

### III. COHO AND PINK SALMON MANAGEMENT ASSESSMENT

#### South of Cape Falcon

##### Management Goals and Preseason Expectations

Coho management objectives for California and Oregon fisheries south of Cape Falcon were to maximize catch of OPI area hatchery coho stocks while achieving the escapement goal for OCN stocks (200,000 adults in 1989). Consideration was also given to the impact rate of these fisheries on Washington coastal and Puget Sound coho stocks.

Portions of the south of Cape Falcon area coho fisheries have been restricted by management objectives for Klamath River fall chinook. Recent reductions in allowable harvest rates established for Klamath River fall chinook in the KMZ area have resulted in significant changes in the time and area distribution of harvest impacts on OCN coho stocks.

Beginning with the 1987 season, a revised salmon FMP allocation schedule was implemented for ocean troll and recreational users south of Cape Falcon. The revised allocation provides a transfer ("rollover") of a portion of the recreational quota to trollers about August 1, if the projected total ocean recreational fishery catch is less than the preseason harvest allocation.

Allowable harvests for 1989 were based on preseason abundance estimates for individual OPI area stock units including public hatchery, private hatchery, and OCN. Preseason abundance estimates were 1,381,500 public hatchery coho; 206,400 private hatchery coho; 5,200 from the Oregon STEP program; and 446,200 OCN coho for a total of 2,039,300 coho. Fishery impacts and catch quotas for final Council-adopted seasons were assessed using a microcomputer spreadsheet version of the WDF/NBS catch-regulation model.

Council-adopted preseason regulations allowed a total fishery impact of 846,000 coho associated with ocean fisheries south of Cape Falcon. Using procedures described in Preseason Report I (February 1989), the OCN coho ocean escapement was estimated to be 207,000 coho under adopted regulations, sufficient to achieve the spawning escapement goal of 200,000 fish after inriver harvest.

##### Ocean Fisheries

###### Troll

The 1989 ocean troll fishery south of Cape Falcon was subject to an overall preseason harvest impact of 561,000 coho, based on preseason estimates of troll catch and impacts (hooking mortality) by catch area. An estimated 87,000 coho were projected preseason to be lost to hooking mortality, leaving 474,000 coho for actual harvest. This compares to 625,300 coho estimated preseason to be available for harvest in 1988 (adjusted inseason to 670,300).

The Council did not make an inseason adjustment (i.e., rollover) from the recreational fishery to the troll fishery in 1989. Rollovers of coho determined to be in excess of the recreational fishery needs occurred in both 1987 and 1988 seasons. The south of Cape Falcon recreational fishery was

closed in 1989, prior to the preseason scheduled closing date, due to quota attainment.

The troll coho catch quota was partitioned into several subarea catch ceilings. These subarea ceilings were designed for port equity concerns in the extreme northern and southern fishing areas. They were also implemented to prevent substantial geographical shifts in coho impacts that differ from those anticipated preseason. This occurred in 1987 when substantially more OCN coho were impacted off the Coos Bay area resulting in a spawning escapement that was less than half the goal.

The overall troll coho catch quota was 474,000 coho in 1989. Subarea ceilings within the overall catch quota allowed no more than 349,000 coho south of Cascade Head, of which no more than 89,000 coho could be caught south of the Orford Reef Red Buoy. A separate subarea catch quota of 5,000 coho was reserved preseason for the troll fishery south of Horse Mountain by deducting it from the overall catch quota and subarea ceilings. This guaranteed 5,000 subarea catch quota was to begin upon the attainment of the overall catch quota or subarea ceilings minus the deduction.

All south of Cape Falcon troll fisheries landed a total of 477,900 coho, less than 1 percent above the catch quota (Table III-1). The landings for the area south of Cascade Head totaled 338,200 coho, 97 percent of the subarea catch ceiling. The landings for the area south of the Orford Reef Red Buoy were 42,300 coho, 48 percent of the subarea catch ceiling. The landings for the area south of Horse Mountain occurring after the coho season closed to the north were 1,500 coho, 29 percent of the subarea catch ceiling (Table I-9).

For the Cape Falcon to Cascade Head area, the all-species fishery opened July 12 without landing restrictions and closed July 14 for the preseason scheduled 3 day closure at 75 percent of the south of Cape Falcon coho catch quota. The fishery reopened July 18 through August 17. Single daily landing restrictions of 50 coho were in effect until August 13. From August 14 through August 17 the area was under a ratio fishery requirement of at least one chinook for each two coho landed.

The all-species fishery between Cascade Head and the Orford Reef Red Buoy opened July 1 through July 14 under single daily landing restrictions of 50 coho. It was closed July 15 through July 17 for the scheduled 3 day closure at 75 percent of the south of Cape Falcon coho catch quota. It reopened July 18 through August 17 under a ratio fishery requirement of at least one chinook for each two coho landed. The subarea from Cape Arago to the Orford Reef Red Buoy was closed July 14 through July 31 and August 18 through August 31 to reduce ocean catch impacts of Klamath River fall chinook outside of the KMZ.

Coho fishing in the KMZ was permitted in the June 5 through June 8 season. There was also a September 15 through October 31 Trinidad Head to Punta Gorda (Eel River area) all-species fishery within 6 nautical miles of shore. Total coho harvest in the Eel River fishery was 400 fish.

The California troll all-species fishery south of the KMZ was opened from Horse Mountain to Point Arena, June 5 through June 17, July 2 through July 14, and July 29 through September 30. Closure periods were scheduled preseason to reduce ocean catch impacts of Klamath River fall chinook outside of the KMZ.

Table III-1. Ocean harvest and hooking mortality impacts for coho salmon by all fisheries in the OPI area during the 1989 season with comparable catches for 1988, 1987, 1986 and 1985 in thousands of fish.

	1989 Ocean		Percent of		Ocean Catch (thousands of fish)			
	Catch Quota	1989 Quota	1989 <sup>a/</sup>	1988	1987	1986	1985	
			<u>TROLL</u>					
Leadbetter Pt. to Cape Falcon	32.3 <sup>b/</sup>	115	37.1 <sup>c/</sup>	0.0 <sup>e/</sup>	26.2	94.2	32.8 <sup>h/</sup>	
South of Cape Falcon	474.0	101	477.9 <sup>d/</sup>	676.0 <sup>e/</sup>	385.7 <sup>f/</sup>	428.3 <sup>g/</sup>	55.4	
Oregon	-	-	436.6	623.0	342.1	393.8	44.3	
California	-	-	41.3	50.9	43.6	34.5	11.1	
Troll Total	506.3	102	515.0	676.0	411.9	522.5	88.2	
			<u>RECREATIONAL</u>					
Leadbetter Pt. to Cape Falcon	111.4	105	116.5	28.9	87.7	104.4	110.8 <sup>i/</sup>	
Cape Falcon to U.S.-Mexico Border	285.0	100	285.3	249.0	198.1	191.4	166.7	
Oregon	-	-	238.0	216.4	152.1	174.6	151.5	
California	-	-	47.3	34.7	46.0	16.8	15.2	
Recreational Total	396.4	101	401.8	277.9	285.8	295.8	277.5	
Total OPI Ocean Fisheries	902.7	102	916.8 <sup>c/d/</sup>	953.9 <sup>e/</sup>	697.7 <sup>f/</sup>	818.3 <sup>g/</sup>	365.7 <sup>h/i/</sup>	

a/ Preliminary.  
b/ Inseason revised catch quota after adjustments from earlier north of Cape Falcon catch quota overages during (1) troll fishery between U.S.-Canada border and Carroll Island (1,300 coho) and (2) overage in recreational fishery (1,400 coho).  
c/ Does not include the postseason hooking mortality estimated at 1,200 coho in all-species-except-coho commercial troll fishery.  
d/ Does not include the postseason hooking mortality estimated at 87,200 coho in south of Cape Falcon commercial troll fishery.  
e/ Does not include the postseason hooking mortality estimated at 112,700 coho in south of Cape Falcon commercial troll fishery, and 2,800 coho in the Columbia River all-species-except-coho commercial troll fishery.  
f/ Does not include the postseason hooking mortality estimated at 17,700 coho in south of Cape Falcon commercial troll fisheries.  
g/ Does not include the postseason hooking mortality estimated at 57,400 coho in south of Cape Falcon commercial troll fisheries.  
h/ Does not include the postseason hooking mortality estimated at 44,000 coho in south of Cape Falcon commercial troll fisheries.  
i/ Includes fishery catch of 10,500 coho from Buoy 10 fishery in the mouth of Columbia River, August 18 through August 22, until Columbia River area ocean fishery closed plus 300 fish caught illegally in the ocean north of Klipsan Beach.

From Point Arena to the U.S.-Mexico border, the all-species fishery was open June 1 through September 30 with no species landing restrictions.

A preliminary postseason estimate of coho hook-and-release mortality in the all-species-except-coho troll fisheries is estimated at 87,200 coho compared to the preseason estimate of 87,000. Factors contributing to this year's loss and similar high losses since about 1986 are: (1) major increases in troll effort (vessel days) in the Cape Falcon to Orford Reef Red Buoy area, particularly during the spring (May through June) all-species-except-coho fisheries to take advantage of high chinook abundance and harvest opportunity; (2) larger coho stock sizes; and (3) longer periods of all-species-except-coho fishing due to coho quota restrictions. With the addition of coho hooking mortality, the total south of Cape Falcon troll fishery impact is estimated to be 565,100 coho. This impact level is within 1 percent of the adopted preseason troll harvest impact of 561,000 coho.

### Recreational

The ocean recreational fishery had a catch quota of 285,000 coho with different opening dates for the Cape Falcon to Horse Mountain and south of Horse Mountain subareas (Table I-3). This compares to a 1988 preseason catch quota of 298,400 (adjusted inseason to 253,400).

For the Cape Falcon to Orford Reef Red Buoy subarea, the recreational all-species season opened May 1 through May 27 in waters less than 27 fathoms deep (approximately zero to two miles from shore). This restriction was intended to reduce early-season coho harvest and expand chinook fishing opportunities. After May 28 the fishery operated without the area restriction. From May 28 through July 27 the fishery was open 7 days per week. Friday and Saturday closures were implemented from July 28 through August 19 to dampen coho catch rates. The fishery closed midnight August 20 with sufficient coho catch quota remaining to meet the anticipated needs of the recreational fishery between the Orford Reef Red Buoy and Horse Mountain. The fishery reopened from September 2 through September 4 when coho excess to the needs of the Orford Reef Red Buoy to Horse Mountain recreational fishery were identified. Ocean recreational fishermen landed 204,900 coho in this area (201,300 in 1988), 72 percent of the entire south of Cape Falcon recreational catch.

The KMZ area recreational fishery opened May 1 and closed on September 30, as scheduled preseason. The 1989 KMZ general season provided a coho harvest of 76,600 fish (46,300 in 1988), 27 percent of the entire south of Cape Falcon recreational catch.

In the area south of Horse Mountain, the all-species season was continuous from February 18 through November 12. A total of 3,700 coho were harvested (3,500 in 1988), 1 percent of the entire south of Cape Falcon recreational catch.

### Inside Fisheries

River and estuary recreational coho fisheries in this area are considered to have a minor impact on critical coho stocks. Recreational fisheries operating in Yaquina and Coos bays target primarily private hatchery fish, while

fisheries in other coastal estuaries and rivers target a mix of natural and hatchery stocks. The 1989 harvest information for inside fisheries is not available. Oregon coastwide coastal river inside harvests are estimated at an average of 17,000 coho for the years 1986 through 1988.

### Spawning Escapement

#### Public Hatchery Escapements

A preliminary estimate (through January 24, 1990) of total coho returns to Oregon coastal and Klamath River hatcheries is 43,000 adults (47,500 in 1988). Approximately 37,300 adult coho returned to Oregon coastal facilities, 8 percent above the 1988 returns. An estimated 5,700 adults returned to Klamath River hatcheries, 66 percent below 1988 returns. Both Oregon coastal and Klamath River hatchery goals were reached. (Table III-2).

#### Private Hatchery Escapements

Adult coho returns to Oregon private aquaculture facilities are estimated to be 46,900 in 1989. This is 59 percent below the estimated 115,700 coho which returned in 1988 (Table II-6). Due to low returns in 1989, Oregon's remaining private coho aquaculture company plans to quit the ocean ranching business. If plans are followed, 1990 will be the last return year from major private aquaculture coho releases. Releases of sufficient numbers to maintain a brood stock will be continued.

#### OCN Escapement

Spawning surveys are not completed for coastal river and lake systems, so a final analysis is not yet available. A preliminary assessment of OCN spawning escapement, adjusted for private and public hatchery strays in some systems, indicates about 135,000 adult spawners (Table III-3). This compares to 162,000 adult spawners in 1988.

#### Goal Assessment

Postseason evaluations indicate that enough coho escaped to inland areas to meet Klamath River basin and Oregon coastal public hatchery smolt production goals.

Preliminary escapement information suggests the OCN spawning escapement goal of 200,000 was not achieved.

Quotas and catches for 1989 are compared to 1985-1988 catches in Table III-1. A review of OPI catch and escapement since 1970 is shown in Table III-4.

### North of Cape Falcon

#### Management Goals and Preseason Expectations

Management goals for fisheries which impact coho in the area north of Cape Falcon are described in the Council's framework amendment (Section 3.1.1.2,

Table III-2. Preliminary 1989 adult (male and female) salmon escapements in thousands of fish to ODFW coastal salmon hatcheries and CDFG hatcheries on the Klamath River compared with escapements since 1973 and 1989 management goals.

Year	Oregon Coastal (ODFW)			Klamath River California		
	Chinook		Coho	Chinook		Coho
	Spring	Fall		Spring	Fall	
1973	-	4.2	18.4	2.5	8.6	8.0
1974	-	1.6	35.1	4.3	12.5	0.5
1975	-	2.1	4.9	3.7	10.3	0.3
1976	2.9	0.5	38.7	3.3	14.0	4.3
1977	2.4	4.2	6.5	1.1	6.3	0.9
1978	4.4	1.6	5.6	3.8	13.0	1.8
1979	7.0	2.0	23.0	1.4	3.6	3.0
1980	7.9	1.8	22.4	0.5	6.5	3.6
1981	2.5	1.8	21.5	2.4	4.4	2.9
1982	4.1	2.3	15.8	1.3	10.4	4.9
1983	3.9	4.0	12.8	0.8	14.1	4.0
1984	5.6	3.3	34.7	1.1	7.2	2.0
1985	8.7	3.5	17.1	2.9	21.2	9.9
1986	30.6	5.8	37.7	8.1	32.4	3.5
1987	22.8	7.1	13.1	8.8	28.4	23.0
1988	22.0	6.4	34.6	13.9	33.5	12.9
1989 <sup>a/</sup>	32.7	4.6	37.3	5.5	21.3	5.7
1989 Goal <sup>b/</sup>	9.4	2.2	11.0	3.0	17.5	2.3

a/ Preliminary returns through January 6, 1990.

b/ Hatchery escapement goals for ODFW include number of adult fish needed to meet 1989 agency production goals (e.g., STEP and department hatchery production goals for smolts and presmolts) and do not include private hatchery needs.

Table III-3. Estimated escapements in thousands of Oregon coastal public hatchery and natural adult coho stocks, 1971-1989 with 1971-1975 average.

Year	Total Returns to Facility	N.F. Umpqua		Natural Spawning Escapement (OCN) a/			Total Coastal Freshwater Catch b/	Total Estimated Ocean Escapement to Coast c/
		Winchester Dam	Lakes	Rivers	Total OCN			
1971-1975	20.1	0.4	14.9	166.6	181.4	16.6	218.5	
1971	29.1	0.4	30.8	293.2	324.0	24.1	377.6	
1972	12.9	0.3	10.8	116.9	127.7	16.6	157.5	
1973	18.4	0.4	18.8	143.5	162.3	15.4	196.5	
1974	35.1	0.4	7.9	126.4	134.3	13.5	183.3	
1975	4.9	0.5	6.1	153.0	159.1	13.5	178.0	
1976	38.7	0.3	6.5	156.8	163.3	19.6	221.9	
1977	6.5	0.4	6.8	61.0	67.8	13.5	88.2	
1978	5.6	0.5	5.1	72.2	77.3	4.5	87.9	
1979	23.0	0.4	6.8	167.0	173.8	1.5	198.7	
1980	22.4	0.2	6.5	104.3	110.8	6.3	139.7	
1981	21.5	0.1	7.2	70.5	77.7	9.9	109.2	
1982	15.8	2.7	7.2	124.7	131.9	14.7	165.1	
1983	12.8	1.2	4.3	55.5	59.8	6.8	80.6	
1984	34.7	3.2	13.5	194.0	207.5	17.4	262.8	
1985	17.1	4.0	9.2	183.4	192.6	15.7	229.4	
1986	37.7	9.6	13.8	179.0	192.8	30.3	270.4	
1987	12.9	2.2	6.0	78.3	84.3	7.7	107.1	
1988	34.6	1.2	7.0	155.0	162.0	13.3	208.8	
1989 <sub>d/</sub>	37.3	3.0	5.0	130.0 <sup>e/</sup>	135.0	17.1	192.4	

a/ May include some private hatchery strays after 1978.

b/ Freshwater sport catch from ODFW salmon/steelhead punch card information and represents only those fish >24 inches (i.e., adults).

c/ Does not include private hatchery returns.

d/ Preliminary data.

e/ Preliminary area-under-the-curve estimates of spawning adults expanded from index stream system surveys. Counts adjusted for private hatchery strays based on past stray rates. Counts are also adjusted for public hatchery/STEP facility strays in the Umpqua River basin based on past stray rates.

Table III-4. OPI adult coho catch and escapement in thousands of fish, 1970-1989.<sup>a/</sup>

Year	Ocean Fisheries		Inland Escapement		Total OPI	Private Hatchery		Adjusted OPI <sup>c/</sup>
	Troll	Sport	Coastal <sup>b/</sup>	Columbia River		Fish in OPI	Ocean Catches	
1970	1,394.0	475.2	40.5	872.2	2,781.9			
1971	2,422.4	681.7	29.7	527.0	3,660.8			
1972	1,214.9	533.6	13.3	269.0	2,030.8			
1973	1,257.4	422.1	26.8	283.7	1,990.0			
1974	1,995.3	636.8	36.0	452.9	3,121.0			
1975	1,027.8	441.6	5.7	292.2	1,767.3			
1976	2,796.3	931.1	43.0	326.4	4,096.8			
1977	632.8	392.5	7.8	87.3	1,120.4	8.2		1,112.2
1978	1,051.6	499.6	8.2	297.3	1,856.7	21.5		1,835.2
1979	1,006.3	318.5	25.9	264.4	1,615.1	40.3		1,574.8
1980	482.8	501.3	25.6	287.9	1,297.6	44.2		1,253.4
1981	789.2	327.6	24.1	162.4	1,303.3	144.6		1,158.7
1982	691.4	272.1	22.5	435.9	1,421.9	122.2		1,299.7
1983	401.1	260.7	11.2	104.2	777.2	135.2		642.0
1984	84.8 <sup>d/</sup>	175.5	33.8	407.4	701.5	10.2		691.3
1985	132.2 <sup>e/</sup>	264.3	29.7	356.2	782.4	63.3		719.1
1986	577.6 <sup>f/</sup>	295.8	49.0	1,517.6	2,440.0	94.9		2,345.1
1987	429.6 <sup>g/</sup>	285.8	37.2	300.8	1,053.4	170.0		883.4
1988	781.2 <sup>h/</sup>	278.1	45.4	655.2	1,759.9	103.7		1,656.2
1989 <sup>i/</sup>	589.1 <sup>j/</sup>	402.3	44.9	676.7	1,713.0	48.0		1,665.0

a/ Components of the OPI are California, Oregon, and Ilwaco troll harvest; California, Oregon, and Ilwaco sport harvest; Columbia River gillnet catch, hatchery, and dam escapements; Oregon coast hatchery escapements and Winchester Dam counts (Umpqua); and Klamath River hatchery escapements. Does not include OCN coho freshwater catch, OCN spawning escapement, STEP hatchery returns, or Oregon coastal private hatchery returns.

b/ Oregon coastal and California combined. Includes fish entering hatchery facilities, and Winchester Dam counts.

c/ For 1970-1976, total OPI excludes catch of private hatchery fish and is identical to the adjusted.

d/ Includes estimated hooking mortality of 24,000 coho during commercial troll fishery south of Cape Falcon, including California.

e/ Includes estimated hooking mortality of 44,000 coho during commercial troll fishery from Cape Falcon to Cape Blanco.

f/ Includes estimated hooking mortality of 57,400 coho during commercial troll fisheries south of Cape Falcon.

g/ Includes estimated hooking mortality of 17,700 coho during commercial troll fisheries south of Cape Falcon.

h/ Includes estimated hooking mortality of 112,700 coho during commercial troll fisheries south of Cape Falcon.

i/ Data are preliminary.

j/ Includes estimated hooking mortality of 87,200 coho during commercial troll fisheries south of Cape Falcon.



page 3-3). Coho stocks impacted by these fisheries include natural and hatchery stocks which originate from Oregon coastal rivers and lakes, the Columbia River, Washington coastal rivers, Puget Sound, and southern British Columbia. Stock-specific impacts of fisheries vary by time and area. Generally, Washington coastal and Puget Sound origin stocks are found in greater concentration in more northerly areas, while fisheries show increasing contributions to catches by Columbia River and Oregon coastal stocks in southern areas.

The allowable harvest for fisheries operating in this area in 1989 was based on the need to protect several depressed Washington coastal and Puget Sound natural stocks. Natural stocks from the Skagit River in Puget Sound and the Queets River on the Washington coast were not expected to be sufficiently abundant to achieve their spawning escapement goals. Spawning escapement expectations assumed an anticipated level of harvest by the Canadian troll fishery off the west coast of Vancouver Island (1.8 million), PFMC fisheries south of Cape Falcon, and, in some cases, by inside area fisheries directed at other species and stocks.

OCN coho contribute a minor portion of their total ocean harvest to fisheries north of Cape Falcon.

Columbia River hatchery stock abundance is an important consideration in determining allowable ocean harvest. The 1989 expected stock abundance for Columbia River hatchery stocks was approximately 15 percent less than the level of abundance used in planning 1988 fisheries. This reduced abundance results in increased rates of impact on weak natural stocks of coho in mixed stock ocean fisheries for a particular level of harvest. However, natural stock abundance levels for Stillaguamish-Snohomish, Hood Canal, Hoh, and Grays Harbor stocks were improved, relative to the 1988 season, and influenced the Council to allow for a much greater total allowable harvest of coho north of Cape Falcon than occurred in 1988.

Sharing of allowable coho harvest between ocean nontreaty recreational and commercial fisheries was guided by the Council framework amendment allocation schedule for this area (75/25 sport/troll split for coho).

## Ocean Fisheries

### Nontreaty Troll

A pink-directed all-species troll fishery operated from Carroll Island to the U.S.-Canada border, west of a line that approximately follows the 100 fathom depth contour, for the periods August 7-10 and August 16-18. The 100 fathom restriction was implemented to increase the pink to coho ratio in this fishery. The fishery operated under a Council coho quota of 40,000, a chinook guideline of 4,000, and a Pacific Salmon Commission, Fraser Panel guideline of 145,000 pink salmon. The estimated total coho catch for this fishery was 41,400, or 1,400 fish in excess of the quota. Pink catches in this fishery were 35,900, or 109,100 fish short of the guideline.

The southern, all-species troll fishery was conducted from the Columbia River Red Buoy line south to Cape Falcon. The area restrictions were implemented to facilitate participation by smaller boats. This fishery was scheduled to open

for only one day, August 21, due to the risk of exceeding the adjusted coho quota (32,300). Landing restrictions of 40 coho and 4 chinook per day were imposed to reduce the effectiveness of the fleet. The quota was not achieved on the first day, and the fishery reopened on August 24 and was extended north to Leadbetter Point. Due to low coho success rates and low effort the fishery remained open through September 10, when projections showed that less than one full days fishing remained in the quota. The total coho catch for this fishery was 37,100, or 4,800 fish in excess of the quota.

### Treaty Indian Troll

The treaty Indian troll fishery was constrained by a total coho quota of 77,000 for the Klallam, Hoh, Makah, Quileute, and Quinault tribes operating in ocean fishing areas and in Area 4B (for the May 1 through September 30 ocean management period). The all-species fishery was conducted from July 15 through August 8 and from August 30 through September 5. The fishery closed on September 5 upon attainment of the coho quota. Total season coho impact for the treaty troll fishery in the ocean area (and Area 4B) was 81,400. An additional 2,400 coho were caught in eastern Strait of Juan de Fuca, Areas 5 and 6C.

### Recreational

The total recreational fishery allowable coho harvest of 225,000 fish was partitioned into 3 subarea quotas. The all-species recreational fishery began on June 26 in the two southern subareas (Columbia River and Westport), and on July 2 in the Neah Bay-LaPush subarea. Fishing for salmon was allowed Sunday through Thursday only, a regime which has been in place for these fisheries since 1985. Bag restriction was uniform across subareas (two fish, any species).

Coho catch rates were high coastwide and all 3 subareas were closed upon attainment of their coho quotas prior to preseason scheduled closures. The Neah Bay-LaPush subarea was closed on July 26 with 22,300 coho, or 99 percent of the 22,500 subarea quota. The Westport subarea closed on August 30 with landings of 88,200 coho, or 97 percent of their 91,100 quota. The Columbia River subarea was closed on August 17 with 116,600 coho, or 105 percent of the 111,400 subarea quota. Total coho catches for the entire recreational fishery in ocean waters totaled 227,100, or 101 percent of the overall quota of 225,000. A state-waters all-species (4B add-on) recreational fishery from the Bonnilla-Tatoosh line to the Sekiu River opened on August 16 with a coho quota of 20,000. This fishery continued on a Saturday through Thursday schedule through September 7, when the coho quota was reached. Total coho catches in this fishery were 19,900, or 99 percent of the quota.

### Columbia River Coho

#### Inside Fisheries

Coho harvest statistics for Columbia River commercial and recreational fisheries are presented in Appendix B, Table B-21. The 1989 Columbia River nontreaty gillnet fishery harvest was 374,900 coho. This compares to the 1988 catch of 362,800 and the 1971-1975 average catch of 199,400 coho. The treaty Indian mainstem commercial gillnet coho catch was 2,600. This compares to the

1988 catch of 7,000 and the 1971-1975 average catch of 9,100 coho.

The mainstem recreational adult coho catch below Bonneville Dam was 82,100 with all but 200 taken in the area downstream of the Astoria-Megler Bridge. In 1989, inriver managers authorized a special fishery in the area from the Astoria-Megler Bridge downstream to Light 26 at Chinook-Hammond during the period August 1-August 13. The August 1 opening for this special fishery was consistent with the opening for the mainstem recreational fishery above the Astoria-Megler Bridge. Catches during this special fishery counted toward the overall Buoy 10 harvest guidelines and totaled 500 chinook and 3,200 coho. The regular Buoy 10 area fishery opened on August 14 with a 2 fish bag limit and harvest guidelines of 127,000 coho through August 27, 30,000 chinook through September 4 and a season total harvest guideline of 200,000 coho. The bag limit was increased to 3 fish after September 4; however, fishery effort declined after mid-September and was minimal after mid-October in spite of some of the highest catch rates occurring during this late season time frame (Table III-5). Historical Buoy 10 catches and effort data are provided in Appendix B, Table B-22.

#### Ocean Escapement

The Columbia River ocean escapement of early and late coho stocks was 667,500 fish, up slightly from the 1988 return of 657,700 adults (Appendix B, Table B-21). This return was 84 percent above the 1971-1975 average ocean escapement of 362,300 adults.

#### Goal Assessment

Ocean escapement for both early and late stock components of Columbia River coho met all hatchery production goals and provided for significant inside sport and commercial fishery opportunities.

#### Washington Coastal Coho

##### Inside Fisheries and Spawning Escapements

A stock by stock description of inside fisheries and spawning escapements is provided below. Estimates of escapement, and in some cases catch, are preliminary and are likely to be changed when final estimates become available. Annual estimates of inriver run size, harvest, and escapement for each coastal river are provided in Appendix B, Tables B-24, B-26, and B-27.

Willapa Bay - The total Willapa Bay gillnet catch was 66,400 coho, 34 percent greater than 1988 and 37 percent greater than the 1979-1988 period average of 48,100 coho. The sport fishery harvest for 1989 is presently unavailable; the average sport catch for the period 1979-1988 is 2,600. Willapa Bay coho are managed for hatchery production. Escapement of hatchery coho to Willapa Bay facilities in 1989 was 31,000, slightly greater than the 1979-1988 average of 29,800 and well above program requirements.

Grays Harbor - Grays Harbor fisheries continued to be restricted in 1989 in anticipation of low returns of natural spawning Chehalis River coho. The total gillnet catch was 26,500 including 1,600 by non-Indian fishermen; 23,300 by the Quinault Indian Nation; and 1,700 by the Chehalis Tribe. The total

Table III-5. Estimated weekly effort (in angler trips) and catches of chinook and coho in the 1989 Chinook-Hammond and Buoy 10 sport fisheries.<sup>a/</sup>

Week Number	Ending Date or Period	Angler Trips	Catch		Catch Per Trip
			Chinook	Coho	
32	August 6	3,171	137	1,757	0.60
33	August 13	<u>4,751</u>	<u>355</u>	<u>1,438</u>	<u>0.38</u>
Chinook-Hammond Fishery Subtotal		7,922	492	3,195	0.47
34	August 20	33,848	4,241	13,525	0.52
35	August 27	36,620	6,381	11,847	0.50
36	September 3	33,840	3,303	23,704	0.80
37	September 10	19,088	1,449	10,550	0.63
38	September 17	11,765	429	10,636	0.94
39	September 24	4,630	56	2,426	0.54
40	October 1	2,374	15	2,590	1.10
41	October 8	1,336	0	1,361	1.02
42	October 15	591	26	1,012	1.76
43	October 22	455	0	911	2.00
44	October 29	<u>301</u>	<u>0</u>	<u>158</u>	<u>0.52</u>
Buoy 10 Fishery Subtotal <sup>b/</sup>		144,848	15,900	78,720	0.65
Grand Total		152,780	16,390	81,915	0.64

a/ Includes boat based fishery and shore-based fisheries at Clatsop Spit and Columbia River North Jetty.

b/ Does not include catch and effort data for the Chinook-Hammond fishery occurring during weeks 32 and 33.

catch compares with 24,100 coho caught during the 1988 season. Sport catch estimates for the 1989 season are not available at this time, but are expected to be below the recent 10 year average catch of 4,500.

A final escapement estimate of coho to Grays Harbor facilities is not yet available, but is anticipated to be well above the goal of 14,000 adults. Estimates of natural spawning escapement are not currently available.

Quinault River - The treaty Indian gillnet fishery targeted on hatchery coho from early September through mid-November. The total gillnet harvest of 9,000 coho was about 30 percent less than the 1988 level and 40 percent below the previous five year average.

Hatchery and natural escapements of Quinault River coho are not yet available for 1989.

Queets River - Queets River fisheries were established by preseason agreement and based on preseason abundance estimates and planned Council ocean fisheries. The treaty gillnet fishery was structured to target on returning hatchery coho during September and early October, followed by a reduced level of fishing for updating natural coho and chinook run sizes until mid-October. The inseason updates indicated that the natural coho run was approximately 25 percent smaller than forecasted. Coho were also caught incidentally during large mesh gillnet fisheries in late October-early November. The season-long harvest of fall coho by the net fishery was 5,800, slightly larger than in 1988, but about 10 percent less than the previous five year average. A relatively small river sport fishery operated through November.

The inseason run size update of natural coho suggests that the spawning escapement will be about 3,600, or about 38 percent below the lower end of the spawning escapement goal range. Preliminary analysis of spawning ground data appears to verify this projection. The escapement level expected preseason was 4,900.

Hoh River - Management of fall coho was based on a preseason agreement. Evaluation of inseason catch and effort information on the Quillayute and Queets Rivers, prior to significant run entry of Hoh River coho suggested reduced run sizes might be as low as 66 percent of preseason forecasts.

The tribal fishery was continued at a schedule of two days per week, reduced from the preseason schedule. The reduced schedule was maintained in order to obtain later updates and allow the fishery to continue in case run entry proved to be delayed rather than reduced. An update confirmed a lower run size approaching 4,100 fish. The Indian gillnet fishery schedule was further reduced, allowing continuation at one day per week through November with a one week closure prior to steelhead season.

The tribal fishery caught approximately 2,000 natural coho from this stock, plus an additional 400 dip-in and Hoh-bound hatchery-reared fish. The river sport fishery was expected to catch 100 adult coho from this stock.

Natural escapement based on the inseason update and preliminary review of spawning ground summaries should meet or slightly exceed 2,000 fish. Returns

of Hoh-bound hatchery-reared fish were below preseason expectations.

Broodstock collection efforts went smoothly this year with better success than 1988. Approximately 80 pair of wild coho were captured in operations this year.

Quillayute River - The summer coho run in the Quillayute River was managed primarily for its hatchery component. The treaty gillnet fishery targeted on this run from mid-August through mid-September, harvesting 600 fish, 85 percent below the 1984-1988 average.

The Quillayute fall coho harvest was based on a preseason management agreement. The inseason update indicated that natural and hatchery run sizes were significantly lower than predicted preseason. The treaty fishery on fall coho commenced in mid-September and continued through mid-October, when concern over the impact on the stock closed the fishery for the season.

The preliminary escapement estimate was 7,600, a slight increase over 1988's escapement of 7,200 fish. Broodstock efforts removed nearly 250 adults from the river.

#### Goal Assessment

The preseason agreement provided for spawning escapements within the established range for the Quillayute coho. Preliminary estimates indicated the escapement slightly exceeded the preseason target. The summer and fall hatchery stocks also exceeded their goals.

#### Puget Sound Coho

##### Inside Fisheries

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 Sound, and Hood Canal. In addition, consideration is given to treaty/nontreaty allocations of Canadian stocks. 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 nontreaty) is presented in Appendix B, Table B-31. The 1989 total commercial catch of coho was 969,600, or 78 percent of the 1988 total (1,246,300), but 2 percent greater than the average catch for the period of 1981-85 (950,700). Nontreaty net harvest was 333,800 coho, which represents 73 percent of the 459,500 coho caught in 1988, and approximately the same number as the average catch for the period 1981-85 (334,100).

Treaty Indian net and troll fisheries harvested 635,800 coho in 1989, or 80 percent of the 1988 total (786,800), and 5 percent more than the 1981-85 average catch of 606,600. A total of 2,900 coho were caught in the Strait of Juan de Fuca (excluding area 4B) by the treaty Indian troll fishery. No nontreaty trolling was conducted in Puget Sound waters in 1989.

Recreational coho harvest data for Puget Sound during 1989 are unavailable at this time. The total recreational harvest of coho in marine waters of Puget

Sound in 1988 was 215,500, and the average catch during the period 1981-85 was 197,800. Historical recreational harvests are presented in Appendix B, Table B-32.

#### Spawning Escapement

Estimates of 1989 natural spawning escapements are unavailable at this time. Hatchery and natural run component escapements and catches for combined Puget Sound origin stock units, for the years 1976-1988 are presented in Appendix B, Table B-33. The Skagit stock unit is managed for a natural run escapement goal of 30,000 adult spawners. Anticipated low abundance of the Skagit natural stock in 1989, and harvests by fisheries impacting this stock throughout its range, were expected to result in spawning escapement well below goal levels for this stock in 1989.

#### Goal Assessment

Generally, hatchery egg take goals were achieved during 1989. Escapement estimates for natural stocks are currently not available.

#### Coastwide Goal Assessment Summary

A summary of 1989 performance for coho salmon by river system and stock in relation to escapement goals is presented in Table III-6.

Table III-6. Summary of 1989 performance for coho salmon by river system and stock in relation to escapement goals (1989 data preliminary).

System	1989 Escapement Goal	Escapement Goal Assessment
Columbia River and Oregon Coastal Coho (OPI)	OCN spawning escapement of 200,000.	Preliminary OCN escapement is 135,000; 68 percent of goal (adjustment for hatchery strays not complete). Hatchery egg take goals achieved.
Washington Coastal Coho	Natural spawning escapements within 1983 court-ordered range for Quillayute, Queets, and Hoh. Grays Harbor natural escapement of 35,400; meet hatchery egg take goals; meet treaty obligations.	Queets river natural escapement below lower end of management range. Quillayute and Hoh River escapements within goal range. Grays Harbor natural escapement goal estimate unavailable. Hatchery egg take goals achieved. No information available on catch allocation.
Puget Sound Coho	Meet escapement objectives for natural and hatchery stocks. Skagit River natural escapement expected to be below the goal (30,000). Meet treaty allocation requirements, and inside non-Indian fishery needs for 6 management units.	Data not available for natural spawning escapement. Hatchery egg take goals achieved for all stocks. No information available on catch allocation.