

CHAPTER II

CHINOOK SALMON MANAGEMENT

CENTRAL VALLEY CHINOOK STOCKS

Central Valley Chinook stocks include fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin rivers and their tributaries. Two of these stocks were listed under the ESA: (1) Sacramento River winter Chinook, listed as endangered in January 1994; and (2) Central Valley spring Chinook, listed as threatened in September 1999.

Management Objectives

The following conservation objectives guided Council management of Central Valley Chinook salmon stocks in the 2008 fisheries: (1) for fall Chinook in the Sacramento River system, an escapement goal of 122,000 to 180,000 hatchery and natural adults; and (2) for Sacramento River winter and Central Valley spring Chinook, the ESA consultation standard concerning the duration and timing of the commercial and recreational ocean salmon fisheries south of Point Arena.

Regulations to Achieve Objectives

Harvest impacts on SRFC were the primary management concern in fisheries south of Cape Falcon, Oregon. In 2008, nearly all Chinook-directed fisheries occurring south of Cape Falcon were closed. Under these 2008 regulations, the projected escapement to the Sacramento River was 59,000 fall Chinook adults, which is less than half of the lower end of the conservation objective range.

Season and size limit details are presented in Tables I-1 and I-3.

Inside Harvest

Recreational angling for salmon in Central Valley rivers was highly restricted in 2008 relative to recent years. In 2008, an estimated 650 SRFC were harvested, resulting in a harvest rate of one percent of the river run. Angler surveys conducted in the Sacramento River Basin for nine years between 1991 and 2007, during which time harvest regulations were much more liberal than 2008, produced an estimated mean harvest rate of 14 percent of the river run. Since 1990, regulations have closed the mainstem Sacramento River to retention of salmon from January 15 to July 15, a period when winter Chinook adults are thought to be most abundant. Beginning in 2004, the retention closure was enacted earlier, on January 1 from the Carquinez Bridge to Red Bluff, in response to recovery of winter Chinook CWT's in the sport fishery. In response to the low escapements in the Stanislaus, Toulumne, and Merced rivers during the last decade, the majority of the San Joaquin River has been closed to recreational salmon fishing.

Escapement and Management Performance

Sacramento River Fall Chinook

In 2008, a total of 66,264 natural and hatchery fall Chinook adults were estimated to have returned to the Sacramento River basin for spawning. This represents the lowest escapement estimate on record and is approximately 12 percent higher than the preseason forecast of 59,000. The 2008 escapement estimate did not meet the lower boundary of the FMP conservation objective of 122,000 to 180,000 hatchery and natural adults. Fall Chinook returns to Sacramento River hatcheries totaled 17,724 adults. Adult hatchery return goals at Coleman, Feather River, and Nimbus hatcheries were not met; however, egg take goals were met at each of these hatcheries. Available data indicate hatchery-produced fish constitute a majority

of the Sacramento River naturally spawning fall Chinook population. Table II-1 and Figure II-1 display historical natural and hatchery fall spawner escapements. For a more detailed breakdown of the historical escapements, see Appendix B, Tables B-1 and B-2.

Sacramento River Winter and Spring Chinook

Spawner escapement of endangered winter Chinook salmon in 2008 was estimated to be 2,850 jacks and adults. This estimate is derived from a carcass survey conducted on the upper Sacramento River. It should be noted that in past years the reported spawner escapement of Sacramento River winter Chinook was derived from expanded counts at Red Bluff Diversion Dam. Spawner escapement estimates from Red Bluff Diversion Dam counts have been made since 1967, yet from 1987 to present the estimates were derived by expanding counts made during the period of dam operation (which overlap with approximately 15 percent of the winter run migration period). Estimates from the carcass survey have been regarded by the California Department of Fish and Game as the official winter run spawner escapement estimate since 2001. Due to the small proportion of the winter run migration sampled during the operation of Red Bluff Diversion Dam, the estimates from the carcass survey are considered to better represent winter run spawner escapement. For a more detailed description of the carcass survey and Red Bluff Diversion Dam estimates of winter run spawner escapement, see: Killam, D. and Krebs, B., Chinook Salmon Populations for the Upper Sacramento River Basin in 2007, State of California, Department of Fish and Game, SRSSAP Technical Report No. 08-4, 2008. Estimates derived from both the carcass survey and the expanded Red Bluff Diversion Dam counts are presented in Table B-3. Ocean fishery impacts on the returning cohort of winter Chinook spawners in 2008 were incurred primarily during the 2007 season south of Point Arena, California.

Returns of spring Chinook to the Sacramento River system totaled approximately 13,361 fish (jacks and adults), most of which (an estimated 11,943 fish) returned to the upper Sacramento River tributaries; the remaining 1,418 fish returned to the Feather River Hatchery. The method used to estimate the spring Chinook return to the Feather River Hatchery was modified in 2005. In previous years, the estimate was equal to the number of Chinook that entered the hatchery during the early period of Chinook spawning. In 2005 through 2008, prior to the spring run spawning period, fish that entered the hatchery were tagged and returned to the river; the number of tagged fish that re-entered the hatchery during the spring run spawning period was used as the estimate of spring Chinook escapement in the Feather River. The fish that were tagged at the hatchery and returned to the river but did not re-enter the hatchery during the spawning period were counted in the natural fall run survey and reported as Feather River fall Chinook. The natural area surveys in the Feather River are not currently capable of separating the spring and fall runs.

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

San Joaquin River Fall Chinook

San Joaquin River spawning areas are used primarily by fall Chinook. The estimated San Joaquin River fall Chinook spawning escapement in 2008 totaled 2,466 jacks and adults in natural areas and 301 jacks and adults to hatcheries (Appendix B, Tables B-1 and B-2 provide historical spawner escapements). Salmon production in the San Joaquin River is determined largely by spring outflows three years earlier. Since 1986, spawner returns to the San Joaquin River have constituted less than 10 percent of the total Central Valley escapement for fall run Chinook.

NORTHERN CALIFORNIA COAST CHINOOK STOCKS

Northern California stocks include fall and spring stocks north of the entrance to San Francisco Bay. Primary river systems in this area are (from north to south) the Smith, Klamath, Mad, Eel, Mattole, and

Russian rivers. Coastal Chinook stocks south of the Klamath River were listed as threatened under the ESA in September 1999.

Management Objectives

In 2008, the projected failure to meet the lower end of the SRFC conservation goal range of 122,000 to 180,000 hatchery and natural adults in the absence of fishing resulted in a nearly complete closure of ocean fisheries affecting northern California Chinook salmon stocks. KRFC were managed in accordance with 2008 Council guidance calling for a maximum adult natural spawner reduction rate of 67 percent, with a minimum spawner escapement (floor) of 40,700 adults in natural areas. The 2008 minimum spawner escapement floor was raised from 35,000 (Amendment 9) to 40,700 in response to the triggering of an overfishing concern after failing to meet the 35,000 spawner escapement floor for three consecutive years (2004, 2005, and 2006). The available harvest of KRFC was shared equally between non-tribal and tribal fisheries (tribes with Federally-recognized fishing rights). KRFC also provided the basis for the NMFS ESA consultation standard for California coastal Chinook, which limits the ocean harvest rate on age-4 KRFC to no more than 16.0 percent.

Regulations to Achieve Objectives

To achieve the management objectives for KRFC, the adopted regulations were designed to result in: (1) a Klamath River run of 115,400 fall Chinook adults resulting in a spawner escapement of 40,700 fish in natural areas, taking into account projected river fishery impacts of 52,300 adults and returns to basin hatcheries; (2) 50 percent (27,000) of the allowable adult harvest for tribal subsistence and commercial fisheries; (3) 83 percent (22,500) of the non-tribal harvest to the Klamath River recreational fishery; and (4) 13.4 percent (600) of the ocean harvest to the KMZ recreational fishery. These harvest allocations were expected to result in an 88 percent/12 percent California/Oregon sharing of KRFC ocean troll harvest. The age-4 ocean harvest rate resulting from the above configuration was expected to be 2.4 percent.

Inside Harvest

Yurok and Hoopa tribes shared a federally reserved right of 50 percent (27,000) of the available harvest surplus of adult Klamath fall Chinook. The State of California managed the river recreational fishery under a 22,500 adult fall Chinook quota. Tribal adult fall Chinook landings totaled 22,260, which was 82 percent of the quota (Appendix B, Table B-5). The estimated recreational fishery harvest was 1,863 adult fish, which was 8 percent of the quota. Harvest estimates from streams outside the Klamath River Basin were not available.

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. Cursory, nonsystematic surveys are conducted on one tributary of the Mad River and two tributaries of the Eel River. Video counts of Chinook passage at Mirabel Dam on the Russian River have been conducted since 2000 (Appendix B, Table B-7).

The 2008 preseason forecast of the KRFC age-4 ocean harvest rate was 2.4 percent (the ESA consultation standard for California Coastal Chinook was no more than 16.0 percent). The postseason evaluation of the 2008 age-4 ocean harvest rate was not available in time for this report.

Klamath River Fall Chinook

The 2008 preliminary postseason river run size estimate for KRFC was 70,572 adults compared to the preseason predicted ocean escapement (river run size) of 115,400 adults. The escapement to natural spawning areas was 30,925 adults, which was 0.8 times the preseason prediction of 40,700 adults. The estimated number of hatchery returns was 13,552 adults. Table II-2, Figure II-2, and Appendix B, Table B-4 present historical harvest and escapement data for KRFC.

Spawning escapement to the upper Klamath River tributaries (Salmon, Scott, and Shasta Rivers), where spawning was only minimally affected by hatchery strays, totaled 7,935 adults. The Shasta River has historically been the most important Chinook salmon spawning stream in the upper Klamath River, supporting a spawning escapement of 30,700 adults as recently as 1964, and 63,700 in 1935. The escapement in 2008 to the Shasta River was 2,741 adults, while escapement to the Salmon and Scott Rivers was 1,749 and 3,445 adults, respectively (Appendix B, Table B-6).

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 ocean harvest distributions overlap somewhat, they are categorized 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.

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 B.C. and SEAK, and to a much lesser degree, in Council area fisheries off Washington and Oregon, and terminal area fisheries. Analysis of CWTs indicates the populations from five major mid-Oregon coast (MOC) systems between the Coos and the Elk Rivers are harvested primarily in ocean fisheries off B.C., Washington, and Oregon, with minor catches in 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, B.C., and SEAK.

Management Objectives

The conservation objective for Oregon coast salmon was 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. This stock has been an abundant stock historically, therefore preseason abundance estimates were not developed for this stock, and it has not been of critical management concern. ESA consultation standards for OCN coho, LCN coho, and California Coastal Chinook, and KRFC management objectives generally result in reduced Council-area ocean fishery impacts on Oregon south/local migrating Chinook stocks. In 2008 due to the SRFC conservation alert, Council-area Chinook fisheries were closed south of Cape Falcon. Humbug Mountain to Cape Falcon Chinook fisheries have a minor impact on most of the stocks originating from the NOC, which have a northerly marine distribution pattern.

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. Preseason abundance estimates were not available for Oregon coast Chinook; however, based on postseason abundance indicators, Council area fisheries impacts on this stock have not significantly affected objective

achievement in recent years. Under the 2008 regulations, the STT did not expect the aggregate conservation objective for this stock to be met; however, because of the constraints required for SRFC, LCN and OCN coho, Council area fisheries were not expected to affect compliance.

"For the 2008 Oregon State-waters terminal area fisheries, conservative regulations were adopted with the intention of reducing impacts on these stocks. These regulations included season quotas, daily and weekly landing limits in commercial fisheries, and reduced daily and season bag limits in recreational fisheries.

Inside Harvest

Inside recreational harvest of fall and spring Chinook occurred in most Oregon coastal estuaries and rivers. Complete estimates of the 2008 recreational Chinook harvest in freshwater areas were not available. Historical estimates of the recreational harvest of fall and spring Chinook, derived from Oregon Department of Fish and Wildlife (ODFW) salmon and steelhead angler catch record cards are reported in Table II-3.

Escapement and Management Performance

Actual escapement was not estimated for this stock aggregate. Achievement of an aggregate 150,000 to 200,000 naturally spawning adults was assessed through indices (e.g., stream surveys, dam counts, etc.). The escapement goal was equivalent to peak spawner index counts of 60 to 90 adults per mile in nine index streams and included both spring and fall Chinook. Peak spawner index counts were based on traditional non-random surveys. ODFW is developing alternate methodologies for establishing escapement goals for several fall Chinook PSC indicator stocks. The escapement goals and assessments for these stocks will likely change upon completion of this process.

The overall quota for the three terminal area commercial fisheries was 1,000 Chinook. The catch estimate for those fisheries was 520 Chinook.

North Migrating Chinook

An index of adult spawners (peak count per index mile) in nine standard streams was 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 2008 were preliminarily estimated at 40 adults per mile, less than 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) were available for the Winchuck, Chetco, and Pistol Rivers (Appendix B, Table B-8). Rogue River carcass counts were used as an indicator of trends in escapement for naturally produced fall Chinook, but these surveys were not conducted in 2008 (Table II-4). In addition, two trend indicators of escapement for naturally produced spring Chinook were 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 had been stable or increasing since the early 1990s but were below the recent five-year returns in 2008 (Figures II-3 and II-4). The aggregate Oregon coast goal of 150,000 to 200,000 naturally spawning Chinook adults was probably not met in 2008.

Coastal Hatchery Chinook

Preliminary estimates of total fall and spring Chinook returns to Oregon coastal hatcheries in 2008 were 2,700 and 6,100 adults, respectively (Table II-3). Hatchery egg-take goals were expected to be met at all stations.

COLUMBIA RIVER BASIN CHINOOK STOCKS

Columbia River Basin Chinook salmon stocks include fall, summer, and spring stocks. NMFS has listed five Chinook 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 (LRH) tule stock and lower river wild (LRW) bright stock, both of which are part of the ESA-listed lower Columbia River Chinook ESU; Spring Creek Hatchery (SCH) tule stock; upriver bright (URB) stock, which includes the ESA-listed Snake River fall Chinook ESU; and mid-Columbia bright (MCB) hatchery stock. Management details for Columbia River spring and summer Chinook stocks are not discussed, since Council-managed ocean salmon fisheries have very limited impacts on these stocks (less than a 2 percent exploitation rate in base-period fisheries). Appendix B, Tables B-12 through B-19, contain historical harvest and escapement data for fall, summer, and spring stocks. Appendix B, Table B-20 summarizes catch information for all three Chinook runs in the Columbia Basin. Additional information on these stocks can be found in the *Joint Staff Report: stock status and fisheries for spring Chinook, summer Chinook, sockeye, steelhead, and other species and miscellaneous regulations* and the *Joint Staff Report concerning the fall in-river commercial harvest of Columbia River fall Chinook, summer steelhead, coho salmon chum salmon, and sturgeon* published annually by the joint staffs of ODFW and WDFW.

Management Objectives

Council-area fisheries north of Cape Falcon in 2008 were managed to access SCH and LRH stocks while meeting the NMFS ESA consultation standards for the ESA-listed Snake River fall Chinook ESU and lower Columbia River Chinook ESU (both LCR natural tules and LRW). The standard for the Snake River fall Chinook ESU was no less than a 30.0 percent reduction in the Snake River Fall Index (SRFI) from the 1988 through 1993 base period exploitation rate for all ocean fisheries combined. The standard for ESA-listed lower Columbia River natural tules was a total (ocean plus inriver) AEQ exploitation rate of no more than 41.0 percent. For preseason modeling, the estimated total exploitation rate on a composite of Washougal, Kalama, Cowlitz, and Big Creek hatchery tules was used as a surrogate for natural tules. The NMFS ESA consultation standard for LRW is a North Lewis River fall Chinook spawning escapement of 5,700. The preseason forecast was for an escapement of 3,800. NMFS guidance for 2008 did not require any additional constraints in Council area fisheries to increase LRW escapement; however, WDFW objectives included managing southern U.S. ocean and inriver fisheries to achieve an AEQ exploitation rate of no more than 10.0 percent on LRW Chinook. In 2008, the WDFW objective for LRW was the primary constraint on Council-area Chinook fisheries north of Cape Falcon.

Inside Harvest

Since the Columbia River Fishery Management Plan expired on December 31, 1998, fall Chinook in Columbia River fisheries have been managed under the guidance of annual management agreements among the *U.S. versus Oregon* parties. In 2008, a new 10 year management agreement was negotiated through the *U.S. versus Oregon* process, which included revisions to some inriver objectives. In particular, the "*2008-2017 U.S. v Oregon Management Agreement*" (2008-2017 MA) specified that with

run sizes of at least 200,000 URB fall Chinook, including at least 6,000 Snake River wild (SRW) fall Chinook, the allowable URB (proxy for ESA-listed Snake River fall Chinook ESU) impact rate would be 38 percent.

In 2008, the fall fisheries were managed to achieve the NMFS ESA consultation standards for the ESA-listed Snake River fall Chinook ESU, and to minimize impacts on ESA-listed LRW, which was forecast at less than its escapement goal. Because of constraints for LRW in ocean and river fisheries, LCR tulle did not constrain inriver fisheries.

Harvestable surplus was projected for all major fall stocks except LRW in 2008. The postseason fall Chinook run reconstruction, however, was not completed in time for this report. The preliminary catch estimate for the non-Indian commercial gillnet fisheries were 4,686 spring, 1,341 summer, and 43,180 fall Chinook, which included 4,586 spring, 59 summer, and 14,170 fall Chinook in Select Area (terminal) fisheries. The preliminary catch estimates for the treaty Indian fisheries were 20,561 spring, 9,029 summer, and 109,063 fall Chinook. The preliminary catch estimate for the recreational fisheries included 7,860 fall Chinook in the Buoy 10 fishery, and 20,311 spring, 2,140 summer, and 10,840 fall Chinook in mainstem fisheries below Bonneville Dam, 1,830 spring Chinook in mainstem fisheries above Bonneville Dam, and 4,600 fall Chinook in the Hanford Reach fishery above McNary dam (Appendix B, Table B-20).

Escapement and Management Performance

Preliminary escapement estimates of 4,823 indicate that LRW did not meet its 5,700 escapement objective (Table II-5). All other Columbia River fall stocks met their escapement objectives. Preliminary estimates of river mouth returns based on inseason run updates were: 56,700 LRH; 5,000 LRW; 95,900 SCH; 224,200 URB; 60,400 MCB, and 6,300 SRW. The total ocean escapement of the five stocks was 441,000 fall Chinook (Figure II-5).

The 2008 URB and SRW run sizes were both large enough to allow a 38 percent harvest rate per the 2008-2017 MA. The preliminary URB harvest rate estimate was 36.4 percent. No specific escapement goal was established for the ESA-threatened Snake River wild fall Chinook stock. 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 the *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 origin spawners in the mainstem Snake River annually; the eight-year mean through 2007 was 2,566. The total adult fall Chinook count at Lower Granite Dam in 2008 was 16,628 up from 10,195 in 2007. A significant portion of recent year years returns were from supplementation programs. An estimate of SRW fall Chinook escapement in 2008 was not available for this report.

No postseason estimates of exploitation rate on Columbia River natural tulle or Snake River fall Chinook for ocean fisheries were available.

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, inclusive). This complex consists of several natural stocks, generally of small to medium-sized populations, and some hatchery production (primarily Willapa Bay and Quinault River). Coastal stocks are not impacted significantly by Council-area ocean fisheries.

Management Objectives

Spawning escapement goals for natural stocks managed within this complex, established in U.S. District Court by WDFW and the treaty Indian tribes, were recognized in the Council's FMP conservation objectives. Objectives for Grays Harbor and the North Coast river systems were established pursuant to the U.S. District Court order in *Hoh versus Baldrige*. 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 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 Indian allocation and inside non-Indian fishery needs.

Regulations to Achieve Objectives

Stocks in this complex tend to range farther north than most Columbia River stocks and, while present in fisheries from Cape Falcon to SEAK, tend to have limited impacts in Council-area ocean fisheries. Preseason abundance estimates were available for the first time in 2008 for the Council preseason management process. However, base period Council-area ocean fishery AEQ exploitation rates of 5 percent or less were below a management threshold that allows effective Council management of these stocks, and therefore they qualified as exceptions to the Council's overfishing criteria.

Willapa Bay Chinook

Inside Harvest

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

No Chinook-directed non-Indian gillnet fishery was conducted during July and the first half of August 2008. This fishery is commonly referred to as the "summer dip-in" fishery; it occurs irregularly because historically it was dependent on Columbia River tule abundance, which are now an ESA listed stock. This fishery was generally assumed to harvest Columbia River tule stocks in a mix similar to adjacent ocean area catches; however, in light of recent catch composition information (>70 percent local Willapa Bay and Grays Harbor origin stock) this assumption has been questioned.

The 2008 pre-season forecast of Chinook returning to Willapa Bay was 29,563 fish (2,516 natural and 27,047 hatchery). Concerned by the low abundance forecast of local Willapa Chinook, the one-day update fishery that typically occurs in late August was eliminated in order to maximize harvest of hatchery coho. Chinook harvest in coho-targeted gillnet fisheries during 2008 totaled 3,595 fish based on preliminary data.

Recreational fisheries in the marine waters of Willapa Bay were open from July 1 through July 31, 2008 concurrent with the Ocean Marine Area 2 (ocean rules applied). From August 1 through August 15, 2008, Willapa Bay was open to recreational fishing with no more than two adults allowed to be harvested daily and August 16, 2008 through January 31, 2009 with no more than three adults allowed to be harvested daily, of which only two could be Chinook. Barbed hooks were allowed when fishing for salmon. Retention of chum salmon was allowed.

Recreational salmon fisheries in tributaries to Willapa Bay varied in duration but were generally open August 1, 2008 through January 31, 2009 with two adult Chinook allowed daily. Single-point, barbless hooks were required in all areas. Recreational harvest estimates were not available for 2008.

Escapement and Management Performance

During 2007, Chinook returning to hatcheries in the Willapa Bay watershed totaled 14,282 fish. Based on current hatchery production, this return was sufficient to achieve the goal of 9,800 total Chinook escapement to Willapa Bay hatchery facilities. An escapement estimate was unavailable for 2008.

The WDFW escapement goal for naturally spawning Chinook in Willapa Bay was 4,350 adults. An estimate of the 2008 natural spawning escapement was not available (the 2007 natural escapement was 1,529 Chinook).

Grays Harbor Chinook

Inside Harvest

Run size, harvest, and escapement data for Grays Harbor Chinook are presented in Appendix B, Table B-25.

Spring Chinook sales were prohibited in the Chehalis Tribe commercial gillnet fishery, but the Tribe reported some ceremonial and subsistence permit fishing during the season. On the Chehalis River and the Humptulips commercial fishing Area 2C the Quinault Indian Nation conducted a spring/summer commercial gillnet fishery with mesh restrictions to reduce impacts on spring Chinook while targeting white sturgeon. The recreational season was also closed to spring Chinook retention in Grays Harbor. No summer non-Indian gillnet fishery directed at non-local Chinook stocks occurred in 2008.

Retention of fall Chinook was allowed on the Humptulips River during the coho-directed non-Indian gillnet fishery in 2008. Fall Chinook were required to be released during the non-Indian gillnet fishery in 2008 on the Chehalis River and live-boxes were required. In the non-Indian recreational fishery, retention of adult Chinook was not allowed in Marine Area 2-2 from September 16 through November 30 and on the Chehalis River (all sections) from September 16 through January 31. In the Humptulips River from the mouth to Hwy 101 Bridge, retention of Chinook was not allowed from October 1 through January 31. Recreational harvest estimates were not available.

The Quinault Indian Nation fall gillnet fishery harvested a total of 1,878 fall Chinook in two separately scheduled areas: the first in the lower Humptulips River and adjacent Area 2C of Grays Harbor and the second in the lower Chehalis River and adjacent areas of Grays Harbor, Areas 2D, 2A, and 2A-1. Fishing was restricted to east of Stearns Bluff in the Chehalis River, and Areas 2D, 2A, 2A-1 to limit catches of Chinook destined to Grays Harbor tributaries other than the Chehalis River. The Humptulips area treaty Indian gillnet fishery caught 1,059 fall Chinook, which was just above the preseason expected catch level. The Chehalis River treaty Indian gillnet fishery caught 731 fall Chinook, which was just below the preseason expected catch level.

Escapement and Management Performance

Chehalis River spring Chinook are of natural origin and managed for an escapement goal of 1,400 adults. The 2008 terminal run forecast for spring Chinook was 912 adult fish; an escapement estimate was not available for the 2008 return. The 2007 final escapement estimate was 651.

Grays Harbor fall Chinook were managed for a natural spawning escapement goal of 14,600 adults. The 2008 Grays Harbor fall Chinook forecast was 15,270 wild and 2,459 hatchery adults; the spawning ground escapement estimate for 2007 was 12,440, which includes some hatchery origin fish. An escapement estimate for 2008 was not available. The established hatchery escapement goals for the

Grays Harbor are 400 for the Chehalis River and 369 for the Humptulips River, both of which were achieved in 2008.

Quinault River Chinook

Inside Harvest

Historical terminal gillnet harvest data for Quinault River Chinook stocks are presented in Appendix B, Table B-27.

A run of natural spawning spring/summer Chinook enters the river from April through July. The spring/summer Chinook run is typically small and any harvest is taken incidentally during fisheries directed at sockeye and steelhead. A total of approximately 10 spring/summer Chinook were harvested in 2008.

The 2008 harvest of Quinault River fall Chinook was mostly hatchery origin fish taken in September and October. The treaty Indian net catch totaled 3,682 fall Chinook.

Escapement and Management Performance

Quinault fall Chinook were managed for hatchery production. The 2008 fall Chinook spawning escapement estimate was not available. Hatchery egg-take goals for fall Chinook were obtained at the tribal facilities. In addition, fall Chinook eggs to supplement hatchery rack returns at the U.S. Fish and Wildlife Service (USFWS) Quinault National Fish Hatchery were taken at the tribal facility.

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-29 and B-30, respectively.

The treaty Indian gillnet harvest of spring/summer Chinook was limited to incidental catch in a ceremonial fishery. Only three Chinook were harvested. The non-Indian in-river recreational fishery was closed to retention of Chinook.

Fall Chinook were harvested from August 31 to October 13 by the treaty Indian gillnet fishery. The fishery followed a schedule set by preseason management agreement between the Quinault Indian Nation and WDFW. The fishery targeted hatchery and natural coho and limited impacts to natural and indicator Chinook by closing after October 13 until the beginning of steelhead season. The treaty Indian gillnet fishery harvested 1,022 fall Chinook in the commercial fishery. Recreational fisheries targeted coho, requiring non-retention of Chinook during standard schedules in the Queets, Clearwater, and Salmon rivers. A catch estimate for this fishery was not available.

Escapement and Management Performance

The preliminary 2008 spawning escapement estimate for Queets River spring/summer Chinook was 305 adults, less than 50 percent of the minimum escapement goal of 700.

Total fall Chinook escapement in 2008 may be near the minimum escapement goal of 2,500. The spawner survey escapement estimate was not completed. Catch sampling suggests a higher proportion of the returns may have been natural fish than forecasted pre-season, with the remaining being “indicator” Chinook. The indicator Chinook originate from wild broodstock taken each year in the river.

Hoh River Chinook

Inside Harvest

Historical terminal run size, catch, and escapement data for Hoh River spring/summer and fall Chinook are presented in Appendix B, Tables B-32 and B-33, respectively.

The 2008 Hoh River spring/summer Chinook terminal abundance forecast was 892 fish, just below the minimum escapement goal of 900. A terminal harvest rate of 6 percent was agreed to so the Tribe could operate a fishery targeting hatchery dip-in Chinook as well as a limited ceremonial and subsistence fishery. The treaty gillnet fishery occurred between the weeks of May 5 and June 16, and was open one day per week during the first three weeks, two days per week for the next three weeks, and one day per week for the remaining week. Tribal regulation in 2008 required a minimum of 8 inch stretch mesh during the first week in order to minimize incidental take of steelhead kelts. The treaty gillnet fishery harvested 299 Chinook, including an estimated 50 taken during separately scheduled ceremonial and subsistence fishing. Results of mark sampling indicated that 267 of these were of hatchery origin (32 natural). Scale samples remain to be analyzed. The non-Indian recreational fishery operated from May 1 through August 31, Wednesdays through Sundays, with a bag limit of one hatchery adult per day from the mouth up to Willoughby Creek. Retention of unmarked Chinook was prohibited. A preliminary estimate of Chinook taken in the sport fishery was not available.

Hoh River fisheries for fall Chinook were based on an expected terminal run size of 2,873 adults, allowing for a terminal harvest rate of 36.1 percent. The spawning escapement was expected to be 1,836 adults.

The tribal fishery targeted 24.8 percent of the terminal run. The treaty Indian gillnet fishery was scheduled for one day per week during the first two weeks of September, two days per week for the next four weeks, three days per week for the next four weeks and two days per week during the final week. The tribal fishery caught approximately 659 Chinook. Results of mark sampling indicated that 634 of these were of natural origin. Coded-wire tag data was not available.

The non-Indian recreational fishery extended from September 1 through November 30, with the river below Willoughby Creek open and a daily-bag-limit of six salmon, two of which could be adults. The portion of the river between Willoughby Creek and Morgan's Crossing was open October 16 through November 30. The delayed opening was to reduce impacts on spawning spring/summer Chinook in that reach. The river above Morgan's Crossing was closed to recreational salmon fishing. A catch estimate was not available for the recreational fishery.

Escapement and Management Performance

Tribal catch and expected harvest rates indicate the spring/summer Chinook terminal run size were lower than pre-season expectations. The preliminary 2008 spawning escapement for Hoh River spring/summer Chinook was 550 adults, approximately 39 percent lower than the 900 fish minimum escapement goal established for this stock.

Tribal catch and expected harvest rates indicate the fall Chinook terminal run size was slightly below the level anticipated pre-season. The preliminary 2008 spawning escapement for Hoh River fall Chinook was estimated at 1,774, approximately 48 percent higher than the 1,200 fish minimum escapement goal established for this stock.

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-35 and B-36 respectively. Spring and summer Chinook are currently managed separately, but data for both are combined in Table B-35. All hatchery origin fish are considered to be spring Chinook, and all natural spawners and tribal broodstock collections are considered to be summer Chinook.

The recreational and tribal fisheries for spring and summer Chinook were established by preseason agreement between WDFW and the Quileute Tribe. The total tribal catch for 2008 was 993 spring and 132 summer Chinook and included ceremonial and subsistence use. Estimates of 2008 recreational spring and summer Chinook harvest were not available.

The total 2008 Quileute Tribal harvest of fall Chinook was 1,427, and included ceremonial and subsistence use. An estimate of the 2008 recreational catch was not available.

As in past years, WDFW required release of unmarked Chinook during July and August to reduce impacts of the recreational fishery on the natural summer Chinook stock. The fall recreational fishery from September through November proceeded with normal bag limits and schedule. 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 to reduce impacts to summer Chinook.

Escapement and Management Performance

The management agreement called for an escapement goal of 200 hatchery spring Chinook. The actual rack return was 826, which exceeded hatchery requirements.

The summer Chinook run was managed to achieve an escapement of 1,200 adults, jacks, and broodstock collection combined. The preliminary estimated natural spawning summer Chinook escapement of 904 was under the escapement goal.

Terminal area fisheries on fall Chinook are managed for a target 40 percent harvest rate, with a minimum escapement level of 3,000 adults. The preliminary escapement estimate of 4,306 fall Chinook was above the escapement goal.

PUGET SOUND CHINOOK STOCKS

Puget Sound Chinook stocks include all fall, summer, and spring stocks originating from U.S. tributaries in Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek, inclusive). This stock complex consists of numerous natural Chinook stocks of small to medium sized populations and significant hatchery production. The Puget Sound ESU was listed under the ESA as threatened in March 1999.

Management Objectives

The stocks within this complex and their respective FMP conservation objectives were established in U.S. District Court by WDFW and the treaty Indian 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 escapement during periods 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 returns plus natural escapement) for specific rivers or regions of origin may vary from the FMP 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]).

NMFS has developed rebuilding exploitation rate (RER) standards for some ESA-listed Puget Sound stocks (Table II-5). Predicted total exploitation rates were compared to these standards and used by NMFS in setting ESA consultation standards for the combined Council/Puget Sound salmon fisheries. Puget Sound stocks were managed pursuant to the provisions of a WDFW/Tribal management plan approved under a 4(d) rule promulgated by NMFS.

Regulations to Achieve Objectives

Puget Sound stocks contribute to fisheries off B.C., are present to a lesser degree off SEAK, and are impacted to a minor degree by Council-area ocean fisheries. Base period Council-area ocean fishery AEQ exploitation rates of 5 percent or less were below a management threshold which allowed effective Council management of these stocks, and they qualify as exceptions to the Council's overfishing criteria.

Inside Harvest

Commercial inside fishery harvest of Puget Sound Chinook was managed on the basis of six regional stock management units or, in some cases, component stocks within management units: Strait of Juan de Fuca, Nooksack-Samish, Skagit, Stillaguamish-Snohomish, South Puget Sound, and Hood Canal. Harvest was 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-38. These catches included some fish of non-Puget Sound origin. The total commercial harvest in Puget Sound in 2008 was 105,163 Chinook, compared to 122,048 Chinook caught in 2007. The 2008 non-Indian net catch was 6,119 Chinook, compared to 6,785 Chinook caught in 2007. The 2008 treaty Indian net and troll harvest was 99,044 Chinook, compared to 115,263 Chinook caught in 2007.

Recreational Chinook catches in the Puget Sound recreational fishery for years 1971 through 2007 are presented in Appendix B, Table B-39. Catch estimates for the 2008 Puget Sound recreational fishery were not available.

Escapement and Management Performance

Puget Sound Chinook management goals for fishery planning processes in 2008 were expressed in terms of constraints on total fishery exploitation rates (RER). Information to evaluate performance against these constraints was not available.

Historical 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-40. Historical spring Chinook escapement data are presented in Appendix B, Table B-43.

All Puget Sound spring Chinook hatchery escapement goals were met. Preliminary data suggest most Puget Sound hatcheries met their summer/fall Chinook goals.

Naturally spawning Puget Sound spring and summer/fall Chinook remained depressed in 2008. Preliminary data suggest no Puget Sound spring Chinook natural stocks met their escapement goals. Preliminary information on 2008 natural spawning escapements for summer/fall Chinook stocks indicate escapement goals were met in some areas, but not in many others. Actual escapement numbers were not

available at this time for most runs. In many natural spawning areas hatchery Chinook comprise a large component of the natural spawning population.

COASTWIDE GOAL ASSESSMENT SUMMARY

Information to assess conservation objectives was unavailable for LCR natural tule Chinook, Snake River wild fall Chinook, Grays Harbor natural fall Chinook, and all Puget Sound natural Chinook stocks. Conservation objectives for all other Council managed Chinook stocks were met except for natural and hatchery spawning adult escapement for SRFC, natural area adult escapement of KRFC, Oregon Coast Chinook, North Lewis River fall (LRW), Hoh spring/summer, Queets spring/summer, and Quillayute summer Chinook.

A summary of 2008 performance for Chinook salmon stocks in relation to Council conservation objectives is presented in Table II-5.

TABLE II-1. Sacramento River natural and hatchery adult fall Chinook escapements in numbers of fish.

| Year | Upper River ^{a/} | | | Lower River | | | Total | | Grand Total |
|--------------------|---------------------------|-----------------------|----------|-------------|-----------------------|----------|----------|-----------------------|---------------------|
| | Hatchery | Natural ^{b/} | Subtotal | Hatchery | Natural ^{b/} | Subtotal | Hatchery | Natural ^{b/} | |
| 1970 | 3,010 | 61,160 | 64,170 | 10,266 | 82,718 | 92,984 | 13,275 | 143,878 | 157,154 |
| 1971 | 1,728 | 67,586 | 69,314 | 11,011 | 74,556 | 85,567 | 12,739 | 142,143 | 154,882 |
| 1972 | 1,259 | 36,485 | 37,744 | 6,766 | 47,647 | 54,413 | 8,025 | 84,132 | 92,157 |
| 1973 | 1,679 | 48,948 | 50,627 | 18,010 | 151,422 | 169,433 | 19,689 | 200,371 | 220,060 |
| 1974 | 1,984 | 66,304 | 68,288 | 11,799 | 121,930 | 133,729 | 13,783 | 188,234 | 202,017 |
| 1975 | 3,289 | 72,986 | 76,275 | 10,781 | 68,564 | 79,346 | 14,071 | 141,550 | 155,621 |
| 1976 | 3,017 | 80,263 | 83,280 | 8,612 | 75,975 | 84,586 | 11,628 | 156,238 | 167,866 |
| 1977 | 6,083 | 60,967 | 67,050 | 14,896 | 82,065 | 96,961 | 20,978 | 143,032 | 164,011 |
| 1978 | 2,717 | 66,991 | 69,708 | 9,937 | 47,303 | 57,240 | 12,654 | 114,295 | 126,948 |
| 1979 | 6,407 | 81,332 | 87,739 | 9,405 | 72,299 | 81,704 | 15,812 | 153,632 | 169,444 |
| 1980 | 10,271 | 45,504 | 55,775 | 14,645 | 71,608 | 86,253 | 24,916 | 117,113 | 142,028 |
| 1981 | 5,883 | 51,831 | 57,714 | 25,047 | 92,129 | 117,177 | 30,930 | 143,960 | 174,890 |
| 1982 | 17,117 | 39,694 | 56,811 | 14,548 | 92,600 | 107,148 | 31,666 | 132,293 | 163,959 |
| 1983 | 6,112 | 42,570 | 48,682 | 12,474 | 48,831 | 61,305 | 18,586 | 91,401 | 109,987 |
| 1984 | 19,594 | 51,772 | 71,366 | 19,131 | 67,733 | 86,865 | 38,725 | 119,505 | 158,230 |
| 1985 | 15,869 | 103,698 | 119,566 | 13,385 | 105,753 | 119,138 | 29,254 | 209,450 | 238,704 |
| 1986 | 11,283 | 113,875 | 125,158 | 10,565 | 102,434 | 112,999 | 21,847 | 216,310 | 238,157 |
| 1987 | 9,981 | 76,861 | 86,842 | 9,851 | 97,930 | 107,782 | 19,833 | 174,791 | 194,623 |
| 1988 | 12,594 | 128,725 | 141,319 | 14,177 | 69,228 | 83,405 | 26,771 | 197,953 | 224,724 |
| 1989 | 10,212 | 67,296 | 77,508 | 14,730 | 59,387 | 74,117 | 24,942 | 126,683 | 151,625 |
| 1990 | 13,464 | 50,225 | 63,689 | 8,283 | 32,973 | 41,256 | 21,747 | 83,198 | 104,945 |
| 1991 | 10,031 | 34,826 | 44,857 | 15,999 | 56,144 | 72,143 | 26,030 | 90,970 | 117,000 |
| 1992 | 6,257 | 30,529 | 36,786 | 15,431 | 27,723 | 43,154 | 21,688 | 58,252 | 79,940 |
| 1993 | 7,056 | 55,144 | 62,200 | 17,570 | 55,412 | 72,982 | 24,626 | 110,556 | 135,182 |
| 1994 | 11,585 | 66,383 | 77,968 | 19,017 | 66,647 | 85,664 | 30,601 | 133,030 | 163,631 |
| 1995 | 24,810 | 112,235 | 137,045 | 16,738 | 141,252 | 157,990 | 41,548 | 253,487 | 295,035 |
| 1996 | 18,848 | 131,268 | 150,116 | 13,670 | 135,803 | 149,474 | 32,519 | 267,071 | 299,590 |
| 1997 | 44,590 | 167,353 | 211,943 | 18,686 | 112,246 | 130,932 | 63,276 | 279,599 | 342,875 |
| 1998 | 42,400 | 60,713 | 103,113 | 27,516 | 107,431 | 134,947 | 69,915 | 168,144 | 238,060 |
| 1999 | 23,194 | 256,629 | 279,823 | 19,029 | 97,089 | 116,118 | 42,224 | 353,718 | 395,942 |
| 2000 | 20,793 | 152,923 | 173,716 | 26,782 | 216,291 | 243,073 | 47,575 | 369,214 | 416,789 |
| 2001 | 23,710 | 179,198 | 202,908 | 33,689 | 358,217 | 391,906 | 57,399 | 537,415 | 594,814 |
| 2002 | 61,946 | 474,812 ^{c/} | 536,758 | 23,747 | 207,883 | 231,630 | 85,693 | 682,695 | 768,388 |
| 2003 | 82,708 | 164,802 | 247,510 | 25,490 | 248,636 | 274,126 | 108,198 | 413,438 | 521,636 |
| 2004 | 51,557 | 70,548 | 122,105 | 28,510 | 132,930 | 161,440 | 80,067 | 203,478 | 283,545 |
| 2005 | 142,135 | 96,716 | 238,851 | 41,166 | 113,990 | 155,156 | 183,301 | 210,706 | 394,007 |
| 2006 | 56,966 | 85,946 | 142,912 | 21,722 | 103,338 | 125,060 | 78,688 | 189,284 | 267,972 |
| 2007 | 11,558 | 32,645 | 44,203 | 9,759 | 33,919 | 43,678 | 21,317 | 66,564 | 87,881 |
| 2008 ^{d/} | 10,173 | 35,786 | 45,959 | 7,551 | 12,754 | 20,305 | 17,724 | 48,540 | 66,264 |
| Goal | | | | | | | | | 122,000- 180,000 |

a/ Above the Feather River; 1971-1985 estimates include Tehama-Colusa Spawning Channel.

b/ Fish spawning in natural areas are the result of hatchery and natural production; estimates generally based on carcass surveys.

c/ Estimation methodology was changed due to an extremely high Battle Creek escapement in 2002.

d/ Preliminary.

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

| Year | Spawning Escapement | | | | Inriver Recreational Catch | | Indian Net Catch | | Non-landed Fishing Mortality | | Inriver Run Size |
|--------------------|-----------------------|---------|---------|---------|-------------------------------|---------|------------------|---------|---------------------------------|---------|-----------------------|
| | Hatchery | Natural | Total | Percent | Numbers | Percent | Numbers | Percent | Numbers | Percent | Numbers |
| 1978 | 12,979 | 58,492 | 71,471 | 77% | 1,694 | 2% | 18,200 | 20% | 1,618 | 2% | 92,983 |
| 1979 | 3,636 | 30,637 | 34,273 | 67% | 2,141 | 4% | 13,650 | 27% | 1,231 | 2% | 51,295 |
| 1980 | 6,511 | 21,483 | 27,994 | 61% | 4,496 | 10% | 12,013 | 26% | 1,137 | 2% | 45,640 |
| 1981 | 4,425 | 33,857 | 38,282 | 48% | 5,983 | 7% | 33,033 | 41% | 2,994 | 4% | 80,292 |
| 1982 | 10,411 | 31,951 | 42,362 | 64% | 8,339 | 13% | 14,482 | 22% | 1,429 | 2% | 66,612 |
| 1983 | 13,865 | 30,784 | 44,649 | 78% | 4,235 | 7% | 7,890 | 14% | 772 | 1% | 57,546 |
| 1984 | 7,496 | 16,064 | 23,560 | 50% | 3,340 | 7% | 18,670 | 40% | 1,691 | 4% | 47,261 |
| 1985 | 22,534 | 25,677 | 48,211 | 75% | 3,582 | 6% | 11,566 | 18% | 1,079 | 2% | 64,438 |
| 1986 | 32,891 | 113,360 | 146,251 | 75% | 21,027 | 11% | 25,127 | 13% | 2,614 | 1% | 195,019 |
| 1987 | 29,123 | 101,717 | 130,840 | 63% | 20,169 | 10% | 53,096 | 25% | 5,029 | 2% | 209,134 |
| 1988 | 33,458 | 79,386 | 112,844 | 59% | 22,203 | 12% | 51,651 | 27% | 4,944 | 3% | 191,642 |
| 1989 | 21,991 | 43,868 | 65,859 | 53% | 8,775 | 7% | 45,565 | 37% | 4,141 | 3% | 124,340 |
| 1990 | 8,067 | 15,596 | 23,663 | 66% | 3,553 | 10% | 7,906 | 22% | 760 | 2% | 35,882 |
| 1991 | 6,484 | 11,649 | 18,133 | 56% | 3,383 | 10% | 10,198 | 31% | 956 | 3% | 32,670 |
| 1992 | 7,360 | 12,028 | 19,388 | 73% | 1,002 | 4% | 5,785 | 22% | 523 | 2% | 26,698 |
| 1993 | 21,643 | 21,858 | 43,501 | 76% | 3,172 | 6% | 9,636 | 17% | 903 | 2% | 57,212 |
| 1994 | 17,072 | 32,333 | 49,405 | 77% | 1,832 | 3% | 11,692 | 18% | 1,054 | 2% | 63,983 |
| 1995 | 37,859 | 161,794 | 199,653 | 90% | 6,081 | 3% | 15,557 | 7% | 1,477 | 1% | 222,768 |
| 1996 | 20,033 | 81,326 | 101,359 | 58% | 12,766 | 7% | 56,476 | 32% | 5,172 | 3% | 175,773 |
| 1997 | 18,662 | 46,144 | 64,806 | 77% | 5,676 | 7% | 12,087 | 14% | 1,167 | 1% | 83,736 |
| 1998 | 29,219 | 42,488 | 71,707 | 79% | 7,710 | 9% | 10,187 | 11% | 1,043 | 1% | 90,647 |
| 1999 | 14,327 | 18,457 | 32,784 | 64% | 2,282 | 4% | 14,660 | 29% | 1,322 | 3% | 51,048 |
| 2000 | 97,611 | 82,728 | 180,339 | 83% | 5,650 | 3% | 29,415 | 13% | 2,673 | 1% | 218,077 |
| 2001 | 55,112 | 77,834 | 132,946 | 71% | 12,134 | 6% | 38,645 | 21% | 3,608 | 2% | 187,333 |
| 2002 | 27,183 | 65,635 | 92,818 | 58% | 10,495 | 7% | 24,574 | 15% | 2,351 | 1% | 160,788 ^{a/} |
| 2003 | 61,782 | 87,642 | 149,424 | 78% | 9,680 | 5% | 30,034 | 16% | 2,810 | 1% | 191,948 |
| 2004 | 22,982 | 23,831 | 46,813 | 59% | 4,003 | 5% | 25,803 | 33% | 2,325 | 3% | 78,944 |
| 2005 | 27,699 | 26,789 | 54,488 | 84% | 1,985 | 3% | 8,016 | 12% | 738 | 1% | 65,227 |
| 2006 | 19,522 | 30,163 | 49,685 | 81% | 62 | 0% | 10,283 | 17% | 1,344 | 2% | 61,374 |
| 2007 | 35,050 | 60,670 | 95,720 | 72% | 6,312 | 5% | 27,573 | 21% | 2,526 | 2% | 132,131 |
| 2008 ^{b/} | 13,552 | 30,925 | 44,477 | 63% | 1,863 | 3% | 22,259 | 32% | 1,973 | 3% | 70,572 |
| Goal | ≥35,000 ^{c/} | | | | | | | | | | |

a/ Inriver run size includes a USFWS estimate of 30,550 fish (19% of the run) that died prior to spawning in September 2002.

b/ Preliminary.

c/ In 2008, fisheries were managed for a natural area spawning escapement of 40,700 adults.

TABLE II-3. Oregon coastal spring and fall Chinook hatchery return and harvest in estuary and freshwater fisheries.

| Year | Return to Facilities | | | Estuary and Freshwater Harvest ^{b/} | |
|-----------------------------|-------------------------------|------|---------|--|------|
| | Public Hatchery ^{a/} | | Private | Spring | Fall |
| | Spring | Fall | All | | |
| 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 | 61.4 |
| 1989 | 32.7 | 4.3 | 14.7 | 23.7 | 53.9 |
| 1990 | 6.3 | 3.4 | 7.8 | 15.5 | 39.9 |
| 1991 | 5.4 | 3.1 | 4.1 | 11.1 | 47.7 |
| 1992 | 2.7 | 4.4 | - | 8.0 | 44.7 |
| 1993 | 10.6 | 2.8 | - | 16.4 | 54.7 |
| 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 | 66.0 |
| 1997 | 29.1 | 2.0 | - | 14.7 | 43.1 |
| 1998 | 11.0 | 2.6 | - | 8.2 | 37.3 |
| 1999 | 18.1 | 3.3 | - | 8.2 | 35.2 |
| 2000 | 24.5 | 3.1 | - | 11.4 | 40.5 |
| 2001 | 26.8 | 5.7 | - | 18.6 | 66.3 |
| 2002 | 24.7 | 2.9 | - | 30.9 | 75.2 |
| 2003 | 17.2 | 3.9 | - | 33.1 | 90.2 |
| 2004 | 20.1 | 2.9 | - | 19.4 | 74.8 |
| 2005 | 11.7 | 2.6 | - | 10.2 | 27.1 |
| 2006 | 7.5 | 2.7 | - | 4.9 | 21.5 |
| 2007 | 6.3 | 2.1 | - | NA | NA |
| 2008 ^{c/} | 6.1 | 2.7 | - | NA | NA |

a/ Adults only.

b/ Freshwater harvests are derived from ODFW salmon/steelhead angler catch record card 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/}

| Year | Fall Chinook Spawner Indices | | South/Local Migrating Spring Chinook Spawner Indices | |
|--------------------|---|--|--|---------------------------------------|
| | North Migrating Peak Count Adults Per Mile | Rogue River (South/local migrating) | Rogue River | |
| | | Adult Carcass Counts | Gold Ray Dam Counts | Umpqua River Winchester Dam Counts |
| 1976 | 45 | - | 20 | 6 |
| 1977 | 71 | 1,356 | 15 | 7 |
| 1978 | 73 | 9,174 | 40 | 5 |
| 1979 | 81 | 8,272 | 29 | 6 |
| 1980 | 89 | 2,221 | 24 | 6 |
| 1981 | 82 | 5,228 | 13 | 5 |
| 1982 | 90 | 2,812 | 23 | 7 |
| 1983 | 42 | 2,737 | 10 | 3 |
| 1984 | 98 | 3,267 | 8 | 5 |
| 1985 | 132 | 5,486 | 28 | 8 |
| 1986 | 109 | 17,177 | 40 | 8 |
| 1987 | 121 | 25,918 | 37 | 8 |
| 1988 | 214 | 31,613 | 39 | 8 |
| 1989 | 138 | 7,408 | 8 | 8 |
| 1990 | 121 | 1,868 | 18 | 6 |
| 1991 | 150 | 2,799 | 9 | 2 |
| 1992 | 138 | 2,366 | 2 | 3 |
| 1993 | 63 | 5,447 | 13 | 4 |
| 1994 | 125 | 7,366 | 4 | 3 |
| 1995 | 103 | 3,958 | 21 | 6 |
| 1996 | 147 | 2,448 | 10 | 4 |
| 1997 | 105 | 1,643 | 10 | 3 |
| 1998 | 99 | 3,601 | 4 | 4 |
| 1999 | 124 | 2,493 | 6 | 3 |
| 2000 | 85 | 3,366 | 3 | 3 |
| 2001 | 203 | 6,380 | 9 | 6 |
| 2002 | 269 | 11,836 | 7 | 7 |
| 2003 | 279 | 14,620 | 19 | 8 |
| 2004 | 198 | 5,326 ^{b/} | 13 | 5 |
| 2005 | 118 | d/ | 6 | 4 |
| 2006 | 100 | d/ | 5 | 3 |
| 2007 | 42 | d/ | 3 | 2 |
| 2008 ^{c/} | 40 | d/ | 4 | 3 |
| Goal | 60-90 | | | |

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/ In 2004 one of the standard survey sections was not sampled. In the previous two years this section accounted for 33% of the total adult carcass counts.

c/ Preliminary.

d/ Surveys were not conducted.

TABLE II-5. Performance of Chinook salmon stocks in relation to 2008 conservation objectives (preliminary data). (Page 1 of 2)

| System and Stock | 2008 Conservation Objective(s) | Achievement |
|---|--|---|
| Sacramento River Chinook | | |
| Fall | 122,000-180,000 natural and hatchery adults. | Preliminary estimate of 66,264 natural and hatchery adult fall Chinook, 54% of the lower end of the escapement goal range. |
| Winter (Endangered) | NMFS ESA consultation standard defines specific limits on management measures to protect Sacramento River winter and spring Chinook. | Commercial and recreational seasons south of Point Arena conformed with the consultation standard. |
| Spring (Threatened) | Same objective as for winter Chinook. | Objective met-see winter Chinook achievement. |
| California North Coast Chinook | | |
| Klamath River Fall | Minimum escapement of 40,700 natural adult spawners. | 30,925 natural area spawners, 88% of FMP conservation objective; 76% of annual management objective. |
| California Coastal (Threatened) | No greater than 16.0% ocean harvest rate on age-4 Klamath River fall Chinook. | Preseason projection of 2.4%; no postseason estimate is currently available. |
| 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). | 40 natural adult spawners per mile, below the lower bound of the aggregate stock index range. |
| Columbia River Basin Fall Chinook | | |
| LRW (Component of threatened lower Columbia River Chinook ESU) | MSY objective of 5,700 natural North Lewis River adult spawners (no specific NMFS ESA guidance for 2007). | Preliminary estimate of 4,823, 85% of the conservation objective. |
| Lower Columbia natural tules (Component of threatened lower Columbia River Chinook ESU) | Total (ocean plus inriver) AEQ exploitation rate on ESA-listed Coweeman River natural tules of no more than 41.0% | Preseason projection of 35.8%. No postseason estimate is currently available. |
| LRH | 14,100 adult hatchery spawners. | Preliminary projection of 23,100 adult hatchery spawners, 228% of goal. |
| SCH | 7,000 adult hatchery spawners. | 26,750 adult hatchery spawners, 382% of target. |
| MCB | No FMP objective; target of 7,750 hatchery adults. | Based on inseason projections, escapement is expected to be 19,700. |
| URB | 40-45,000 natural and hatchery adults above McNary Dam, plus meet treaty Indian obligations. <i>U.S. v. Oregon</i> parties agreed to a target of 45,000 adults between 1991 and 1993, and 46,000 after 1993. | 101,900 natural and hatchery adults over McNary Dam, 222% of MSY target in FMP. |

TABLE II-5. Performance of Chinook salmon stocks in relation to 2008 conservation objectives (preliminary data).
(Page 2 of 2)

| System and Stock | 2008 Conservation Objective(s) | | | Achievement | | |
|--|---|---------------------|-------------|--|---------------------|-------------|
| Columbia River Basin Fall Chinook (continued) | | | | | | |
| Snake River Fall Chinook (Threatened; component of URB) | SRFI ≤0.700 for all ocean fisheries combined (i.e., no less than a 30.0% reduction from the 1988-1993 base period exploitation rate). | | | Preseason SRFI projection of 0.466. No postseason estimate is currently available. | | |
| Washington Coastal Chinook | | | | | | |
| Fall | Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations. | | | Based on preliminary estimates, Quinault hatchery, Quillayute natural, and Hoh River natural objectives were met. Other estimates are not yet available. | | |
| Spring/Summer | Natural spawner escapement objectives as provided in state-tribal agreements; meet hatchery egg-take goals and meet treaty Indian obligations. | | | Based on preliminary estimates, objectives were not met for Hoh and Queets spring/summer natural, and Quillayute summer natural. An estimate was not available for Grays Harbor fall Chinook. | | |
| Puget Sound Chinook (Threatened) | | | | | | |
| | Minor part of Washington ocean harvest; Council ocean management not directed at these stocks. Adult equivalent exploitation rate standard developed for some stocks: | | | Postseason estimates not available. Preseason predictions of adult equivalent exploitation rates and spawner objectives were: | | |
| | <u>Exploitation Rate</u> | <u>Spawner Esc.</u> | <u>ISBM</u> | <u>Exploitation Rate</u> | <u>Spawner Esc.</u> | <u>ISBM</u> |
| · Nooksack spring | · 7% So U.S. | - | ≤60% | 5.1% | | 19% |
| · Skagit summer/fall | · 50% So U.S. | - | ≤60% | 47.1% | | 32% |
| · Skagit spring | · 38% Total | - | ≤60% | 32.3% | | 21% |
| · Stillaguamish summer/fall | · 15% So U.S. | - | ≤60% | 14.8% | | 14% |
| · Snohomish summer/fall | · 15% So U.S. | - | ≤60% | 12.9% | | 17% |
| · Lake Wash. summer/fall | · 15% pre-term SUS | - | ≤60% | 7.3% | | 39% |
| · White River spring | · 20% pre-term SUS | - | - | 15.9% | | |
| · Green River summer/fall | · 15% pre-term SUS | 5,800 | ≤60% | 7.3% | | 38% |
| · Puyallup summer/fall | · 50% Total | - | - | 48.6% | | |
| · Nisqually summer/fall | · NA | 1,100 | - | - | 1,928 | |
| · Skokomish summer/fall | · 15% pre-term SUS | 1,200 | - | 8.3% | 1,207 | |
| · Mid-Hood Canal fall | · 12% pre-term SUS. | - | - | 8.3% | | |
| · Dungeness spring | · 10% So US | - | - | 2.7% | | |
| · Elwha summer/fall | · 10% So US | - | - | 2.8% | | |

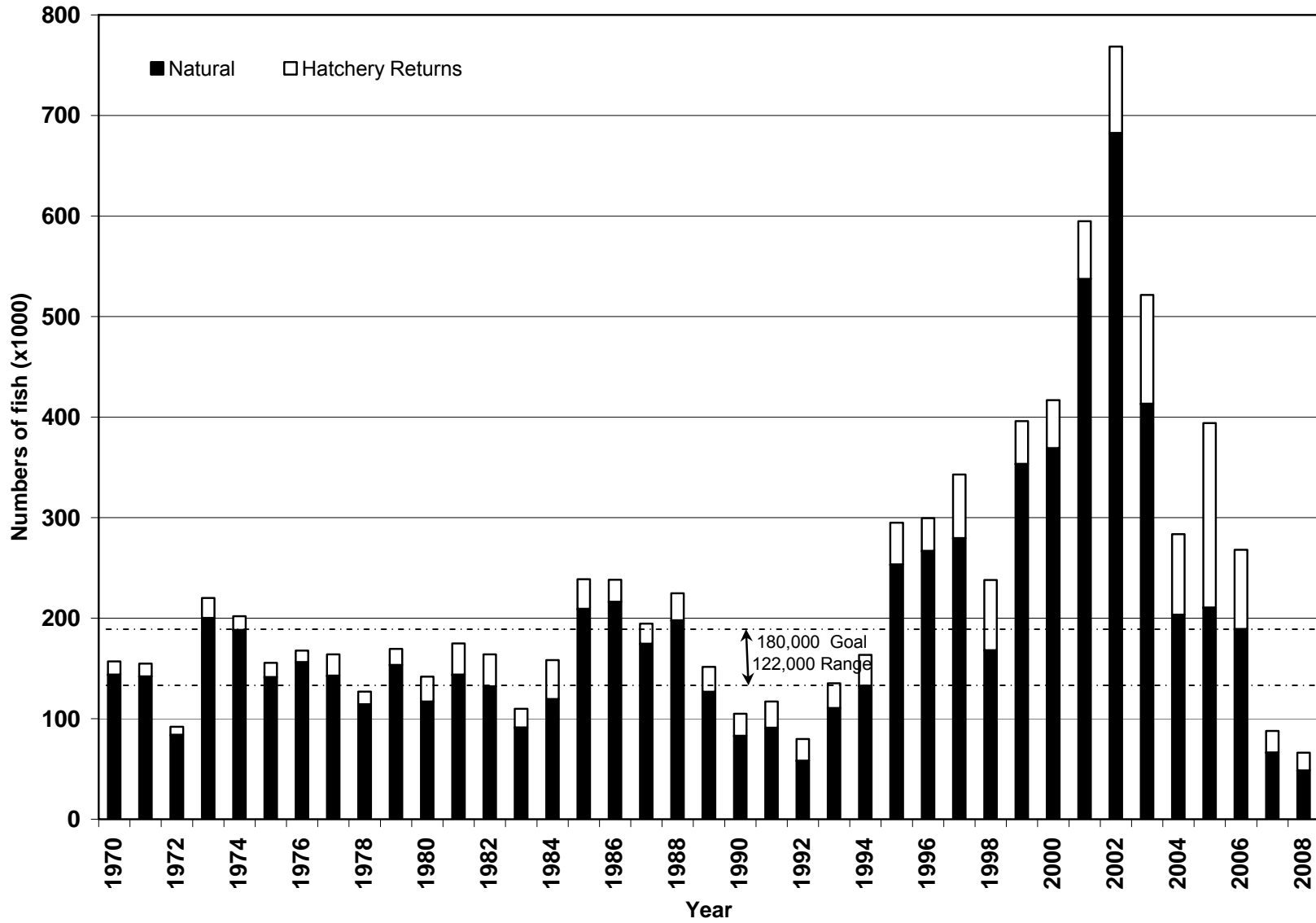


Figure II-1. Sacramento River adult fall Chinook spawning escapements, 1970-2008.

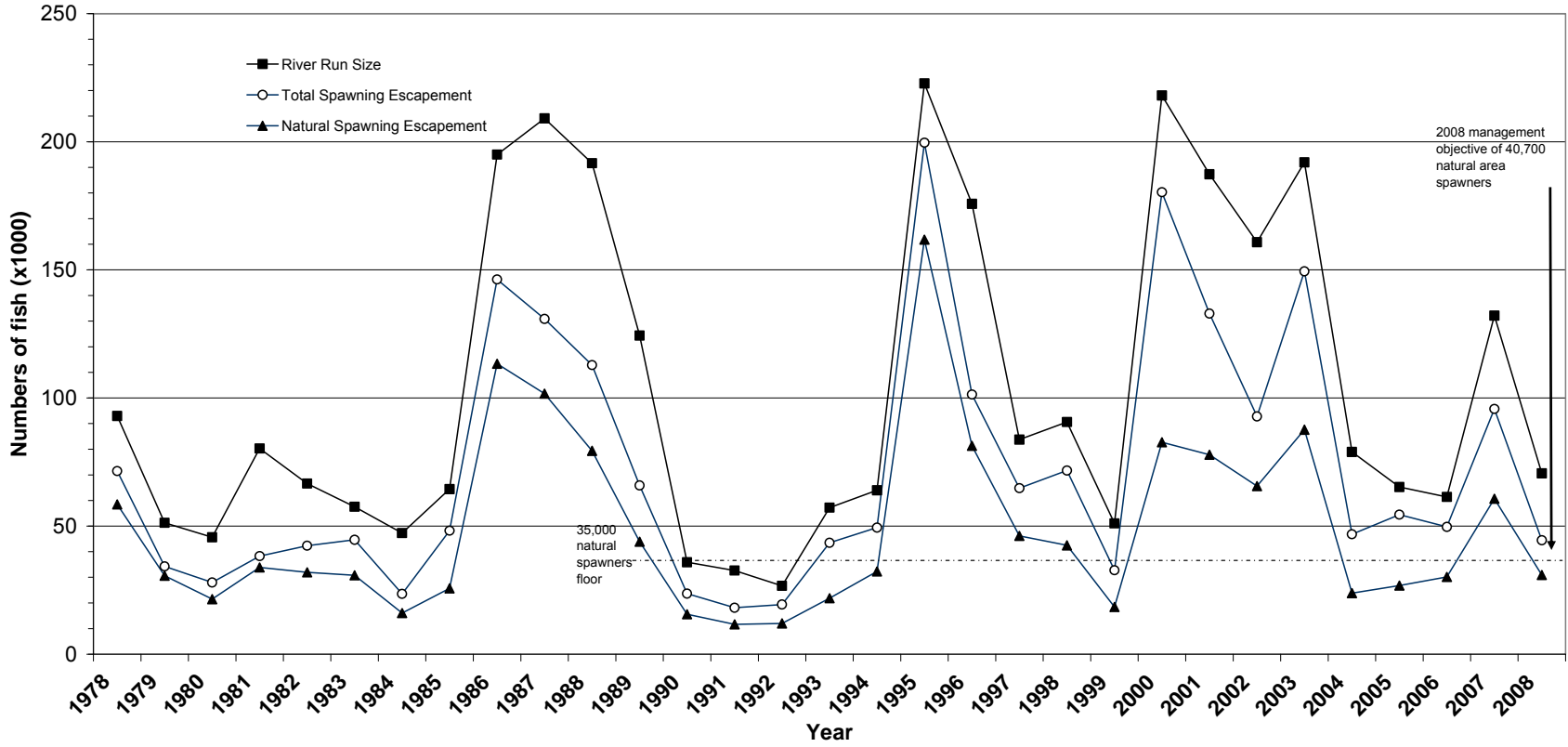


Figure II-2. Klamath River adult fall Chinook returns and spawning escapements, 1978-2008.

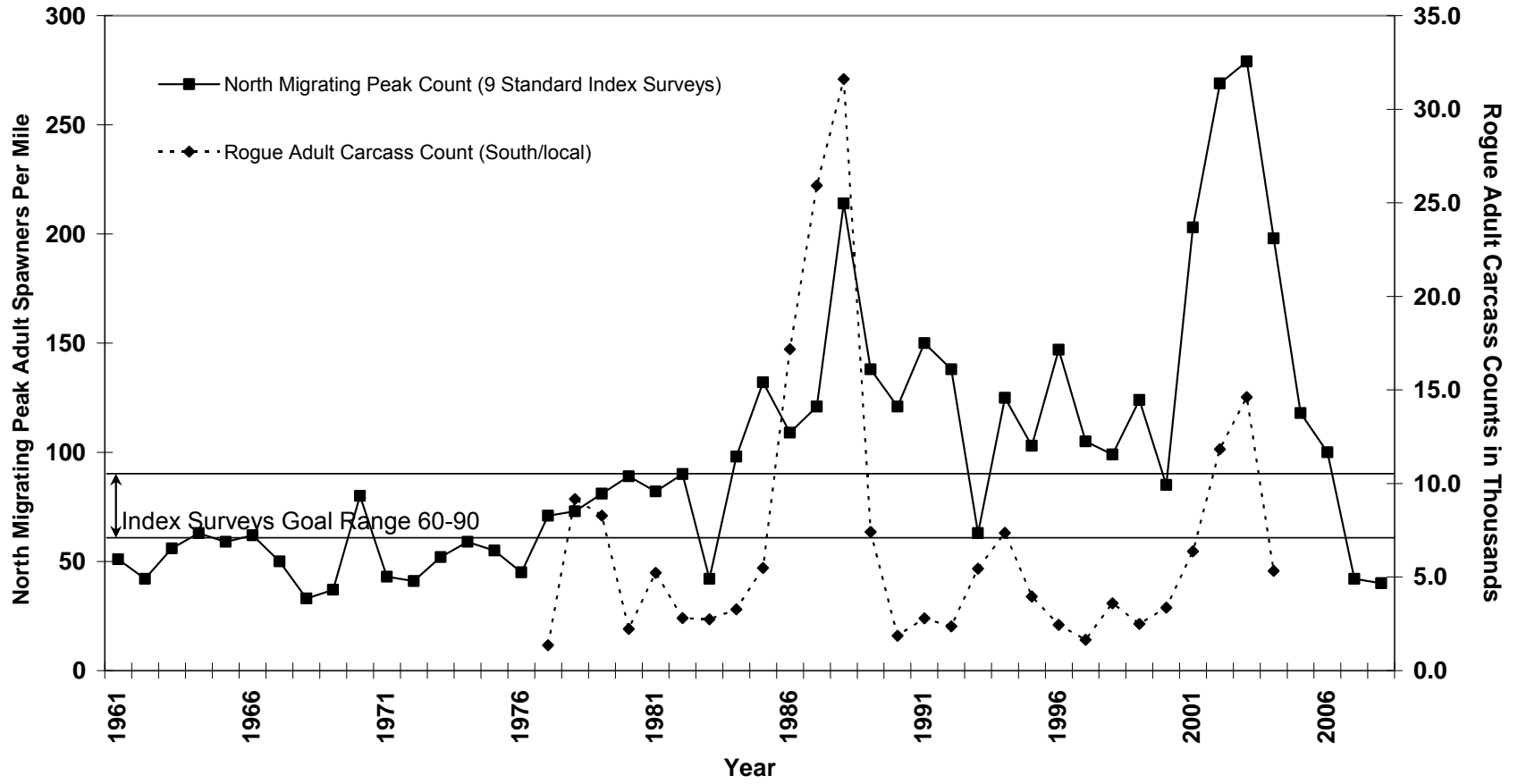


Figure II-3. Spawner indices for naturally produced Oregon coastal fall Chinook, 1961-2008.

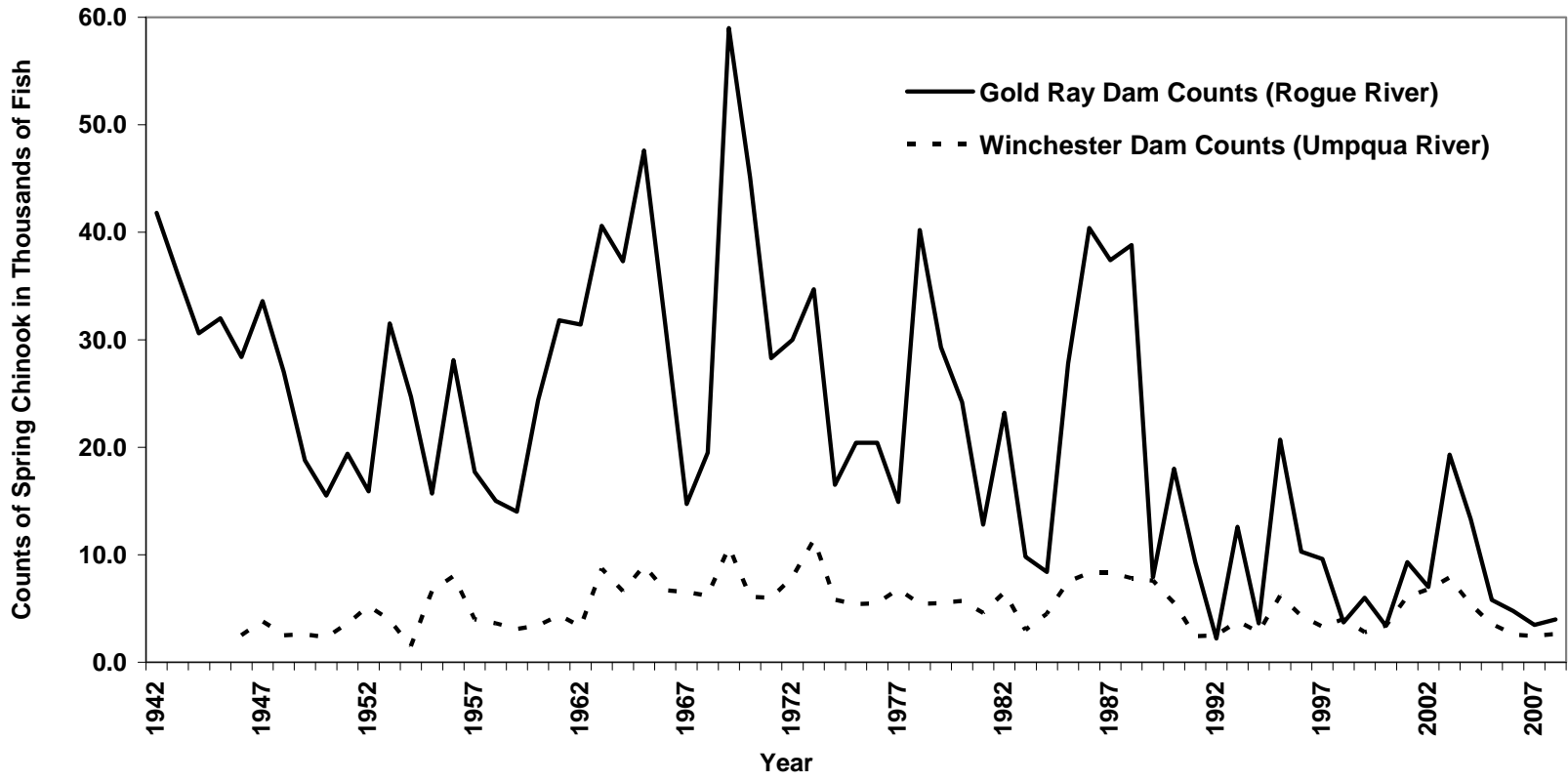


Figure II-4. Escapement indices for naturally produced Oregon coastal south/local migrating spring Chinook, 1942-2008.

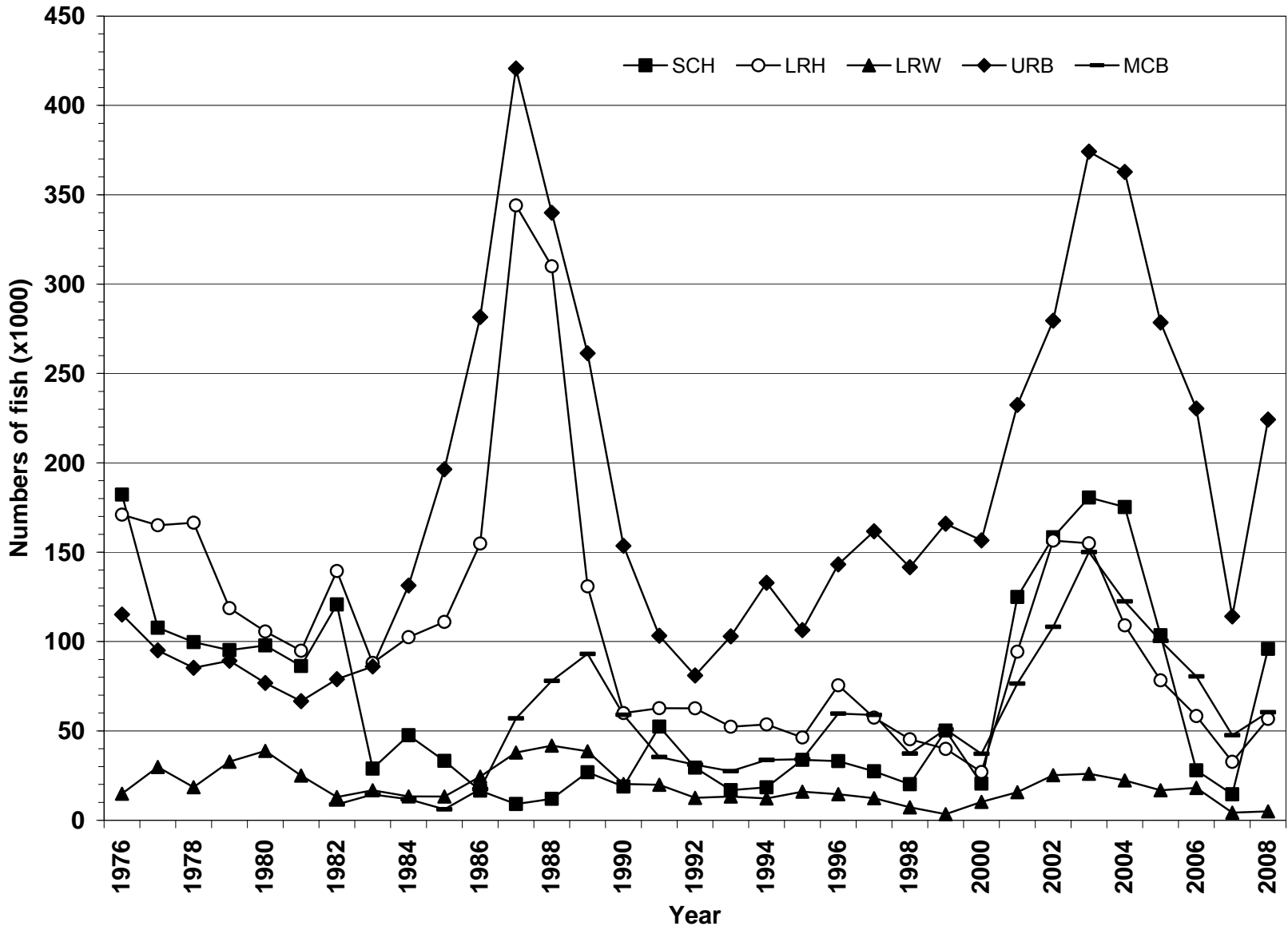


Figure II-5. Columbia River mouth adult returns of the five major fall Chinook stock groups, 1976-2008.

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