

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, although stocks produced north of Leadbetter Point are also intercepted in the OPI area. The largest naturally produced coho stock is OCN coho, which includes coho produced from Oregon river and lake systems south of the Columbia River. OCN coho are managed as a stock aggregate with four identified components. NMFS listed three coho ESUs within the OPI area as threatened: CCC coho listed October 1996, SONCC coho listed May 1997, and OCN coho listed August 1998. In 2002, NMFS began an update of all its listing determinations and in January of 2006 concluded that the OCN ESU did not warrant listing under the ESA. That determination was overruled by a U.S. Court decision in 2007, and subsequently relisted by NMFS as threatened in February 2008. Columbia River natural coho were listed as endangered under the Oregon State ESA in 2002, and as threatened under the Federal ESA on June 28, 2005. The primary OPI hatchery stocks include a south migrating Columbia River (early) stock, a north migrating Columbia River (late) stock, public hatchery coho from the Oregon and northern California Coast, and formerly a small cooperative program along the southern Oregon Coast known as the Salmon Trout Enhancement Program (STEP), which was discontinued after the 2004 brood releases.

Management Objectives

In establishing ocean salmon fisheries that impact OPI area coho stocks, the Council was guided by the reasonable and prudent alternatives of NMFS 1999 Supplemental Biological Opinion and Incidental Take Statement for CCC and SONCC coho and the February 2009 NMFS ESA guidance letter for LCN natural and OCN coho, which required:

1. No directed coho fisheries or retention of coho in all commercial and recreational fisheries off California to protect endangered CCC coho.
2. Marine fishery impacts on endangered CCC and threatened SONCC coho must be no more than 13.0 percent as indicated by projected impacts on RK hatchery coho.
3. Fishery impacts on threatened LCN coho must not exceed a coastwide marine and mainstem Columbia River exploitation rate of 20.0 percent.
4. Fishery impacts on threatened OCN coho must not exceed a coastwide marine and freshwater exploitation rate of 15.0 percent.

Based on parent escapement levels and observed OPI smolt-to-jack survival for 2006 brood OPI smolts, the total allowable OCN coho exploitation rate for 2009 fisheries was no greater than 15.0 percent under the Salmon FMP (Amendment 13) and no greater than 15.0 percent under the matrix developed by the OCN work group during their review of Amendment 13. The work group recommendation was accepted by the Council as expert biological advice in November 2000.

The Council was also guided by a treaty Indian/non-Indian sharing agreement for Columbia upriver coho stocks, which required passage of 50 percent of the run destined for areas above Bonneville Dam.

Regulations to Achieve Objectives

Historically, OPI area coho stocks contributed primarily to ocean fisheries off Oregon and northern California and, to a lesser degree, Washington and B.C. The Council prohibited retention of coho in all fisheries south of the Oregon/California border, and adopted seasons the STT projected would result in exploitation rates of 2.8 percent for RK coho in marine fisheries, 13.0 percent for OCN coho in marine and freshwater fisheries combined, and 12.5 percent for LCN coho in marine fisheries.

Commercial Troll

Commercial troll fisheries had been closed to coho retention south of Cape Falcon since 1993 with the exception of a limited fishery in 2007 and 2009. In 2009, from Cape Falcon to Humbug Mtn. the commercial coho fishery had an overall quota of 21,240 (11,000 preseason plus transfer of additional coho from the recreational fishery quota on an impact neutral, fishery equivalent basis). The fishery was not restricted to mark-selective coho retention. Chinook fishery closures and gear restrictions (four-spread requirement) were also used to reduce coho impacts.

Non-Indian commercial troll fisheries from Cape Falcon to the U.S./Canada border in 2009 had an overall quota of 33,600 coho, (Table I-1). The fisheries were restricted to mark-selective coho retention.

All species treaty Indian fisheries north of Cape Falcon were not restricted to mark-selective retention of coho, and operated on an overall quota of 60,000 coho (Table I-2).

Recreational

Retention of coho has been limited in the recreational fisheries south of Cape Falcon since 1993. Retention of coho has been prohibited off California since 1996 to protect ESA listed CCC coho. All coho directed ocean recreational fisheries in the OPI area have been mark-selective since 1998. Adequate abundance of marked coho in the OPI area has resulted in allowable harvests of marked coho in Oregon and Washington within constraints for OCN and LCN coho.

In 2009, after inseason adjustments, the recreational coho fisheries north of Cape Falcon operated with quotas of 16,100 in the Neah Bay area, 8,080 in the La Push area, 55,270 in the Westport area, and 96,500 in the Columbia River area (Table I-3). The recreational fishery between Cape Falcon and the OR/CA border operated with an overall quota of 110,000 June 20 through August 31. Less than 70,000 coho were harvested, so 40,000 coho remaining on the quota were transferred to the September Cape Falcon to Humbug Mt. recreational and commercial fisheries on an impact neutral, fishery equivalent basis. These inseason adjustments resulted in transfers of 10,240 coho to the September commercial fishery, increasing the quota from 11,000 preseason to 21,240 (Table I-1) and 2,560 coho to the September recreational fishery, increasing the quota from 7,000 preseason to 9,560 (Table I-3).

Inside Harvest

Coho retention in all California fisheries was prohibited.

The 2009 inside recreational harvest of coho in Oregon coastal streams, as in recent years, was very restricted and generally limited to areas where surplus hatchery coho returns were expected. Estimates of the 2009 inriver recreational coho harvest for most areas were not available. Historical estimates of the recreational harvest of adult coho in Oregon coastal estuaries and rivers, derived from ODFW salmon and steelhead angler catch record cards, are reported in Table III-1.

Limited recreational fisheries for naturally-produced coho were approved in the Nehalem, Yaquina, Coos and Coquille estuaries in 2009. The catch estimates were 959, 535, 1,145, and 962 respectively.

A limited fishery for naturally-produced coho was approved in Siltcoos and Tahkenitch Lakes. The recreational fishery opened October 1 and closed December 31 as scheduled. The final catch estimates were similar to the previous 3-year average of 310 adults. The 2009 catch estimates were 265 adults in the Siltcoos Lake fishery and 80 adults in the Tahkenitch Lake fishery.

The 2009 Columbia River non-Indian commercial gillnet fishery harvested 125,400 adult coho, compared to 60,400 coho in 2008. Select Area fisheries in both Oregon and Washington accounted for 80,100 of the total 2009 Columbia River commercial coho catch. The Columbia River treaty Indian mainstem commercial gillnet coho catch was approximately 9,700 fish, compared to the 2008 catch of 21,600 coho. All Columbia River coho commercial fisheries were non-mark-selective. Coho harvest information for Columbia River commercial and recreational fisheries are presented in Appendix B, Table B-21.

The Buoy 10 and mainstem recreational fisheries below Bonneville Dam harvested 52,100 adult coho compared to 10,800 adult coho in 2008. All Columbia River recreational fisheries in 2009 were mark-selective for coho. In 2009, Columbia River managers opened the Buoy 10 fishery August 1 with a daily bag limit allowing two adult salmon in August, no more than one Chinook, and beginning September 1 up to three adult salmon with no Chinook retention. The fishery ran through December 31 with the upriver boundary at the Tongue Point, Oregon to Rocky Point, Washington line. The 2009 Buoy 10 harvest and effort totaled 48,127 coho and 72,803 angler trips (Table III-2). Historical Buoy 10 catch and effort data are provided in Appendix B, Table B-22. Recreational coho harvest estimates for Columbia River tributaries were not available.

Escapement and Management Performance

The overall abundance estimate for OPI area stocks in 2009 was 1,323,200 compared to 736,300 in 2008 and 62 percent greater than the ten-year average of 817,600 (Table III-3; Figure III-1).

Central California Coast and Northern California Coho

For CCC coho, redd counts have been made for the Lagunitas Creek basin since 1995 and are reported in Table B-7. Fifty two redds were counted as of January 29, 2010. However, the spawning season for this watershed may not be complete and the final redd count may change. Estimates were available for escapement to Klamath River Basin hatcheries, but not for coho spawning in natural areas. In 2009, a total of 2,456 adult coho returned to Trinity River Hatchery and 46 adult coho returned to Iron Gate Hatchery. These values compare to a combined goal of 2,000 adults.

Oregon Coast Natural Coho

The preliminary estimate of natural spawner escapement in 2009 to Oregon coastal river and lake systems from the Sixes River north (Oregon coast ESU) was 232,900 adult coho. This compares to 165,400 adults in 2008. Historical spawner escapement estimates of naturally produced coho are reported in Table III-1.

Preliminary information, based on random sampling surveys, indicate the highest total natural spawning population on the Oregon coast since 2002. The estimate of the natural spawning population in 2009 was 235,500, including estimates from the Rogue River, which is part of the SONCC ESU (Table III-4, Figure III-2).

Preliminary postseason estimates of combined marine and freshwater exploitation on OCN coho was 10.9 percent, less than the preseason projection of 13.0 percent, and below the 15.0 percent maximum allowed under the FMP and the OCN work group matrix. Preliminary postseason estimates of marine exploitation on RK coho was 2.4 percent, slightly lower than the preseason projection of 2.8 percent, and well below the 13.0 percent maximum ESA consultation standard.

Oregon Coastal Hatchery Coho

The preliminary estimate of total coho returns to Oregon coastal public hatcheries was 5,600 adults (Table III-1). Hatchery egg-take goals were expected to be met at all public hatchery stations.

Columbia River Coho

The 2009 ocean escapement of adult early and late Columbia River coho stocks was 721,600 fish, compared to 483,400 adults in 2008 (Appendix B, Table B-21). The 2009 Columbia River coho abundance was sufficient to meet all hatchery brood stock escapement needs.

Preliminary postseason estimates of marine exploitation on LCN coho was 9.8 percent, less than the preseason projected 12.5 percent.

WASHINGTON COASTAL COHO STOCKS

Washington coastal coho 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, inclusive). The stocks in this group most pertinent to ocean salmon fishery management were Willapa Bay (hatchery), Grays Harbor, Quinault (hatchery), Queets, Hoh, and Quillayute coho. Those stocks contribute primarily to ocean fisheries off Washington and B.C.

Management Objectives

Management goals for Grays Harbor and Olympic Peninsula coho stocks included achieving natural spawning escapement objectives and treaty Indian allocation requirements. The Council's conservation objectives for stocks managed for natural production were based on maximum sustainable yield (MSY) spawner escapements established pursuant to the U.S. District Court order in *Hoh versus Baldrige*. The conservation objectives for the Queets, Hoh, and Quillayute rivers were developed as ranges intended to bracket estimates of MSY escapement. The range reflects the degree of uncertainty inherent by using the high estimate of recruits-per-spawner and the low estimate of carrying capacity for the lower bound, and the low estimate of recruits-per-spawner and the high estimate of smolt carrying capacity for the upper end of the range. The ranges were further adjusted upward by 26-184 percent for risk aversion and habitat considerations. However, annual natural spawning escapement targets may vary from the FMP conservation objectives if agreed to by WDFW and the treaty Indian tribes under the provisions of *Hoh versus Baldrige* and subsequent U.S. District Court orders. After an annual agreement is reached, ocean fishery escapement objectives are established for each river, or region of origin. The agreement includes provisions for treaty Indian allocation requirements and inside non-Indian fishery needs. No agreements on annual spawning targets for Washington coastal coho other than those in the FMP were made in 2009.

Regulations to Achieve Objectives

Washington coastal did not play a primary role in 2009 Council-area ocean fishery management because of impact constraints on Interior Fraser (Thompson River, B.C.) and LCN coho stocks. Overall harvest quotas were limited to levels well below those of the late 1980s and early 1990s. All non-Indian ocean coho fisheries north of Cape Falcon were mark-selective. Treaty Indian fisheries were not mark-selective.

Willapa Bay Coho

Inside Harvest

Historical terminal run size, harvest and escapement data for Willapa Bay coho are presented in Appendix B, Table B-24. The 2009 gillnet coho harvest in Willapa Bay totaled 74,417 fish. Based on the preseason forecast for a terminal run of 71,350 fish, the scheduled commercial fisheries were expected to harvest approximately 29,903 total coho.

From June 28, 2009 through July 31, 2009, Willapa Bay (Marine Area 2-1) was open for recreational fishing concurrent with the Ocean Marine Area 2 (ocean rules applied). From August 1-15, 2009, Willapa Bay was open to recreational fishing with a daily-bag-limit of six salmon with no more than two adults. From August 16, 2009 through January 31, 2010, Willapa Bay was open to recreational fishing with a daily-bag-limit of six salmon, no more than three adults, of which only two could be Chinook. Chum retention was not allowed. Barbed hooks were allowed August 1, 2009 – January 31, 2010. Expected harvest in recreational fisheries based on pre-season forecast abundance was 2,036 coho. Marine and freshwater recreational harvest estimates were not available for 2009, but for 2008, Marine Area 2-1 and freshwater recreational harvest estimates totaled 1,221 fish.

Freshwater recreational fisheries in the Willapa Bay watersheds varied in duration but were generally open for salmon fishing from August 1, 2009 through January 31, 2010 with a daily-bag-limit of six salmon, and no more than two or three adults, one of which could be an unmarked adult coho. Chum retention was not allowed.

Escapement and Management Performance

Willapa Bay coho were managed primarily for natural production. Estimates of natural spawning escapement for 2009 were not available. The most recent but still preliminary natural escapement estimate available was 18,474 in 2008, which met the WDFW escapement objective of 13,090 natural spawners. Escapement to Willapa Bay hatcheries in 2008 was estimated at 11,897 coho, which met the WDFW escapement objective of 6,100 spawners.

Grays Harbor Coho

Inside Harvest

Historical terminal run size, harvest and escapement data for Grays Harbor coho are presented in Appendix B, Table B-26. The run size forecast for Grays Harbor coho, after accounting for ocean fishery impacts, was 119,088 fish (57,849 natural and 61,239 hatchery). Treaty Indian and non-Indian gillnet fisheries harvested 29,048 coho (natural, hatchery, and net-pen origin) in 2009. This included 28,487 coho in the Quinault Indian Nation fisheries, 561 in the non-Indian gillnet fishery, and an estimated 3,400 in the Chehalis tribal fishery.

Recreational harvest estimates for 2009 were not available. Marine Area 2.2 was open from September 16 through November 30 for two adult salmon daily, one of which could be an unmarked adult coho, with no Chinook or chum retention.

The Chehalis River and its tributaries were open for coho fishing on the following dates and areas, with a bag limit of two adult coho with no Chinook or chum retention:

- September 16-30, 2009 downstream of the bridge crossing at the town of Porter and closed to fishing for salmon upstream of Lakeside Industries Tower (approximately 1 ½ miles upstream of Hwy 101 Bridge) in Aberdeen. No more than one retained coho could be unmarked.
- October 1 through October 15, 2009 from the mouth of the Chehalis River to the high bridge on Weyerhaeuser 1000 line approximately 400 yards downstream of Roger Creek. No more than one adult coho could be unmarked.
- October 16, 2008 through January 31, 2010 from the mouth of the Chehalis River to the high bridge on Weyerhaeuser 1000 line approximately 400 yards downstream of Roger Creek. No unmarked coho could be retained.

The Humptulips River recreational fishery from the mouth to the Hwy 101 Bridge was open September 16 through January 31, 2010 for retention of up to two marked adult coho, with no retention of adult

Chinook, unmarked coho or chum. No more than one adult Chinook could be retained. Bait was prohibited from September 16-30, 2009.

The Quinault Indian Nation operated two separately scheduled gillnet fisheries for Chinook, coho, and chum in the area of the Lower Humptulips and in the area of the Lower Chehalis, as described in Chapter II under the section labeled Grays Harbor Chinook. The expected coho fishery impacts were limited by the expected abundance and harvest of Chinook in the Lower Chehalis side of the fishery and by the expected abundance and harvest of natural coho in the Lower Humptulips side of the fishery. The Humptulips area fishery harvested 11,414 coho, while the Chehalis area fishery harvested 17,073 coho. Harvest levels on the Humptulips fishery were 98 percent over pre-season expected levels while the Chehalis fishery harvest was 20 percent over pre-season expected levels.

Escapement and Management Performance

Grays Harbor coho were managed for natural production with a spawning escapement goal of 35,400. Natural spawning escapement estimates for 2006, 2007, and 2008 were 17,767, 25,121 and 34,054, respectively. Failure to achieve the escapement goal of 35,400 for three consecutive years triggers an Overfishing Concern under the terms of the Salmon FMP. An escapement estimate for 2009 Grays Harbor coho was not available.

Quinault River Coho

Inside Harvest

Historical terminal run size, harvest, and escapement for Quinault River coho are presented in Appendix B, Table B-28. The treaty Indian gillnet fishery targeted hatchery Chinook and coho from early September through mid-November. A total of 54,902 coho were harvested by the gillnet fishery during the 2009 season.

Escapement and Management Performance

Quinault River coho were managed for hatchery production. Escapement estimates for Quinault River coho in 2009 were not available. The Quinault National Fish Hatchery egg take objectives for 2009 were achieved.

Queets River Coho

Inside Harvest

Historical terminal run size, harvest, and escapement for Queets River coho are presented in Appendix B, Table B-31. Queets River fisheries were managed under preseason agreement with WDFW based on preseason abundance estimates and planned Council ocean fisheries. The treaty Indian gillnet fishery was structured to target returning hatchery and natural coho while also allowing harvest on Chinook that would achieve a total tribal and non-tribal harvest rate of 40 percent. The total harvest of coho in the gillnet fishery was 25,003 commercially landed fish, which was above the expected preseason catch of 9,017. The gillnet harvest was comprised of a mix of early-timed hatchery fish and normally/late-timed natural fish, with most of the larger than expected catch attributed to a greater hatchery return than expected. A final estimate of the hatchery/natural mix in the catch was not available. Recreational fisheries operated with standard bag limits for coho (no mark-selective restriction) and a standard schedule in the Queets, Clearwater, and Salmon Rivers. Recreational fisheries for Chinook operated in a similar manner as coho, except within Olympic National Park waters where only mark-selective Chinook retention was allowed.

Escapement and Management Performance

A 2009 natural escapement estimate was not available, but the tribal catch through the season suggested the natural escapement exceeded the escapement floor. The expected natural coho escapement for 2009 based on the pre-season effort model was 19,163, with an escapement objective range of 5,800 to 14,500 natural coho. Spawning escapements in 2006, 2007, and 2008 were less than the objective; and therefore triggered an Overfishing Concern, which is being addressed under the terms of the Salmon FMP. Releases of supplemental coho were discontinued after 2004 so there were no returns of those fish in 2009.

Hoh River Coho

Inside Harvest

Historical terminal run size, catch, and escapement data for Hoh River coho are presented in Appendix B, Table B-34. The terminal run size of Hoh River wild coho was projected to be 8,392. The treaty Indian gillnet fishery occurred from the week of September 1 to the week of December 31 (which included Weeks 49 – 52 of Steelhead Management), as described in Chapter II under the section labeled Hoh River Chinook. The tribal fishery harvested approximately 4,294 coho, with 3,609 estimated to be natural origin, including dip-in fish. The non-Indian recreational fishery extended from September 1 through November 30, with the area below Willoughby Creek open and a daily-bag-limit of six salmon, two of which could be adults and no mark-selective coho restriction. The portion of the river between Willoughby Creek and Morgan's Crossing opened October 16 to reduce impacts on spawning spring/summer Chinook in that reach. The river above Morgan's Crossing did not open for recreational salmon fishing. A catch estimate for the recreational fishery was not available.

Escapement and Management Performance

The preliminary spawning escapement estimate for natural coho in the Hoh River was 4,615, which was within the escapement goal range of 2,000 to 5,000 established for this stock.

Quillayute River Coho

Inside Harvest

Historical terminal run size, catch, and escapement data for Quillayute River summer and fall coho are presented in Appendix B, Table B 37. The recreational and tribal fisheries for coho were established by pre-season agreement between WDFW and the Quileute Tribe. A total of 3,645 (1,018 natural) summer coho were harvested in the Quileute Tribe's commercial and ceremonial and subsistence fisheries. An estimate of the 2009 recreational catch was not available.

The Quileute Tribal harvest of fall coho in 2009 was 36,693 (including ceremonial and subsistence catch). Tribal net fisheries harvested 14,906 natural fall coho. An estimate of the 2009 recreational catch was not available.

WDFW reduced the impacts of the recreational fishery on natural summer and fall coho by requiring mark-selective fisheries for coho through October. The Quileute Tribe did not have a closure in their fishery this year, but as in past years, reduced their fishery to 29 hours per week during July and August.

Escapement and Management Performance

The summer coho run in the Quillayute is managed primarily for its hatchery component, which returns in August and September. The summer coho hatchery rack return was 8,085. This is well above the goal of 300. An additional 30 natural summer coho were collected as brood stock. The preliminary estimate for

natural summer coho escapement was 978, plus 30 natural brood stock collected from the Sol Duc hatchery.

The preliminary 2009 escapement estimate for natural fall coho was 8,312 plus 50 natural brood stock collected from the Sol Duc hatchery. This was above the escapement goal of 6,300 to 15,800 established for this stock.

PUGET SOUND COHO STOCKS

Puget Sound coho salmon stocks include natural and hatchery stocks originating from U.S. tributaries in Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek, inclusive). The primary stocks in this group that are most pertinent to ocean salmon fishery management were eastern Strait of Juan de Fuca, Hood Canal, Skagit, Stillaguamish, Snohomish, and South Puget Sound (hatchery) coho. Those stocks contribute primarily to ocean fisheries off Washington and B.C.

Management Objectives

The Council's conservation objectives were based on the Puget Sound Salmon Management Plan, which defined management objectives and long-term goals for these stocks as developed by representatives from Federal, state, and tribal agencies. Conservation objectives for specific stocks were based on either maximum sustainable production for stocks managed primarily for natural production or on hatchery escapement needs for stocks managed for artificial production. 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. However, annual natural management objectives may vary from the FMP conservation objectives if agreed to by WDFW and the treaty Indian tribes under the provisions of *U.S. versus Washington* and subsequent U.S. District Court orders. (see "Memorandum Adopting Salmon Management Plan"; *U.S. versus Washington*, 626 F. Supp. 1405 [1985]). .

The PSC adopted a management plan for coho salmon originating in Washington and southern B.C. river systems in 2002. The plan was directed at the conservation of key management units, four from Southern B.C. (Interior Fraser, Lower Fraser, Strait of Georgia Mainland, Strait of Georgia Vancouver Island) and nine from Washington (Skagit, Stillaguamish, Snohomish, Hood Canal, Strait of Juan de Fuca, Quillayute, Hoh, Queets, and Grays Harbor). Under the plan, the United States and Canada were required to constrain total fishery exploitation rates to levels associated with the categorical status and target exploitation rates of the key management units as determined by domestic managers. Ceilings on exploitation rates by intercepting fisheries were established through formulas specified in the plan. Categorical status was employed by the PST under the 2002 Coho Agreement to indicate general ranges of allowable total exploitation rates for U.S. and Canadian coho management units in 2009. Three categories were employed: low (total exploitation rate <20 percent), moderate (total exploitation rate 20-40 percent), and abundant (total exploitation rate >40 percent).

In 2009, the Council adopted annual management objectives for Puget Sound coho as recommended by WDFW and tribal co-managers under provisions of *U.S. versus Washington*. The annual objectives were based on the PSC categorical status and associated maximum exploitation rate limits as follows:

- Strait of Juan de Fuca (East and West): Low status 40 percent maximum exploitation rate
- Hood Canal: Normal status 65 percent maximum exploitation rate
- Skagit: Low status 35 percent maximum exploitation rate
- Stillaguamish: Low status 35 percent maximum exploitation rate
- Snohomish: Low status 40 percent maximum exploitation rate

The Council formally adopted exploitation rate management objectives for Puget Sound coho in November 2009, which were consistent with PSC objectives, and will replace the longstanding FMP spawning escapement objectives in 2010.

Regulations to Achieve Objectives

Puget Sound coho stocks did not play a primary role in 2009 ocean fishery management considerations, since management of impacts to Interior Fraser (Thompson River, B.C. Canada) and LCN coho were more constraining. Inside fisheries, primarily in Puget Sound, were constrained by Interior Fraser and to meet PSC objectives for Skagit and Stillaguamish coho. The mark-selective regulations in ocean and Puget Sound recreational fisheries served to increase harvest of marked hatchery fish while minimizing impacts on natural Puget Sound coho, LCN coho, OCN coho, and Interior Fraser coho.

Inside Harvest

Commercial inside harvest of Puget Sound coho was managed on the basis of six regional management 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-38. The 2009 total Puget Sound commercial catch of coho was 218,084 fish, compared to a catch of 211,431 coho in 2008. Non-Indian harvest was 20,668 coho, compared to a catch of 6,468 coho in 2008. Treaty Indian net and troll fisheries harvested 197,416 coho, compared to a catch of 227,483 coho in 2008.

Historical coho catches in the Puget Sound recreational fishery for the years from 1971 through 2008 are listed in Appendix B, Table B-39. Catch estimates for the 2009 Puget Sound recreational fishery were not available.

Escapement and Management Performance

No post season estimates were available for southern U.S. inside harvest impacts on coho stocks subject to the PSC coho management plan; therefore the 2009 preseason exploitation rate objectives agreed to by WDFW and tribal co-managers could not be evaluated. Preliminary escapement information indicates natural Puget Sound coho escapements were generally average or below average but actual escapement numbers were not available.

Strait of Juan de Fuca coho (both Eastern and Western stocks) were managed as a unit in 2009 for an exploitation rate agreed to WDFW and tribal co-managers under the authority of *U.S. versus Washington* Court Orders. However, Spawning escapements for the Western stock in 2005, 2006, 2007, and 2008 were less than the objective; and therefore triggered an Overfishing Concern, which is being addressed under the terms of the Salmon FMP.

BRITISH COLUMBIA COHO STOCKS

Management Objectives

B.C. coho stocks were managed under the PSC management plan as described in the previous section on Puget Sound coho.

Regulations to Achieve Objectives

In 2009, Interior Fraser coho were in the “low” status category, which required the total exploitation rate in southern U.S. fisheries not to exceed 10.0 percent. This requirement constrained both Council area and inside fisheries. The preseason expectation was that the total southern U.S. fishery exploitation rate on Interior Fraser coho would be 9.8 percent (6.2 percent in Council area fisheries). The mark-selective regulations in ocean and Puget Sound recreational fisheries served to increase harvest of marked hatchery fish while minimizing impacts on wild Interior Fraser coho.

Inside Harvest

Harvest of coho in inside waters affecting B.C. coho stocks occurred in Puget Sound fisheries, which were described in the previous section of this chapter.

Escapement and Management Performance

No post season estimates of southern U.S. inside harvest impacts on coho stocks subject to the PSC coho management plan were available. Preseason expectations were for an exploitation rate of 3.3 percent for inside fisheries.

COASTWIDE GOAL ASSESSMENT SUMMARY

Conservation objective achievement assessments were not available for many coho stocks; however, those that were available all met their objectives. Skagit, Stillaguamish and Snohomish coho spawning escapement estimates were not available but the preseason expectation was for a return less than the FMP objectives. Puget Sound FMP conservation objectives have been updated to reflect PCS based exploitation rate management and will be in place for 2010.

A summary of 2009 performance for coho salmon by stock in relation to the Council’s conservation objectives is presented in Table III-5.

TABLE III-1. Estimated returns to Oregon coastal streams and lakes in thousands of adult coho.

Year	Returns to Hatcheries			Winchester Dam			Inside Harvest Impacts ^{d/}	Ocean Escapement to Oregon Coast ^{a/}	
	Private	Public	STEP ^{b/}	Count ^{c/} (North Umpqua)	Number of OCN Spawners ^{a/}				
					Lakes	Rivers			Total
1970	-	36.2	-	0.1	20.5	51.2	71.7	39.8	147.8
1971	-	29.1	-	0.4	29.2	65.6	94.8	24.1	148.4
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	3.4	19.4	22.7	6.8	174.2
1984	115.4	28.6	-	3.2	14.8	59.7	74.4	17.4	239.1
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	601.8
1987	119.3	12.3	0.2	2.1	4.2	25.9	30.1	7.7	171.7
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	15.5	1.6	1.9	4.4	16.9	20.9	9.5	85.4
1991	35.1	39.6	4.9	3.9	7.2	30.4	37.6	31.5	152.6
1992	-	23.3	0.6	5.0	2.0	40.2	42.2	18.7	89.9
1993	-	20.2	2.0	2.3	10.1	45.2	55.3	13.3	93.2
1994	-	23.4	1.8	2.0	5.8	38.3	44.2	2.4	73.8
1995	-	25.2	0.4	2.7	11.2	42.8	54.0	3.6	85.8
1996	-	23.4	1.0	5.1	13.5	60.5	74.0	4.0	107.6
1997	-	17.7	0.2	2.2	8.6	14.8	23.4	4.3	47.8
1998	-	15.3	0.2	4.6	11.1	20.9	32.0	5.2	57.2
1999	-	13.3	0.4	3.3	13.4	36.4	49.9	2.8	69.7
2000	-	15.0	0.5	9.7	12.7	57.4	70.1	4.5	99.7
2001	-	37.4	1.4	16.0	19.7	152.9	172.6	10.1	237.5
2002	-	30.9	2.6	7.4	22.2	238.4	260.6	8.1	309.5
2003	-	15.9	3.6	10.7	16.7	211.9	228.6	6.7	265.5
2004	-	13.2	0.8	7.2	18.7	156.7	175.4	6.3	202.8
2005	-	10.0	0.3	8.9	14.7	139.4	154.1	5.9	179.2
2006	-	9.8	0.1	7.0	24.4	104.5	128.8	2.3	148.1
2007	-	3.6	0.0	2.7	9.0	57.2	66.2	1.3	73.8
2008	-	6.3	0.0	0.2	23.6	141.8	165.4	2.6	174.4
2009 ^{e/}	-	5.6	0.0	0.7	17.4	215.5	232.9	6.9	246.0

a/ Does not include estimates for the southern OCN component (Rogue River). Spawner escapements to rivers prior to 1990 were estimated by a nonrandom standard index of streams north of the Rogue River. A total coastwide spawner escapement methodology based on stratified random sampling (SRS) was initiated in 1990 and used through 1997 and was 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. Since 1998 a random site selection procedure based on the EPA's Environmental Monitoring and Assessment Program (EMAP) has been used.

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

c/ Natural and hatchery fish prior to 1990, unmarked fish only thereafter.

d/ 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.

e/ Preliminary.

TABLE III-2. Estimated weekly effort (in angler trips) and catches of Chinook and coho in the 2009 Buoy 10 recreational fisheries (all data are preliminary).^{a/}

Week Number	Ending Date of Period	Angler Trips	Catch		Catch Per Trip
			Chinook	Coho	
31	Aug.-2	436	31	109	0.32
32	Aug.-9	2,250	175	869	0.46
33	Aug.-16	9,796	2,416	3,688	0.62
34	Aug.-23	21,522	1,358	15,413	0.78
35	Aug.-30	19,883	1,815	14,835	0.84
36	Sept.-6	9,657	119	7,688	0.81
37	Sept.-13	5,462	22	2,960	0.55
38	Sept.-20	1,993	4	696	0.35
39	Sept.-27	1,646	-	1,772	1.08
40-44	Oct.-31	158	-	97	0.61
Total		72,803	5,940	48,127	0.74

a/ Includes boat-based and shore-based fisheries from the new (2000) upstream boundary at the Tongue Point/Rocky Point line downstream to the Buoy 10 line including 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 1-30 for Chinook and marked coho, with the daily-bag-limit of two adult salmon, only one of which may be a Chinook, except Chinook retention was prohibited from August 25-30.

TABLE III-3. Oregon production index (OPI) area coho harvest impacts, spawning, abundance, and exploitation rate estimates in thousands of fish.^{a/}

Year or Avg.	Oregon and California Coastal Returns							Ocean	
	Ocean Fisheries ^{b/}		Hatcheries and Freshwater		Private Hatcheries	Columbia River Returns	Abundance	Exploitation Rate Based on OPI Abundance ^{d/}	OCN Exploitation Rate Based on Postseason FRAM
	Troll	Sport	Harvest ^{c/}	OCN Spawners					
1970-1975	1,629.6	558.4	45.8	55.2	-	460.4	2,749.3	0.80	-
1976-1980	1,253.6	555.0	31.2	31.1	26.1	263.3	2,154.2	0.83	-
1981-1985	451.2	274.0	37.2	56.0	176.8	305.3	1,328.6	0.60	-
1986	638.9	320.6	79.3	70.0	453.7	1,549.1	3,026.7	0.34	-
1987	468.2	296.2	45.1	30.1	119.3	316.5	1,377.9	0.60	-
1988	844.7	297.2	61.1	56.8	116.1	670.9	1,989.2	0.57	-
1989	645.1	425.5	61.1	46.4	46.9	709.0	1,871.2	0.57	-
1990	275.9	357.1	28.7	22.5	35.6	196.7	1,128.5	0.69	-
1991	448.4	469.9	77.8	38.1	35.1	955.1	1,823.2	0.45	-
1992	67.4	256.5	51.0	44.2	-	216.1	610.0	0.51	-
1993	13.1	140.8	38.6	55.7	-	114.2	342.1	0.42	-
1994	2.7	3.0	28.1	48.5	-	169.2	250.5	0.02	0.07
1995	5.4	43.5	37.5	57.3	-	74.8	215.9	0.22	0.12
1996	7.0	31.8	45.7	79.3	-	113.0	297.3	0.14	0.08
1997	5.5	22.4	26.9	31.6	-	148.1	204.6	0.12	0.12
1998	3.5	12.8	29.4	34.3	-	168.4	265.2	0.06	0.08
1999	3.6	36.5	22.6	51.2	-	274.1	414.0	0.10	0.08
2000	25.2	74.6	33.3	81.1	-	547.6	901.0	0.13	0.07
2001	38.1	216.8	75.7	185.2	-	1,108.3	1,438.6	0.16	0.07
2002	15.0	118.7	54.0	269.0	-	499.9	990.5	0.14	0.12
2003	28.8	252.4	45.0	235.3	-	677.3	1,183.6	0.23	0.14
2004	26.2	159.3	38.1	199.9	-	442.5	826.8	0.22	0.15
2005	10.5	58.2	42.5	164.1	-	341.0	592.1	0.12	0.11
2006	4.5	47.5	29.3	132.8	-	386.4	557.1	0.09	0.06
2007	26.2	128.5	11.0	71.4	-	331.1	536.5	0.28	0.11
2008 ^{e/}	0.6	26.4	14.8	165.8	-	488.4	736.3	0.04	0.02
2009 ^{e/}	27.7	201.2	9.3	235.5	-	721.6	1,323.2	0.19	0.11

a/ The OPI area includes ocean and inside harvest impacts and escapement to streams and lakes south of Leadbetter Pt., Washington.

b/ Includes estimated nonretention mortality: troll fishery--hook-and-release mortality for 1982-2005 and drop-off mortality for all years; sport fishery--hook-and-release mortality for 1994-2005 and drop-off mortality for all years.

c/ Includes returns from Salmon-Trout Enhancement Program (STEP) smolt releases through the 2007 return year, after which the program was terminated.

d/ 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.

e/ Preliminary.

TABLE III-4. OCN adult coho salmon conservation objective, fishery impacts, and spawner escapement.

Year	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					
	Conservation Objective ^{b/}	Preseason Projection	Postseason Estimate ^{c/}	Northern ^{d/}	North		South Central ^{f/}	Southern ^{g/}	Coastwide	Northern ^{d/}	North		Southern ^{g/}	Coastwide Average
					Central ^{e/}	Central ^{f/}					Central ^{e/}	Central ^{f/}		
1990	-	-	-	2.2	5.6	13.5	1.2	22.5	2	5	8	3	6	
1991	-	0.460	0.454	9.3	6.7	21.6	0.5	38.1	10	6	13	1	9	
1992	-	0.420	0.511	2.4	15.4	24.4	2.0	44.2	3	13	15	5	11	
1993	-	0.260	0.423	4.5	7.8	43.1	0.8 ^{h/}	55.7	5	7	27	1 ^{h/}	14	
1994	≤0.20	0.111	0.068	3.5	9.8	30.9	4.3	48.5	4	8	19	11	12	
1995	≤0.20	0.118	0.124	3.9	13.6	36.5	3.4	57.3	4	12	22	8	14	
1996	≤0.20	0.125	0.083	3.3	18.1	52.6	5.2	79.3	4	16	32	13	19	
1997	≤0.20	0.110	0.124	2.1	2.8	18.4	8.2	31.6	2	2	11	20	8	
1998	≤0.13	0.119	0.078	2.6	3.3	26.1	2.3	34.3	3	3	16	6	8	
1999	≤0.15	0.087	0.076	8.9	11.8	29.2	1.4	51.2	10	10	18	3	13	
2000	≤0.15	0.082	0.073	17.9	14.3	37.9	11.0	81.1	20	12	23	27	20	
2001	≤0.08	0.074	0.074	33.5	25.2	113.9	12.6	185.2	37	22	70	31	45	
2002	≤0.15	0.123	0.123	52.5	104.0	104.1	8.4	269.0	58	89	64	20	66	
2003	≤0.15	0.144	0.144	59.6	68.9	100.1	6.8	235.3	66	59	62	16	57	
2004	≤0.15	0.147	0.147	33.1	40.4	101.9	24.5	199.9	37	35	63	60	49	
2005	≤0.15 ^{i/}	0.111	0.111	16.5	51.4	86.3	10.0	164.1	18	44	53	24	40	
2006	≤0.15 ^{i/}	0.096	0.059	24.1	21.2	83.5	3.9	132.8	27	18	51	10	32	
2007	≤0.20	0.113	0.109	17.5	12.3	36.4	5.2	71.4	19	11	22	13	17	
2008	≤0.08	0.069	0.020	27.7	57.9	79.8	0.4	165.8	31	50	49	1	40	
2009 ^{j/}	≤0.15	0.130	0.109	39.6	74.6	118.7	2.6	235.5	44	64	73	6	58	

a/ A spawner escapement methodology study based on SRS had been in effect from 1990 to 1997 in which coho salmon population estimates have been made for Oregon coastal river systems from the Sixes River and north. Since 1998 a random site selection procedure based on the EPA's Environmental Monitoring and Assessment Program (EMAP) has been used. 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/ The Salmon FMP specified an allowable marine and freshwater exploitation rate of 20%, however, the OCN workgroup matrix specified 15% and the Council chose to manage at the more conservative level for 2005 and 2006.

j/ Preliminary.

TABLE III-5. Performance of coho salmon stocks in relation to 2009 conservation objectives (preliminary data). (Page 1 of 2)

System and Stock	2009 FMP Conservation Objective	Achievement
OPI Area Coho		
(Columbia River and coastal stocks south of Leadbetter Point)	Natural spawner escapement objectives as provided below; meet hatchery egg-take goals; meet treaty Indian obligations.	Hatchery egg-take goals achieved. No information available on catch allocation.
Northern California (Threatened) and CCC (Endangered)	No directed coho fisheries or retention of coho south of Humbug Mt. Marine exploitation rate $\leq 13.0\%$ as indicated by R/K hatchery stocks. Council adopted a projected exploitation rate on R/K hatchery coho of 2.8%.	No fisheries south of the California/Oregon border. Postseason marine exploitation rate estimate of 2.4% was below the 13.0% maximum.
OCN	Combined marine and freshwater exploitation rate $\leq 15.0\%$. Council adopted a projected exploitation rate on OCN of 13.0%	Postseason marine and freshwater exploitation rate estimate of 12.9% was below 15% maximum.
Columbia River Natural (Threatened)	Combined marine and mainstem Columbia River exploitation rate $\leq 20.0\%$. Council adopted management measures resulted in a projected marine exploitation rate of 12.5 in Council fisheries%.	A postseason mainstem Columbia River exploitation rate estimate was not available; the postseason marine exploitation rate of 9.8% in Council fisheries was below the 12.5% preseason expectation.
Washington Coast Coho		
	Natural spawner escapement objectives as provided below and in state/tribal agreements; meet hatchery egg-take goals; meet treaty Indian obligations.	Hatchery egg-take goals achieved. No information available on catch allocation.
Grays Harbor	35,400 natural adult spawners.	Escapement estimate is not yet available; pre-season projection was 53,800.
Queets	5,800 to 14,500 natural adult spawners.	Escapement estimates is not yet available; pre-season projection was 25,500
Hoh	2,000 to 5,000 natural adult spawners.	Preliminary estimate of 4,600 is within the goal range.
Quillayute Fall	6,300 to 15,800 natural adult spawners.	Preliminary estimate of 8,362 is within the goal range.

System and Stock	2009 FMP Conservation Objective	Achievement
Puget Sound Coho	Natural spawner escapement objectives as provided below and in state/tribal agreements; meet hatchery egg-take goals; meet treaty Indian obligations and inside non-Indian fishery needs for six management units.	Data not available for 2009 natural spawner escapements. Hatchery egg-take goals likely will be met.
Strait of Juan de Fuca	≤40% total exploitation rate. 12,800 adult spawners.	Preseason expected ocean escapement of 18,300 adult fish for eastern and western Strait of Juan de Fuca combined and a 12% total exploitation rate.
Hood Canal	≤65% total exploitation rate. 21,500 natural adult spawners.	Preseason expected ocean escapement of 36,100 adult fish and a 47% total exploitation rate.
Skagit	≤35% total exploitation rate. 30,000 natural adult spawners.	Preseason expected ocean escapement of 27,200 adult fish and a 33% total exploitation rate.
Stillaguamish	≤35% total exploitation rate. 17,000 natural adult spawners.	Preseason expected ocean escapement of 10,200 adult fish and a 33% total exploitation rate.
Snohomish	≤40% total exploitation rate. 70,000 natural adult spawners.	Preseason expected ocean escapement of 52,200 adult fish and a 26% total exploitation rate.

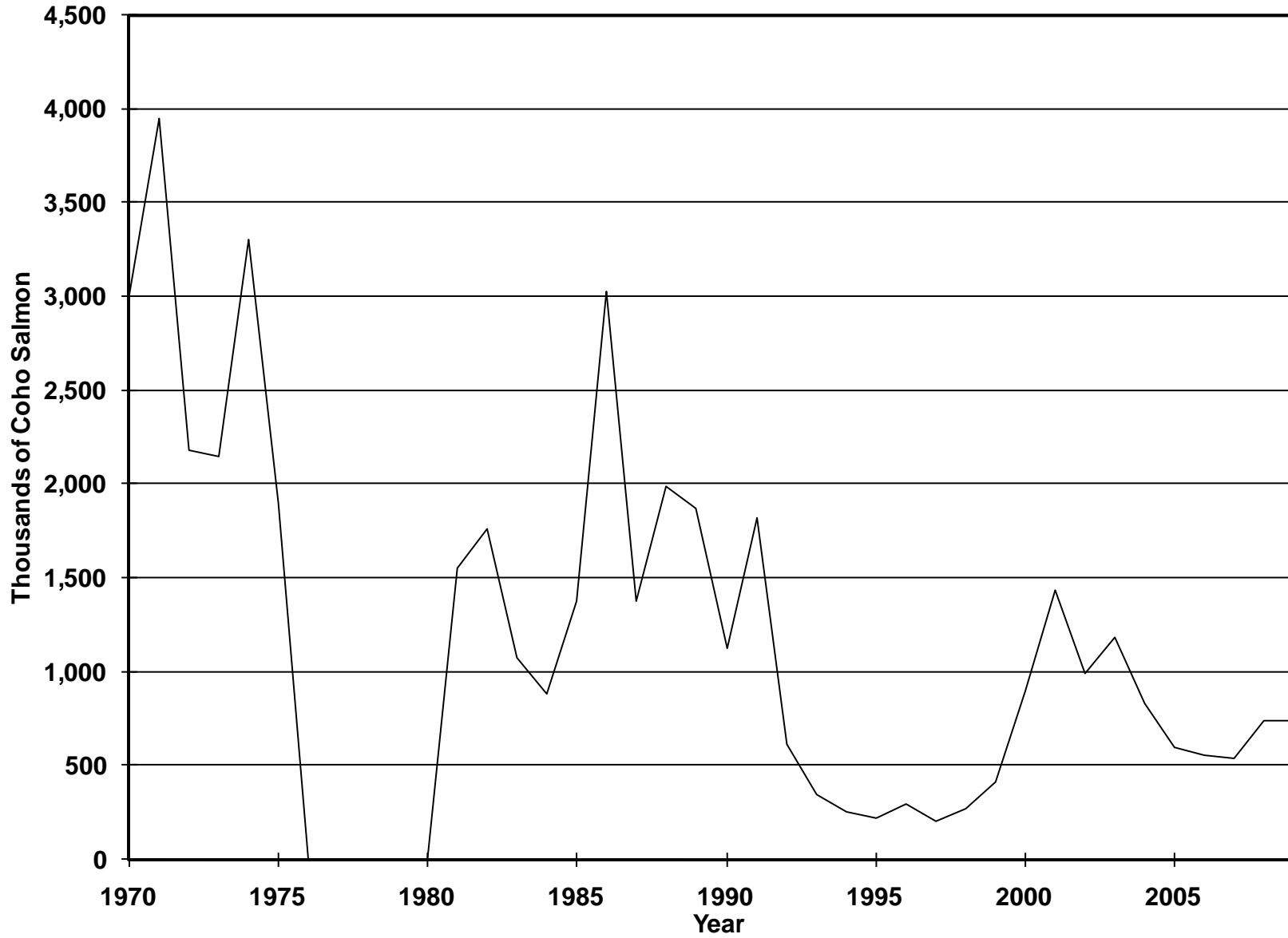


Figure III-1. Oregon Production Index (OPI) area coho abundance estimates by stratified random surveys (SRS) accounting methods (1970-2009).

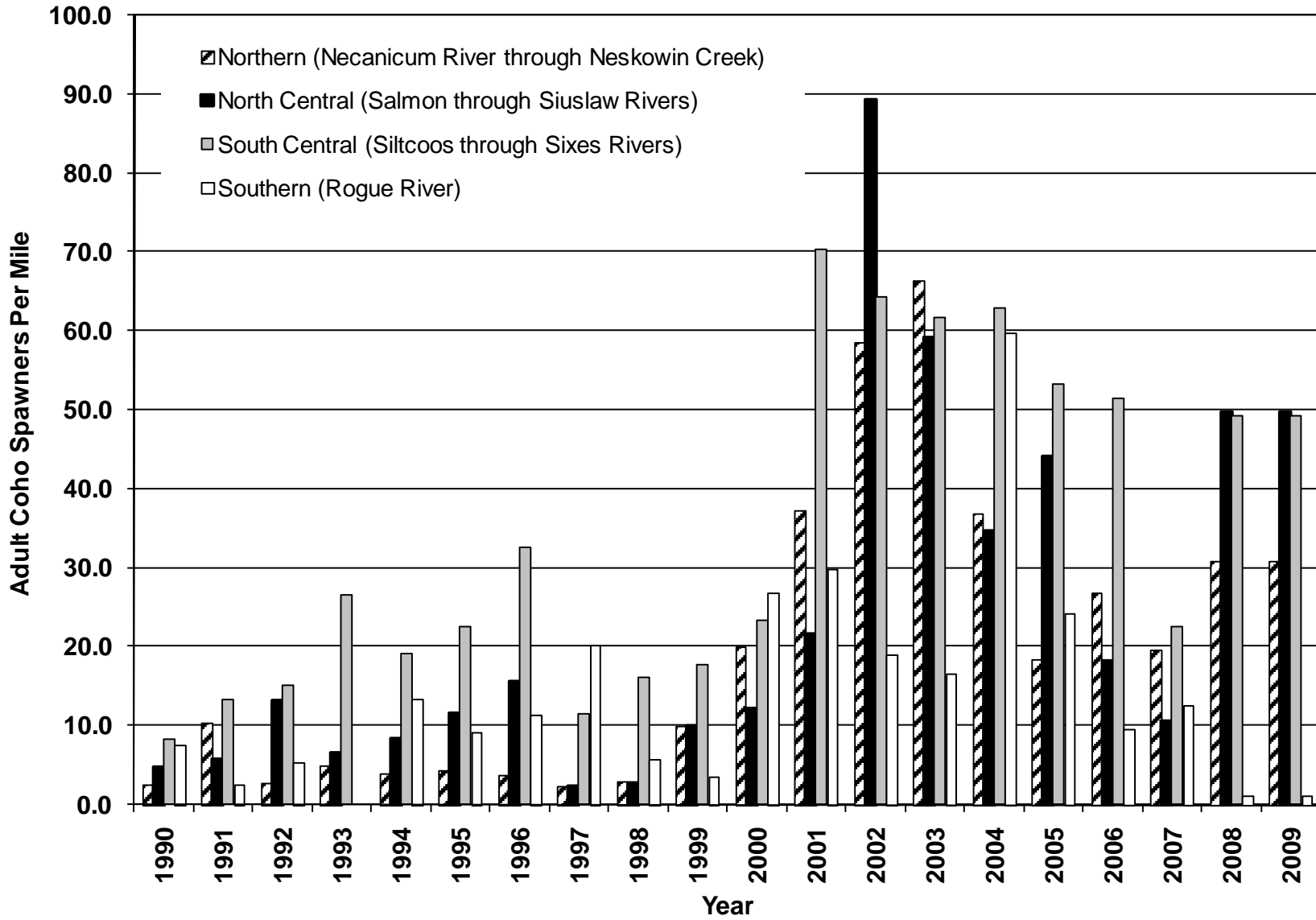


Figure III-2. Oregon coastal natural (OCN) adult coho spawners per habitat mile by coastal region based on SRS accounting methods, 1990-2009.