

## 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 are 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 2009 fisheries: (1) for SRFC, 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 2009, nearly all Chinook-directed fisheries occurring south of Cape Falcon were closed. Under the 2009 regulations, the projected escapement to the Sacramento River was 122,050 fall Chinook adults.

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 2009, with most times and areas closed to salmon retention. In 2008 and 2009 an upper Sacramento River recreational fishery targeting Sacramento River late-fall Chinook was conducted. The 2008 fishery occurred from November 1, 2008 through December 31, 2008 and an estimated 52 SRFC were harvested (an additional 85 SRFC were estimated to be harvested in the Feather River in June 2008, resulting in a total SRFC inriver harvest of 137 adults in 2008). In 2009, the upper Sacramento River late-fall run fishery was the only Central Valley fishery open to Chinook retention and, in an attempt to decrease harvest of SRFC, the fishery was not opened until November 16, 2009. Preliminary estimates indicate that zero SRFC were harvested in the 2009 late-fall fishery. 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 coded-wire-tags (CWTs) in the sport fishery. In response to the low escapements in the Stanislaus, Tuolumne, 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 2009, a total of 39,530 natural and hatchery SRFC adults were estimated to have returned to the Sacramento River basin for spawning (Table II-1, Figure II-1). The 2009 adult escapement estimate is the lowest on record and continues the declining trend in SRFC escapement despite the 2008 and 2009 closures of nearly all ocean Chinook fisheries south of Cape Falcon and Central Valley Chinook fisheries

targeting SRFC. SRFC have failed to meet the lower bound of the FMP conservation objective of 122,000 to 180,000 hatchery and natural adults for the third consecutive year, thereby triggering an Overfishing Concern under the terms of the FMP. Fall Chinook returns to Sacramento River hatcheries totaled 17,435 adults. Adult hatchery return goals were met at Feather River and Nimbus hatcheries, but not at Coleman National Fish Hatchery; 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. In 2009, 22,095 SRFC adults spawned in natural areas. Table II-1 and Figure II-1 display historical natural and hatchery fall spawner escapement estimates. For a more detailed breakdown of the historical escapement see Appendix B, Tables B-1 and B-2.

### **Sacramento River Winter and Spring Chinook**

Spawner escapement of endangered winter Chinook salmon in 2009 was estimated to be 4,483 adults and 54 jacks. This estimate is derived from a carcass survey conducted on the upper Sacramento River. Spawner escapement estimates derived from Red Bluff Diversion Dam counts have been made since 1967, and from 1987 to 2008 the estimates were derived by expanding counts made during the period of dam operation (which overlaps with approximately 15 percent of the winter run migration period). In 2009, the period of dam operation was delayed by one month which did not allow for a winter run escapement estimate to be made based on Red Bluff Diversion Dam passage (the gates at Red Bluff Diversion Dam were down beginning on June 15, 2009, whereas the gates are down typically on May 15). However, even during years with typical Red Bluff Diversion Dam operation timing, the estimates from the carcass survey are considered to better represent winter run spawner escapement owing to the small proportion of the winter run migration sampled during the Red Bluff Diversion Dam operation period.

Escapement of spring Chinook to the Sacramento River system in 2009 totaled 4,506 fish (jacks and adults), most of which (an estimated 3,517 fish) returned to the upper Sacramento River tributaries; the remaining 989 fish returned to the Feather River Hatchery. No estimate of spring Chinook escapement to the Sacramento River could be made in 2009 due to the changes in Red Bluff Diversion Dam operation described above for winter Chinook. 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. From 2005 through 2009, 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 2009 totaled 2,082 jacks and adults in natural areas and 1,802 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 2009, concern over the abundance of SRFC led to very limited ocean fisheries affecting northern California Chinook salmon stocks. KRFC were managed in accordance with 2009 Council guidance calling for a maximum adult natural spawner reduction rate of 67 percent, with a minimum spawner escapement of 40,700 adults in natural areas. The 2008 and 2009 minimum spawner escapement was raised from 35,000 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 130,200 fall Chinook adults resulting in a spawner escapement of 40,700 fish in natural areas, taking into account projected river fishery impacts of 65,000 adults and returns to basin hatcheries; (2) 50 percent (30,900) of the allowable adult harvest for tribal subsistence and commercial fisheries; (3) 99.6 percent (30,800) of the non-tribal harvest to the Klamath River recreational fishery; and (4) 100 percent (approximately 100 fish) of the ocean harvest to the KMZ recreational fishery. The age-4 ocean harvest rate resulting from the above configuration was expected to be less than one tenth of one percent.

### *Inside Harvest*

Yurok and Hoopa tribes shared a federally reserved right of 50 percent (30,900) of the available harvest surplus of adult Klamath fall Chinook. The State of California managed the river recreational fishery under a 30,800 adult fall Chinook quota. Tribal adult fall Chinook landings totaled 28,387, which was 92 percent of the quota (Appendix B, Table B-5). The estimated recreational fishery harvest was 5,575 adult fish, which was 18 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 2009 preseason forecast of the KRFC age-4 ocean harvest rate was less than one tenth of one percent (the ESA consultation standard for California Coastal Chinook was no more than 16.0 percent). The postseason evaluation of the 2009 KRFC age-4 ocean harvest rate was not available in time for this report.

## **Klamath River Fall Chinook**

The 2009 preliminary postseason river run size estimate for KRFC was 100,747 adults compared to the preseason predicted ocean escapement (river run size) of 130,200 adults. The escapement to natural spawning areas was 44,589 adults, which was 1.1 times the preseason prediction of 40,700 adults. The estimated number of hatchery returns was 19,614 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 10,516 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 2009 to the Shasta River was 6,145 adults, while escapement to the Salmon and Scott Rivers was 2,204 and 2,167 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., SEAK and Oregon terminal area fisheries. NOC stocks are harvested to a much lesser degree, in Council area fisheries off Washington and Oregon. 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, Oregon and terminally. Minor catches occur in California fisheries and variable catches in SEAK troll 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. Because of the depressed status of SRFC, Council-area Chinook fisheries were closed south of Cape Falcon in 2008, and only a 10 day recreational season was permitted in the KMZ in 2009. Humbug Mountain to Cape Falcon Chinook fisheries have minor impacts 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 2009 regulations, the STT was uncertain that the aggregate conservation objective for this stock would 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 2009 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 and partial mark-selective restrictions 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 2009 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 Oregon coastal Chinook stocks, including fall Chinook PSC indicator stocks. Upon completion of this process, the escapement goals and assessments for these stocks will likely change.

The overall quota for the two terminal area commercial fisheries was 600 Chinook. The catch estimate for those fisheries was 433 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 2009 were preliminarily estimated at 61 adults per mile, within 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 have not been conducted since 2004 (Table II-4). Therefore, 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 declining since 2003, although the 2009 returns were an increase over the previous two years (Figures II-3 and II-4). The aggregate Oregon coast goal of 150,000 to 200,000 naturally spawning Chinook adults was probably met in 2009.

## 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 wild (SRW) fall Chinook 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 2009 were managed to access SCH and LRH stocks while meeting the NMFS ESA consultation standards for the ESA-listed SRW fall Chinook ESU and lower Columbia River Chinook ESU (both LCR natural tules and LRW). The standard for the SRW 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 38.0 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 8,600. In 2009, the NMFS ESA consultation standard for the threatened LCR tule Chinook 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 were managed through 2007 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, including at least 6,000 SRW fall Chinook, the allowable URB impact rate would be 38 percent. NMFS used the URB impact rate as a proxy in the SRW consultation standard.

In 2009, the fall fisheries were managed to achieve the NMFS ESA consultation standards for the threatened SRW and LCR tule Chinook.

Harvestable surplus was projected for all major fall stocks in 2009. 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 33,450 fall Chinook in mainstem fisheries and 8,000 fall Chinook in Select Area (terminal) fisheries. The preliminary catch estimates for the treaty Indian fisheries were 75,100 adult fall Chinook. The preliminary catch estimate for the recreational fisheries included 5,940 fall Chinook in the Buoy 10 fishery, and 12,800 fall Chinook in mainstem fisheries below Bonneville Dam, and 6,560 fall Chinook in the Hanford Reach fishery above McNary Dam (Appendix B, Table B-20).

### *Escapement and Management Performance*

All Columbia River fall stocks except LRW met their escapement objectives (Table II-5, Appendix B, Tables B-15 to B19). The LRW escapement objective was 5,700 adult spawners in the North Fork Lewis River; however, the preliminary escapement estimate was 5,400. Preliminary estimates of total return to the river were: 75,000 LRH; 7,800 LRW; 59,400 SCH; 194,800 URB; and 93,500 MCB. The total return to the river mouth of the five stocks was 430,500 fall Chinook (Figure II-5).

The 2009 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 28.5 percent. No specific escapement goal was established for the ESA-threatened SRW. 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 SRW 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 2008 was 2,786. The total adult fall Chinook count at Lower Granite Dam in 2009 was 15,167 down from 16,628 in 2008. A significant portion of recent years returns were from supplementation programs. An estimate of SRW fall Chinook spawning escapement in 2009 was not available for this report.

No postseason estimates of exploitation rate on Columbia River natural tulle or SRW 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). Fall stocks are impacted primarily in B.C and SEAK fisheries, while spring stocks are not significantly impacted in any ocean fisheries. Neither spring nor fall coastal stocks are impacted significantly by Council-area ocean fisheries.

### *Management Objectives*

Willapa Bay natural fall Chinook do not have a conservation objective defined in the Salmon FMP, although WDFW has a spawning escapement objective of 4,350 natural Chinook, which is based on peak density estimates and watershed area.

Spawning escapement goals for natural stocks managed within this complex north of Willapa Bay, 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. No agreements on annual spawning targets for Washington coastal Chinook other than those in the FMP were made in 2009.

Washington coastal Chinook stocks have base period Council-area ocean fishery AEQ exploitation rates of 5 percent or less which are below a management threshold for effective Council management of these stocks, and therefore qualify as exceptions to the Council's overfishing criteria.

### **Regulations to Achieve Objectives**

Preseason abundance forecasts for some Washington coastal Chinook stocks 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 for these stocks 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 2009. 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 2009 pre-season forecast of Chinook returning to Willapa Bay was 36,768 fish (1,951 natural and 34,817 hatchery). Because the forecast was below the WDFW conservation objective, inside fisheries were managed for an impact rate of no more than 30 percent (583 natural Chinook). Consequently, 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 2009 totaled 6,868 fish (618 natural) based on preliminary data.

Recreational fisheries in the marine waters of Willapa Bay were open from June 28 through July 31, 2009 concurrent with the Ocean Marine Area 2 (ocean rules applied). From August 1 through August 15, 2009, Willapa Bay was open to recreational fishing with no more than two adults allowed to be harvested daily. Barbed hooks were allowed when fishing for salmon and retention of chum salmon was allowed. Regulations changed for the period between August 16, 2009 through January 31, 2010 to allow harvest of no more than three adults daily, only two of which could be Chinook. Barbed hooks were allowed when fishing for salmon and retention of chum salmon was not allowed.

Recreational salmon fisheries in tributaries to Willapa Bay varied in duration but were generally open from August 1, 2008 through January 31, 2010 with two adult Chinook allowed daily. Single-point, barbless hooks were required in all areas. Recreational harvest estimates were not available for 2009.



## **Escapement and Management Performance**

During 2008, Chinook returning to hatcheries in the Willapa Bay watershed totaled 15,241 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 2009.

The WDFW escapement goal for naturally spawning Chinook in Willapa Bay was 4,350 adults. An estimate of the 2009 natural spawning escapement was not available (the 2008 natural escapement was 1,542 Chinook). An estimated 976 natural Chinook were harvested in commercial and recreational fisheries in 2009, above the preseason expectation of 583.

### *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 2009.

The non-Indian gillnet fishery in Humptulips commercial Area 2-C allowed retention of fall Chinook and marked coho. Live boxes were required and unmarked coho could not be retained. There was no non-Indian gillnet fishery scheduled in the Chehalis River in 2009. The recreational fishery in Marine Area 2-2 was open from September 16 through November 30, although Chinook retention was not allowed. The recreational fishery in the Chehalis River was closed to Chinook retention. In the recreational Humptulips River fishery from the mouth to Hwy 101 Bridge, retention of Chinook was allowed from September 16 through January 31. Recreational harvest estimates were not available.

The Quinault Indian Nation fall gillnet fishery harvested a total of 2,485 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, and 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 1,328 fall Chinook, which was just below the preseason expected catch level. The Chehalis River treaty Indian gillnet fishery caught 1,157 fall Chinook, which was half of 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 2009 terminal run forecast for spring Chinook was 1,018 adult fish; an escapement estimate was not available for the 2009 return. The 2008 final escapement estimate was 995.

Grays Harbor fall Chinook were managed for a natural spawning escapement goal of 14,600 adults. The 2009 Grays Harbor fall Chinook forecast was 19,325 wild and 2,938 hatchery adults; the total spawning ground escapement estimate for 2008 was 15,331, which included some hatchery origin fish. The established hatchery escapement goals for Grays Harbor are 400 for the Chehalis River, which was not

achieved in 2008 and 369 for the Humptulips River, which was achieved in 2008. Natural and hatchery escapement estimates for 2009 were not available.

### *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 40 spring/summer Chinook were harvested in 2009.

The 2009 harvest of Quinault River fall Chinook was mostly hatchery origin fish taken in September and October. The treaty Indian net catch totaled 5,455 fall Chinook.

#### **Escapement and Management Performance**

Quinault fall Chinook were managed for hatchery production. The 2009 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 with a number of Chinook also returning to the Federal hatchery, given strong flows in Cook Creek.

### *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. Fishing remained closed during the spring/summer period through to the last week of August. The non-Indian in-river recreational fishery was closed to retention of Chinook.

Fall Chinook were harvested from August 29 through October 29 by the treaty Indian gillnet fall fishery. The fishery followed a plan set by a preseason management agreement between the Quinault Indian Nation and WDFW to target hatchery and natural coho, but also allowed harvest of natural and indicator Chinook. The treaty Indian gillnet fishery harvested 1,522 fall Chinook in the commercial fishery. Recreational fisheries targeted coho and Chinook during standard schedules in the Queets and Clearwater Rivers. The on-reservation Salmon River recreational salmon harvest was limited to retention of coho. Only mark-selective Chinook retention was allowed within Olympic National Park waters. Catch estimates for recreational fisheries were not available.

#### **Escapement and Management Performance**

The preliminary 2009 spawning escapement estimate for Queets River spring/summer Chinook was 495 adults, about 70 percent of the minimum escapement goal of 700.

The fall Chinook spawner survey escapement estimate was not completed; however, total fall Chinook escapement in 2009 is expected to be above the minimum escapement goal of 2,500. High flow conditions during Chinook spawning may adversely affect the quality of independent spawner survey

escapement estimates. 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 2009 Hoh River spring/summer Chinook terminal abundance forecast was 1,061 fish, allowing for a terminal harvest rate of 15 percent. The treaty gillnet fishery occurred between the weeks of May 4 and the week of July 6, and was open two days per week during the first six weeks and one day per week for the remaining four weeks. Tribal regulation in 2009 required a minimum of 8 inch stretch mesh during the first four weeks in order to minimize incidental take of steelhead kelts. The treaty Indian gillnet fishery harvested 141 Chinook, including an estimated five taken during separately scheduled ceremonial and subsistence fishing. Results of mark sampling and scales indicated that 108 of these were of hatchery origin (33 natural). A mark-selective non-Indian recreational fishery operated downstream of Willoughby Creek from May 16 through August 31, Wednesdays through Sundays, with a bag limit of one marked adult per day. 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 3,276 adults, allowing for a terminal harvest rate of 35.3 percent. The spawning escapement was expected to be 2,120 adults.

The tribal fishery targeted 23.96 percent of the terminal run. The treaty Indian gillnet fishery was scheduled for one day per week during the first week of September (Week 36), two days per week in Week 37, Week 39 through week 41 and Week 46 to Week 3 (2010), and three days per week in Week 38 and Weeks 42 to Week 45. The tribal fishery caught approximately 534 Chinook. Results of mark sampling indicated that 523 of these were of natural origin; CWT data were 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 preliminary estimate of Chinook taken in the sport fishery was not available.

#### **Escapement and Management Performance**

Tribal catch and expected harvest rates indicate the spring/summer Chinook terminal run size was lower than preseason expectations. The preliminary 2009 spawning escapement for Hoh River spring/summer Chinook was estimated at 880 adults, approximately 20 fish lower than the 900 fish escapement floor established for this stock.

Tribal catch and expected harvest rates indicated the fall Chinook terminal run size was slightly below the level anticipated preseason. A preliminary 2009 spawning escapement for Hoh River fall Chinook was estimated at 1,494, which was 76 percent of the forecast escapement of 1,966. The escapement goal was 1,200, and terminal fisheries targeted a harvest rate of approximately 40 percent.

## *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 management of these stocks is currently under review by the WDFW and Quileute Tribal co-managers.

The recreational and tribal fisheries for spring and summer Chinook were established by a preseason management agreement between WDFW and the Quileute Tribe. The total tribal catch for 2009 was 380 spring and 126 summer Chinook and included ceremonial and subsistence use. Estimates of 2009 recreational spring and summer Chinook harvest were not available.

The total 2009 Quileute Tribal harvest of fall Chinook was 2,434, and included ceremonial and subsistence use. An estimate of the 2009 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 722, 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 895 was under the escapement goal.

Terminal area fisheries on fall Chinook were managed for a target 40 percent harvest rate, with a minimum escapement level of 3,000 adults. The preliminary escapement estimate of 3,083 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]).

In 2009 Puget Sound stocks were managed pursuant to the provisions of a WDFW/Tribal management plan approved under a 4(d) rule promulgated by NMFS. This plan contains exploitation rate ceilings for ESA-listed Puget Sound stocks that were compared to predicted exploitation rates to assess compliance with ESA consultation standards (Table II-5).

### **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. Puget Sound stocks have base period Council-area ocean fishery AEQ exploitation rates of 5 percent or less which are below a management threshold for effective Council management of these stocks, and therefore 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 2009 was 77,052 Chinook, compared to 105,163 Chinook caught in 2008. The 2009 non-Indian net catch was 2,749 Chinook, compared to 6,103 Chinook caught in 2008. The 2009 treaty Indian net and troll harvest was 74,303 Chinook, compared to 103,567 Chinook caught in 2008.

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

#### *Escapement and Management Performance*

Puget Sound Chinook management goals for fishery planning processes in 2009 were expressed in terms of constraints on total fishery rebuilding exploitation rates (RER) or on exploitation rates on fisheries south of the Canadian border for those stocks without RERs. 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 but one Puget Sound spring Chinook hatchery escapement goals were met (93 percent at Kendall Creek). 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 2009. Preliminary data suggest no Puget Sound spring Chinook natural stocks met their escapement goals. Preliminary information on 2009 natural spawning escapements for summer/fall Chinook stocks indicate

escapement goals were met in some areas, but not in many others. Escapement estimates for 2009 were not available 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, SRW 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, Hoh spring/summer, Queets spring/summer, and Quillayute summer Chinook.

A summary of 2009 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 escapement in numbers of fish.

Year	Upper River <sup>a/</sup>			Lower River			Total		Grand Total
	Hatchery	Natural <sup>b/</sup>	Subtotal	Hatchery	Natural <sup>b/</sup>	Subtotal	Hatchery	Natural <sup>b/</sup>	
1970	3,010	61,160	64,170	10,266	82,230	92,496	13,275	143,390	156,666
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	12,359	72,299	84,658	18,766	153,632	172,398
1980	10,271	45,504	55,775	14,725	71,608	86,333	24,996	117,113	142,108
1981	5,883	51,831	57,714	25,115	92,129	117,245	30,998	143,960	174,958
1982	17,117	39,694	56,811	15,229	92,600	107,829	32,347	132,293	164,640
1983	6,112	42,570	48,682	12,735	48,831	61,566	18,847	91,401	110,248
1984	19,594	51,772	71,366	19,873	67,733	87,607	39,467	119,505	158,972
1985	15,869	103,698	119,566	13,987	105,753	119,740	29,856	209,450	239,306
1986	11,283	113,875	125,158	12,511	102,434	114,945	23,793	216,310	240,103
1987	9,981	76,861	86,842	10,291	97,930	108,222	20,273	174,791	195,063
1988	12,594	128,725	141,319	16,921	69,228	86,149	29,515	197,953	227,468
1989	10,212	67,296	77,508	15,668	59,387	75,055	25,880	126,683	152,563
1990	13,464	50,225	63,689	8,428	32,973	41,401	21,892	83,198	105,090
1991	10,031	34,826	44,857	17,435	56,144	73,579	27,466	90,970	118,436
1992	6,257	30,529	36,786	15,831	27,723	43,554	22,088	58,252	80,340
1993	7,056	55,144	62,200	19,778	55,412	75,190	26,834	110,556	137,390
1994	11,585	66,383	77,968	20,972	66,647	87,619	32,556	133,030	165,586
1995	24,810	112,235	137,045	17,017	141,252	158,269	41,827	253,487	295,314
1996	18,848	131,268	150,116	15,712	135,803	151,516	34,561	267,071	301,632
1997	44,590	167,353	211,943	20,651	112,246	132,897	65,241	279,599	344,840
1998	42,400	60,713	103,113	35,364	107,431	142,795	77,763	168,144	245,908
1999	23,194	256,629	279,823	22,917	97,089	120,006	46,112	353,718	399,830
2000	20,793	152,923	173,716	27,530	216,291	243,821	48,323	369,214	417,537
2001	23,710	179,198	202,908	35,650	358,217	393,867	59,360	537,415	596,775
2002	61,895	474,812 <sup>c/</sup>	536,707	25,278	207,883	233,161	87,173	682,695	769,868
2003	82,882	164,802	247,684	26,696	248,636	275,332	109,578	413,438	523,016
2004	52,145	70,548	122,693	31,262	132,930	164,192	83,407	203,478	286,885
2005	139,979	96,716	236,695	45,320	113,990	159,310	185,299	210,706	396,005
2006	56,819	85,946	142,765	23,087	103,338	126,425	79,906	189,284	269,190
2007	11,543	32,645	44,188	9,833	33,919	43,752	21,376	66,564	87,940
2008	10,181	35,366	45,547	8,331	10,578	18,909	18,512	45,944	64,456
2009 <sup>d/</sup>	5,433	11,054	16,487	12,002	11,041	23,043	17,435	22,095	39,530
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 <sup>a/</sup>
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 <sup>b/</sup>	13,552	30,850	44,402	48%	1,919	2%	22,259	24%	24,178	26%	92,758
2009 <sup>b/</sup>	19,614	44,589	64,203	64%	5,575	6%	28,387	28%	2,583	3%	100,748
Goal		≥35,000 <sup>c/</sup>									

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 and 2009, 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 <sup>b/</sup>	
	Public Hatchery <sup>a/</sup>		Private	Spring	Fall
	Spring	Fall	All		
<b>THOUSANDS OF CHINOOK</b>					
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	42.7
1979	7.0	2.0	0.4	16.4	30.8
1980	7.9	1.8	3.4	11.9	22.1
1981	2.5	1.8	5.1	11.2	29.6
1982	4.1	2.3	12.1	11.6	24.7
1983	3.9	4.0	6.1	4.9	21.1
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	54.3
1996	26.7	3.6	-	25.6	51.0
1997	29.1	2.0	-	14.7	37.0
1998	11.0	2.6	-	8.2	31.5
1999	18.1	3.3	-	8.2	29.3
2000	24.5	3.1	-	11.4	37.4
2001	26.8	5.7	-	18.6	53.3
2002	24.7	2.9	-	30.9	58.8
2003	17.2	3.9	-	33.1	72.3
2004	20.1	2.9	-	19.4	78.4
2005	11.7	2.6	-	10.2	51.6
2006	7.5	2.7	-	4.9	47.7
2007	6.3	2.1	-	NA	NA
2008	6.1	2.7	-	NA	NA
2009 <sup>c/</sup>	7.2	4.2	-	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.<sup>a/</sup>

Year	Fall Chinook Spawner Indices		South/local Migrating Spring Chinook Spawner Indices	
	North Migrating Peak Count Adults Per Mile	Rogue River	Rogue River	
		(South/local migrating) 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 <sup>b/</sup>	13	5
2005	118	d/	6	4
2006	100	d/	5	3
2007	42	d/	3	2
2008 <sup>c/</sup>	40	d/	4	3
2009 <sup>c/</sup>	61	d/	5	5
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 2009 conservation objectives (preliminary data). (Page 1 of 2)

System and Stock	2009 Conservation Objective(s)	Achievement
<b>Sacramento River Chinook</b>		
Fall	122,000-180,000 natural and hatchery adults.	<b>Preliminary estimate of 39,530 natural and hatchery adult fall Chinook, 32% of the lower end of the escapement goal range.</b>
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.
<b>California North Coast Chinook</b>		
Klamath River Fall	Minimum escapement of 40,700 natural adult spawners.	44,589 natural area spawners, 127% of FMP conservation objective; 110% 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 <0.1%; no postseason estimate is currently available.
<b>Oregon Coast Chinook</b>		
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).	61 natural adult spawners per mile, above the lower bound of the aggregate stock index range.
<b>Columbia River Basin Fall Chinook</b>		
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 2009).	<b>Preliminary estimate of 5,400 is 95% of the conservation objective.</b>
Lower Columbia natural tules (Component of threatened lower Columbia River Chinook ESU)	Total (ocean plus inriver) AEQ exploitation rate on ESA-listed natural tules of no more than 38.0%.	Preseason projection of 38.0%. No postseason estimate is currently available.
LRH	14,100 adult hatchery spawners.	Preliminary projection of 28,056 adult hatchery spawners, 199% of goal.
SCH	7,000 adult hatchery spawners.	13,700 adult hatchery spawners, 196% of target.
MCB	No FMP objective; target of 7,750 hatchery adults.	21,470 adult hatchery spawners, 277% of target.
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 60,000 in 2009.	104,684 natural and hatchery adults over McNary Dam, 232% of MSY target in FMP.

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

System and Stock	2009 Conservation Objective(s)	Achievement																																																																																																									
<b>Columbia River Basin Fall Chinook (continued)</b>																																																																																																											
Snake River Fall Chinook (Threatened; component of URB)	SRFI $\leq 0.700$ 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 0.473. No postseason estimate is currently available.																																																																																																									
<b>Washington Coastal Chinook</b>																																																																																																											
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, 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.	<b>Based on preliminary estimates, objectives were not met for Hoh and Queets spring/summer natural, and Quillayute summer natural. An estimate is not available for Grays Harbor spring Chinook.</b>																																																																																																									
<b>Puget Sound Chinook</b> (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:																																																																																																									
	<table border="1"> <thead> <tr> <th></th> <th>Exploitation Rate</th> <th>Spawner Esc.</th> <th>ISBM</th> <th>Exploitation Rate</th> <th>Spawner Esc.</th> <th>ISBM</th> </tr> </thead> <tbody> <tr> <td>· Nooksack spring</td> <td>· 6.6% So U.S.</td> <td>-</td> <td><math>\leq 60\%</math></td> <td>6.6%</td> <td></td> <td>11%</td> </tr> <tr> <td>· Skagit summer/fall</td> <td>· 50% So U.S.</td> <td>-</td> <td><math>\leq 60\%</math></td> <td>48.7%</td> <td></td> <td>29%</td> </tr> <tr> <td>· Skagit spring</td> <td>· 38% Total</td> <td>-</td> <td><math>\leq 60\%</math></td> <td>33.5%</td> <td></td> <td>14%</td> </tr> <tr> <td>· Stillaguamish summer/fall</td> <td>· 25% So U.S.</td> <td>-</td> <td><math>\leq 60\%</math></td> <td>22.7%</td> <td></td> <td>45%</td> </tr> <tr> <td>· Snohomish summer/fall</td> <td>· 15% So U.S.</td> <td>-</td> <td><math>\leq 60\%</math></td> <td>13.6%</td> <td></td> <td>20%</td> </tr> <tr> <td>· Lake Wash. summer/fall</td> <td>· 15% pre-term SUS</td> <td>-</td> <td>-</td> <td>10.7%</td> <td></td> <td></td> </tr> <tr> <td>· White River spring</td> <td>· 20% pre-term SUS</td> <td>-</td> <td>-</td> <td>15.9%</td> <td></td> <td></td> </tr> <tr> <td>· Green River summer/fall</td> <td>· 15% pre-term SUS</td> <td>5,800</td> <td><math>\leq 60\%</math></td> <td>10.7%</td> <td>5,813</td> <td>56%</td> </tr> <tr> <td>· Puyallup summer/fall</td> <td>· 50% Total</td> <td></td> <td>-</td> <td>48.8%</td> <td></td> <td></td> </tr> <tr> <td>· Nisqually summer/fall</td> <td>· NA</td> <td>1,100</td> <td>-</td> <td>-</td> <td>1,792</td> <td></td> </tr> <tr> <td>· Skokomish summer/fall</td> <td>· 15% pre-term SUS</td> <td>1,200</td> <td>-</td> <td>11.9%</td> <td>1,217</td> <td></td> </tr> <tr> <td>· Mid-Hood Canal fall</td> <td>· 11.9% pre-term SUS.</td> <td>-</td> <td>-</td> <td>11.7%</td> <td></td> <td></td> </tr> <tr> <td>· Dungeness spring</td> <td>· 10% So US</td> <td>-</td> <td>-</td> <td>4.3%</td> <td></td> <td></td> </tr> <tr> <td>· Elwha summer/fall</td> <td>· 10% So US</td> <td>-</td> <td>-</td> <td>4.2%</td> <td></td> <td></td> </tr> </tbody> </table>		Exploitation Rate	Spawner Esc.	ISBM	Exploitation Rate	Spawner Esc.	ISBM	· Nooksack spring	· 6.6% So U.S.	-	$\leq 60\%$	6.6%		11%	· Skagit summer/fall	· 50% So U.S.	-	$\leq 60\%$	48.7%		29%	· Skagit spring	· 38% Total	-	$\leq 60\%$	33.5%		14%	· Stillaguamish summer/fall	· 25% So U.S.	-	$\leq 60\%$	22.7%		45%	· Snohomish summer/fall	· 15% So U.S.	-	$\leq 60\%$	13.6%		20%	· Lake Wash. summer/fall	· 15% pre-term SUS	-	-	10.7%			· White River spring	· 20% pre-term SUS	-	-	15.9%			· Green River summer/fall	· 15% pre-term SUS	5,800	$\leq 60\%$	10.7%	5,813	56%	· Puyallup summer/fall	· 50% Total		-	48.8%			· Nisqually summer/fall	· NA	1,100	-	-	1,792		· Skokomish summer/fall	· 15% pre-term SUS	1,200	-	11.9%	1,217		· Mid-Hood Canal fall	· 11.9% pre-term SUS.	-	-	11.7%			· Dungeness spring	· 10% So US	-	-	4.3%			· Elwha summer/fall	· 10% So US	-	-	4.2%			
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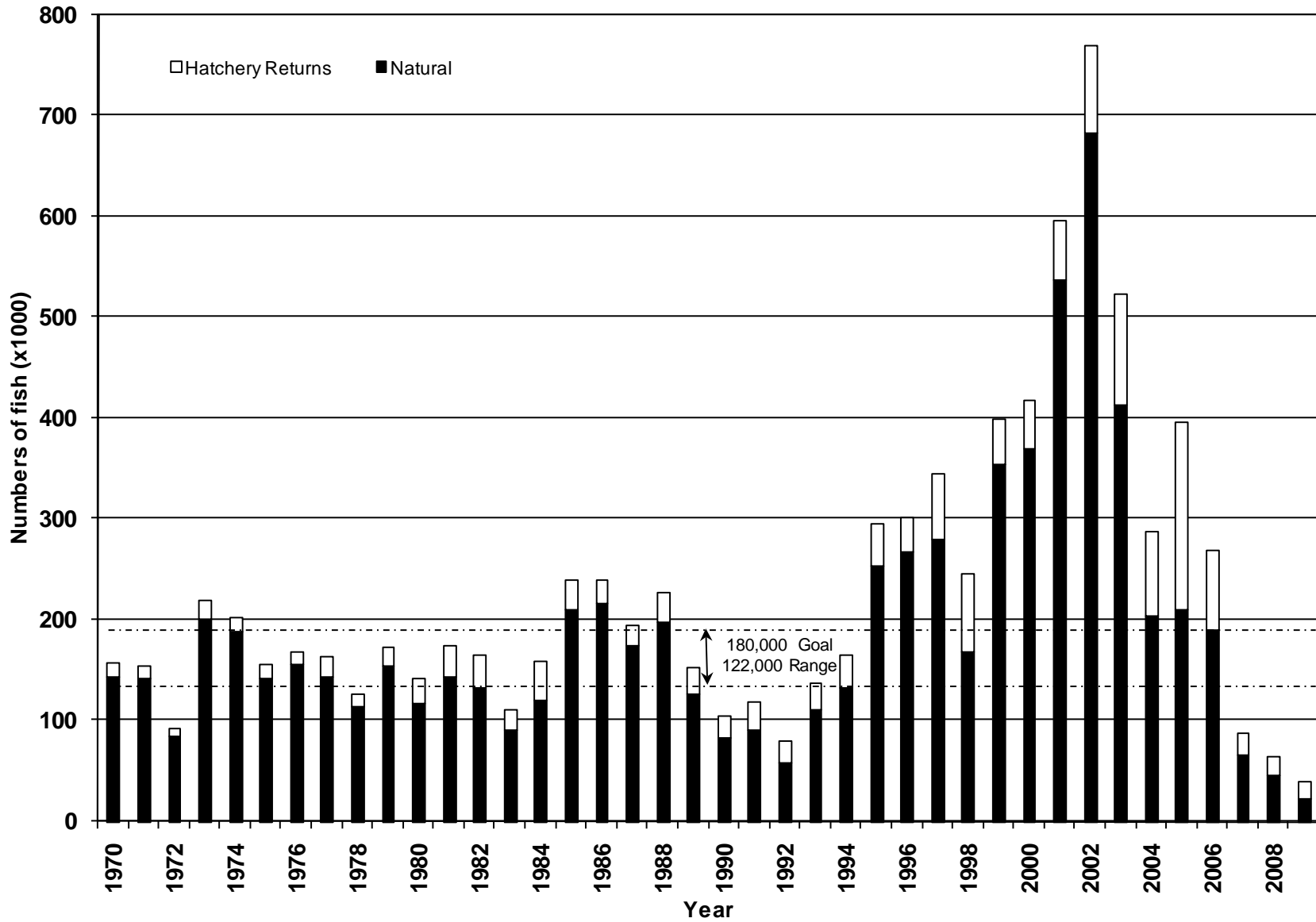


Figure II-1. Sacramento River adult fall Chinook spawning escapement, 1970-2009.

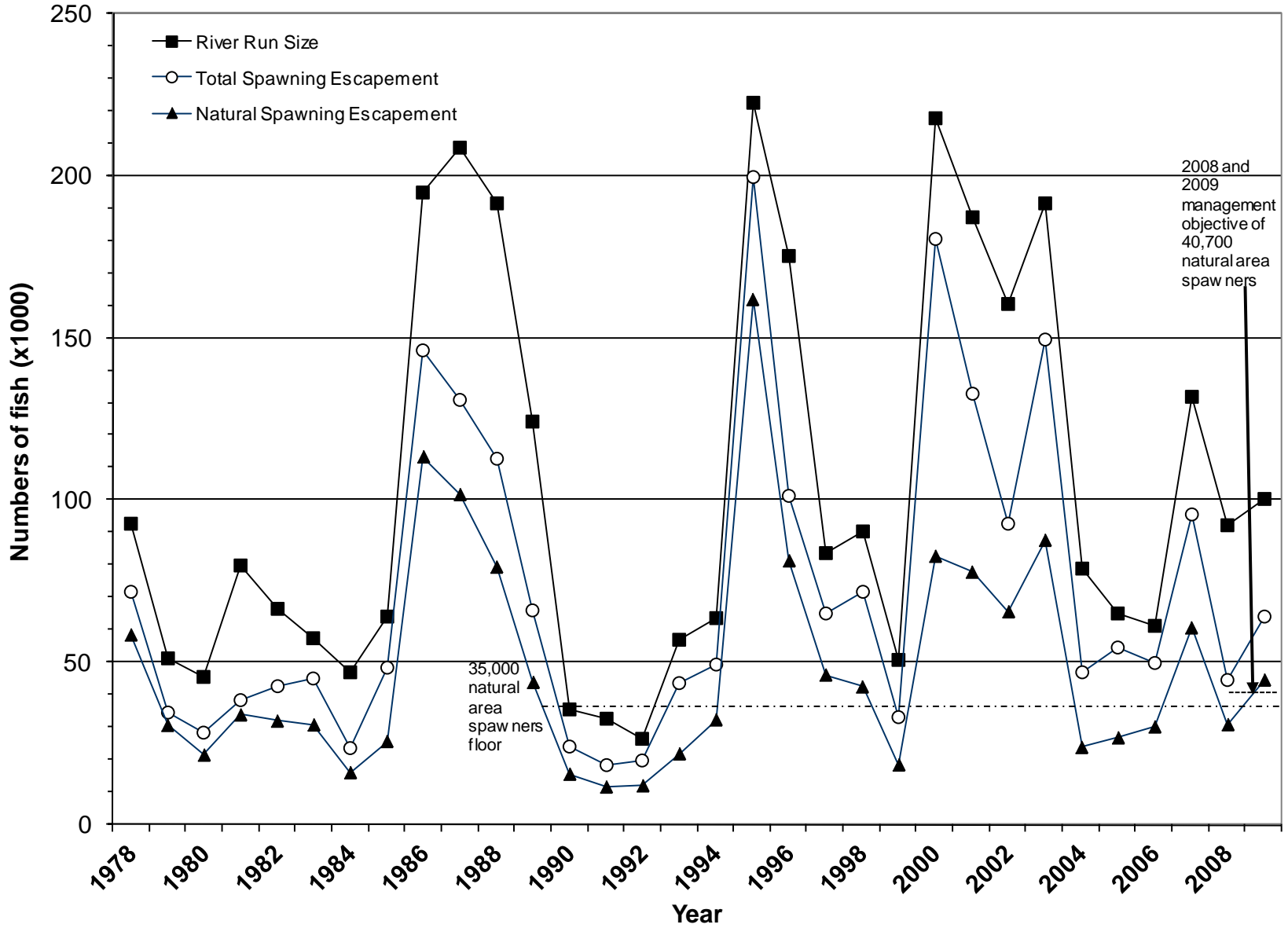


Figure II-2. Klamath River adult fall Chinook returns and spawning escapement, 1978-2009.

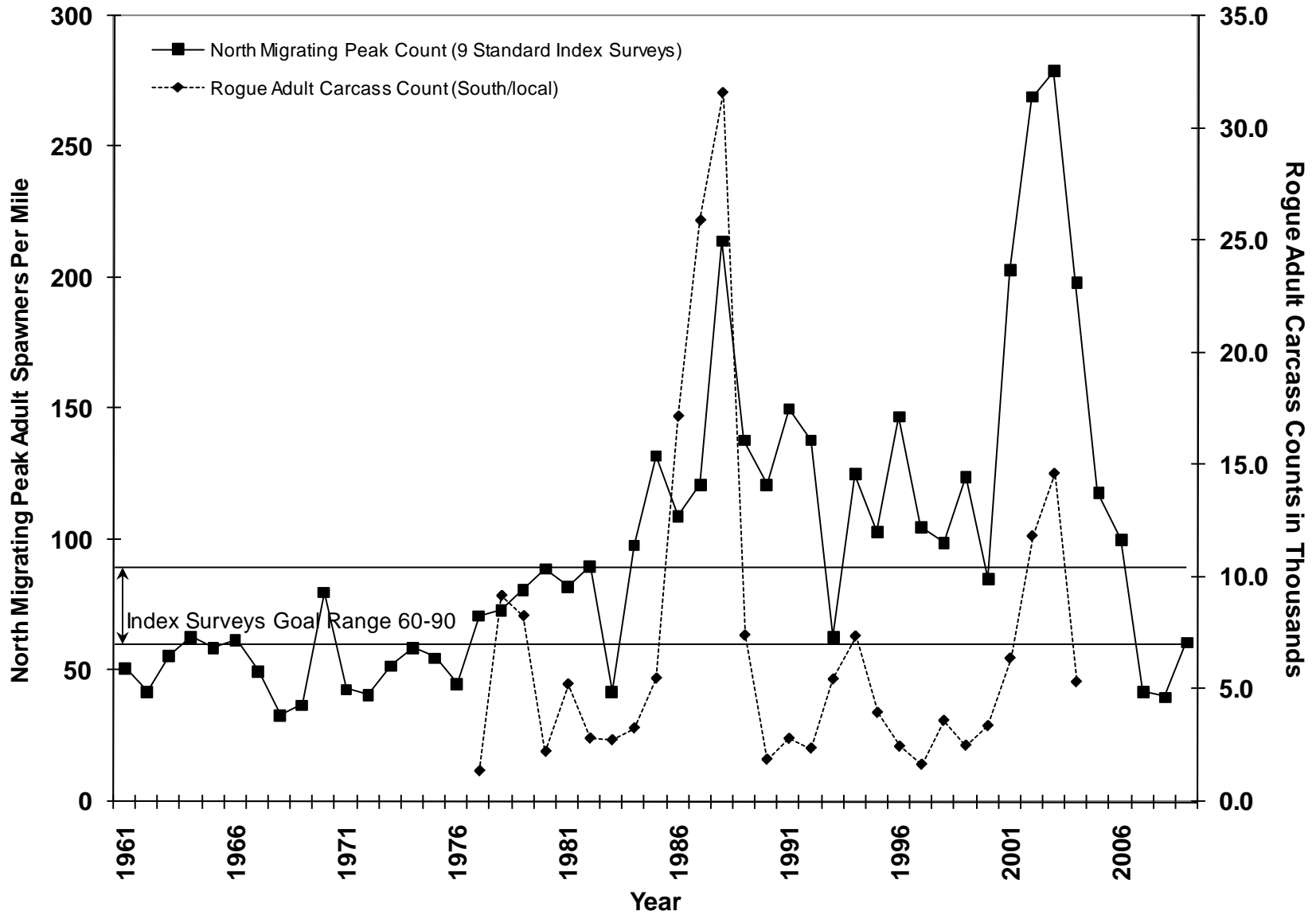


Figure II-3. Spawner indices for naturally produced Oregon coastal fall Chinook, 1961-2009.

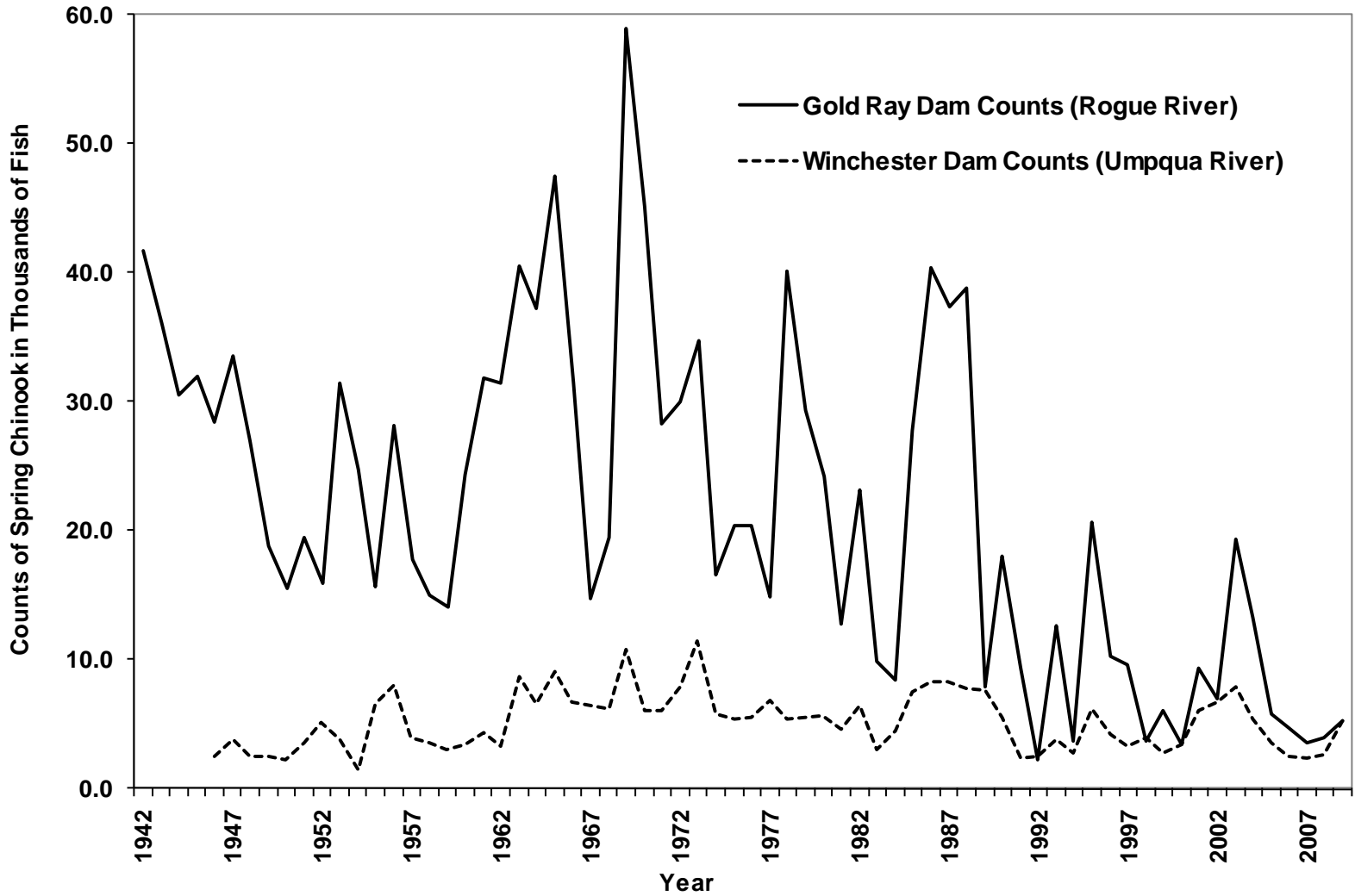


Figure II-4. Escapement indices for naturally produced Oregon coastal south/local migrating spring Chinook, 1942-2009.



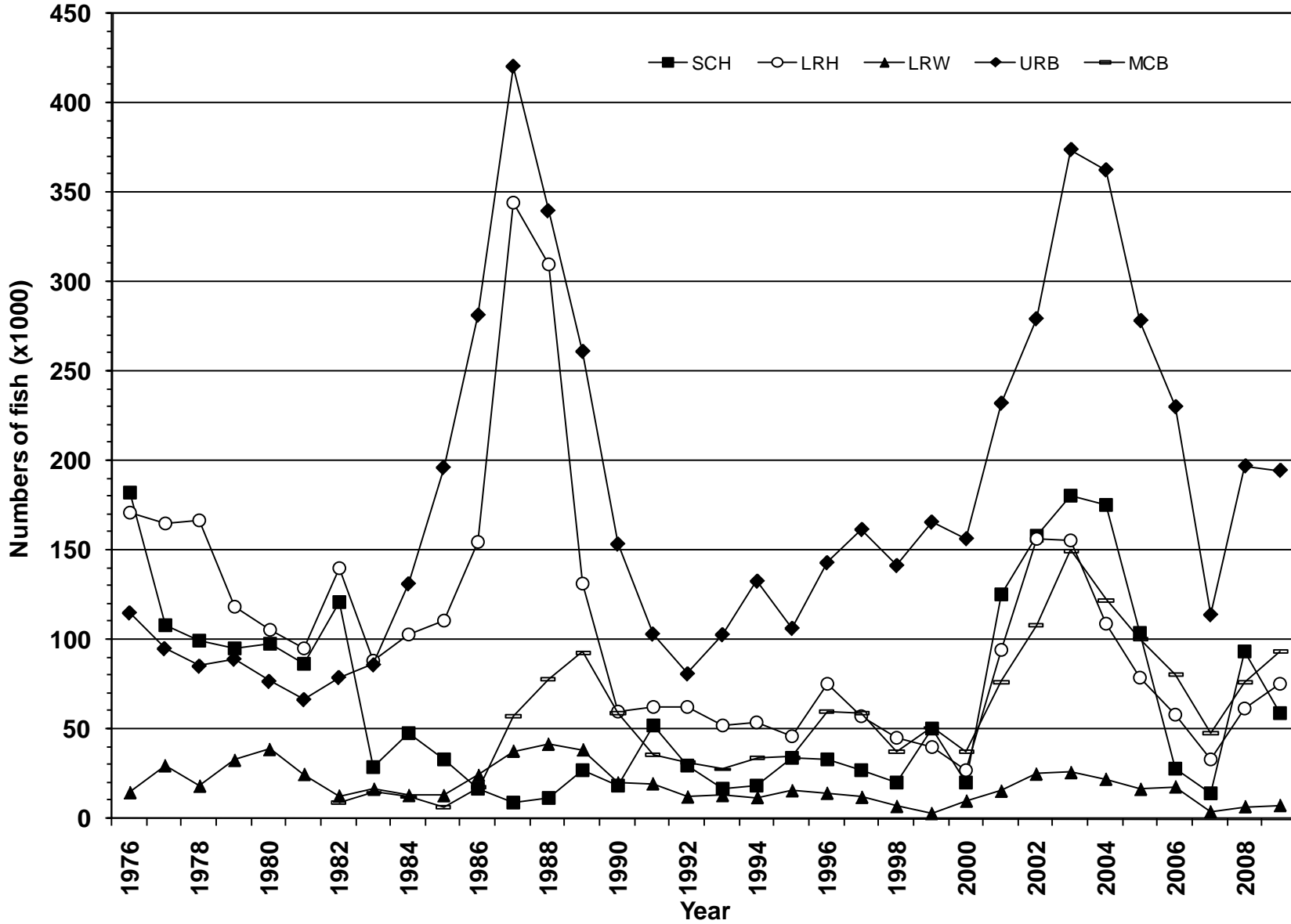


Figure II-5. Columbia River mouth adult returns of the five major fall Chinook stock groups, 1976-2009.

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