factors, including: (1) inaccuracies in abundance forecasts for these and other stocks which are exploited by mixed stock fisheries, (2) deviations of actual catches and fishery patterns from preseason expectations, (3) anomalies in stock distribution and migration patterns, and (4) for the Puget Sound coho stocks, differences in assessment methodologies (postseason estimates are based on run reconstruction assumptions which differ substantially from those represented in the Fishery Regulatory Assessment Model).

CHAPTER I
ABUNDANCE PROJECTIONS AND CONCERNS

ABUNDANCE PROJECTIONS

Abundance expectations in 2000 are summarized for key chinook and coho salmon stocks in Tables I-1 and I-2, respectively. Information on pink salmon abundance, which is only significant in odd-numbered years, is contained in Chapter IV. Overall Council salmon management goals, as developed for Amendment 14, are presented in Appendix A, Table A-1. The Council expects Amendment 14 to be implemented during the 2000 salmon season.

In addition to the key stocks with abundance projections listed in Tables I-1 and I-2, Council management decisions for the 2000 ocean salmon fishing seasons may be constrained by other stocks listed under the Endangered Species Act (ESA) which do not have abundance projections. These include Sacramento River winter, Central Valley spring, California coastal, and Snake River fall chinook; and central California and southern Oregon/northern California coho.

SALMON TECHNICAL TEAM CONCERNS

The ability of state and tribal comanagers to reach agreement on preseason abundance forecasts is critical to enable the Salmon Technical Team (STT) to prepare reports necessary to initiate the annual Council planning process in a timely manner. The lack of agreement places the STT in the position of reanalyzing the bases of competing forecasts de-novo, with neither access to all available information nor the time to undertake a reasonable analysis. Since it is not feasible for the STT to generate a separate forecast of its own, when abundance forecasts differ significantly, multiple model analyses must be performed. This can greatly increase the STT's workload and the difficulty of presenting abundance forecasts and modeling results in a form that is readily comprehensible to the public.

TABLE I-1. Preliminary preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Area, Type of Prediction and/or Stock or Stock Grouping	Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction and Source
California Central Valley (Index) Sacramento and San Joaquin Basins, Fall, Late Fall and Spring Run	790.4	847.7 (644.3)	1,051.0 (629.1)	849.0 (1,059.1)	533.0 (742.2)	654.0 (1,313.4)	Linear regression analysis of inriver age-2 jacks on CVI of the following year. California Department of Fish and Game.
Klamath River (Ocean Abundance) Fall Run, Age-3 and -4 Fish	205.9	105.4 (113.0)	124.8 (125.9)	155.4 (138.9)	454.7 (283.8)	172.1 (481.4)	Linear regression analysis of age-specific ocean abundance estimates on inriver runs of same cohort; 1979-1992 broods. Klamath River Technical Team.
Oregon Coast							
North and South/Local Migrating	---------- Preseason Estimates Not Made ----------						None.
Columbia River (Ocean Escapement)							
Upriver Spring	134.0	24.6 (38.6)	36.2 (38.3)	67.8 (114.1)	37.2 (51.5)	12.0 (10.2)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Willamette Spring	58.5	46.0 (52.6)	32.8 (43.5)	27.4 (34.5)	38.7 (33.4)	48.5 (39.1)	Age-specific linear regressions of cohort returns in previous run years. ODFW staff.
Sandy Spring	3.8	4.3 (3.3)	3.9 (4.2)	3.8 (5.2)	3.3 (4.1)	4.3 (2.5)	Recent year average. ODFW staff.
Cowlitz Spring	2.0	2.1 (1.6)	1.5 (1.1)	1.4 (1.9)	1.9 (1.8)	1.4 (2.2)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Kalama Spring	1.4	0.3 (1.0)	0.5 (0.4)	0.7 (0.6)	0.6 (0.6)	0.5 (0.7)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Lewis Spring	2.6	1.5 (1.7)	0.9 (1.6)	2.4 (2.2)	1.9 (1.7)	2.7 (3.7)	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Upriver Summer	33.3	16.5 (26.2)	17.3 (21.5)	16.7 (28.0)	16.8 (16.1)	9.6 (15.0)	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
URB Fall	171.1	147.5 (166.7)	150.8 (142.3)	166.4 (164.9)	88.9 (143.2)	110.3 (106.5)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
SCH Fall	21.9	65.8 (49.3)	14.2 (20.2)	21.9 (27.4)	27.6 (33.1)	17.5 (33.8)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
LRW Fall	3.5	2.6 (3.3)	8.1 (7.3)	7.5 (12.3)	8.8 (14.6)	12.4 (16.0)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
LRH Fall	23.7	34.8 (37.4)	19.2 (45.3)	54.2 (57.4)	37.7 (75.5)	35.8 (46.4)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
MCB Fall	50.6	38.3 (49.9)	47.8 (36.8)	72.1 (59.7)	40.8 (59.7)	26.5 (34.2)	Age-specific average cohort ratios/cohort regressions. Columbia River Joint Staff.
Washington Coast (Ocean Escapement)							
Willapa Bay Natural	4.2	4.2	-	-	-	-	
Willapa Bay Hatchery	18.9	15.5	64.5	49.0 (54.0)	34.6 (48.8)	- (41.8)	Mean return per release by age class.
Other Coastal Stocks	---------- Not Available ----------						Washington Department of Fish and Wildlife and tribes.

TABLE I-1. Preliminary preseason **adult chinook** salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Area, Type of Prediction and/or Stock or Stock Grouping		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction and Source
Puget Sound[a/]								Washington Department of Fish and Wildlife and tribes.
Nooksack/Samish	Hatchery	19.0	27.0	28.0	34.0	27.0	38.5 (22.2)	brood release times average return-at-age/release.
East Sound Bay	Hatchery	5.0	2.2	0.5	1.2	1.7	3.5 (0.1)	Average 1994-1996 run size.
Skagit	Natural	7.3	7.6	6.6	6.4	7.1	5.0 (9.6)	1987-1991average return at age and 1989-1997 return/spawner.
	Hatchery	0.0	0.0	0.0	0.1	1.0	1.6 (3.3)	1994 brood release times average return per release.
Stillaguamish	Natural	1.5	1.5	1.6	1.6	1.3	1.8 (1.4)	Estimate based on spawner -recruit information
Snohomish	Natural	6.0	5.6	5.6	5.2	4.2	4.3 (5.9)	Average of 1996-1999 run size.
	Hatchery	2.0	7.8	6.5	7.7	6.7	2.2 (6.0)	Lbs released times average return per lb release.
Tulalip	Hatchery	5.0	4.5	2.5	4.0	2.7	2.3 (4.1)	1995 brood release times average return per release.
South Puget Sound	Natural	17.5	14.4	21.8	18.2	19.0	21.7 (34.5)	Average return/spawner times 1996 run size times 1996 escapement for Puyallup. Average 1994-1998 run size for Nisqually.
	Hatchery	65.4	70.1	67.8	65.1[b/]	51.9	49.6 (74.5)	Average return at age times cohort release for Green, McAllister, and 10E. Mean run size for Nisqually and Coulter Creek. Mean return time number released for Puyallup and Chambers Creek Average of 2 different methods for the Deschutes River: (1) mean return/ fingerling release times 1996 brood fingerling releases and (2) mean return per lb released times 1996 brood lbs released. Average of 2 different methods for Carr Inlet: (1) 1980-1998 average run size and (2) average return/lb released times 1996 brood lbs released.
Hood Canal	Natural and Hatchery	17.4	14.0	6.7	2.7	9.0	3.9 (9.0)	Hatchery lbs released times 1995-1999 average return, and 1995-1998 natural run reconstruction contributions.
Strait of Juan de Fuca	Natural	3.4	0.9	0.9	0.8	0.9	0.9 (0.9)	1988-1997 mean return at age for Hoko. 1993-1998 mean run size for Elwha.
	Hatchery	0.8	1.9	1.7	2.2	2.8	3.0 (1.9)	BY 1985-1995 expanded CWT returns.

a/ Forecast is Puget Sound run size available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries. Postseason estimates not available for 1996.
b/ The Muckleshoot Tribe's Green River Hatchery chinook forecast is 10,857 based on the 1990-1995 average hatchery return to Area 10A. This results in a South Sound hatchery estimate of 58,000 fish.

TABLE I-2. Preliminary, preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction
OPI Area (Total Abundance) (California and Oregon Coasts and Columbia River)		727.9	620.6 (371.9)	165.8 (233.1)	463.8 (239.7)	372.8 (286.6)	369.8 (214.6)	Sum of stock component estimates.
OPI Public Hatchery		671.4	559.2 (319.6)	118.4 (203.6)	376.1 (215.3)	309.2 (182.6)	301.5 (145.6)	Multiple linear regression of OPI public hatchery jacks to adults adjusted for Columbia River delayed smolt release, data base 1970-1999 SRS accounting. Public hatchery prediction is partitioned into Columbia River early and late, and coastal stocks based on the percent of jacks observed and recent year average stock specific maturation rates.
Columbia River Early		326.3	325.5 (174.9)	63.8 (126.4)	206.9 (129.8)	142.2 (98.0)	196.8 (74.4)	
Columbia River Late		278.0	140.9 (120.7)	24.9 (47.3)	86.5 (53.7)	114.4 (30.8)	61.3 (22.5)	
Coastal		67.1	92.8 (24.0)	29.7 (29.9)	82.7 (31.8)	52.7 (53.8)	43.4 (48.7)	
OCN		55.9	60.7 (51.9)	47.2 (29.2)	86.4 (24.1)	63.2 (102.9)	60.0 (65.5)	For river production, relates ocean recruits (SRS Accounting) to upwelling, sea surface temperature; data base 1970-1999. Most recent 3-year average abundance for lake production.
STEP		0.6	0.7 (0.4)	0.2 (0.3)	1.3 (0.3)	0.4 (1.2)	8.3 (0.5)	Smolt production with 1998 smolt to adult survival rates adjusted by changes in OPI public hatchery jacks per smolt between 1999 and 1998 release years.
Washington Coast								
Willapa	Natural	9.9	8.3	3.3	-	-	-	Marine survival estimate from Bingham Creek jack returns applied to estimate smolt production
	Hatchery	19.6	40.5	20.8	72.5	72.1	50.4	Ratio of 1998 jack return to 1991-1997 average applied to average survival/release.
Grays Harbor	Natural	47.8	57.7	30.1	26.1	121.4	103.4	1995 brood escapement times average return per spawner, adjusted by smolt production estimates and jack return rate.
	Hatchery	75.8	30.4	25.6	104.3	95.7	108.1	Smolt releases times expected marine survivals based on jack return rates.
Quinault	Natural	4.4	7.3	6.5	2.0	4.9	10.3	1991-1995 brood year average ocean recruits per spawner, adjusted for expected reduced survival.
	Hatchery	7.4	8.2	3.9	5.1	14.0	11.6	1992-1995 average adult survival rate applied to release.
Queets	Natural	2.7	4.3	4.2	4.3	8.3	12.1	1992-1995 brood year average survival rate to ocean recruit, for CWT and unmarked smolts applied to 1997 brood smolt production.
	Hatchery	11.8	13.8	4.6	16.9	28.1	21.9	1992-1995 brood year average survival rate to ocean recruit applied to smolt release. Includes supplementation releases, using same method.
Hoh	Natural	3.5	3.2	3.4	2.8	4.2	6.8	Average Queets smolts per square mile multiplied by 299 square miles of Hoh River watershed and recent year marine survivals for Bingham Creek and Queets.

TABLE I-2. Preliminary, preseason **adult coho** salmon stock ocean abundance forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		Preseason Estimates of Adults (Postseason Estimates in Parentheses) 2000	1999	1998	1997	1996	1995	Methodology for 2000 Prediction
Quillayute Fall Run	Natural	8.7	14.5	8.0	8.9	13.0	13.1	Average recruits per spawner multiplied by the 1997 spawner escapement.
	Hatchery	13.9	9.4	4.4	9.1	13.9	7.6	Mean ocean recruits per release, multiplied by releases.
Quillayute Summer Run	Natural	1.6	1.2	1.3	1.6	0.9	3.1	Recent average ocean recruits multiplied by actual brood year escapement.
	Hatchery	5.4	3.5	1.8	3.6	5.1	2.1	Average ocean recruits per release, multiplied by the number of smolts released.
WA Coast Total	Natural	78.6	96.5	56.8	45.7	152.7	148.8	
	Hatchery	133.9	105.8	61.1	211.5	228.9	201.7	
Puget Sound[a/]								b/
Strait	Natural	18.0	14.7	16.8	6.5	10.7	11.4	
	Hatchery	13.6	37.7	28.3	29.7	38.2	40.5	
Nooksack-Samish	Natural	14.9	13.8	30.8	28.0	55.8	42.6	
	Hatchery	65.5	95.0	119.1	223.3	328.9	280.5	
Skagit	Natural	30.2	75.7	55.0	70.9	44.8	64.7	
	Hatchery	10.3	10.9	12.9	22.1	45.2	41.2	
Stillaguamish	Natural	17.7	35.7	47.8	36.0	51.6	70.3	
Snohomish	Natural	53.0	141.6	165.3	186.6	338.1	358.3	
	Hatchery	62.1	87.8	47.1	184.6	212.9	228.0	
South Sound	Natural	11.7	19.4	57.2	135.0	142.5	127.1	
	Hatchery	121.8	372.1	408.7	674.1	659.9	488.1	
Hood Canal	Natural	c/	65.1	108.0	78.4	25.1	36.4	
	Hatchery	38.5	96.8	95.2	66.3	59.6	58.9	
Puget Sound Total	Natural	c/	366.0	480.9	541.4	668.6	710.8	
	Hatchery	311.8	700.3	711.3	1,200.1	1,344.7	1,137.2	

a/ Run sizes scaled to FRAM base period (1979-1981) catch and escapement.

b/ A variety of methods were used for 1999, primarily based on smolt production and survival. See text in Chapter III and "1999 Puget Sound Coho Salmon Forecast Methodology" report for details.

c/ A range of 34,300 to 79,400 for Hood Canal (see Chapter III for details). With this range, the total natural production range is 179,800 to 224,900 fish

CHAPTER II
CHINOOK SALMON ASSESSMENT

SACRAMENTO RIVER FALL CHINOOK SALMON

Predictor Description

The Council's framework amendment sets the escapement goal for Sacramento River fall chinook as a range from 122,000 to 180,000 adults. The fall stock comprises over 90% of the escapement of all chinook stocks that use Central Valley streams and hatcheries. The Central Valley index (CVI), which provides an annual index of abundance for the combined Central Valley chinook stocks, is the sum of ocean fishery chinook harvests in the area south of Point Arena plus the Central Valley adult chinook spawning escapement (Table II-1). The CVI harvest index is the ocean harvest landed south of Point Arena as a percent of the CVI.

Until 1989, the Salmon Technical Team (STT) based its projection of the CVI on recent CVI levels (with general consideration given for brood year natural escapements), hatchery releases, and the previous year jack runs. Beginning in 1989 and continuing through 1991, the CVI definition was modified to exclude spawning escapements of Sacramento River winter chinook and several possible predictors were examined, including weight and number of juveniles in hatchery releases and previous year jack returns. As a result of the analyses, since 1991, the STT has treated the regression between the Central Valley jack estimate for the previous year and the subsequent CVI as the best predictor of the forthcoming CVI (Figure II-1).

Predictor Performance

For the 1985-1999 period, the CVI preseason forecast has ranged from 0.50 to 1.67 times the postseason CVI estimate (Table II-2).

The 1999 CVI projection of 847,700 fish was based on the jack to CVI relationship from 1989 to 1998. The postseason estimate for the 1999 CVI was 644,300 fish, approximately 24% lower than the preseason projection (Table II-2). The postseason estimate of 52% for the CVI harvest index was 12% lower than the preseason projection of 59% (Table II-1).

2000 Stock Status

The CVI projection for 2000, based on the jack to CVI relationship of the most recent ten years of data (1990-1999), is 790,400 adult chinook (Figure II-1), 93% of the 1999 projection.

Evaluation of 1999 Regulations on 2000 Stock Abundance

The CVI harvest index has varied significantly since it was first calculated in 1970. After reaching its lowest level in 1985 (51%), the index rose to 78% in 1988 and ranged between 71% and 78% over the 1989-1995 period (Table II-1). The CVI harvest index fell to approximately 65% in 1996 and 1997, and to approximately 53% in 1998 and 1999. This decline in the CVI harvest index accompanied the reduction in fishing effort south of Point Arena between 1996 and 1999.

A repeat of 1999 regulations would be expected to result in a CVI harvest index similar to that observed in 1999 (52%). Applying the complement of this fraction (1 - 0.52) to the 2000 CVI projection of 790,400 fish and multiplying that quantity by the typical percentage of Central Valley chinook spawners that are fall run fish (approximately 90%), yields a projected 2000 adult escapement of 341,500 Sacramento River fall chinook, above the upper end of the escapement goal range (Figure II-2).

TABLE II-1. Indices of annual abundance and ocean fishery impacts on California Central Valley chinook in thousands of fish. (Page 1 of 1)

Year	Ocean Chinook Landings South of Pt. Arena			Hatchery and Natural Escapements of Central Valley Adults			CVI Abundance (Ocean Landings + Escapement)	CVI Harvest Index (%)[b/]
	Troll	Sport	Total	Fall	Other[a/]	Total		
1970	226.8	111.1	337.9	190.5	55.6[c/]	246.1	584.0	58
1971	150.7	166.3	317.0	190.6	62.0	252.6	569.6	56
1972	229.8	187.6	417.4	99.6	46.1	145.7	563.1	74
1973	422.5	180.9	603.4	227.1	27.1	254.2	857.6	70
1974	282.7	141.6	424.3	205.6	35.7	241.3	665.6	64
1975	234.4	92.7	327.1	159.2	47.6	206.8	533.9	61
1976	237.9	68.6	306.4	168.8	43.8	212.6	519.0	59
1977	263.8	76.6	340.4	148.7	42.8	191.5	531.9	64
1978	291.0	65.9	356.9	136.9	17.1	154.0	510.9	70
1979	234.1	108.5	342.6	167.9	11.3	179.2	521.8	66
1980	294.3	77.1	371.4	155.9	31.6	187.5	558.9	66
1981	289.9	73.8	363.7	189.3	18.8	208.1	571.8	64
1982	418.4	122.5	540.9	177.2	38.3	215.5	756.4	72
1983	178.2	53.0	231.2	121.0	12.8	133.8	365.0	63
1984	221.7	78.7	300.3	197.5	17.0	214.5	514.8	58
1985	212.3	121.8	334.1	308.9	18.1	327.0	661.1	51
1986	502.5	114.8	617.3	259.0	33.2	292.2	909.5	68
1987	446.8	152.8	599.7	188.0	25.5	213.5	813.2	74
1988	830.5	130.4	960.9	244.9	28.0	272.9	1,233.8	78
1989	363.8	130.9	494.7	149.6	17.9	167.5	662.2	75
1990	336.2	112.7	448.9	108.3	13.6	121.9	570.8	79
1991	254.6	62.1	316.7	112.3	15.3	127.6	444.3	71
1992	163.5	66.7	230.2	85.3	8.2	93.5	323.7	71
1993	259.7	99.3	359.0	131.5	10.4	141.9	500.9	72
1994	290.4	159.9	450.3	148.8	6.8	155.6	605.9	74
1995	670.6	354.6	1,025.2	272.0	16.2	288.2	1,313.4	78
1996	348.9	129.3	478.2	255.3	8.7	264.0	742.2	64
1997	482.5	208.4	690.9	350.8	17.4	368.2	1,059.1	65
1998	221.5	114.5	336.0	253.0	40.1	293.1	629.1	53
1999[d/]	258.8	76.1	334.9	294.5	14.9[e/]	309.4	644.3	52

a/ Spring run of the current calendar year and late fall and winter runs of the following calendar year.
b/ Ocean harvest landed south of Pt. Arena as a percent of the CVI.
c/ Percent of adults in 1970 spring run assumed the same as 1971 (72%, 5,500 total).
d/ Preliminary.
e/ Late-fall and winter contributions unknown - respective averages of 1995-1999 escapement used.

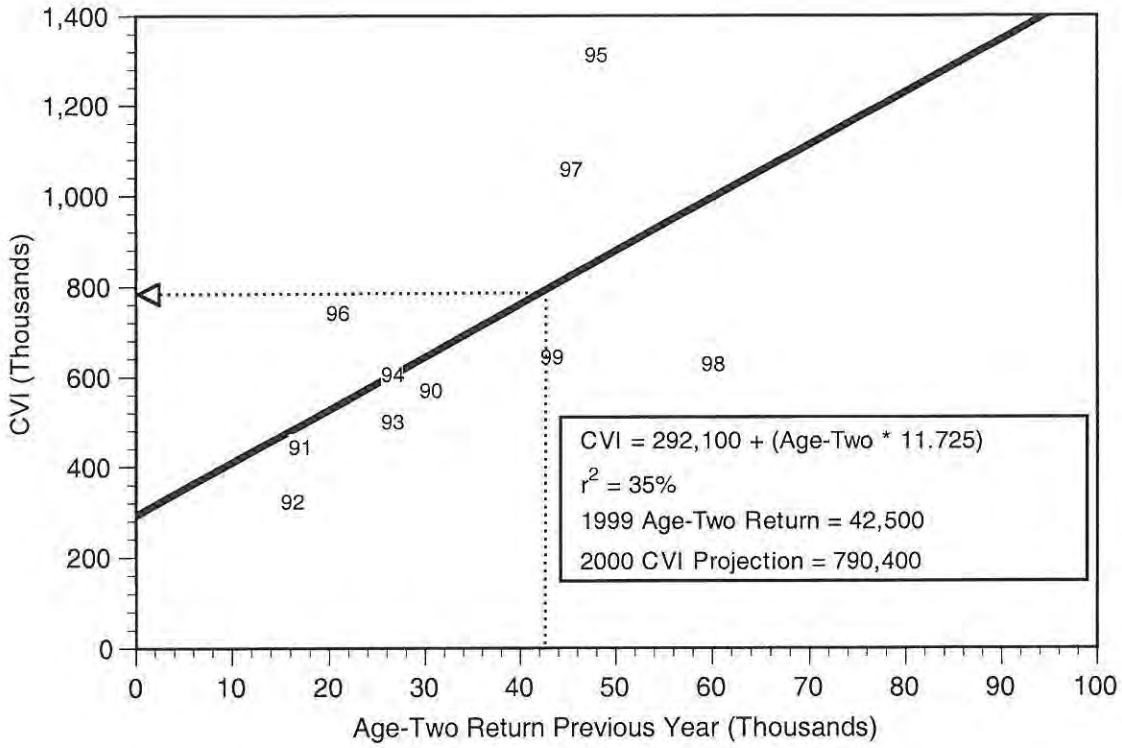

FIGURE II-1. Linear regression of CVI on inriver age-two Central Valley chinook of the previous year, 1990-1999. Years shown are CVI year.

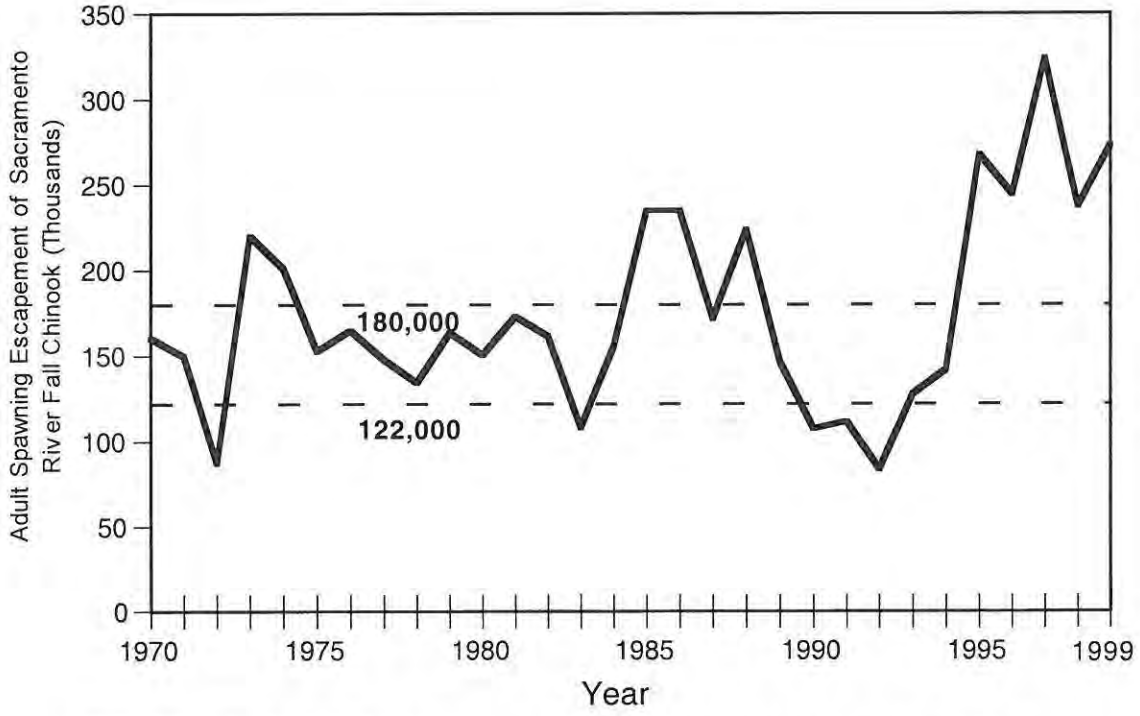

FIGURE II-2. Spawning escapements of adult Sacramento River fall chinook, 1970-1999, and the goal range for the stock of 122,000 to 180,000 adult fish (1999 estimate is preliminary).

TABLE II-2. Comparisons of preseason and postseason estimates for the CVI in thousands of fish. (Page 1 of 1)

Year or Average	Preseason	Postseason	Preseason/Postseason
1985	524.8	661.1	0.79
1986	546.5	909.5	0.60
1987	592.9	813.2	0.73
1988	707.1	1,233.8	0.57
1989	625-885	662.2	0.94-1.34
1990	500-900	570.7	0.88-1.58
1991	466.0	444.3	1.05
1992	452.0	323.7	1.40
1993	501.0	500.9	1.00
1994	503.0	605.9	0.83
1995	654.0	1,313.4	0.50
1996	533.0	742.2	0.72
1997	849.0	1,059.1	0.80
1998	1,051.0	629.1	1.67
1999	847.7	644.3	1.32

KLAMATH RIVER FALL CHINOOK

Predictor Description

For Klamath River fall chinook, linear regressions relate the preseason ocean abundance estimates of age-three and age-four fish to the previous year's river run size estimates of age-two and age-three fish, respectively (Table II-3). The ocean abundance estimates were derived from a cohort analysis of coded-wire tag (CWT) information (brood years 1979-1995). The y-intercept of the regressions was constrained to zero, which gives the biologically reasonable expectation that a river run size of zero predicts an ocean abundance of zero for the same cohort the following spring. The Klamath River regression models have been updated each year using the revised data points for age-three and age-four fish and the river run sizes of age-two and age-three fish of the previous year.

Ocean fisheries harvest small numbers of age-two and age-five Klamath River fall chinook. The abundance of age-two fish was not projected, because no precursor to age-two fish of that brood is available. The preseason ocean abundance of age-five fish was estimated by a product rather than a regression as follows: the 1999 age-four river run size was divided by the average age-four maturity rate, 0.937, to estimate the age-four ocean population from which the river run was derived, that quantity was then multiplied by the complement of the maturity rate and by an assumed over-winter survival rate of 0.80 to estimate the number of fish in this cohort that will carry over as age-five fish in 2000.

Predictor Performance

Since 1985, the preseason ocean abundance projections for age-three fish have ranged from 29% to 214% of the postseason abundance estimates (Table II-4). The age-four preseason projections for these same years ranged from 58% to 301% of the postseason estimates. For years of low stock abundance, particularly 1991-1994, the regression models generally have overpredicted ocean stock size. The 1999 age-three preseason prediction was 48% of the postseason estimate, while the age-four prediction was 261% of the postseason estimate (Table II-4).

Management of Klamath River fall chinook harvest since 1986 has attempted to achieve specific harvest rates on fully-vulnerable age-four and age-five fish in ocean and river fisheries (Table II-5). The Council has used a combination of quotas and time/area restrictions in ocean fisheries in an attempt to meet the harvest rate goal set each year. Since 1992, fisheries have been managed to achieve 50/50 allocation between tribal and non-tribal fisheries. River fisheries have been managed on the basis of adult chinook quotas (tribal net fishing) and partial quotas that trigger area closures (recreational fishing).

The Council's framework plan goal for Klamath River fall chinook (Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 67% , with a minimum escapement of 35,000 natural spawning adults. The amendment allows for any ocean and inriver allocation that meets the spawner reduction rate goal if it also meets the minimum escapement floor. Given the preseason estimate, the regulations adopted in 1999 by the Secretary of Commerce were expected to provide an inriver escapement of 47,900 adults, with 35,000 spawning in natural areas, and an age-four ocean harvest rate of 12%. Based on postseason estimates, the 1999 age-4 ocean harvest rate was 11% (Table II-6). The postseason estimate of the 1999 ocean abundance is 88,900 age-3 fish and 24,100 age-4 fish, contrasting with their preseason forecasts of 42,400 age-3 fish and 63,000 age-4 fish. The 1999 inriver spawning escapement was 33,000 adults, of which 18,600 spawned in natural areas. The low number of natural spawners represents a serious overprediction by the model.

2000 Stock Status

The year 2000 projected ocean abundance of Klamath River fall chinook salmon is 174,800 age-3 fish (Figure II-3) and 31,100 age-4 fish (Figure II-4).

In the absence of ocean and river fisheries in 2000, the projected stock abundance, in conjunction with the average maturity rates observed for the 1979-1994 broods (38.2%, 93.7%, and 100% for age-three, age-

TABLE II-3. Estimated number of fall chinook salmon by age entering the Klamath River in thousands of fish, including estimates of ocean harvest rates and ocean abundance.[a/] (Page 1 of 1)

	River Run					Ocean Harvest Rate		Ocean Abundance		
Calendar Year	Age-2	Age-3	Age-4	Age-5	Total Adults	Age-3	Age-4	Age-3	Age-4	Total
1981	28.1	64.0	14.3	1.8	80.1	0.42	0.66	246.6	45.6	292.2
1982	39.4	30.0	33.9	2.6	66.5	0.57	0.65	344.5	106.7	451.2
1983	3.8	35.8	20.7	0.9	57.5	0.28	0.70	103.8	84.9	188.7
1984	8.3	29.6	15.2	2.3	47.1	0.14	0.43	103.0	29.1	132.1
1985	69.4	30.7	32.7	0.9	64.4	0.25	0.29	138.0	46.0	184.0
1986	44.5	167.9	26.9	0.1	194.8	0.30	0.52	604.1	56.1	660.2
1987	19.0	120.7	88.0	b/	208.7	0.36	0.53	415.4	192.9	608.4
1988	24.0	136.5	53.5	1.2	191.3	0.37	0.45	612.2	108.7	720.9
1989	9.1	15.2	105.6	3.2	124.0	0.21	0.44	129.7	190.0	319.7
1990	4.4	9.1	26.6	0.2	35.8	0.61	0.61	113.3	68.7	182.0
1991	1.8	14.4	18.1	0.1	32.6	0.10	0.21	43.9	24.8	68.7
1992	13.7	7.3	18.3	1.0	26.7	0.02	0.04	20.8	20.0	40.8
1993	7.6	48.5	8.1	0.6	57.1	0.11	0.11	97.7	10.4	108.1
1994	14.4	35.6	25.0	1.0	61.6	0.05	0.07	68.7	30.3	99.1
1995	22.8	194.1	17.2	2.4	213.7	0.10	0.21	458.0	23.4	481.1
1996	9.5	38.5	136.6	0.3	175.4	0.08	0.17	112.1	171.5	283.8
1997	8.0	34.9	44.2	4.6	83.7	0.09	0.10	87.5	51.4	138.9
1998	4.7	58.9	30.0	1.7	90.5	0.02 c/	0.11	90.4[c/]	35.5[c/]	126.0
1999	19.1	29.4	20.2	1.3	50.9	d/	0.11c/	88.9[e/]	24.1	113.0

a/ Ocean harvest rate and ocean abundance of age-3 fish in 1981 and age-4 fish in 1981 and 1982 from CDFG; all others from KRTAT.
b/ Fewer than 50 fish.
c/ Preliminary: incomplete cohort data (age-5 data unavailable).
d/ Not estimated: incomplete cohort data (age-4 and age-5 data unavailable).
e/ Preliminary: incomplete cohort data (age-4 and age-5 data unavailable).

TABLE II-4. Comparisons of preseason and postseason ocean abundance estimates for age-three and age-four Klamath River fall chinook. (Page 1 of 1)

Age	Season	Preseason Estimate	Postseason Estimate	Pre/Postseason
3	1985	56,500	138,000	0.41
	1986	213,000[a/]	604,100	0.35
	1987	255,900	415,400	0.62
	1988	185,400	612,200	0.30
	1989	225,300	129,700	1.74
	1990	239,500	113,300	2.11
	1991	88,100	43,900	2.01
	1992	25,000	20,800	1.20
	1993	147,200	97,700	1.51
	1994	69,000	68,700	1.00
	1995	134,500	458,000	0.29
	1996	239,900	112,100	2.14
	1997	112,300	87,500	1.28
	1998	88,000	90,400[b/]	0.97
	1999	42,400	88,900[b/]	0.48
4	1985	45,500	46,000	0.99
	1986	53,000	56,100	0.94
	1987	164,900	192,900	0.85
	1988	149,100	108,700	1.37
	1989	172,400	190,000	0.91
	1990	40,100	68,700	0.58
	1991	35,700	24,800	1.44
	1992	35,800	20,000	1.79
	1993	31,300	10,400	3.01
	1994	68,900	30,300	2.27
	1995	37,600	23,400	1.61
	1996	214,800	171,700	1.25
	1997	43,100	51,400	0.84
	1998	36,800	35,500	1.04
	1999	63,000	24,100[b/]	2.61

a/ A 75% jack count adjustment was applied, because (1) most of the jacks were in the Trinity River and (2) the basin jack count was outside the data base.

b/ Preliminary (incomplete cohort data).

TABLE II-5. Summary of management objectives and performance for Klamath River fall chinook. (Page 1 of 1)

	Preseason Stock Abundance Projection		Postseason Stock Abundance Estimate		Preseason Harvest Rate Target on Age-four Fish[a/]		Actual Harvest Rate on Age-four Fish[b/]		Adult Numerical Preseason Harvest Target		Adult Actual Numerical Harvest	
Year	Age-3	Age-4	Age-3	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	213,000	53,000	604,100	56,100	0.35	0.50	0.52	0.74	72,000	37, 700	224,200	46,200
1987	255,900	164,900	415,400	192,900	0.35	0.53	0.53	0.56	121,200	78,200	260,900	73,300
1988	185,400	149,100	612,200	108,700	0.39	0.53	0.45	0.84	114,100	65,400	288,300	73,900
1989	225,300	172,400	129,700	190,000	0.38	0.49	0.44	0.46	128,100	67,600	114,000	54,300
1990	239,500	40,100	113,300	68,700	0.38	0.49	0.61	0.31	85,100	31,200	115,700	11,400
1991	88,100	35,700	43,900	24,800	0.16	0.28	0.21	0.44	16,700	12,800	9,700	13,100
1992	25,000	35,800	20,800	20,000	0.08	0.15	0.04	0.27	4,200	4,200	1,600	6,200
1993	147,200	31,300	97,700	10,400	0.15	0.43	0.11	0.49	20,100	22,500	12,400	13,200
1994	69,000	68,900	68,700	30,300	0.09	0.20	0.07	0.30	10,400	14,300	6,000	13,500
1995	134,500	37,600	458,000	23,400	0.09	0.32	0.21	0.21	13,500	18,500	54,300	20,100
1996	239,900	214,800	112,100	171,700	0.21	0.66	0.17	0.39	88,400	129,100	38,700	68,800
1997	112,300	43,100	87,500	51,400	0.12	0.43	0.10	0.26	17,600	26,500	13,800	17,800
1998	88,000	36,800	90,400	35,500	0.09	0.29	0.11	0.30	10,200	14,800	5,400	17,900
1999[c/]	42,400	63,000	88,900	24,100	0.12	0.28	0.11	0.45	12,300	18,100	7,400	16,700

a/ Ocean harvest rate target expressed as fraction of ocean stock projection. River harvest rate target expressed as fraction of fish projected to enter the river.
b/ Ocean harvest rate expressed as fraction of ocean stock abundance. River harvest rate expressed as fraction of fish entering the river.
c/ Preliminary.

TABLE II-6. Harvest levels and rates of age-three and age-four Klamath River fall chinook (biological years are defined as September 1 through August 31 for ocean fisheries). (Page 1 of 2)

	Ocean Fisheries							River Fisheries[a/]		
	KMZ			North of	South of		Ocean			
Year	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
HARVEST LEVELS (numbers of fish)										
Age Three										
1986	30,040	3,759	33,799	58,086	103,129	161,214	195,013	8,100	18,100	26,200
1987	24,826	6,032	30,858	43,453	84,487	127,940	158,798	11,400	11,400	22,800
1988	29,739	7,625	37,364	44,685	156,167	200,852	238,216	12,500	15,600	28,100
1989	735	5,307	6,042	12,206	10,342	22,547	28,589	2,700	900	3,600
1990	1,324	8,741	10,065	42,998	20,131	63,129	73,194	1,300	1,400	2,700
1991	0	1,457	1,457	840	2,174	3,014	4,471	2,118	1,719	3,837
1992	0	0	0	520	0	520	520	97	834	931
1993	0	1,077	1,077	1,034	9,216	10,249	11,326	5,426	3,411	8,837
1994	56	282	339	0	3,585	3,585	3,924	4,541	971	5,512
1995	0	1,712	1,712	21,428	26,151	47,579	49,291	11,839	4,129	15,968
1996	73	255	327	109	8,912	9,022	9,349	12,234	3,845	16,079
1997	0	1,310	1,310	2,292	4,584	6,875	8,185	2,166	2,736	4,902
1998[b/]	0	150	150	399	922	1,321	1,471	2,231	5,782	8,013
1999[b/]	0	0	0	2,778	1,852	4,630	4,630	4,887	1,735	6,622
Age Four										
1986	3,588	532	4,119	12,145	12,876	25,022	29,141	17,000	2,900	19,900
1987	13,784	2,992	16,777	48,526	36,751	85,276	102,053	41,000	8,500	49,500
1988	5,958	2,919	8,876	12,371	27,704	40,076	48,952	38,600	6,200	44,800
1989	12,359	13,10	25,461	33,928	24,217	58,145	83,606	41,000	7,700	48,700
1990	1,118	2,842	3,960	29,414	8,655	38,069	42,029	6,000	2,200	8,200
1991	73	656	728	747	3,715	4,462	5,190	7,569	1,187	8,756
1992	47	47	94	688	78	766	860	4,360	437	4,797
1993	0	0	0	230	884	1,114	1,114	3,786	164	3,950
1994	0	591	591	473	1,032	1,505	2,096	6,664	813	7,477
1995	0	176	176	1,843	2,779	4,622	4,797	2,957	377	3,334
1996	757	1,147	1,904	6,904	19,715	26,619	28,523	43,540	9,042	52,582
1997	303	682	986	1,630	2,389	4,019	5,005	8,734	2,585	11,319
1998[b/]	0	123	123	3,718	0	3,718	3,841	7,163	1,821	8,984
1999[b/]	25	450	476	1,439	813	2,252	2,728	8,679	488	9,167
HARVEST RATE										
Age Three										
1986	0.05	0.01	0.06	0.10	0.17	0.27	0.32	0.05	0.11	0.16
1987	0.06	0.01	0.07	0.10	0.20	0.31	0.38	0.09	0.09	0.19
1988	0.05	0.01	0.06	0.07	0.26	0.33	0.39	0.09	0.11	0.21
1989	0.01	0.04	0.05	0.09	0.08	0.17	0.22	0.18	0.06	0.24
1990	0.01	0.08	0.09	0.38	0.18	0.56	0.65	0.14	0.15	0.30
1991	0.00	0.03	0.03	0.02	0.05	0.07	0.10	0.21	0.17	0.37
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.01	0.12	0.13
1993	0.00	0.01	0.01	0.01	0.09	0.10	0.12	0.11	0.07	0.18
1994	0.00	0.00	0.00	0.00	0.05	0.05	0.06	0.13	0.03	0.15
1995	0.00	0.00	0.00	0.05	0.06	0.10	0.11	0.06	0.02	0.09
1996	0.00	0.00	0.00	0.00	0.08	0.08	0.08	0.32	0.10	0.42
1997	0.00	0.01	0.01	0.03	0.05	0.08	0.09	0.06	0.08	0.14
1998[b/]	0.00	0.00	0.00	0.00	0.01	0.01	0.02	0.04	0.10	0.14
1999[b/]	0.00	0.00	0.00	0.03	0.02	0.05	0.05	0.17	0.06	0.23

TABLE II-6. Harvest levels and rates of age-three and age-four Klamath River fall chinook (biological years are defined as September 1 through August 31 for ocean fisheries). (Page 1 of 2)

	Ocean Fisheries							River Fisheries[a/]		
	KMZ			North of	South of		Ocean			
Year	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total	Net	Sport	Total
HARVEST RATE (continued)										
Age Four										
1986	0.06	0.01	0.07	0.22	0.23	0.45	0.52	0.63	0.11	0.74
1987	0.07	0.02	0.09	0.25	0.19	0.44	0.53	0.47	0.10	0.56
1988	0.05	0.03	0.08	0.11	0.25	0.37	0.45	0.72	0.12	0.84
1989	0.07	0.07	0.13	0.18	0.13	0.31	0.44	0.39	0.07	0.46
1990	0.02	0.04	0.06	0.43	0.13	0.55	0.61	0.23	0.08	0.31
1991	0.00	0.03	0.03	0.03	0.15	0.18	0.21	0.38	0.06	0.44
1992	0.00	0.00	0.00	0.03	0.00	0.04	0.04	0.25	0.02	0.27
1993	0.00	0.00	0.00	0.02	0.09	0.11	0.11	0.47	0.02	0.49
1994	0.00	0.02	0.02	0.02	0.03	0.05	0.07	0.27	0.03	0.30
1995	0.00	0.01	0.01	0.08	0.12	0.20	0.21	0.18	0.02	0.21
1996	0.00	0.01	0.01	0.04	0.11	0.16	0.17	0.32	0.07	0.39
1997	0.01	0.01	0.02	0.03	0.05	0.08	0.10	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.10	0.00	0.10	0.11	0.24	0.06	0.30
1999[b/]	0.00	0.02	0.02	0.06	0.03	0.09	0.11	0.43	0.02	0.45

a/ Net fishery estimates provided by Yurok and Hoopa Tribes. Sport fishery estimates provided by CDFG.
b/ Preliminary data (incomplete cohort)

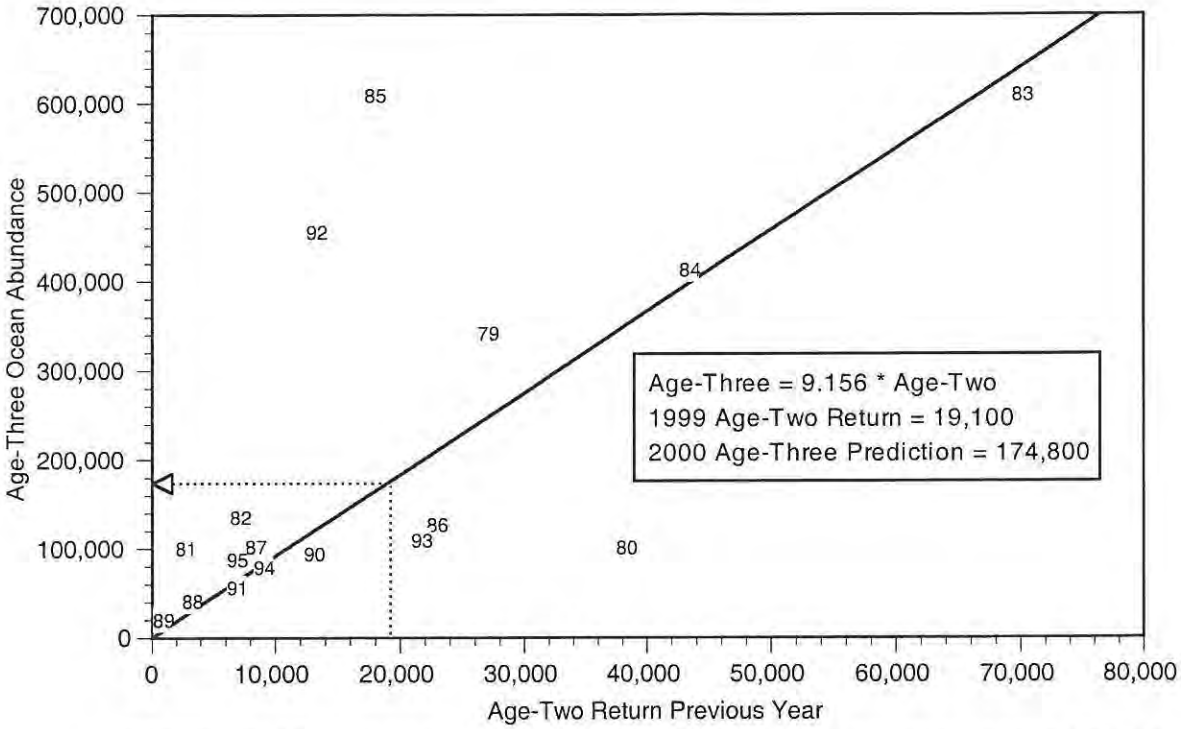

FIGURE II-3. Linear regression of age-three ocean abundance on inriver age-two Klamath River fall chinook of the same cohort, 1979-1995 broods (years shown are brood years).

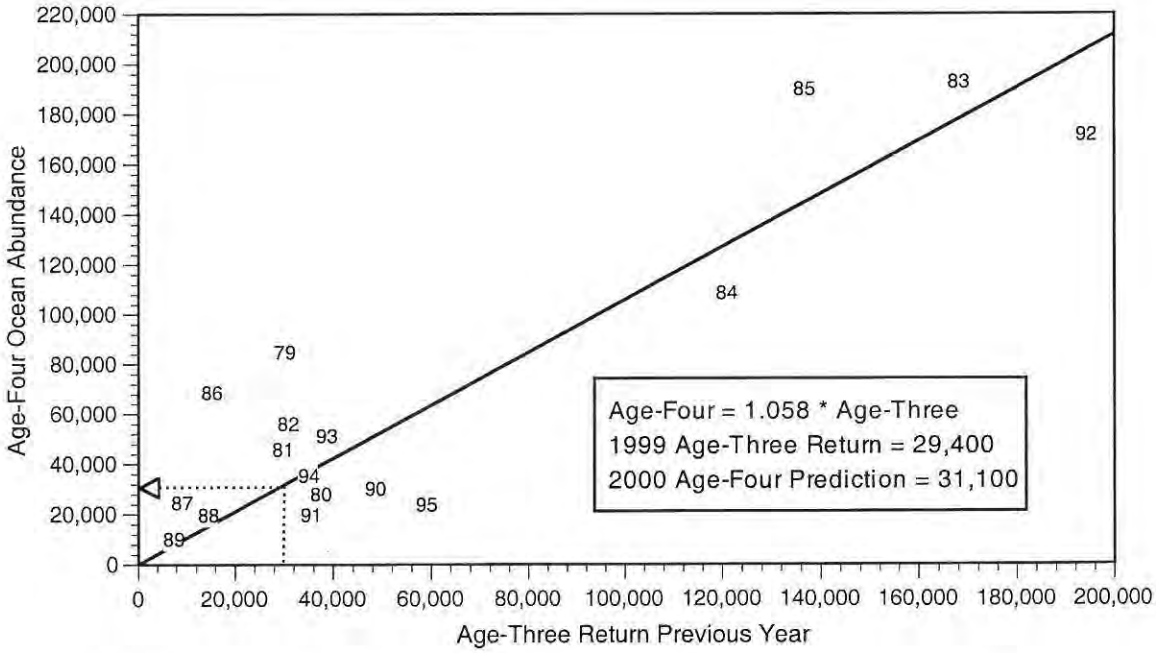

FIGURE II-4. Linear regression of age-four ocean abundance on inriver age-three Klamath River fall chinook of the same cohort, 1979-1995 broods (years shown are brood years).

four, and age-five fish, respectively), would produce a 2000 spawning population of 97,000 adults. Assuming the five-year natural spawner average (70%), 67,900 of these fish would be expected to spawn in natural areas. In 1999, 56% of the adults returning to the river spawned in natural areas.

Late-season ocean fisheries in 1999 (September-November) were estimated to have harvested zero age-three, 22 age-four, and 20 age-five Klamath River fall chinook (in summer equivalent units). This harvest should be deducted from the ocean fishery's allocation in determining the 2000 allowable ocean harvest.

Evaluation of 1999 Regulations on 2000 Stock Abundance

The Klamath Ocean Harvest Model (KOHM) has not yet been updated to evaluate 2000 ocean fishery options. The KOHM was developed for use in evaluating 1988 fishery options and has been updated each year thereafter. When the model is calibrated for 2000, it will be calibrated to the average 1986-1990 fishery observations and expected 2000 stock strengths for Klamath, Central Valley, and Rogue River fall chinook. A precise evaluation of the 1999 regulations coupled with the 2000 stock predictions is not possible at this time. However, the Harvest Rate Model (HRM) developed by the KRTAT provides an approximate evaluation based on the following assumptions:

1. A maximum spawner reduction rate of 67%.
2. A natural spawner floor of 35,000 adults.
3. A 50% harvest share for the tribes.
4. An allocation of 15% of the nontribal harvest to the river recreational fishery.

Under these assumptions, the HRM projects a spawning population of approximately 50,000 adults, of which 35,000 would be expected to spawn in natural areas. The total harvest projected by the HRM under this scenario would be 55,200 adults (tribes 27,600; in-river sport 4,100; ocean troll/sport 23,500), with age-four ocean and river harvest rates of 15.1% and 52.8%, respectively. These projections are provided for comparative purposes only; the Council does not use the HRM to model Klamath River fall chinook fisheries.

OTHER CALIFORNIA COASTAL CHINOOK STOCKS

Other California streams that contribute to ocean fisheries include the Smith, Little, Mad, Eel, and Mattole Rivers, and Redwood Creek. All of these streams support fall stocks and are believed to contribute to ocean fisheries off the California and Oregon coasts. Current information is insufficient to forecast ocean abundance levels for these stocks.

OREGON COASTAL CHINOOK STOCKS

Oregon coastal chinook stocks are categorized into two major subgroups based on ocean migration patterns. Although their ocean harvest distributions somewhat overlap, they have been labeled as either north or south/local migrating.

Oregon Coastal North Migrating Chinook

North migrating chinook stocks include stocks north of and including the Elk River, with the exception of Umpqua River spring chinook. Based on CWT analysis, the populations from ten major north Oregon coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in Pacific Salmon Commission (PSC) ocean fisheries off British Columbia and southeast Alaska and to a much lesser degree in Council area fisheries off Washington and Oregon, primarily in terminal area fisheries. CWT analysis indicates that populations from five major mid-Oregon coast (MOC) systems from the Coos through the Elk Rivers are harvested primarily in ocean fisheries off British Columbia, Washington, and Oregon, with minor contributions to California fisheries.

Predictor Description and 2000 Stock Status

Specific techniques have not been developed to make quantitative abundance predictions for these stocks for use in annual development of Council area fishery regulations. Qualitative expectations are based on parental year spawner escapement and recently developed hatchery indicator stocks for use in the PSC management process.

Natural spawner escapement is assessed yearly from the Nehalem through Coquille Rivers. Peak spawning counts of adults are obtained from standard index areas on these rivers and monitored to assess stock trends (*Review of 1999 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3). Natural fall chinook stocks from the Nehalem River on the north Oregon coast south to the Elk River near Humbug Mountain dominate production from this subgroup. Also present in lesser numbers are naturally-produced spring chinook stocks from several rivers and hatchery fall and/or spring chinook produced in the Trask, Nestucca, Salmon, Alsea, and Elk Rivers.

North Oregon Coast (NOC)

Since 1986, the Salmon River Hatchery production has been coded-wire-tagged and used as an indicator stock for the NOC stock component. Because these fish are mostly harvested in PSC fisheries, the STT has not reviewed the procedure by which this indicator stock is used in estimating annual stock status. Based on this indicator stock and compared with index abundances since 1986, the STT is informed that expectations in 2000 are for an average abundance.

Mid-Oregon Coast (MOC)

Since 1992, the Elk River Hatchery production has been coded-wire-tagged for use as an indicator stock for the MOC stock component. Forecasts of abundance assume that river returns of younger age classes of a brood reflect abundance of the remaining, as yet immature, ocean residents of the brood. Age-specific ocean escapements for 1999 are not currently available. The STT has not undertaken a review of the methods used by state staff in preparing these abundance forecasts.

Based on the density index of total spawners, the generalized expectation for ocean coastal north migrating (NOC & MOC) stocks in 2000 is for average abundance. The density of adult spawners per mile observed since 1985 are a primary indicator that these stocks are generally healthy.

South/Local Migrating Chinook

South/local migrating chinook stocks include Rogue River spring and fall chinook and fall chinook from smaller rivers south of the Elk River. These stocks are important contributors to ocean fisheries off Oregon and northern California. Another central Oregon stock, Umpqua River spring chinook, contributes primarily to ocean fisheries off Oregon and California and to a lesser degree, off Washington, British Columbia, and southeast Alaska.

Predictor Description and 2000 Stock Status

Quantitative abundance predictions are not made for these stocks, although an abundance index for Rogue River fall chinook has been developed. General trends in stock abundance for southern Oregon coastal chinook stocks are assessed through escapement indices (*Review of 1999 Ocean Salmon Fisheries,* Chapter II, Table II-4 and Figures II-3 and II-4).

Natural fall chinook stocks from river systems south of the Elk River and spring chinook stocks from the Rogue and Umpqua Rivers dominate production from this subgroup. Also present in lesser numbers are hatchery fall chinook with the majority of releases occurring in the Chetco River. Substantial releases of hatchery spring chinook occur in both the Rogue and Umpqua Rivers.

Umpqua River and Rogue River Spring Chinook

Umpqua and Rogue Rivers spring chinook contribute to ocean fisheries primarily as age-three fish. Mature chinook enter the rivers primarily during April and May and generally prior to annual fisheries. Quantitative abundance predictions are not made for these stocks.

Rogue River Fall Chinook

Rogue River fall chinook contribute to ocean fisheries principally as age-three through age-five fish. Mature fish enter the river each year from mid-July through October, with the peak run occurring during August and September.

Annual predictions of Rogue River fall chinook are used for the purposes of ocean impact modeling and, specifically, for use in assessing allowable Klamath Management Zone (KMZ) area harvest. A Rogue River fall chinook ocean abundance index has been developed based on carcass counts, ocean exploitation rates and cohort reconstruction methods. Linear regression analysis is used to relate the Rogue River fall chinook ocean abundance index for age-three, age-four, and age-five fish to inriver carcass counts of age-two, age-three and age-four fish, respectively, of the previous year. The inriver age composition estimates are based on scale sampling of carcasses. Ocean exploitation rates are based on Klamath River fall chinook CWT analysis since 1979 because Rogue River fall chinook ocean exploitation rate information is not available. The ocean harvest distribution and age composition of both Rogue and Klamath fall chinook are similar. The Rogue River fall chinook ocean abundance index for 2000 was unavailable when this report went to press, but is expected to be similar to the 1999 index of 4,000 chinook, and still below the long-term average (Table II-7).]

Other Stocks

Information is insufficient to forecast the abundance of fall chinook from other smaller rivers south of the Elk River. These stocks are minor contributors to general season mixed stock ocean fisheries.

Evaluation of 1999 Regulations on 2000 Stock Abundance

Given the 1999 regulations and the projected 2000 Oregon coastal chinook stock abundance, it is expected that the aggregate Oregon coastal chinook goal of 150,000 to 200,000 naturally spawning adults will be met.

CHINOOK STOCKS NORTH OF CAPE FALCON

Columbia River Fall Chinook

Predictor Description and Past Performance

Columbia River fall chinook stocks typically form the largest contributing stock group to Council chinook fisheries north of Cape Falcon. Abundance of these stocks is a major factor in determining impacts of fisheries on weak natural stocks critical to Council area management. Abundance predictions are made for five distinct fall stock units characterized as being of primarily hatchery or primarily natural production and originating above or below Bonneville Dam. The upriver brights (URB) and lower Columbia River wild (LRW) are primarily naturally produced stocks. The lower Columbia River hatchery (LRH) tule, Spring Creek Hatchery (SCH) tule, and mid-Columbia River brights (MCB) are primarily hatchery produced stocks. The tule stocks generally mature at an earlier age than the natural fall stocks and do not migrate as far north.

Preseason estimates of Columbia River fall chinook stock abundance, used by the STT to assess the Council's adopted fishery regulations, are based on age and stock-specific forecasts of annual ocean escapement (return to the Columbia River). These forecasts are developed by the technical staffs of the Columbia River management agencies. Columbia River return forecast methodologies used for Council management are generally identical to those used for planning Columbia River fall season fisheries,

TABLE II-7. Rogue River fall chinook inriver run and ocean population indices. (Page 1 of 1)

Return Year	Inriver Run Index in Thousands of Fish[a/]					Ocean Impact Rate (percentage) by Age[b/]		Ocean Population Index in Thousands of Fish[c/]			
	Age-2	Age-3	Age-4	Age-5	Total[d/]	Age-3	Age-4-5	Age-3	Age-4	Age-5	Total
1977	1.9	0.8	0.3	0.0	3.0	40	60	13.7	1.5	0.1	15.3
1978	1.0	6.1	2.3	0.1	9.5	40	60	72.7	6.0	0.3	78.9
1979	0.2	1.0	6.5	0.0	7.7	36	68	16.6	30.0	0.1	46.7
1980	0.4	0.2	0.9	0.6	2.2	43	75	9.3	7.8	2.5	19.5
1981	1.0	3.1	0.9	0.3	5.2	42	66	13.6	4.0	0.8	18.5
1982	0.7	1.3	1.3	0.1	3.4	57	65	13.3	3.9	0.4	17.5
1983	0.2	0.6	0.9	0.0	1.7	28	70	7.7	3.5	0.1	11.3
1984	0.2	0.8	1.1	0.1	2.2	14	43	10.8	4.0	0.1	14.9
1985	2.5	1.3	3.5	0.6	7.9	25	29	13.6	6.8	0.9	21.3
1986	3.2	12.8	2.4	0.5	18.9	30	52	102.1	7.1	1.1	110.3
1987	2.8	8.5	19.8	0.4	31.5	36	53	88.3	46.9	0.8	136.1
1988	0.9	3.2	16.5	1.0	21.6	37	45	21.7	38.4	1.8	61.9
1989	0.5	1.3	4.0	2.1	7.8	21	44	10.4	8.4	3.7	22.4
1990	0.0	0.3	1.4	0.2	1.9	61	61	11.1	5.5	0.6	17.2
1991	0.2	0.4	1.9	0.5	2.9	10	21	3.8	3.2	0.6	7.7
1992	0.5	0.3	1.5	0.5	2.8	2	4	4.1	2.3	0.5	6.9
1993	0.3	3.5	1.5	0.5	5.7	11	11	17.2	2.9	0.6	20.7
1994	0.5	0.8	5.8	0.9	7.9	5	7	3.2	9.4	0.9	13.6
1995	0.2	0.6	1.4	2.0	4.1	10	21	4.3	1.9	2.5	8.6
1996	0.1	0.4	1.8	0.1	2.3	8	17	2.6	2.6	0.1	5.3
1997	0.1	0.3	1.0	0.3	1.7	9	10	2.0[e/]	1.6	0.3	3.9
1998	0.1	0.5	2.6	0.3	3.4	2	11	3.3[e/]	4.0[e/]	0.3	7.6
1999	-	-	-	-	-	-	11	0.6	2.7	0.8	4.0
2000	-	-	-	-	-	-	-	NA	NA	NA	NA

a/ Index based on carcass counts in spawning survey index areas. Carcass counts in 1978, 1979 and 1980 adjusted for prespawning mortality. Carcass counts in 1996 adjusted for high river flows during latter part of survey season. Age composition developed from carcass scale sampling.

b/ Exploitation rates since 1979 are based on Klamath River fall chinook cohort analysis.

c/ Based on cohort reconstruction methods. Index values for 1999 predicted from regression equations; postseason estimates are not available.

d/ Excludes age-six fish.

e/ Preliminary; complete cohort not available. Used mean maturity rate to derive estimate.

although minor updates to Council estimates of inriver run size may occur prior to finalization of the inriver fishery plans.

The 2000 return of each fall chinook stock group is estimated using relationships between successive age groups within a brood year. The data base for these relationships was constructed by combining age-specific estimates of escapement and inriver fishery catches for years since 1964, although only the more recent broods (1975-1994) are used in most current predictions. Fall chinook stock identification in the Columbia River mixed stock fisheries is determined by sampling catch and escapement for such factors as CWT recovery and visual stock identification (VSI). Age composition estimates are based on CWT data and scale reading of fishery and escapement samples, where available. These stock and age data for Columbia River fall chinook are the basis for the return data presented in the *Review of 1999 Ocean Salmon Fisheries* (Appendix B, Tables B-15 through B-19). The 1999 returns for the five fall chinook stocks listed in this report will differ somewhat from those provided in the *Review of 1999 Ocean Salmon Fisheries* since ocean escapement estimates were updated after that report was printed.

Performance of the preliminary river return estimation methodology can be assessed, in part, by examining the differences between preseason and postseason estimates (Table II-8). The 1990 -1999 average March preliminary preseason estimates as a percentage of the postseason estimates for the URB, LRW, LRH, and SCH, and MCB stock estimates are 86%, 92%, 98%, and 1.04%,and 1.05% respectively. The return of tule stocks has generally been underpredicted in recent years. The return of SCH adults was overpredicted in 1999, but has been underpredicted the previous four years, the LRH return has been underpredicted the past six years.

Inaccuracies of ocean escapement estimates developed for the March Council meeting are partly a result of the lack of assessment of variable ocean fishery impacts on these stocks. March estimates of the inriver run size abundance for Columbia River fall chinook stocks are based on age-specific and stock-specific cohort relationships for a database impacted by the historic marine fisheries during the last 20 years. The STT combines the initial inriver run size (ocean escapements) with expected Council area fishery harvest levels and stock distribution patterns to produce adjusted ocean escapement estimates based on the proposed ocean fishing regulations. These revised estimates are available at the end of the Council preseason planning process in April (Table II-8) and should provide a more accurate prediction of ocean escapement.

2000 Stock Status

The preliminary forecast for 2000 URB fall chinook ocean escapement is 171,100 adults, similar to the 1999 return of 166,700 adults. No preseason estimate of Snake River wild fall chinook ocean escapement for 1999 is currently available. However, the Columbia River technical staffs are expected to develop a run size estimate for this critical ESA listed stock during the March or April Council meeting process.

Ocean escapement of LRW fall chinook in 2000 is forecast at 3,500 adults, almost identical to the record low 1999 observed return of 3,300 adults. The forecast is 61% of the spawning escapement goal of 5,700 into the North Lewis River, Washington.

The preliminary forecast for 2000 ocean escapement of LRH fall chinook is for a return of 23,700 adults, a record low return. Recent reductions in LRH production, especially in Oregon as a result of Mitchell Act funding cuts, have decreased the ocean escapement needed to meet hatchery brood stock requirements. The March forecast return is about equal to the estimated ocean escapement of adults needed to meet broodstock requirements.

Ocean escapement of SCH fall chinook in 2000 is projected to be 21,900 adults, only 44% of the 1999 actual return of 49,300 adults and below the recent 5 year average.

The preliminary forecast for the 2000 ocean escapement of MCB fall chinook is 50,600 adults, close to the 1999 observed return of 49,900 adults. The MCB chinook are primarily returns from hatchery releases of

TABLE II-8. Predicted and postseason returns of Columbia River adult fall chinook in thousands of fish. (Page 1 of 2)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
URB	1984	90.1	93.0	131.4	0.69	0.71
	1985	159.1	159.1	196.4	0.81	0.81
	1986	285.9	286.1	281.5	1.02	1.02
	1987	436.4	436.4	420.7	1.04	1.04
	1988	450.7	446.5	339.9	1.33	1.31
	1989	234.0	231.8	261.3	0.90	0.89
	1990	127.2	126.9	153.6	0.83	0.83
	1991	88.8	88.9	103.3	0.86	0.86
	1992	68.4	66.3	81.0	0.84	0.82
	1993	84.5	82.7	102.9	0.82	0.80
	1994	85.4	94.7	132.8	0.64	0.71
	1995	110.3	125.0	106.5	1.04	1.17
	1996	88.9	94.1	143.2	0.62	0.66
	1997	166.4	158.0	164.9	1.01	0.96
	1998	150.8	141.8	142.3	1.06	1.00
	1999	147.5	102.1	166.7	0.88	0.61
				1984-1999 average:	0.90	0.89
				1990-1999 average:	0.86	0.84
LRW	1984	16.7	NA	13.3	1.26	NA
	1985	12.9	NA	13.3	0.97	NA
	1986	15.7	NA	24.5	0.64	NA
	1987	29.2	NA	37.9	0.77	NA
	1988	43.3	42.1	41.7	1.04	1.01
	1989	27.3	26.9	38.6	0.71	0.70
	1990	23.7	23.4	20.3	1.17	1.15
	1991	12.7	12.7	19.8	0.64	0.64
	1992	17.4	16.7	12.5	1.39	1.34
	1993	12.5	11.9	13.3	0.94	0.89
	1994	14.7	13.2	12.2	1.20	1.08
	1995	12.4	11.5	16.0	0.78	0.72
	1996	8.8	8.1	14.6	0.60	0.55
	1997	7.5	7.2	12.3	0.61	0.59
	1998	8.1	7.0	7.3	1.11	0.96
	1999	2.6	2.5	3.3	0.79	0.76
				1984-1999 average:	0.91	0.87
				1990-1999 average:	0.92	0.87
LRH	1984	70.4	89.0	102.4	0.69	0.87
	1985	81.5	86.7	111.0	0.73	0.78
	1986	171.6	173.9	154.8	1.11	1.12
	1987	294.9	298.7	344.1	0.86	0.87
	1988	267.7	246.5	309.9	0.86	0.80
	1989	104.9	97.5	130.9	0.80	0.74
	1990	68.5	65.5	60.0	1.14	1.09
	1991	71.4	73.1	62.7	1.14	1.17
	1992	113.2	121.5	62.6	1.81	1.94
	1993	79.3	77.7	52.3	1.52	1.49
	1994	36.1	46.5	53.6	0.67	0.87
	1995	35.8	42.4	46.4	0.77	0.91
	1996	37.7	48.3	75.5	0.50	0.64
	1997	54.2	68.7	57.4	0.94	1.20
	1998	19.2	22.5	45.3	0.42	0.50
	1999	34.8	38.2	37.4	0.93	1.02
				1984-1999 average:	0.93	1.00
				1990-1999 average:	0.98	1.08

TABLE II-8. Predicted and postseason returns of Columbia River adult fall chinook in thousands of fish. (Page 2 of 2)

Stock	Year	March Preseason Forecast[a/]	April STT Modeled Forecast[b/]	Postseason Return	March Pre/Postseason	April Pre/Postseason
SCH	1984	21.3	27.0	47.5	0.45	0.57
	1985	34.9	37.1	33.2	1.05	1.12
	1986	16.0	16.2	16.6	0.96	0.98
	1987	9.1	9.2	9.1	1.00	1.01
	1988	6.5	5.9	12.0	0.54	0.49
	1989	29.5	23.0	26.8	1.10	0.86
	1990	27.3	23.7	18.9	1.44	1.25
	1991	56.3	61.4	52.4	1.07	1.17
	1992	40.9	41.3	29.5	1.39	1.40
	1993	19.9	18.2	16.8	1.18	1.08
	1994	20.2	28.9	18.5	1.09	1.56
	1995	17.5	22.5	33.8	0.52	0.67
	1996	27.6	35.2	33.1	0.83	1.06
	1997	21.9	25.7	27.4	0.80	0.94
	1998	14.2	14.2	20.2	0.70	0.70
	1999	65.8	61.0	49.3	1.33	1.24
				1984-1999 average:	0.97	1.01
				1990-1999 average:	1.04	1.11
MCB	1990	69.5	69.3	59.1	1.18	1.17
	1991	48.4	48.5	35.9	1.35	1.35
	1992	42.5	40.7	31.1	1.37	1.31
	1993	33.0	32.3	27.4	1.20	1.18
	1994	23.9	26.7	33.7	0.71	0.79
	1995	26.5	30.1	34.2	0.77	0.88
	1996	40.8	43.2	59.7	0.68	0.72
	1997	72.1	61.9	59.7	1.21	1.04
	1998	47.8	44.9	36.8	1.30	1.22
	1999	38.3	27.7	49.9	0.77	0.56
				1990-1999 average:	1.05	1.02

a/ March preseason forecasts are ocean escapements based on terminal run size and stock-specific cohort relationships affected by the historical "normal" ocean fisheries during the brood year data base time period (generally 1978-1994).

b/ STT modeled forecasts adjust March preseason forecasts for Council-adopted ocean regulations each year and should provide a more accurate estimate of expected ocean escapement.

bright fall chinook stock in the area below McNary Dam, although some natural spawning in tributaries in the area between Bonneville and McNary dams also occurs.

Washington Coastal Chinook

Predictor Description and Past Performance

Preseason abundance estimates for many Washington coastal chinook stocks are not available for consideration in Council preseason fishery management planning. Since Council fisheries have only a minor impact on the ocean escapement of Washington coastal stocks, they also have not been included in the preseason fishery impact assessment reports prepared by the STT.

2000 Stock Status

Preseason forecasts for most Washington coastal chinook stocks are not available at this time. Willapa Bay hatchery fall chinook are forecast at 18,900 adults, 27% above the 1999 preseason projection. Willapa Bay natural fall chinook are forecast at 4,200 adults, 26% above the 1999 forecast.

Puget Sound Chinook

Expectations for Puget Sound run size of the various stock management units of this region are listed in Table I-1. A comparison of preseason and postseason forecasts for recent years is detailed in Table II-9. The STT has not undertaken a review of the methods employed by state and tribal staffs in preparing these abundance forecasts. Methodologies for estimates are described in the annual Puget Sound management reports (starting in 1993, reports are available by Puget Sound management unit, not by individual species). Forecasts for Puget Sound stocks generally assume production is dominated by age-four adults. Puget Sound chinook were listed as threatened under the ESA in March 1999.

2000 Stock Status

Spring Chinook

Spring chinook originating in Puget Sound are expected to remain depressed. Runs in the Nooksack, Skagit, White, and Dungeness Rivers are of continuing concern.

Summer/Fall Chinook

Preliminary information for Puget Sound summer/fall stocks indicates that the total 2000 return is expected to be similar to the 1999 preseason forecast. Changes in the abundance of individual stocks from various production areas are detailed in Table I-1.

The total return from Puget Sound hatchery production is forecasted to be about the same as 1999 (4% above the 1999 predicted level). However, expected returns from north Puget Sound facilities are forecasted to be 31% less than 1999 returns, while returns from south Puget Sound facilities are expected to be 20% greater than in 1999.

The total return of natural Puget Sound summer/fall stocks is expected to be about the same as in 1999. Returns to the Skagit River are forecast to be similar to 1999 and the escapement goal is not expected to be attained. Returns to the Stillaguamish and Snohomish rivers are also expected to similar to the 1999 preseason forecasts. Returns to the Strait of Juan de Fuca are forecast to be the same as the 1999 level, and returns to south Puget Sound are forecast to be down about 24% compared to 1999 level. Natural stocks from Puget Sound have experienced poor survival in recent years, resulting in depressed production and escapements. Only four natural Puget Sound summer/fall chinook stocks have met escapement goals at least once in the last five years (Hoko, Snohomish, Green, and Nisqually). However, two of these stocks (Green and Niqually) have significant numbers of hatchery chinook that stray into natural spawning areas and are counted as natural fish.

TABLE II-9. Comparison of preseason and postseason forecasts of Puget Sound run size for summer/fall chinook. Postseason estimates for 1998 are preliminary.[a/] (Page 1 of 1)

Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
	Nooksack-Samish - Hatchery and Natural			**East Sound Bay - Hatchery**			**Skagit - Hatchery**			**Skagit - Natural**		
1993	50.4	32.9	1.53	3.2	3.8	0.84	1.0	1.4	0.71	14.0	7.0	2.00
1994	46.6	28.1	1.66	3.2	0.8	4.00	1.3	4.3	0.30	8.4	6.6	1.27
1995	38.5	22.2	1.73	3.5	0.2	17.50	1.6	3.3	0.48	5.0	9.6	0.52
1996	27.0	29.4	0.92	1.7	0.7	2.43	1.0	1.2	0.83	7.1	12.2	0.58
1997	34.0	34.2	0.99	1.2	1.2	1.00	0.1	0.0	-	6.4	6.2	1.03
1998	28.5	29.5	0.97	0.5	0.3	1.67	0.0	0.1	-	6.4	14.9	0.43
	Stillaguamish - Natural			**Snohomish - Hatchery**			**Snohomish - Natural**			**Tulalip - Hatchery**		
1993	14.0	7.0	2.00	1.6	2.7	0.59	4.9	5.7	0.86	2.8	1.4	2.00
1994	8.4	6.6	1.27	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.9	1.47
1995	5.0	9.6	0.52	2.2	6.0	0.37	4.3	5.9	0.73	2.3	4.1	0.56
1996	7.1	12.2	0.58	6.7	9.2	0.73	4.2	8.0	0.53	2.7	4.0	0.68
1997	6.4	1.2	5.33	7.7	2.7	2.85	5.2	4.4	1.18	4.0	8.6	0.47
1998	1.6	1.6	1.00	6.5	1.1	5.91	5.6	6.4	0.88	2.5	7.2	0.35
	South Puget Sound - Hatchery			**South Puget Sound - Natural**			**Hood Canal - Hatchery and Natural**					
1993	61.8	36.8	1.68	26.5	19.8	1.34	11.7	4.8	2.44			
1994	52.7	46.2	1.14	18.0	29.9	0.60	11.5	3.8	3.03			
1995	49.6	74.5	0.67	21.7	34.5	0.63	3.9	9.4	0.41			
1996	51.9	57.6	0.90	19.0	35.8	0.53	9.0	8.2	1.10			
1997	65.1	46.5	1.40	18.2	20.6	0.88	2.7	7.9	0.34			
1998	67.8	54.2	1.25	21.8	27.3	0.80	6.7	16.3	0.41			
	Strait of Juan de Fuca - Hatchery			**Strait of Juan de Fuca - Natural**								
1993	0.7	0.2	3.50	3.1	2.4	1.29						
1994	3.9	1.6	2.44	1.0	0.5	2.00						
1995	3.0	0.1	30.00	0.9	2.7	0.33						
1996	2.8	0.2	14.00	0.9	3.1	0.29						
1997	2.2	0.3	7.33	0.8	3.5	0.23						
1998	0.8	1.7	0.47	1.7	1.9	0.89						

a/ Puget Sound run size is defined as the run available to Puget Sound net fisheries. Does not include fish caught by troll and recreational fisheries.

Evaluation of 1999 Regulations on 2000 Stock Abundance North of Cape Falcon

A detailed assessment of 2000 projected ocean fishery impacts with 1999 regulations for north of Cape Falcon chinook stocks has not been completed. The chinook model used for impact assessment in 1999 is currently being modified to include recent data on ocean fishery impacts and abundance forecasts. The updating procedure for the chinook model used for impact assessment incorporates adjustments due to variable impacts by ocean fisheries. It will not be ready for use in 2000 until the March Council meeting.

Council fisheries north of Cape Falcon have a very minor impact on most stocks that originate in Washington coastal and Puget Sound Rivers since they have northerly marine distribution patterns. The stocks that are major contributors to Council fisheries north of Cape Falcon include Columbia River fall hatchery tules, which normally account for more than half the total catch, Puget Sound summer/fall, lower Columbia River spring, and California and Oregon coastal chinook stocks.

CHAPTER III
COHO SALMON ASSESSMENTS

COLUMBIA RIVER AND OREGON COASTAL COHO (OREGON PRODUCTION INDEX AREA)

The majority of the coho harvested in the Oregon production index (OPI) area originate from stocks produced in rivers located within the OPI area (Leadbetter Point, Washington, to the U.S.-Mexico border). These stocks include hatchery and natural production from the Columbia River, Oregon coast, and northern California.

The Council adopted revised abundance estimation predictors in 1987, for use starting in 1988, which were expected to more accurately predict the abundance of individual stock components originating in the OPI area. These stock components are: (1) public hatchery (OPIH), (2) Oregon coastal natural river (OCNR), (3) Oregon coastal natural lake (OCNL), (4) private hatchery (PRIH), and (5) hatchery smolt production from the Oregon coastal Salmon Trout Enhancement Program (STEP).

A stratified random sampling (SRS) study, implemented in 1990, indicated an overestimation of annual OCN spawner escapement. Because OPI area ocean impacts are proportioned to the various OPI stocks based on ocean escapements, a reduction in OCN spawner escapement indicates that traditional OCN abundances are overestimated, while traditional abundance estimates for other OPI area stocks are underestimated. Starting in 1992, the Council adopted an abundance adjustment procedure for use in assessing fishery impacts. This procedural change, based on improved estimates of OCN spawner escapements, adjusted traditional index abundances of the various OPI area stocks. In attempting to achieve targeted exploitation rates and spawner escapement goals, the various OPI area stock abundance index predictions have been scaled in the Fishery Regulation Assessment Model (FRAM) to reflect the results of the ongoing OCN spawner study and are referred to as SRS abundances. In 1998, based on eight years of SRS abundance estimates, the historic OPI data set was rescaled to reflect the adjusted OCN abundance estimates.

Beginning in 1999, with the availability of a long term data set in SRS values, all five OPI area stock abundances were projected in SRS accounting. Direct comparisons of 2000 abundance forecasts with recent year SRS abundance projections, both preseason and postseason, are reported in Table III-1. For comparative purposes, OPI area stock abundance projections using index values for 1985-1998 are reported in Appendix B, Table B-1. To facilitate fishery modeling with the coho FRAM, abundance estimates are converted from SRS values into index values using the relationship between the two historic data sets. All fishery impacts and escapements from the coho FRAM are converted to and reported in SRS values.

Public Hatchery Coho

OPI area public hatchery coho smolt production occurs primarily in Columbia River facilities and net pens. Several facilities located in Oregon coastal rivers and in the Klamath River, California, collectively produce lesser amounts of coho as well. OPI area smolt releases are reported by geographic area since 1960 in Appendix B, Table B-2.

Predictor Description

Since 1988, the adult abundance of the OPIH index stock has been predicted using a linear multiple regression that relates OPI hatchery adults to the Columbia River, coastal Oregon, and Klamath River jack returns from the same cohort (previous year jack counts), and the proportion of Columbia River smolts from the same cohort with delayed release rearing strategy. All jack counts were adjusted for misidentified small adults (mostly Columbia River returns).

TABLE III-1. Preliminary 1992-1999 preseason and postseason coho stock SRS abundance estimates for OPI area stocks in thousands of fish.[a/]

Stock	Year	Preseason	Postseason	Preseason/Postseason
OPIH	1992	479.2	540.3	0.89
	1993	589.4	261.7	2.25
	1994	147.5	203.9	0.72
	1995	301.5	145.6	2.07
	1996	309.2	182.6	1.69
	1997	376.1	215.3	1.75
	1998	118.4	203.6	0.58
	1999	559.2	319.6	1.75
OCN	1992	77.1	90.1	0.86
	1993	82.2	98.9	0.83
	1994	49.3	45.2	1.09
	1995	60	68.5	0.88
	1996	63.2	86.1	0.73
	1997	86.4	27.8	3.11
	1998	47.2	29.2	1.62
	1999	60.7	51.9	1.17
STEP	1992	2.1	1.2	1.75
	1993	5.5	3.5	1.57
	1994	0.8	1.8	0.44
	1995	8.3	0.5	16.60
	1996	0.4	1.2	0.33
	1997	1.3	0.3	4.33
	1998	0.2	0.3	0.67
	1999	0.7	0.4	1.75

a/ Forecasts represent SRS accounting to assess fishery impacts. See text for explanation.

Specifically, the OPIH stock predictor uses the dependent variables of Columbia River jacks adjusted for small adults (Jack CR), Oregon coastal and Klamath River Basin jacks adjusted for small adults (Jack OC), and a correction term for delayed smolts released from Columbia River hatcheries (Jack CR * [SmD/SmCR]) to predict public hatchery stock abundance.

For the 2000 abundance prediction, the data base includes 1970-1999 recruits, excluding the El Niño adult impact year of 1983. It also includes 1969-1998 jack returns, excluding 1982, also due to El Niño influence. The model, with coefficients, is:

$$OPIH(t) = b*\text{Jack CR}(t-1)+c*\text{Jack OC}(t-1)+d*\text{Jack CR}(t-1)*[\text{SmD}(t-1)/\text{SmCR}(t-1)]$$

Where:

b	=	19.447560
c	=	20.504542
d	=	31.296147
adjusted r^2	=	0.96

The OPIH stock data set, and a definition of the above terms, are presented in Appendix B, Table B-3.

Predictor Performance

Recent year OPIH stock preseason abundance predictions, adjusted to SRS accounting, are compared with postseason estimates in Table III-1. The 1999 preseason abundance prediction of 559,200 OPIH coho was 175% of the preliminary postseason estimate of 319,600 coho.

Since 1983 the OPIH predictor has performed poorly, due principally to high interannual variability in the jack to adult ratios.

2000 Stock Status

Using the appropriate values from Table B-3, the OPIH abundance prediction for 1999 is 671,400. The 2000 forecast is 120% of the 1999 preseason prediction of coho and 210% of the 1999 postseason estimate (Table III-1).

Oregon Coastal Natural Coho

The OCN stock is composed of natural production from OCNR and OCNL systems, which are predicted independently.

Predictor Description

Oregon Coastal Natural Rivers

From 1988-1993, the abundance of OCNR index coho was predicted using a modified Ricker spawner-recruit model. The predictor related OCNR recruits to the parent brood stock size incorporating an adjustment for ocean survival based on OPI hatchery smolt to jack survival the previous year. Due to a tendency to overpredict abundances, the data base in the predictor was shortened from 1970-1991 to 1980-1991 starting with 1992 predictions.

Because of concern that the adopted OCNR model does not adequately incorporate environmental variability, an alternative model was used for predicting 1994 and 1995 index abundances. The model related ocean upwelling, sea surface temperatures, and year to predict OCNR index coho abundance.

For 1996-1998, the environmental based model, without the year component, was used in predicting OCNR stock abundances. In addition, the predictions were in SRS rather than traditional index accounting.

Specifically, the OCNR environment-based predictor uses annual deviation from the mean April-June Bakun upwelling index at 42° N latitude (UpAnom), and annual deviation from the mean January sea surface temperature at Charleston, Oregon (JanAnom), to predict OCNR abundance.

For 1999 and 2000, the environmental based model with the year component, was used for predicting OCNR stock abundances. The 1999 OCNR abundance prediction data base includes 1971-1999 recruits, 1970-1999 upwelling, and 1971-2000 sea surface temperatures. The model, with coefficients, is:

$$\ln(\text{Recruits}(t)) = a+b*\text{UpAnom}(t-1)+c*\text{JanAnom}(t)+d*\text{Year}(t)$$

Where:

a	=	143.85875
b	=	0.001323
c	=	-0.143231
d	=	-0.070137
adjusted r^2	=	0.77

The OCNR stock data set, and a definition of the above terms, are presented in Appendix B, Table B-4.

Oregon Coastal Natural Lakes

Since 1988, the abundance of OCNL index coho has been predicted using the most recent three-year average adult stock abundance. OCNL coho production occurs from three lake systems (Ten Mile, Siltcoos, and Tahkenitch lake systems). Production from these systems has declined substantially from the levels observed during 1950-1980 but has been relatively stable.

Predictor Performance

Recent-year OCN stock preseason SRS abundance predictions are compared to postseason estimates in Table III-1. The 1999 preseason abundance prediction of 60,700 OCN coho was 117% of the preliminary postseason estimate of 51,900 coho.

2000 Stock Status

The 2000 preseason prediction for OCN (river and lake systems combined) is 55,900 coho, 92% of the 1999 preseason prediction of 60,700 coho and 108% of the 1999 postseason estimate (Table III-1). The 2000 preseason SRS prediction for OCNR and OCNL components are 43,900 and 12,000 coho, respectively.

Private Hatchery Coho

There have not been any Oregon coastal PRIH coho smolt releases since 1990. Thus, there was no recruitment for 1992-2000 of the PRIH coho stock.

Salmon Trout Enhancement Hatchery Coho Smolt Program

Predictor Description

Since 1988, preseason abundance predictions for Oregon coastal STEP index coho smolt production facilities have been based on the Council-approved procedure. This procedure evaluates: (1) smolt releases by facility, (2) smolt to adult survival based on the previous year's survival by facility, and (3) survival adjustments based on changes in OPI smolt to jack survival the previous year.

Predictor Performance

Recent-year STEP preseason abundance predictions are compared to postseason estimates in Table III-1. The 1999 preseason abundance prediction of 700 coho was 175% of the preliminary postseason estimate of 400 coho.

2000 Stock Status

The 2000 preseason STEP index abundance prediction is 600 coho, which equates to 600 coho. The 2000 prediction is similar to the 1999 preseason prediction of 700 coho (Table III-1).

Oregon Production Index Area Summary of 2000 Stock Status

The 2000 combined OPI area stock abundance is predicted to be 727,900 coho, which is 117% of the 1999 preseason prediction of 620,600 coho and 196% of the 1999 postseason estimate of 371,900 coho. The 2000 OPI area predictions can be compared to historical abundances in Table III-2 and Figure III-1.

WASHINGTON COASTAL AND PUGET SOUND COHO STOCKS

Predictor Description and Past Performance

A variety of preseason abundance estimators currently are employed for Washington coastal and Puget Sound coho stocks (Table I-2).

In previous years, initial estimates of abundance for some Puget Sound and Washington coastal stocks, prepared by state and tribal staffs for use by the STT in Council preseason planning, represented terminal run sizes assuming an average ocean or preterminal area fishery impact rate. Forecasts of ocean escapement for each stock were adjusted according to the approximate level of harvest expected in Council and other fisheries (e.g., West Coast Vancouver Island [WCVI] troll) and average stock distribution patterns by time and area. These adjustments were made with the use of the FRAM, a stock-fishery impact assessment model which has been employed by the STT and other management entities in planning since 1980. This year is the second year the run predictions were provided in terms of ocean recruits. This eliminates the need to expand the runs from a terminal run to an estimate of ocean abundance.

For the 1999 season, allowable ocean fishery impacts in the area north of Cape Falcon were determined by the depressed status of Oregon and Washington coastal natural coho stocks and also Columbia River hatchery stocks. A comparison of expected preseason and postseason abundance estimates for these stocks in recent years is presented in Tables III-3 and III-4. Postseason estimates of 1999 stock abundances for some of these stocks are not available at this time.

The comparison of preseason and postseason estimates of returns to terminal areas reflects annual errors in abundance estimates, deviations in ocean fisheries from preseason expectations, and variations in ocean distributions of stocks as described in the introduction. Fishery impact levels anticipated preseason may be quite different than those which actually occur. Postseason reconstructions of total fishery impacts and abundance estimates have not been completed for the 1999 season.

2000 Stock Status

Willapa Bay

This year (2000) is the first year hatchery and wild coho forecasts are estimated independently. The 2000 Willapa Bay hatchery total ocean coho stock abundance forecast is 19,634 adults, approximately 50% of the 1999 preseason forecast. The prediction is based upon the recent three year mean per release without adjustment based on jack abundance. The estimate of natural coho for 2000 is 9,900 adults. This prediction is based on assumed smolt production estimate (170,000) and an estimated marine survival (6%).

TABLE III-2. Oregon production index (OPI) coho harvest , spawning and abundance estimates by SRS accounting in thousands of fish.[a/] (Page 1 of 1)

	Ocean Fisheries[b/]		Oregon and California Coastal Returns						
Year	Troll	Sport	Hatcheries and Freshwater Harvest[c/]	OCN Spawners[d/]	Private Hatcheries	Columbia River Returns	Abundance	Ocean Exploitation Rate (%) Based on OPI Abundance[e/]	OCN Exploitation Rate (%) Based on Postseason FRAM
1970	1,463.7	499.0	80.3	71.7	-	895.3	3,010.0	65	-
1971	2,543.5	715.8	53.8	94.8	-	544.5	3,952.4	83	-
1972	1,275.6	560.3	29.9	34.1	-	277.8	2,177.7	84	-
1973	1,320.3	443.2	42.2	55.4	-	291.3	2,152.4	82	-
1974	2,095.1	668.6	49.5	34.5	-	460.8	3,308.5	84	-
1975	1,079.2	463.7	19.2	40.4	-	292.5	1,895.0	81	-
1976	2,936.1	977.7	62.6	40.7	-	337.0	4,354.1	90	-
1977	664.4	412.1	21.4	19.5	4.2	93.8	1,202.7	89	-
1978	1,104.2	524.6	12.6	19.8	12.3	307.1	1,946.1	83	-
1979	1,056.6	334.4	27.4	45.0	49.2	275.1	1,697.6	79	-
1980	506.9	526.4	32.1	30.3	38.7	301.6	1,350.9	73	-
1981	830.9	339.9	34.1	32.6	117.8	170.3	1,255.8	81	-
1982	740.9	300.4	37.1	76.2	184.7	453.1	1,474.2	62	-
1983	429.6	275.0	18.2	22.7	133.9	100.5	710.8	79	-
1984	95.8	174.2	51.2	74.4	115.4	414.2	808.1	32	-
1985	166.4	280.4	45.4	73.9	332.0	366.2	856.3	43	-
1986	643.5	320.6	81.8	70.0	453.7	1,527.8	2,556.0	34	-
1987	469.1	296.2	45.3	30.1	119.3	307.6	962.2	60	-
1988	844.7	297.2	62.4	56.8	116.1	664.8	1,807.9	57	-
1989	646.9	425.5	62.3	46.4	46.9	701.6	1,839.9	55	-
1990	277.6	357.1	30.6	20.9	35.6	196.1	917.9	69	-
1991	450.6	469.9	84.0	36.4	35.1	934.3	2,010.2	45	-
1992	67.5	256.5	52.6	39.3	-	210.9	627.2	51	-
1993	13.2	140.8	41.5	54.5	-	113.9	363.8	42	-
1994	2.7	3.0	31.8	43.7	-	168.9	251.1	2	7
1995	5.4	43.5	39.3	52.4	-	74.0	214.6	23	12
1996	7.0	31.8	49.6	73.0	-	111.3	278.0	14	8
1997	5.5	22.4	26.3	22.7	-	145.9	222.8	12	12
1998	3.5	11.5	27.3	30.9	-	159.4	232.6	6	8
1999[f/]	3.6	42.0	19.5	46.9	-	259.9	371.9	12	NA

a/ The OPI includes ocean and inside harvest impacts and escapement to streams and lakes south of Leadbetter Point, Washington.

b/ Includes estimated nonretention mortality: troll fishery--hook-and-release mortality for 1982-1999 and drop-off mortality for all years; sport fishery--hook and release mortality for 1994-1999 and drop-off mortality for all years.

c/ Includes returns from STEP smolt releases.

d/ Spawners returning to rivers have historically been estimated by a nonrandom standard index. Beginning in 1990, returns have also been estimated with a stratified random sampling (SRS) method. The SRS method indicates that actual total natural spawners are less than those projected by the standard index.

e/ Ocean fishery impacts on private hatchery stock and returns to private hatcheries are excluded in calculating the OPI area stock aggregate ocean exploitation rate index. Because of uncertainties in estimates of OCN coho spawners, the Oregon production exploitation rate index does not represent a true exploitation rate on OPI coho.

f/ Preliminary.

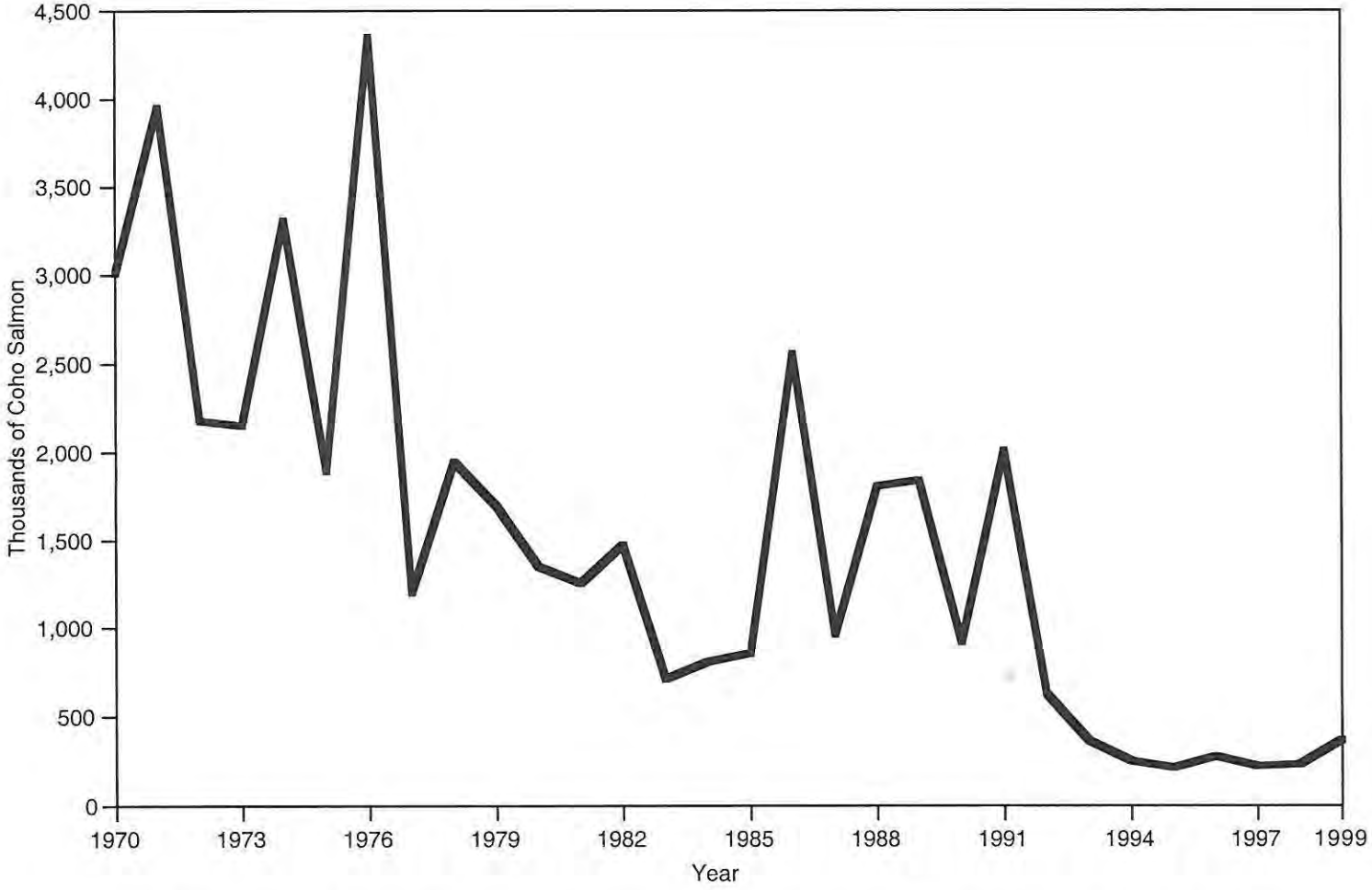

FIGURE III-1. Oregon production area coho salmon abundance estimates by SRS accounting methods, 1970-1999.

TABLE III-3. Preseason and postseason ocean escapements for selected **Washington coastal** adult natural coho stocks in thousands of fish. The 1999 postseason estimates are preliminary. (Page 1 of 1)

Year	Hoh River Fall			Queets River Fall			Grays Harbor[a/]		
	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	2.7	7.7	0.35	5.2	9.7	0.54	28.7	103.8	NA
1985	6.6	5.2	1.27	11.3	6.0	1.88	56.4	25.1	NA
1986	3.9	6.4	0.61	5.2	5.8	0.90	51.6	33.3	NA
1987	5.5	7.2	0.76	9.0	8.9	1.01	103.3	55.7	NA
1988	2.0	2.6	0.77	4.7	4.5	1.04	26.4	56.7	0.47
1989	5.7	5.4	1.06	6.2	5.5	1.13	43.0	60.9	0.71
1990	5.1	4.5	1.13	5.9	6.9	0.86	48.3	67.5	0.72
1991	3.4	5.4	0.63	7.9	8.6	0.92	138.0	118.4	1.17
1992	4.9	5.0	0.98	5.6	7.0	0.80	48.4	44.7	1.08
1993	4.8	1.9	2.53	6.5	5.4	1.20	84.7	40.2	2.11
1994	3.0	1.4	2.14	3.6	1.2	3.00	31.3	15.5	2.02
1995	4.4	5.4	0.81	7.2	7.3	0.99	64.4	69.5	0.93
1996	3.0	5.8	0.52	5.4	8.3	0.65	82.7	101.0	0.82
1997	1.6	1.4	1.14	2.4	2.0	1.20	14.8	25.4	0.58
1998	3.2	6.2	0.52	4.5	6.5	0.69	27.1	33.6	0.81
1999	2.8	6.6	0.42	3.7	3.8	0.97	50.3	NA	NA

a/ The source of the postseason return estimates is Washington Department of Fish and Wildlife.

TABLE III-4. Preseason and postseason ocean escapements for selected **Puget Sound** adult natural coho stocks in thousands of fish. The 1999 postseason estimates are preliminary. (Page 1 of 1)

	Skagit River			Stillaguamish River			Hood Canal			Quillayute River Fall		
Year	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1984	29.6	37.2	0.80	NA	26.9	NA	NA	57.5	NA	7.0	10.9	0.64
1985	26.1	31.3	0.83	NA	34.4	NA	NA	38.5	NA	19.2	15.7	1.22
1986	43.5	73.4	0.59	37.0	49.9	0.74	NA	82.2	NA	6.1	17.0	0.36
1987	33.0	41.2	0.80	29.7	46.3	0.64	NA	71.7	NA	11.7	23.8	0.49
1988	29.6	29.9	0.99	24.5	35.4	0.69	18.2	15.5	1.17	10.4	9.1	1.14
1989	31.2	27.6	1.13	24.5	13.5	1.81	36.8	25.5	1.44	14.5	11.2	1.29
1990	37.6	26.3	1.43	30.8	34.1	0.90	43.9	14.2	3.09	15.2	9.5	1.60
1991	40.8	11.8	3.46	32.9	11.3	2.91	17.6	15.3	1.15	8.8	10.9	0.81
1992	35.7	9.5	3.76	18.7	18.0	1.04	10.1	19.9	0.51	12.5	13.5	0.93
1993	28.1	14.5	1.94	24.5	10.6	2.31	39.5	16.7	2.37	7.6	4.7	1.62
1994	17.9	30.5	0.59	10.2	30.3	0.34	13.5	57.1	0.24	7.0	6.4	1.09
1995	30.0	16.2	1.85	32.7	20.4	1.60	19.3	41.1	0.47	8.5	14.2	0.60
1996	26.7	8.7	3.07	29.8	10.1	2.95	15.4	37.3	0.41	9.2	18.7	0.49
1997	34.2	40.1	0.85	15.7	12.9	1.22	38.1	100.4	0.38	5.1	4.9	1.04
1998	41.1	83.2	0.49	37.7	NA	NA	87.3	117.9	0.74	7.4	15.5	0.48
1999	53.4	NA	NA	27.3	NA	NA	45.2	NA	NA	12.8	NA	NA

Grays Harbor

Preseason predictions of abundance are made for natural fish throughout the system and for hatchery fish returning to three freshwater rearing complexes and two saltwater net pen sites. The estimate of Grays Harbor natural stock abundance for 2000 is 47,800 ocean recruits. The estimate of hatchery stock ocean abundance is 75,800 adults.

The hatchery forecast was derived by multiplying smolt releases by the 1991-1998 average survival rate. The staffs of the Washington Department of Fish and Wildlife (WDFW) and the Quinault Indian Nation (QIN) have reached agreement on 2000 forecasts for wild coho returning to Grays Harbor. The agreed forecast represents the mean of QIN and WDFW estimates of terminal returns per spawner expanded to December age-2 fish for modeling purposes.

Quinault River

The forecast for the Quinault natural coho ocean run size is 4,400 fish, a reduction of 39% from the 1999 projected level. This estimate represents the 1997 brood year escapement (3,200) multiplied by the 1992-1995 brood year average ocean recruits per spawner, adjusted by a factor reflecting anticipated reduced survival (0.529).

The Quinault hatchery coho ocean run size forecast is 7,400 fish, a decrease of 9% compared to the 1999 forecast level. The forecast is derived from the mean 1992-1995 brood year observed marine survival rates (0.0136) and 1997 brood year smolt releases (548,600).

Queets River

The Queets natural coho ocean run size is forecast at 2,700 fish, a decrease of 38% from the 1999 forecast level. This forecast represents the estimated smolt production from natural spawning (73,600) multiplied by the 1992-1995 brood year average observed ocean survival rate (0.0319 for tagged fish, 0.0380 for untagged fish).

Forecast ocean abundance of supplemental production from smolt releases is 800 fish, a 74% decrease from the 1999 forecast. This forecast is based on releases (55,400) multiplied by the 1992-1995 brood year average observed marine survival rate.

The Queets hatchery coho ocean run size forecast is 11,000 fish, a slight increase compared to the 1999 forecast level. This forecast is based on the smolt release of 679,000 multiplied by the 1992-1995 brood year average observed marine survival rate (0.0161).

Hoh River

The Hoh River natural coho ocean run size is forecast at 3,500 fish, an increase of 9% compared to the 1999 forecast. This forecast is based on estimated smolt production per spawner (based on Queets) and the average of recent year ocean survival rates for the Bingham Creek and Queets wild coho.

No hatchery production is projected for the Hoh system for 1999.

Quillayute River

The Quillayute River summer natural and hatchery coho ocean recruits are forecast at 1,600 and 5,400 fish, respectively. The natural component run size is based on average ocean recruits per spawner and brood year escapements. The hatchery component run forecast is based on average ocean recruits per release multiplied by the number of smolts released. The 2000 forecast abundance of natural summer coho is 33% above the 1999 forecast while the hatchery forecast is 54% above the 1999 forecast level.

The Quillayute River fall natural and hatchery coho ocean run sizes are forecast at 8,700 and 13,900 fish, respectively. The forecast of the natural component run size is based on the average recruits per spawner, multiplied by the 1997 spawning escapement. The hatchery production forecast is based on average ocean recruits per release multiplied by the number of smolts released. The 2000 forecast abundance of natural and hatchery components are 40% below and 54% above the 1999 forecast levels.

Puget Sound

The expectation for total abundance of natural and hatchery Puget Sound coho stocks combined is 50% to 54% below the 1999 preseason forecast level. Abundance of natural stocks is expected to be 39% to 51% below 1999 forecast levels, while the abundance of hatchery stocks is expected to be 55% below the 1999 preseason forecast.

A variety of methods were used for the 2000 Puget Sound coho forecast. For all hatchery predictions a new cohort (landed catch plus escapement) database for return years 1986-1991 was used to estimate historic survival rates. The average survival for these years times the smolts released yielded the predicted December age-two cohort size. Because these years did not reflect the poor survivals observed in more recent years, an adjustment to the predictions were made, lowering the estimates. The survival rate for 1986-1991 was scaled by the ratio of the Puget Sound average December age-two recruit survival from 1996-1999 (2.5%) to the 1986-1991 average (10.05%). The exceptions are the deep South Sound facilities (Minter, Nisqually, South Sound pens), which were scaled by 20% of the ratio of the 1999 average (1.8%) to the 1986-1991 average. This reduction served to bring the forecasted 2000 marine survival rates into the same region as the estimated 1999 marine survival rates (0.5% or less). The Strait of Juan de Fuca facilities (Elwha and Dungeness) use the mid point of the hatchery survival rates for Hood Canal and Quillayute.

Generally, the forecasts for wild stocks were the estimated number of wild smolts multiplied by recent average marine survival rates. The forecasts for south Puget Sound were derived as described in the following paragraphs.

Due to extreme low survival of Deschutes coho, rates were selected which declined (from north to south): 3% for the Lake Washington, Green River and East Kitsap production areas; 2% for the Puyallup and Nisqually Rivers and South Puget Sound; and 1% for the Deschutes River. For the Stillaguamish and Snohomish Rivers, a rate of 6% was selected, lower than the average of the last two brood years (1995-1996) estimated at Sunset Falls (7.2%). The STT was presented with two different forecasts for Hood Canal coho. The WDFW forecast is as follows:

b*c*d = 34,300 ocean recruits (45,600 *December age 2 fish*)
where:

- a = an estimate of smolt production obtained from trapping studies on four tributaries to Hood Canal (25,220);
- b = a ratio between "a" and the production potential of the same tributaries as derived from 1977 WDF Technical Report 28 (42.6%);
- c = an estimate of the total smolt production potential from Hood Canal from 1977 WDF Technical Report 28 (1,006,577); and
- d = an assumed ocean survival of 8%.

The Point No Point Treaty Council forecast is 105,800 December Age 2 fish. This forecast is derived by multiplying the 1990 and 1992 through 1995 brood year average ratio between the December age-2 run size, as estimated from a terminal run reconstruction program (5.046), and the smolt production estimate from Big Beef Creek (20,967). The STT has not examined the relative merits of either forecast in depth in deference to allowing discussions between state and tribal co-managers to continue. The STT has made two model runs, one with each forecast, to provide an indication of the potential significance of the difference between the two forecasts.

For the rivers entering the Strait of Juan de Fuca, the coastal marine survival rate of 6% was applied to the smolt estimate producing a December age-2 forecast of 18,000. For the north Sound systems (Nooksack

through the Skagit River) a rate of 8% was selected, down from the average marine survival rate (11.8%) for the four odd-numbered brood years measured thus far at the Baker River. The Skagit forecast is adjusted to account for underestimates of escapements during the base years of 1979-1981.

Detailed descriptions of these methodologies are available in the 2000 Puget Sound Coho Salmon Forecast Methodology report available through WDFW and the Northwest Indian Fisheries Commission.

SELECTIVE FISHERY CONSIDERATIONS

As the region has moved forward with mass marking of hatchery coho salmon stocks, selective fishing options are an important consideration for fishery managers. Table III-5 summarizes estimates of mass mark rates for coho stocks from Southern British Columbia to the Oregon coast, based on preseason abundance forecasts. Agencies have released coho mass marked with adipose clips from the 1997 brood, making these fish available to 2000 fisheries.

EVALUATION OF 1999 REGULATIONS ON 2000 STOCK ABUNDANCE

Oregon Production Index Area

Ocean fisheries were modeled based on 1999 regulations, an expected WCVI coho mortality of 50,000 fish, and 2000 preseason abundance predictions. Under this scenario, the expected exploitation rate on OCN coho is 9.1%. The expected OCN spawner escapement is 48,400 adults. Escapements and fishery impacts for OCN and Rogue/Klamath coho were estimated using the FRAM (Tables III-6 and III-7).

Based on parent escapement levels and observed OPI smolt-to-jack survival for 1997 brood OPI smolts, the total allowable OCN coho exploitation rate for 2000 fisheries is no greater than 15% under Amendment 13 (see Appendix A, Tables A-2 and A-3).

Ocean escapements into the Columbia River in 2000 would be sufficient to provide for treaty Indian obligations, inside non-Indian fisheries, and meet hatchery requirements under 1999 ocean fishing regulations.

North of the Oregon Production Index Area

Ocean escapement expectations for selected naturally-spawning coho stocks, given 2000 preseason abundance forecasts and preseason projections for 1999 fishing patterns, are presented in Table III-6. The expected escapements assume projections for 1999 catch levels, season structure, and regulations for all Council area ocean fisheries, U.S. inside water fisheries (e.g., Puget Sound), and Canadian fisheries (e.g., WCVI troll). Escapements and fishery impacts were estimated using FRAM, the fishery impact model used by the STT for the 1999 preseason assessment, updated with 2000 abundance forecasts. More detailed fishery management goals for Council area coho stocks are listed in Appendix A, Table A-1.

Ocean escapements for most natural coho stocks north of the OPI index area would be expected to be below their spawning escapement goals under 1999 regulations. Impacts of inside fisheries would ultimately determine levels of anticipated spawning escapements. For 2000, fisheries directed at pink salmon would be expected to impact Puget Sound coho stocks to a lesser degree than fishing patterns for 1999.

Ocean escapement expectations for 2000 vary substantially by stock compared to 1999 with Puget Sound stocks showing a considerable difference. The biggest variation among the North coastal stocks is shown by the Queets.

TABLE III-5. Mass marking of 1997 brood coho available to 2000 Council fisheries. All stocks were marked with an adipose fin clip. (Page 1 of 1)

Region	Ocean Recruits		Percent Mass Marked
	Wild	Hatchery	
PUGET SOUND STOCKS:			
Nooksack-Samish & 7/7A Independent	14.9	65.5	11.3%
Skagit	30.2	10.3	21.4%
Stillaguamish	17.7	0	0.0%
Snohomish	53.0	62.1	21.8%
South Puget Sound Normal	11.7	101.2	76.2%
South Puget Sound Delayed	0	20.6	92.3%
Hood Canal: WDFW Estimate	34.3	38.5	44.5%
Pt. No Pt. Estimate	79.4	53.2	33.6%
Strait of Juan de Fuca & Area 9	13.5	13.7	35.6%
Puget Sound Total: WDFW Estimate	175.3	311.9	48.1%
Pt. No Pt. Estimate	220.4	326.6	42.9%
WASHINGTON COASTAL STOCKS:			
Makah	0	11.7	26.2%
North Coast Independent Tributaries	5.0	0	0.0%
Quillayute Summer	1.6	5.4	73.3%
Quillayute Fall	8.7	13.9	52.6%
Hoh	3.5	0	0.0%
Queets	2.7	11.7	13.6%
Quinault	4.4	7.4	9.2%
Grays Harbor	35.8	56.9	57.9%
Willapa Bay	9.9	19.6	61.3%
Washington Coastal Total	71.6	126.6	47.9%
COLUMBIA RIVER STOCKS:			
Columbia River Early	0	326.3	89.6%
Columbia River Late	0	278.0	98.5%
Columbia River Total	0	604.3	93.7%
OREGON COASTAL	55.9	67.7	48.8%
SOUTHERN BRITISH COLUMBIA STOCKS:[a/]			
West Coast Vancouver Island	183.8	17.4	7.2%
Southeast Vancouver Island	13.5	23.8	12.0%
Quinsam	158.0	28.0	8.8%
Puntledge	23.6	9.7	22.3%
Big Qualicum	29.9	29.2	47.1%
Capilano	2.7	15.8	85.4%
Fraser	67.7	117.8	54.4%
Southern British Columbia Total	479.2	241.7	26.0%

a/ For this assessment, we used 1999 abundances adjusted for known 2000 mark rates. Estimates of 2000 run sizes will be available the first week in March.

TABLE III-6. Estimated year 2000 ocean escapements for critical natural and Columbia River hatchery coho stocks based on preliminary 2000 preseason abundance forecasts and 1999 Council regulations compared to predicted 1999 preseason escapements.[a/] (Page 1 of 1)

Stock	Ocean Escapement Estimates Under 1999 Regulations[b/]			
	2000 Preseason Abundance		1999 Preseason Abundance[c/]	2000 Spawning Escapement Goal[d/]
	COHO (thousands)			
	WDFW[e/]	Pt. No Pt.		
Natural Coho Stocks				
Skagit	18.2	18.5	53.4	30.0
Stillaguamish	12.6	12.8	27.3	17.0
Snohomish	37.8	38.3	108.1	70.0
Hood Canal	22.3	52.9	45.2	21.5
Strait of Juan de Fuca	9.5	9.6	8.8	12.8
Quillayute Fall	7.4	7.5	12.8	6.3-15.8
Hoh	3.0	3.0	2.8	2.0-5.0
Queets	2.2	2.3	3.7	5.8-14.5
Grays Harbor	40.6	40.8	50.3	35.4
OCN	48.9 (9.1%)	49.0 (9.0%)	52.8 (8.7%)	≤15%[f/]
Hatchery Stocks				
Columbia Early	215.0	215.7	200.3	22.5
Columbia Late	166.0	167.1	78.1	16.3

a/ Quota levels include harvest and hooking mortality estimates used in planning the Council's 1999 ocean fisheries and a coho catch for the Canadian troll fishery off the West Coast of Vancouver Island (WCVI).

b/ Ocean escapement is generally the estimated number of coho escaping ocean fisheries and entering freshwater. For Puget Sound stocks, ocean escapement is the estimated number of coho entering Area 4B which are available for U.S. net fisheries in Puget Sound and spawning escapement after impacts associated with the Canadian and Puget Sound troll and recreational fisheries have been deducted. For the OCN coho stock, this value represents the estimated spawner escapement in SRS accounting. For Columbia River hatchery stocks, ocean escapement represents the number of coho after the Buoy 10 fishery.

c/ Based on a Canadian catch of 50,000 coho off of WCVI.

d/ Spawning escapement goals are not directly comparable to ocean escapement, because inside fishery harvest is not considered.

e/ Differing ocean escapement estimates result from differing WDFW and Point No Point Treaty Council projections for Hood Canal coho.

f/ From 1994-1997 the long-term goal (under Amendment 11) was 42 adults per mile on standard index surveys. Beginning in 1998, the goal was modified by the Endangered Species Act requirements and follows Amendment 13. For 2000, the conservation objective is to allow a combined freshwater and marine harvest exploitation rate no greater than 15%, based on low parent escapement and medium marine survival.

TABLE III-7. Comparison of Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho harvest mortality and exploitation rates by fishery under Council-adopted 1999 regulations and preliminary 2000 preseason abundance (based on WDFW estimates for Hood Canal coho). (Page 1 of 1)

	Harvest Mortality and Exploitation Rate			
	OCN		RK	
Fishery	Number	Percent	Number	Percent
SOUTHEAST ALASKA	16	0.03	0	0.00
BRITISH COLUMBIA	137	0.26	0	0.00
PUGET SOUND/STRAITS	347	0.66	0	0.00
NORTH OF CAPE FALCON				
Treaty Indian Troll	249	0.47	0	0.00
Recreational	336	0.64	9	0.05
Non-Indian Troll	354	0.67	0	0.00
SOUTH OF CAPE FALCON				
Recreational:				
Cape Falcon to Humbug Mt.	370	0.70	13	0.07
Humbug Mt. to Horse Mt. (KMZ)	440	0.83	512	2.87
Fort Bragg	253	0.48	238	1.34
South of Pt. Arena	514	0.97	94	0.53
Troll:				
Cape Falcon to Humbug Mt.	768	1.46	14	0.08
Humbug Mt. to Horse Mt. (KMZ)	91	0.17	108	0.61
Fort Bragg	8	0.02	16	0.09
South of Pt. Arena	345	0.65	59	0.33
BUOY 10	65	0.12	15	0.08
ESTUARY/FRESHWATER	489	0.93	---	---
TOTAL	4,782	9.06	1,078	6.05

CHAPTER IV
FRASER RIVER AND PUGET SOUND PINK SALMON ASSESSMENTS

Two major stocks comprise the pink salmon population available to Council ocean fisheries during odd-numbered years. Table IV-1 provides a summary of recent run sizes.

The more abundant of the two runs originates from the Fraser River in British Columbia. Average run size for the period 1977-1999 (odd numbered years only) is approximately 13.2 million, ranging from 3.6 million in 1999 to 19 million in 1985. Fraser River pink salmon forecasts have been based on the relationship of fry index values and sea surface salinity at the time of juvenile emigration.

The ocean abundance of Puget Sound pink salmon stocks has averaged 2.3 million during the period 1977-1997 (odd numbered years only), ranging from 0.5 million in 1981 to 3.7 million in 1989. Forecasts of abundance are based on cyclic relationships of adult production and parent spawner abundance.

Fraser River and Puget Sound pink runs occur in significant numbers only in odd-numbered years.

TABLE IV-1. Actual run sizes (odd numbered years 1977-1999) for Fraser River and Puget Sound pink salmon in millions of salmon.

Year	Puget Sound[a/]	Fraser River[b/]
1977	0.86	8.21
1979	1.31	14.40
1981	0.48	18.68
1983	1.00	15.35
1985	3.01	19.04
1987	2.59	7.17
1989	3.70	16.67
1991	2.28	16.67
1993[c/]	2.75	17.43
1995[d/]	3.43	12.50
1997[d/]	4.41	8.20
1999	NA	3.56

a/ For 1977-1983, the number in this column represents the Puget Sound run size after Canadian and U.S. ocean fisheries. Numbers after 1983 represent total Puget Sound run size.

b/ Total run size.

c/ Preliminary estimate. Area 4B run size adjusted for an average 1989-1991 interception rate of 24.6 percent.

d/ Preliminary estimate. Likely to be adjusted when GSI bias-correction methodologies are finalized.

60th Galaxy Gold side 1

APPENDIX A
SUMMARY OF COUNCIL STOCK MANAGEMENT GOALS

LIST OF TABLES

60#
Galaxy Gold
Seed 2

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
CALIFORNIA CENTRAL VALLEY - All fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin Rivers and their tributaries. Management of this stock complex is based primarily on Sacramento River fall chinook, which includes a large hatchery component, and natural Sacramento River winter chinook which are listed as endangered. The San Joaquin system has been severely degraded by water development projects and pollution. Natural populations of spring chinook there have been extirpated and remaining spawning areas are utilized primarily by fall chinook which have comprised <10% of the total Central Valley fall run.			
Sacramento River Fall	122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).	Yes.	High abundance, large hatchery component. Single largest contributor to ocean fisheries off California, a significant contributor off southern and central Oregon, and present north into British Columbia. Primary impact south of Pt. Arena; considerable overlap with coastal and Klamath River fall chinook between Pt. Arena and Horse Mt.
Sacramento River Spring Threatened	NMFS jeopardy standard/recovery plan (not established at time of printing). No defined objective for ocean management prior to listing.	Indirectly. MSY criteria undefined. Assessment of ocean distribution and fishery impacts needed for ESA determination and to aid management. Present level of ocean fishery impacts limited by measures constraining harvest on Sacramento River winter and Klamath River fall chinook.	Severely depressed. Minor contributor to ocean fisheries off California, also known to occur off Oregon. Ocean fishery impacts primarily incidental to harvest of Sacramento River fall chinook and may be lower due to differences in run timing. MSY undefined but substantially reduced from historic levels by man-caused loss and deterioration of freshwater habitat.
Sacramento River Winter Endangered (1994)	NMFS jeopardy standard/recovery plan. Since 1996, an annual preseason objective of a 31% increase in the adult spawner replacement rate (equivalent to a 1.77 replacement rate) relative to the observed 1989-1993 mean rate of 1.35. Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim rebuilding program.	Depressed and listed, recent increase. Minor contributor to ocean fisheries south of Pt. Arena. Ocean fishery impacts incidental to harvest of Sacramento River fall chinook. Primary impact south of Pt. Arena.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 2 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
NORTHERN CALIFORNIA COAST - All fall and spring stocks of California streams north of the entrance to San Francisco Bay. Management of this stock complex is based primarily on meeting spawning escapements for natural fall chinook. Limited data is available except for the Klamath River. An assessment and monitoring program is under consideration by CDFG for stocks originating from the Smith, Eel, Mattole and Mad Rivers which might provide a more thorough management basis for the future. Significant water diversion problems in several drainages. In the Klamath River Basin, there is significant hatchery production of fall chinook and less so of spring chinook, resulting primarily from mitigation programs for dams constructed in both Upper Klamath and Trinity Rivers.			
Eel, Mattole, Mad, and Smith Rivers (Fall and Spring) Eel, Mattole and Mad River stocks - Threatened (1999)	Undefined. Indices of spawning abundance limited to one tributary of the Mad River and two tributaries of the Eel River. NMFS jeopardy standard/recovery plan for Eel, Mattole, and Mad River stocks not established at time of printing.	Indirectly. Data insufficient to define MSY criteria. CDFG developing an assessment and monitoring program. Conservation achieved by objective for Klamath River fall chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.	Depressed. Limited management data. Believed to occur in ocean fisheries off northern California and southern Oregon. Ocean fishery impacts incidental to fisheries for Sacramento and Klamath Rivers fall chinook. No preseason or postseason abundance estimates available.
Klamath River Fall (Klamath and Trinity Rivers)	33-34% of potential adult natural spawners, but no fewer than 35,000 naturally spawning adults in any one year. Brood escapement rate must average 33-34% over the long-term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Objective designed to allow a wide range of spawner escapements from which to develop an MSY objective or proxy while protecting the stock during prolonged periods of reduced productivity. Adopted 1988 based on Hubbell and Boydstun (1985); KRTT (1986); PFMC (1988); minor technical modifications in 1989 and 1996 (Table I-1). Natural spawners to maximize recruitment are estimated at 41,000 to 106,000 adults (Hubbell and Boydstun 1985).	Yes. A conservation alert or overfishing concern will be based on a failure to meet the 35,000 floor.	Abundance variable from high to depressed. Major contributor to ocean fisheries from Humbug Mt., OR to Horse Mt., CA (the KMZ) and to Klamath River tribal and recreational fisheries. Significant contributor to ocean fisheries from central Oregon to central California. Coastwide impacts are considered in meeting allocation requirements for Indian tribes with federally recognized fishing rights and the inland fishery. Specific management measures for this stock generally are implemented from Pigeon Pt., California to Florence, Oregon.
Klamath River Spring (Klamath and Trinity Rivers)	Undefined.	Indirectly. MSY criteria undefined. Productive potential protected by the objective for Klamath River fall chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.	Depressed. Believed to occur in ocean fisheries off northern California and southern Oregon (based on Trinity River Hatchery fish). Impacts incidental to ocean fisheries for Sacramento and Klamath Rivers fall chinook.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 3 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- CHINOOK ---	
OREGON COAST - All fall and spring stocks from Oregon streams south of the Columbia River. No preseason abundance estimates available. Management based primarily on an aggregate objective of 150,000 to 200,000 natural adult spawners (attainment of objective based on a postseason estimate of 60-90 natural adult spawners per mile in nine standard index streams). This objective is based on optimal escapement estimates for individual coastal rivers at habitat capacity (Thompson 1977). Lower end of the objective range is nearly twice the estimated MSY spawning escapement of 79,000 fall chinook adults based on stock recruit analysis (McGie 1982). Significant hatchery production also exists within the coastal streams.			
Southern Oregon (Aggregate of fall and spring stocks in all streams south of Elk River; Rogue River fall stock is used to indicate relative abundance and ocean contribution rates)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile. Conservation also ensured by the objective for Klamath River fall chinook which includes a large inside allocation component that reduces ocean fishery exploitation rate in areas inhabited by these fish.	Medium to low abundance. Data limited except for Rogue River fall stock. Stocks migrate southerly or remain local and fall chinook contribute to ocean fisheries off northern California and Oregon, less so for spring stocks.
Central and Northern Oregon (Aggregate of fall and spring stocks in all streams from the Elk River to just south of the Columbia River)	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	Yes, based on postseason estimates of <60 natural adult spawners per mile.	Variable between high and medium abundance. Stocks migrate northward and contribute to ocean fisheries off British Columbia and SE Alaska and to a lesser degree off Washington and Oregon.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 4 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- CHINOOK ---	
COLUMBIA RIVER BASIN - All pertinent fall, summer, and spring stocks of the Columbia River and its tributaries. Stocks within this complex are noted by area of origin: lower river (below Bonneville Dam), mid-river (Bonneville to McNary Dams), and upper river (above McNary Dam). Spawner escapement goals for these stocks are set through procedures of the U.S. District Court in U.S. v. Oregon and subsequent court orders. These goals are set forth in the Columbia River Fishery Management Plan and are recognized in the Council's conservation objectives. Annual inside fishery management planning activities are conducted within the Columbia River Compact and other state and tribal management forums. The Columbia River Compact, initially established by Oregon and Washington to jointly administer commercial fisheries within the Columbia River, takes into account the impacts from other state and tribal fisheries (e.g., recreational, ceremonial, subsistence, etc.) authorized under the Columbia River Fish Management Plan. The majority of ocean chinook harvest north of Cape Falcon is provided by Columbia River salmon stocks, primarily hatchery production of tule fall chinook from the Bonneville Pool (Spring Creek) and lower river hatcheries, smaller numbers of upper river bright hatchery and natural fall chinook, and some lower river hatchery spring chinook (Cowlitz). Hatchery objectives are based on long-range production programs and/or mitigation requirements associated with displaced natural stocks. Threatened Snake River fall chinook, which suffer from severe dam passage mortalities and extreme loss of freshwater habitat, are of prime concern in limiting ocean exploitation rates in all ocean fisheries north of Pigeon Pt., California. These limits act to provide considerable protection to other weak natural stocks subject to ocean fishery impacts.			
North Lewis River Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.	No. Listed stock. ESA jeopardy standard provides interim rebuilding program. Base period Council-area ocean fishery impacts around 7%.	Medium to low abundance. Present in ocean fisheries north of Cape Falcon to SE Alaska.
Lower River Hatchery Fall	15,400 adults to meet egg-take goal or as determined by management entities.	No (hatchery exception).	Medium to low abundance. Major contributor to ocean fisheries north of Cape Falcon to central British Columbia.
Lower River Hatchery (Spring)	2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.	No (hatchery exception).	Medium to low abundance. Present in ocean fisheries north of Cape Falcon to SE Alaska.
Upper Willamette (Spring) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). Willamette River Management Plan provides an MSY proxy of 30,000 to 45,000 hatchery and natural adults over Willamette River falls, depending on run size.	No. Listed stock. ESA jeopardy standard provides interim rebuilding program. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding.	Low abundance. Present in fisheries north of Cape Falcon to SE Alaska.
Mid-River Bright Hatchery (Fall)	None for ocean fishery management.	No (hatchery exception).	Medium to high abundance. Contributor to ocean fisheries off Washington, British Columbia, and southeast Alaska. Primarily produced at Bonneville Hatchery.
Spring Creek Hatchery (Fall)	7,000 adults to meet hatchery egg-take goal.	No (hatchery exception).	Low abundance. Significant contributor to ocean fisheries north of Cape Falcon to southern British Columbia.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 5 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
COLUMBIA RIVER BASIN (continued)			
Klickitat, Warm Springs, John Day, and Yakima Rivers (Spring)	Hold ocean fishery impacts at or below base period (<1%) and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state and tribal management entities considering separate conservation objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding. Major habitat restoration addressing water withdrawals and dam passage and blockages is necessary for rebuilding.	Long-term depressed abundance. No significance to ocean fisheries, infrequent occurrence in fisheries north of Cape Falcon to Alaska.
Snake River Fall Threatened (1992)	NMFS jeopardy/recovery standard. Since 1995, Council has met a standard of limiting its fisheries so that the total exploitation rate on age-3 and age-4 Lyons Ferry Hatchery fall chinook (representing Snake River fall chinook) for all ocean fisheries (including Canada) has been ≤70% of the 1988-1993 average adult equivalent exploitation rate. Prior to listing, managed within objectives for upper Columbia River bright fall chinook.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim rebuilding program. Recovering historic abundance unlikely as dams block former primary spawning area.	Present in ocean fisheries from central California to southeast Alaska with greatest contribution to Canadian fisheries. Primary impacts in Council fisheries north of Cape Falcon, but also extending to Pigeon Pt., CA.
Snake River Spring/Summer Threatened (1992)	Not applicable for ocean fisheries.	No. Listed stock. Base period Council-area ocean fishery impacts rare (unmeasurable). Dam passage mortality must be reduced to allow stock recovery.	Depressed, recent trend downward. Rare occurrence in ocean fisheries from Washington to SE Alaska.
Upper River Bright (Fall)	40,000 natural bright adults above McNary Dam (MSY proxy adopted in 1984 based on CRFMP. The management goal has been increased to 45,000 by Columbia River managers in recent years.	Limited. Base period Council-area ocean fishery exploitation rate <4% prevents effective Council fishery management and rebuilding.	High to medium abundance. Significant contributor to ocean fisheries off Canada and to a lesser extent Washington and Oregon. Primary impact area north of Cape Falcon.
Upper River Summer	Hold ocean fishery impacts at or below base period (<2%); recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).	Limited. Base period Council-area ocean fishery exploitation rate <2% prevents effective Council fishery management and rebuilding. Dam passage mortalities must be reduced to allow rebuilding.	Long-term depressed abundance. Present in ocean fisheries north of Cape Falcon to southeast Alaska.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 6 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
COLUMBIA RIVER BASIN (continued)			
Upper River Spring Endangered (1999)	None applicable to ocean fisheries. Ensure ocean fishery impacts remain rare and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state/tribal management entities considering separate objectives for these stocks).	No. Listed stock. Base period Council-area ocean fishery impacts rare (not measurable), making Council management and rebuilding ineffective. Reduce dam passage mortalities to allow rebuilding.	Long-term depressed abundance. Captive broodstock programs started in 1997. No significance to ocean fisheries. Rare occurrence in ocean fisheries north of Cape Falcon to Canada.
WASHINGTON COAST - All pertinent fall, summer and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of the Elwha River). This stock complex consists of several natural stocks, generally of small to medium sized populations, and some hatchery production (Willapa Bay and the Quinault River). Stocks in this complex tend to range further north than most Columbia River stocks and, while present in fisheries from Cape Falcon to SE Alaska, are not significantly impacted by Council-area ocean fisheries. Preseason abundance estimates are generally not available for Council management. These stocks qualify as **exceptions** to the Council's overfishing criteria due to very low fishery impacts. Spawning escapement goals for stocks managed within this complex, established in U.S. District Court by WDFW and the treaty tribes, are recognized in the Council's conservation objectives below. Objectives for Grays Harbor and the north coast river systems have been established pursuant to the U.S. District Court order in Hoh v. Baldrige. However, annual natural spawning escapement targets may vary from the conservation objectives below if agreed to by WDFW and the treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders. After agreement is reached on the annual targets, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for treaty allocation and inside, non-Indian fishery needs.			
Willapa Bay Fall (natural)	Undetermined.	Limited (exploitation rate exception).	
Willapa Bay Fall (hatchery)	8,200 adult return to hatchery.	No (hatchery exception).	
Grays Harbor Fall	14,600 natural adult spawners--MSP based on full seeding of spawning and rearing habitat (WDF 1979).	Limited (exploitation rate exception).	
Grays Harbor Spring	1,400 natural adult spawners.	"	
Quinault Fall	Hatchery production.	No (hatchery exception).	
Queets Fall	Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).	Limited (exploitation rate exception).	
Queets Spring/Summer	Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.	"	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 7 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
WASHINGTON COAST (continued)			
Hoh Fall	Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).	"	
Hoh Spring/Summer	Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.	"	
Quillayute Fall	Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).	"	
Quillayute Spring/Summer	1,200 natural adult spawners for summer component (MSY).	"	
Hoko Summer/Fall (Western Strait of Juan de Fuca)	850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults used for supplementation program.	"	
PUGET SOUND - All fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). This stock complex consists of numerous natural chinook stocks of small to medium sized populations and significant hatchery production. Puget Sound stocks contribute to fisheries off British Columbia and are present into SE Alaska, but are impacted to a minor degree by Council-area ocean fisheries. Base period, Council-area ocean fishery exploitation rates (adult equivalent) of 2% or less are below a management threshold which allows effective Council management of these stocks and they qualify as **exceptions** to the Council's overfishing criteria. The stocks within this complex and their respective conservation objectives, established in U.S. District Court by WDFW and the Treaty tribes, are recognized below. The conservation objectives for stocks managed primarily for natural production were developed by a State/Tribal Management Plan Development Team following the Boldt Decision and were based on "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The objectives were estimated for the average spawning escapements during periods that were thought to represent spawner abundances that provided maximum production (Ames and Phinney 1977). The objectives for stocks managed for artificial production are based on hatchery escapement needs. Annual management targets (expected hatchery plus natural escapement) for specific rivers or regions of origin may vary from the conservation objectives by following fixed procedures established in U.S. District Court as outlined in "Memorandum Adopting Salmon Management Plan" (U.S. v. Washington, 626 F. Supp. 1405 [1985]).			
Eastern Strait of Juan de Fuca Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 3,825 natural and hatchery adult spawners--2,900 for the Elwha River (Ames and Phinney 1977) and 925 for the Dungeness River (Smith and Sele 1994).	Limited (exploitation rate exception).	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 8 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
PUGET SOUND (continued)			
Skokomish Summer/Fall (Hood Canal) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,650 natural adult spawners (Ames and Phinney 1977).	"	
Nooksack Spring (early) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners.	"	
Skagit Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 14,850 natural adult spawners (Ames and Phinney 1977).	"	
Skagit Spring Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 3,000 natural adult spawners based on mean escapement 1959-1968.	"	
Stillaguamish Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners (Ames and Phinney 1977).	"	
Snohomish Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 5,250 natural adult spawners (Ames and Phinney 1977).	"	
Cedar River Summer/Fall (Lake Washington) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,200 natural adult spawners (Hage *et al.* 1994).	"	
White River Spring Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 1,000 natural adult spawners.	"	
Green River Summer/Fall Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 5,750 natural adult spawners (Ames and Phinney 1977).	"	
Nisqually River Summer/Fall (South Puget Sound) Threatened (1999)	NMFS jeopardy standard/recovery plan (not established at time of printing). MSP objective of 900 natural adult spawners.	"	

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 9 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - CHINOOK - - -	
SOUTHERN BRITISH COLUMBIA - Fall and spring stocks of British Columbia coastal streams and the Fraser River. Management based primarily on natural and hatchery fall chinook. Base period, Council-area ocean fishery exploitation rates (adult equivalent) on the coastal stocks of 1% or less are below a management threshold which allows effective Council management of these stocks and they qualify as **exceptions** to the Council's overfishing criteria.			
Coastal Stocks	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority and would also be an exploitation rate exception.	Medium abundance. Major contributors to ocean fisheries off British Columbia; significant contributors north into SE Alaska and present off northern Washington.
Fraser River	Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.	No. Under Canadian authority.	Medium abundance. Major contributors to ocean fisheries off British Columbia; contributors off northern Washington; and present north into SE Alaska.
		- - - COHO - - -	
OREGON PRODUCTION INDEX AREA - All Washington, Oregon, and California natural and hatchery coho stocks from streams south of Leadbetter Pt. Significant production from Columbia River and Oregon coastal hatcheries provide harvest in ocean fisheries throughout the Council management area. Ocean fisheries are usually limited primarily to meet natural escapement objectives. Treaty Indian obligations, nontreaty harvest opportunity, and hatchery requirements must also be factored in for the Columbia River stocks. Both natural and hatchery components have been severely depressed for several yeas due to a combination of previously high fishery impacts, major losses or degradation of freshwater habitat, and long-term marine conditions unfavorable to coho survival.			
Central California Coast Threatened (1996)	NMFS jeopardy standard/recovery plan. Since 1998, no retention of coho in commercial and recreational fisheries off California in conjunction with total marine fishery impacts of no more than 13% on Rogue/Klamath hatchery coho (surrogate stock). Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim protection of productive capacity. Recovery limited by deterioration of significant portions of freshwater habitat, distribution at southern edge of coho range, and ongoing unfavorable marine conditions.	Very minor component of OPI area fisheries, limited potential for significant contribution to ocean and inland fisheries. Current impacts incidental in ocean fisheries off California. Development of monitoring and assessment program considered for Ten Mile River, Noyo River, Gualala River, Lagunitas Creek, and Scott Creek. Rogue/Klamath coho are believed to have a similar, but more northerly distribution.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 10 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX (continued)			
Northern California Threatened (1997)	NMFS jeopardy standard/recovery plan. Since 1998, total marine fishery impacts limited to no more than 13% on Rogue/Klamath hatchery coho (surrogate stock) and no retention of coho in California ocean fisheries. Objective undefined prior to listing.	No. Listed stock, MSY criteria undefined. ESA jeopardy standard provides interim protection of productive capacity. Recovery may last more than 10 years even with no fishery impacts due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Depressed and listed. Very minor natural component of OPI area fisheries, potential for minor contribution to ocean fisheries off California and southern Oregon, and inland California fisheries. Current impacts incidental in ocean and inland fisheries (total non-retention south of Cape Falcon since 1994). CDFG considering monitoring to provide data for the Smith, Trinity, Eel, Mattole, and Klamath Rivers.
Oregon Coastal Natural Comprised of Southern, South-Central, North-Central, and Northern Oregon stocks. Threatened (1997 and 1998)	NMFS jeopardy standard/recovery plan consistent with Council's objective under Amendment 13 and the Oregon Plan: For each of the 4 component stocks, a rebuilding and data collection program with an allowable marine and freshwater exploitation rate of no more than 13% to 35%, depending on parent escapement and ocean survival trends (adopted 1997). For a detailed description of the objective, see Section 3.3.2. Prior PFMC objectives contained in PFMC (1984 and 1993).	No. Listed stock, rebuilding program initiated in 1998. The annual conservation objective should allow component stocks to rebuild when environmental conditions are favorable. Recovery for some components may last more than 10 years even with no fishery impacts due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.	Depressed and listed. Major natural component of OPI area which, when abundant, contributes to ocean fisheries off California, Oregon, and Washington south of Leadbetter Pt., and freshwater fisheries in Oregon coastal streams. Current impacts primarily incidental in ocean fisheries under a total nonretention regulation south of Cape Falcon since 1994.
Columbia River Late (Hatchery)	Hatchery rack return goal of 17,200 adults.	No (hatchery exception).	Major component of ocean fisheries north of Cape Falcon. When abundant, significant contributors to ocean fisheries off Oregon north into Canada and Columbia River fisheries.
Columbia River Early (Hatchery)	Hatchery rack return goal of 18,800 adults.	No (hatchery exception).	Major component of OPI area fisheries. When abundant, significant contributors to ocean fisheries off California and north to Leadbetter Pt., WA and to Columbia River fisheries. Current ocean fishery impacts from very limited retention fisheries north of Cape Falcon and incidental hook-and-release mortality in fisheries south of Cape Falcon.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 11 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
OREGON PRODUCTION INDEX (continued)			
Columbia River (Natural)	Undefined. Management is in a transitional phase pending completion of a critical review that may establish an explicit objective.	Not presently. See management information.	Extinct above the Dalles Dam, very rare below. Lower river coho are a candidate species under the ESA with an ongoing effort to determine if a reproducing population can be found and rebuilt.
WASHINGTON COASTAL - All pertinent natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western Strait of Juan de Fuca (West of the Elwha River). Management goals for Grays Harbor and Olympic Peninsula coho stocks include achieving natural spawning escapement objectives and treaty allocation requirements, although Grays Harbor also contains a significant amount of hatchery production. The conservation objectives for these stocks are based on MSY spawner escapements established pursuant to the U.S. District Court order in Hoh v. Baldrige. Annual natural spawning escapement targets and total escapement objectives are established by the Washington Department of Fish and Wildlife and treaty tribes under the provisions of U.S. v. Washington and subsequent U.S. District Court orders. After agreement to annual targets is reached by the parties in this litigation, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for providing treaty allocation requirements and inside, non-Indian fishery needs. The conservation objectives for the Queets, Hoh and Quillayute Rivers were developed as ranges intended to bracket the current best estimates of MSY escapement. The range of each objective reflects the degree of uncertainty inherent by using the high estimate of recruits-per-spawner and low estimate of carrying capacity for the lower bound, and the low estimate of recruits-per-spawner with the high estimate of smolt carrying capacity for the upper end of the range. The ranges were subsequently adjusted upward for risk aversion and again for habitat considerations by 26% to 184% (Lestelle et al. 1984).			
Willapa Bay (Hatchery)	Meet WDFW program objectives.	No (hatchery exception).	Minor component of ocean fisheries off northern Oregon north into Canada. Significant contributor to inside commercial net and recreational fisheries. WDFW critically reviewing current management to determine if objectives for natural stocks are warranted.
Grays Harbor	35,400 natural adult spawners (MSP based on WDF [1979]) or annual target agreed to by WDFW and the Quinault Indian Nation .	Yes. Conservation alert or overfishing concern based on fewer than 35,400 natural spawners.	Medium to high abundance. Minor contributor to ocean fisheries off Oregon and north into Canada. Significant contributor to Washington inside tribal fishery, minor contributor to inside recreational fishery.
Quinault (Hatchery)	Meet hatchery program objectives and provide escapement to utilize production potential for naturally spawning fish.	No (hatchery exception).	Contributor to ocean fisheries off Washington and north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 12 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		- - - COHO - - -	
WASHINGTON COAST (continued)			
Queets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quinault Indian Nation.	Yes. Conservation alert or overfishing concern based on fewer than 5,800 natural spawners.	Small population. Low to depressed abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.
Hoh	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and Hoh Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 2,000 natural spawners.	Small population. Medium to low abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Quillayute Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle *et al.* 1984) or annual target agreed to by WDFW and the Quillayute Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 6,300 natural spawners.	Small population. Depressed abundance. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Quillayute Summer (Hatchery)	Meet hatchery program objectives.	No (hatchery exception).	Low to depressed abundance. Early river entry timing. Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.
Western Strait of Juan de Fuca (Sekiu, Hoko, Clallam, Pysht, East and West, and Lyre Rivers and Miscellaneous streams west of the Elwha River)	MSP objective of 9,720 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to through fixed procedures established in U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 9,720 natural spawners.	Small population. Low to depressed abundance. Little information on ocean distribution. A new annual objective of stepped exploitation rates is under consideration by WDFW and the tribes.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 13 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- COHO ---	
PUGET SOUND - All pertinent natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). The Puget Sound Salmon Management Plan defines management objectives and long term goals for these stocks as developed by representatives from federal, state and tribal agencies. Conservation objectives for specific stocks are currently based on either MSP principles for stocks managed primarily for natural production or upon hatchery escapement needs for stocks managed for artificial production. However, a transition to exploitation rate management is currently under consideration by the involved managers. Annual escapement targets for these coho stocks are developed through procedures established in U.S. District Court. Puget Sound management procedures are outlined in a "Memorandum Adopting Salmon Management Plan" (U.S. v. Washington, 626 F. Supp. 1405 [1985]). The original conservation objectives were developed by a State/Tribal Management Plan Development Team following the Boldt Decision with the goal for natural spawning stocks defined as "the adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions." The methodology used to develop the objectives was based on assessment of the quantity and quality of rearing habitat and the number of adult spawners required to fully seed the habitat (Zillges 1977). Some objectives have subsequently been modified in 1983 by the U.S. District Court Fisheries Advisory Board (Clark 1983 and PSSSRG 1997) and later determinations of the WDFW/Tribal Technical Committee.			
Eastern Strait of Juan de Fuca (Streams east of Salt Creek through Chimacum Creek))	MSP objective of 3,130 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to in fixed procedures set by U.S. District Court. The Elwha and Dungeness Rivers are not included in this objective, but are managed on a harvest rate basis.	Yes. Conservation alert or overfishing concern based on fewer than 3,130 natural spawners.	Small population. Low to depressed abundance. Little information on ocean distribution. A new annual objective of stepped exploitation rates is under consideration by WDFW and the tribes.
Hood Canal	MSP objective of 21,500 natural adult spawners (Clark 1983 modified since 1994 by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 21,500 natural spawners.	Low to medium abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective utilizing stepped exploitation rates is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal.
Skagit	MSP objective of 30,000 natural adult spawners (Zillges 1977 and Clark 1983) or annual target agreed to in fixed procedures set by U.S. District Court. (The spawner assessment methodology is currently being revised and may result in an objective significantly different from 30,000.)	Yes. Conservation alert or overfishing concern based on fewer than 30,000 natural spawners.	Low to depressed abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 14 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
		--- COHO ---	
PUGET SOUND (continued)			
Stillaguamish	MSP objective of 17,000 natural adult spawners (Zillges 1977) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 17,000 natural spawners.	Medium to low abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal..
Snohomish	MSP objective of 70,000 natural adult spawners (Zillges 1977 as modified by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 70,000 natural spawners.	High to medium abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries. A new annual objective is under consideration by WDFW and the tribes which may utilize harvest rate management rather than a fixed spawner goal..
South Puget Sound (Hatchery)	Hatchery rack return goal of 52,000 adults. Natural production goals under development.	No (hatchery exception).	High abundance. Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor off British Columbia, in Puget Sound, and inside tribal fisheries.
SOUTHERN BRITISH COLUMBIA COAST - Stocks of southern British Columbia coastal streams (including Vancouver Island) and the Fraser River.			
Coastal Stocks	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Medium to low abundance. Major contributors to ocean fisheries off British Columbia; significant contributors north into SE Alaska and present off northern Washington.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.	No. Not under Council management authority.	Medium to low abundance. Major contributors to ocean fisheries off British Columbia.

TABLE A-1. Conservation objectives and management information for salmon stocks of significance to ocean salmon fisheries as provided in Amendment 14 which is expected to be implemented during the 2000 salmon fishery season. Abundance information is generally based on the period 1994-1998.[a/] (Page 15 of 15)

Stock	Conservation Objective (to be met annually unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information
	- - - PINK (odd-numbered years) - - -		
The Fraser River Panel of the Pacific Salmon Commission (PSC) manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48° N latitude to meet Fraser River natural spawning escapement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ which is not in the Fraser River Panel Area (U.S.) waters consistent with Fraser River Panel management intent. Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing ocean pink harvest within fixed constraints of coho and chinook harvest ceilings and providing for treaty allocation requirements.			
Puget Sound	900,000 natural spawners or consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel)	No. Minor impacts in Council fisheries and not under Council management authority.	High abundance. Contributors to ocean fisheries off British Columbia and in Puget Sound. Present south into Oregon. Rare off California.
Fraser River	Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel)	No. Minor impacts in Council fisheies and not under Council management authority.	High to medium abundance. Major contributors to ocean fisheries off British Columbia; present into SE Alaska and off Washington and northern Oregon. Rare off California.

a/ This table may be updated periodically by formal amendments to the FMP or comprehensive technical reviews which result in modified conservation objectives or the development of rebuilding programs in response to overfishing concerns. In addition, any stock listed under the ESA and its jeopardy standard or recovery plan will immediately be incorporated in the table.

TABLE A-2. Allowable fishery impact rate criteria for OCN coho stock components.

PARENT SPAWNER STATUS		MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt) Low (<0.0009)	Medium (0.0009 to 0.0034)	High (>0.0034)
		Allowable Total Fishery Impact Rate		
High:	Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1	≤15%	≤30%[a/]	≤35%[a/]
Medium:	Parent spawners achieved Level #1 or greater rebuilding criteria	≤15%	≤20%[a/]	≤25%[a/]
Low:	Parent spawners less than Level #1 rebuilding criteria	≤15% ≤10-13%[b/]	≤15%	≤15%

Rebuilding Criteria	OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Total
Full Seeding at Low Marine Survival:	21,700	55,000	50,000	5,400	132,100
Level #2 (75% of full seeding):	16,400	41,300	37,500	4,100	99,300
Level #1 (50% of full seeding):	10,900	27,500	25,000	2,700	66,100
38% of Level #1 (19% of full seeding):	4,100	10,500	9,500	1,000	25,100

Stock Component (Boundaries)	Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)				
Northern: (Necanicum River to Neskowin Creek)	Nehalem	Tillamook	Nestucca	Ocean Tribs.	
	17,500	2,000	1,800	400	
North-Central: (Salmon River to Siuslaw River)	Siletz	Yaquina	Alsea	Siuslaw	Ocean Tribs.
	4,300	7,100	15,100	22,800	5,700
South-Central: (Siltcoos River to Sixes River)	Umpqua	Coos	Coquille	Coastal Lakes	
	29,400	7,200	5,400	8,000	
Southern: (Elk River to Winchuck River)	Rogue				
	5,400				

a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding: (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component and (2) no coho-directed harvest impacts will be allowed within that particular basin.

b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.

TABLE A-3. Maximum allowable fishery impact rate for OCN coho under Amendment 13 based on parent escapement levels by stock component and marine survival category.

Fishery Year (t)	Parent Escapement Year (t-3)	Estimated OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Hatchery Jack Survival Rate (t-1)	Marine Survival Category	Maximum allowable Fishery Impact Rate
1998	1995	4,000	13,600	34,800	4,200	0.04%	Low	10-13%
1999	1996	3,300	18,100	51,500	5,400	0.10%	Med	15%
2000	1997	2,100	2,800	17,700	8,300	0.13%	Med	15%
2001	1998	2,600	3,300	25,200	2,200	-	-	-
2002	1999	8,300	11,500	27,000	2,400	-	-	-

TABLE A-4. Estimated coho salmon natural spawner abundance (SRS accounting) in Oregon coastal basins for each OCN coho management component. Estimates adjusted for visual observation bias by multiplying estimate by 1.33 . (Page 1 of 1)

Component and Basin	Miles	Adjusted SRS Natural Coho Spawner Estimates										
		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999[a/]	1990-1999 Mean
NORTHERN:												
Nehalem	386	1,552	3,975	1,268	2,265	2,369	1,564	1,057	1,173	1,190	3,410	1,982
Tillamook	249	265	3,000	261	860	924	275	661	388	271	2,119	902
Nestucca	167	189	728	684	401	313	1,811	519	271	169	2,117	720
Direct Ocean Tributaries	97	191	1,579	209	983	485	319	1,043	314	946	698	677
TOTAL	899	2,197	9,282	2,422	4,509	4,091	3,969	3,280	2,146	2,576	8,344	4,282
NORTH CENTRAL:												
Siletz	118	441	984	2,447	400	1,200	607	763	336	394	1,203	878
Yaquina	109	381	380	633	549	2,448	5,668	5,127	384	365	2,248	1,818
Alsea	221	1,189	1,561	7,029	1,071	1,279	681	1,637	680	213	1,923	1,726
Siuslaw	514	2,685	3,740	3,440	4,428	3,044	6,089	7,625	668	1,089	2,617	3,543
Direct Ocean Tributaries	201	895	67	1,821	1,331	1,743	573	2,975	775	1,222	3,522	1,492
TOTAL	1,163	5,591	6,732	15,370	7,779	9,714	13,618	18,127	2,843	3,283	11,513	9,457
SOUTH CENTRAL:												
Umpqua	1,083	3,737	3,600	2,152	9,311	4,485	11,020	9,749	2,233	8,426	6,471	6,118
Coos	208	2,273	3,813	15,625	15,284	14,583	10,447	12,128	1,127	3,167	4,976	8,342
Coquille	331	2,712	5,651	2,116	7,384	5,035	2,116	16,169	5,720	2,466	3,044	5,241
Coastal Lakes	-	4,393	7,251	1,986	10,145	5,841	11,216	13,493	8,603	11,107	12,710	8,675
TOTAL	1,622	13,115	20,315	21,879	42,124	29,944	34,799	51,539	17,683	25,166	27,201	28,377
SOUTH:												
Rogue[b/]	-	2,796	765	1,935	174	5,303	4,221	5,386	8,282	2,249	2,370	3,348
COASTWIDE	-	23,699	37,094	41,606	54,586	49,052	56,607	78,332	30,954	33,274	49,247	45,445

a/ Estimates for 1999 are preliminary, but have been adjusted for the presence of hatchery fish.
b/ Mark recapture estimate based on seining at Huntley Park in the lower Rogue River.

60th Galaxy Gold side 1

APPENDIX B
OREGON PRODUCTION INDEX DATA

LIST OF TABLES

60#
Celery Gold
side 2

TABLE B-1. Preliminary preseason and postseason coho stock **index** abundance estimates for OPI area stocks in thousands of fish, 1985-1998.[a] (Page 1 of 2)

Stock	Year	Preseason	Postseason	Preseason/ Postseason
OPIH	1985	476.6	657.4	0.73
	1986	1,544.9	2,381.7	0.65
	1987	565.4	817.1	0.69
	1988	1,591.0	1,556.4	1.02
	1989	1,381.5	1,620.0	0.85
	1990	909.6	594.2	1.53
	1991	1,215.4	1,802.9	0.67
	1992	385.3	472.8	0.81
	1993	479.2	222.8	2.15
	1994	98.3	202.7	0.49
	1995	218.0	134.8	1.62
	1996	245.5	174.3	1.41
	1997	289.2	191.7	1.51
	1998	71.8	200.7	0.36
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
Total OCN				
	1986	304.0	291.4	1.04
	1987	476.0	197.1	2.42
	1988	480.3	352.9	1.36
	1989	446.2	315.5	1.41
	1990	321.0	283.9	1.13
	1991	421.9	255.5	1.65
	1992	265.7	256.6	1.04
	1993	283.3	251.9	1.12
	1994	140.9	134.1	1.05
	1995	219.0	159.0	1.38
	1996	181.3	236.5	0.77
	1997	247.9	77.3	3.21
	1998	133.8	61.1	2.19
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
OCNR	1985	296.0	303.4	0.98
	1986	285.6	273.4	1.04
	1987	458.0	187.1	2.45
	1988	464.3	340.2	1.36
	1989	430.0	305.1	1.41
	1990	307.5	271.9	1.13
	1991	409.2	241.8	1.69
	1992	255.0	252.9	1.01
	1993	273.9	236.8	1.16
	1994	134.4	128.1	1.05
	1995	211.1	145.5	1.45
	1996	169.7	221.5	0.77
	1997	236.3	67.6	3.50
	1998	121.5	47.3	2.57
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				

TABLE B-1. Preliminary preseason and postseason coho stock **index** abundance estimates for OPI area stocks in thousands of fish, 1985-1998.[a/] (Page 2 of 2)

Stock	Year	Preseason	Postseason	Preseason/ Postseason
OCNL	1985	6.6[b/]	12.6[c/]	0.52
	1986	18.4[b/]	18.0[c/]	1.02
	1987	18.0	10.0	1.80
	1988	16.0	12.7	1.26
	1989	16.2	10.5	1.54
	1990	13.5	12.0	1.13
	1991	12.7	13.8	0.92
	1992	10.7	3.7	2.89
	1993	9.4	15.1	0.62
	1994	6.5	6.0	1.08
	1995	7.9	13.6	0.58
	1996	11.6	15.1	0.77
	1997	11.6	9.7	1.20
	1998	12.3	12.2	1.01
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				
PRIH	1985	96.8	424.4	0.23
	1986	285.5	584.9	0.49
	1987	465.6	300.1	1.55
	1988	302.5	229.0	1.32
	1989	206.4	104.8	1.97
	1990	142.8	124.3	1.15
	1991	37.1	60.4[d/]	0.61
No PRIH returns after 1991				
STEP	1985	-	-	-
	1986	-	-	-
	1987	6.1	0.5	13.48
	1988	0.4	2.6	0.15
	1989	5.2	2.5	2.12
	1990	3.5	4.3	0.81
	1991	6.9	8.6	0.80
	1992	1.7	1.1	1.62
	1993	4.5	3.0	1.50
	1994	0.5	1.8	0.28
	1995	6.0	0.5	12.00
	1996	0.3	1.1	0.27
	1997	1.0	0.3	3.33
	1998	0.2	0.3	0.67
Beginning in 1999, abundance estimates are made only by SRS accounting (see Table III-1)				

a/ Estimates for 1988-1995 use the Council-adopted revised abundance procedure developed in 1987, except for the OCNR predictor which was revised in 1992 and was based on an alternative environmental predictor during 1994-1998. Also, the OPIH predictor was fit through zero in 1994 and 1995.

b/ This estimate is for the Ten Mile Lake system only.

c/ Includes postseason estimate for the Ten Mile, Siltcoos and Tahkenitch lake systems.

d/ Estimated harvest occurring outside the OPI area is not available.

TABLE B-2. Millions of coho smolts released annually into the OPI area by geographic area and rearing agency.[a/] (Page 1 of 1)

	Columbia River						Oregon Coast						
		Washington						Private Aquaculture					Total
Year	Oregon	Toutle[b/]	Cowlitz[c/]	Combined	Federal	Total	ODFW[d/]	Yearlings	Zeros	Combined	Total	California	OPI
1960	2.2	-	-	2.5	1.7	6.4	1.0	-	-	-	1.0	0.0	7.4
1961	4.6	-	-	6.3	4.2	15.1	1.4	-	-	-	1.4	0.1	16.6
1962	6.7	-	-	5.5	2.3	14.5	2.5	-	-	-	2.5	0.4	17.4
1963	6.5	-	-	8.0	7.9	22.4	2.7	-	-	-	2.7	0.5	25.6
1964	6.9	-	-	6.5	4.6	18.0	2.3	-	-	-	2.3	0.5	20.8
1965	6.4	-	-	7.8	6.4	20.6	2.1	-	-	-	2.1	1.1	23.8
1966	6.0	-	-	12.1	6.5	24.6	2.1	-	-	-	2.1	0.7	27.4
1967	7.0	-	-	8.5	8.6	24.1	2.4	-	-	-	2.4	1.3	27.8
1968	5.5	-	-	6.6	7.2	19.3	3.2	-	-	-	3.2	1.8	24.3
1969	6.3	10.5	5.2	15.7	5.6	27.6	3.4	-	-	-	3.4	1.4	32.4
1970	5.2	9.8	4.6	14.4	4.4	24.0	3.4	-	-	-	3.4	1.4	28.8
1971	7.2	13.5	3.1	16.6	4.5	28.2	4.1	-	-	-	4.1	1.0	33.3
1972	6.9	13.6	5.2	18.8	4.2	29.9	3.8	-	-	-	3.8	1.6	35.3
1973	6.3	11.1	5.9	17.0	5.2	28.5	3.9	-	-	-	3.9	1.2	33.6
1974	6.9	9.5	7.2	16.7	4.3	27.9	4.1	-	0.1	0.1	4.2	0.6	32.7
1975	6.6	5.9	12.4	18.3	4.1	29.0	3.4	-	0.1	0.1	3.5	1.6	34.1
1976	8.2	5.6	10.9	16.5	4.2	28.9	4.0	0.7	1.4	2.1	6.1	0.6	35.6
1977	8.4	6.4	10.6	17.0	6.0	31.4	3.2	1.1	1.3	2.4	5.6	0.9	37.9
1978	9.1	10.2	8.0	18.2	5.3	32.6	4.0	0.3	9.6	9.9	13.9	0.5	47.0
1979	8.8	8.2	9.1	17.3	2.8	28.9	4.5	0.9	4.9	5.8	10.3	0.8	40.0
1980	5.5	5.9[e/]	11.7	17.6	5.0	28.1	3.4	4.1	10.7	14.8	18.2	0.8	47.1
1981	5.9	8.6[e/]	14.2	22.8	3.7	32.5	3.9	6.6	17.3	23.9	27.8	0.9	61.2
1982	5.6	4.0	14.9	18.9	3.3	27.8	4.3	3.2	19.9	23.1	27.4	0.6	55.8
1983	6.2	2.4	15.0	17.4	3.4	27.0	3.0	1.3	14.8	16.1	19.1	0.9	47.0
1984	8.9	2.5	14.2	16.7	3.6	29.3	4.5	1.4	9.5	10.9	15.4	0.7	45.4
1985	9.1	3.9	13.8	17.7	2.0	28.8	3.8	4.2	4.4	8.6	12.5	0.2	41.5
1986	9.1	3.8	15.3	19.1	4.7	32.9	4.8	3.1	5.5	8.6	13.4	1.8	48.1
1987	6.8	3.3	15.4	18.7	3.3	28.8	4.9	0.5	4.1	4.6	9.5	1.3	39.6
1988	6.2	2.8	16.1	18.9	4.5	29.5	5.3	1.1	3.7	4.8	10.1	1.2	40.8
1989	6.6	2.5	17.0	19.5	3.5	29.6	5.0	2.0	8.0	10.0	15.0	1.3	45.9
1990	8.0	3.3	14.3	17.6	4.7	30.3	5.7	2.8	2.8	5.6	11.3	1.2	42.8
1991	10.4	3.7	15.3	19.0	5.9	35.3	5.3	0.0	0.0	0.0	5.3	1.5	42.1
1992	11.5	4.3	14.3	18.6	2.7	32.8	6.2	0.0	0.0	0.0	6.2	0.7	39.7
1993	11.1	4.3	14.8	19.1	4.2	34.4	4.3	0.0	0.0	0.0	4.3	0.8	39.5
1994	9.1	2.5	12.0	14.5	3.0	26.6	5.0	0.0	0.0	0.0	5.0	0.6	32.3
1995	7.1	3.4	12.9	16.3	1.7	25.2	3.7	0.0	0.0	0.0	3.7	0.7	29.5
1996	8.4	3.4	12.9	16.3	3.4	28.0	3.3	0.0	0.0	0.0	3.3	0.3	31.6
1997	6.1	3.2	7.8	11.0	3.9	21.0	2.9	0.0	0.0	0.0	2.9	0.7	24.6
1998[f/]	6.1	5.8	11.4	17.2	3.6	26.8	1.7	0.0	0.0	0.0	1.7	0.6	29.1
1999[f/]	6.9	3.1	11.5	14.6	3.8	25.3	1.1	0.0	0.0	0.0	1.1	0.7	27.1

a/ A coho smolt is here defined as 30 fish per pound or larger and released in February or later.
b/ All releases are of early run (Toutle River) stock.
c/ All releases are of late run (Cowlitz River) stock.
d/ Beginning in 1989, does not include minor releases from STEP projects.
e/ Excludes 3.5 million assumed lost at Toutle Hatchery on May 18, 1980, during the eruption of Mt. Saint Helens.
f/ Preliminary.

TABLE B-3. Data set used in predicting 2000 Oregon production index hatchery (OPIH) adult coho with SRS[a/] accounting. Adults and jacks shown in thousands of fish and smolts in millions of fish. (Page 1 of 1)

Year (t)	Adult OPIH (t)	Jack CR (t-1)	Jack OC (t-1)	Sm CR (t-1)	Sm D (t-1)
1970	2,765.1	148.6	13.6	27.6	0.0
1971	3,365.0	172.8	6.6	24.0	0.0
1972	1,924.8	100.8	2.9	28.3	0.0
1973	1,817.0	85.7	5.7	29.9	1.8
1974	3,071.1	132.1	12.1	28.5	2.9
1975	1,652.8	75.1	1.1	27.8	1.8
1976	3,885.3	146.2	25.3	29.0	2.0
1977	987.5	46.2	7.5	28.9	0.2
1978	1,824.1	99.2	4.0	31.4	0.0
1979	1,476.7	64.1	8.4	32.6	5.0
1980	1,224.0	51.6	6.0	28.9	6.7
1981	1,064.5	40.6	8.1	28.1	5.6
1982	1,266.8	55.0	6.3	32.4	6.8
1983[b/]	595.7	61.0	7.2	27.7	5.0
1984	689.4	28.1	3.6	27.0	5.1
1985	717.5	18.2	7.8	29.2	9.1
1986	2,435.8	64.7	12.9	28.8	12.2
1987	880.1	24.1	8.7	32.9	9.0
1988	1,666.1	72.2	12.9	28.8	7.7
1989	1,721.4	55.0	5.8	29.5	7.2
1990	718.4	37.1	9.6	29.6	8.5
1991	1,874.8	60.8	7.9	30.3	7.1
1992	540.8	19.9	5.7	35.3	6.0
1993	261.7	19.7	7.5	32.8	5.5
1994	202.4	3.8	1.3	34.4	6.0
1995	147.2	9.1	2.7	26.6	3.1
1996	184.5	14.1	3.2	25.2	4.2
1997	200.6	15.8	4.6	28.0	3.4
1998	200.2	6.8	3.0	21.0	2.5
1999	319.6	21.7	5.5	26.8	3.0
2000[c/]	671.4	30.7	3.5	27.1	4.1

a/ Adult OPIH = Harvest impacts plus escapement for public hatchery stocks originating in the Columbia River, Oregon coastal rivers and the Klamath River, California.
Jack CR = Columbia River jack returns corrected for small adults.
Jack OC = Oregon coastal and California hatchery jack returns corrected for small adults.
Sm CR = Columbia River smolt release.
Sm D = Columbia River delayed smolt releases.

b/ Data not used in the analysis due to El Niño impacts.

c/ Preseason predicted adults.

TABLE B-4. Data set used in predicting 2000 Oregon coastal natural river (OCNR) coho recruits with SRS accounting. Recruits shown in thousands of fish. (Page 1 of 1)

Year	Recruits to Ocean SRS	Ln SRS (Recruits)	JanAnom[a/]	UpAnom (t-1)[a/]
1971	416.3	6.03141	-1.504	30.08
1972	185.5	5.22305	-1.704	10.08
1973	235.0	5.45959	-0.604	23.08
1974	196.4	5.28015	-0.804	47.08
1975	208.4	5.33946	-0.604	48.08
1976	451.7	6.11302	-1.004	65.08
1977	161.3	5.08327	-0.204	32.08
1978	111.7	4.71582	1.396	17.08
1979	188.8	5.24069	-1.404	-2.92
1980	108.3	4.68491	0.596	17.08
1981	174.5	5.16192	1.896	-1.92
1982	185.7	5.22413	-0.104	-8.92
1983	97.1	4.57574	1.196	14.08
1984	94.8	4.55177	0.696	-24.92
1985	124.9	4.82751	-0.004	-24.92
1986	97.9	4.58395	0.096	-24.92
1987	70.8	4.25986	0.596	-39.92
1988	124.6	4.82511	-0.104	-21.92
1989	103.8	4.64247	-0.604	-43.92
1990	60.4	4.10099	-0.004	-21.92
1991	70.1	4.24992	-1.104	-37.92
1992	87.4	4.4705	0.096	43.08
1993	81.1	4.39568	0.196	7.08
1994	39.2	3.66868	1.096	-50.92
1995	53.8	3.98527	0.596	-3.92
1996	70.1	4.24992	1.296	-1.92
1997	16.3	2.79117	0.596	9.08
1998	17.2	2.84491	2.096	-24.92
1999	37.8	3.87330	-0.504	18.08
2000[b/]	43.9	3.63231	-0.104	84.08

a/ JanAnom = The annual deviation from mean (1971-2000) January sea surface temperature (degrees Centigrade) at Charleston, Oregon.
UpAnom = Annual deviation from mean (1970-1999) April-June Bakun upwelling index at 42° N latitude.

b/ Preseason adult prediction.

APPENDIX C
CAPE FLATTERY AND STRAIT OF JUAN DE FUCA HISTORICAL CHINOOK SALMON CATCHES

LIST OF TABLES

60th
Galaxy
Gold
side 2

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 1 of 4)

	Treaty Indian			Non-Indian				
Area and Year	Troll	Net	Total	Troll	Net	Sport[a/]	Total	Grand Total
				CHINOOK LANDINGS				
Areas 4 and 4A								
1979	408	3	411	26,549	0	3,058	29,607	30,018
1980	2,386	1,211	3,597	22,252	0	2,836	25,088	28,685
1981	3,666	209	3,875	17,267	0	3,207	20,474	24,349
1982	12,713	267	12,980	16,509	0	3,180	19,689	32,669
1983	2,899	62	2,961	9,547	0	2,452	11,999	14,960
1984	2,086	0	2,086	2,326	0	229	2,555	4,641
1985	6,765	493	7,258	4,414	0	2,052	6,466	13,724
1986	5,208	87	5,295	4,656	0	3,248	7,904	13,199
1987	9,475	3,681	13,156	4,838	0	2,599	7,437	20,593
1988	13,289	2,991	16,280	21,941	-	3,767	25,708	41,988
1989	15,278	780	16,058	282	-	2,077	2,359	18,417
1990	13,620	30	13,650	16,286	-	2,258	18,544	32,194
1991	16,103	235	16,338	15,238	-	2,465	17,703	34,041
1992	17,384	9	17,393	17,076	-	1,082	18,158	35,551
1993	20,579	24	20,603	16,115	-	1,466	17,581	38,184
1994	1,946	4	1,950	-	-	-	-	1,950
1995	7,489	2	7,491	3	-	110	113	7,604
1996	9,690	13	9,703	0	-	55	55	9,758
1997[b/]	11,567	2	11,569	3,785	-	478	4,263	15,832
1998[b/]	13,851	0	13,851	4,160	-	-	4,160	18,011
1999[b/]	26,441	4	26,445	12,698	-	-	12,698	39,143
Area 4B								
1979	8,436	2,391	10,827	214	1,402	-	1,616	12,443
1980	10,694	4,561	15,255	0	368	-	368	15,623
1981	15,950	4,820	20,770	2	542	-	544	21,314
1982	19,605	6,411	26,016	293	1,699	-	1,992	28,008
1983	20,102	7,273	27,375	8	264	-	272	27,647
1984	14,627	1,478	16,105	3	18	-	21	16,126
1985	7,524	3,673	11,197	2	279	-	281	11,478
1986	5,861	6,484	12,345	0	39	-	39	12,384
1987	11,341	3,987	15,328	-	5	-	5	15,333
1988	15,465	1,966	17,431	-	0	-	0	17,431
1989	18,009	1,932	19,941	-	0	452	452	20,393
1990	17,593	775	18,368	-	0	416	416	18,784
1991	7,648	214	7,862	-	0	380	380	8,242
1992	10,956	43	10,999	-	0	33	33	11,032
1993	9,079	752	9,831	-	0	218	218	10,049
1994	1,947	22	1,969	-	-	-	-	1,969
1995	2,248	272	2,520	-	-	26	26	2,546
1996	4,814	130	4,944	-	-	5	5	4,949
1997[b/]	1,748	118	1,866	-	-	8	8	1,874
1998[b/]	402	1	403	-	-	103	103	506
1999[b/]	902	7	909	-	-	-	-	909

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 2 of 4)

Area and Year	Treaty Indian			Non-Indian				Grand Total
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	
CHINOOK LANDINGS								
Area 5								
1979	140	6,971	7,111	43	3,400	30,914	34,357	41,468
1980	64	6,305	6,369	0	737	20,591	21,328	27,697
1981	81	12,842	12,923	1	2,774	17,145	19,920	32,843
1982	76	15,780	15,856	9	2,566	12,538	15,113	30,969
1983	176	8,263	8,439	7	551	16,839	17,397	25,836
1984	1,413	8,879	10,292	9	399	11,993	12,401	22,693
1985	4,065	7,892	11,957	18	612	18,382	19,012	30,969
1986	15,008	9,599	24,607	0	85	36,146	36,231	60,838
1987	17,360	4,624	21,984	-	37	21,528	21,565	43,549
1988	32,660	5,458	38,118	-	51	22,645	22,696	60,814
1989	40,027	7,155	47,182	-	1	34,934	34,935	82,117
1990	28,105	4,005	32,110	-	4	37,752	37,756	69,866
1991	23,625	2,787	26,412	-	35	29,682	29,717	56,129
1992	15,005	851	15,856	-	0	24,385	24,385	40,241
1993	1,763	649	2,412	-	0	19,014	19,014	21,426
1994	1,512	5,836	7,348	-	-	487	487	7,835
1995	4,297	4,537	8,834	-	-	2,718	2,718	11,552
1996	7,087	472	7,559	-	-	4,393	4,393	11,952
1997[b/]	345	374	719	-	-	9,892	9,892	10,611
1998[b/]	169	828	997	-	-	836	836	1,833
1999[b/]	225	704	929	-	-	NA	NA	NA
Area 6C								
1979	3	170	173	0	107	49,688	49,795	49,968
1980	22	80	102	0	46	47,187	47,233	47,335
1981	1,243	245	1,488	8	74	34,207	34,289	35,777
1982	211	314	525	29	72	17,304	17,405	17,930
1983	614	520	1,134	2	13	41,221	41,236	42,370
1984	527	1,739	2,266	15	43	36,010	36,068	38,334
1985	1,568	1,086	2,654	11	142	25,885	26,038	28,692
1986	10,553	1,094	11,647	0	0	32,452	32,452	44,099
1987	17,539	2,063	19,602	-	6	31,216	31,222	50,824
1988	8,606	2,076	10,682	-	80	16,637	16,717	27,399
1989	12,088	828	12,916	-	1	17,098	17,099	30,015
1990	10,336	382	10,718	-	0	12,735	12,735	23,453
1991	7,222	301	7,523	-	0	9,605	9,605	17,128
1992	9,025	47	9,072	-	0	13,705	13,705	22,777
1993	1,196	0	1,196	-	0	13,202	13,202	14,398
1994	605	6	611	-	-	1,174	1,174	1,785
1995	148	1	149	-	-	3,631	3,631	3,780
1996	34	2	36	-	-	2,838	2,838	2,874
1997[b/]	29	0	29	-	-	2,317	2,317	2,346
1998[b/]	195	6	201	-	-	1,323	1,323	1,524
1999[b/]	4	0	4			NA	NA	NA

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 3 of 4)

Area and Year	Treaty Indian			Non-Indian				Grand Total
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	
COHO LANDINGS								
Areas 4 and 4A								
1979	1,522	36	1,558	143,469	0	25,884	169,353	170,911
1980	19,488	44	19,532	69,133	0	25,274	94,407	113,939
1981	15,578	44	15,622	94,514	0	25,868	120,382	136,004
1982	92,170	78	92,248	84,171	0	39,521	123,692	215,940
1983	28,196	18	28,214	2,353	0	51,826	54,179	82,393
1984	30,534	0	30,534	16,441	0	6,371	22,812	53,346
1985	51,564	18	51,582	44	0	23,594	23,638	75,220
1986	33,631	160	33,791	19,026	0	21,759	40,785	74,576
1987	52,406	49	52,455	1,171	0	25,406	26,577	79,032
1988	33,546	80	33,626	2,229	-	15,809	18,038	51,664
1989	42,362	174	42,536	41,089	-	20,237	61,326	103,862
1990	43,143	0	43,143	34,285	-	25,356	59,641	102,784
1991	43,445	50	43,495	24,124	-	23,343	47,467	90,962
1992	47,415	35	47,450	7,664	-	12,990	20,654	68,104
1993	41,142	20	41,162	3,163	-	19,027	22,190	63,352
1994	0	0	0	-	-	-	-	-
1995	24,812	0	24,812	20,805	-	8,203	29,008	53,820
1996	14,991	2	14,993	13,042	-	6,634	19,676	34,669
1997	9,419	0	9,419	-	-	0	0	9,419
1998[b/]	7,074	0	7,074	-	-	0	0	7,074
1999[b/]	32,142	8	32,150	1,913	-	5,370	7,283	39,433
Area 4B								
1979	3,062	12,465	15,527	2,003	10,335	-	12,338	27,865
1980	251	1,843	2,094	1	1,810	-	1,811	3,905
1981	2,976	2,763	5,739	3	810	-	813	6,552
1982	4,179	29,025	33,204	13,776	12,257	-	26,033	59,237
1983	3,616	7,580	11,196	8	1,131	-	1,139	12,335
1984	1,454	12,800	14,254	0	25	-	25	14,279
1985	573	17,024	17,597	50	1,359	-	1,409	19,006
1986	7,042	10,624	17,666	14	721	-	735	18,401
1987	5,171	3,956	9,127	-	14	-	14	9,141
1988	4,670	268	4,938	-	3	-	3	4,941
1989	11,618	13,819	25,437	-	0	19,882	19,882	45,319
1990	25,603	5,211	30,814	-	29	20,286	20,315	51,129
1991	8,193	1,222	9,415	-	0	15,132	15,132	24,547
1992	10,253	49	10,302	-	0	11,711	11,711	22,013
1993	2,157	939	3,096	-	0	8,168	8,168	11,264
1994	0	5	5	-	-	-	-	5
1995	3,087	884	3,971	-	-	4,640	4,640	8,611
1996	1,125	19	1,144	-	-	2,327	2,327	3,471
1997	3,796	30	3,826	-	-	1,494	1,494	5,320
1998[b/]	609	47	656	-	-	8,062	8,062	8,718
1999[b/]	1,131	4	1,135	-	-	-	-	1,135

TABLE C-1. Salmon catches in numbers of fish from the Cape Flattery and Strait of Juan de Fuca areas, by gear and species. (Page 4 of 4)

Area and Year	Treaty Indian			Non-Indian				
	Troll	Net	Total	Troll	Net	Sport[a/]	Total	Grand Total
COHO LANDINGS								
Area 5								
1979	222	52,431	52,653	193	25,549	76,876	102,618	155,271
1980	6	40,988	40,994	0	4,190	18,746	22,936	63,930
1981	75	51,297	51,372	54	5,205	33,045	38,304	89,676
1982	110	81,909	82,019	109	9,509	54,728	64,346	146,365
1983	217	32,725	32,942	161	1,655	40,598	42,414	75,356
1984	556	33,695	34,251	36	1,251	27,270	28,557	62,808
1985	1,304	67,810	69,114	541	3,328	72,065	75,934	145,048
1986	4,459	60,436	64,895	18	332	102,727	103,077	167,972
1987	3,085	57,579	60,664	-	332	80,101	80,433	141,097
1988	430	18,691	19,121	-	390	85,164	85,554	104,675
1989	1,101	48,947	50,048	-	2	112,235	112,237	162,285
1990	1,663	25,848	27,511	-	306	185,118	185,424	212,935
1991	4,680	32,865	37,545	-	715	166,936	167,651	205,196
1992	1,119	5,159	6,278	-	0	84,457	84,457	90,735
1993	88	3,351	3,439	-	0	42,571	42,571	46,010
1994	0	14,168	14,168	-	-	31	31	14,199
1995	124	13,447	13,571	-	-	35,271	35,271	48,842
1996	195	1,532	1,727	-	-	29,446	29,446	31,173
1997[b/]	0	898	898	-	-	37,012	37,012	37,910
1998[b/]	37	1,049	1,086	-	-	23,640	23,640	24,726
1999[b/]	0	1,378	1,378	-	-	826	826	2,204
Area 6C								
1979	0	900	900	0	521	13,730	14,251	15,151
1980	0	433	433	0	308	5,405	5,713	6,146
1981	76	885	961	27	197	19,412	19,636	20,597
1982	679	1,556	2,235	674	269	16,467	17,410	19,645
1983	129	269	398	17	69	31,167	31,253	31,651
1984	67	400	467	30	36	31,213	31,279	31,746
1985	86	1,128	1,214	82	543	16,861	17,486	18,700
1986	214	469	683	0	0	39,024	39,024	39,707
1987	656	1,307	1,963	-	19	45,614	45,633	47,596
1988	127	1,910	2,037	-	296	30,791	31,087	33,124
1989	255	1,093	1,348	-	22	33,592	33,614	34,962
1990	269	519	788	-	0	42,080	42,080	42,868
1991	326	2,381	2,707	-	1	25,081	25,082	27,789
1992	238	155	393	-	0	17,136	17,136	17,529
1993	22	16	38	-	0	13,309	13,309	13,347
1994	1	27	28	-	-	9	9	37
1995	39	24	63	-	-	6,987	6,987	7,050
1996	0	31	31	-	-	15,122	15,122	15,153
1997[b/]	0	0	0	-	-	16,600	16,600	16,600
1998[b/]	80	20	100	-	-	5,304	5,304	5,404
1999[b/]	0	0	0	-	-	NA	NA	NA

a/ Recreational catches for Area 4B are included in Areas 4 and 4A catches for ocean opening and represent total catches from the port of Neah Bay. Any fisheries open only in Area 4B (i.e., the late-season state-water fisheries) is reported as Area 4B catch. Recreational catches for Areas 5 and 6C represent catches for the Sekiu and eastern Strait areas (punch card Areas 5 and 6), respectively.

b/ Preliminary.

TABLE C-2. Comparative Strait of Juan de Fuca treaty Indian troll commercial chinook catches during the early part (October through January) of the winter season. (Page 1 of 1)

	Area			
Year	4B	5	6C	Total (Oct.-Jan.)
1989-1990	9,410	35,668	9,893	54,971
1990-1991	1,597	18,829	7,833	28,259
1991-1992	1,025	18,950	7,370	27,345
1992-1993	3,843	4,612	661	9,116
1983-1994	970	1,847	999	3,816
1994-1995	323	488	58	869
1995-1996	1,470	1,050	14	2,534
1996-1997	196	2,232	0	2,428
1997-1998[a/]	16	57	29	102
1998-1999[a/]	218	0	0	218
1999-2000[a/]	30	0	0	30

a/ Preliminary.

60# Galaxy Gold Side 1

APPENDIX D
SALMON HARVEST ALLOCATION SCHEDULES

TABLE OF CONTENTS

60#
Galaxy Gold
side 2

HARVEST ALLOCATION -- SECTION 5.3 OF AMENDMENT 14[1/]

5.3 ALLOCATION

> *"Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."*
> *Magnuson-Stevens Act, National Standard 4*

Harvest allocation is required when the number of fish is not adequate to satisfy the perceived needs of the various fishing industry groups and communities, to divide the catch between (non-Indian) ocean and inside fisheries and among ocean fisheries, and to provide treaty Indian fishing opportunity. In allocating the resource between ocean and inside fisheries, the Council considers both inriver harvest and spawner escapement needs. The magnitude of inriver harvest is determined by the states in a variety of ways, depending upon the management area. Some levels of inriver harvests are designed to accommodate federally recognized inriver Indian fishing rights, while others are established to allow for non-Indian harvests of historic magnitudes. Several fora exist to assist this process on an annual basis. The North of Cape Falcon Forum, a state and tribal sponsored forum, convenes the pertinent parties during the Council's preseason process to determine allocation and conservation recommendations for fisheries north of Cape Falcon. The Klamath Fishery Management Council fulfills much the same roll with regard to Klamath River salmon stocks. The individual states also convene fishery industry meetings to coordinate their input to the Council.

5.3.1 Commercial (Non-Tribal) and Recreational Fisheries North of Cape Falcon

5.3.1.1 Goal, Objectives, and Priorities

Harvest allocations will be made from a total allowable ocean harvest which is maximized to the largest extent possible but still consistent with treaty obligations, state fishery needs and spawning escapement requirements, including jeopardy standards for stocks listed under the ESA. The Council shall make every effort to establish seasons and gear requirements which provide troll and recreational fleets a reasonable opportunity to catch the available harvest. These may include single-species directed fisheries with landing restrictions for other species.

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows:

- Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily and area closures and restrictions on gear and daily limits.
- Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

The priorities listed below will be used to help guide establishment of the final harvest allocation while meeting the overall commercial and recreational fishery objectives.

At total allowable harvest levels up to 300,000 coho and 100,000 chinook:

- Provide coho to the recreational fishery for a late June through early September all-species season. Provide chinook to allow (1) access to coho and, if possible, (2) a minimal chinook-only fishery prior to

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1/ Amendment 14 is expected to be implemented during the 2000 salmon fishing season.

the all-species season. Adjust days per week and/or institute area restrictions to stabilize season duration.

- Provide chinook to the troll fishery for a May and early June chinook season and provide coho to (1) meet coho hooking mortality in June where needed and (2) access a pink salmon fishery in odd years. Attempt to ensure that part of the chinook season will occur after June 1.

At total allowable harvest levels above 300,000 coho and above 100,000 chinook:

- Relax any restrictions in the recreational all-species fishery and/or extend the all-species season beyond Labor Day as coho quota allows. Provide chinook to the recreational fishery for a Memorial Day through late June chinook-only fishery. Adjust days per week to ensure continuity with the all-species season.

- Provide coho for an all-salmon troll season in late summer and/or access to a pink fishery. Leave adequate chinook from the May through June season to allow access to coho.

5.3.1.2 Allocation Schedule Between Gear Types

Initial commercial and recreational allocation will be determined by the schedule of percentages of total allowable harvest as follows:

TABLE 5-1. Initial commercial/recreational harvest allocation schedule north of Cape Falcon.

Coho			Chinook		
Harvest (thousands of fish)	Percentage[a/]		Harvest (thousands of fish)	Percentage[a/]	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ The allocation must be calculated in additive steps when the harvest level exceeds the initial tier.

This allocation schedule should, on average, allow for meeting the specific fishery allocation priorities described above. The initial allocation may be modified annually by preseason and inseason trades to better achieve (1) the commercial and recreational fishery objectives and (2) the specific fishery allocation priorities. The final preseason allocation adopted by the Council will be expressed in terms of quotas which are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch.

To provide flexibility to meet the dynamic nature of the fisheries and to assure achievement of the allocation objectives and fishery priorities, deviations from the allocation schedule will be allowed as provided below and as described in Section 6.5.3.2 for certain selective fisheries.

1. Preseason species trades (chinook and coho) which vary from the allocation schedule may be made by the Council based upon the recommendation of the pertinent recreational and commercial SAS representatives north of Cape Falcon. The Council will compare the socioeconomic impacts of any such recommendation to those of the standard allocation schedule before adopting the allocation which best meets FMP management objectives.

2. Inseason transfers, including species trades of chinook and coho, may be permitted in either direction between recreational and commercial fishery quotas to allow for uncatchable fish in one fishery to be reallocated to the other. Fish will be deemed "uncatchable" by a respective commercial or recreational fishery only after considering all possible annual management actions to allow for their harvest which meet framework harvest management objectives, including single species or exclusive registration

fisheries. Implementation of inseason transfers will require (a) consultation with the pertinent recreational and commercial SAS members and the STT and (b) a clear establishment of available fish and impacts from the transfer.

3. An exchange ratio of four coho to one chinook shall be considered a desirable guideline for preseason trades. Deviations from this guideline should be clearly justified. Inseason trades and transfers may vary to meet overall fishery objectives. (The exchange ratio of four coho to one chinook approximately equalizes the species trade in terms of average ex-vessel values of the two salmon species in the commercial fishery. It also represents an average species catch ratio in the recreational fishery.)

4. Any increase or decrease in the recreational or commercial total allowable catch (TAC), resulting from an inseason restructuring of a fishery or other inseason management action, does not require reallocation of the overall north of Cape Falcon non-Indian TAC.

5. The commercial TACs of chinook and coho derived during the preseason allocation process may be varied by major subareas (i.e., north of Leadbetter Point and south of Leadbetter Point) if there is a need to do so to decrease impacts on weak stocks. Deviations in each major subarea will generally not exceed 50% of the TAC of each species that would have been established without a geographic deviation in the distribution of the TAC. Deviation of more than 50% will be based on a conservation need to protect the weak stocks and will provide larger overall harvest for the entire fishery north of Cape Falcon than would have been possible without the deviation. In addition, the actual harvest of coho may deviate from the initial allocation as provided in Section 6.5.3.2 for certain selective fisheries.

6. The recreational TACs of chinook and coho derived during the preseason allocation process will be distributed among four major recreational port areas as described in the coho and chinook distribution sections below. Additionally, based on the recommendations of the SAS members representing the ocean sport fishery north of Cape Falcon, the Council will include criteria in its preseason salmon management recommendations to guide any inseason transfer of coho among the recreational subareas to meet recreational season duration objectives. Inseason redistributions of quotas within the recreational fishery or the distribution of allowable coho catch transfers from the commercial fishery may deviate from the preseason distribution. The Council may also deviate from subarea quotas to (1) meet recreational season objectives based on agreement of representatives of the affected ports and (2) in accordance with Section 6.5.3.2 with regard to certain selective fisheries.

5.3.1.3 Recreational Subarea Allocations

Coho

The north of Cape Falcon preseason recreational TAC of coho will be distributed to provide 50% to the area north of Leadbetter Point and 50% to the area south of Leadbetter Point. The distribution of the allocation north of Leadbetter point will vary, depending on the existence and magnitude of an inside fishery in Area 4B which is served by Neah Bay.

In years with no Area 4B fishery, the distribution of coho north of Leadbetter Point (50% of the total recreational TAC) will be divided to provide 74% to the area between Leadbetter Point and the Queets River (Westport), 5.2% to the area between Queets River and Cape Flattery (La Push), and 20.8% to the area north of the Queets River (Neah Bay). In years when there is an Area 4B (Neah Bay) fishery under state management, the allocation percentages north of Leadbetter Point will be modified to maintain more equitable fishing opportunity among the ports by decreasing the ocean harvest share for Neah Bay. This will be accomplished by adding 25% of the numerical value of the Area 4B fishery to the recreational TAC north of Leadbetter Point prior to calculating the shares for Westport and La Push. The increase to Westport and La Push will be subtracted from the Neah Bay ocean share to maintain the same total harvest allocation north of Leadbetter Point. Table 5-2 displays the resulting percentage allocation of the total recreational coho catch north of Cape Falcon among the four recreational port areas (each port area allocation will be rounded to the nearest hundred fish, with the largest quotas rounded downward if necessary to sum to the TAC).

TABLE 5-2. Percentage allocation of total allowable coho harvest among the four recreational port areas north of Cape Falcon.

Port Area	Without Area 4B Add-on	With Area 4B Add-on	
Columbia River	50.0%	50.0%	
Westport	37.0%	37.0%	plus 17.3% of the Area 4B add-on
La Push	2.6%	2.6%	plus 1.2% of the Area 4B add-on
Neah Bay	10.4%	10.4%	minus 18.5% of the Area 4B add-on

Example distributions of the recreational coho TAC north of Leadbetter Point would be as follows:

Sport TAC North of Cape Falcon	Without Area 4B Add-On				With Area 4B Add-On [a/]					
								Neah Bay		
	Columbia River	Westport	La Push	Neah Bay	Columbia River	Westport	La Push	Ocean	Add-on	Total
50,000	25,000	18,500	1,300	5,200	25,000	19,900	1,400	3,700	8,000	11,700
150,000	75,000	55,500	3,900	15,600	75,000	57,600	4,000	13,600	12,000	25,400
300,000	150,000	111,000	7,800	31,200	150,000	114,500	8,000	27,500	20,000	47,500

a/ The add-on levels are merely examples. The actual numbers in any year would depend on the particular mix of stock abundances and season determinations.

Chinook

Subarea distributions of chinook will be managed as guidelines and shall be calculated by the STT with the primary objective of achieving all-species fisheries without imposing chinook restrictions (i.e., area closures or bag limit reductions). Chinook in excess of all-species fisheries needs may be utilized by directed chinook fisheries north of Cape Falcon or by negotiating a chinook/coho trade with another fishery participant group.

Inseason management actions may be taken by NMFS Regional Director to assure that the primary objective of the chinook harvest guidelines for each of the three recreational subareas north of Cape Falcon are met. Such actions might include: closure from 0 to 3, or 0 to 6, or 3 to 200, or 5 to 200 nautical miles from shore; closure from a point extending due west from Tatoosh Island for 5 miles, then south to a point due west of Umatilla Reef Buoy, then due east to shore; closure from North Head at the Columbia River mouth north to Leadbetter Point; change species which may be landed; or other actions as prescribed in the annual regulations.

5.3.2 Commercial and Recreational Fisheries South of Cape Falcon (Old Section 8.1.2)

The allocation of allowable ocean harvest of coho salmon south of Cape Falcon has been developed to provide a more stable recreational season and increased economic benefits of the ocean salmon fisheries at varying stock abundance levels. When coupled with various recreational harvest reduction measures or the timely transfer of unused recreational allocation to the commercial fishery, the allocation schedule is designed to help secure recreational seasons extending at least from Memorial Day through Labor Day, assist in maintaining commercial markets even at relatively low stock sizes, and fully utilize available harvest. Total ocean catch of coho south of Cape Falcon will be treated as a quota to be allocated between troll and recreational fisheries as provided in Table 5-3.

(Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be accomplished during the Council's preseason process.)

TABLE 5-3. Allocation of allowable ocean harvest of coho salmon (thousands of fish) south of Cape Falcon.[a/]

Total Allowable Ocean Harvest	Recreational Allocation		Commercial Allocation	
	Number	Percentage	Number	Percentage
≤100	≤100[b/c/]	100[b/]	b/	b/
200	167[b/c/]	84[b/]	33[b/]	17[b/]
300	200	67	100	33
350	217	62	133	38
400	224	56	176	44
500	238	48	262	52
600	252	42	348	58
700	266	38	434	62
800	280	35	520	65
900	290	32	610	68
1,000	300	30	700	70
1,100	310	28	790	72
1,200	320	27	880	73
1,300	330	25	970	75
1,400	340	24	1,060	76
1,500	350	23	1,150	77
1,600	360	23	1,240	78
1,700	370	22	1,330	78
1,800	380	21	1,420	79
1,900	390	21	1,510	79
2,000	400	20	1,600	80
2,500	450	18	2,050	82
3,000	500	17	2,500	83

a/ The allocation schedule is based on the following formula: first 150,000 coho to the recreational base (this amount may be reduced as provided in footnote b); over 150,000 to 350,000 fish, share at 2:1, 0.667 to troll and 0.333 to recreational; over 350,000 to 800,000 the recreational share is 217,000 plus 14% of the available fish over 350,000; above 800,000 the recreational share is 280,000 plus 10% of the available fish over 800,000.
Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow general coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be determined in the Council's preseason process. Deviations from the allocation may also be allowed to meet jeopardy standards for ESA listed stocks (e.g., the 1998 biological opinion for California coastal coho requires no retention of coho in fisheries off California).

b/ If the commercial allocation is insufficient to meet the projected hook-and-release mortality associated with the commercial all-salmon-except-coho season, the recreational allocation will be reduced by the number needed to eliminate the deficit.

c/ When the recreational allocation is 167,000 coho or less, special allocation provisions apply to the recreational harvest distribution by geographic area (unless superseded by requirements to meet a jeopardy standard for ESA listed stocks); see text of FMP as modified by Amendment 11 allocation provisions.

The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while

still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

The allocation schedule is also designed to assure there are sufficient coho allocated to the troll fishery at low stock levels to ensure a full chinook troll fishery. This hooking mortality allowance will have first priority within the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for the estimated incidental coho mortality will be deducted from the recreational share. At higher stock sizes, directed coho harvest will be allocated to the troll fishery after hooking mortality needs for chinook troll fishing have been satisfied.

The allowable harvest south of Cape Falcon may be further partitioned into subareas to meet management objectives of the FMP. Allowable harvests for subareas south of Cape Falcon will be determined by an annual blend of management considerations including:

1. abundance of contributing stocks
2. allocation considerations of concern to the Council
3. relative abundance in the fishery between chinook and coho
4. escapement goals
5. maximizing harvest potential

Troll coho quotas may be developed for subareas south of Cape Falcon consistent with the above criteria. California recreational catches of coho, including projections of the total catch to the end of the season, would be included in the recreational allocation south of Cape Falcon, but the area south of the Oregon-California border would not close when the allocation is met; except as provided below when the recreational allocation is at 167,000 or fewer fish.

When the south of Cape Falcon recreational allocation is equal to or less than 167,000 coho:

1. The recreational fisheries will be divided into two major subareas, as listed in #2 below, with independent quotas (i.e., if one quota is not achieved or is exceeded, the underage or overage will not be added to or deducted from the other quota; except as provided under #3 below).

2. The two major recreational subareas will be managed within the constraints of the following impact quotas, expressed as a percentage of the total recreational allocation (percentages based on avoiding large deviations from the historical harvest shares):

   a. Central Oregon (Cape Falcon to Humbug Mountain) - 70%

   b. South of Humbug Mountain - 30%

      In addition,

      (1) Horse Mountain to Point Arena will be managed for an impact guideline of 3 percent of the south of Cape Falcon recreational allocation, and

      (2) there will be no coho harvest constraints south of Point Arena. However, the projected harvest in this area (which averaged 1,800 coho from 1986-1990) will be included in the south of Humbug Mountain impact quota.

3. Coho quota transfers can occur on a one-for-one basis between subareas if chinook constraints preclude access to coho.

SELECTIVE FISHERY GUIDELINES -- SECTION 6.5 OF AMENDMENT 14

6.5 SEASONS AND QUOTAS

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6.5.3 Species-Specific and Other Selective Fisheries

6.5.3.1 Guidelines

In addition to the all-species and single or limited species seasons established for the commercial and recreational fisheries, other species-limited fisheries, such as "ratio" fisheries and fisheries selective for marked or hatchery fish, may be adopted by the Council during the preseason regulatory process. In adopting such a fishery, the Council will consider the following guidelines:

1. Harvestable fish of the target species are available.

2. Harvest impacts on incidental species will not exceed allowable levels determined in the management plan.

3. Proven, documented, selective gear exists (if not, only an experimental fishery should be considered).

4. Significant wastage of incidental species will not occur or a written economic analysis demonstrates the landed value of the target species exceeds the potential landed value of the wasted species.

5. The species specific or ratio fishery will occur in an acceptable time and area where wastage can be minimized and target stocks are maximally available.

6. Implementation of selective fisheries for marked or hatchery fish must be in accordance with U.S. v. Washington stipulation and order concerning co-management and mass marking (Case No. 9213, Subproceeding No. 96-3) and any subsequent stipulations or orders of the U.S. District Court, and consistent with international objectives under the Pacific Salmon Treaty (e.g., to ensure the integrity of the coded-wire tag program).

6.5.3.2 Selective Fisheries Which May Change Allocation Percentages North of Cape Falcon

As a tool to increase management flexibility to respond to changing harvest opportunities, the Council may implement deviations from the specified port area allocations and/or gear allocations to increase harvest opportunity through fisheries that are selective for marked salmon stocks (e.g., marked hatchery salmon). The benefits of any selective fishery will vary from year to year and fishery to fishery depending on stock abundance, the mix of marked and unmarked fish, projected hook-and-release mortality rates, and public acceptance. These factors should be considered on an annual and case-by-case basis when utilizing selective fisheries. The deviations for selective fisheries are subordinate to the allocation priorities in Section 5.3.1.1 and may be allowed under the following management constraints:

1. Selective fisheries will first be considered during the months of August and/or September. However, the Council may consider selective fisheries at other times, depending on year to year circumstances identified in the preceding paragraph.

2. The total impacts within each port area or gear group on the critical natural stocks of management concern are not greater than those under the original allocation without the selective fisheries.
3. Other allocation objectives (i.e., treaty Indian, or ocean and inside allocations) are satisfied during negotiations in the North of Cape Falcon Forum.

4. The selective fishery is assessed against the guidelines in Section 6.5.3.1.

5. Selective fishery proposals need to be made in a timely manner in order to allow sufficient time for analysis and public comment on the proposal before the Council finalizes its fishery recommendations.

If the Council chooses to deviate from the specified port and/or gear allocations, the process for establishing a selective fishery would be as follows:

1. Allocate the TAC among the gear groups and port areas according to the basic FMP allocation process described in Section 5.3.1 without the selective fishery.

2. Each gear group or port area may utilize the critical natural stock impacts allocated to its portion of the TAC to access additional harvestable, marked fish, over and above the harvest share established in step one, within the limits of the management constraints listed in the preceding paragraph.

Inside Back Cover
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Summary of Monitoring Results from the 1999 Buoy 10 and Columbia River Area Ocean Selective Fisheries

Oregon Department of Fish and Wildlife
Washington Department of Fish and Wildlife

March, 2000

Introduction

This summary is the result of joint monitoring efforts by Oregon Department of Fish and Wildlife (ODFW) and Washington Department of Fish and Wildlife (WDFW) for the 1999 recreational selective coho salmon fisheries in the Columbia River estuary (Buoy 10) and in the adjacent ocean area from Cape Falcon, Oregon to Leadbetter Point, Washington. A full report is underway which will incorporate the methodologies used in a monitoring report on the 1999 selective fishery on the central coast of Oregon ('DRAFT, 1999 Monitoring Program for Selective Ocean Coho Salmon Fisheries Off the Central Oregon Coast from Cape Falcon to Humbug Mountain', ODFW, 1999). The central Oregon coast report was recently reviewed by the Scientific and Statistical Committee of the Pacific Fishery Management Council (PFMC) and is currently being finalized by ODFW.

Fishery Descriptions

The Columbia River area ocean recreational (ocean) fishery from Cape Falcon, Oregon to Leadbetter Point, Washington opened on July 19th and remained open through the scheduled closing date of September 30th. The coho quota of 55,000 was not attained. The fishery, originally open Sunday-Thursday, was opened seven days a week beginning September 3rd when it became clear that the quota would not be reached. The harvest guideline for chinook was 7,600. The bag limit was two salmon per day but only one chinook and no more than six salmon per calendar week with minimum size limits of 24" for chinook and 16" for coho. Selective fishery regulations required all retained coho to have a healed adipose finclip.

The estuary fishery (Buoy 10) in the Columbia River from the mouth upriver to the Astoria-Megler Bridge opened August 1st through December 31st. The bag limit was two salmon per day with minimum size limits of 24" chinook and 16" for coho. The Buoy 10 fishery was not quota managed but selective fishery regulations required all retained coho to have a healed adipose finclip. The Buoy 10 fishery outpaced the preseason expectation for chinook retention by the end of August and was closed to chinook retention August 30th to reduce overall impacts and preserve Columbia River chinook sharing agreements.

Methods

The ODFW and WDFW hired full-time observers for at-sea observation of the ocean and Buoy 10 salmon fisheries. Charter operators from the ports of Ilwaco, Astoria, Warrenton, Hammond, and Garibaldi volunteered space on their vessels to accommodate ODFW and WDFW observers. Additionally, WDFW observed private fishing boats from an adjacent vessel.

Observers aboard charter boats collected information about fish encounters, areas fished and types of gear used. Data recorded included species hooked, presence or absence of

the adipose fin, size (legal or sublegal), and result of fish contacting the gear (fish retained, released, or dropped off) for every hookup the observer witnessed.

Observers aboard the adjacent vessel witnessed hookups by the private boat fleet. The observer vessel was positioned near a concentration of private fishing boats. When a hookup was observed on a private boat, the observer vessel provided a vantage point to record as much of the above information as could be witnessed.

Dockside port samplers collected catch information through interviews and catch inspections as fishing boats returned to the docks. Data collected per boat included catch by species, presence or absence of adipose fins on all retained salmon, number of anglers, and total number of salmon released by species. Landed salmon were sampled for species, fork length, scale collection, fin mark, and coded-wire tag. Due to the mass marking of hatchery coho, electronic detection equipment was used to indicate the presence or absence of coded-wire tags in all coho.

The ODFW dockside and onboard observers collected gear profile data including method (trolling or mooching), number of hooks, bait or lure, use of flasher, and type of weight.

Total effort data was collected through either exit or entrance counts of vessels passing through the entrance of the ports. Dockside sampling data was then expanded according to the observed effort profile to estimate total retained and released catch.

Catch and Effort

Retained salmon catch and angler effort in the Columbia River area ocean selective fishery are shown in Table 1. Anglers retained 27,132 coho and 3,253 chinook on 28,100 angler trips. Although catch rates in the ocean fishery were approximately one salmon per angler trip, less than half of the 55,000 coho quota and the 7,600 chinook guideline was attained.

Retained salmon catch and angler effort in the Buoy 10 selective fishery are shown in Table 2. Anglers retained 8,960 coho and 9,850 chinook on 49,576 angler trips. Coho catch rates were less than anticipated partly due to a lower than forecast return of Columbia River hatchery coho and a shift of angler effort to chinook targeted fishery.

Coho Handle

The WDFW and ODFW staff observed anglers onboard charter and private boats throughout the ocean selective fishery season. They observed 1,404 (5.2%) of the 27,132 coho retained in the ocean fishery (Table 3). Observers recorded 402 unmarked coho handled for an overall mark rate of 78%.

Observation of the Buoy 10 selective fishery was conducted primarily by WDFW and was concentrated in the August and September timeframe when angler effort and coho catch are the greatest. Observers recorded 232 (2.6%) of the 8,960 coho retained in the

Buoy 10 fishery (Table 4). Observers recorded 61 unmarked coho handled for an overall mark rate of 79%.

Preseason vs. Postseason Estimates of Coho Mark Rates

Table 5 compares preseason and postseason estimates of mark rate for the Buoy 10 and ocean selective fisheries. Preseason projections of 1999 coho mark rates were estimated using the coho Fishery Regulation and Assessment Model (FRAM). Postseason estimates were calculated from coho encounter data collected during onboard observations. Postseason estimates of mark rates in both fisheries were consistently greater than preseason estimates.

Dockside vs. Observer Data in Selective Fisheries

Observation data on 1999 selective coho fisheries were collected in part to investigate potential bias in estimates of coho mark rates based on angler recognition of released coho. Mark rates calculated from data collected at the dock were generally consistent with those calculated from observer data (Tables 6 and 7).

The dockside sampling of the ocean area selective fishery showed a coho mark rate of 72% compared with 78% estimated from observation data. The dockside sampling of the Buoy 10 selective fishery showed a similarly lower coho mark rate of 76% compared to the 79% estimated from observation data. Although both fisheries exhibited a lower mark rate based on dockside sampling versus onboard observation, further analyses are necessary to determine if these differences are statistically significant.

Compliance

Using combined information from dockside sampling and boat patrols conducted by Oregon State Police (OSP) and WDFW's Enforcement Program, estimates of compliance with selective regulations were assessed as a percentage of the retained coho catch with a healed adipose finclip (Tables 6 and 7). Oregon and Washington enforcement personnel contacted over 1,700 anglers in the Buoy 10 and the ocean fisheries combined. Compliance rates in these two selective fisheries were considerably less than the 2.5% rate assumed preseason.

Compliance with the selective fishery regulations in the ocean area fishery was very high for both private and charter vessels. Approximately 35% of the total retained coho in the ocean selective fishery were sampled at the dock and an estimated 1% did not have an adipose clip. This compliance rate of 99% was confirmed by random state enforcement boat patrols.

Compliance with the selective fishery regulation in the Buoy 10 fishery was also high. Approximately one-third of the total retained coho in the Buoy 10 selective fishery were sampled at the dock and an estimated 2% did not have an adipose finclip.

Estimated Mortality

Estimates of total coho mortality in the Buoy 10 and ocean selective fisheries are shown in Table 8. This analysis uses observed coho mark rates from ODFW and WDFW at-sea sampling to estimate total coho retention and release. Estimates of incidental mortality are calculated using rates adopted by the PFMC for 1999 recreational fisheries (5% drop off mortality and 8% hooking mortality).

Incidental coho mortality in the ocean selective fishery is estimated at 2,301. When combined with the 27,132 retained coho, estimated total coho mortality in the ocean selective fishery is 29,433.

Incidental mortality in the Buoy 10 selective fishery is estimated at 762 coho. When combined with the 8,960 retained coho, estimated total coho mortality in the Buoy 10 selective fishery is 9,722.

Drop Off Rates

Observers from ODFW and WDFW recorded information on fish which were hooked but lost before being brought to the boat, commonly referred to as drop offs. Current PFMC methodology for estimating mortality due to drop off uses a rate of 5% of the total number of fish handled (retention plus release). Estimates of drop off mortality rates from observation data collected during the ocean selective fisheries are displayed in Table 9. Rates for both chinook and coho were never estimated to be greater than 3%. Based on this analysis, the methodology for assessing drop off mortality adopted by the PFMC is conservatively high.

Gear Profile

Preliminary results from the gear profile work in the Columbia River area ocean selective fishery suggests that 99% of the anglers are trolling rather than mooching. Additionally, 85% of anglers are using bait versus artificial lures and of the bait anglers over 80% used a tandem hook setup.

Conclusion

Preliminary postseason results from the 1999 monitoring of the Buoy 10 and ocean selective fisheries indicate that preseason assumptions concerning mark rate, compliance, and drop off used in the modeling of these fisheries are adequately conservative when assessing these fisheries.

Acknowledgments

The selective fishery monitoring of these fisheries is a joint effort of WDFW and ODFW and their respective enforcement divisions. The ODFW and WDFW would like to thank the charter operators who voluntarily provided space on their boats for observers. Special

recognition is due all samplers and observers who spent a great deal of time collecting the data presented in this summary.

Table 1. Salmon retention and angler effort in the 1999 Columbia River area ocean selective fishery.

		Charter			Private			Bank			Total		
	Date	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook
Oregon	July	393	544	53	1,712	1,925	167	0	0	0	2,105	2,469	220
	August	824	971	200	2,829	2,388	421	0	0	0	3,653	3,359	621
	September	513	804	36	1,153	917	58	0	0	0	1,666	1,721	94
	Total	1,730	2,319	289	5,694	5,230	646	0	0	0	7,424	7,549	935
Washington	July	1,267	1,868	197	2,999	3,303	298	182	0	0	4,448	5,171	495
	August	2,672	3,587	582	6,251	5,815	925	2,210	84	0	11,133	9,486	1,507
	September	1,531	2,574	133	2,535	2,266	183	1,029	86	0	5,095	4,926	316
	Total	5,470	8,029	912	11,785	11,384	1,406	3,421	170	0	20,676	19,583	2,318
Subtotals	July	1,660	2,412	250	4,711	5,228	465	182	0	0	6,553	7,640	715
	August	3,496	4,558	782	9,080	8,203	1,346	2,210	84	0	14,786	12,845	2,128
	September	2,044	3,378	169	3,688	3,183	241	1,029	86	0	6,761	6,647	410
Grand Total		7,200	10,348	1,201	17,479	16,614	2,052	3,421	170	0	28,100	27,132	3,253

Table 2. Salmon retention and angler effort in the 1999 Buoy 10 selective fishery.

		Charter			Private			Bank			Total		
	Date	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook	Angler Trips	Coho	Chinook
Oregon	August	442	115	125	14,853	1,738	3,819	671	45	9	15,966	1,898	3,953
	September	12	2	0	4,172	1,619	15	699	101	0	4,883	1,722	15
	Total	454	117	125	19,025	3,357	3,834	1,370	146	9	20,849	3,620	3,968
Washington	August	721	92	185	21,394	2,861	5,690	0	0	0	22,115	2,953	5,875
	September	334	83	0	6,278	2,304	7	0	0	0	6,612	2,387	7
	Total	1,055	175	185	27,672	5,165	5,697	0	0	0	28,727	5,340	5,882
Subtotals	August	1,163	207	310	36,247	4,599	9,509	671	45	9	38,081	4,851	9,828
	September	346	85	0	10,450	3,923	22	699	101	0	11,495	4,109	22
Grand Total		1,509	292	310	46,697	8,522	9,531	1,370	146	9	49,576	8,960	9,850

Table 3. Observation data from the Columbia River area ocean selective fishery.

	Coho			
	Unmarked Handle	Marked Handle	Total Handle	Mark Rate
Washington				
July	56	261	317	82%
August	103	361	464	78%
September	36	136	172	79%
Oregon				
July	38	134	172	78%
August	148	438	586	75%
September	21	74	95	78%
Subtotals				
July	94	395	489	81%
August	251	799	1,050	76%
September	57	210	267	79%
Total	402	1,404	1,806	78%

Table 4. Observation data from the Buoy 10 selective fishery.

	Coho			
	Unmarked Handle	Marked Handle	Total Handle	Mark Rate
Washington				
August	14	42	56	75%
September	47	190	237	80%
Oregon				
August	0	1	1	100%
September	0	0	0	0%
Subtotals				
August	14	42	56	75%
September	47	190	237	80%
Total	61	232	293	79%

Table 5. Projected and observed coho mark rates in Buoy 10 and Columbia River area ocean fisheries.

Ocean Catch Area	Marked Handle	Total Handle	Observed Mark Rate	FRAM Projected Mark Rate
Columbia River				
July	395	489	81%	67%
August	799	1,050	76%	71%
September	210	267	79%	70%
Buoy 10				
August	42	56	75%	73%
September	190	237	80%	74%

Table 6. Dockside sampling data from the 1999 Columbia River area ocean selective fishery. a/

	Coho				
	Legal-Sized Unmarked Releases	Legal-Sized Marked Retention	Unmarked Retention	Mark Rate	Compliance Rate /b
Washington					
July	2,114	5,160	11	71%	99.8%
August	3,425	9,440	46	73%	99.5%
September	2,183	4,922	4	69%	99.9%
Oregon					
July	762	2,452	17	76%	99.3%
August	1,145	3,335	24	74%	99.3%
September	631	1,709	12	73%	99.3%
Subtotals					
July	2,876	7,612	28	72%	99.6%
August	4,569	12,775	70	73%	99.5%
September	2,814	6,631	16	70%	99.8%
Total	10,259	27,018	114	72%	99.6%

a/ Expanded for sampling.

b/ Compliance based on dockside sampling by WDFW, ODFW and State Police.

Table 7. Dockside sampling results from the 1999 Buoy 10 selective fishery. a/

	Coho				
	Legal-Sized Unmarked Releases	Legal-Sized Marked Retention	Unmarked Retention	Mark Rate	Compliance Rate /b
Washington					
August	1,059	2,912	41	73%	98.6%
September	784	2,385	2	75%	99.9%
Oregon					
August	341	1,856	42	83%	97.8%
September	493	1,684	38	76%	97.8%
Subtotals					
August	1,400	4,768	83	76%	98.3%
September	1,277	4,069	40	76%	99.9%
Total	2,677	8,837	123	76%	99%

a/ Expanded for sampling.

b/ Compliance based on dockside sampling by WDFW, ODFW and State Police.

Table 8. Estimated coho mortality in the Buoy 10 Columbia River area ocean selective fisheries.

		Total Retention	Marked Retention	Unmarked Retention a/	Unmarked Releases	Total Handle b/	Observed Mark Rate	Drop Off Mortality c/	Release Mortality d/	Incidental Mortality e/	Total Mortality f/
Ocean	July	7,640	7,564	76	1,698	9,338	81.0%	467	136	603	8,243
	August	12,845	12,717	128	3,887	16,732	76.0%	837	311	1,148	13,993
	September	6,647	6,581	66	1,683	8,330	79.0%	416	135	551	7,198
	Total	**27,132**	**26,861**	**271**	**7,268**	**34,400**		**1,720**	**581**	**2,301**	**29,433**
Buoy 10	August	4,851	4,802	49	1,552	6,403	75.0%	320	124	444	5,295
	September	4,109	4,068	41	976	5,085	80.0%	254	78	332	4,441
	Total	**8,960**	**8,870**	**90**	**2,528**	**11,488**		**574**	**202**	**777**	**9,737**

a/ Based on compliance rates of 99%.
b/ Marked retention/observed mark rate.
c/ 5% of total handle.
d/ 8% of unmarked releases.
e/ Drop off + release mortality.
f/ Total retention + incidental mortality.

Table 9. Estimated drop off mortality in the Columbia River area ocean selective fishery. a/

	Coho				Chinook			
	Observed Drop Offs	Estimated Drop Off Mortality b/	Total Handle	Est. Drop Off Mort. / Tot. Handle c/	Observed Drop Offs	Estimated Drop Off Mortality b/	Total Handle	Est. Drop Off Mort. / Tot. Handle c/
July	137	11	489	2.2%	12	1	124	0.8%
August	238	19	1,050	1.8%	44	4	225	1.6%
September	38	3	267	1.1%	1	0	28	0.4%
Total	413	33	1,806	1.8%	57	5	377	1.2%

a/ Observed drop off of chinook and coho estimated from the ratio of chinook to coho in the retained catch.
b/ Assumes fish which drop off will die at the same rate (8%) as fish brought to the boat and released.
c/ 5% assumed preseason.

SALMON ADVISORY SUBPANEL COMMENTS ON REVIEW OF 1999 FISHERIES AND SUMMARY OF 2000 STOCK ABUNDANCE ESTIMATES

The Salmon Advisory Subpanel requests the Council take action to acknowledge and support increased funding for salmon production at the "Mitchell Act" hatcheries on the Columbia River.

Over 50 years ago, the Mitchell Act created hatcheries to mitigate for lost Columbia River salmon production due to hydroelectric dams. The Salmon produced by these hatcheries became the backbone of the Washington ocean salmon fishery and are also critical to the survival of most lower Columbia River salmon fisheries.

Production in these hatcheries during the past ten years has declined substantially due to lack of funding and reprogramming. In response, the states of Washington, Oregon, and Idaho have drafted a plan entitled *Mitchell Act Hatchery and Fish Screen Reform 2001.* This plan has been submitted to Congress for funding. The plan includes proposals for broodstock reform, conservation marking, and species reintroduction among other measures designed to make future production compatible with wild salmon runs.

Survival of an ocean fishery north of Cape Falcon is dependent upon the full funding and implementation of this plan.

PFMC
03/07/00

SCIENTIFIC AND STATISTICAL COMMITTEE COMMENTS ON REVIEW OF 1999 FISHERIES AND SUMMARY OF 2000 STOCK ABUNDANCE ESTIMATES

Mr. Doug Milward of the Salmon Technical Team (STT) reviewed the 1999 ocean salmon fisheries and 2000 stock abundance estimates for the Scientific and Statistical Committee (SSC). He stated the 2000 preseason abundance forecast for most chinook and coho stocks were similar to last years' preseason estimates. The Klamath River chinook forecast is larger than last years' estimates; however, the Council has the option of managing for the escapement floor of 35,000 natural spawners. The escapement was below the floor in 1999. Two more years of sub-floor escapements would result in an overfishing determination. A precautionary approach should be used when managing this stock. Basing management decisions to meet minimum escapement levels leaves little or no room for error if the escapement floor is to be met or exceeded.

The SSC requested the STT add the postseason estimates for all stocks listed in Table I-1 and I-2 in the *Preseason Report I (Stock Abundance Analysis for 2000 Ocean Salmon Fisheries)*. The SSC is concerned methods used to predict stock abundances are changing without review.

PFMC
03/07/00

Monitoring Results from the 1999 Ocean Recreational Selective Fisheries from Leadbetter Point to the U.S. Canada Border

Washington Department of Fish and Wildlife

Wendy Beeghley
Doug Milward
Scott Barbour

January, 2000

The Pacific Fishery Management Council (PFMC) adopted selective fisheries for coho in all four ocean areas from Cape Falcon, Oregon to the U.S./Canada border as well as the Buoy 10 fishery in the Columbia River estuary. This paper is a report on the three areas north of Leadbetter Point (Catch Record Card Areas 2, 3 and 4).

When the Council set the 1999 selective fisheries, assumptions were made about coho and chinook abundance, distribution of stocks, coho mark rates, compliance with the new regulations, and incidental mortality. A monitoring plan was developed to test some of these assumptions through dockside catch and effort sampling along with direct on-water observations of the fisheries in progress.

Fishery Descriptions

AREA 2: The ocean recreational fishery from Leadbetter Point, Washington to the Queets river (Area 2) opened on July 19 and was scheduled to run through the earlier of September 30 or attainment of the 42,200 coho quota. A harvest guideline of 13,400 chinook also existed. The fishery was open Sunday through Thursday, July 19 through August 29, and then seven days per week August 30 through September 30, for a total of 62 fishing days. A two salmon daily bag limit was in effect, only one of which could be a chinook. Retained coho were required to have a healed adipose fin clip. No more than 6 salmon were allowed per person in 7 calendar days (Sunday through Saturday). The fishery was closed from 0 - 3 miles from shore beginning August 22.

AREA 3: The ocean recreational fishery from the Queets river to Cape Alava (Area 3) opened on July 19 and was scheduled to run through the earlier of September 30 or attainment of the 2,600 coho quota. A harvest guideline of 400 chinook was also in effect. The fishery was open seven days per week July 19 through September 30, for a total of 74 fishing days with a two salmon daily bag limit; retained coho were required to have a healed adipose fin clip.

AREA 4: The ocean recreational fishery from Cape Alava to the US/Canada border (Area 4) opened on July 19 and was scheduled to run through the earlier of September 30 or attainment of the 10,200 coho quota . The fishery was open seven days per week July 19 through September 30, for a total of 74 fishing days, with a two salmon daily bag limit and no chinook retention; retained coho were required to have a healed adipose fin clip.

Methods

AREA 2: WDFW stationed four dockside samplers and two on-water observers in Westport to monitor the Area 2 selective fishery. The on-water observers concentrated their efforts on the charter fleet operating from Westport. Charter operators volunteered space on their vessels to accommodate the WDFW observers. The observers on charter boats collected information about that specific boat's encounters for the day. Data recorded included species hooked,

presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off) for each hookup that occurred on that vessel.

Dockside port samplers collected catch information through interviews and catch inspections as fishing boats returned to port. Data collected per boat included catch by species, presence or absence of adipose fins on all retained salmon, number of anglers, total number of salmon released by species, and number of adipose-clipped coho released. Landed salmon were sampled for species, fin mark, and coded-wire tag and scale collection. Due to the mass marking of hatchery coho, electronic detection equipment was used to indicate the presence or absence of coded-wire tags in all coho.

Total effort data was collected through counts of vessels leaving the port on their way to the fishing grounds each day. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

AREA 3: WDFW stationed one employee in La Push to monitor the selective recreational ocean fishery in Area 3. Because there is little to no charter boat activity in La Push, and because the private sport activity is relatively low and scattered, on-water observation was not feasible. The port sampler in La Push handed out voluntary salmon angler trip reports to as many fishers as possible and collected them upon the anglers' return to port.

Dockside, the port sampler collected catch information through interviews and catch inspections as described above. Total effort data was collected through a count of vessels returning to the port. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

AREA 4: WDFW stationed four people dockside and two on-water observers in Neah Bay to monitor the Area 4 selective fishery. The on-water observers worked from a WDFW vessel, observing hookups by the private boat fleet. The observer vessel positioned itself each day near concentrations of private fishing boats. When a hookup occurred, the WDFW vessel moved as close as feasible, and observers recorded species hooked, presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off) as possible.

In addition, WDFW personnel fished aboard a privately owned boat whenever possible and recorded the above information about each encounter. This method was implemented when it became apparent that due to conditions such as fog, low effort, and the fact that fishers didn't tend to group in one area like in other areas along the coast, it was possible to witness more encounters this way.

On-water observers also rode along on charter boats whenever possible. Charter operators in Neah Bay volunteered space on their vessels to accommodate the WDFW observers. The observers on charter boats collected information identical to that collected in Westport. However, low charter boat salmon effort from Neah Bay resulted in very few ride-along trips.
Finally, voluntary salmon angler trip reports were handed out by WDFW dockside staff as in La Push. The trip reports were collected from anglers as they returned to port.

Dockside, the port samplers collected catch information through interviews and catch inspections as described above. Total effort data was collected through counts of vessels leaving the port on their way to the fishing grounds each day. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

Catch and Effort

In Area 2, 19,072 anglers caught a total of 12,595 coho or 30% of the 42,200 coho quota, and 6,585 chinook or 49% of the 13,400 chinook guideline.

In Area 3, 2,921 anglers caught a total of 2,577 coho or 56% of the 4,600[1] coho quota, and 984 chinook or 246% of the 400 chinook guideline.

In Area 4, 8,102 anglers caught a total of 5,370 coho or 53% of the 10,200 coho quota.

Table 1 shows estimated total effort and landed salmon catch by month for the catch areas north of Leadbetter Point.

Selective Fishery Observation

AREA 2. WDFW staff observed anglers on board charter boats for each week the fishery was open in Area 2. Data collected include observations of 815 legal-sized coho encountered aboard chartered fishing vessels. Of these encounters, 483 coho were retained, which is 3.8% of the 12,595 coho retained in the ocean fishery. The mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 60%. The mark rate by month was 62%, 60% , and 54% for July, August and September respectively (Table 2). Twenty-eight percent of the 1,817 salmon observed hooked in Area 2 dropped off prior to being landed.

AREA 3. The voluntary angler trip report system was the only method used to collect encounter rate data from Area 3 since effort is too low and dispersed to accommodate on the water remote platform observations, and there is no charter boat fleet in La Push. Data collected in the fishery include records of 250 individual hook-ups of legal-sized coho from private fishing vessels brought to the boat. Of these encounters, 88 coho were retained, which is 3.4% of the 2,577 coho retained in the fishery. The mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 40%. The mark rate by month was 39%, 44%, and 36% for July, August and September respectively (Table 2). The trip report data showed that of the 361 salmon hooked, 48 salmon (13%) dropped off prior to being landed.

AREA 4. WDFW staff observed catch in the Area 4 fishery from an on-water remote platform, through fishing from a privately owned boat, and from a few charter ride alongs. A total of 395 legal-sized coho were observed as they were brought to the boat. Of these encounters, 87 coho were retained, which is 1.6% of the 5,370 coho retained in the fishery. The

[1]The original Area 3 coho quota of 2,600 plus an additional 2,000 made available in-season from coho remaining on the non-treaty troll fishery quota.

mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 26.%. The mark rate by month was 29%, 24%, and 29% for July, August and September respectively (Table 2). Of the 562 salmon observed hooked, 72 salmon (13%) dropped off prior to being landed.

Ocean Troll Fisheries

The 1999 non-Treaty and Treaty troll fisheries were non-selective fisheries. The coho mark rates observed in landings from these fisheries could provide another assessment the actual mark rate in the ocean population of coho

Non-Treaty Troll Fishery. The non-Treaty troll fishery was open for coho and chinook in a non-selective plug only fishery beginning July 10 with quotas of 20,000 coho and 7,000 chinook. The fishery is not a very good choice for comparison with the sport fishery because Area 4 was closed within 17 miles of shore for the first part of the fishery and later, all of Area 4 was closed. Furthermore, the fishery was directed towards chinook with plugs the only legal gear, and coho catches were low. Even with a sample rate of 74%, the total catch of 3,815 coho distributed between Areas 2,3 and 4 is not enough coho to do a very good comparison.

Impacts in the fishery were modeled with the FRAM model and the mark rate for coho was predicted to be 49%. If the fishery had gone exactly as planned pre-season, the landed catch should have been 9,760 marked coho and 10,240 unmarked coho. The actual landed catch in the fishery was 3,815 and of the 2,809 sampled coho, 1,043 (37%) were marked.

Treaty Troll Fishery. The Treaty troll fishery was open for coho and chinook in a non-selective fishery beginning August 1 with quotas of 38,500 coho and 30,000 chinook. Impacts in the fishery were modeled with the FRAM model and the mark rate was predicted to be 42%. If the fishery had gone exactly as planned pre-season, the landed catch should have been 16,016 marked coho and 22,484 unmarked coho. The actual landed catch in the fishery was 33,441; of the 9,142 sampled coho, 3,034 (33%) were marked. Since no selection was presumed to have taken place in the fishery it should be possible to expand the sample data to the total catch providing another method of estimating the mark rate in the ocean population of coho. Applying the mark rate observed through dockside sampling to the 33,441 landed coho, 11,099 are estimated to have been marked fish and 22,342 unmarked fish. Landings from the Treaty troll fishery were more than 5,000 fish under the quota, but with the mark rate significantly lower than projected pre-season, the number of landed unmarked coho was almost identical to the pre-season prediction.

The 33% mark rate observed in the Treaty troll fishery compares to a rate of 26% in the Area 4 sport fishery. The difference in mark rates may be due to the fact that the Treaty troll fishery occurs mainly outside of the Straits, while a large portion of the sport fishery effort occurs inside the Strait of Juan de Fuca, and the mark rate on coastal and Columbia River coho stocks was higher than that on Puget Sound stocks.

<u>Comparison of Pre-season vs. Post-season Estimates of Coho Mark Rates</u>

Pre-season projections of 1999 coho mark rates were estimated using the coho Fishery Regulation Assessment Model (FRAM). The coho FRAM uses inputs of pre-season run size projections and historic coded wire tag recovery data to predict the resulting impacts from a proposed fishery. Fram model run 9931 was the final pre-season assessment of the PFMC's adopted fishery package for the 1999 ocean fisheries. Table 3 compares the coho mark rates projected by the FRAM model with those observed through on-water monitoring in Areas 2, 3, and 4 in 1999.

Observation data showed actual coho mark rates very similar to pre-season projections in Area 2. The total observed coho mark rate for the season in the ocean Area 2 selective fishery was 60% compared to 61% projected pre-season. The observed mark rates in Areas 3 and 4 were lower than projected pre-season. In ocean Area 3, the observed coho mark rate was 40%, compared to the pre-season projection of 54%. The observed coho mark rate in the ocean Area 4 selective fishery 26%, compared to 43% projected pre-season.

Comparison of Dockside and Observer Data in Selective Fisheries

Observation data on 1999 selective coho fisheries were collected in part to investigate potential bias in estimates of coho mark rates based on angler recognition of released coho. Relative to estimates of released salmon from fishery observation data, information collected at the dock shows a small bias towards higher numbers of salmon released (Table 4).

The dockside sampling of the ocean Area 2 selective fishery showed a coho release rate of 46%, compared to a rate of 40% observed on the water. In Area 3, dockside sampling data showed a coho release rate of 68%, compared to a rate of 65% reported on voluntary angler catch reports. Dockside sampling data from Area 4 showed a coho release rate of 80%, compared to a rate of 78% observed on the water.

Compliance

Concerns about compliance with selective regulations existed pre-season because 1999 was the first year for selective ocean fisheries in Areas 2, 3, and 4. Information on compliance was collected through both dockside sampling by the WDFW sampling program and enforcement activities conducted by WDFW Enforcement staff.

Compliance with the selective fishery regulation in the ocean area fishery was high for both private and charter vessels. In Area 2, 37% of the total estimated number of coho landed were sampled dockside by the ocean sampling program. In Area 3, 74% of the total estimated coho landed were sampled, and in Area 4, 34% were sampled dockside. Dockside sampling showed compliance rates for the season of 99.2%, 98.4%, and 96.4% for Area 2, Area 3, and Area 4 respectively (Table 5).
Boat patrols, dockside enforcement, and investigative work conducted by WDFW Enforcement found nearly identical selective fishery compliance rates. In Area 2, the compliance rate was estimated at 99.5%; a 98.1% compliance rate was estimated in Area 3, and a compliance rate of 95.4% was estimated for Area 4 (Attachment 1).

Drop Off Rates

On-water observers in all areas recorded information on fish which were hooked but lost before being brought to the boat, commonly referred to as drop offs. For this study, the definition of drop off was that the fish was actually hooked but became free before it could be landed. This definition calls for some judgement on the part of the observers or anglers recording the data, resulting in potential bias.

Current Council methodology for estimating mortality due to drop off uses a rate of 5% of the total number of fish handled (retention plus release). Mortality rates for the season estimated from on-water observation data ranged from 1% in Areas 3 and 4 to 3% in Area 2. Estimates of drop off mortality rates from on-water observation data collected during the ocean selective fisheries are compared with FRAM projections in Table 6.

Estimated Mortality

Table 7 shows the FRAM pre-season projections of total coho mortality. Estimates of actual coho mortality in the ocean selective fisheries are shown in Table 8. This analysis uses estimates of coho mark rates from on-water sampling to estimate total coho release. Estimates of incidental mortality are calculated using rates adopted by the Council for recreational fisheries (5% drop off mortality and 8% hooking mortality).

Incidental coho mortality in Area 2 is estimated at 1,704 which, when combined with a total coho retention of 12,595, puts the estimate of total coho mortality in the Area 2 selective fishery at 14,299. This compares to a pre-season projected total mortality of 47,936 coho. Had the fishery taken its full quota, the total coho mortality would have been nearly identical to what was modeled pre-season.

In Area 3, incidental mortality is estimated at 602 which, when combined with a total coho retention of 2,577, puts the estimate of total coho mortality in the ocean selective fishery at 3,179. This compares to a pre-season projected total mortality of 3,018 coho.

Incidental coho mortality in Area 4 is estimated at 2,211 which, when combined with a total coho retention of 5,370, puts the estimate of total coho mortality in the ocean selective fishery at 7,581. This compares to a pre-season projected total mortality of 22,127 coho. Had the fishery taken its full quota, the total coho mortality would have been significantly higher than what was modeled pre-season because a much higher percent of the handled fish would have been unmarked since the observed mark rate was lower than projected pre-season.

Conclusion

The coho mark rate in Area 2 was nearly identical to pre-season projections. The ratio of marked coho decreased compared to pre-season projections moving north where the influence of Puget Sound stocks is higher.

The release data collected through dockside interviews matched what was observed during on-

water observations. Angler recollection did not appear to decrease with an increasing number of released fish.

The selective fishing compliance rate ranged from 95% to over 99% on the coast. Enforcement activities suggested identical compliance rates to what was observed by samplers on the dock. The pre-season model projected a rate of 5% retention of all unmarked handled coho; in-season data showed a retention rate of 1% of handled unmarked coho in all three areas.

Acknowledgments

The Ocean Sampling Program staff would like to thank all of the samplers and observers whose data collection made these analyses possible, and Sargent Mike Cenci and the officers of the Ocean Enforcement Division who supplied their compliance information. Additionally, a special thanks to Mark Cedergreen and Butch Smith as well as the Westport Charter Boat Association and the Ilwaco Charter Boat Association and the charter boat operators who voluntarily gave us access to ride along with the fleet as they fished.

TABLE 1: Salmon catch and effort by area and month in the 1999 ocean recreational fisheries.

MONTH	Area 2			Area 3			Area 4		
	Angler trips	Coho	Chinook	Angler trips	Coho	Chinook	Angler trips	Coho	Chinook
July	5,329	4,060	2,271	1,022	661	396	2,524	1,456	0
August	9,427	7,264	3,103	1,230	1,318	488	3,950	2,963	0
Sept	4,319	1,271	1,211	669	598	100	1,628	951	0
TOTAL	**19,075**	**12,595**	**6,585**	**2,921**	**2,577**	**984**	**8,102**	**5,370**	**0**

TABLE 2: 1999 mark rate of legal-sized coho encountered during on-board observation (Areas 2 and 4) and from angler trip reports (Area 3) in the ocean recreational fisheries.

		Total Encountered	Marked Encountered	Unmarked Encountered	Unknown Encountered	Coho Mark Rate
AREA 2	July	213	132	81	0	62.0%
	August	534	318	216	0	59.6%
	Sept	68	37	31	0	54.4%
	Total	**815**	**487**	**328**	**0**	**59.8%**
AREA 3	July	173	67	106	0	38.7%
	August	55	24	31	0	43.6%
	Sept	22	8	14	0	36.4%
	Total	**250**	**99**	**151**	**0**	**39.6%**
AREA 4	July	145	42	101	2	29.0%
	August	208	49	158	1	23.6%
	Sept	42	12	30	0	28.6%
	Total	**395**	**103**	**289**	**3**	**26.1%**

TABLE 3: 1999 mark rate of legal-sized coho encountered during on-board observation (Area 2 and 4) and from angler trip reports (Area 3) in the ocean recreational fisheries compared with the FRAM preseason projected mark rates.

		Total Legal Sized Coho Encountered	Observed Coho Mark Rate	Projected Coho Mark Rate
AREA 2	July	213	62.0%	63.9%
	August	534	59.6%	60.1%
	Sept	68	54.4%	60.1%
	Total	**815**	**59.8%**	**60.5%**
AREA 3	July	173	38.7%	60.5%
	August	55	43.6%	50.2%
	Sept	22	36.4%	50.2%
	Total	**250**	**39.6%**	**53.8%**
AREA 4	July	145	29.0%	43.1%
	August	208	23.6%	42.9%
	Sept	42	28.6%	42.9%
	Total	**395**	**26.1%**	**43.0%**

TABLE 4: Comparison of coho release rates observed on-water and reported through dockside interviews in the 1999 ocean recreational fisheries.

		ON-WATER OBSERVATIONS			DOCKSIDE REPORTS		
		Coho Retained	Coho Released	Release Rate	Coho Retained	Coho Released	Release Rate
AREA 2	July	127	104	45.0%	1,119	992	47.0%
	August	318	269	45.8%	3,086	2,470	44.5%
	Sept	38	43	53.1%	459	526	53.4%
	Total	**483**	**416**	**46.3%**	**4,664**	**3,988**	**46.1%**
AREA 3	July	64	109	63.0%	365	834	69.6%
	August	17	38	69.1%	1,179	2,406	67.1%
	Sept	7	15	68.2%	372	797	68.2%
	Total	**88**	**162**	**64.8%**	**1,916**	**4,037**	**67.8%**
AREA 4	July	43	103	70.5%	527	1,769	77.0%
	August	34	188	84.7%	962	3,774	79.7%
	Sept	10	49	83.1%	330	1,723	83.9%
	Total	**87**	**308**	**78.0%**	**395**	**7,266**	**94.8%**

TABLE 5: Compliance with selective fishery regulations observed through dockside port sampling.

		Total Coho Landed	Marked Coho Landed	Unmarked Coho Landed	% Landed Coho Marked
AREA 2	July	4,060	4,032	28	99.3%
	August	7,264	7,233	31	99.6%
	Sept	1,271	1,229	42	96.7%
	Total	**12,595**	**12,494**	**101**	**99.2%**
AREA 3	July	661	649	12	98.2%
	August	1,318	1,292	26	98.0%
	Sept	598	594	4	99.3%
	Total	**2,577**	**2,535**	**42**	**98.4%**
AREA 4	July	1,456	1,396	60	95.9%
	August	2,963	2,869	94	96.8%
	Sept	951	911	40	95.8%
	Total	**5,370**	**5,176**	**194**	**96.4%**

TABLE 6: Estimated drop off mortality in the 1999 ocean recreational fisheries using on-water observation data.

		Total Salmon Handled	Observed Drop Offs	Estimated Observed Drop Off Mortality a/	FRAM total Drop Off Mortality b/	Observed Drop Off Mortality Rate c/
AREA 2	July	363	185	15	18	4.1%
	August	810	273	22	41	2.7%
	Sept	141	45	4	7	2.6%
	Total	**1,314**	**503**	**40**	**66**	**3.1%**
AREA 3	July	219	42	3	11	1.5%
	August	68	6	0	3	0.7%
	Sept	26	0	0	1	0.0%
	Total	**313**	**48**	**4**	**16**	**1.2%**
AREA 4	July	183	39	3	9	1.7%
	August	245	19	2	12	0.6%
	Sept	62	14	1	3	1.8%
	Total	**490**	**72**	**6**	**25**	**1.2%**

a/ Assumes 8% hooking mortality rate on observed drop offs.
b/ Total drop off mortality calculated using FRAM methodology (5% of handled fish).
c/ Estimated drop off mortality/Total salmon handled; 5% used by FRAM pre-season.

TABLE 7: Preseason FRAM (model run 9931) projected coho mortality in the 1999 ocean recreational fisheries.

		Total Retention	Marked Retention	Unmarked Retention	Unmarked Released	Total Handled a/	Predicted Mark Rate	Drop Off Mortality b/	Release Mortality c/	Incidental Mortality d/	Total Mortality e/
AREA 2	July	5,000	4,854	146	2,776	8,086	63.9%	404	222	626	5,626
	August/Sept f/	37,200	35,931	1,269	24,115	63,608	60.1%	3,180	1,929	5,110	42,310
	Total	**42,200**	**40,785**	**1,415**	**26,891**	**71,694**	**60.5%**	**3,585**	**2,151**	**5,736**	**47,936**
AREA 3	July	1,000	967	33	637	1,698	60.5%	85	51	136	1,136
	August/Sept	1,600	1,520	80	1,521	3,218	50.2%	161	122	283	1,883
	Total	**2,600**	**2,487**	**113**	**2,158**	**4,916**	**53.8%**	**246**	**173**	**418**	**3,018**
AREA 4	July	7,000	6,541	459	8,717	16,135	43.1%	807	697	1,504	8,504
	August/Sept	11,200	10,459	741	14,074	25,942	42.9%	1,297	1,126	2,423	13,623
	Total	**18,200**	**17,000**	**1,200**	**22,791**	**42,077**	**43.0%**	**2,104**	**1,823**	**3,927**	**22,127**

a/ Marked handled + Unmarked handled.
b/ 5% of total handled.
c/ 8% of unmarked released.
d/ Drop off + Release mortality.
e/ Total retention + Incidental mortality.
f/ August and September are modeled as one unit.

TABLE 8: Estimated actual coho mortality in the 1999 ocean recreational fisheries.

		Total Retention	Marked Retention	Unmarked Retention	Unmarked Released	Total Handled a/	Observed Mark Rate	Drop Off Mortality b/	Release Mortality c/	Incidental Mortality d/	Total Mortality e/
AREA 2	July	4,060	4,032	28	2,446	6,506	62.0%	325	196	521	4,581
	August/Sept	8,535	8,462	73	5,815	14,350	59.0%	717	465	1,183	9,718
	Total	**12,595**	**12,494**	**101**	**8,261**	**20,856**	**59.8%**	**1,043**	**661**	**1,704**	**14,299**
AREA 3	July	661	649	12	1,015	1,676	38.7%	84	81	165	826
	August/Sept	1,916	1,886	30	2,622	4,538	41.6%	227	210	437	2,353
	Total	**2,577**	**2,535**	**42**	**3,637**	**6,214**	**39.6%**	**311**	**291**	**602**	**3,179**
AREA 4	July	1,456	1,396	60	3,364	4,820	29.0%	241	269	510	1,966
	August/Sept	3,914	3,780	134	11,578	15,492	24.4%	775	926	1,701	5,615
	Total	**5,370**	**5,176**	**194**	**14,941**	**20,311**	**26.1%**	**1,016**	**1,195**	**2,211**	**7,581**

a/ Marked retention/Observed mark rate.
b/ 5% of total handled.
c/ 8% of unmarked released.
d/ Drop off + Release mortality.
e/ Total retention + Incidental mortality.

Yurok Testimony to the PFMC, March 7, 2000

Escapement Shortfall

The Yurok Tribe is concerned that the Klamath fall chinook natural spawning escapement was only 18,600 last year, which is substantially less than the 35,000 minimum spawning escapement floor. We recognize that this poor escapement was not a result of any fishery harvesting more than its preseason target, but was the fault of the predictor, which overestimated stock abundance and the proportion of natural fish.

In light of the substantial shortfall in escapement last year, we considered recommending a conservation buffer for the coming year. However, analysis by the Klamath River Technical Advisory Team indicates that a fairly substantial buffer results in minimal added assurance that the floor will be met. Once again, this is because of the inaccuracy of the stock abundance predictor.

Additionally, analysis conducted by the KRTAT last year indicates that the inaccuracy of the predictor is the primary factor that reduces harvest and spawning escapement over the long-term. Given all of these ramifications from a poor predictor, we hope that substantial effort will be put toward improving the performance of the Klamath fall chinook predictor in the near future. We realize that this is not a simple task, and that it will take a substantial commitment, however we feel that the potential benefits to the stock and the people that depend upon the stock will make it worthy of such an effort.

Inriver Sport Fishery

As some of you may recall, there were substantial discussions last year regarding the fact that the inriver sport fishery routinely exceeded its allocation and that portions of the river were not monitored in this fishery. We would like to acknowledge that substantial efforts were made by the California Department of Fish and Game to monitor the entire river last year, which resulted in the allocation not being exceeded. We encourage the Department to continue this thorough monitoring and real-time management of the inriver sport fishery.

ESTIMATION PROCEDURES AND METHODOLOGIES

Situation: Under Council Operating Procedure 15, the Scientific and Statistical Committee (SSC) and Salmon Technical Team (STT) share responsibilities for reviewing estimation methods used in the preseason salmon management process. The formal review by the SSC generally ends in November prior to the current preseason process. The role of the STT is to report to the Council at the March meeting on the status of all current estimation procedures and models used to analyze the management options and identify any problems or potential changes to model inputs or parameters that could occur in April.

At the November 1999 Council meeting, two issues were identified by the SSC and Council as needing additional resolution for the 2000 salmon fishing season:

1. Incorporation of changes to the Chinook Fishery Regulation Assessment Model (FRAM) to allow modeling of the effect of selective fisheries and possibly other potentially minor modifications.

2. The determination of an appropriate nonretention mortality rate to use in year 2000 recreational salmon fisheries.

Technical personnel involved with the Chinook FRAM will brief the SSC on the status of model changes for the 2000 season prior to the beginning of the Council meeting.

At its November Council meeting, the STT provided the Council with a preliminary report on nonretention mortality in the recreational salmon fishery. At the March Council meeting, the STT will submit its final recommendations for the year 2000 fisheries for SSC review and Council approval. The SSC will submit its review of the technical changes at the Council meeting (Supplemental SSC Report B.2.).

Council Action: As appropriate, approve changes in technical procedures, including the nonretention mortality rates for year 2000 recreational ocean salmon fisheries.

Reference Materials:

1. STT recommendations for hooking mortality rates in 2000 recreational ocean chinook and coho fisheries (STT Report B.2.).

PFMC
02/22/00

STT RECOMMENDATIONS FOR HOOKING MORTALITY RATES IN 2000 RECREATIONAL OCEAN CHINOOK AND COHO FISHERIES.

Summary

The Salmon Technical Team (STT) reviewed recent and past information regarding studies of hook and release mortality for sport caught chinook and coho salmon. Literature reviews, recent studies where only personal communications were available, administrative reports, and council documents were evaluated to determine whether there is sufficient new information to warrant a change in the recreational fishery hooking mortality rates currently employed by the Pacific Fishery Management Council.

The STT recommendations are:

1) Apply a single, interim hook-and-release mortality rate (HRM) of 14% (compared to the current rate of 8%) to chinook and coho salmon of all sizes released from recreational ocean fisheries using trolling, mooching, and motor mooching methods, except for California-style mooching.

2) Continue to apply a weighted average of recreational troll and California-style mooching mortality rates to California recreational ocean salmon fisheries where California-style mooching is used, with California-style mooching HRM based on California Department of Fish and Game (CDFG) recommendations and weights based on the prevalence of fishing techniques in California recreational fisheries. For 2000 fisheries this procedure yields a rate of ~~24~~ 23.2% South of Pt. Arena

3) Continue to apply an additional dropoff mortality rate of 5% to all fish caught by ocean salmon hook-and-line fisheries to account for dropoff mortality, predation loss, noncompliance, etc.

4) Support further research on estimating HRM, estimating encounter rates, and developing fleet profiles of fishing gear/methods and hook wound location, and gear-species-specific hook wound location mortality rates.

Introduction

Non-landed fishing mortality is becoming a more significant concern because of Endangered Species Act listings and the increasing proportion of ocean catch that is not retained as a result of non-retention fisheries and mass marked selective fisheries targeted at hatchery fish. Within the last few years, results of several studies of non-landed mortality have become available for hook and line fisheries from Central California to Northern British Columbia. The results of these newer studies have often been inconsistent with earlier ones, which has increased uncertainty regarding non-landed fishing mortality. Several recent studies have examined the research methods and conclusions of these studies. We do not attempt another in-depth analysis here, but rather summarize these studies and the recommendations of recent reviews in Appendix A.

There are several types of non-landed mortality rates involved with hook-and-line fisheries:

- *Immediate release mortality* rate is the proportion of fish released that die within 24 hours;
- *Short-term release mortality* rate is the proportion of fish released that die after 24 hours of release but within a few days (e.g., 4 days);
- *Delayed mortality* rate is the proportion of the fish released that die after the short-term;
- *Drop-off mortality* rate is the proportion of fish encountered by the gear that is killed without being brought to the vessel intact (e.g., lost to pinniped predation);
- Other mortality losses represent the proportion of handled fish which is killed before release (e.g., non-compliance).

The STT focused this review of available information on HRM, which includes immediate, short-term, and delayed mortality.

Background

In 1986, the STT adopted hooking mortality rates based on a Delphi consensus of a panel of experts after reviewing the available literature on HRM studies (Stohr and Fraidenburg 1986). At that time, a HRM of 30% was being applied to all hook and line fisheries in the US and Canada with an additional 5% mortality rate added to account for dropoffs (Stohr and Fraidenburg 1986). The HRM rates recommended and adopted were 30% for both chinook and coho in recreational and troll fisheries, adjusted to 26% for barbless hooks. This decision resulted in a single HRM rate of 26% applied to all Council hook and line fisheries. The STT adopted these recommendations, but applied an additional 5% mortality to account for drop-off and incidental mortality. Thus a total 31% mortality rate was applied to all salmon released from hook-and-line fisheries conducted in ocean waters, and a 5% dropoff and incidental mortality rate was applied to all landed catch.

By 1993, several additional studies on HRM had been conducted and the Washington Department of Fisheries (WDF), Puget Sound Treaty Tribes, and the Northwest Indian Fisheries Commission (1993) undertook a review of hooking mortality. They reviewed recent and previous studies and made recommendations that separate rates be applied to legal and sublegal chinook and coho salmon in recreational fisheries. The HRM rates recommended by WDF et al. (1993) for recreational fisheries using single point barbless hooks were:

Coho		Chinook	
Legal	Sublegal	Legal	Sublegal
7%	15%	10%	20%

WDF et al. (1993) made no recommendations for changes in rates applied to commercial fisheries, but recommended further research to investigate differences between HRMs rates in freshwater, estuarine, and marine fisheries, effects of terminal gear, size differences, species differences, and interactions among these factors.

In 1994, the STT reviewed recent HRM studies and the recommendations of WDF et al. (1993). The STT considered using weighted averages of rates estimated in published studies, which resulted in estimates of 6% HRM for coho salmon in recreational fisheries, and 10% HRM for chinook salmon in recreational fisheries. However, the STT concluded that there was insufficient information to justify using separate rates for chinook and coho in recreational fisheries, and recommended using an average rate of 8% for both species. The STT also recommended that rates of 24% for chinook and 35% for coho should be used for HRM in commercial fisheries using barbless hooks. They further recommended that all fisheries should have an additional 5% mortality added to account for dropoff mortality and 2% to account for other sources of mortality (e.g., predation, long-term mortality, non-compliance, etc.) applied to all contacted fish. Thus the total mortality rates recommended by the STT were:

Recreational Fisheries	Commercial Fisheries	
Both Species	Coho	Chinook
15%	42%	31%

The STT (1994) recommended further research into differences between barbed and barbless hooks, encounter rates and the efficacy of targeting individual species in single species fisheries, size distributions of fish encountered, and multiple encounters, and also recommended that HRM studies be conducted south of Cape Falcon for comparison with results from studies conducted in more northern waters.

The Council subsequently reduced the recreational HRM rates used in assessment modeling to 8%, and left commercial HRM rates at 26% for both chinook and coho salmon. An additional 5% mortality was

applied to all retained and released fish in commercial troll and recreational fisheries to account for dropoff mortality.

In the early 1990s, CDFG began to investigate the hooking mortality associated with California-style mooching, in which whole bait is drifted head down. There was concern that this fishing method resulted in a higher incidence of hook wounds in deep, more lethal locations. Initial studies surveyed hook wound locations and applied mortality rates from Wertheimer's (1988) study of commercial troll hooking mortality rates (CDFG 1995a, 1995b). These studies indicated that hooking mortality associated with California style mooching was substantially higher than the mortality associated with trolling bait or lures. Further studies conducted by CDFG in which fish were held in onboard tanks confirmed the higher mortality associated with mooching, and suggested that the deeper hook wound locations also resulted in a higher proportion of delayed mortality because fish took longer to die from wounds to the gullet than from wounds to the gills or heart (Grover 1996, Grover and Palmer-Zwahlen in prep). In 1997 CDFG proposed that higher HRM rates be applied to California recreational fisheries based on a weighted average of mortality rates associated with mooching and trolling, with weights derived from data collected from fishery observations and profiles of the two fishing methods in California recreational fisheries (CDFG 1997a, 1997b). Since 1998, the PFMC has used the rates recommended by CDFG for California recreational fisheries.

Methods

At the November 1999 Council meeting, the STT reviewed the available information on HRM and considered various ways to estimate HRM in light of these research results. The efforts of the STT were limited to consideration of available information on HRM in recreational ocean fisheries. Based on its own deliberations, and discussions with the Scientific and Statistical Committee, the following methods were employed:

1) Estimate immediate HRM rates for each species as the median value of available estimates. Each study/gear/method treatment in recent recreational fishery confinement studies was considered as an independent estimate.[1] Because most confinement studies reported problems with holding fish for extended periods of time, and these holding problems were believed to contribute to additional mortality beyond that associated with hooking and release, only estimates of immediate mortality (occurring within 24 hr of capture) were used to estimate median HRM rates.

2) Expand estimates of immediate HRM for short-term HRM. Estimates of immediate mortality were expanded by the ratio of short-term mortality (within 96 hr) to immediate mortality reported in studies in which no problems were reported with holding conditions (NRC data collected in Neah Bay in September, 1992, and Puget Sound in 1992 and 1993):

Species	Sample size	24hr mortalities	96hr mortalities	96hr/24hr
chinook	330	32	38	1.19
Coho	538	25	33	1.32
combined	868	57	71	1.25

Because of the small number of studies and relatively small differences between the estimated expansions for both species, the data were combined to produce a single expansion factor of 1.25.

3) Expand short-term HRM estimates for delayed mortality beyond 96 hours. Short-term HRM estimates were expanded by a factor of 1.13, based on the recommendations of the Chinook Technical Committee

[1] Estimates based on sample sizes of fewer than 50 fish were excluded from consideration because results are statisitcally unreliable; these studies tended to produce the most extreme HRM estimates. Estimates of HRM from California-style mooching were also excluded because this method is unique to California and has an extremely high hooking mortality rate due to a high incidence of gut hooking; the Council has previously deferred to CDFG for estimates of HRM associated with this technique.

(PSC, 1997) as derived from Wertheimer (1988). This expansion is based on commercial troll studies on chinook only, and was initially derived to account for delayed mortality occurring beyond a 6-day holding period. No recreational fishery based estimates of delayed mortality or of 6-day holding mortality were available.

Results

Evaluation of the estimates included in this analysis finds no clearly identifiable differences in HRM rates between species, size, or terminal gear. Combining the data for both species gives a median immediate HRM of 10%. The STT therefore recommends that a single overall hook-and-release mortality rate of 14% be applied to chinook and coho salmon of all sizes released from recreational ocean fisheries that use trolling, mooching, and motor mooching methods, except for California-style mooching.

Immediate HRM	Adjusted for Short-Term HRM	Adjusted for Long-Term HRM
10.0%	12.5%	14.0%

For California recreational ocean salmon fisheries where California-style mooching is used, the STT recommends that a weighted average of recreational troll and California-style mooching HRM rates continue to be applied. The California-style mooching HRM should be based on CDFG recommendations, and the weights should reflect the profiles of fishing techniques in California recreational fisheries.

CDFG sample data on circle hook location frequencies from charter boats that used mooching techniques during 1998 and 1999 provide a means of estimating the HRM rate for this fishery. Applying location-specific HRM rates estimated during earlier research studies involving the R/V Mako to the hook location relative frequencies resulted in a California-style long-term HRM estimate of 36%. The formula used to estimate HRM for California recreational fisheries is (CDFG, 1997b):

$$HRM = (w_T * HRM_T) + (1-w_T)*HRM_M$$

with

$$w_T = (T_P * T_S) / [(T_P * T_S) + (M_P * M_S)]$$

and

Notation	Quantity	Value
T_P	P(angler days trolling)	0.46
T_S	# shakers per troll angler day	0.51
HRM_T	HRM: troll	0.14
M_P	P(angler days mooching)	0.54
M_S	# shakers per mooch angler day	0.31
HRM_M	HRM: mooch	0.36

The resulting HRM is 32%. The STT recommends that this rate be used as the 2000 estimate of HRM for California recreational fisheries.

The STT recommends that an additional dropoff mortality rate of 5% continue to be applied to all fish

encountered in ocean salmon hook-and-line fisheries to account for dropoff mortality, predation loss, noncompliance, etc.

Discussion

Species Differences - Many studies and previous reviews have noted size- and species-related differences in HRM rates (Cox-Rogers 1998; NRC 1999; WDF et al. 1993). Although individual studies have reported differences in HRM between chinook and coho salmon, the patterns and averages for both species are remarkably similar (Figure 3, Tables 1,2). The average immediate HRM rates for all studies combined (total mortalities/total fish captured) are 10.0% for chinook (Table 1) and 9.6% for coho (Table 2). The median point estimates of immediate HRM rate for samples of at least 50 fish are 9% for chinook and 10.3% for coho. The STT does not believe that these differences are great enough to justify using separate rates for chinook and coho, and recommends combining the immediate HRM data for both species and using the resulting median rate, which is 10%.

Fish Size - The effect of fish size on HRM is a function of the relative size of the gear to the fish, the type of terminal gear, and the fishing method used. The lowest level of HRM occurs when fish are too small to be fully vulnerable to the gear. For coho salmon, it appears that very small fish (<30cm) may have higher HRM than intermediate size fish, but that HRM increases for larger fish. For chinook salmon, there is not as clear a size trend in HRM, though it appears that small fish may suffer higher HRM than larger fish (CTC 1997), and, for California-style mooching, estimates based on hook wound location suggest that legal-size chinook have consistently higher HRM rate than do sublegals (CDFG 1995b). This pattern suggests a similar, though less pronounced, size dependence of HRM for chinook as is apparent for coho. Higher HRM in small fish has been attributed to greater damage caused by hook wounds associated with the greater size of terminal gear in relation to the fish. Because hooks are larger in relation to the size of fish, they cause relatively larger wounds and greater physical damage in small fish. In coho salmon, the increase in HRM in large fish has been attributed to the behavior of fish and the relationship between the size of fish and the size of the bait. Canadian studies conducted in 1999 reported a pronounced increase in HRM with fish size for mooching that was not observed for other trolling (Cox-Rogers personal communication). It has been observed that larger fish tend to ingest hooks more deeply and thus have a tendency to sustain hook wounds in deeper, more critical locations, and that this tendency is more pronounced with more passive bait presentation methods (Cox-Rogers personal communication). While the greater damage to small fish tends to result in rapid death, the deep hook wound locations in the back of the mouth, gullet, and gut tend to result in higher delayed mortality rates.

Year/Study Effects - Part of the difficulty in interpreting the relationship of HRM to fish size stems from the confounding of size with year (and study) effects. Gear, technique, holding times, methods, and estimation methods vary widely among studies. The relationships between HRM estimates and variability in research methods can be evaluated only through controlled experimental design.

Most of the small fish (< 30 cm) for both chinook and coho came from one study carried out in BC in 1985 (Gjernes 1990, Gjernes et al. 1993). These fish suffered higher HRM rates than did larger fish in subsequent studies, but fish this small are very rarely encountered in Council fisheries. Most of the larger fish for both species were caught in 1996, 1997, and 1998 (Cox-Rogers 1998, NRC 1998, NRC 1999, Grover and Palmer Zwahlen 1998, in prep.).

Similar effects confound the interpretation of delayed mortality during holding and effects of different terminal gear and fishing methods. Canadian studies held fish for only 24 hr; the holding studies by NRC off the Oregon coast and by CDFG off the California coast were conducted in 1996 and 1997 when conditions were not conducive to holding fish for extended periods of time. The CDFG study estimated 8% holding mortality of control fish in four days. The only studies that attempted to estimate delayed mortality by holding fish for up to 4 days, and in which holding effects were not identified as an additional source of mortality, were the NRC studies in 1992, and 1993 in Puget Sound and 1992 in Neah Bay. Even within these studies, some data were not reported because of high mortality, although it was attributed to adverse environmental conditions.

The immediate and short-term HRM rates (<24 hr) reported in studies with poor holding conditions and high delayed mortality are probably reasonably accurate. The NRC studies in 1996 and 1997, which reported some of the highest delayed mortality, also reported some of the higher estimates of immediate and short-term mortality. While it is probable that a significant proportion of the delayed mortality is attributable to holding fish in adverse conditions and that fish released would not be subject to the additional stress encountered during the holding period, fish captured in the fishery while these studies were in progress would have been subject to the same environmental conditions while they were being landed, and would probably suffer higher mortality than would fish caught in more benign conditions.

While the interaction of factors confounds attempts to distinguish between sources of variability in observed HRM rates, it appears that variability in rates over time is at least as great as the variability between locations for fisheries using similar gear and methods.

Fishing Gear/ Method Effects – The data presently available lack the resolution to distinguish statistically between different fishing methods, with the exception of California-style mooching. For all other methods, differences between HRM associated with mooching, trolling bait, and trolling lures have been inconsistent and minor compared with the between-year and between-study variability.

The influence of fishing technique on HRM is apparent in results of CDFG research using circle hooks. CDFG research demonstrated that relatively large circle hooks when drift mooched with bait in the head-~~down~~ position eliminated gut hooking of sublegal fish; this gear-method increases gut hook rates as fish size increases (CDFG 1996).

The effect of fish behavior was also demonstrated by the CDFG studies. A statistically significant difference was observed between the contact rate of sublegal fish per angler day for troll and mooch. Mooching gear contacted a significantly smaller portion of sublegals than did the troll gear. This difference may related to the behavior of smaller fish, which are more likely to chase down prey than to eat drifting dead bait. In addition, the angler can influence the gut hook rate (and the HRM) when mooching by feeding line or setting the hook when a strike is noticed.

Hook Location and Fleet Profiles. Available information indicates that there is a strong relationship between hook wound location and HRM rates, and that hook location is a function of gear and fishing technique. The procedure employed by the STT to estimate HRM for California recreational fisheries uses a weighted average the HRM rates associated with mooching and trolling, with weights derived from the relative frequency of angler days of the two fishing methods from the previous year and the number of sublegal encounters per angler day (CDFG 1997b). The STT recommends that similar approaches be used to estimate fishery-specific HRM rates whenever the data permit.

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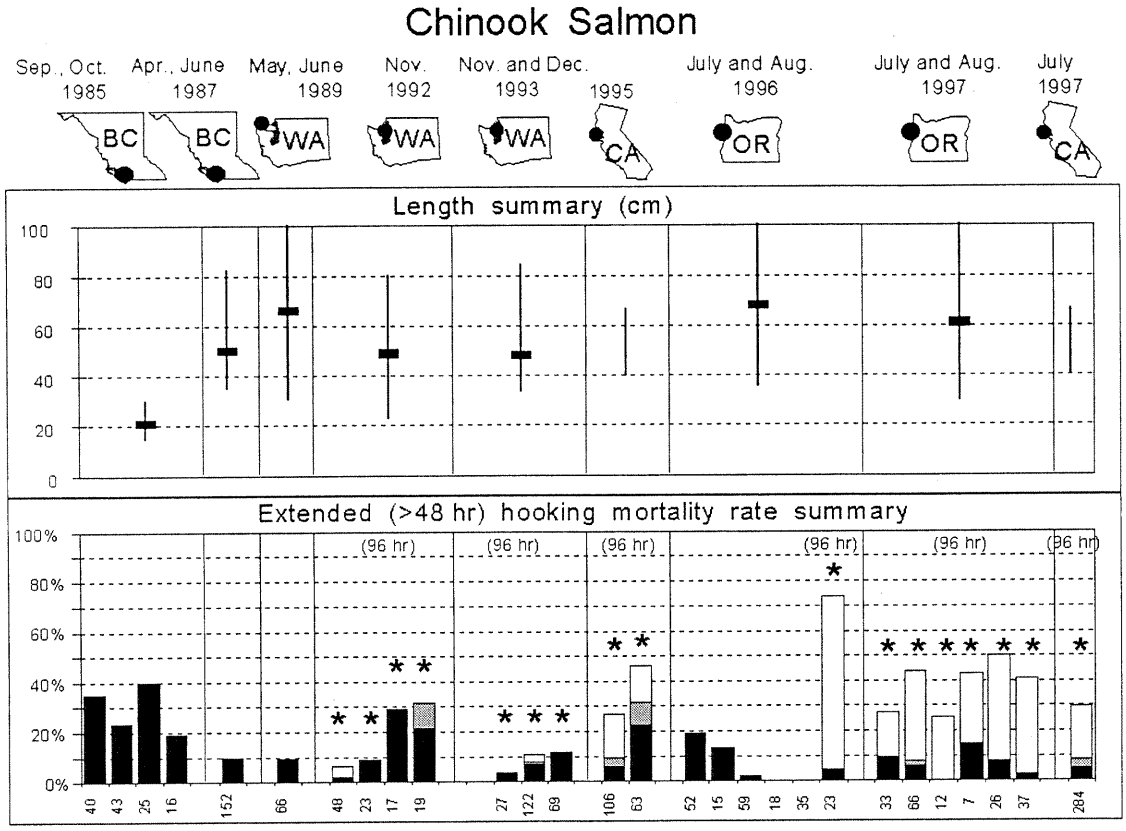


Figure 1. Estimates of short-term hooking mortality of chinook salmon caught on recreational gear from recent studies. The upper panel shows the location and year of the study. The center panel shows the size range and mean size of fish captured. The bottom panel shows mortality for different gear/ method combinations, with immediate mortality (<24hr) as solid bars, intermediate (24-36 hr) as shaded bars, and extended (96 hr) mortality as open bars. Sample sizes are shown below the axis, and samples that held fish for 96 hr are marked with an asterisk. (Figure from Dr. Robert Conrad, personal communication.)

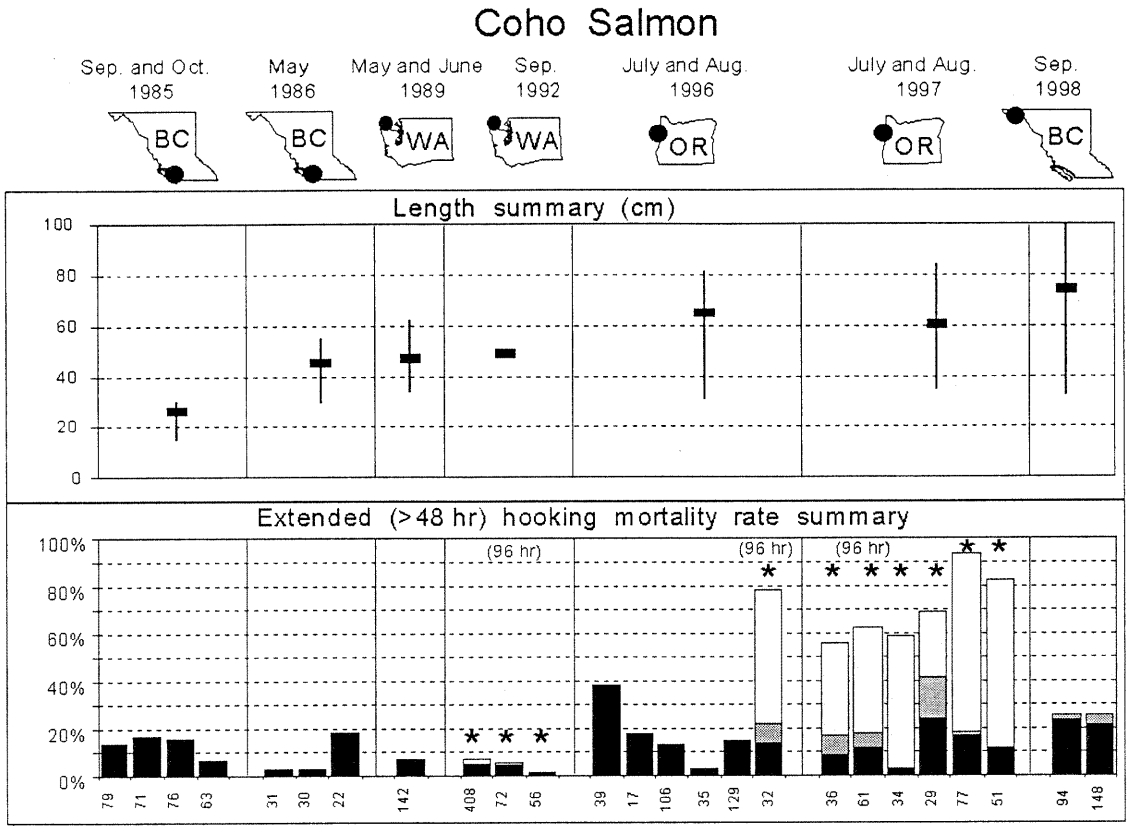


Figure 2. Estimates of short-term hooking mortality of coho salmon caught on recreational gear from recent studies. The upper panel shows the location and year of the study. The center panel shows the size range and mean size of fish captured. The bottom panel shows mortality for different gear/ method combinations, with immediate mortality (<24hr) as solid bars, intermediate (24-36 hr) as shaded bars, and extended (96 hr) mortality as open bars. Sample sizes are shown below the axis, and samples that held fish for 96 hr are marked with an asterisk. (Figure from Dr. Robert Conrad, personal communication.)

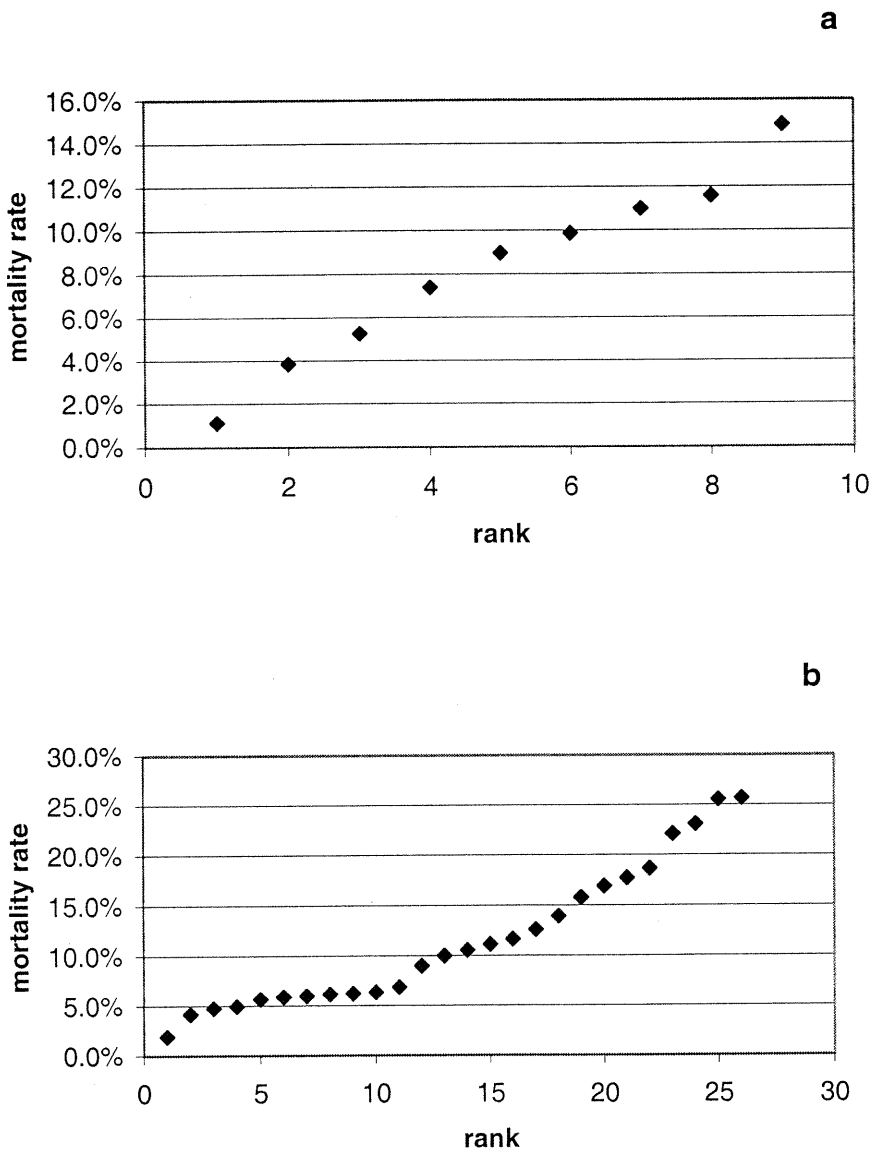


Figure 3. Immediate (<24 hr) hook-and-release mortality rates for (a) chinook and (b) coho salmon from recent confinement studies. Data are all point estimates of HRM for individual gear/method combinations based on samples of at least 50 fish ranked in order of mortality. The median estimate for chinook is 9.0% and the median estimate for coho is 10.25%

Table 1. Estimates of immediate (<24 hr) hook-and-release mortality for chinook salmon based on confinement studies. The average mortality rate for all studies combined (total deaths/total captures), excluding the estimate for California-style mooching, is 10.0%.

Study	location	size	gear	method	hook type	captures	deaths	Immediate mortality	Total mortality
NRC 1996	OR	28-87 cm fl	anchovy/herring	troll	4/0 + 3/0 barbless	19	0	0.0%	0.0%
NRC 1996	OR	28-87 cm fl	flasher + bait	troll	4/0 barbless	47	0	0.0%	0.0%
NRC 1997	OR	32-79 cm fl	anchovy/herring	mooch	3/0 circle	12	0	0.0%	0.0%
NRC 1996	OR	28-87 cm fl	anchovy/herring	troll	4/0 barbless	90	1	1.1%	1.6%
NRC 1992	WA area 10	23-84 cm tl	cut-plug herring	mooch	4/0 + 3/0 barbless	48	1	2.1%	2.9%
NRC 1997	OR	32-79 cm fl	flasher + bait	troll	4/0 + 3/0 barbless	37	1	2.7%	3.8%
NRC 1992	WA area 10	23-84 cm tl	cut-plug herring	troll	4/0 + 3/0 barbless	27	1	3.7%	5.2%
NRC 1996	OR	28-87 cm fl	flasher + bait	troll	4/0 + 3/0 barbless	78	3	3.8%	5.4%
NRC 1997	OR	32-79 cm fl	anchovy/herring	mooch	4/0 + 3/0 barbless	76	4	5.3%	7.4%
NRC 1996	OR	28-87 cm fl	anchovy/herring	mooch	4/0 + 3/0 barbless	37	2	5.4%	7.6%
NRC 1997	OR	32-79 cm fl	anchovy/herring	mooch	4/0 barbless	43	3	7.0%	9.9%
NRC 1992	WA area 10	23-84 cm tl	flasher + lure	troll	4/0 barbless	122	9	7.4%	10.4%
NRC 1997	OR	32-79 cm fl	flasher + bait	troll	6/0 siwash	26	2	7.7%	10.9%
NRC 1992	WA area 10	23-84 cm tl	cut-plug herring	troll	4/0 + 3/0 barbless	23	2	8.7%	12.3%
NRC 1989	WA area 5	31-101 cm fl	cut-plug herring	motor mooch	2/0 + 1/0 barbless	67	6	9.0%	12.6%
Gjernes 1990	s. BC	35-80 cm fl	flasher + lure	troll	4/0+4/0 barbless	152	15	9.9%	13.9%
NRC 1996	OR	28-87 cm fl	anchovy/herring	mooch	4/0 barbless	91	10	11.0%	15.5%
NRC 1992	WA area 10	23-84 cm tl	flasher + lure	troll	5/0 + 5/0 barbless	69	8	11.6%	16.4%
NRC 1997	OR	32-79 cm fl	anchovy/herring	CA mooch	4/0 barbless	7	1	14.3%	20.2%
Gjernes 1990-92	N BC area 1	71-105 cm fl	cut-plug herring	motor mooch	5/0 + 3/0 barbed	101	15	14.9%	21.0%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	4 treble barbless	16	3	18.8%	26.5%
NRC 1992	WA area 10	36-67 cm fl	cut-plug herring	troll	4/0 + 3/0 barbless	16	3	18.8%	26.5%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	1/0 barbless	43	10	23.3%	32.8%
NRC 1992	WA area 10	23-84 cm tl	flasher + lure	troll	4/0 barbless	17	5	29.4%	41.5%
NRC 1992	WA area 10	23-84 cm tl	flasher + lure	troll	5/0 + 5/0 barbless	19	6	31.6%	44.6%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	1/0 barbed	40	14	35.0%	49.4%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	4 treble barbed	25	10	40.0%	56.5%

Table 2. Estimates of immediate (<24 hr) hook-and-release mortality for coho salmon based on confinement studies. The average mortality rate for all studies combined (total deaths/total captures), excluding the estimate for California-style mooching, is 9.6%.

Study	location	Size	gear	method	hook type	captures	deaths	mortality rate	Total mortality
NRC 1996	OR	32-98 cm fl	anchovy/herring	troll	4/0 + 3/0 barbless	52	1	1.9%	2.7%
NRC 1997	OR	28-93 cm fl	anchovy/herring	mooch	3/0 circle	35	1	2.9%	4.0%
Gjernes 90b	s. BC	30-55 cm	lures	troll	1/0 barbed	31	1	3.2%	4.6%
Gjernes 90b	s. BC	30-55 cm	lures	troll	1/0 barbless	30	1	3.3%	4.7%
NRC 1992	WA area 4B	35-75 cm tl	flasher + lure	troll	4/0 + 3/0	72	3	4.2%	5.9%
NRC 1992	WA area 4B	35-75 cm tl	cut-plug herring	troll	4/0 + 3/0	464	22	4.7%	6.7%
Cox-Rogers 1999	N BC area 4	Small	cut-plug herring	motor mooch	4/0 + 5/0 barbless	81	4	4.9%	7.0%
NRC 1996	OR	32-98 cm fl	anchovy/herring	troll	4/0 barbless	247	14	5.7%	8.0%
NRC 1992	WA area 4B	35-75 cm tl	various	troll	4/0 + 3/0	577	34	5.9%	8.3%
Cox-Rogers 1999	N BC area 4	Small	cut-plug herring	troll	4/0 + 5/0 barbless	134	8	6.0%	8.4%
Cox-Rogers 1999	N BC area 3	Small	cut-plug herring	troll	4/0 + 5/0 barbless	65	4	6.2%	8.7%
NRC 1996	OR	32-98 cm fl	flasher + bait	troll	4/0 barbless	306	19	6.2%	8.8%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	4 treble barbless	63	4	6.3%	9.0%
NRC 1989	WA - area 5	34-62 cm fl	cut-plug herring	motor mooch	2/0 + 1/0 barbless	146	10	6.8%	9.7%
Cox-Rogers 1999	N BC area 3	Small	lures	troll	4/0 + 5/0 barbless	78	7	9.0%	12.7%
Cox-Rogers 1999	N BC area 4	Small	lures	troll	4/0 + 5/0 barbless	120	12	10.0%	14.1%
NRC 1997	OR	28-93 cm fl	flasher + bait	troll	4/0 + 3/0 barbless	57	6	10.5%	14.9%
Cox-Rogers 1999	N BC area 3	Small	cut-plug herring	motor mooch	4/0 + 5/0 barbless	54	6	11.1%	15.7%
Gjernes 1990-92	N BC area 1	59-83 cm fl	cut-plug herring	motor mooch	5/0 + 3/0 barbed	103	12	11.7%	16.5%
NRC 1996	OR	32-98 cm fl	flasher + bait	troll	4/0 + 3/0 barbless	143	18	12.6%	17.8%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	1/0 barbed	79	11	13.9%	19.7%
NRC 1996	OR	32-98 cm fl	anchovy/herring	mooch	4/0 + 3/0 barbless	21	3	14.3%	20.2%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	4 treble barbed	76	12	15.8%	22.3%
NRC 1997	OR	28-93 cm fl	anchovy/herring	mooch	4/0 barbless	37	6	16.2%	22.9%
Gjernes 1985	s. BC	<30 cm	flasher + lure	troll	1/0 barbless	71	12	16.9%	23.9%
NRC 1997	OR	28-93 cm fl	flasher + bait	troll	6/0 siwash	79	14	17.7%	25.0%
Gjernes 90b	s. BC	30-55 cm	lures	troll	treble barbed	22	4	18.2%	25.7%
NRC 1997	OR	28-93 cm fl	anchovy/herring	mooch	4/0 + 3/0 barbless	59	11	18.6%	26.3%
Cox-Rogers 1999	N BC area 1	Larger	cut-plug herring	motor mooch	4/0 + 5/0 barbless	95	21	22.1%	31.2%
NRC 1996	OR	32-98 cm fl	anchovy/herring	mooch	4/0 barbless	65	15	23.1%	32.6%
Cox-Rogers 1999	N BC area 3	46-85 cm	cut-plug herring	motor mooch	4/0 barbless	94	24	25.5%	36.1%
Cox-Rogers 1999	N BC area 3	46-95 cm	cut-plug herring	motor mooch	4/0 + 4/0 barbless	148	38	25.7%	36.3%
NRC 1997	OR	28-93 cm fl	anchovy/herring	CA mooch	4/0 barbless	29	12	41.4%	58.4%

Appendix A
Summary of Recent Studies and Analyses of Hooking and Release Mortality Rates

Recent Studies

NRC Studies

Natural Resources Consultants have carried out a number of HRM studies in recent years both in Puget Sound and on the coast of Oregon.

1989 - Chinook and coho were caught with mooching gear by recreational anglers fishing out of Sekiu on the Strait of Juan de Fuca. A total of 213 fish were captured and held in net pens. Most fish were held for 48 hr., with a few held longer and some held for 14 to 27 hr. Some data were collected in September, but discarded because of higher mortality attributed to a lethal plankton bloom. HRM was estimated at 6.85% for coho and 8.96% for chinook. Most mortalities occurred in the first 12 hr (NRC 1991).

1992 - Coho were sampled from a charterboat fishing out of Neah Bay in August and September. Terminal tackle included cut plug herring, flashers with flies, and surface trolled flies. The August portion of the study was curtailed due to high holding mortalities; the study was resumed in September. Only results from data collected in September were originally reported (NRC 1994), though August data were subsequently reported in a review conducted for the Pacific States Marine Fisheries Commission (NRC 1999). Immediate (<24 hr) HRM was estimated to be 4.3%, with a short-term (4-day) HRM rate of 6.2% (NRC 1994).

1992 - Juvenile chinook (blackmouth) were sampled with chartered sport fishing boats in the fall/winter fishery in Puget Sound. Fish were held at the Edmonds fishing pier. The study was repeated in 1993 with fish held at NMFS Manchester field station. Terminal gears used flasher and hoochie, flasher and spoon, or drift mooched plug cut herring on a tandem mooching rig. Immediate HRM was estimated to be 8.8%, with a short-term HRM of 11.5% (NRC 1999) [previously reported as 10.2% (NRC 1994), and 9.2% (NRC 1998)].

1996 - Chinook and coho were caught with sport fishing gear from a charterboat, held in onboard holding tanks, and transferred to (raceways at the Newport Ore-Aqua facility) broodstock tubes in Yaquina Harbor. A variety of trolling and mooching terminal gear and methods were evaluated. High holding mortality rates (92% for chinook and 88% for coho) led to discontinuation of the holding portion of the experiment and subsequently mortality was observed only during the onboard holding period. Short-term HRM was estimated at 6.1% for chinook and 15.3% for coho (NRC 1999) [previously reported as 4% for chinook and 8% for coho (NRC 1998)].

1997 - The 1996 study was repeated with charterboats fishing out of Newport and Coos Bay. A variety of trolling and mooching methods was used. Fish were placed in broodstock tubes in the onboard holding tanks and then tethered in Yaquina Bay or offshore near Yaquina and Coos Bays. The broodstock tubes were checked at the time of transfer to long-term holding to estimate immediate HRM, and at the end of 4 days to estimate delayed mortality. Short-term HRM was estimated at 6.1% for chinook and 12.9% for coho (NRC 1999) [previously reported as 8% for chinook and 16% for coho (NRC 1998)].

CDFG Studies

1992 - A study was initiated to estimate the prevalence of mooching and trolling in California fisheries and to determine whether or not the two methods had different hooking mortality rates. Recreational anglers in the San Francisco and Monterey port areas were interviewed and asked about the methods and gear used and the numbers of fish released.

1993 - Angler interviews were repeated and the mortality rates of trolling and California -style mooching in California recreational fisheries were compared. Recreational fishing on charterboats was monitored by observers. Fishing method, dropoffs, depth, and location were recorded. Species and hook wound location was recorded for released fish. Species, length, hook wound location, and bleeding severity were recorded for retained fish. An attempt was made to obtain comparable sample sizes for trolling and mooching. HRM was estimated by applying the mortality rates for hook wound location estimated by Wertheimer (1989) to the observed distributions of wound location by fishing method. Estimated mortality for trolling was 12.3% for legal size fish and 12.8% for sublegal fish. Estimated mortality for mooching was 60.9% for legal size fish and 46.9% for sublegal fish (CDFG 1995a).

1994, 95 - Methods used in 1993 were repeated in 1994 and 1995 with similar results (CDFG 1995b).

1995 - Chinook were caught from a research vessel using California-style mooching with 2/0 barbless hooks. Fish were held in an onboard holding tank for 24 to 34 hr. Observed HRM was 37%, with 62% of the fish hooked in the gullet. Researchers postulated that most gullet-hooked fish would subsequently die (Grover 1995).

1996 - Chinook were caught using California-style mooching with barbless circle hooks, J hooks, and J hooks with blockers. Various bait orientations were used. Fish were held in the onboard holding tank for 4 days with the tanks checked for mortalities at least twice daily. Observed mortality rates were 59.8% for J hooks (with and without blockers), and 33.3% for circle hooks, with the majority of mortality occurring between 48 and 96 hr (Palmer-Zwahlen and Grover 1997).

1997 - Chinook were caught using California-style mooching with 3/0, 4/0, and 5/0 barbless circle hooks. Fish were held up to 96 hr in an onboard holding tank and checked at 12 hr intervals. Mortality at 96 hr. was 31% with the majority of mortality occurring between 48 and 96 hr (Grover and Palmer-Zwahlen 1997).

DFO Studies

1992-93 - Cut-plug herring were motor mooched at Langara Island in British Columbia for chinook and coho (Terry Gjernes personal communication cited in Cox-Rogers 1998). Details of the study (sample sizes, hook arrangement, holding facilities, holding times, etc.) are not given, but HRM rates of 15% for chinook and 10% for coho are reported.

1998 - Professional guides were contracted to compare single and double hook rigs with motor mooching in northern BC (Cox-Rogers 1998). Coho were the species targeted and fish were held for up to 24 hours. The fish encountered in this study were notably larger than coho typically encountered in Council fisheries, and the researchers commented on the tendency for larger coho to swallow the bait deeper and be hooked in more critical locations. A total of 242 large coho salmon were captured and observed. Hook wounds locations were classified as: Out (fish not hooked at time of landing), Deep Mouth (throat, gill arch, posterior portions of mouth and tongue, etc), Outer Mouth (hooks easily visible and easily removed), and Body/Head (fish hooked outside the mouth). Though differences were noted in hook wound location, there were no differences in estimated mortality rates. HRM rate for both hook arrangements combined was 25.6%.

1999 - Hooking mortality studies were conducted in three areas of northern BC to investigate recreational coho HRM (Steven Cox-Rogers, personal communication):

At Dundas Island (Area 3) recreational fishing vessels were chartered from July 26-30, and fish were caught using motor-mooched cut-plug herring, trolled cut-plug herring, and trolled artificial lures on downriggers. No significant differences were apparent between gears. Fish were small (mean post-orbital to fork length of 59.3 cm) and were held in tanks and net pens for 24 hr. HRM was estimated to be 8.6% from a sample of 197 fish.

At Stevens Island (Area 4) similar methods were employed from August 12-18 with similar results. Fish

were again reported to be small (mean post-orbital length of 60.1 cm) and 24 hr HRM estimated to be 7.2% from a sample of 335 fish.

At Langara Island, lodge guests were sampled from August 23-30. The only fishing method employed was motor-mooched plug-cut herring. Coho were held in tanks for 24 hr, and were reported to be larger than in areas 3 and 4 (mean post-orbital length of 64.3 cm). HRM was reported to be 22.1% from a sample of 95 fish.

Recent Reviews

CTC 1997

The Pacific Salmon Commission's Joint Chinook Technical Committee (CTC) reviewed incidental fishing mortality for chinook salmon in commercial troll, recreational, gillnet, and seine fisheries (PSC 1997). For recreational chinook fisheries, the CTC noted differences in mortality rate dependent on hook type (barbed vs. barbless), fishing technique (troll vs. mooch), and size of the fish. The CTC developed recommendations by adjusting the HRM rates estimated in recent studies to a standard 6 day holding period based on rates observed in NRC 1991, NRC 1994a, and Gjernes et al. 1993, and then further adjusting the 6-day mortality rate estimates for long-term mortality by multiplying the standardized 6-day rates by 1.13 based on Wertheimer (1988).

The CTC attempted to quantify dropoff mortality further in 2 categories: escaped encounters, and predation mortality. Escaped encounters were assumed to be hooked in peripheral locations and died at the rate observed for chinook hooked in the mouth in NRC 1991 and NRC 1994a. Fish removed from the gear by predators were assumed to suffer 100% mortality.

CTC recommendations for HRM rates in PSC recreational fisheries were:

chinook ≥33 cm: 12.3%
chinook <33 cm: 32.2%

Since most PSC recreational fisheries do not encounter many fish <33 cm, the CTC recommended that the rate of 12.3% be applied unless there was evidence that significant numbers of smaller chinook were encountered, in which case, a weighted average of the two rates should be applied. They further recommended that area specific dropoff mortality rates should also be applied to all fish boated (landed catch + released catch). Their recommended drop-off mortality rates were:

Southeast Alaska	3.6%
Puget Sound	14.5%
Oregon	2.7%

PSARC 1999

Cox-Rogers, et al.(1999) reviewed hooking mortality rates in recreational fisheries to develop recommendations for rates to be applied to recreational fisheries in British Columbia. Rates currently applied in BC are 10% for coho and 15% for chinook, and do not account for drop-off, incidental, or long-term mortality.

They did not develop specific recommendations for rates to be applied, but did conclude that:

1) For British Columbia marine recreational fisheries, hooking mortality for coho and chinook is likely dependent on the gear and methods used. Region-wide hooking mortality rates are not appropriate.

2) For British Columbia marine recreational fisheries, assumed hooking mortality rates for coho and chinook assessment/management modeling should take into account gear and method differences.

3) Assessment programs should be developed to quantify gear and method-specific hooking mortality rates for coho and chinook in major British Columbia marine recreational fisheries where information is lacking. Creel surveys should routinely collect information on the fishing methods being used in specific fisheries.

4) Assessment programs should be considered to address the delayed effects of hooking mortality on long-term survival and the ability of released coho and chinook to return and spawn successfully.

NRC 1999

In the fall of 1998,Natural Resources Consultants conducted a review of hooking mortality studies for the Pacific States Marine Fisheries Commission (NRC 1999). This review was conducted on behalf of the Pacific Fishery Management Council, and included both commercial troll and recreational salmon fisheries.

NRC (1999) noted the large variability in experimental methods employed by field studies for handling, calming, and holding fish, as well as variability in environmental conditions, during the studies. They observed that while immediate and short-term HRM rates were highly correlated with hook-wound location, the relationship between hook wound location and mortality becomes obscured for longer holding periods. The researchers attributed this mortality to stress from poor holding conditions.

Additional Analysis of Reported Results

The database for individual fish held in confinement studies (NRC 1999) was obtained from Doug McNair and additional statistical analyses were performed by Dr. Robert Conrad (SSC and Northwest Indian Fisheries Commission). When immediate (<24 hr), one day (24-36 hr), and extended (~96 hr) mortality are viewed by study and year, it is readily apparent that studies conducted in the late 1990s had higher mortality rates than studies conducted in the late 1980s and early 1990s (Figs. 1, 2). Another striking difference is the proportionate increase in long-term mortality relative to immediate mortality. For the NRC studies in Oregon this increase has been attributed to holding conditions, but, for the CDFG (1997) study, the difference has been attributed the tendency for deep hook wounds associated with California-style mooching to take longer to kill fish than more severe wounds in less critical locations.

It is also evident that apparent size dependence of mortality for coho is confounded by year/study effects (Fig.1). Coho less than 30 cm were encountered only in the 1985 DFO study, and coho greater than 60 cm were encountered primarily in 1996 though 1998 in NRC and DFO studies. There is far less difference in the size ranges of chinook between studies, with the single exception of the 1985 DFO study, in which most chinook were under 30 cm (Fig. 1).

SALMON ADVISORY SUBPANEL COMMENTS ON ESTIMATION PROCEDURES AND METHODOLOGIES

The Salmon Advisory Subpanel (SAS) generally supports the Salmon Technical Team (STT) recommendations for nonretention mortality rates to use in the 2000 recreational fisheries. We recognize the rates proposed are interim rates for 2000 only, and that study will continue regarding the value for permanent rates.

In addition, we recommend hooking mortality rates in inside and terminal recreational fisheries be reviewed.

PFMC
03/07/00

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON
ESTIMATION PROCEDURES AND METHODOLOGIES

Modifications to the Coho and Chinook Fishery Regulation Assessment Models

The Scientific and Statistical Committee (SSC) was informed of a slight change in the coho fishery regulation assessment model (FRAM) that accounts for the Thompson River coho stock. These changes affect only the Fraser component of the model and do not affect any other stocks in the model.

At the November 1999 Council meeting, a presentation was given to the SSC on changes proposed for the chinook FRAM model for the 2000 management season. Mr. Larrie LaVoy presented an update on the status of these changes to FRAM. Proposed changes to chinook FRAM to allow it to evaluate mark-selective fishery proposals were not completed. Since there will be no mark-selective fisheries proposed for chinook for the 2000 management season, this will not present any problems. The only other changes to chinook FRAM were the addition of new tag code information for two stocks (White River spring chinook and Fraser late). These additions have virtually no impacts on the estimates of stock composition of Council fisheries.

Recreational Nonretention Hooking Mortality Rates

Dr. Robert Kope of the STT discussed the STT report on recommendations for hooking mortality rates in 2000 recreational ocean salmon fisheries (STT Report B.2.). The SSC had endorsed the methodology used in the report at the November 1999 meeting. The only changes from November were that some previously published estimates of hooking mortality rates were found to be incorrect on examination of the original data. These estimates were corrected for the STT analysis. In addition, estimates from three studies conducted in Canadian marine waters during 1999 were added to the analysis.

The SSC concurs with the recommendations of the STT based on a review of their report:

- Adopt a single hook-and-release mortality rate of 14% for chinook and coho salmon of all sizes released from recreational ocean fisheries using trolling, mooching, and motor mooching methods, except for California-style mooching.

- Continue to apply a weighted average of recreational troll and California-style mooching rates to California recreational ocean salmon fisheries.

- Continue to apply an additional dropoff mortality rate of 5% to all fish caught by ocean salmon hook-and-line fisheries to account for dropoff mortality, predation loss, noncompliance, etc.

- Support further research to estimate hook-and-release mortality rates, encounter rates, and develop fleet profiles of fishing gear/methods and hook wound locations.

In addition, the SSC recommends additional research on methods for expanding estimates of immediate hook-and-release mortality to long-term mortality estimates be conducted.

PFMC
03/07/00

INSEASON MANAGEMENT RECOMMENDATIONS FOR OPENINGS PRIOR TO MAY 1

Situation: The 1999 ocean salmon fishing regulations specify the Council will make inseason recommendations to the National Marine Fisheries Service (NMFS) at the March Council meeting for certain fisheries which may open earlier than May 1, 2000. The fisheries under consideration are the commercial and recreational fisheries off Oregon, south of Cape Falcon, and the commercial test fishery off California south of Pillar Point. Last year, the Council opened fisheries between Cape Falcon and Humbug Mountain on April 1. Three test fisheries were open under limited quotas south of Pillar Point beginning April 14.

With regard to the April test fishery off California, NMFS made the following comments in a letter to the Council last November:

> At the March 2000 meeting, the Council will consider inseason recommendations for a test fishery off California in April south of Pillar Point. While NMFS strongly encourages the collection of data to provide better stock composition data for specific areas and times, the listing of Central Valley spring chinook makes it difficult for NMFS to support the use of commercial quota fisheries off California prior to May to gather samples. Preliminary analysis of the samples taken from the April 1999 test fishery off Half Moon Bay indicate that 31% of the catch consisted of Central Valley spring chinook, mostly of hatchery origin (84% of the spring chinook). Commercial test fisheries occurring prior to May 1 should be conducted through exempted fishing permits so that only the numbers of fish required for a valid sample size are taken in the test fishery.

Council Action: Provide NMFS with recommendations for inseason action to:

1. Set opening dates for any all-salmon-except-coho commercial and recreational fisheries the Council wishes to open prior to May 1 off Oregon.

2. Specify the areas, season, quota, and special regulations (based on the results of the 1999 fishery) for the commercial experimental fishery in April off California south of Pillar Point.

Reference Materials: None.

PFMC
02/22/00

OREGON DEPARTMENT OF FISH AND WILDLIFE PROPOSED APRIL 1 OPENER FOR OREGON TROLL AND RECREATIONAL CHINOOK FISHERIES FROM CAPE FALCON TO HUMBUG MOUNTAIN

Beginning in 1997, chinook directed fisheries from Cape Falcon to Humbug Mountain opened during April. In 1997 and 1998 the opening date was April 15, and in 1999 the opening date was April 1. Chinook catches during these April fisheries were 4,500; 20,000; and 800 in 1997, 1998, and 1999 respectively. Recreational catch and effort during April fisheries has been extremely low with combined 1997 through 1999 landings of less than 50 fish.

The opening date of April 1 is again proposed for 2000 for both the commercial troll and recreational fisheries from Cape Falcon to Humbug Mountain. All gear and bag limits would remain the same as 1999. Additionally, the control zone at the mouth of Tillamook Bay would be subject to closure under state regulations.

PFMC
03/07/00

SALMON ADVISORY SUBPANEL COMMENTS ON INSEASON MANAGEMENT RECOMMENDATIONS FOR OPENINGS PRIOR TO MAY 1

The Salmon Advisory Subpanel troll representative and California salmon industry respectfully withdraw its request for an April test fishery in California. Given the apparent stock distribution and the Endangered Species Act status of some of the fish contacted in that fishery, it is felt it may not be appropriate at this time to continue the fishery as it was designed. We would like to thank the Council, California Department of Fish and Game, and the National Marine Fisheries Service for their support, and we hope at some point in the future we will again have an opportunity to work toward developing alternatives outside of the traditional season structures.

PFMC
03/07/00

The KFMC is passed the following motion on March 7, 2000.

KFMC is considering a conservation buffer or trigger for a 2 fish option in the Klamath Management Zone recreational fishery. Details will be offered later by KFMC action.

INDEPENDENT MULTIDISCIPLINARY SCIENCE TEAM (IMST)

February 15, 2000

Mr. Jim Greer, Director
Oregon Department of Fish and Wildlife
2501 SW First Avenue
Portland, OR 97207

Dear Jim,

I write to you on behalf of the IMST because ODFW represents the State of Oregon in the PFMC, and because the IMST is to provide scientific peer review of state agency programs relative to salmon recovery under the Oregon Plan for Salmon and Watersheds. The IMST is concerned about any salmon management options for the year 2000 that are not consistent with the recovery of wild coho salmon stocks. We see no evidence of rebuilding or recovery of OCN coho salmon stocks. The numbers of OCN recruits have decreased from over 200,000 in the 1970s to lows of about 15,000 in recent years.

We believe that incidental fishery impacts on OCN coho salmon should be minimized in 2000. The principal reason for this recommendation is the current status of these stocks. The number of OCN spawners surveyed in 1997 was the lowest since 1990. These spawners were the parents of the adult recruits of 2000. Thus we expect few recruits will be produced from that brood year, reducing the potential for significant recovery. The flood events of 1997 and 1998 may also decrease the recruits from the 1997 brood year.

During the past three consecutive brood years, OCN (river component) coho salmon (1996, 1997, and 1998) recruits have failed to replace spawners. These are the only brood years that have failed to replace themselves since 1970. Thus OCN stocks demonstrate a serious decline in recent years. Moreover, many local populations of OCN coho are at critically low levels along the Oregon Coast and in the Lower Columbia River (several hundred or less). These low numbers increase the risk of local extirpation.

Other considerations that argue for minimizing impacts to OCN stocks are:

1. Models for predicting abundance of OCN coho are imprecise. OCN coho abundances were overestimated in 1997, 1998 and 1999. Such overestimates are of special concern at current low levels of abundance because of the risk of local extirpation.

2. Estimates of hook-and-release mortality of unmarked coho salmon vary widely, and the assumed mortality rates from ocean fisheries may be underestimated. The impacts of increased mortality rates on OCN stocks, even if low, have uncertain risks with respect to achieving recovery.

State of Oregon

John Buckhouse
Wayne Elmore
Stan Gregory
Kathleen Kavanagh
James Lichatowich
Logan Norris, Chair
William Pearcy

In view of the above considerations, we recommend that ODFW and PFMC maximize spawner escapement and abundance in the adult recruits of 2000. Improved spawner escapement is a prerequisite for a rapid recovery if ocean conditions continue to improve. Where ODFW participates in fishery management decisions, we recommend that the Department minimize impacts to OCN stocks by not recommending a selective fishery in the ocean for coho salmon during the year 2000.

Sincerely yours,

Logan A. Norris, Chair
Independent Multidisciplinary Science Team

LAN:grs

cc: John A. Kitzhaber, Governor
Brady Adams, Senate President
Lynn Snodgrass, Speaker of the House
Joint Legislative Committee on Stream Restoration and Species Recovery
Roy Hemmingway, Manager, Oregon Plan
Roy Elicher, ODFW
Don McIsaac, PFMC
IMST

JOINT TESTIMONY BY THE QUINAULT, HOH, QUILEUTE TRIBES ON THE TENATIVE MODELING OF 2000 MANAGEMENT MEASURES BY THE PACIFIC FISHERY MANAGEMENT COUNCIL

Mr. Chairman and Council, the Quinault, Hoh, and Quileute Tribes wish to make a brief statement regarding the tentative modeling of the ocean treaty troll fishery options.

- Again this year, it is the desire of the Quinault, Hoh, and Quileute Tribes to continue to meet the escapement floors or goals for runs originating in the area from Grays Harbor to Quillayute River. This continues to be an important objective for management of ocean fisheries off the coast of Washington.

- The Queets wild coho are of particular concern this year. The wild stock is coming of one of the lowest escapements and lowest observed smolt yield on record. Even with no preterminal and terminal area fisheries, the resulting escapement will be well below half the escapement floor established for this stock, if Queets supplemental coho are not counted

- We want to continue to emphasize that any selective fishery proposals advanced by the Council must be consistent with the U.S. District Court's stipulation and order regarding mass marking and selective fisheries.

- For chinook, several important contributing stocks continue to be depressed. However, we intend to live up to the commitment that we made in 1988 to not increase our impacts on Columbia River chinook stocks of concern.

- We still remain early in the process of establishing, cooperatively, with other Tribes and the Washington Department of Fish and Wildlife, potential ocean fisheries that will ensure acceptable levels of escapements for natural stocks of concerns as well as for our important hatchery stocks.

- For the ocean treaty troll fishery, we offer the following treaty troll management measures for tentative modeling and analysis by the Salmon Technical Team:

Option 1 -	zero (0) coho 20,000 chinook for May/June chinook only fishery.
Option 2 -	10,000 coho August/September all species fishery 30,000 chinook (20,000 May/June, 10,000 all species)
Option 3 -	12,400 coho August/September all species fishery 30,000 chinook (20,000 May/June, 10,000 all species).

The coho proposals are consistent with previously adopted PFMC measures for 1994, 1997, and 1998. Given the reduced abundance of key natural coho stocks North of Cape Falcon, we cannot support adoption of last year's adopted coho option for consideration as a reasonable option this year.

In light of the reduced abundance of key natural coho stocks we also believe that the Council should adopt a zero (0) coho option for non-treaty fisheries North of Cape Falcon for purposes of analysis, public comment, and consideration.

In fashioning our proposal for treaty troll chinook harvest levels we have focused on impacts on Columbia River stocks. The treaty troll chinook harvest levels proposed may require further adjustment to insure that impacts on Puget Sound chinook stocks are acceptable.

Coho and Chinook Options for the 2000 Washington Treaty Troll Fishery

Makah Tribe
March 7, 2000

The Makah Tribe proposes these options for the Treaty Troll fishery in a year in which some coho stocks are forecast at low abundance levels. Among the stocks about which we are concerned are:

- Queets, whose low forecast abundance follows two low brood cycle returns, and is already below escapement floor, even before fishing begins.

- Skagit, which has a forecast abundance slightly below its escapement goal.

- Strait of Juan de Fuca natural coho also are forecast at an abundance which will make it impossible to achieve its former escapement goal, but it should be possible to manage fisheries to meet its exploitation rate objective under the Comprehensive Coho Management Plan.

- There are several other stocks which are above their escapement goals, but not by a great deal, and which we will be watching carefully.

In addition, the south Puget Sound hatchery coho are forecast at a low abundance. Even though the ocean fisheries are not managed around these hatchery fish, their absence takes away a buffer that has traditionally absorbed a lot of fishery impacts. In short, we have a conservation problem this year, and we want to respond to it.

The State and the Tribes have already held meetings and discussions on management objectives for Puget Sound coho stocks. In spite of the fact that the Quinault Tribe has forecast the Queets abundance at a very low level, we understand that there have not been similar discussions on coastal coho stocks. In the absence of clearly defined management objectives for coastal stocks, we propose these options in hopes that they are sensitive to the needs of the stocks, and can also meet the needs of the co-managers. These options are summarized in the following table. All except for the High Option take fewer coho than would be allowed under the Puget Sound Intertribal Allocation Agreement, but we are willing to take these steps as part of a concerted conservation effort by all of the co-managers.

Table 1.
Proposed Treaty Troll Options

Option	Chinook	Coho	Comments
Low	30,000	0	Chinook catch not to exceed 10,000 after June 30; no coho retention.
Medium	30,000	20,000	20,000 chinook in May-June; 10,000 in August-September.
High	30,000	38,500	20,000 chinook in May-June; 10,000 in August-September.

Low Option

We offer this option of zero coho targeted fishing in the treaty troll fishery in hopes that drastic conservation action on the part of all fisheries that impact Queets coho can help to rebuild this weak brood cycle in the Queets River. This option will also have the effect of limiting impacts on other stocks of concern. We couple this coho option with a front-loaded chinook fishery (30,000 TAC, with a catch not to exceed 10,000 after June 30) and no coho retention during the chinook fishery.

Our data from the Treaty Troll Encounter Rate Study indicate that coho impacts would be minimal under this option. Total coho encounters (all stocks) in May and June will likely be about 220 fish, of which approximately 3 would be Queets coho. After the hooking mortality rate, we would expect a mortality of one Queets coho — which would probably be a hatchery fish. In July, with more coho in the area, we could expect to encounter somewhat over 4,000 coho, of which about 70 might be Queets fish. The non-retention hooking mortality rate would result in an impact of about 20 Queets coho, of which about 4 would be wild. Thus, total wild Queets impacts from this option would be a mortality of about 4 fish. Even if the currently modeled encounter rates are used, the estimated mortality would be only 14 fish.

We emphasize, however, that this approach is not merely non-retention of wild coho. Our experience in 1994 shows that merely eliminating coho fishing in the ocean is not sufficient to rebuild this stock. Every fishery impacting Queets coho should share in the conservation burden for rebuilding. Under this option, we are proposing no coho-targeted fishing in all fisheries that impact Queets wild coho. This includes all ocean troll and sport fisheries and Queets River fisheries. We therefore expect that this option for the treaty troll fishery will be linked to a similar approach in other treaty and non-treaty fisheries. We are willing to forego all coho-targeted fishing *this year* if all other treaty and non-treaty fisheries that impact Queets coho are willing to take the same approach.

Medium Option

If other co-managers whose fisheries impact Queets coho are unwilling to forego coho-targeted fishing this year, we see little positive result in completely zeroing out only the treaty troll fishery. We believe, however, that the Queets coho can still see a substantial rebuilding of escapement -- perhaps a 25 to 30 percent increase over the escapement in the parent brood year -- with a modest coho fishery in the treaty ocean troll fishery, coupled with modest coho fishing in other ocean and river fisheries.

In this option, we propose a 30,000 chinook quota for the treaty troll fishery, with 20,000 to be taken in May and June (with no coho retention). The remaining 10,000 chinook would be taken in August, along with 20,000 coho.

Of the 20,000 coho taken in August, we expect that about 360 would be Queets fish; of those, 67 would be wild fish. The impacts during May and June would be similar to that of the Low Option: about one Queets hatchery coho.

High Option

We offer our High Option to be considered if the co-managers believe that last year's fishing levels represent a sufficiently conservative approach to coho management this year. It is not insensitive to the needs of the weak stocks, however, and we believe that it can still offer a significant improvement in brood cycle escapement for Queets coho.

For chinook, this High Option is identical to the Medium Option: a TAC of 30,000 chinook, 20,000 taken in May and June and 10,000 in August and perhaps September.

The coho TAC under this option is 38,500 fish, which was the quota for the Treaty Troll Fishery in 1999. These coho would be taken in August and September.

Again, this High Option still allows co-managers some flexibility in fishing, with a significant improvement in Queets brood cycle escapement. Impacts on natural Queets coho would be about 130 fish. If we had a management objective of 2,400 natural + supplemental spawners in the Queets system (an increase of about 30 percent over the parent year) this option would leave 970 to be caught by all other fisheries (treaty and non-treaty, river and ocean) while still achieving that escapement objective.

Although we have tried to be sensitive to the needs of the stocks in developing these options, we have been operating at somewhat of a disadvantage. We have repeatedly asked the QTA tribes to discuss their management objectives for this stock, but we have received no real quantitative information. We therefore developed these options around the objective of a significant and substantial increase in escapement of Queets coho above the parent brood year. If other co-managers would present more specific objectives for escapement, we would be pleased to discuss how we might tailor the ocean fisheries to help them meet those objectives. But in the

meantime, we offer these options to you as the only options designed around improving escapement.

TESTIMONY OF
THE COLUMBIA RIVER TREATY TRIBES
BEFORE PACIFIC FISHERIES MANAGEMENT COUNCIL
MARCH 7, 2000
SACRAMENTO, CALIFORNIA

Good afternoon Mr. Chairman and members of the Council. My name is Justin Gould. I am a member of the Nez Perce Fish and Wildlife Commission. I am here today to present comments on behalf of the four Columbia River treaty tribes: the Yakama, Warm Springs, Umatilla and Nez Perce tribes.

The 2000 Spring Creek Hatchery tule chinook forecast of almost 21,000 is less than half of last year's return of 49,000 fish. Tule chinook make up the majority of the catch in ocean fisheries between Cape Falcon and the U.S. - Canada border. The Spring Creek Hatchery tule returns in the mid 1970s were in the 180,000 range, almost nine times this year's forecast. For Columbia River Upriver Bright fall chinook return, the forecast of about 170,000 fish is similar to last year's return.

The imbalance between Spring Creek and Upriver Bright fall chinook, together with constraints on impacts for listed Snake River fall chinook, creates allocation problems for Columbia River fisheries. The federal government will propose restrictions that will prevent the tribes from harvesting a 50% share of the fall chinook, as required under U.S. v. Oregon.

The forecast for Columbia River coho suggests a much larger return than last year. According to management agreements for upper Columbia River coho, the tribes are **entitled** to a 50% share of the harvestable surplus. We expect the states to monitor and include **all** sources of non-Indian fishery mortalities in the lower river to **ensure** the adequate passage of coho past Bonneville Dam in order for the tribes to have the opportunity to harvest their share of the coho.

The Columbia River tribes continue to question the utility of mass marking and selective fisheries. Our understanding was that the mass marking of coho was to be an experiment. It seems like it has advanced to the full scale implementation phase. There also appears to be a movement for the mass marking of chinook. There are still unresolved technical issues concerning the mass marking and selective fishing for chinook that are far more complicated than for coho. The idea of selective fishing as a way to address wild stock concerns is seductive because it diverts attention from the real problem: low wild fish survival. Managers are so interested in figuring out how to mass mark salmon that they haven't stopped to consider the longer term implications. Our experience with steelhead in the Columbia River indicates that mass marking and selective fishing by itself will not restore wild runs. It **is not** prudent to move ahead with mass marking and selective fishing for chinook.

Although the forecast for the Snake River wild fall chinook is not ready, last year's Lower Granite Dam counts were the highest on record. Some of last years increase in the wild Snake River counts were the results of supplementation that the tribes **successfully** advocated for. The tribes believe that this provides a good foundation for recovery. However, the federal government discounts the value of successful supplementation programs. Other examples of successful supplementation include restoring fall chinook returns to the Umatilla, Yakima, and Klickitat Rivers, spring chinook in the Clearwater and Umatilla Rivers, and coho in the Yakima River.

Upper Columbia River spring chinook are forecasted to return in the largest numbers since 1978. This should be good news. The tribes proposed a modest increase in harvest rates. However, the federal government is attempting to constrain tribal fisheries because of concerns for listed stocks in the Snake River basin, stocks for which they have made no effort to restore, expect for constraining fisheries. This must stop. As outlined in United States versus Oregon, the tribes' ceremonial and subsistence fisheries have the **highest** priority for spring and summer season fisheries. Ceremonial fisheries are vital to the continuation of **traditional** tribal religious practices, such as First Salmon Ceremonies, Memorials, and Death-Wakes.

The Columbia River tribes are **working hard** to contribute to the rebuilding of upriver salmon and steelhead using the **limited** tools available to us like voluntary restrictions on harvest and working to increase the production of upriver stocks through supplementation. However, it is difficult to expand supplementation when hatchery funding puts a priority on status quo programs. It is difficult to find justice in restricting only fisheries while hydropower, ranching, logging, urban development, and agricultural activities continue their unregulated impacts on salmon habitat and survival. The science shows that some Columbia River stocks will recover only if major changes in the hydropower system, such as breaching or drawdown take place. The dams continue to indiscriminately harvest salmon, while the fishermen are left to fight over the crumbs

The Federal government has the legal obligation under federal law **to restrict other** activities that impact listed species **before** restricting the Columbia River treaty Indian fishery any further. This must be done to **comply** with the conservation principles established in United States versus Oregon. **Until everyone**, Indian and non-Indian, can resume fishing at its full potential, we can not forget the work that we have to do **together** to recover all salmon and steelhead runs for our future generations.

The recovery of the Columbia River salmon is also dependent on international negotiations. Columbia River tribes **support** the movement of the Pacific Salmon Commission toward a system based on **stock abundance**. We have given our representatives the following guiding principles in the negotiations, which also have application to our lower river and coastal fisheries:

- Harvest rates must account for **all** sources of mortalities and be sustainable and support rebuilding of weak and depressed stocks.

- Non-tribal river and ocean fisheries **must** allow sufficient escapement so the tribes can harvest their fair share of the harvestable surplus. The allocation between tribal and non-tribal fisheries must include mortalities from all sources, not just fishery mortalities.

- **Habitat** protection and restoration and stock supplementation must be a part of the long term solution.

It is difficult to recommend specific options at this time. However, due to the low numbers of Spring Creek Hatchery fall chinook, the Columbia River tribes ask that the Council to instruct the Salmon Technical Team to include an option with **zero non-Indian** fishing north of Cape Falcon. This would return the maximum number of Spring Creek fish to the Columbia River and give the greatest flexibility for in-river allocation. The tribes are also interested in reviewing the Team's analysis of last year's fisheries North of Cape Falcon with this year's projected returns and **All** ocean fishery models **must** be analyzed for cumulative impacts relative to listed Snake River stocks and the projected escapement of Spring Creek Hatchery fall chinook. This concludes my statement. Thank You.

PRELIMINARY DEFINITION OF 2000 MANAGEMENT OPTIONS

Situation: Using the Salmon Advisory Subpanel (SAS) management recommendations as a base, the Council should identify the range of management elements in the options for public review (harvest ranges, special restrictions, and basic season structure). The Salmon Technical Team (STT) will attempt to collate the Council's identified management elements into coordinated coastwide options. The collated options will be returned to the Council for review and tentative adoption on Wednesday, March 8, 2000 followed by STT analysis and final adoption of the options on Friday, March 10, 2000. Attachment B.4.a. provides guidance for developing and assessing the options.

Before defining the options, the Council should be briefed on any pertinent management constraints resulting from: actions by the Pacific Salmon Commission, recommendations of the Klamath Fishery Management Council, action by the California Fish and Game Commission to set the allocation of Klamath River fall chinook for the inside recreational fishery, and constraints for stocks listed under the Endangered Species Act. Recently developed jeopardy standards should be available by meeting time for the newly listed stocks which have Council fishery impacts (i.e., Central Valley spring, California coastal, lower Columbia River, and Puget Sound chinook stocks). In addition, by inseason action, NMFS made federal regulations consistent with California state regulations by delaying the year 2000 opening of the California recreational seasons south of Point Arena by approximately two weeks. This change was made to help reduce impacts on threatened Sacramento River spring chinook.

Any option considered for adoption which deviates from fishery management plan (FMP) objectives will require implementation by emergency rule. If an emergency rule appears to be necessary, the Council must clearly identify and justify the need for such an action consistent with emergency criteria established by the Council (Attachment B.4.b.).

One public comment letter on the 2000 salmon season was received at the Council office in time for inclusion in the briefing book (Public Comment B.4.). The letter, from Oregon Trout, opposes any fisheries off Oregon that target coho salmon.

Council Action: Using the SAS proposals and other agency and public input, define basic management elements and alternatives for STT collation into coastwide management options.

Reference Materials:

1. Guidance for Option Development and Assessment (Attachment B.4.a.).
2. Emergency Changes to the Salmon FMP (Attachment B.4.b.).
3 Public Comment B.4.
4. SAS proposed options (Supplemental SAS Report B.4.).

PFMC
02/23/00

O R E G O N T R O U T

February 9, 2000

Donald O. McIsaac, Ph.D
Pacific Fishery Management Council
2130 S. W. Fifth Av., Suite 224
Portland, OR 97201

Re: 2000 Ocean Salmon Seasons

Dear Dr. McIsaac:

Oregon Trout opposes any ocean fisheries off the coast of Oregon this year that target coho salmon. Because of the fact that the last three brood years of OCN coho stocks have failed to replace themselves, we do not believe that any fishery that could adversely impact these stocks is warranted.

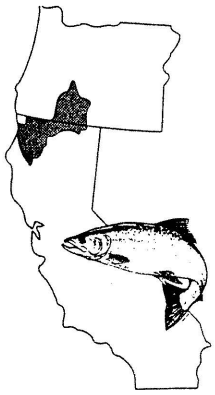
The Pacific Fisheries Management Council has an obligation to be a leader in efforts to recover federally listed coho salmon. Allowing any harvest impacts on these stocks, considering their present dire circumstances, would be contrary to your conservation mandate.

Oregon Trout believes that the current situation warrants a complete suspension of all ocean fisheries targeting coho salmon. We also believe that any future coho fishery should be constructed around terminal fisheries that harvest only hatchery produced salmon.

Sincerely,

Jim Myron
Conservation Director

Cc: Oregon Fish & Wildlife Commission



Klamath Fishery Management Council

Working to Restore Anadromous Fish in the Klamath River Basin
P.O. Box 1006 Yreka, California 96097
(530) 842-5763 Fax (530) 842-4517

March 2, 2000

California Commercial
Salmon Fishing Industry

California Department
of Fish and Game

California Offshore Sport Fishery

Hoopa Valley Indian Tribe

Klamath In-River Sport Fishery

National Marine Fisheries Service

Non-Hoopa Indian Representative

Oregon Commercial
Salmon Fishing Industry

Oregon Department
'sh and Wildlife

P Fishery Management
Council

U.S. Department of the Interior

Mr. Robert Treanor
Executive Director
California Fish and Game Commission
P.O. Box 944209
Sacramento, California 94244-2090

Dear Mr. Treanor:

The Klamath Fishery Management Council (KFMC) would like to take this opportunity to inform the California Fish and Game Commission on the results of our meeting of February 23-25, 2000, in Brookings Harbor, Oregon. We discussed, among other items, recommendations regarding this year's Klamath fall chinook fishery management options, including issues associated with the freshwater sport fishery.

The KFMC reached consensus on the following motion:

That any Klamath fall chinook that are agreed to be available for harvest and that are not used by ocean fisheries be allocated to the non-tribal Klamath in-river fishery in terms of maturing adult fish, such that:

- **This does not affect 50/50 fish-for-fish tribal/non-tribal sharing**
- **It meets natural spawner escapement objectives.**
- **It is intended that the ocean fishery allocations be finalized by the end of the April PFMC meeting for the California Fish and Game Commission's consideration.**

The KFMC attempted to develop a recommendation on the in-river sport fishery allocation, but was unable to reach consensus at this time.

We appreciate your consideration of these recommendations.

Sincerely,

Mary Ellen Mueller, Ph. D.
(for) Chair

KFMC RECOMMENDATIONS TO PFMC[1]

The KFMC met February 23-25 and March 5-6, 2000 to discuss management of Klamath River fall chinook for 2000. A summary of our discussions and recommendations follow.

Issue: Failure to achieve the Klamath River spawner escapement floor in 1999.

The KFMC discussed the cause of the failure to achieve the Klamath River natural spawner escapement floor in 1999 with the Klamath River Technical Advisory Team (KRTAT). They report that the abundance of age 4 fish was only about 1/3 of the pre-season prediction, and the age 3 abundance was about double the pre-season prediction. The river escapement of age 3 fish was not sufficient to offset the shortfall of age 4 fish. Also, the natural component of the escapement was only 56% compared to a pre-season prediction of 73% natural spawners.

Our stock projection models were updated to include these new data points.

The stock has been managed to meet the escapement floor for natural spawners of 35,000 adult fish in 9 out of the past 10 years. The floor was not achieved in 1990, 1991, 1992, 1993, 1994, and 1999. This past year represented the third consecutive year that the fisheries have been managed to meet the floor.

Adjustments were made in the prediction methods beginning in 1994 to remove bias at low stock sizes. These adjustments included forcing the ages 3 and 4 regression lines through zero and using the recent 5-year average natural escapement percentage for projecting the proportion of spawners that use natural areas. The KRTAT has reviewed alternatives for predicting the proportion of natural fish in the run and has concluded that the five year average is still the best method currently available.

Issue: Discussion of 35,000 escapement floor.

The KFMC discussed the 35,000-fish escapement "floor." Past practice has been to use the floor as a target, rather than an actual floor. No fishing would have been allowed in most recent years if the objective were to achieve a high probability that the 35,000 escapement floor would have been met in those years.

Assuming the current prediction methods are unbiased, there is presently a 50% chance of failing to achieve the natural spawner floor in a floor-managed year. The KRTAT analysis indicates that, given this year's predicted stock abundance, achieving a 70% probability of meeting or exceeding the 35,000 natural spawner floor would require raising the natural escapement target to 50,000 adults (71,400, including hatchery fish). The low precision in the stock abundance predictors and the estimated proportion of natural spawners increases the magnitude of errors in these predictions.

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[1] Adopted by KFMC March 6, 2000.

The KFMC recommends that the escapement floor be used as a minimum escapement target for the basin for the year 2000 management season.

Issue: Threat of overfishing the stock

Three consecutive years of failing to achieve the escapement floor for Klamath fall chinook would meet the FMP definition of an overfished stock. This would require agency consultation and a technical analysis aimed at correcting the situation.

It is apparent that the Klamath Basin fall chinook runs continue to be severely depressed. The available data indicate very low survival of naturally produced fish, evidenced by low recruitment following large adult escapements. Immediate attention needs to be paid to habitat conditions in the main stems of the Klamath and Trinity rivers, as well as in the major tributaries. Flows in these areas need to be increased and timed to restore production of native salmonids within the basin. Further reductions in ocean and river fisheries will, in our opinion, serve no purpose but to further penalize the fishermen and local communities that depend on Klamath River fishery resources.

The KFMC has considered the threat of not meeting the escapement floor in 2000, and has decided to stay with the projection models used in 1999, adjusted to include the new data points. Thus, the KFMC endorses the stock abundance projection report of the KRTAT dated 9 February 2000.

The KFMC recognizes that failure to meet the floor in 2000 may require the KFMC to consider raising the escapement target in 2001. This would be done to better assure that this stock does not meet the FMP definition of an overfished stock.

Issue: Allocation of fish to the river sport fishery

The KFMC discussed the allocation of fall chinook to the river sport fishery and received a report that the California Fish and Game Commission is considering allocating 15-20 % of the non-tribal share of Klamath fall chinook to the river sport fishery. A motion by the KFMC to allocate 15% of the non-tribal share to the river sport fishery failed to achieve a consensus vote. A subsequent motion passed that any maturing adult fall chinook that are not utilized in ocean fisheries, and that are available for harvest in 2000, should be made available by the Commission to the river sport fishery (see attached letter to the California Fish and Game Commission).

A Commission subcommittee met March 3 and is recommending that the Commission adopt the 15 % allocation to the river sport fishery. Thus, the KFMC and PFMC should use the 15 % figure for developing 2000 ocean fishing regulation options.

Issue: Allocation of fish to the KMZ sport fishery

The KFMC again agrees that 17 % of the ocean share of Klamath River fall chinook should be allocated to the KMZ sport fishery. To achieve its allocation, the fishery should be managed

based on time and area closures, minimum size limits, and bag and possession limits.

Issue: Allocation of fish to the CA and OR troll fisheries

The KFMC recognizes that ESA constraints may have a greater influence on ocean fishing regulations than the allowable harvest of Klamath fall chinook. The KFMC recommends that 1999 commercial regulations be used as the base for developing 2000 regulations. In 1999, the allowable harvest rate for age 4 fish was 12.3%. In 2000, the rate may increase to as high as 15%. The SAS representatives from the two states should negotiate, in consultation with KFMC representatives, how these fish can be utilized in 2000.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

1514-04-020

March 7, 2000

Mr. Jim Lone
Chairman
Pacific Fisheries Management Council
2130 S.W. Fifth Avenue, Suite 224
Portland, Oregon 97201

Dear Mr. Lone:

Amendment 12 to the Pacific Coast Salmon Fishery Management Plan (Salmon FMP) requires that the Pacific Fishery Management Council (PFMC or Council) manage their fisheries consistent with consultation standards developed by the National Marine Fisheries Service (NMFS) regarding actions necessary to protect species listed under the Endangered Species Act (ESA). This letter summarizes NMFS' consultation standards and provides guidance for the 2000 season for listed species.

NMFS is in the process of approving Amendment 14 to the Salmon FMP, which we expect to complete by early summer. Amendment 14 carries forward the provisions of Amendment 12 with respect to the ESA. Its implementation will therefore not affect either the process for providing guidance or its substance.

Chinook Salmon

Puget Sound Chinook Salmon

This is the first year that NMFS will provide guidance to the Council related to the Puget Sound chinook ESU. NMFS plans to expand its PFMC consultation this year to include consideration of federal actions related to Puget Sound fisheries. NMFS' consultation standards for Puget Sound chinook will generally be expressed in terms of total or southern U.S. fishery exploitation rate limits. It is therefore appropriate, from a substantive point of view, to consult concurrently on this broader range of actions affecting the listed species. Procedurally the Council forum and associated North of Falcon process provide the appropriate forums for doing the necessary management planning. Under the current management structure, PFMC fisheries are included as part of the suite of fisheries that comprise the fishing regime negotiated each year by the co-managers under U.S. v. Washington to meet management objectives for Puget Sound and Washington Coastal salmon stocks. NMFS has recognized this interdependent and interrelated management structure in stating its intent to combine its consultation on the 2000 PFMC

X-read by Bill Robinson

management measures with its consultation regarding other federal actions that encompass Puget Sound fisheries. Therefore, in adopting its regulations, the Council must determine that its fisheries in the ocean, when combined with the suite of other fisheries impacting this ESU, meet the management targets set for stocks within this ESU.

Having established the connection between Council and Puget Sound fisheries for consultation and management planning purposes, it is also appropriate to acknowledge that impacts on Puget Sound chinook stocks in Council fisheries are generally quite low. NMFS estimated in its 1999 PFMC opinion that the exploitation rates on Puget Sound chinook spring and fall chinook stock aggregates have been zero and between one and two percent, respectively, in recent years. Management actions taken to meet exploitation rate targets will therefore occur primarily in the Puget Sound fisheries, but the nature of the existing process is such that ocean fishery impacts will be accounted for, and are at least potentially liable to constraint if necessary to meet particular targets.

NMFS and the co-managers are collaborating to develop the necessary standards. Those standards are not likely to be available until after the March Council meeting. It will therefore be necessary to ensure that the state, tribal, and federal participants are confident that the range of options developed at the March meeting are sufficiently broad to encompass the foreseeable outcomes. NMFS will help facilitate that determination.

Lower Columbia River Chinook

The Lower Columbia River (LCR) chinook ESU is comprised of a spring component, a far north-migrating bright component, and a component of north-migrating tules. The three remaining spring stocks within the ESU include those on the Cowlitz, Kalama, and Lewis rivers. The historic habitat for these spring chinook stocks is now largely inaccessible due to impassable dams. Although some spring chinook spawn naturally in each of these rivers, these are presumed to be largely hatchery-origin fish with little resulting natural production. The remaining spring stocks are therefore dependent, for the time being, on the associated hatchery production programs. The hatcheries have met their escapement objectives in recent years, and are expected to do so again in 2000, thus ensuring that what remains of the genetic legacy is preserved until a more comprehensive recovery program designed to reestablish self-sustaining populations is implemented. No additional management constraints in PFMC fisheries are considered necessary.

Three natural-origin bright stocks have been identified in the LCR ESU. The North Fork Lewis stock is used as a harvest indicator stock for ocean and in-river fisheries. The North Fork Lewis stock has exceeded its escapement objective of 5,700 every year since 1980 except that it was below goal in 1999 (the run size was 3,300) and is expected to be only slightly higher again in 2000 (predicted return of 3,500). The escapement short fall is attributed to severe flooding events in 1995 and 1996. However, given the long history of healthy returns, NMFS concludes that these reduced returns are not indicative of a population at risk of extinction. NMFS does not anticipate the need to take specific management actions in the ocean to protect the bright component of the LCR ESU in 2000. NMFS does expect that the management agencies will continue to take appropriate actions through their usual authorities, similar to those taken in

1999, to return the stocks to their full productive capacity. More specific guidance may be provided in the future if the stocks do not return to full production in the near future.

Unlike the spring stocks or the bright component of the ESU, LCR tule stocks are impacted substantially in PFMC fisheries. There are only two or three self-sustaining populations of tule chinook in the Lower Columbia River (Coweeman, East Fork Lewis, and possibly Clackamas) that are not substantially influenced by hatchery strays. Returns to the East Fork and Coweeman have been stable and near interim escapement goals in recent years. The status of the Clackamas stock is uncertain, but may also be supported in part by hatchery strays. Apart from these stocks, the system is dominated by hatchery production and whatever natural spawning does occur is heavily influenced by hatchery strays. The effect of hatchery operations on the ESU is currently the subject of a separate consultation. Tule production in the lower River has already been reduced by more than half as a result of funding reductions.

NMFS reviewed the status of LCR tules in the recent PST opinion. Tules will benefit substantially from the ocean harvest regime in the Pacific Salmon Treaty (PST) agreement because of this ocean distribution, which is centered off the west coast of Vancouver Island and the Washington coast. NMFS developed a preliminary Recovery Exploitation Rate (RER) for the Coweeman population of 65 percent as part of the PST consultation. Although further review of this estimate is warranted, NMFS believes that the RER of 65% for the Coweeman stock is consistent with its continued survival and recovery, and expects the PFMC fisheries to be managed such that the total ER does not exceed that level. However, NMFS also expects that management constraints for other stocks will result in exploitation rates that are substantially lower than 65%. Exploitation rates on tule chinook in Southeast Alaskan and Canadian fisheries are expected to total between 15 and 20 percent under the new PST agreement. Washington coastal fisheries have been limited by multiple management constraints and fisheries in the lower Columbia River will continue to be limited by Snake River fall chinook and Lower Columbia River brights, among others. Further work on the tule component of the LCR ESU is required, but NMFS believes that the appropriate course is to integrate future harvest management actions with recovery planning efforts that will seek to rebuild a broad range of self-sustaining, naturally producing tule stocks.

Upper Columbia River Spring Chinook
Upper Willamette River Chinook Salmon
Snake River Spring/Summer Chinook

Spring stocks from the Upper Columbia River and Willamette River Basins and spring/summer stocks from the Snake River are rarely caught in PFMC fisheries. Management actions designed to limit catch from these ESUs beyond what will be provided by harvest constraints for other stocks are therefore not considered necessary.

Snake River Fall Chinook Salmon

NMFS' guidance in recent years regarding Snake River fall chinook was complicated by uncertainties about whether there would be a PST agreement or not, and further by uncertainty

about whether the agreement, if struck, would apply in some way to PFMC fisheries in particular. The PST agreement was concluded in 1999 so the complicated range of guidance contingencies is no longer necessary. NMFS' biological opinion related to the PST agreement outlined the expected catch reductions resulting from the agreement, but also limited the combined effect of the Southeast Alaska, Canadian, and PFMC fisheries to a total age three and four adult equivalent exploitation rate that is 30% less than that observed during the 1988-1993 base period. It therefore will be necessary for the PFMC fisheries to be managed to ensure that the 30% base period reduction criterion for the aggregate of all ocean fisheries is achieved.

Sacramento River Winter Chinook Salmon

The guidance provided for winter chinook has not changed from that required by the February 18, 1997, amendment to the March 8, 1996, biological opinion. The 1997 amendment required that ocean fishery impacts on winter chinook be reduced sufficiently to achieve a three year replacement rate of 1.77, which is 31% above the average replacement rate observed for the 1989 to 1993 brood years. This requirement will remain in effect through the 2001 salmon seasons. NMFS will then review available information and reevaluate the effects of ocean harvest on recovery of the ESU. It is expected that the Salmon Technical Team will continue to use the winter chinook ocean harvest model to assess relative effects of fishery impacts on winter chinook escapement.

Central Valley Spring Chinook Salmon

The Central Valley spring chinook ESU was listed as threatened effective November 15, 1999 (63 FR 11481). Recent increases in abundance of Central Valley spring chinook populations have occurred under harvest management measures developed by the PFMC in compliance with the 1996 and 1997 biological opinions for Sacramento River winter chinook. The similar life history features shared between spring and winter chinook, particularly run timing, make it likely that the harvest constraints implemented for winter chinook have also benefitted spring chinook and will continue to do so. The two week delay in the opening of the 2000 recreational seasons south of Point Arena implemented by the California Fish and Game Commission will provide additional protection to spring chinook. For the 2000 season, NMFS anticipates that the existing ESA consultation standards for Sacramento River winter chinook will afford sufficient protection to Central Valley spring chinook and that no additional protective measures will be necessary for the ESU.

California Coastal Chinook Salmon

The California Coastal chinook ESU was listed as threatened effective November 15, 1999 (63 FR 11481). Ocean exploitation rates on California coastal chinook stocks are likely intermediate between those that exist for Central Valley chinook stocks and Klamath River fall chinook. The absence of reliable estimates of ocean exploitation rates on Central Valley chinook and the uncertainty regarding population abundance and short term trends for California coastal chinook populations make it difficult to assess the potential for coastal chinook populations to recover under the existing Salmon FMP conservation objectives and ESA requirements. Ocean

exploitation rates on California coastal chinook have likely declined in recent years in concert with the reduction in ocean harvest rates on Klamath River fall chinook and as a result of ESA constraints to protect Sacramento River winter chinook. For the 2000 season, the age-four ocean exploitation rate forecast for Klamath River fall chinook may not exceed 0.17, which is the maximum observed since 1996. The guidance is intended to prevent harvest impacts on California Coastal chinook from increasing substantially above levels that have occurred since 1996. Accordingly, the 2000 management recommendations should avoid seasons off northern California likely to increase impacts on California Coastal chinook relative to seasons of the past four years.

Coho Salmon

NMFS considered the effects of west coast ocean fisheries on listed populations of coho salmon in a supplemental biological opinion dated April 28, 1999. The opinion provided ESA consultation standards for the three listed ESUs in Oregon and California: Oregon Coastal, Southern Oregon/Northern California Coastal, and Central California Coastal coho salmon. The requirements of that opinion, which are summarized below, will remain in effect for the 2000 season.

Oregon Coastal Coho Salmon

Amendment 13 provides separate exploitation rate targets for four Oregon Coastal Natural (OCN) sub-stocks that depend on measures of prior escapement and ocean survival. NMFS requires that the three northern sub-stocks be managed according to the provisions of Amendment 13. The southern sub-stock is part of the Southern Oregon/Northern California Coastal Coho ESU and will be managed in accordance with the requirements for that ESU.

Southern Oregon/Northern California Coastal Coho Salmon

Management measures developed under the FMP must be designed to achieve an ocean exploitation rate on Rogue/Klamath hatchery stocks of no greater than 13%, the lowest exploitation rate on Oregon Coastal Natural sub-aggregates specified under Amendment 13.

Central California Coastal Coho Salmon

Little information on past harvest rates or current hooking mortality incidental to chinook fisheries exists for Central California Coastal coho. For the 2000 season, coho-directed fisheries and coho retention in chinook-directed fisheries are prohibited off California.

Chum Salmon

Hood Canal Summer Chum

Chum salmon are not targeted or caught incidentally in PFMC salmon fisheries. Management constraints in ocean fisheries for the protection of Hood Canal summer chum are also not considered necessary.

Sockeye Salmon

Snake River Sockeye Salmon
Ozette Lake Sockeye Salmon

Sockeye salmon are not targeted or caught incidentally in PFMC salmon fisheries. Management constraints in ocean fisheries for the protection of listed sockeye salmon are therefore not considered necessary.

Steelhead

NMFS has listed two ESUs of steelhead as endangered and seven ESUs as threatened in Washington, Oregon, Idaho, and California. Steelhead are rarely caught in ocean fisheries and ocean fishery management actions that seek to shape fisheries to minimize impacts to steelhead are not considered necessary. The Council and states should prohibit the retention of steelhead in ocean recreational fisheries to minimize the effect of whatever catch may occur.

Cutthroat Trout

Umpqua River Cutthroat trout are not caught in ocean salmon fisheries. Management actions to limit impacts are therefore not required.

Please call if you have additional questions.

Sincerely,

Will Stelle, Jr.
Regional Administrator
Northwest Region

Rodney R. McInnis
Acting Regional Administrator
Southwest Region

PFMC Briefing Statement
Pacific Salmon Commission Activities
March 7, 2000

Following the completion of the new long-term agreement on June 30, 1999, the Pacific Salmon Commission (PSC) has begun the task of implementing the fishery regimes and other actions described by the agreement. Meetings were held in December, January and February to address the many issues necessary to the successful implementation of the agreement provisions. The PSC has established a Northern Boundary and Transboundary Restoration and Enhancement Fund and a Southern Boundary Restoration and Enhancement Fund that has received initial investments of $10 million to each fund from the U.S. Treasury. Northern and Southern Fund Committees of the PSC will administer these trust funds to support activities to develop an improved resource information base, rehabilitate and restore habitat, and enhance wild stock production. Other activities of primary interest focused on addressing the implementation of the chinook and coho regimes and the new habitat agreement and responding to the Washington and Oregon mass marking and selective fisheries proposals.

The abundance based chinook regime required by the agreement will be implemented beginning in 2000. The PSC Chinook Technical Committee (CTC) is working to calibrate the model that will be used to evaluate the catch targets and fisheries restrictions that are required by the agreement. CTC representatives will be working with the tribes and states during the PFMC and North of Falcon pre-season planning process to assure that our fisheries plans are consistent with the PSC agreement. The PSC will be meeting on April 26-27 to hear a report from the CTC and to evaluate the parties' fisheries regimes for 2000 as they relate to the chinook agreement.

The PSC has formed a Coho Workgroup that has been tasked with developing the abundance based coho fisheries plan that is required by the agreement. The workgroup and Coho Technical Committee have developed a workplan that will lead to the implementation of this new plan beginning in 2001. For 2000, the tribes, WDFW and ODFW have agreed to meet with Canada on a manager-to-manager basis to provide an opportunity for each party to input to the other party's pre-season planning processes for both coho and chinook. Meetings are scheduled for March 14 and 28 for this purpose.

The PSC heard a status report from its Selective Fisheries Evaluation Committee (SFEC) concerning the mass marking and selective fisheries proposal submitted by WDFW and ODFW, and made the following statement.

> "*Concerns have been expressed about the mass marking of chinook by Washington and Oregon and potential selective fisheries and the impacts of those activities on the viability of the coded wire tagging program. While there was not agreement on the level of risk to that program, there are unresolved concerns about the ability of the Parties to fulfill bilateral obligations to maintain a coded*

wire tag program, and to implement their responsibilities under Chapter 3of Annex 4 of the Pacific Salmon treaty. The Commission reiterated the need for Parties to maintain the integrity and reliability of the coded wire tagging program as provided in the 1985 Memorandum of Understanding."

WDFW and ODFW committed to taking the lead and bringing new analytical capabilities to address these outstanding technical issues and solve the problems identified by the SFEC such that the integrity and reliability of the CWT program can be maintained.

The PSC has established a committee to develop a process for implementing the new Habitat and Restoration agreement. The committee is developing a format for the parties to report annually on stocks that are not likely to rebuild by harvest management actions alone and the factors limiting their production.

SALMON ADVISORY SUBPANEL

PROPOSED INITIAL SALMON MANAGEMENT OPTIONS FOR 2000 NON-INDIAN OCEAN FISHERIES

March 7, 2000

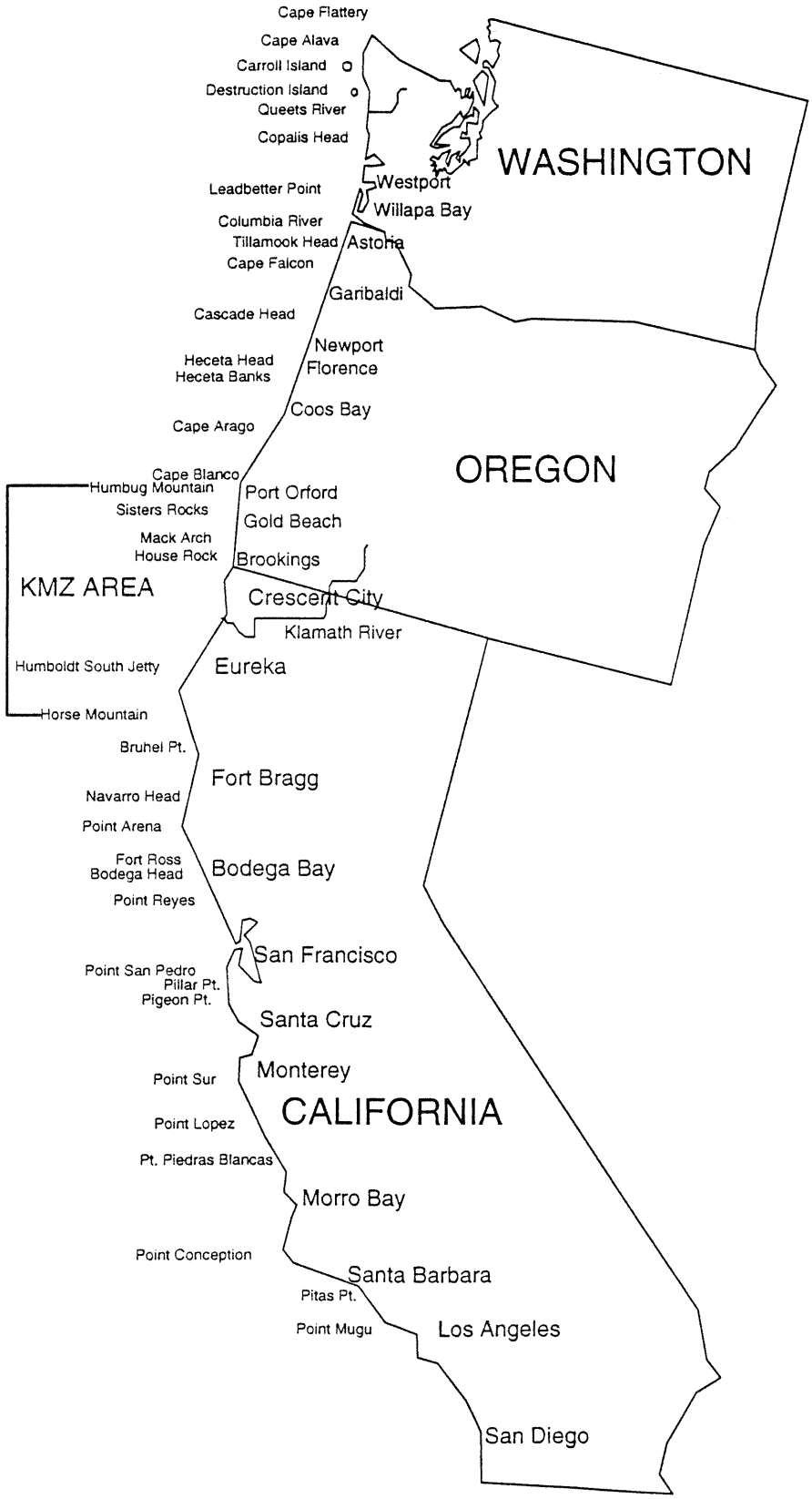
Cape Flattery
Cape Alava
Carroll Island
Destruction Island
Queets River
Copalis Head
WASHINGTON
Leadbetter Point
Westport
Willapa Bay
Columbia River
Tillamook Head
Astoria
Cape Falcon
Garibaldi
Cascade Head
Newport
Heceta Head
Heceta Banks
Florence
Coos Bay
Cape Arago
OREGON
Cape Blanco
Humbug Mountain
Port Orford
Sisters Rocks
Gold Beach
Mack Arch
House Rock
Brookings
KMZ AREA
Crescent City
Klamath River
Humboldt South Jetty
Eureka
Horse Mountain
Bruhel Pt.
Fort Bragg
Navarro Head
Point Arena
Fort Ross
Bodega Head
Bodega Bay
Point Reyes
San Francisco
Point San Pedro
Pillar Pt.
Pigeon Pt.
Santa Cruz
Monterey
Point Sur
CALIFORNIA
Point Lopez
Pt. Piedras Blancas
Morro Bay
Point Conception
Santa Barbara
Pitas Pt.
Point Mugu
Los Angeles
San Diego

TABLE 1. **Commercial troll** management options proposed by the SAS for non-Indian ocean salmon fisheries, 2000. (Page 1 of 4)

As described >

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. WCVI mortality of 50,000 coho; 192,000 chinook harvest in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 1999 preseason expected harvest rate for WCVI troll. 3. Treaty Indian commercial ocean troll quotas of: _____ chinook (_____ in May; _____ in June; _____ for all-salmon season); _____ coho 4. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 5. Non-Indian Troll TAC: 12,500 chinook 25,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: _____ chinook _____ coho 4. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 5. Non-Indian Troll TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 18,750 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: _____ chinook _____ coho 4. Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 5 .Non-Indian Troll TAC: 0 chinook and selective fishery impacts associated with a landed catch of 12,500 coho.
U.S.-Canada Border to Cape Falcon • May 1 thru earlier of June 15 or 10,000 chinook guideline. All salmon except coho. Columbia Control Zone closed (B.7.) Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.	**U.S.-Canada Border to Cape Falcon** • May 1 thru earlier of June 15 or 10,500 chinook quota. All salmon except coho. Columbia Control Zone is closed (same area as described for recreational fishery beginning in 1999).	**U.S.-Canada Border to Cape Falcon** • Closed.
Queets River to Cape Falcon • July 7 thru earliest of Sept. 30 or the overall chinook quota (preseason 2,500 chinook guideline) or 25,000 coho quota. All salmon. Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (B.7.).	**Queets River to Cape Falcon** • Aug. 11 thru earliest of Sept. 30 or the overall chinook quota (preseason 1,500 chinook guideline) or 18,750 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (same area as for sport fishery).	**Queets River to Cape Falcon** • Aug. 18 thru earlier of Sept. 30 or the marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (B.7.).

TABLE 1. **Commercial troll** management options proposed by the SAS for non-Indian ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I South of Cape Falcon	OPTION II South of Cape Falcon	OPTION III South of Cape Falcon
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 3. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt. • Apr. 1 thru Aug. 28, and Sept. 1 thru Oct. 31. All salmon except coho. See Oregon State regulations for a description of the closed area at the mouth of Tillamook Bay. [**Note:** Incidental retention of halibut is not allowed during April.]	**Cape Falcon to Humbug Mt.** • Same as Option I.	**Cape Falcon to Humbug Mt.** • Same as Option I.
Humbug Mt. to OR-CA Border • May 1 thru May 31. All salmon except coho.	**Humbug Mt. to OR-CA Border** • Same as Option I.	**Humbug Mt. to OR-CA Border** • Same as Option I.
Sisters Rocks to Mack Arch • 8/1 thru earlier of 8/31 or 2,500 chinook quota. All salmon except coho. Open 0-4 nautical miles. All salmon must be landed and delivered to Gold Beach, Port Orford or Brookings within 24 hours of closure.	**Sisters Rocks to Mack Arch** • Same as Option I.	**Sisters Rocks to Mack Arch** • Same as Option I.
House Rock, OR to Humboldt South Jetty • Sept. 1 thru earlier of Sept. 30 or 7,000 chinook quota. All salmon except coho. Possession and landing limit of 30 fish per day. All fish caught in this area must be landed within the area. Klamath Control Zone closed (see B.7.). Within the 7,000 chinook quota is a harvest guideline limiting landings at the port of Brookings to no more than 1,000 chinook. If this guideline is reached prior to the overall quota, the fishery will close north of the Oregon-California border. When the fishery is closed north of the Oregon-California border and open to the south, Oregon State regulations provide for the following action: Vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival.	**OR-CA Border to Humboldt South Jetty** • Same as Option I except southern boundary would be Punta Gorda and there would be control zones at the mouths of the Eel and Mattole Rivers.	**OR-CA Border to Humboldt South Jetty** • Same as Option I.

TABLE 1. **Commercial troll** management options proposed by the SAS for non-Indian ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Horse Mt. to Pt. Arena (Fort Bragg) • Sept. 1 thru Sept. 30. All salmon except coho.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.
Pt. Arena to Pt. Reyes (Bodega Bay) • July 18 thru Sept. 30. All salmon except coho. Minimum size limit 27 inches.	**Pt. Arena to Pt. Reyes (Bodega Bay)** • Same as Option I.	**Pt. Arena to Pt. Reyes** • Same as Option I.
Fort Ross to Pt. Reyes (test fishery inside 6 nm) • July 1 thru earlier of July 15 or 4,500 chinook quota. All salmon except coho. Fishery closed July 3, 4, 8 and 9. Minimum size limit 26 inches (to be consistent with 1998 and 1999 test fisheries). Open only inside 6 nautical miles. Landing limit of 30 fish per day. All fish caught in this area must be landed in Bodega Bay. Fish taken outside this area may not be landed at Bodega Bay while this fishery is open.	**Fort Ross to Pt. Reyes** • Same as Option I.	**Fort Ross to Pt. Reyes** • Same as Option I.
Pt. Reyes to Pt. San Pedro • June 1 thru Sept 30. All salmon except coho. Minimum size limit 26 inches thru June 30 and 27 inches thereafter. • Oct. 1 thru Oct. 14. All salmon except coho. Open only inside 3 nautical miles. Minimum size limit 27 inches.	**Pt. Reyes to Pt. San Pedro** • Same as Option I.	**Pt. Reyes to Pt. San Pedro** • Same as Option I.
Pt. San Pedro to Pigeon Pt. • May 1 thru Sept. 30. All salmon except coho.	**Pt. San Pedro to Pigeon Pt.** • Same as Option I.	**Pt. San Pedro to Pigeon Pt.** • Same as Option I.
Pigeon Pt. to U.S.-Mexico Border • May 1 thru Aug. 31. All salmon except coho.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

B.1. Minimum size limits in inches (when seasons are open):

	Chinook		Coho		
Area (when open)	Total Length	Head-off	Total Length	Head-off	Pink
North of Cape Falcon	28.0	21.5	16.0	12.0	None
Cape Falcon to Pt. Arena*	26.0*	19.5*	-	-	None
South of Pt. Arena prior to July 1*	26.0*	19.5*	-	-	None
South of Pt. Arena after June 30*	27.0*	20.25*	-	-	None

* Chinook not less than 26 inches (19.5 inches head-off) taken in open seasons south of Cape Falcon may be landed north of Cape Falcon only when the season is closed north of Cape Falcon.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

3. Transit Through Closed Areas with Salmon on Board - It is unlawful for a vessel to have troll gear in the water while transiting any area closed to salmon fishing while possessing salmon.

TABLE 1. **Commercial troll** management options proposed by the SAS for non-Indian ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (continued)

4. Gear - Single point, single shank barbless hooks are required and circle hooks are required when mooching.

5. Spread - A single leader connected to an individual lure or bait.

6. Line, Spread and Gear Restrictions:

   a. Off **Oregon south of Cape Falcon**, no more than 4 spreads are allowed per line.

   b. Off **California**, no more than 6 lines are allowed per vessel.

7. Control Zone Definitions:

   Columbia Commercial Control Zone - The ocean area at the Columbia River mouth bounded by a line extending for 6 nautical miles due west from North Head along 46°18'00" N to 124°13'18" W, then southerly to 46°13'24" N and 124°11'00" W (green, Columbia River Entrance Lighted Bell Buoy #1), then southerly to 46°11'06" N and 124°11'00" W (red, Columbia River Approach Lighted Whistle Buoy), then northeast along red buoy line to the tip of the south jetty.

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W. (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

8. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board and the estimated time of arrival. This stipulation will be implemented by state regulations for California, Oregon and Washington, as required.

9. Incidental Halibut Harvest - The operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A, during authorized periods, while trolling for salmon. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone 206/634-1838). Applicants must apply prior to April 1 of each year. Incidental harvest is authorized only during **May and June** troll seasons and after July 31 if quota remains and if announced on the NMFS hotline (phone 800-662-9825). ODFW and WDFW will monitor landings and if they are projected to exceed the 23,490 pound preseason allocation or the Area 2A non-Indian commercial halibut TAC, NMFS will take inseason action to close the incidental halibut fishery.

   Option I: License holders may land no more than 1 halibut per each __ chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches.

   Option II: License holders may land no more than 1 halibut per each 5 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches. (1999 regulations)

10. Inseason Management - In addition to standard inseason actions or inseason modifications already noted under the season description, the following inseason guidance is provided to NMFS:

    - Transfers of 5,000 fish or less between subarea quotas north of Cape Falcon shall be done on a fish-for-fish basis;
    - At the March 2001 meeting, the Council will consider inseason recommendations to: (1) open commercial seasons for all salmon except coho prior to May 1 in areas off Oregon, and (2) identify the areas, season, quota, and special regulations for any experimental April fisheries.

11. Consistent with Council management objectives, the State of Oregon may establish additional late-season, chinook-only fisheries in state waters. Check state regulations for details.

12. For the purposes of CDFG Code, Section 8232.5, the definition of the KMZ for the ocean salmon season shall be that area from Humbug Mt., Oregon to Horse Mt., California.

TABLE 2. **Recreational** management options proposed by the SAS for ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
North of Cape Falcon	**North of Cape Falcon**	**North of Cape Falcon**
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. WCVI mortality of 50,000 coho; 192,000 chinook harvest in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 1999 preseason expected harvest rate for WCVI troll. 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 8,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 7. Recreational TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 75,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 6,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 7. Recreational TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 56,250 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required); LRW chinook harvest index of _____ %. 2. Same as Option I. 3. Neah Bay/La Push agreed coho allocation of 80%/20%. 4. No Area 4B add-on fishery.. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6.Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 7. Recreational TAC: 0 chinook and selective fishery impacts associated with a landed catch of 37,500 coho.
U.S.-Canada Border to Cape Alava (Neah Bay) • July 3 thru earlier of Sept. 30 or 7,800 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of ___ chinook.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 10 thru earlier of Sept. 30 or 5,850 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 24 thru earlier of Sept. 30 or 3,975 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Cape Alava to Queets River (La Push) • July 3 thru earlier of Sept. 30 or 1,950 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of ___ chinook.	**Cape Alava to Queets River (La Push)** • July 10 thru earlier of Sept. 30 or 1,475 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**Cape Alava to Queets River (La Push)** • July 24 thru earlier of Sept. 30 or 975 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Queets River to Leadbetter Pt. (Westport) • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 27,750 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. ~~No more than 6 fish per calendar week (Sun. thru Sat.).~~ Inseason management may be used to sustain season length and limit harvest within a guideline of _____ chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 20,800 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed inside the area defined by a line drawn from the lighthouse to Buoy 2 to Buoy 3 to the Grays Harbor north jetty. Inseason management may be used to sustain season length and limit harvest within a guideline of _____ chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 13,875 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed 0-3 nautical miles offshore.

TABLE 2. **Recreational** management options proposed by the SAS for ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Leadbetter Pt. to Cape Falcon (Columbia River) • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 37,500 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. ~~No more than 6 fish per calendar week (Sun. thru Sat.).~~ **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 28,125 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 18,750 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of _____ %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of _____ % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); ____% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; __/__ CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt • Except as provided below during the selective fishery, the season will be: Apr. 1 thru Oct. 31. All salmon except coho. 2 fish per day. No more than 6 fish in 7 consecutive days. Legal gear limited to artificial lures and plugs of any size, or bait no less than 6 inches long (excluding hooks and swivels). All gear must have no more than 2 single point, single shank barbless hooks. Divers are prohibited and flashers may be used only with downriggers. See Oregon State regulations for a description of a closure at the mouth of Tillamook Bay. Selective fishery: • Sun., Tue., Wed., Thur., and Sat. of each week, July 1 thru earlier of July 31 or a landed catch of 25,000 coho. All salmon. 2 fish per day, all retained coho must have a healed adipose fin clip. No special gear restrictions except B.3. (barbless hooks). Inseason action may be used to adjust open days to effectively utilize the available quota. **Note:** On closed days during the selective fishery no angling for any species of salmon is allowed. All salmon except coho season reopens the earlier of Aug. 1 or attainment of the coho quota.	**Cape Falcon to Humbug Mt** • Same as Option I except no selective fishery (i.e., Apr. 1 thru Oct. 31; all salmon except coho; 2 fish per day, etc.).	**Cape Falcon to Humbug Mt** • Same as Option II.

TABLE 2. **Recreational** management options proposed by the SAS for ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Humbug Mt. to Horse Mt. • May 27 thru July 4 and July 29 thru Sept. 10. All salmon except coho. 2 fish per day. No more than 4 fish in 7 consecutive days. Klamath Control Zone (B.6.) closed. One rod per angler (B.4.). (74 days)	**Humbug Mt. to Horse Mt.** • Same as Option I, except a daily bag limit of 1 fish and the openings would be May 20 thru July 9 and July 29 thru Sept. 10. (85 days--Coalition recommendation)	**Humbug Mt. to Horse Mt.** • Same as Option II, except openings would be May 20 thru July 9 and July 24 thru Sept. 10. (90 days--Coalition recommendation)
Horse Mt. to Pt. Arena • Feb. 12 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. (circle hook when mooching). One rod per angler (B.4.).	**Horse Mt. to Pt. Arena** • Same as Option I except season closes Oct. 1.	**Horse Mt. to Pt. Arena** • Same as Option I.
In 2001, the season will open Feb. 17 (nearest Sat. to Feb. 15) for all salmon except coho. 2 fish per day, 20 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as Option I.	Year 2001 opening same as Option I.
Pt. Arena to Pigeon Pt. • Apr. 15 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. One rod per angler. Special gear restriction B.5. (circle hooks when mooching).	**Pt. Arena to Pigeon Pt.** • Same as Option I, except closes Oct. 29 (nearest Sunday to Nov. 1).	**Pt. Arena to Pigeon Pt.** • Same as Option I, except season closes Oct.. 29.
In 2001, the season will open Apr. 14 for all salmon except coho. 2 fish per day, 20 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.
Pigeon Pt. to U.S.-Mexico Border • Apr. 1 thru Oct. 1. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. One rod per angler north of Pt. Conception.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I, except closing date of Sept
In 2001, the season is tentatively set to open March 31 for all salmon except coho, 2 fish per day, 20 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

1. Minimum size limits (total length in inches) when areas are open:

Area (when open)	Chinook	Coho	Pink
North of Cape Falcon	24.0	16.0	None
Cape Falcon to Horse Mt.	20.0	16.0	None, except 20.0 off CA
South of Horse Mt.*	20.0*	-	20.0

* **Except** 24.0 inches from opening day thru May 31.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished . Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

3. Hooks: Single point, single shank barbless hooks are required for all fishing gear north of Pt. Conception, California. ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.

TABLE 2. **Recreational** management options proposed by the SAS for ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (Continued)

4. Restriction on Number of Fishing Rods North of Pt. Conception, California: All persons fishing for salmon, and all persons fishing from a boat with salmon on board, may use no more than one rod per angler.

5. Option I: Special Gear Restrictions Between Horse Mt. and Pt. Conception, California:

   Single point, single shank, barbless **circle** hooks must be used if angling by any means other than trolling and no more than 2 such hooks shall be used. When angling with 2 hooks, the distance between the hooks must not exceed 5 inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). A circle hook is defined as a hook with a generally circular shape and a point which turns inwards, pointing directly to the shank at a 90° angle. Circle hooks are not required when artificial lures are used without bait.

   Trolling defined: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing a fish.

   Options II and III: Special Gear Restrictions off California:

   No more than 2 single point, single shank hooks may be used.

6. Control Zone Definitions:

   Columbia Recreational Control Zone (modified in 1999) - An area at the Columbia River mouth bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N/124°06'50" W) and the green lighted Buoy #7 (46°15'09' N/124°06'16" W); on the east by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N/124°03'07" W to its intersection with the north jetty; on the north by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°14'48" N/124°05'20" W) and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south by a line running northeast/southwest between the red lighted Buoy #4 and the tip of the south jetty (46°14'03" N/124°04'05" W) and then along the south jetty to the point of intersection with the Buoy #10 line (see Figure 4).

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

   Sacramento Control Zone - The ocean area bounded by a line commencing at Bolinas Pt. (Marin County, 37°54'17" N, 122°43'35" W) southerly to Duxbury Buoy to Channel Buoy 1 to Channel Buoy 2 to Pt. San Pedro (San Mateo County, 37°35'40" N, 122°31'10" W).

7. Inseason Management: Regulatory modifications may become necessary inseason to meet preseason management objectives such as quotas, harvest guidelines and season duration. Actions could include modifications to bag limits or days open to fishing, and extensions or reductions in areas open to fishing.

   The procedure for inseason coho transfer among recreational subareas north of Cape Falcon will be:

   After conferring with representatives of the affected ports and the Salmon Advisory Subpanel recreational representatives north of Cape Falcon, NMFS may transfer coho inseason among recreational subareas to help meet the recreational season duration objectives (for each subarea). Any transfers between subarea quotas of 5,000 fish or less shall be done on a fish-for-fish basis.

   At the March 2000 meeting, the Council will consider an inseason recommendation to open seasons for all salmon except coho prior to May 1 in areas off Oregon.

8. Additional Seasons in State Territorial Waters: Consistent with Council management objectives, the states of Washington and Oregon may establish limited seasons in state waters. Oregon state-water fisheries are limited to chinook salmon. Check state regulations for details.

GUIDANCE FOR OPTION DEVELOPMENT AND ASSESSMENT

Developing management options is a complex process which may be assisted by following consistent procedures wherever possible. The recommendations below were developed by the Salmon Technical Team (STT), with input from the Salmon Advisory Subpanel (SAS), and approved by the Council to help guide the option development process. They are suggested guidelines and not inflexible requirements.

1. **March Management Options**:

   a. To aid option assessment, the Council urges pertinent agency and tribal managers to have the Fishery Regulation Assessment Models ready to run no later than the first day of the March Council meeting.

   b. On the first day of the March meeting, the Council should provide specific guidance for the allowable level of impacts on OCN coho and priorities for the allocation of impacts on critical stocks (e.g., Klamath River fall chinook, Sacramento River winter chinook, Snake River fall chinook, etc.). Council staff can modify the option tables to insure that these objectives are clearly identified and addressed. Each time the Council reviews the options, it should confirm or amend its guidance on the objectives and priorities.

   c. Generally, Option I should include the Salmon Advisory Subpanel's (SAS) priority seasons and management measures. Options II and III are used to show seasons in which one group or the other gets more or less of its priorities, to illustrate the effect of other management measures (e.g., variations in bag limits for recreational fisheries), or to allow for different inside/outside allocations (e.g., options north of Cape Falcon). The final adopted options should meet basic conservation requirements.

   d. SAS representatives should clearly identify their fishery priorities (e.g., first two fish, continuous season between Point X and Y, etc.) and engage in negotiations as necessary to resolve conflicts among gear groups and areas to arrive at cohesive and coordinated options.

   e. The SAS requests assessments of impacts off California include tables with data for all harvest cells, not just those below Point Arena.

   f. Avoid adopting more than three options. The Council should attempt to identify all significant or new management measures that might be considered for final adoption. However, it is not necessary or possible to model each potential option. Many variations can simply be noted in the description of the three main options. Additional options or variations may be provided for Council consideration during the public comment period which follows the March Council meeting. This period ends with completion of public comment on the tentative adoption of final management measures during the first day of the April Council meeting (Tuesday).

2. **April Meeting**:

   The Council has indicated that on the last day of the March meeting, it will determine the schedule for final adoption of management measures at the April meeting (Thursday afternoon versus Friday).

PFMC
02/23/00

EMERGENCY CHANGES TO THE SALMON FISHERY MANAGEMENT PLAN
(Excerpt from Council Operating Procedures 26)

Criteria

The following criteria will be used to evaluate requests for emergency action by the U.S. Secretary of Commerce:

1. The issue was not anticipated or addressed in the salmon plan or an error was made.

2. Waiting for a plan amendment to be implemented would have substantial adverse biological or economic consequences.

3. In the case of allocation issues, the affected user representatives support the proposed emergency action.

4. The action is necessary to meet fishery management plan objectives.

5. If the action is taken, long-term yield from the stock complex will not be decreased.

Process

The Pacific Fishery Management Council (Council) will consider proposals for emergency changes at the March meeting and decide whether or not a specific issue appears to meet all the applicable criteria. If the Council decides to pursue any proposal, it will direct the Salmon Technical Team (STT) to prepare an impact assessment for review by the Council at the April meeting, prior to final action. Any proposals for emergency change will be presented at the public hearings between the March and April meetings. It is the clear intent of the Council that any proposals for emergency change be considered no later than the March meeting in order that appropriate attention be devoted at the April meeting to developing management recommendations which maximize the social and economic benefits of the harvestable portion of the stocks.

However, the Council may consider other proposals for emergency change at the April meeting if suggested during the public review process, but such proposals must clearly satisfy all of the applicable criteria and are subject to the requirements for an impact assessment by the STT.

PFMC
02/22/00

Statement of Jim Harp
on the Preliminary Definition of 2000 Management Options
to the Pacific Fishery Management Council
March 7, 2000

Mr. Chairman, I would like to make a brief statement regarding the status of the salmon resource in 2000 and the tribes' current thinking about a range of options for the ocean treaty troll fishery.

- This year, the forecasts for coho on the Washington coast are mixed for both wild and hatchery stocks. Because of the low forecasts for Queets, OCN, and several Puget Sound coho stocks, it will be a challenge to develop appropriate fisheries for this year.

- For chinook, as I mentioned before, several important contributing stocks continue to be depressed. However we still intend to live up to the commitment that we made in 1988 to not increase our impacts on Columbia River chinook stocks of concern. Additional listed chinook stocks will require continued attention to work out fisheries that meet the ESA requirements for these stocks.

- The tribes still have concerns about our ability to appropriately analyze and manage selective fisheries, but we appreciate the reports that WDFW and ODFW have been providing on the monitoring and sampling of their selective fisheries. We encourage the states to continue rigorous monitoring and sampling of these fisheries and continue communication on this issue with the tribes.

- For this year, we want to emphasize that any selective fishery proposals advanced by the Council must be consistent with the U.S. District Court's stipulation and order regarding mass marking and selective fisheries.

- We are beginning the process of establishing, cooperatively with the Washington Department of Fish and Wildlife, a package of fisheries that will ensure acceptable levels of escapement for

natural stocks of concern. In some cases we may not yet have agreement on specific 2000 management objectives, but the tribes intend to work cooperatively toward that end.

The Council has heard two different perspectives on the appropriate options for the Treaty Troll fishery. Negotiations on the appropriate level for the treaty troll fishery will continue throughout the North of Falcon process. Our goal this week is to simply lay out a range of reasonable options for the ocean fisheries. What is reasonable is always at least partly a subjective process. This lack of consensus makes things more difficult. In an attempt not to pre-judge the final outcome of the tribal negotiations, I offer the following range of preliminary options for the ocean treaty troll fishery for analysis by the Salmon Technical Team with the understanding that this is only the first step towards finalizing options this week to be sent out for public review.

Treaty Troll Options	Coho	Chinook
Option 1	_____	_____
Option 2	_____	_____
Option 3	_____	_____

OREGON COASTAL NATURAL COHO MANAGEMENT REVIEW - PROGRESS REPORT

Situation: Under Amendment 13 to the *Pacific Coast Salmon Plan* and by the terms of the Oregon Salmon Plan, the management of Oregon coastal natural (OCN) coho salmon is subject to a comprehensive, adaptive review this year. The purpose of the review is to assure the rebuilding program adopted in the Oregon Salmon Plan and Amendment 13 in 1997 still reflects the best science and approach to rebuilding the OCN coho stock. In addition, Amendment 13 and the Oregon Salmon Plan are the basis for management under the terms of the current National Marine Fisheries Service (NMFS) biological opinion for stocks listed under the Endangered Species Act that are impacted in Council fisheries.

In November 1999, the Council approved a review process and work group to be headed by Oregon Department of Fish and Wildlife personnel. The work group has met once and will report on the work completed and future plans. Council representatives on the work group are Drs. Pete Lawson, Robert Kope, and John Coon.

Council Action: Provide direction as necessary to the OCN coho management work group.

Reference Materials: None.

PFMC
02/22/00

Year 2000 Oregon Coastal Natural Coho Management Review

A performance review of Plan Amendment 13 to the Pacific Fishery Management Council (PFMC) Salmon Management Plan is stipulated in the language of the Amendment. Amendment 13 is modeled after the coho harvest management component of the Oregon Coastal Salmon Restoration Initiative (Oregon Plan) and that document includes a similar performance review stipulation. The goal of the review is to assure that the harvest management portion of the rebuilding plan for Oregon Coastal Natural (OCN) coho is based upon the best available science.

The review of Plan Amendment 13 will be completed in 2000, will span historical data through brood year 1996 returns, and will be a cooperative effort among PFMC co-managers. In the November 1999 meeting of the PFMC, the Oregon Department of Fish and Wildlife (ODFW) proposed the formation of an ad hoc work group to complete the review. The proposed group included representatives from ODFW and PFMC, the Scientific and Statistical Committee (SSC), the Oregon Production Index Technical Team (OPITT), and Oregon's Governor appointed Independent Multidisciplinary Science Team (IMST). ODFW was designated as the lead agency. The PFMC approved this structure and authorized John Coon from staff, Dr. Pete Lawson from the SSC, and Dr. Robert Kope from the STT to participate. ODFW has designated Sam Sharr and Curt Melcher from the Interjurisdictional Fisheries Group and Tom Nickelson from the Northwest Region as representatives. All three ODFW representatives as well as Dr. Lawson from the SSC are co-authors of the Amendment 13 risk assessment document. Curt Melcher is an STT representative and can represent that group in Dr. Kope's absence. Both Dr. Lawson and Curt Melcher serve on OPITT and can represent that group as well. The IMST has not formally designated participants but has agreed to periodic participation. Sam Sharr of ODFW will act as informal chair of the group.

The work group will attempt to meet the following timelines:

- December 1999: Initial meeting of work group.
  - Identify key issues.
  - Initial work assignments.
- Nov. 1999 – Feb. 2000: Data compilation and model review.
- Mar. 2000: Progress report to SSC, PFMC, and IMST.
- Mar. – Jun. 2000: Continuation of data analysis.
- Jun. 2000: Progress report to SSC and IMST.
- Jun. – Sep. 2000: Data analysis and report writing.
- Sep. 2000: Preliminary report to SSC, PMFC, and IMST.
- Sep. – Nov. 2000: Revisions and final edits to report.
- Nov. 2000: Final report to SSC, PFMC, and IMST.

The work group held it's first formal meeting on December 17, 1999 in Corvallis, OR. Sam Sharr, John Coon, Pete Lawson, Curt Melcher, and Tom Nickelson were in attendance. Dr. Bill Pearcy and Dr. Stan Gregory of Oregon State University attended as

IMST representatives. The purpose of the meeting was to define key harvest management issues for OCN coho recovery and to make initial work assignments with respect to investigating and resolving those issues.

There was consensus among the group that, while the two-dimensional management matrix (Table 1) in Plan Amendment 13 is conceptually sound, existing parental spawner and marine survival decision points need to be reconsidered and possibly redefined. The feasibility of sub-aggregate specific management was also identified as an issue based upon observed differences in recruitment among OCN sub-aggregates. Finally, the group wanted to ensure that data collected subsequent to the adoption of Amendment 13 be included in all new analyses. Specifically, the group posed the following questions:

1) Are parental spawner decision points at ~~X~~19%, 50%, and 75% of full seeding adequate to achieve recovery?
2) Do the current marine survival decision points based on data for hatchery fish accurately reflect historically observed ranges of low, medium, and high survival categories and are the categories properly scaled to represent wild fish? Survival?
3) Are there low levels of marine survival or parental spawning escapement at which we are no longer willing to accept any harvest impacts?
4) What is the lowest impact achievable for OCN coho without seriously jeopardizing fisheries that are directed at other species?
5) Are sufficient data available to apply the management matrix to stock sub-aggregates or gene conservation groups (GCG's) instead of the entire coastal aggregate?
6) Will data acquired or updated since the Amendment 13 Risk Assessment Analysis change our decision criteria?

To address these questions the work group identified data, analytical, and modeling needs and made the following work assignments:

1) Data
   a) Update habitat classification database in the Habitat Based Production Model. (Nickelson).
   b) Update data files for all remaining population parameters (e.g. recent year parental escapement, marine survival etc.). (Lawson and Nickelson)
2) Analysis
   a) Analyze the historic coded-wire tag recovery database from ocean fisheries for sub-aggregate specific temporal and spatial distribution trends. (Melcher and Sharr)
3) Modeling
   a) Examine the sensitivity of extinction probability to variations in population size and exploitation rate when marine survival is held constant. Complete this analysis for fixed marine survival values selected from across the range of observed values. (Lawson).
   b) Re-simulate the application of Amendment 13 using different marine survival and parental spawner trigger points. (Lawson and Nickelson).

c) Update historic harvest rates by fishery using FRAM with new Stratified Random Survey (SRS) escapement estimates and new Council adopted hooking mortality rates. (Melcher)

To date, task 3c is complete, and some work has begun on items 1a, 1b, and 3a. The group will give the SSC and the Council a progress report again in June.

Table 1. Matrix of allowable fishery exploitation rates for OCN coho under Amendment 13 of the PFMC Salmon Management Plan.

PARENT SPAWNER STATUS [b/]	SMOLT TO ADULT MARINE SURVIVAL [a/]		
	Low	**Medium**	**High**
	ALLOWABLE TOTAL FISHERY IMPACT		
High Parent Spawners achieved Level #2 rebuilding criteria *and* grand parent spawners achieved Level #1 rebuilding criteria	**≤15%**	**≤30%**	**≤35%**
Medium Parent spawners achieved Level #1 or greater rebuilding criteria	**≤15%**	**≤20%**	**≤25%**
Low Parent spawners less than Level #1 rebuilding criteria	**≤15%** **≤10-13%** [c/]	**≤15%**	**≤15%**

Stock Component Rebuilding Criteria:	**Level #1** (50%)	**Level #2** (75%)
Northern	10,900	16,400
North - Central	27,500	41,300
South - Central	25,000	37,500
Southern	2,700	4,100
Total	66,100	99,300

a/ ~~Smolt~~ smolt to adult survival as estimated from measured smolt to jack survival for OPI coho.

b/ In the event that a spawner criteria is achieved, but a major basin within the sock component is less than ten percent of the full seeding level, the next tier of additional harvest would not be allowed in mixed stock fisheries for that component, nor additional impacts within that particular basin.

c/ This exploitaiton rate criteria applies when parent spawners are less than 38% of the Level #1 rebuilding criteria, or when marine survival conditions are extremely low as in 1994-95 (I.e. < 0.06% hatchery smolt to jack survival).

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON OREGON COASTAL NATURAL COHO MANAGEMENT REVIEW - PROGRESS REPORT

At its November 1999 meeting, the Council approved an Oregon Department of Fish and Wildlife (ODFW) proposal to form an ad-hoc work group to ensure the harvest management portion of the rebuilding plan for Oregon coastal natural (OCN) coho is based on the best available science. Mr. Sam Sharr of ODFW informed the Scientific and Statistical Committee (SSC) of the work group's progress to date.

The SSC considers the group's work plan to be systematic and well-considered. In addition to the list of questions the work group proposes to address, the SSC would also like the group to evaluate whether improvements could be made to the current method of estimating marine survival, which is a critical parameter for setting allowable OCN exploitation rates. The SSC is particularly interested in how the previous year's smolt-to-jack ratio is used to infer smolt-to-adult survival in the current year, and also, how survival data for hatchery fish is extrapolated to natural coho stocks. In terms of the composition of the work group, the SSC strongly encourages regular participation by the Independent Multidisciplinary Science Team.

PFMC
03/08/00

UPDATES ON ACTIVITIES TO RESTORE NATURAL STOCKS

Situation: This agenda item provides an opportunity for the agencies and tribes to update the Council and public on actions they are taking to help assure the restoration of natural salmon stocks. This item will occur on both the March and April Council agendas to allow the agencies and tribes to select the time and location which best suits their personnel needs in making meaningful presentations.

Council Action: None.

Reference Materials: None.

PFMC
02/22/00

SALMON RESTORATION IN CALIFORNIA – 1989 THROUGH 1999

Nearly $525 million have been expended in California for salmon (and steelhead) restoration during the past decade. During the first half of the decade, the Department of Fish and Game Fishery Restoration Grant Program was the major vehicle for disbursement of restoration funds made available through legislative processes. During the latter half of the decade, major funding, at State and Federal levels, became available for salmon (and steelhead) restoration in the Central Valley drainage. Beginning in 1997, new annual State funding of $8 million became available for restoration work in drainages outside the Central Valley, and a major commitment to the State of ongoing Federal funding for coastal stream restoration outside the Central Valley was made in the Federal budget for 2000. Highlights of restoration funding for the past 10 years are listed below. Restoration efforts focus on improvement of habitat for fish that spawn naturally.

- **Fishery Restoration Grants Program**

  Nearly $38 million were distributed from a variety of sources for salmon (and steelhead) restoration throughout the State, though most projects were implemented on coastal streams outside the Central Valley. Several State funding sources supported this program.

Commercial Salmon Trollers Enhancement and Restoration Program (Salmon Stamp)	$8.00 million
California Wildlife, Coastal, and Park Land Conservation Fund of 1988 (Proposition 70)	$10.00 million
Cigarette and Tobacco Products Surtax Fund (Proposition 99)	$2.20 million
Wildlife Conservation Board (mainly through Proposition 19, enacted 1984, funds for instream work)	$4.25 million
Salmon and Steelhead Trout Restoration Account (SB-271, enacted 1997)	$13.30 million

  Projects included instream and upslope restoration, public involvement and education, purchases of equipment for Department habitat restoration work and for Department hatcheries, and limited numbers of cooperative fish rearing projects.

- **Cental Valley Project Improvement Act Salmon Restoration Program**

  From 1993 through 1999, nearly $354 million in State and Federal funds have been expended for a variety of restoration projects in the Central Valley drainage.

- **CALFED**

  Just over $110.6 million have been expended or committed for projects in the Central Valley drainage since 1997. Projects under this program include fish passage improvement, floodplain and habitat restoration, habitat and species assessment and monitoring, public involvement, and environmental education.

- **Four-Pumps Agreement**

  The agreement, between the departments of Water Resources and Fish and Game, was entered to provide funds to help offset fish losses at the State Water Project pumping facility in the south Delta. Two accounts were established under the agreement. A lump sum of $15 million was directed to restoration of salmon, steelhead, and striped bass. Most of these funds were expended for salmon restoration in the Central Valley. An ongoing account to offset annual losses of salmon at the pumping facility has provided just under $3.25 million to date for Central Valley salmon restoration projects.

- **Tracy Fish Facility Mitigation Program**

  Somewhat similar to the Four-Pumps Agreement, this program provides Federal funds to the State to offset losses at the Central Valley Project pumping facility in the south Delta. Since 1996, just over $4 million have been made available for restoration and enforcement projects in the Central Valley. An additional $7.3 million have been committed for projects yet to be specified.

- **Northern California Steelhead Monitoring and Assessment**

  The Department of Fish and Game has implemented a program for studying and providing restoration guidance for steelhead along the northern coast. Led by a Senior Fishery Biologist, and staffed with 14 permanent positions and 26 temporary help personnel years, the program will determine population status and trends for naturally spawning and hatchery steelhead in streams north of the Russian River. Information collected will lead to recommendations for steelhead restoration work in northern California streams. It may be necessary to significantly increase staffing with increase Federal protection of steelhead to comply with provisions of the agreement between the Department of Fish and Game and the National Marine Fisheries Service.

Supplemental USFWS Report B.6.
March 2000

Update on USFWS Activities to Restore Natural Stocks

The Service has been actively involved in a number of activities that support the protection and restoration of natural stocks. In the habitat arena, the Service is working closely with other partners through the Central Valley Project Improvement Act and CalFed to promote anadromous fish restoration in the Central Valley and Bay Delta areas under an ecosystem restoration approach. The major activities in recent years have been efforts to provide additional flows for fish migration, spawning, and rearing and efforts to reduce anadromous fish mortality at the Delta pumps through reduced water export during times of peak juvenile fish emigration. There are a number of habitat improvement projects on the horizon for the Central Valley and Bay Delta areas under the longer term planning process of CalFed.

The Service, along with the Hoppa Valley Tribe, has been intimately involved with the Trinity River Flow Evaluation Study and has a lead role with the Hoopa Valley Tribe, Bureau of Reclamation, and Trinity County for the Trinity River Mainstem Fishery Restoration draft EIS/EIR. We hope to have a Record of Decision to provide increased flows in the Trinity River within the next couple of months. The Service is involved in many other projects throughout WA, OR, CA, and ID including the Interior Columbia River Basin Ecosystem Management Project (ICBEMP) which is being developed to address a long term aquatic conservation strategy, a terrestrial conservation strategy, and a landscape strategy that includes economic impacts for east-side Forest Service and BLM lands in the Columbia River Basin.

One additional habitat project that should be of special interest in California is the Battle Creek Restoration Program. Battle Creek, a tributary of the upper Sacramento River, represents a high potential for future natural production of salmon and steelhead. In fact, early fisheries investigators claimed that Battle Creek was one of the most important salmon producing tributaries of the Sacramento River when its ecosystem had its original form and function. Stream habitats in Battle Creek, like others in the Central Valley, were severely degraded beginning with the development of hydropower and irrigation withdrawals in the late nineteenth century. The Battle Creek Restoration Program seeks to correct many of these habitat problems. Winter chinook, spring chinook, and steelhead (all listed) currently spawn in the system. The Service is working with a number of partners on this project including: the Battle Creek Watershed Conservancy, the Battle Creek Working Group, Pacific Gas and Electric, landowners, National Marine Fisheries Service, California Department of Fish and Game, U.S. Bureau of Reclamation, California Department of Water Resources, Central Valley Project Association, and the Nature Conservancy. This is truly a unique partnership program of many entities with the goal of enhancing natural production while maintaining the economic well-being of the local community.

Currently, the biggest limiting factors preventing salmon and steelhead from fully utilizing the upper water shed are low flows and inadequate passage. Higher flows will occur as part of this

restoration project and will mean more available habitat for rearing juvenile salmon as well as additional cooler water during summer for holding and spawning adult salmon. Passage problems will also be alleviated as part of the restoration project. Specifically, the restoration proposal includes: 1) increasing the minimum flows from the present amount of 3-5 cfs year around to approximately 35-88 cfs adjusted seasonally; 2) decommissioning five diversion dams (Wildcat, Coleman, South, Lower Ripley Creek, and Soap Creek diversion dams) and transferring their associated water rights to instream uses; 3) screening and enlarging ladders at three diversion dams (Inskip, Eagle Canyon, and North Battle Creek Feeder diversion dams); and 4) constructing new infrastructure (tailrace connectors) that eliminate mixing of North and South Fork waters and significantly reduce redundant screening requirements. A Memorandum of Understanding for hydropower modifications was signed in June of 1999 and the construction phase is tentatively projected for completion in 2003. The parties are currently proceeding through the NEPA and FERC amendment process. The Service plans to integrate Coleman NFH operations with the Battle Creek Restoration Program and is currently conducting a review of the Coleman hatchery program.

SALMON TECHNICAL TEAM

ROUND TWO:

COLLATION OF PRELIMINARY SALMON MANAGEMENT OPTIONS FOR 2000 OCEAN FISHERIES

March 9, 2000

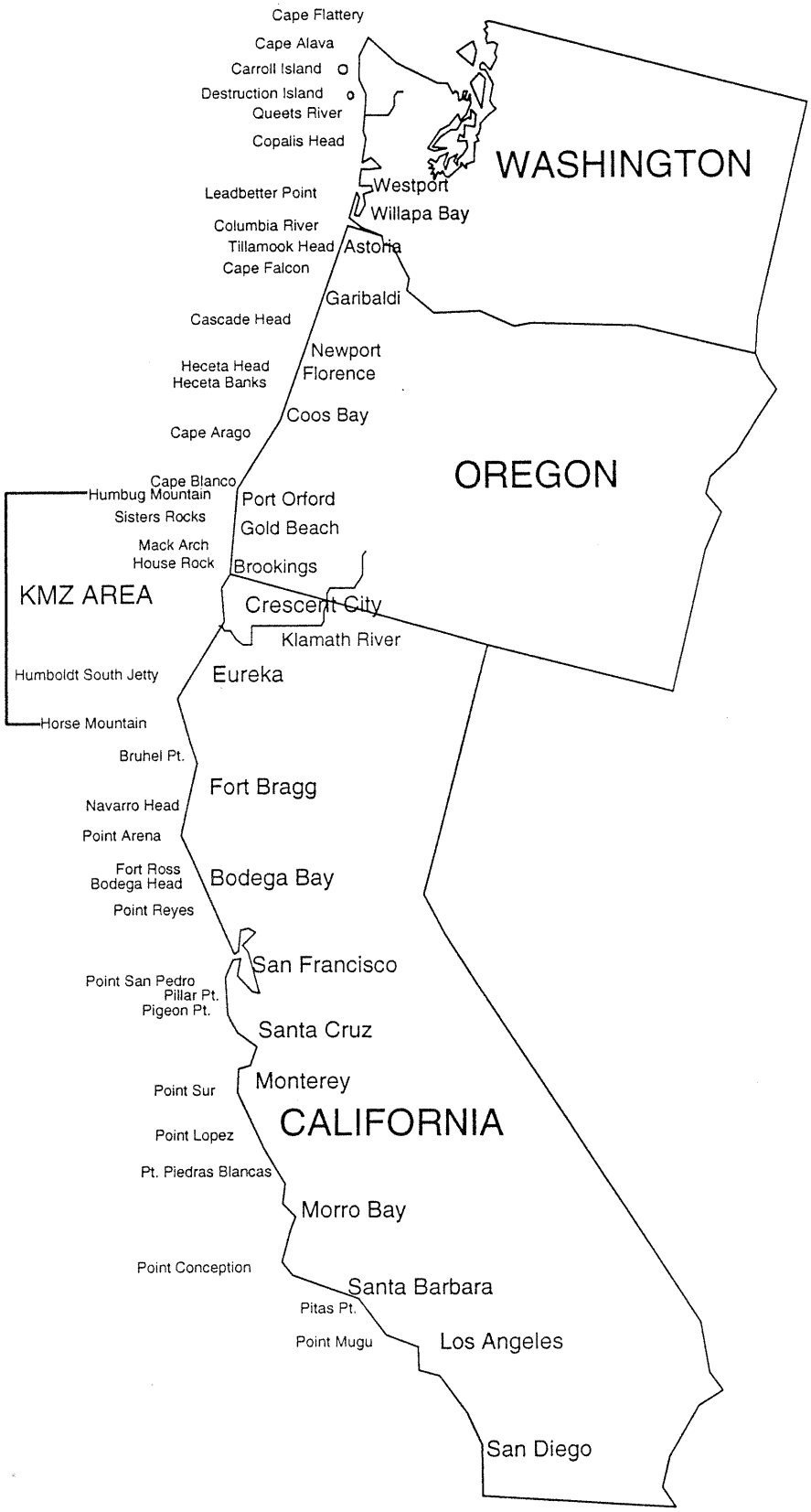
Cape Flattery
Cape Alava
Carroll Island
Destruction Island
Queets River
Copalis Head
WASHINGTON
Leadbetter Point
Westport
Willapa Bay
Columbia River
Tillamook Head
Astoria
Cape Falcon
Garibaldi
Cascade Head
Newport
Heceta Head
Heceta Banks
Florence
Coos Bay
Cape Arago
OREGON
Cape Blanco
Humbug Mountain
Port Orford
Sisters Rocks
Gold Beach
Mack Arch
House Rock
Brookings
KMZ AREA
Crescent City
Klamath River
Humboldt South Jetty
Eureka
Horse Mountain
Bruhel Pt.
Fort Bragg
Navarro Head
Point Arena
Fort Ross
Bodega Head
Bodega Bay
Point Reyes
San Francisco
Point San Pedro
Pillar Pt.
Pigeon Pt.
Santa Cruz
Monterey
Point Sur
CALIFORNIA
Point Lopez
Pt. Piedras Blancas
Morro Bay
Point Conception
Santa Barbara
Pitas Pt.
Point Mugu
Los Angeles
San Diego

TABLE 1. **Commercial troll** management options collated by the STT for round two of non-Indian ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I North of Cape Falcon	OPTION II North of Cape Falcon	OPTION III North of Cape Falcon
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Treaty Indian commercial ocean troll quotas of: 30,000 chinook (20,000 in May and June; 10,000 for all-salmon season in Aug.-Sept. 15); 38,500 coho 4. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 5. Non-Indian Troll TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 25,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 25,000 chinook (20,000 in May and June; 5,000 for all-salmon season in Aug.-Sept. 15); 12,400 coho 4. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 5. Non-Indian Troll TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 18,750 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 20,000 chinook in May and June; 0 coho 4. Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 5. Non-Indian Troll TAC: 0 chinook and selective fishery impacts associated with a landed catch of 12,500 coho.
U.S.-Canada Border to Cape Falcon • May 1 thru earlier of June 15 or 10,000 chinook guideline. All salmon except coho. Columbia Control Zone closed (B.7.) Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.	**U.S.-Canada Border to Cape Falcon** • May 1 thru earlier of June 15 or 8,500 chinook quota. All salmon except coho. Columbia Control Zone is closed (same area as described for recreational fishery beginning in 1999).	**U.S.-Canada Border to Cape Falcon** • Closed.
Queets River to Cape Falcon • July 7 thru earliest of Sept. 30 or the overall chinook quota (preseason 2,500 chinook guideline) or 25,000 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River Control Zone is closed (B.7.).	**Queets River to Cape Falcon** • Aug. 11 thru earliest of Sept. 30 or the overall chinook quota (preseason 1,500 chinook guideline) or 18,750 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (same area as for sport fishery).	**Queets River to Cape Falcon** • Aug. 18 thru earlier of Sept. 30 or 12,500 marked coho quota. All salmon except chinook. All retained coho must have a healed adipose fin clip. Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (B.7.).

TABLE 1. **Commercial troll** management options collated by the STT for round two of non-Indian ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I South of Cape Falcon	OPTION II South of Cape Falcon	OPTION III South of Cape Falcon
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.9% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.3% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.4 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,700 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.6% age-4 ocean harvest rate; 35,600 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.1 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,900 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.6% age-4 ocean harvest rate; 35,400 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 7.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.2% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.5 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,500 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.4% age-4 ocean harvest rate; 35,800 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt. • Apr. 1 thru Aug. 29, and Sept. 1 thru Oct. 31. All salmon except coho. See Oregon State regulations for a description of the closed area at the mouth of Tillamook Bay. [**Note:** Incidental retention of halibut is not allowed during April.]	**Cape Falcon to Humbug Mt.** • Same as Option I, except openings are Apr. 1 thru July 19, Aug. 1 thru Aug. 28, and Sept. 1 thru Oct. 31.	**Cape Falcon to Humbug Mt.** • Same as Option II.
Humbug Mt. to OR-CA Border • May 1 thru May 31. All salmon except coho.	**Humbug Mt. to OR-CA Border** • Same as Option I.	**Humbug Mt. to OR-CA Border** • Same as Option I.
Sisters Rocks to Mack Arch • 8/1 thru earlier of 8/31 or 2,500 chinook quota. All salmon except coho. Open 0-4 nautical miles. All salmon must be landed and delivered to Gold Beach, Port Orford or Brookings within 24 hours of closure.	**Sisters Rocks to Mack Arch** • Same as Option I.	**Sisters Rocks to Mack Arch** • Same as Option I.
House Rock, OR to Humboldt South Jetty • Sept. 1 thru earlier of Sept. 30 or 7,000 chinook quota. All salmon except coho. Possession and landing limit of 30 fish per day. All fish caught in this area must be landed within the area. Klamath Control Zone closed (see B.7.). Within the 7,000 chinook quota is a harvest guideline limiting landings at the port of Brookings to no more than 1,000 chinook. If this guideline is reached prior to the overall quota, the fishery will close north of the Oregon-California border. When the fishery is closed north of the Oregon-California border and open to the south, Oregon State regulations provide for the following action: Vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival.	**House Rock, OR to Humboldt South Jetty** • Same as Option I.	**House Rock, OR to Humboldt South Jetty** • Same as Option I.

TABLE 1. **Commercial troll** management options collated by the STT for round two of non-Indian ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Horse Mt. to Pt. Arena (Fort Bragg) • Sept. 1 thru Sept. 30. All salmon except coho.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.
Pt. Arena to Pt. Reyes (Bodega Bay) • July 18 thru Sept. 30. All salmon except coho. Minimum size limit 27 inches. **Fort Ross to Pt. Reyes** (test fishery inside 6 nm) • July 1 thru earlier of July 15 or 3,500 chinook quota. All salmon except coho. Fishery closed July 3 and 4. Minimum size limit 26 inches (to be consistent with 1998 and 1999 test fisheries). Open only inside 6 nautical miles. Landing limit of 30 fish per day. All fish caught in this area must be landed in Bodega Bay. Fish taken outside this area may not be landed at Bodega Bay while this fishery is open.	**Pt. Arena to Pt. Reyes (Bodega Bay)** • Same as Option I. **Fort Ross to Pt. Reyes** • Same as Option I, except 4,500 chinook quota.	**Pt. Arena to Pt. Reyes** • Same as Option I. **Fort Ross to Pt. Reyes** • Same as Option II, except fishery follows a cycle of 2days open/2 days closed.
Pt. Reyes to Pt. San Pedro • July 1 thru Sept 30. All salmon except coho. Minimum size limit 26 inches thru June 30 and 27 inches thereafter.	**Pt. Reyes to Pt. San Pedro** • Same as Option I, except opening is May 21 thru Sept. 30.	**Pt. Reyes to Pt. San Pedro** • Same as Option II.
Pt. San Pedro to U.S.-Mexico Border • May 1 thru Sept. 30. All salmon except coho.	**Pt. San Pedro to U.S.-Mexico Border** • May 1 thru Aug. 15 and Sept. 15 thru Sept. 30. All salmon except coho.	**Pt. San Pedro to U.S.-Mexico Border** • Same as Option II.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

B.1. Minimum size limits in inches (when seasons are open):

	Chinook		Coho		
Area (when open)	Total Length	Head-off	Total Length	Head-off	Pink
North of Cape Falcon	28.0	21.5	16.0	12.0	None
Cape Falcon to Pt. Arena*	26.0*	19.5*	-	-	None
South of Pt. Arena prior to July 1*	26.0*	19.5*	-	-	None
South of Pt. Arena after June 30*	27.0*	20.25*	-	-	None

* Chinook not less than 26 inches (19.5 inches head-off) taken in open seasons south of Cape Falcon may be landed north of Cape Falcon only when the season is closed north of Cape Falcon.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

3. Transit Through Closed Areas with Salmon on Board - It is unlawful for a vessel to have troll gear in the water while transiting any area closed to salmon fishing while possessing salmon.

TABLE 1. **Commercial troll** management options collated by the STT for round two of non-Indian ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (continued)

3. Hooks - Single point, single shank barbless hooks are required and circle hooks are required when fishing by any means other than trolling. ***Trolling is defined*** as angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing fish.

5. Spread - A single leader connected to an individual lure or bait.

6. Line, Spread and Gear Restrictions:

   a. Off **Oregon south of Cape Falcon**, no more than 4 spreads are allowed per line.

   b. Off **California**, no more than 6 lines are allowed per vessel.

7. Control Zone Definitions:

   Columbia Commercial Control Zone - The ocean area at the Columbia River mouth bounded by a line extending for 6 nautical miles due west from North Head along 46°18'00" N to 124°13'18" W, then southerly to 46°13'24" N and 124°11'00" W (green, Columbia River Entrance Lighted Bell Buoy #1), then southerly to 46°11'06" N and 124°11'00" W (red, Columbia River Approach Lighted Whistle Buoy), then northeast along red buoy line to the tip of the south jetty.

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W. (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

8. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board and the estimated time of arrival. This stipulation will be implemented by state regulations for California, Oregon and Washington, as required.

9. Incidental Halibut Harvest - The operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A, during authorized periods, while trolling for salmon. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone 206/634-1838). Applicants must apply prior to April 1 of each year. Incidental harvest is authorized only during **May and June** troll seasons and after July 31 if quota remains and if announced on the NMFS hotline (phone 800-662-9825). ODFW and WDFW will monitor landings and if they are projected to exceed the 23,490 pound preseason allocation or the Area 2A non-Indian commercial halibut TAC, NMFS will take inseason action to close the incidental halibut fishery.

   Option I: License holders may land no more than 1 halibut per each 2 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 50 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches.

   Option II: License holders may land no more than 1 halibut per each 5 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches. (1999 regulations)

10. Inseason Management - In addition to standard inseason actions or inseason modifications already noted under the season description, the following inseason guidance is provided to NMFS:

    - Transfers of 5,000 fish or less between subarea quotas north of Cape Falcon shall be done on a fish-for-fish basis;
    - At the March 2001 meeting, the Council will consider inseason recommendations to: (1) open commercial seasons for all salmon except coho prior to May 1 in areas off Oregon, and (2) identify the areas, season, quota, and special regulations for any experimental April fisheries (proposals must meet Council protocol and be received in November 2000).

11. Consistent with Council management objectives, the State of Oregon may establish additional late-season, chinook-only fisheries in state waters. Check state regulations for details.

12. For the purposes of CDFG Code, Section 8232.5, the definition of the KMZ for the ocean salmon season shall be that area from Humbug Mt., Oregon to Horse Mt., California.

TABLE 2. **Recreational** management options collated by the STT for round two of ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I North of Cape Falcon	OPTION II North of Cape Falcon	OPTION III North of Cape Falcon
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 8,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 7. Recreational TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 75,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 6,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 7. Recreational TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 56,250 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required); 2. Same as Option I. 3. Neah Bay/La Push agreed coho allocation of 80%/20%. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6.Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 7. Recreational TAC: 0 chinook and selective fishery impacts associated with a landed catch of 37,500 coho.
U.S.-Canada Border to Cape Alava (Neah Bay) • July 3 thru earlier of Sept. 30 or 6,600 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 500 chinook.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 10 thru earlier of Sept. 30 or 5,000 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 24 thru earlier of Sept. 30 or 3,900 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Cape Alava to Queets River (La Push) • July 3 thru earlier of Sept. 30 or 1700 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 300 chinook.	**Cape Alava to Queets River (La Push)** • July 10 thru earlier of Sept. 30 or 1,200 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**Cape Alava to Queets River (La Push)** • July 24 thru earlier of Sept. 30 or 975 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Queets River to Leadbetter Pt. (Westport) • Sun. thru Thurs. July 3 thru earlier of Sept. 30 or 29,200 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and limit harvest within a guideline of 7,400 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 21,900 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed inside the area defined by a line drawn from the lighthouse to Buoy 2 to Buoy 3 to the Grays Harbor north jetty. Inseason management may be used to sustain season length and limit harvest within a guideline of 6,450 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 13,875 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed 0-3 nautical miles offshore.

TABLE 2. **Recreational** management options collated by the STT for round two of ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Leadbetter Pt. to Cape Falcon (Columbia River) • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 37,500 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 4,300 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 28,100 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 3,450 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 18,750 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.
South of Cape Falcon	**South of Cape Falcon**	**South of Cape Falcon**
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.9% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.3 % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.4% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,700 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.6% age-4 ocean harvest rate; 35,600 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.1% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,900 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.6% age-4 ocean harvest rate; 35,400 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 7.3%(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.2% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.5 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (27,500 fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.4% age-4 ocean harvest rate; 35,800 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt • Except as provided below during the selective fishery, the season will be: Apr. 1 thru Oct. 31. All salmon except coho. 2 fish per day. No more than 6 fish in 7 consecutive days. Legal gear limited to artificial lures and plugs of any size, or bait no less than 6 inches long (excluding hooks and swivels). All gear must have no more than 2 single point, single shank barbless hooks. Divers are prohibited and flashers may be used only with downriggers. See Oregon State regulations for a description of a closure at the mouth of Tillamook Bay. Selective fishery: • Sun., Tue., Wed., Thur., and Sat. of each week, July 1 thru earlier of July 31 or a landed catch of 25,000 coho. All salmon. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish in 7 consecutive days. No special gear restrictions except B.3. (barbless hooks). Open days may be adjusted to utilize the available quota. **Note:** On closed days during the selective fishery, no angling for any species of salmon is allowed. All salmon except coho season reopens the earlier of Aug. 1 or attainment of the coho quota.	**Cape Falcon to Humbug Mt** • Same as Option I, except no selective fishery (i.e., Apr. 1 thru Oct. 31; all salmon except coho; 2 fish per day, etc.).	**Cape Falcon to Humbug Mt** • Same as Option II.

TABLE 2. **Recreational** management options collated by the STT for round two of ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Humbug Mt. to Horse Mt. • May 30 thru July 4 and Aug. 5 thru Sept. 10. All salmon except coho. 2 fish per day. No more than 4 fish in 7 consecutive days. Klamath Control Zone (B.6.) closed. One rod per angler (B.4.). (20% effort buffer used to help limit harvest) (73 days)	**Humbug Mt. to Horse Mt.** • Same as Option I, except openings are May 27 thru July 6 and July 29 thru Sept. 10; and a bag limit of 1 fish per day. (No effort buffer applied) (85 days)	**Humbug Mt. to Horse Mt.** • Same as Option I, except openings are June 1 thru July 4 and Aug. 5 thru Sept. 10. (71)
Horse Mt. to Pt. Arena • Feb. 12 thru July 4 and July 25 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. (circle hooks when mooching). One rod per angler (B.4.).	**Horse Mt. to Pt. Arena** • Same as Option I, except open continuously from Feb. 12 thru Nov. 12.	**Horse Mt. to Pt. Arena** • Same as Option I.
In 2001, the season will open Feb. 17 (nearest Sat. to Feb. 15) for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as Option I.	Year 2001 opening same as Option I.
Pt. Arena to Pigeon Pt. • Apr. 15 thru Oct. 29. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. One rod per angler. Special gear restriction B.5. (circle hooks when mooching).	**Pt. Arena to Pigeon Pt.** • Same as Option I, except opening is Apr. 15 thru Nov. 5 and B.5. Option II (restriction on number and type of hooks).	**Pt. Arena to Pigeon Pt.** • Same as Option I.
In 2001, the season will open Apr. 14 for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.
Pigeon Pt. to U.S.-Mexico Border • Apr. 1 thru Oct. 1. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. One rod per angler north of Pt. Conception.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.
In 2001, the season will open March 31 for all salmon except coho, 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

1. Minimum size limits (total length in inches) when areas are open:

Area (when open)	Chinook	Coho	Pink
North of Cape Falcon	24.0	16.0	None
Cape Falcon to Horse Mt.	20.0	16.0	None, except 20.0 off CA
South of Horse Mt.*	20.0*	-	20.0

* **Except** 24.0 inches from opening day thru May 31.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished . Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

TABLE 2. **Recreational** management options collated by the STT for round two of ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (Continued)

3. Hooks: Single point, single shank barbless hooks are required for all fishing gear north of Pt. Conception, California. ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.

4. Restriction on Number of Fishing Rods North of Pt. Conception, California: All persons fishing for salmon, and all persons fishing from a boat with salmon on board, may use no more than one rod per angler.

5. Option I: Special Gear Restrictions Between Horse Mt. and Pt. Conception, California:

   Single point, single shank, barbless **circle** hooks must be used if angling by any means other than trolling and no more than 2 such hooks shall be used. When angling with 2 hooks, the distance between the hooks must not exceed 5 inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). A circle hook is defined as a hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle such that the shank bend and point should lie flat on a flat surface. Circle hooks are not required when artificial lures are used without bait.

   Trolling defined: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing a fish.

   Options II: Special Gear Restrictions off California:

   Anglers must use no more than 2 single point, single shank barbless hooks.

6. Control Zone Definitions:

   Columbia Recreational Control Zone (modified in 1999) - An area at the Columbia River mouth bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N/124°06'50" W) and the green lighted Buoy #7 (46°15'09' N/124°06'16" W); on the east by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N/124°03'07" W to its intersection with the north jetty; on the north by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°14'48" N/124°05'20" W) and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south by a line running northeast/southwest between the red lighted Buoy #4 and the tip of the south jetty (46°14'03" N/124°04'05" W) and then along the south jetty to the point of intersection with the Buoy #10 line (see Figure 4).

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

7. Inseason Management: Regulatory modifications may become necessary inseason to meet preseason management objectives such as quotas, harvest guidelines and season duration. Actions could include modifications to bag limits or days open to fishing, and extensions or reductions in areas open to fishing.

   The procedure for inseason coho transfer among recreational subareas north of Cape Falcon will be:

   After conferring with representatives of the affected ports and the Salmon Advisory Subpanel recreational representatives north of Cape Falcon, NMFS may transfer coho inseason among recreational subareas to help meet the recreational season duration objectives (for each subarea). Any transfers between subarea quotas of 5,000 fish or less shall be done on a fish-for-fish basis.

   At the March 2001 meeting, the Council will consider an inseason recommendation to open seasons for all salmon except coho prior to May 1 in areas off Oregon.

8. Additional Seasons in State Territorial Waters: Consistent with Council management objectives, the states of Washington and Oregon may establish limited seasons in state waters. Oregon state-water fisheries are limited to chinook salmon. Check state regulations for details.

TABLE 3. Preliminary projection of impacts and escapements (thousands of fish) for round two of STT collated options.

KEY STOCK/CRITERIA	IMPACT or ESCAPEMENT for OPTIONS			OBJECTIVE or COMPARATIVE NUMBER	
	I	II	III		
CHINOOK					
Upper River Brights	190.6	191.3	193.3	55.6	Ocean escapement[a/]
Mid-Columbia Brights	56.9	57.1	57.7	-	Information only
Lower River Hatchery Tules	24.0	24.8	26.8	24.0	Ocean escapement[b/]
Lewis River Wild (threatened)	2.57	2.58	2.63	5.7	MSY spawner goal[c/]
Spring Creek Hatchery Tules	24.0	24.8	27.2	11.1	Ocean escapement[d/]
Snake River Fall (threatened) SRFI				≤0.70	Exploitation rate - all ocean fisheries[e/]
Klamath River Fall	35.6	35.4	35.8	35.0	Floor level natural spawners
Tribal/Nontribal Allocation	50/50	50/50	50/50	50/50	Required allocation
Age 4 harvest rate	13.6%	13.6%	13.4%	≤17.0%	Jeopardy standard for coastal chinook[e/]
KMZ Sport Fishery	17%	17%	17%	17%	Agreed allocation
CA/OR split	50/50	59/41	59/41	-	Information only
River Recreational Fishery	15%	15%	15%	15%	CA Fish and Game Commission
Sacramento Winter (endangered)	31.4%	31.1%	31.5%	≥31.0%	Increase in age 3 replacement rate[e/]
COHO					
Skagit	22.1	22.7	23.1	30.0	MSP adult spawners (not annual target)[f/]
Stillaguamish	14.0	14.6	14.9	17.0	"
Snohomish	42.1	43.7	44.7	70.0	"
Hood Canal	57.7	25.5	26.1	21.5	"
Strait of Juan de Fuca	10.7	11.1	11.3	12.8	"
Quillayute Fall	8.0	8.3	8.4	6.3-15.8	MSY adult spawner range (not target)[f/]
Hoh	3.2	3.4	3.4	2.0-5.0	"
Queets					"
Wild	2.4	2.5	2.6	5.8-14.5	"
Supplemental	0.7	0.7	0.7	-	
Hatchery	9.6	10.1	10.4	-	
Grays Harbor	42.6	43.8	44.5	35.4	MSP adult spawners (not annual target)[f/]
OCN	8.9%	8.3%	7.3%	≤15%	Marine and freshwater exploitation rate[e/]
RK	5.3%	6.8%	5.2%	≤13%	Marine exploitation rate[e/]
Columbia River Early	217.0	241.3	251.4	41.7	Ocean escapement[g/]
Columbia River Late	169.4	191.5	208.3	29.2	Ocean escapement[g/]

a/ Minimum to achieve 43,500 adult escapement over McNary Dam, assuming normal distribution and no mainstem harvest.
b/ Minimum to achieve 15,500 spawner return to meet hatchery egg-take goal, assuming normal distribution and no lower river mainstem or tributary harvest.
c/ ESA guidance met by meeting objective for LCR tules.
d/ Minimum to achieve 7,000 Spring Creek Hatchery return egg-take goal, assuming normal distribution and no mainstem harvest.
e/ ESA guidance or jeopardy standard.
f/ Annual management objectives subject to aggreement between WDFW and treaty tribes.
g/ Minimum to achieve hatchery egg-take goals of 22,500 early and 16,300 late coho, assuming average distribution patterns and no mainstem or tributary fisheries.

TABLE 4. Expected coastwide Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho exploitation rates by fishery under the proposed 2000 management option collation, round two. (Page 1 of 1)

	Exploitation Rate (Percent)					
	OCN			RK		
Fishery	I	II	III	I	II	III
SOUTHEAST ALASKA	0.03	0.03	0.03	0.00	0.00	0.00
BRITISH COLUMBIA	0.12	0.12	0.12	0.00	0.00	0.00
PUGET SOUND/STRAITS	0.65	0.66	0.67	0.00	0.00	0.00
NORTH OF CAPE FALCON						
Treaty Indian Troll	0.38	0.13	0.00	0.00	0.00	0.00
Recreational	0.55	0.40	0.24	0.04	0.02	0.02
Non-Indian Troll	0.32	0.30	0.18	0.00	0.00	0.00
SOUTH OF CAPE FALCON						
Recreational:						
Cape Falcon to Humbug Mt.	1.06	0.41	0.41	0.08	0.04	0.04
Humbug Mt. to Horse Mt. (KMZ)	0.73	0.92	0.72	2.38	2.94	2.33
Fort Bragg	0.44	0.81	0.44	1.20	2.20	1.20
South of Pt. Arena	0.72	0.72	0.72	0.39	0.39	0.39
Troll:						
Cape Falcon to Humbug Mt.	1.98	1.72	1.71	0.11	0.09	0.09
Humbug Mt. to Horse Mt. (KMZ)	0.15	0.15	0.15	0.52	0.50	0.50
Fort Bragg	0.02	0.02	0.02	0.09	0.09	0.09
South of Pt. Arena	0.65	0.79	0.80	0.33	0.39	0.39
BUOY 10	0.20	0.18	0.18	0.12	0.11	0.11
ESTUARY/FRESHWATER	0.93	0.94	0.95	---	---	---
TOTAL	8.91	8.30	7.8434	5.27	6.77	5.17

ADOPTION OF 2000 MANAGEMENT OPTIONS FOR SALMON TECHNICAL TEAM ANALYSIS

Situation: The Salmon Technical Team (STT) will present the Council with coordinated coastwide management options which embody, to the extent possible, the management elements identified by the Council under agenda item B.4. on Tuesday. At this time, the Council may need to clarify STT questions and should assure the options presented are those for which the Council desires full STT analysis and consideration for final adoption on Friday.

Council Action: Clarify STT questions, and adopt management options for STT analysis.

Reference Materials:

1. Collation of Preliminary Salmon Management Options (Supplemental STT Report B.7.).

PFMC
02/23/00

The KFMC passed the following motion on March 8, 2000.

Motion: to modify Option 1 of the recreational management options proposed by the SAS for ocean salmon 2000 fisheries for the KMZ sport fishery as follows: a 2 fish daily bag limit on all salmon except coho, with a 20% effort buffer, that would assure maintaining a 17% share of the ocean allocation for the KMZ sport fishery, 50/50 tribal/non-tribal sharing, and a 35,000 natural spawner floor.

SALMON TECHNICAL TEAM

COLLATION OF PRELIMINARY SALMON MANAGEMENT OPTIONS FOR 2000 OCEAN FISHERIES

March 8, 2000

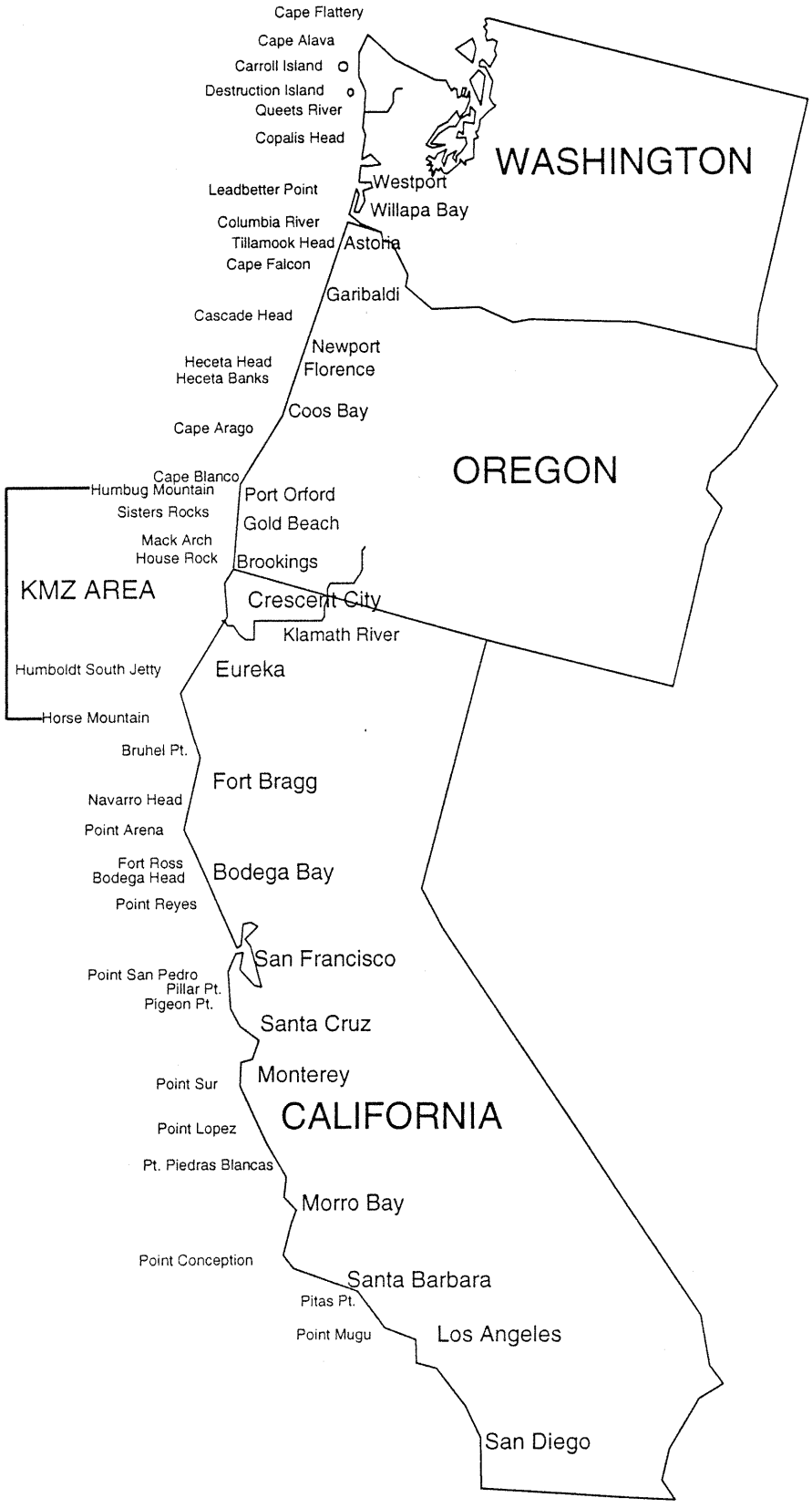
Cape Flattery
Cape Alava
Carroll Island
Destruction Island
Queets River
Copalis Head
WASHINGTON
Leadbetter Point
Westport
Willapa Bay
Columbia River
Tillamook Head
Astoria
Cape Falcon
Garibaldi
Cascade Head
Newport
Heceta Head
Heceta Banks
Florence
Coos Bay
Cape Arago
OREGON
Cape Blanco
Humbug Mountain
Port Orford
Sisters Rocks
Gold Beach
Mack Arch
House Rock
Brookings
KMZ AREA
Crescent City
Klamath River
Humboldt South Jetty
Eureka
Horse Mountain
Bruhel Pt.
Fort Bragg
Navarro Head
Point Arena
Fort Ross
Bodega Head
Bodega Bay
Point Reyes
San Francisco
Point San Pedro
Pillar Pt.
Pigeon Pt.
Santa Cruz
Monterey
Point Sur
CALIFORNIA
Point Lopez
Pt. Piedras Blancas
Morro Bay
Point Conception
Santa Barbara
Pitas Pt.
Point Mugu
Los Angeles
San Diego

TABLE 1. **Commercial troll** management options collated by the STT for non-Indian ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I NORTH OF CAPE FALCON	OPTION II NORTH OF CAPE FALCON	OPTION III NORTH OF CAPE FALCON
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Treaty Indian commercial ocean troll quotas of: 30,000 chinook (20,000 in May and June; 10,000 for all-salmon season in Aug.-Sept. 15); 38,500 coho 4. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 5. Non-Indian Troll TAC: 12,500 chinook 25,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 25,000 chinook (20,000 in May and June; 5,000 for all-salmon season in Aug.-Sept. 15); 12,400 coho 4. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 5. Non-Indian Troll TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 18,750 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 20,000 chinook in May and June; 0 coho 4. Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 5. Non-Indian Troll TAC: 0 chinook and selective fishery impacts associated with a landed catch of 12,500 coho.
U.S.-Canada Border to Cape Falcon • May 1 thru earlier of June 15 or 10,000 chinook guideline. All salmon except coho. Columbia Control Zone closed (B.7.) Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.	**U.S.-Canada Border to Cape Falcon** • May 1 thru earlier of June 15 or 8,500 chinook quota. All salmon except coho. Columbia Control Zone is closed (same area as described for recreational fishery beginning in 1999).	**U.S.-Canada Border to Cape Falcon** • Closed.
Queets River to Cape Falcon • July 7 thru earliest of Sept. 30 or the overall chinook quota (preseason 2,500 chinook guideline) or 25,000 coho quota. All salmon. Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River Control Zone is closed (B.7.).	**Queets River to Cape Falcon** • Aug. 11 thru earliest of Sept. 30 or the overall chinook quota (preseason 1,500 chinook guideline) or 18,750 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (same area as for sport fishery).	**Queets River to Cape Falcon** • Aug. 18 thru earlier of Sept. 30 or 12,500 marked coho quota. All salmon except chinook. All retained coho must have a healed adipose fin clip. Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (B.7.).

TABLE 1. **Commercial troll** management options collated by the STT for non-Indian ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

Oregon SAS preferred **SOUTH OF CAPE FALCON - OPTION I-OR**	California SAS preferred **SOUTH OF CAPE FALCON - OPTION I-CA**	**SOUTH OF CAPE FALCON - OPTION II**
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 10.1 %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.8 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 14.0% age-4 ocean harvest rate; 34,900 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 10.0 %(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.9 % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.0 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.7% age-4 ocean harvest rate; 35,100 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.7% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.7% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.8 % (goal ≥31%). 3. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 14.0% age-4 ocean harvest rate; 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt. • Apr. 1 thru Aug. 29, and Sept. 1 thru Oct. 31. All salmon except coho. See Oregon State regulations for a description of the closed area at the mouth of Tillamook Bay. [**Note:** Incidental retention of halibut is not allowed during April.]	**Cape Falcon to Humbug Mt.** • Same as Option I-OR, except openings are Apr. 1 thru July 19, Aug. 1 thru Aug. 28, and Sept. 1 thru Oct. 31.	**Cape Falcon to Humbug Mt.** • Same as Option I. - OR.
Humbug Mt. to OR-CA Border • May 1 thru May 31. All salmon except coho.	**Humbug Mt. to OR-CA Border** • Same as Option I-OR.	**Humbug Mt. to OR-CA Border** • Same as Option I. - OR.
Sisters Rocks to Mack Arch • 8/1 thru earlier of 8/31 or 3,500 chinook quota. All salmon except coho. Open 0-4 nautical miles. All salmon must be landed and delivered to Gold Beach, Port Orford or Brookings within 24 hours of closure.	**Sisters Rocks to Mack Arch** • Same as Option I-OR, except quota is 2,500 chinook.	**Sisters Rocks to Mack Arch** • Same as Option I-CA.
House Rock, OR to Humboldt South Jetty • Sept. 1 thru earlier of Sept. 30 or 7,000 chinook quota. All salmon except coho. Possession and landing limit of 30 fish per day. All fish caught in this area must be landed within the area. Klamath Control Zone closed (see B.7.). Within the 7,000 chinook quota is a harvest guideline limiting landings at the port of Brookings to no more than 1,000 chinook. If this guideline is reached prior to the overall quota, the fishery will close north of the Oregon-California border. When the fishery is closed north of the Oregon-California border and open to the south, Oregon State regulations provide for the following action: Vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival.	**House Rock, OR to Humboldt South Jetty** • Same as Option I-OR.	**House Rock, OR to Humboldt South Jetty** • Same as Option I, except southern boundary would be Punta Gorda and there would be control zones at the mouths of the Eel and Mattole Rivers.

TABLE 1. **Commercial troll** management options collated by the STT for non-Indian ocean salmon fisheries, 2000. (Page 3 of 4)

OR preferred Option I-OR

A. SEASON OPTION DESCRIPTIONS

OPTION-CA I CA preferred option

OPTION II

Horse Mt. to Pt. Arena (Fort Bragg)
- Sept. 1 thru Sept. 30. All salmon except coho.

Horse Mt. to Pt. Arena (Fort Bragg)
- Same as Option I-OR.

Horse Mt. to Pt. Arena (Fort Bragg)
- Same as Option I.

Sept. 30 ✓

Pt. Arena to Pt. Reyes (Bodega Bay)
- July 18 thru ~~Aug. 31~~. All salmon except coho. Minimum size limit 27 inches.

Pt. Arena to Pt. Reyes (Bodega Bay)
- Same as Option I-OR.

Pt. Arena to Pt. Reyes
- Same as Option I.

Fort Ross to Pt. Reyes (test fishery inside 6 nm)
- July 1 thru earlier of July 15 or 3,500 chinook quota. All salmon except coho. Fishery closed July 3 and 4. Minimum size limit 26 inches (to be consistent with 1998 and 1999 test fisheries). Open only inside 6 nautical miles. Landing limit of 30 fish per day. All fish caught in this area must be landed in Bodega Bay. Fish taken outside this area may not be landed at Bodega Bay while this fishery is open.

Fort Ross to Pt. Reyes
- Same as Option I-OR except 4,500 chinook quota.

Fort Ross to Pt. Reyes
- Same as Option I except fishery follows a cycle of 2days open/2 days closed.

Pt. Reyes to Pt. San Pedro
- July 1 thru Sept 30. All salmon except coho. Minimum size limit 26 inches thru June 30 and 27 inches thereafter.

Pt. Reyes to Pt. San Pedro
- Same as Option I-OR except opening is May 21 thru Sept. 30.

Pt. Reyes to Pt. San Pedro
- Same as Option I-OR.

Pt. San Pedro to ~~Pigeon Pt.~~
- May 1 thru Sept. 30. ~~All salmon except coho.~~

Pt. San Pedro to Pigeon Pt.
- Same as Option I-OR.

Pt. San Pedro to Pigeon Pt.
- Same as Option I.

~~Pigeon Pt.~~ to U.S.-Mexico Border
- May 1 thru ~~Aug. 31~~. ~~All salmon except coho.~~

Pigeon Pt. to U.S.-Mexico Border
- Same as Option I-OR.

Pigeon Pt. to U.S.-Mexico Border
- Same as Option I.

(2)

May 1 AUG 15
sept. 15 - Sept. 30

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

B.1. Minimum size limits in inches (when seasons are open):

Area (when open)	Chinook		Coho		Pink
	Total Length	Head-off	Total Length	Head-off	
North of Cape Falcon	28.0	21.5	16.0	12.0	None
Cape Falcon to Pt. Arena*	26.0*	19.5*	-	-	None
South of Pt. Arena prior to July 1*	26.0*	19.5*	-	-	None
South of Pt. Arena after June 30*	27.0*	20.25*	-	-	None

* Chinook not less than 26 inches (19.5 inches head-off) taken in open seasons south of Cape Falcon may be landed north of Cape Falcon only when the season is closed north of Cape Falcon.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

3. Transit Through Closed Areas with Salmon on Board - It is unlawful for a vessel to have troll gear in the water while transiting any area closed to salmon fishing while possessing salmon.

TABLE 1. **Commercial troll** management options collated by the STT for non-Indian ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (continued)

4. Hooks - Single point, single shank barbless hooks are required and circle hooks are required when mooching.

5. Spread - A single leader connected to an individual lure or bait.

6. Line, Spread and Gear Restrictions:

   a. Off **Oregon south of Cape Falcon**, no more than 4 spreads are allowed per line.

   b. Off **California**, no more than 6 lines are allowed per vessel.

7. Control Zone Definitions:

   Columbia Commercial Control Zone - The ocean area at the Columbia River mouth bounded by a line extending for 6 nautical miles due west from North Head along 46°18'00" N to 124°13'18" W, then southerly to 46°13'24" N and 124°11'00" W (green, Columbia River Entrance Lighted Bell Buoy #1), then southerly to 46°11'06" N and 124°11'00" W (red, Columbia River Approach Lighted Whistle Buoy), then northeast along red buoy line to the tip of the south jetty.

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W. (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

8. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board and the estimated time of arrival. This stipulation will be implemented by state regulations for California, Oregon and Washington, as required.

9. Incidental Halibut Harvest - The operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A, during authorized periods, while trolling for salmon. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone 206/634-1838). Applicants must apply prior to April 1 of each year. Incidental harvest is authorized only during **May and June** troll seasons and after July 31 if quota remains and if announced on the NMFS hotline (phone 800-662-9825). ODFW and WDFW will monitor landings and if they are projected to exceed the 23,490 pound preseason allocation or the Area 2A non-Indian commercial halibut TAC, NMFS will take inseason action to close the incidental halibut fishery.

   Option I: License holders may land no more than 1 halibut per each __ chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches.

   Option II: License holders may land no more than 1 halibut per each 5 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches. (1999 regulations)

10. Inseason Management - In addition to standard inseason actions or inseason modifications already noted under the season description, the following inseason guidance is provided to NMFS:

    - Transfers of 5,000 fish or less between subarea quotas north of Cape Falcon shall be done on a fish-for-fish basis;
    - At the March 2001 meeting, the Council will consider inseason recommendations to: (1) open commercial seasons for all salmon except coho prior to May 1 in areas off Oregon, and (2) identify the areas, season, quota, and special regulations for any experimental April fisheries.

11. Consistent with Council management objectives, the State of Oregon may establish additional late-season, chinook-only fisheries in state waters. Check state regulations for details.

12. For the purposes of CDFG Code, Section 8232.5, the definition of the KMZ for the ocean salmon season shall be that area from Humbug Mt., Oregon to Horse Mt., California.

TABLE 2. **Recreational** management options collated by the STT for ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

NORTH OF CAPE FALCON - OPTION I (Hood Canal PNP forecast)	NORTH OF CAPE FALCON - OPTION II (Hood Canal State forecast)	NORTH OF CAPE FALCON - OPTION III (Hood Canal State forecast)
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 8,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 7. Recreational TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 75,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). LRW chinook harvest index of _____ % 2. Same as Option I 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 6,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 7. Recreational TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 56,250 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required); LRW chinook harvest index of _____ %. 2. Same as Option I. 3. Neah Bay/La Push agreed coho allocation of 80%/20%. 4. No Area 4B add-on fishery. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of _____ coho in Aug. and _____ coho in Sept. All retained coho must have an adipose fin clip. 6.Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 7. Recreational TAC: 0 chinook and selective fishery impacts associated with a landed catch of 37,500 coho.
U.S.-Canada Border to Cape Alava (Neah Bay) • July 3 thru earlier of Sept. 30 or 6,600 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 500 chinook.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 10 thru earlier of Sept. 30 or 5,000 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 24 thru earlier of Sept. 30 or 3,900 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Cape Alava to Queets River (La Push) • July 3 thru earlier of Sept. 30 or 1700 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 300 chinook.	**Cape Alava to Queets River (La Push)** • July 10 thru earlier of Sept. 30 or 1,200 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**Cape Alava to Queets River (La Push)** • July 24 thru earlier of Sept. 30 or 975 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Queets River to Leadbetter Pt. (Westport) • Sun. thru Thurs. July 3 thru earlier of Sept. 30 or 29,200 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and limit harvest within a guideline of 7,400 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 21,900 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed inside the area defined by a line drawn from the lighthouse to Buoy 2 to Buoy 3 to the Grays Harbor north jetty. Inseason management may be used to sustain season length and limit harvest within a guideline of 6,450 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 13,875 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed 0-3 nautical miles offshore.

TABLE 2. **Recreational** management options collated by the STT for ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

Leadbetter Pt. to Cape Falcon (Columbia River) • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 37,500 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 4,300 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 28,100 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 3,450 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 18,750 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.
SOUTH OF CAPE FALCON - OPTION I-OR	**SOUTH OF CAPE FALCON - OPTION I-CA**	**SOUTH OF CAPE FALCON - OPTION II**
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 10.1%(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8 % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.8% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 14.0% age-4 ocean harvest rate; 34,900 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 10.0%(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.9% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.0% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 13.7% age-4 ocean harvest rate; 35,100 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.7%(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.7% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of ___ % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvest (_____ fish) for tribes with federally recognized fishing rights (Hoopa Valley and Yurok); 14.0% age-4 ocean harvest rate; 34,900 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt • Except as provided below during the selective fishery, the season will be: Apr. 1 thru Oct. 31. All salmon except coho. 2 fish per day. No more than 6 fish in 7 consecutive days. Legal gear limited to artificial lures and plugs of any size, or bait no less than 6 inches long (excluding hooks and swivels). All gear must have no more than 2 single point, single shank barbless hooks. Divers are prohibited and flashers may be used only with downriggers. See Oregon State regulations for a description of a closure at the mouth of Tillamook Bay. Selective fishery: • Sun., Tue., Wed., Thur., and Sat. of each week, July 1 thru earlier of July 31 or a landed catch of 25,000 coho. All salmon. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish in 7 consecutive days. No special gear restrictions except B.3. (barbless hooks). Inseason action may be used to adjust open days to effectively utilize the available quota. **Note:** On closed days during the selective fishery, no angling for any species of salmon is allowed. All salmon except coho season reopens the earlier of Aug. 1 or attainment of the coho quota.	**Cape Falcon to Humbug Mt** • Same as Option I-OR.	**Cape Falcon to Humbug Mt** • Same as Option I, except no selective fishery (i.e., Apr. 1 thru Oct. 31; all salmon except coho; 2 fish per day, etc.). -OR

TABLE 2. **Recreational** management options collated by the STT for ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS		
OPTION I-OR	OPTION I-CA	OPTION II
Humbug Mt. to Horse Mt. • May 27 thru July 7 and July 29 thru Sept. 10. All salmon except coho. 2 fish per day. No more than 4 fish in 7 consecutive days. Klamath Control Zone (B.6.) closed. One rod per angler (B.4.).	**Humbug Mt. to Horse Mt.** • Same as Option I-OR.	**Humbug Mt. to Horse Mt.** • Same as Option I-OR.
Horse Mt. to Pt. Arena • Feb. 12 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. (circle hooks when mooching). One rod per angler (B.4.).	**Horse Mt. to Pt. Arena** • Same as Option I-OR except season closes Oct. 1.	**Horse Mt. to Pt. Arena** • Same as Option I-CA.
In 2001, the season will open Feb. 17 (nearest Sat. to Feb. 15) for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as Option I-OR.	Year 2001 opening same as Option I-OR.
Pt. Arena to Pigeon Pt. • Apr. 15 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. One rod per angler. Special gear restriction B.5. (circle hooks when mooching).	**Pt. Arena to Pigeon Pt.** • Same as Option I-OR, except closes Oct. 29 (nearest Sunday to Nov. 1) and B.5. (restriction on number and type of hooks).	**Pt. Arena to Pigeon Pt.** • Same as Option I-CA.
In 2001, the season will open Apr. 14 for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I-OR.	Year 2001 opening same as in Option I-OR.
Pigeon Pt. to U.S.-Mexico Border • Apr. 1 thru Oct. 1. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. One rod per angler north of Pt. Conception.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I-OR.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I-OR.
In 2001, the season is tentatively set to open March 31 for all salmon except coho, 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I-OR.	Year 2001 opening same as in Option I-OR.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

1. Minimum size limits (total length in inches) when areas are open:

Area (when open)	Chinook	Coho	Pink
North of Cape Falcon	24.0	16.0	None
Cape Falcon to Horse Mt.	20.0	16.0	None, except 20.0 off CA
South of Horse Mt.*	20.0*	-	20.0

* **Except** 24.0 inches from opening day thru May 31.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished . Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

TABLE 2. **Recreational** management options collated by the STT for ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (Continued)

3. Hooks: Single point, single shank barbless hooks are required for all fishing gear north of Pt. Conception, California. ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.

4. Restriction on Number of Fishing Rods North of Pt. Conception, California: All persons fishing for salmon, and all persons fishing from a boat with salmon on board, may use no more than one rod per angler.

5. Option I: Special Gear Restrictions Between Horse Mt. and Pt. Conception, California:

   Single point, single shank, barbless **circle** hooks must be used if angling by any means other than trolling and no more than 2 such hooks shall be used. When angling with 2 hooks, the distance between the hooks must not exceed 5 inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). A circle hook is defined as a hook with a generally circular shape and a point which turns inwards, pointing directly to the shank at a 90° angle. Circle hooks are not required when artificial lures are used without bait.

   Trolling defined: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing a fish.

   Options II and III: Special Gear Restrictions off California:

   Anglers must use no more than 2 single point, single shank barbless hooks.

6. Control Zone Definitions:

   Columbia Recreational Control Zone (modified in 1999) - An area at the Columbia River mouth bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N/124°06'50" W) and the green lighted Buoy #7 (46°15'09' N/124°06'16" W); on the east by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N/124°03'07" W to its intersection with the north jetty; on the north by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°14'48" N/124°05'20" W) and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south by a line running northeast/southwest between the red lighted Buoy #4 and the tip of the south jetty (46°14'03" N/124°04'05" W) and then along the south jetty to the point of intersection with the Buoy #10 line (see Figure 4).

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

7. Inseason Management: Regulatory modifications may become necessary inseason to meet preseason management objectives such as quotas, harvest guidelines and season duration. Actions could include modifications to bag limits or days open to fishing, and extensions or reductions in areas open to fishing.

   The procedure for inseason coho transfer among recreational subareas north of Cape Falcon will be:

   After conferring with representatives of the affected ports and the Salmon Advisory Subpanel recreational representatives north of Cape Falcon, NMFS may transfer coho inseason among recreational subareas to help meet the recreational season duration objectives (for each subarea). Any transfers between subarea quotas of 5,000 fish or less shall be done on a fish-for-fish basis.

   At the March 2001 meeting, the Council will consider an inseason recommendation to open seasons for all salmon except coho prior to May 1 in areas off Oregon.

8. Additional Seasons in State Territorial Waters: Consistent with Council management objectives, the states of Washington and Oregon may establish limited seasons in state waters. Oregon state-water fisheries are limited to chinook salmon. Check state regulations for details.

TABLE 3. Impact estimates for STT collated options.

	IMPACTS for OPTIONS[a/]				
STOCK/CRITERIA	I-OR	I-CA	II	III	OBJECTIVE
CHINOOK					
Upper River Brights	193.2	193.2	194.0	195.9	43.5
Mid-Columbia Brights	57.1	57.1	57.3	57.9	-
Lower River Hatchery Tules	24.2	24.2	25.1	27.0	14.4
Lewis River Wild	2.57	2.57	2.59	2.64	5.7
Spring Creek Hatchery Tules	24.1	24.1	25.0	27.4	7.0
Snake River Fall LFI					≤0.70
Klamath River Fall	34.9	35.1	34.9	34.9	35.0
Tribal/Nontribal Allocation	50/50	50/50	50/50	50/50	50/50
Age 4 harvest rate	14.0	13.7	14.0	14.0	≤17.0
KMZ Sport Fishery	17%	17%	17%	17%	17%
CA/OR split	50/50	59/41	50/50	50/50	-
Sacramento Winter	31.8%	31.0%	31.8%	31.8%	≥31.0%
COHO					
Skagit	22.0	22.0	22.7	23.1	30.0
Stillaguamish	14.0	14.0	14.5	14.9	17.0
Snohomish	42.0	42.0	43.6	44.6	70.0
Hood Canal	57.5	57.5	25.5	26.0	21.5
Strait of Juan de Fuca	10.6	10.6	11.1	11.3	12.8
Quillayute Fall	7.9	7.9	8.2	8.3	6.3-15.8
Hoh	3.2	3.2	3.3	3.4	2.0-5.0
Queets					
Wild	2.4	2.4	2.5	2.5	5.8-14.5
Supplemental	0.7	0.7	0.7	0.7	-
Hatchery	9.6	9.6	10.0	10.3	-
Grays Harbor	42.3	42.3	43.7	44.3	35.4
OCN	10.1	10.0	8.7	8.3	≤15%
RK Rogue Klamath	6.8	6.9	6.7	6.7	≤13%
Columbia River Early	215.6	216.0	230.9	237.6	22.5
Columbia River Late	172.2	172.3	183.5	197.0	16.3

a/ Option I-OR pairs: Option I north of Cape Falcon with I-OR south.
Option I-CA pairs: Option I north of Cape Falcon with I-CA south.
Option II pairs: Option II north of Cape Falcon with I-OR south minus the selective sport fishery off central Oregon.
Option III pairs: Option III north of Cape Falcon with I-OR south minus the selective sport fishery off central Oregon.

OREGON COASTAL NATURAL STOCK

Run File: 0006 Date: 03-08-2000 Time: 14:16:19

nber of Fish and Percent of Total Impacts (Total Mortality + Escapement)

	Number	Pct
S.E. Alaska	16	0.03
Canada	63	0.12
Puget Sound/SJF	344	0.65
Treaty Troll	209	0.40
N.Falcon		
Sport	286	0.54
Troll	489	0.93
S.Falcon Sport		
Falcon-Humbug	556	1.05
KMZ	488	0.92
Ft. Bragg	428	0.81
So California	382	0.72
S.Falcon Troll		
Falcon-Humbug	1,039	1.97
KMZ	80	0.15
Ft. Bragg	8	0.02
So California	345	0.65
Buoy 10	104	0.20
Freshwater Sport	484	0.92
TOTAL	5,320	10.08
capement	47,946	89.92

March option 1 OR w/ 14% HMR
2000

OREGON COASTAL NATURAL STOCK

Run File: 0003 Date: 03-08-2000 Time: 12:19:34

ber of Fish and Percent of Total Impacts (Total Mortality + Escapement)

	Number	Pct
S.E. Alaska	16	0.03
Canada	63	0.12
Puget Sound/SJF	344	0.65
Treaty Troll	209	0.40
N.Falcon		
Sport	286	0.54
Troll	488	0.93
S.Falcon Sport		
Falcon-Humbug	555	1.05
KMZ	487	0.92
Ft. Bragg	428	0.81
So California	382	0.72
S.Falcon Troll		
Falcon-Humbug	926	1.75
KMZ	80	0.15
Ft. Bragg	8	0.02
So California	420	0.79
Buoy 10	103	0.20
Freshwater Sport	485	0.92
TOTAL	5,280	10.00
apement	47,986	90.00

March 2000 Option 1 CA w/14% AMR

Rogue / Klamath coho

STOCK CATCH PLUS NON-RETENTION
Run File: Date: 03-08-2000 Time: 14:20:07

Number of Fish and Percent of Total Impacts (Total Mortality + Escapement)

	Number	Pct
S.E. Alaska	0	0.00
Canada	0	0.00
Puget Sound/SJF		
Treaty Net	0	0.00
Treaty Troll	0	0.00
NonTreaty Net	0	0.00
Sport	0	0.00
North of Falcon		
Treaty Troll	0	0.00
Ocean Sport	7	0.04
Ocean Troll	0	0.00
S.Falcon Sport		
Falcon-Humbug	15	0.08
KMZ	531	2.97
Ft. Bragg	392	2.20
So California	70	0.39
S.Falcon Troll		
Falcon-Humbug	20	0.11
KMZ	91	0.51
Ft. Bragg	16	0.09
So California	59	0.33
Buoy 10	20	0.11
TOTAL	1,221	6.84

March option 1 OR
2000

Rogue/Klamath Coho

Stocks : U-KlamRog, M-KlamRog

STOCK CATCH PLUS NON-RETENTION
Run File: Date: 03-08-2000 Time: 14:22:40

==========

ber of Fish and Percent of Total Impacts (Total Mortality + Escapement)

	Number	Pct
S.E. Alaska	0	0.00
Canada	0	0.00
Puget Sound/SJF		
Treaty Net	0	0.00
Treaty Troll	0	0.00
NonTreaty Net	0	0.00
Sport	0	0.00
North of Falcon		
Treaty Troll	0	0.00
Ocean Sport	7	0.04
Ocean Troll	0	0.00
S.Falcon Sport		
Falcon-Humbug	15	0.08
KMZ	531	2.97
Ft. Bragg	393	2.20
So California	70	0.39
S.Falcon Troll		
Falcon-Humbug	17	0.09
KMZ	91	0.51
Ft. Bragg	16	0.09
So California	70	0.39
v 10	20	0.11
TOTAL	1,229	6.88

March 2000 Option 1 CA

SCHEDULE OF PUBLIC HEARINGS AND APPOINTMENT OF HEARINGS OFFICERS FOR SALMON MANAGEMENT OPTIONS

Situation: Attachment B.8.a. provides a schedule of public hearings for the Council management options. Five hearings are scheduled as follows: March 27 in Westport, Washington, North Bend, Oregon, and Santa Rosa, California; and March 28 in Tillamook, Oregon and Eureka, California. The public will also be able to provide their comments and recommendations on the options in Portland, Oregon during the April Council meeting.

Council Action: Confirm the hearing sites, dates, and officers.

Reference Materials:

1. Schedule of Salmon Fishery Management Option Hearings (Attachment B.8.a.).

PFMC
02/23/00

SCHEDULE OF SALMON FISHERY MANAGEMENT OPTION HEARINGS
Pacific Fishery Management Council
March 27-28, 2000[1/]

Date Time/Day	Location	Council	NMFS	USCG	Staff	Salmon Team	Meeting Facility Contact
March 27 Monday 7 p.m.	Chateau Westport 710 West Hancock Westport, WA 98595					D. Milward	Hans Streeich (360) 268-9101 Phone (360) 268-1646 Fax
March 27 Monday 7 p.m.	Pony Village Motor Lodge Club Room Virginia Avenue North Bend, OR 97459					C. Melcher	Ms. Barbara Lentz (541) 756-3191 Phone (541) 756-5818 Fax
March 27 Monday 7 p.m.	Flamingo Resort Hotel and Conference Center 2777 - 4th Street Santa Rosa, CA 95405					A. Grover	Ms. Martin (707) 545-5877 Phone (707) 568-0442 Fax
March 28 Tuesday 7 p.m.	Shilo Inn Tillamook Room 2535 N Main Tillamook, OR 97141					C. Melcher	Ms. Jenine Hildebrand (503) 842-5510 Phone (503) 842-5510 Fax
March 28 Tuesday 7 p.m.	Red Lion Hotel Eureka Evergreen Room 1929 Fourth Street Eureka, CA 95501					A. Grover	Carol Clymo-Palmer (707) 441-4712 Phone (707) 445-4712 Fax

PFMC
02/23/00

i/ The Council will also receive public comment at the Portland, Oregon meeting during the week of April 3-7, 2000.

ADOPT 2000 MANAGEMENT OPTIONS FOR PUBLIC REVIEW

Situation: The Council will review the Salmon Technical Team (STT) impact analysis and advisory, tribal, and public comments before adopting proposed ocean salmon fishery management options for public review. The adopted options should meet fishery management plan objectives (spawner escapement goals, allocations, etc.) and encompass a realistic range of alternatives from which the final management measures will emerge. Any need for implementation by emergency rule must be clearly noted and consistent with the Council's emergency criteria.

Council Action: Adopt final ocean salmon fishery management options for public review.

Reference Materials:

1. STT Analysis (Supplemental STT Report B.9.).

PFMC
02/22/00

ENFORCEMENT CONSULTANTS COMMENTS ON ADOPTION OF 2000 MANAGEMENT OPTIONS FOR PUBLIC REVIEW

The Enforcement Consultants have reviewed the salmon options that are going out for public review. We have not identified any enforcement concerns in the 2000 options package as currently purposed.

PFMC
03/09/00

SALMON TECHNICAL TEAM

ANALYSIS OF PRELIMINARY SALMON MANAGEMENT OPTIONS FOR 2000 OCEAN FISHERIES

March 10, 2000

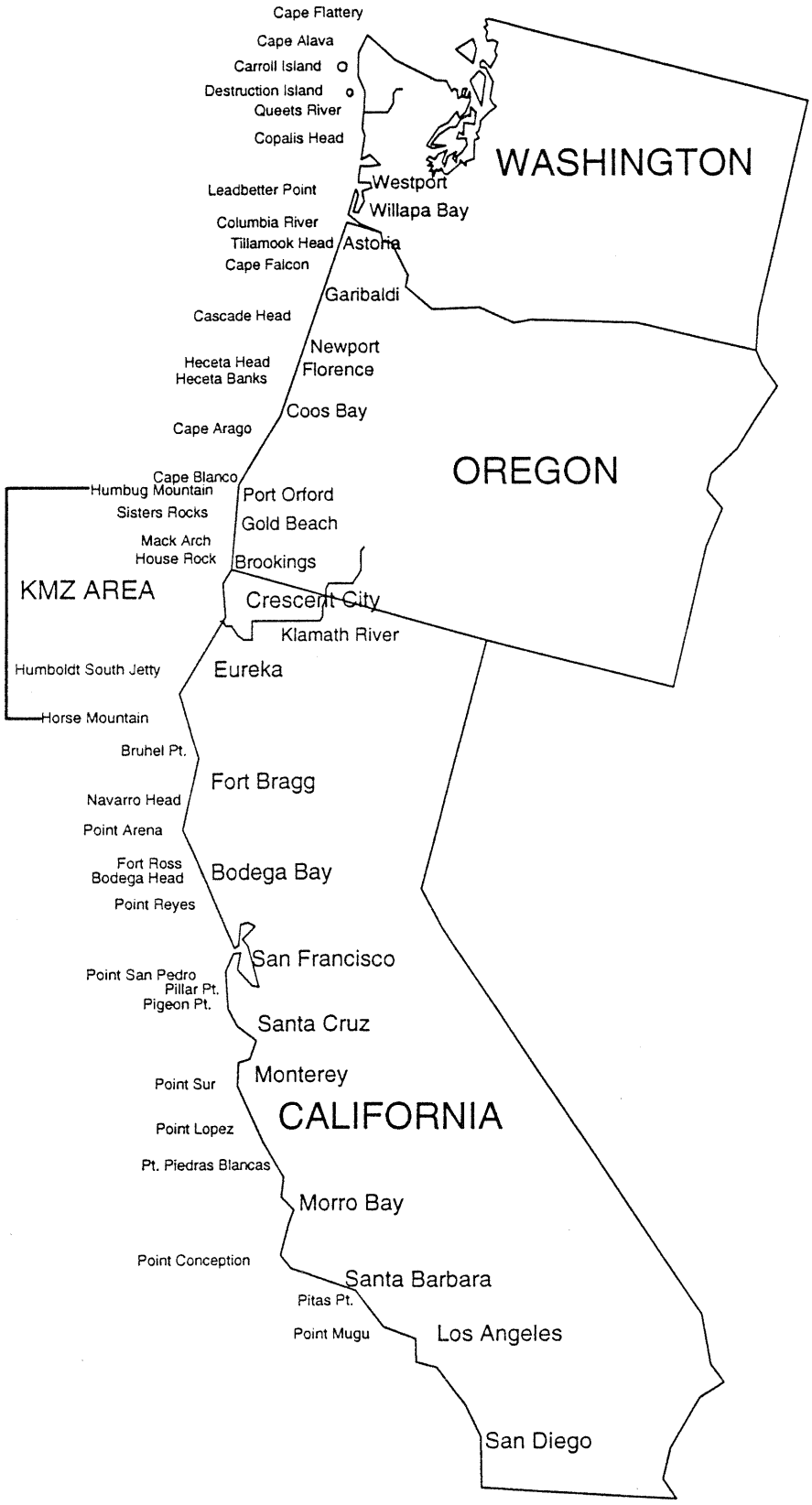
Cape Flattery
Cape Alava
Carroll Island
Destruction Island
Queets River
Copalis Head
WASHINGTON
Leadbetter Point
Westport
Willapa Bay
Columbia River
Tillamook Head
Astoria
Cape Falcon
Garibaldi
Cascade Head
Newport
Heceta Head
Heceta Banks
Florence
Coos Bay
Cape Arago
OREGON
Cape Blanco
Humbug Mountain
Port Orford
Sisters Rocks
Gold Beach
Mack Arch
House Rock
Brookings
KMZ AREA
Crescent City
Klamath River
Humboldt South Jetty
Eureka
Horse Mountain
Bruhel Pt.
Fort Bragg
Navarro Head
Point Arena
Fort Ross
Bodega Head
Bodega Bay
Point Reyes
San Francisco
Point San Pedro
Pillar Pt.
Pigeon Pt.
Santa Cruz
Monterey
Point Sur
CALIFORNIA
Point Lopez
Pt. Piedras Blancas
Morro Bay
Point Conception
Santa Barbara
Pitas Pt.
Point Mugu
Los Angeles
San Diego

TABLE 1. **Commercial troll** management options analyzed by the STT for non-Indian ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I North of Cape Falcon	OPTION II North of Cape Falcon	OPTION III North of Cape Falcon
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Treaty Indian commercial ocean troll quotas of: 30,000 chinook (20,000 in May and June; 10,000 for all-salmon season in Aug.-Sept. 15); 38,500 coho 4. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 5. Non-Indian Troll TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 25,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 25,000 chinook (20,000 in May and June; 5,000 for all-salmon season in Aug.-Sept. 15); 12,400 coho 4. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 5. Non-Indian Troll TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 18,750 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Treaty Indian commercial ocean troll quotas of: 20,000 chinook in May and June; 0 coho 4. Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 5. Non-Indian Troll TAC: 0 chinook and selective fishery impacts associated with a landed catch of 12,500 coho.
U.S.-Canada Border to Cape Falcon • May 1 thru earlier of June 15 or 10,000 chinook guideline. All salmon except coho. Columbia Control Zone closed (B.7.) Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts.	**U.S.-Canada Border to Cape Falcon** • May 1 thru earlier of June 15 or 8,500 chinook quota. All salmon except coho. Columbia Control Zone is closed (same area as described for recreational fishery beginning in 1999).	**U.S.-Canada Border to Cape Falcon** • Closed.
Queets River to Cape Falcon • July 7 thru earliest of Sept. 30 or the overall chinook quota (preseason 2,500 chinook guideline) or 25,000 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River Control Zone is closed (B.7.).	**Queets River to Cape Falcon** • Aug. 11 thru earliest of Sept. 30 or the overall chinook quota (preseason 1,500 chinook guideline) or 18,750 marked coho quota. All salmon (all retained coho must have a healed adipose fin clip). Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (same area as for sport fishery).	**Queets River to Cape Falcon** • Aug. 18 thru earlier of Sept. 30 or 12,500 marked coho quota. All salmon except chinook. All retained coho must have a healed adipose fin clip. Cycle of 4 days open/3 days closed. Each vessel may possess, land and deliver no more than 100 coho per open period (trip limits, gear restrictions and guidelines may be adjusted inseason). Vessels must land and deliver their fish within 24 hours of any closure of this fishery within the area or adjacent closed area. Columbia River control zone is closed (B.7.).

TABLE 1. **Commercial troll** management options analyzed by the STT for non-Indian ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I South of Cape Falcon	OPTION II South of Cape Falcon	OPTION III South of Cape Falcon
Projections and Assumptions: 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.9% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.3% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.4 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,700 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.6% age-4 ocean harvest rate; 35,600 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.1 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,900 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.6% age-4 ocean harvest rate; 35,400 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 7.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.2% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.5 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,500 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.4% age-4 ocean harvest rate; 35,800 natural spawners (goal = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt. • Apr. 1 thru Aug. 29, and Sept. 1 thru Oct. 31. All salmon except coho. See Oregon State regulations for a description of the closed area at the mouth of Tillamook Bay. [**Note:** Incidental retention of halibut is not allowed during April.]	**Cape Falcon to Humbug Mt.** • Same as Option I, except openings are Apr. 1 thru July 19, Aug. 1 thru Aug. 28, and Sept. 1 thru Oct. 31.	**Cape Falcon to Humbug Mt.** • Same as Option II.
Humbug Mt. to OR-CA Border • May 1 thru May 31. All salmon except coho.	**Humbug Mt. to OR-CA Border** • Same as Option I.	**Humbug Mt. to OR-CA Border** • Same as Option I.
Sisters Rocks to Mack Arch • 8/1 thru earlier of 8/31 or 2,500 chinook quota. All salmon except coho. Open 0-4 nautical miles. All salmon must be landed and delivered to Gold Beach, Port Orford or Brookings within 24 hours of closure.	**Sisters Rocks to Mack Arch** • Same as Option I.	**Sisters Rocks to Mack Arch** • Same as Option I.
House Rock, OR to Humboldt South Jetty • Sept. 1 thru earlier of Sept. 30 or 7,000 chinook quota. All salmon except coho. Possession and landing limit of 30 fish per day. All fish caught in this area must be landed within the area. Klamath Control Zone closed (see B.7.). Within the 7,000 chinook quota is a harvest guideline limiting landings at the port of Brookings to no more than 1,000 chinook. If this guideline is reached prior to the overall quota, the fishery will close north of the Oregon-California border. When the fishery is closed north of the Oregon-California border and open to the south, Oregon State regulations provide for the following action: Vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival.	**House Rock, OR to Humboldt South Jetty** • Same as Option I.	**House Rock, OR to Humboldt South Jetty** • Same as Option I.

TABLE 1. **Commercial troll** management options analyzed by the STT for non-Indian ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Horse Mt. to Pt. Arena (Fort Bragg) • Sept. 1 thru Sept. 30. All salmon except coho.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.	**Horse Mt. to Pt. Arena (Fort Bragg)** • Same as Option I.
Pt. Arena to Pt. Reyes (Bodega Bay) • July 18 thru Sept. 30. All salmon except coho. Minimum size limit 27 inches.	**Pt. Arena to Pt. Reyes (Bodega Bay)** • Same as Option I.	**Pt. Arena to Pt. Reyes** • Same as Option I.
Fort Ross to Pt. Reyes (test fishery inside 6 nm) • July 1 thru earlier of July 15 or 3,500 chinook quota. All salmon except coho. Fishery closed July 3 and 4. Minimum size limit 26 inches (to be consistent with 1998 and 1999 test fisheries). Open only inside 6 nautical miles. Landing limit of 30 fish per day. All fish caught in this area must be landed in Bodega Bay. Fish taken outside this area may not be landed at Bodega Bay while this fishery is open.	**Fort Ross to Pt. Reyes** • Same as Option I, except 4,500 chinook quota.	**Fort Ross to Pt. Reyes** • Same as Option II, except fishery follows a cycle of 2days open/2 days closed.
Pt. Reyes to Pt. San Pedro • July 1 thru Sept 30. All salmon except coho. Minimum size limit 26 inches thru June 30 and 27 inches thereafter.	**Pt. Reyes to Pt. San Pedro** • Same as Option I, except opening is May 21 thru Sept. 30.	**Pt. Reyes to Pt. San Pedro** • Same as Option II.
Pt. San Pedro to U.S.-Mexico Border • May 1 thru Sept. 30. All salmon except coho.	**Pt. San Pedro to U.S.-Mexico Border** • May 1 thru Aug. 15 and Sept. 15 thru Sept. 30. All salmon except coho.	**Pt. San Pedro to U.S.-Mexico Border** • Same as Option II.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

B.1. Minimum size limits in inches (when seasons are open):

	Chinook		Coho		
Area (when open)	Total Length	Head-off	Total Length	Head-off	Pink
North of Cape Falcon	28.0	21.5	16.0	12.0	None
Cape Falcon to Pt. Arena*	26.0*	19.5*	-	-	None
South of Pt. Arena prior to July 1*	26.0*	19.5*	-	-	None
South of Pt. Arena after June 30*	27.0*	20.25*	-	-	None

* Chinook not less than 26 inches (19.5 inches head-off) taken in open seasons south of Cape Falcon may be landed north of Cape Falcon only when the season is closed north of Cape Falcon.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

3. Transit Through Closed Areas with Salmon on Board - It is unlawful for a vessel to have troll gear in the water while transiting any area closed to salmon fishing while possessing salmon.

TABLE 1. **Commercial troll** management options analyzed by the STT for non-Indian ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (continued)

3. Hooks - Single point, single shank barbless hooks are required and circle hooks are required when fishing by any means other than trolling. ***Trolling is defined*** as angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing fish.

5. Spread - A single leader connected to an individual lure or bait.

6. Line, Spread and Gear Restrictions:

   a. Off **Oregon south of Cape Falcon**, no more than 4 spreads are allowed per line.

   b. Off **California**, no more than 6 lines are allowed per vessel.

7. Control Zone Definitions:

   Columbia Commercial Control Zone - The ocean area at the Columbia River mouth bounded by a line extending for 6 nautical miles due west from North Head along 46°18'00" N to 124°13'18" W, then southerly to 46°13'24" N and 124°11'00" W (green, Columbia River Entrance Lighted Bell Buoy #1), then southerly to 46°11'06" N and 124°11'00" W (red, Columbia River Approach Lighted Whistle Buoy), then northeast along red buoy line to the tip of the south jetty.

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W. (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

8. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate amount of salmon (by species) on board and the estimated time of arrival. This stipulation will be implemented by state regulations for California, Oregon and Washington, as required.

9. Incidental Halibut Harvest - The operator of a vessel that has been issued an incidental halibut harvest license may retain Pacific halibut caught incidentally in Area 2A, during authorized periods, while trolling for salmon. License applications for incidental harvest must be obtained from the International Pacific Halibut Commission (phone 206/634-1838). Applicants must apply prior to April 1 of each year. Incidental harvest is authorized only during **May and June** troll seasons and after July 31 if quota remains and if announced on the NMFS hotline (phone 800-662-9825). ODFW and WDFW will monitor landings and if they are projected to exceed the 23,490 pound preseason allocation or the Area 2A non-Indian commercial halibut TAC, NMFS will take inseason action to close the incidental halibut fishery.

   Option I: License holders may land no more than 1 halibut per each 2 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 50 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches.

   Option II: License holders may land no more than 1 halibut per each 5 chinook, except 1 halibut may be landed without meeting the ratio requirement, and no more than 35 halibut may be landed per trip. Halibut retained must meet the minimum size limit of 32 inches. (1999 regulations)

10. Inseason Management - In addition to standard inseason actions or inseason modifications already noted under the season description, the following inseason guidance is provided to NMFS:

    - Transfers of 5,000 fish or less between subarea quotas north of Cape Falcon shall be done on a fish-for-fish basis;
    - At the March 2001 meeting, the Council will consider inseason recommendations to: (1) open commercial seasons for all salmon except coho prior to May 1 in areas off Oregon, and (2) identify the areas, season, quota, and special regulations for any experimental April fisheries (proposals must meet Council protocol and be received in November 2000).

11. Consistent with Council management objectives, the State of Oregon may establish additional late-season, chinook-only fisheries in state waters. Check state regulations for details.

12. For the purposes of CDFG Code, Section 8232.5, the definition of the KMZ for the ocean salmon season shall be that area from Humbug Mt., Oregon to Horse Mt., California.

TABLE 2. **Recreational** management options analyzed by the STT for ocean salmon fisheries, 2000. (Page 1 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I North of Cape Falcon	OPTION II North of Cape Falcon	OPTION III North of Cape Falcon
Projections and Assumptions: 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. WCVI mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll. 3. Neah Bay/La Push agreed coho allocation of 80%/20% adjusted for Area 4B add-on. 4. Area 4B add-on fishery of 8,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Buoy 10 fishery opens Aug. 1 with an expected landed catch of 32,400 coho in Aug. and 22,500 coho in Sept. All retained coho must have an adipose fin clip. 6. Overall non-Indian TAC: 25,000 chinook 100,000 coho Trade: No, but may consider for final adoption in April. 7. Recreational TAC: 12,500 chinook and selective fishery impacts associated with a landed catch of 75,000 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required). 2. Same as Option I 3. Same as Option I. 4. Area 4B add-on fishery of 6,000 coho (chinook nonretention) opens later of ocean closure or Aug. 28. 5. Same as Option I. 6. Overall non-Indian TAC: 20,000 chinook 75,000 coho Trade: No 7. Recreational TAC: 10,000 chinook and selective fishery impacts associated with a landed catch of 56,250 coho.	**Projections and Assumptions:** 1. ESA listed species: Snake River fall chinook LFI of _____ % for all ocean fisheries relative to 1988-1993 average (≤70% required); 2. Same as Option I. 3. Same as Option I. 4. No Area 4B add-on fishery. 5. Same as Option I. 6.Overall non-Indian TAC: 0 chinook 50,000 coho Trade: No 7. Recreational TAC: 0 chinook and selective fishery impacts associated with a landed catch of 37,500 coho.
U.S.-Canada Border to Cape Alava (Neah Bay) • July 3 thru earlier of Sept. 30 or 6,600 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 500 chinook.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 10 thru earlier of Sept. 30 or 5,000 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**U.S.-Canada Border to Cape Alava (Neah Bay)** • July 24 thru earlier of Sept. 30 or 3,900 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Cape Alava to Queets River (La Push) • July 3 thru earlier of Sept. 30 or 1700 coho subarea quota. All salmon (7 days per week). 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and keep harvest within a guideline of 300 chinook.	**Cape Alava to Queets River (La Push)** • July 10 thru earlier of Sept. 30 or 1,200 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.	**Cape Alava to Queets River (La Push)** • July 24 thru earlier of Sept. 30 or 975 coho subarea quota. All salmon except chinook (7 days per week). 2 fish per day, all retained coho must have a healed adipose fin clip.
Queets River to Leadbetter Pt. (Westport) • Sun. thru Thurs. July 3 thru earlier of Sept. 30 or 29,200 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. Inseason management may be used to sustain season length and limit harvest within a guideline of 7,400 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 21,900 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed inside the area defined by a line drawn from the lighthouse to Buoy 2 to Buoy 3 to the Grays Harbor north jetty. Inseason management may be used to sustain season length and limit harvest within a guideline of 6,500 chinook.	**Queets River to Leadbetter Pt. (Westport)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 13,875 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). Closed 0-3 nautical miles offshore.

TABLE 2. **Recreational** management options analyzed by the STT for ocean salmon fisheries, 2000. (Page 2 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Leadbetter Pt. to Cape Falcon (Columbia River) • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 37,500 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 4,300 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 10 thru earlier of Sept. 30 or 28,100 coho subarea quota. All salmon. 2 fish per day, but only 1 chinook and all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Coho retention is prohibited** between Tillamook Head and Cape Falcon beginning Aug. 1 (i.e., all salmon except coho and a daily bag limit of 1 chinook). Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of 3,500 chinook.	**Leadbetter Pt. to Cape Falcon (Columbia River)** • Sun. thru Thurs. July 24 thru earlier of Sept. 30 or 18,750 coho subarea quota. All salmon except chinook. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish per calendar week (Sun. thru Sat.). **Closed** between Tillamook Head and Cape Falcon beginning Aug. 1. Closed in Recreational Columbia Control Zone (newly defined in 1999, see B.6.). Inseason management may be used to sustain season length and limit harvest within a guideline of chinook.
South of Cape Falcon **Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.9% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.3 % (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.4% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,700 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.6% age-4 ocean harvest rate; 35,600 natural spawners (floor = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 50/50 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**South of Cape Falcon** **Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 8.3% (limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 6.8% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.1% (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,900 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.6% age-4 ocean harvest rate; 35,400 natural spawners (floor = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.	**South of Cape Falcon** **Projections and Assumptions:** 1. ESA listed species: OCN coho total incidental marine and freshwater harvest impact of 7.3%(limit of ≤15%); Rogue/Klamath coho incidental marine harvest impact of 5.2% (limit of ≤13%); Sacramento winter chinook age-3 adult spawner increase in mean brood replacement rate of 31.5 % (goal ≥31%). 2. Klamath River fall chinook: 50% of harvestable surplus (27,500 fish) for tribes with federally recognized fishing rights (Hoopa Valley; Yurok); 13.4% age-4 ocean harvest rate; 35,800 natural spawners (floor = 35,000); 15% of non-Indian impacts to Klamath River sport fishery; 59/41 CA/OR sharing of age-4 ocean harvest outside the KMZ sport fishery; 17% of ocean impacts to KMZ ocean sport fishery.
Cape Falcon to Humbug Mt • Except as provided below during the selective fishery, the season will be: Apr. 1 thru Oct. 31. All salmon except coho. 2 fish per day. No more than 6 fish in 7 consecutive days. Legal gear limited to artificial lures and plugs of any size, or bait no less than 6 inches long (excluding hooks and swivels). All gear must have no more than 2 single point, single shank barbless hooks. Divers are prohibited and flashers may be used only with downriggers. See Oregon State regulations for a description of a closure at the mouth of Tillamook Bay. Selective fishery: • Sun., Tue., Wed., Thur., and Sat. of each week, July 1 thru earlier of July 31 or a landed catch of 25,000 coho. All salmon. 2 fish per day, all retained coho must have a healed adipose fin clip. No more than 6 fish in 7 consecutive days. No special gear restrictions except B.3. (barbless hooks). Open days may be adjusted to utilize the available quota. **Note:** On closed days during the selective fishery, no angling for any species of salmon is allowed. All salmon except coho season reopens the earlier of Aug. 1 or attainment of the coho quota.	**Cape Falcon to Humbug Mt** • Same as Option I, except no selective fishery (i.e., Apr. 1 thru Oct. 31; all salmon except coho; 2 fish per day, etc.).	**Cape Falcon to Humbug Mt** • Same as Option II.

TABLE 2. **Recreational** management options analyzed by the STT for ocean salmon fisheries, 2000. (Page 3 of 4)

A. SEASON OPTION DESCRIPTIONS

OPTION I	OPTION II	OPTION III
Humbug Mt. to Horse Mt. • May 30 thru July 4 and Aug. 5 thru Sept. 10. All salmon except coho. 2 fish per day. No more than 4 fish in 7 consecutive days. Klamath Control Zone (B.6.) closed. One rod per angler (B.4.). (20% effort buffer used to help limit harvest) (73 days)	**Humbug Mt. to Horse Mt.** • May 27 thru July 6 and July 29 thru Sept. 10. All salmon except coho. 1 fish per day. No more than 4 fish in 7 consecutive days. Klamath Control Zone (B.6.) closed. One rod per angler (B.4.). (No effort buffer applied) (85 days)	**Humbug Mt. to Horse Mt.** • Same as Option I, except openings are June 1 thru July 4 and Aug. 5 thru Sept. 10. (71days)
Horse Mt. to Pt. Arena • Feb. 12 thru July 4 and July 25 thru Nov. 12 (nearest Sun. to Nov. 15). All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. (circle hooks when mooching). One rod per angler (B.4.).	**Horse Mt. to Pt. Arena** • Same as Option I, except open continuously from Feb. 12 thru Nov. 12.	**Horse Mt. to Pt. Arena** • Same as Option I.
In 2001, the season will open Feb. 17 (nearest Sat. to Feb. 15) for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as Option I.	Year 2001 opening same as Option I.
Pt. Arena to Pigeon Pt. • Apr. 15 thru Oct. 29. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. One rod per angler. Special gear restriction B.5. (circle hooks when mooching).	**Pt. Arena to Pigeon Pt.** • Same as Option I, except opening is Apr. 15 thru Nov. 5 and B.5. Option II (restriction on number and type of hooks).	**Pt. Arena to Pigeon Pt.** • Same as Option I.
In 2001, the season will open Apr. 14 for all salmon except coho. 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.
Pigeon Pt. to U.S.-Mexico Border • Apr. 1 thru Oct. 1. All salmon except coho. 2 fish per day. Minimum size limit 24 inches thru May 31 and 20 inches thereafter. Special gear restriction B.5. One rod per angler north of Pt. Conception.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.	**Pigeon Pt. to U.S.-Mexico Border** • Same as Option I.
In 2001, the season will open March 31 for all salmon except coho, 2 fish per day, 24 inch minimum size limit and the same gear restrictions as in 2000.	Year 2001 opening same as in Option I.	Year 2001 opening same as in Option I.

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS

1. Minimum size limits (total length in inches) when areas are open:

Area (when open)	Chinook	Coho	Pink
North of Cape Falcon	24.0	16.0	None
Cape Falcon to Horse Mt.	20.0	16.0	None, except 20.0 off CA
South of Horse Mt.*	20.0*	-	20.0

* **Except** 24.0 inches from opening day thru May 31.

2. Compliance with Minimum Size or Other Special Restrictions - All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished . Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught.

TABLE 2. **Recreational** management options analyzed by the STT for ocean salmon fisheries, 2000. (Page 4 of 4)

B. GENERAL REQUIREMENTS, DEFINITIONS, RESTRICTIONS OR EXCEPTIONS (Continued)

3. Hooks: Single point, single shank barbless hooks are required for all fishing gear north of Pt. Conception, California. ODFW regulations in the state-water fishery off Tillamook Bay may allow the use of barbed hooks to be consistent with inside regulations.

4. Restriction on Number of Fishing Rods North of Pt. Conception, California: All persons fishing for salmon, and all persons fishing from a boat with salmon on board, may use no more than one rod per angler.

5. Option I: Special Gear Restrictions Between Horse Mt. and Pt. Conception, California: New requirement of the troll fishery.

   Single point, single shank, barbless **circle** hooks must be used if angling by any means other than trolling and no more than 2 such hooks shall be used. When angling with 2 hooks, the distance between the hooks must not exceed 5 inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). A circle hook is defined as a hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle such that the shank bend and point should lie flat on a flat surface. Circle hooks are not required when artificial lures are used without bait.

   Trolling defined: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions, except when landing a fish.

   Options II: Special Gear Restrictions off California:

   Anglers must use no more than 2 single point, single shank barbless hooks.

6. Control Zone Definitions:

   Columbia Recreational Control Zone (modified in 1999) - An area at the Columbia River mouth bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N/124°06'50" W) and the green lighted Buoy #7 (46°15'09' N/124°06'16" W); on the east by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N/124°03'07" W to its intersection with the north jetty; on the north by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°14'48" N/124°05'20" W) and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south by a line running northeast/southwest between the red lighted Buoy #4 and the tip of the south jetty (46°14'03" N/124°04'05" W) and then along the south jetty to the point of intersection with the Buoy #10 line (see Figure 4).

   Klamath Control Zone - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N (approximately 6 nautical miles north of the Klamath River mouth), on the west by 124°23'00" W (approximately 12 nautical miles off shore), and on the south by 41°26'48" N (approximately 6 nautical miles south of the Klamath River mouth).

7. Inseason Management: Regulatory modifications may become necessary inseason to meet preseason management objectives such as quotas, harvest guidelines and season duration. Actions could include modifications to bag limits or days open to fishing, and extensions or reductions in areas open to fishing.

   The procedure for inseason coho transfer among recreational subareas north of Cape Falcon will be:

   After conferring with representatives of the affected ports and the Salmon Advisory Subpanel recreational representatives north of Cape Falcon, NMFS may transfer coho inseason among recreational subareas to help meet the recreational season duration objectives (for each subarea). Any transfers between subarea quotas of 5,000 fish or less shall be done on a fish-for-fish basis.

   At the March 2001 meeting, the Council will consider an inseason recommendation to open seasons for all salmon except coho prior to May 1 in areas off Oregon.

8. Additional Seasons in State Territorial Waters: Consistent with Council management objectives, the states of Washington and Oregon may establish limited seasons in state waters. Oregon state-water fisheries are limited to chinook salmon. Check state regulations for details.

TABLE 3. Preliminary projection of key stock escapements (thousands of fish) or management criteria for proposed options.

	ESCAPEMENT or MANAGEMENT CRITERIA for OPTIONS				
KEY STOCK/CRITERIA	I	II	III	OBJECTIVE or COMPARATIVE NUMBER	
CHINOOK					
Upper River Brights	190.6	191.3	193.3	55.6	Ocean escapement[a/]
Mid-Columbia Brights	56.9	57.1	57.7	-	Information only
Lower River Hatchery Tules	24.0	24.8	26.8	24.0	Ocean escapement[b/]
Lewis River Wild (threatened)	2.57	2.58	2.63	5.7	MSY spawner goal[c/]
Spring Creek Hatchery Tules	24.0	24.8	27.2	11.1	Ocean escapement[d/]
Snake River Fall (threatened) SRFI				≤0.70	Exploitation rate - all ocean fisheries[e/]
Klamath River Fall	35.6	35.4	35.8	35.0	Floor level natural spawners
Tribal/Nontribal Allocation	50/50	50/50	50/50	50/50	Required allocation
Age 4 harvest rate	13.6%	13.6%	13.4%	≤17.0%	Jeopardy standard for coastal chinook[e/]
KMZ Sport Fishery	17%	17%	17%	17%	Agreed allocation
CA/OR split	50/50	59/41	59/41	-	Information only
River Recreational Fishery	15%	15%	15%	15%	CA Fish and Game Commission
Sacramento Winter (endangered)	31.4%	31.1%	31.5%	≥31.0%	Increase in age 3 replacement rate[e/]
Sacramento River Fall	307.2	281.1	283.8	122-180	Natural and hatchery spawners
COHO					
Skagit	22.1	22.7	23.1	30.0	MSP adult spawners (not annual target)[f/]
Stillaguamish	14.0	14.6	14.9	17.0	"
Snohomish	42.1	43.7	44.7	70.0	"
Hood Canal	57.7	25.5	26.1	21.5	"
Strait of Juan de Fuca	10.7	11.1	11.3	12.8	"
Quillayute Fall	8.0	8.3	8.4	6.3-15.8	MSY adult spawner range (not target)[f/]
Hoh	3.2	3.4	3.4	2.0-5.0	"
Queets					"
Wild	2.4	2.5	2.6	5.8-14.5	"
Supplemental	0.7	0.7	0.7	-	
Hatchery	9.6	10.1	10.4	-	
Grays Harbor	42.6	43.8	44.5	35.4	MSP adult spawners (not annual target)[f/]
OCN	8.9%	8.3%	7.3%	≤15%	Marine and freshwater exploitation rate[e/]
RK	5.3%	6.8%	5.2%	≤13%	Marine exploitation rate[e/]
Columbia River Early	217.0	241.3	251.4	41.7	Ocean escapement[g/]
Columbia River Late	169.4	191.5	208.3	29.2	Ocean escapement[g/]

a/ Minimum to achieve 43,500 adult escapement over McNary Dam, assuming normal distribution and no mainstem harvest.
b/ Minimum to achieve 15,500 spawner return to meet hatchery egg-take goal, assuming normal distribution and no lower river mainstem or tributary harvest.
c/ ESA guidance met by meeting objective for LCR tules.
d/ Minimum to achieve 7,000 Spring Creek Hatchery return egg-take goal, assuming normal distribution and no mainstem harvest.
e/ ESA guidance or jeopardy standard.
f/ Annual management objectives subject to aggreement between WDFW and treaty tribes.
g/ Minimum to achieve hatchery egg-take goals of 22,500 early and 16,300 late coho, assuming average distribution patterns and no mainstem or tributary fisheries.

TABLE 4. Chinook and coho **harvest quotas and guidelines (*)** for 2000 ocean salmon fishery management options (thousands of fish). (Page 1 of 1)

Fishery or Quota Designation	Chinook for Option I	Chinook for Option II	Chinook for Option III	Coho for Option I	Coho for Option II	Coho for Option III
NORTH OF CAPE FALCON						
TREATY INDIAN COMMERCIAL TROLL[a/]	30.00	25.00	20.00	38.50	12.40	0.00
NON-INDIAN COMMERCIAL TROLL						
Canada to Cape Falcon (May-June)	10.00*	8.50*	0.00	-	-	-
Queets River to Cape Falcon (July-Sept.)[b/]	2.50*	1.50*	0.00	25.00	18.75	12.50
Subtotal Non-Indian Commercial Troll	12.50	10.00	0.00	25.00	18.75	12.50
RECREATIONAL (selective coho fisheries)						
U.S.-Canada Border to Cape Alava[c/]	0.50*	0.00	0.00	6.60	5.00	3.94
Cape Alava to Queets River[c/]	0.30*	0.00	0.00	1.70	1.22	0.93
Queets River to Leadbetter Pt.[c/]	7.40*	6.5*	0.00	29.20	21.90	13.88
Leadbetter Pt. to Cape Falcon[c/]	4.30*	3.5*	0.00	37.50	28.13	18.75
Subtotal Recreational	12.50	10.00	0.00[d/]	75.00	56.25	37.50
TOTAL NORTH OF CAPE FALCON	55.00	45.00	20.00	138.50	87.40	50.00
SOUTH OF CAPE FALCON						
COMMERCIAL TROLL (all except coho)						
Sisters Rock to Mack Arch (Aug.)	2.5	2.5	2.5			
House Rock to Humboldt S. Jetty (Sept.)	7.0	7.0	7.0			
Fort Ross to Pt. Reyes (July test fishery) OR/CA	3.5	4.5	4.5			
Subtotal Troll	13.0	14.0	14.0			
RECREATIONAL						
Cape Falcon to Humbug Mt. (July/Aug., all salmon)	-	-	-	25.0	0.0	0.0
TOTAL SOUTH OF CAPE FALCON	14.0	14.0	14.0	25.0	0.0	0.0

a/ For the Makah encounter rate study, legal sized fish retained in open periods will be included in the tribal quota.
b/ Selective fishery for marked hatchery coho (healed adipose fin clip).
c/ The subarea chinook harvest is a guideline. The fisheries are restrained by the overall chinook quota north of Cape Falcon. The coho quota is a landed catch of marked hatchery coho.
d/ **Roughly zero.**

TABLE 5. Preliminary projections of **chinook** impacts for 2000 ocean salmon fishery management options. Numbers followed by an asterisk indicate the inclusion of hook-and-release mortality as described in footnote "a". (Page 1 of 2)

Fishery or Stock	2000 Projection for Option I	II	III	1999 Observed
	OCEAN IMPACTS[a/] (thousands of chinook)			
NORTH OF CAPE FALCON[b/]				
Treaty Commercial Troll	30.0	25.0	20.0	27.4
Non-Indian Commercial Troll	12.5	10.0	0.3*	17.5
Sport	12.5	10.0	0.7*	9.9
Total	55.0	45.0	21.0	54.8
CAPE FALCON TO HUMBUG MT.				
Commercial Troll	167.8	154.2	154.2	61.0
Sport[c/]	5.6	4.2	4.2	3.3
Total	173.4	158.4	158.4	64.3
HUMBUG MT. TO HORSE MT.				
Commercial Troll	12.6	12.6	12.6	3.9
Sport[c/]	13.5	15.9	13.1	9.6
Total	26.1	28.5	25.7	13.5
SOUTH OF HORSE MT.				
Commercial Troll	307.0	335.6	333.5	262.0
Sport	156.0	159.9	156.0	81.4
Total	463.0	495.5	489.5	343.4
Area 4B Add-On	0.0	0.0	0.0	0.0
Buoy 10	11.0	11.0	11.0	5.8

a/ Ocean impacts include catch plus hook-and-release mortality (HRM) of legal-sized fish where applicable. Harvest impacts that include HRM are marked with an asterisk. Estimates of bycatch for chinook are generally made for single species fisheries or those with other special restrictions not common to base year fisheries. For 2000, chinook bycatch impacts include an estimated:
100 chinook in Areas 3 and 4 sport fishery in Option II north of Cape Falcon to access the coho quota.
700 chinook in Option III sport fisheries north of Cape Falcon to access coho quota.
300 chinook in Option III commercial fishery north of Cape Falcon to access coho quota.

b/ Assumes a WCVI fishery mortality of 1,200 coho; 1999 chinook harvest level in SE Alaska; 1999 estimated chinook harvest rate in Canadian fisheries, except 75,000 harvest for WCVI troll.

c/ Includes Oregon territorial water, late-season chinook fisheries.

TABLE 6. Preliminary projections of **coho** impacts for 2000 ocean salmon fishery management options. Numbers followed by an asterisk indicate the inclusion of hook-and-release mortality as described in footnote "a". (Page 1 of 1)

Fishery or Stock	2000 Projection for Option I	II	III
	OCEAN IMPACTS[a/] (thousands of coho)		
NORTH OF CAPE FALCON[b/]			
Treaty Commercial Troll	40.5	13.1	0.1
Non-Indian Commercial Troll	30.8	22.8	14.7
Sport	84.0	62.7	42.1
Total	155.3	98.7	56.9
SOUTH OF CAPE FALCON			
Commercial Troll	13.3	12.5	12.5
Sport	33.2	7.6	6.3
Total	46.5	20.1	18.8
Area 4B Add-On	10.4	7.7	0.0
Buoy 10	60.2	60.0	60.0

a/ Ocean impacts include catch plus hook-and-release mortality (HRM) and drop-offs where applicable. Estimates of HRM are for legal size fish which must be released in single species fisheries or those with other special restrictions such as selective fisheries for marked hatchery coho. For 2000, estimated coho bycatch is provided below (numbers marked with a double asterisk indicate selective fisheries for marked hatchery coho).

	Option I	Option II	Option III
Treaty Troll	2,000	700	100
N. of Cape Falcon.Commercial	5,800**	4,100**	2,200**
N. of Cape Falcon Sport	8,900**	56,300**	4,500**
S. of Cape Falcon Commercial	13,300	12,500	12,500
S. of Cape Falcon Sport	15,900**	7,600	6,300
Total	75,000	73,700	38,800

b/ Assumes WCVI harvest of 1,200 coho and nonretention mortalities associated with the Makah encounter rate study.

TABLE 7. Expected coastwide Oregon coastal natural (OCN) and Rogue/Klamath (RK) coho exploitation rates by fishery under the proposed 2000 management option options. (Page 1 of 1)

	Exploitation Rate (Percent)					
	OCN			RK		
Fishery	I	II	III	I	II	III
SOUTHEAST ALASKA	0.03	0.03	0.03	0.00	0.00	0.00
BRITISH COLUMBIA	0.12	0.12	0.12	0.00	0.00	0.00
PUGET SOUND/STRAITS	0.65	0.66	0.67	0.00	0.00	0.00
NORTH OF CAPE FALCON						
Treaty Indian Troll	0.38	0.13	0.00	0.00	0.00	0.00
Recreational	0.55	0.40	0.24	0.04	0.02	0.02
Non-Indian Troll	0.32	0.30	0.18	0.00	0.00	0.00
SOUTH OF CAPE FALCON						
Recreational:						
Cape Falcon to Humbug Mt.	1.06	0.41	0.41	0.08	0.04	0.04
Humbug Mt. to Horse Mt. (KMZ)	0.73	0.92	0.72	2.38	2.94	2.33
Fort Bragg	0.44	0.81	0.44	1.20	2.20	1.20
South of Pt. Arena	0.72	0.72	0.72	0.39	0.39	0.39
Troll:						
Cape Falcon to Humbug Mt.	1.98	1.72	1.71	0.11	0.09	0.09
Humbug Mt. to Horse Mt. (KMZ)	0.15	0.15	0.15	0.52	0.50	0.50
Fort Bragg	0.02	0.02	0.02	0.09	0.09	0.09
South of Pt. Arena	0.65	0.79	0.80	0.33	0.39	0.39
BUOY 10	0.20	0.18	0.18	0.12	0.11	0.11
ESTUARY/FRESHWATER	0.93	0.94	0.95	---	---	---
TOTAL	8.91	8.30	7.34	5.27	6.77	5.17

Agenda B.9.b. Tribal Comments on the 2000 Options
to be adopted for public review.

Comments of Jim Harp on the 2000 Ocean Salmon Fishery Options
March 10, 2000

Mr. Chairman:

- First, I would like to thank the STT for the work they have done to analyze, collate, and compile the range of options before us. The format is an improvement.

- The tribes believe that we have proposed a range of options for 2000 ocean fisheries that adequately capture a range of possibilities for fisheries this year given the low abundance of several of our important coho and chinook stocks. These options also attempt to provide a realistic range of alternatives given the current ESA concerns.

- An issue that we seem to have overlooked earlier in the week is to inform the Council that the Makah Tribe has again submitted a proposal to the Pacific Salmon Commission continue an encounter rate study associated with their troll fishery. Their proposal is basically a repetition of the chinook encounter rate study that they did with their 1998 and 1999 troll fishery. The Makah biologists and the STT will ensure that the appropriate impacts associated with their study are modeled in this year's planning process. These impacts are quite modest compared to the overall fishery impacts. Again, the Makah's are planning on counting any salmon retained during the periods when the troll fishery is open towards the treaty troll quota.

- We would like to remind the Council that management objectives for many stocks have yet to be agreed with between the tribes and WDFW. The tribes and state will be meeting over the next few weeks to both work out management objectives as well as shape fisheries to meet these objectives.

- For chinook, as I mentioned before, several important contributing stocks continue to be depressed. However we still intend to live up to the commitment that we made in 1988 to not increase our impacts over the

base period on the Columbia River chinook stocks of concern.

- The tribes still have concerns about our ability to appropriately analyze selective fishery options. For this year, we want to emphasize that any selective fishery proposals advanced by the Council must be consistent with the U.S. District Court's stipulation and order regarding mass marking and selective fisheries. We hope that WDFW will be presenting a detailed monitoring and sampling plan to the tribes durring the North of Cape Falcon Meetings.

- We are beginning the process of establishing, cooperatively with the Washington Department of Fish and Wildlife, a package of fisheries that will ensure acceptable levels of escapement for natural stocks of concern. In many cases, it will be difficult to meet minimum tribal and non-tribal fishery needs this year, but the tribes intend to work cooperatively with WDFW toward that end.

TESTIMONY OF
THE COLUMBIA RIVER TREATY TRIBES
BEFORE PACIFIC FISHERIES MANAGEMENT COUNCIL
MARCH 10, 2000
SACRAMENTO, CA

Good afternoon Mr. Chairman and members of the Council. My name is Terry Courtney, Jr. I am a member of the Fish and Wildlife Committee of the Confederated Tribes of the Warm Springs Reservation of Oregon. I am here today to present comments on behalf of the four Columbia River treaty tribes: the Yakama, Warm Springs, Umatilla and Nez Perce tribes.

The Columbia River tribes have had time to make a quick review of the analysis of the options by the Salmon Technical Team. The options that the council adopt today for public review need to reflect the status of the stocks. Columbia River tule hatchery fall chinook, one of the main contributors to PFMC fisheries, are expected to be at low levels again. The low return of Spring Creek Hatchery fish will likely cause management problems this fall for Columbia River fisheries. The tribes need to have the flexibility to achieve the harvestable share entitled under case law.

The impact level on Snake River fall chinook is important to the tribes because it is one of the controlling stocks for Columbia River management and it is on the Endangered Species list. The forecast for the return of Snake River wild fall chinook is not yet available, but should be available by the April meeting. The Snake River wild fall

chinook index is also not yet available. The options considered by the Council must be consistent with ESA guidelines for Snake River wild fall chinook. If any of the options fail to meet the Snake River fall chinook guidelines, then the Council can not consider that option for final adoption in April.

The tribes expect the states to manage coho fisheries to pass 50% of the upriver Columbia River coho to Bonneville Dam in accordance with management agreements. The mortalities of Upper Columbia River coho in ocean fisheries must be balanced with the mortalities in inside fisheries in order to meet this obligation. It is difficult to assess the effect of the ocean options without a better understanding of the full package of ocean and inside fisheries, including the effect of selective fisheries on natural stock returns. We will be working with the state and federal agencies to clarify the situation between now and the Council's meeting in April.

Conservation principles must be applied to every part of the life cycle, not just in harvest. Even though the Council has little control over activities other than fisheries, a number of the voting members represent agencies which do have the ability to make improvements in other areas. The Columbia River tribes are willing to work with whoever it takes to make improvements in the salmon runs on which we depend for our cultural existence, because the status quo is not acceptable.

To restore salmon stocks, we must make improvements in habitat conservation and restoration and in water use. The tribes believe the responsible use of hatcheries as supplementation tools is essential to rebuilding wild salmon stocks. Funding must be made available to implement innovative supplementation programs. In the Columbia River, we must find a way to safely pass fish through the hydropower system. Today is the anniversary of the flooding of the treaty fishery at the Celilo Falls by The Dalles Dam, a tremendous loss for the Columbia River tribes. The tribes believe that the science is clear that the most likely way to restore Snake River salmon stocks is to breach the Lower Snake River dams. Others such as Governor Kitzhaber and the U.S. Fish and Wildlife Service also support breaching. Without actions in other areas to restore salmon stocks, restrictive fishery management will become the status quo and that is not acceptable.

It appears that the options being considered by the Council provide an adequate range to send out for public review. However, we must be able to look at the results for the Snake River wild fall chinook harvest index and at the impacts on all stocks for the full package of fisheries before endorsing any option for final adoption.

This concludes my statement. Thank You.