

CHAPTER II - CHINOOK SALMON ASSESSMENT

CHINOOK STOCKS SOUTH OF CAPE FALCON

SACRAMENTO RIVER FALL CHINOOK SALMON

Predictor Description

The Council's Salmon FMP sets the escapement goal for Sacramento River fall Chinook as a range from 122,000 to 180,000 adults. This stock comprises approximately 80-90 percent of the escapement of all Chinook stocks that return to Central Valley streams and hatcheries. The Central Valley Index (CVI), which provides an annual index of abundance for the combined Central Valley Chinook stocks, is the sum of ocean fishery Chinook harvests in the area south of Point Arena plus the Central Valley adult Chinook spawning escapement (Table II-1). The CVI harvest index is the ocean harvest landed south of Point Arena divided by the CVI, and has varied significantly since it was first calculated in 1970 (Table II-1). From 1970–1986 it tracked ocean harvest and ranged from 0.50–0.73. From 1987–1995 it held steady at 0.70–0.79, while ocean harvest ebbed to a low in 1992. From 1996–2006 it again tracked ocean harvest in a generally declining pattern, reaching a low of 0.26 in 2001. The CVI harvest index was 0.48 in 2007.

Prior to 1989, the STT based its projection of the CVI on recent CVI levels (with general consideration given for brood year natural escapements), hatchery releases, and the previous year jack returns. Between 1989 and 1991, several predictors of the CVI were evaluated, including weight and number of juveniles in hatchery releases and previous year jack returns. Since 1991, the STT has used a linear regression of the CVI on the previous year's Central Valley age-2 return to forecast the CVI (Figure II-1). The 2005 data point was excluded from the CVI predictor in 2008 because it has excessive leverage on the predictor and is not informative to prediction of the CVI at lower jack abundances (see Appendix D for details).

Predictor Performance

For the 1985–2007 period, the CVI preseason forecast ranged from 0.49 to 2.16 times its postseason value (Table II-2). The 2007 CVI preseason forecast of 499,900 fish was about 2.16 times greater than its postseason estimate of 232,000 fish (Table II-2).

2008 Stock Status

A total of 5,939 age-2 Chinook are estimated to have returned to the Central Valley in 2007, the lowest return on record. Sacramento River fall Chinook normally make up the majority of the Central Valley stock, but this year they constituted only 32% of the age-2 return used to forecast the CVI. The resulting 2008 CVI forecast is 157,100 adult Chinook (Figure II-1), and is the lowest CVI forecast on record.

Evaluation of 2007 Regulations on 2008 Stock Abundance

A repeat of 2007 regulations is expected to result in a CVI harvest index equal to last year (0.48). Applying the complement of this fraction (1-0.48) to the 2008 CVI forecast of 157,100 fish and multiplying that quantity by the typical proportion of Central Valley adult Chinook spawners that are Sacramento River fall run fish (0.84, five-year average), yields a 2008 adult escapement forecast of 68,400 Sacramento River fall Chinook, which is well below the lower end of the escapement goal range (Figure II-2).

KLAMATH RIVER FALL CHINOOK

Predictor Description

For Klamath River fall Chinook, linear regressions are used to relate September 1 ocean abundance estimates of age-3, age-4, and age-5 fish to that year's river run size estimates of age-2, age-3, and age-4 fish, respectively (Table II-3). Historical abundance estimates were derived from a cohort analysis of CWT information (brood years 1979-2003). The y-intercept of the regressions is constrained to zero, which gives the biologically reasonable expectation that a river run size of zero predicts an ocean abundance remainder of zero for the same cohort. The abundance of age-2 fish is not forecasted because no precursor to age-2 fish of that brood is available. Ocean fisheries harvest small numbers of age-2 Klamath River fall Chinook.

Predictor Performance

Since 1985, the preseason ocean abundance forecasts for age-3 fish have ranged from 0.33 to 2.72 times the postseason estimates; for age-4 fish from 0.47 to 2.60 times the postseason estimates; and for the adult stock as a whole from 0.34 to 2.03 times the postseason estimates (Table II-4). The September 1, 2006 age-3 forecast (515,400) was 0.99 times its postseason estimate (521,400). The age-4 forecast (26,100) was the lowest on record and was 0.80 times its postseason estimate (32,500); and the age-5 forecast (4,700) was 1.63 times its postseason estimate (2,900) (Table II-4).

Management of Klamath River fall Chinook harvest since 1986 has attempted to achieve specific harvest rates on fully-vulnerable age-4 and age-5 fish in ocean and river fisheries (Table II-5). The Council has used a combination of quotas and time/area restrictions in ocean fisheries in an attempt to meet the harvest rate objective set each year. Since 1992, fisheries have been managed to achieve 50/50 allocation between tribal and non-tribal fisheries. Tribal and recreational river fisheries have been managed on the basis of adult Chinook quotas.

The Council's FMP conservation objective for Klamath River fall Chinook (Amendment 9) permits a natural spawner reduction rate via fisheries of no more than 0.67, with a minimum escapement of 35,000 natural spawning adults. The plan allows for any ocean and river harvest allocation that meets the spawner reduction rate constraint, provided it also meets the minimum escapement goal. The regulations adopted in 2007 were expected to result in 35,000 natural spawning adults and an age-4 ocean harvest rate of 16.0 percent. Postseason estimates of these quantities were 59,700 natural spawning adults and, an age-4 ocean harvest rate of 21.0 percent (Table II-6).

2008 Stock Status

The forecast September 1, 2007 (preseason) ocean abundance of Klamath River fall Chinook salmon is 31,600 age-3 fish, the age-4 forecast is 157,200 and the age-5 forecast is 1,900 fish.

Late-season ocean fisheries in 2007 (September-November) were estimated to have harvested zero age-3, 3,700 age-4, and 800 age-5 Klamath River fall Chinook. This harvest will be deducted from the ocean fishery's allocation in determining the 2008 allowable ocean harvest.

Evaluation of 2007 Regulations on 2008 Stock Abundance

A repeat of 2007 fishery regulations, including a river recreational harvest allocation of 26 percent (of the nontribal adult harvest) and a tribal allocation of 50 percent (of the overall adult harvest), would be expected to result in 26,900 natural area adult spawners, which fails to meet the spawner floor objective. The forecasted age-4 ocean harvest rate of 16.8 percent also fails to meet the NMFS ESA consultation standard for California coastal Chinook. If the ocean fisheries (recreational and commercial) were closed

from January through August 2008 between Cape Falcon and Point Sur, and the Klamath River fisheries (tribal and recreational) were closed in 2008, the expected number of natural area adult spawners would be 74,300, with an expected age-4 ocean harvest rate of 2.4 percent (due to ocean harvest that already occurred in the September through November 2007 period).

OTHER CALIFORNIA COASTAL CHINOOK STOCKS

Other California coastal streams that support fall Chinook stocks, which contribute to ocean fisheries off Oregon and California, include the Smith, Little, Mad, Eel, and Mattole rivers, and Redwood Creek. Except for the Smith River, these stocks are included in the California coastal Chinook ESU, which is listed as threatened under the ESA. Current information is insufficient to forecast the ocean abundance of these stocks, however, the NMFS ESA consultation standard restricts the Klamath River fall Chinook age-4 ocean harvest rate to no more than 16.0 percent to limit impacts on these stocks. As indicated in the previous section, the postseason estimate of this rate for 2007 is 21.0 percent, with a preseason forecast of 16.0 percent. If the ocean fishery was closed from January through August 2008 between Cape Falcon and Point Sur, the expected age-4 ocean harvest rate for 2008 would be 2.4 percent (due to ocean harvest that already occurred in the September through November 2007 period).

OREGON COASTAL CHINOOK STOCKS

Oregon coastal Chinook stocks are categorized into two major subgroups based on ocean migration patterns. Although their ocean harvest distributions overlap somewhat, they have been labeled as either north or south/local migrating.

North Migrating Chinook

North migrating Chinook stocks include stocks north of and including the Elk River, with the exception of Umpqua River spring Chinook. Based on CWT analysis, the populations from ten major North Oregon Coast (NOC) river systems from the Nehalem through the Siuslaw Rivers are harvested primarily in ocean fisheries off British Columbia, Canada and Southeast Alaska, and to a much lesser degree in Council area and terminal area (state waters) fisheries off Washington and Oregon. CWT analysis indicates populations from five major mid-Oregon Coast (MOC) systems, from the Coos through the Elk Rivers, are harvested primarily in ocean fisheries off British Columbia, Canada, Washington, and Oregon with minor contributions to California fisheries.

Predictor Description and 2008 Stock Status

Quantitative abundance predictions are not made for these stocks for use in annual development of Council area fishery regulations. Qualitative expectations of abundance are based on parental year spawner escapements and hatchery indicator stock data used in the PSC management process.

Natural spawner escapement is assessed yearly from the Nehalem through Sixes rivers. Peak spawning counts of adults are obtained from standard index areas on these rivers and monitored to assess stock trends (*Review of 2007 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3). Natural fall Chinook stocks from both the NOC and MOC dominate production from this subgroup. Also present in lesser numbers are naturally-produced spring Chinook stocks from several rivers, and hatchery fall and/or spring Chinook released in the Trask, Nestucca, Salmon, Alsea, and Elk Rivers.

North Oregon Coast

Since 1986, the Salmon River Hatchery production has been CWT'd for use primarily as a PSC indicator stock for the NOC stock component. Because these fish are harvested in fisheries north of the Council management area, the STT has not reviewed the procedure by which this indicator stock is used in estimating annual stock status. The annual spawner counts have been decreasing since 2002 despite

excellent parental escapements indices in 2001 to 2004 (*Review of 2007 Ocean Salmon Fisheries*, Appendix B, Table B-11). If this trend continues, the 2008 NOC stock abundance is expected to be less than the 2007 abundance.

Mid-Oregon Coast

Since 1992, the Elk River Hatchery production has been CWT'd for use as a PSC indicator stock for the MOC stock component. Age specific ocean abundance forecasts for 2008 are not currently available. The STT has not undertaken a review of the methods used by Oregon Department of Fish and Wildlife (ODFW) staff in preparing these abundance forecasts.

The annual spawner counts have been decreasing since 2004 despite excellent parental escapements indices in 2001 to 2004 (*Review of 2007 Ocean Salmon Fisheries*, Appendix B, Table B-11). If this trend continues, the 2008 MOC stock abundance is expected to be less than the 2007 abundance.

Based on the density index of total spawners, the generalized expectation for NOC and MOC stocks in 2008 is below recent years average abundance. Specifically, the 2007 spawner density in standard survey areas for the NOC averaged 23 spawners per mile; well below the lower bound of the FMP aggregate goal of 60 to 90 spawners per mile. Moreover, escapements in the NOC escapement indicator basins of the Nehalem, Siletz, and Siuslaw have failed to achieve PSC agreed-to escapement goals in 2007. The escapement of fall Chinook to the Nehalem basin has failed to reach its PSC agreed-to escapement goal (6,989) for the past 2 years. The MOC average spawner per mile from standard survey areas was 20 adult spawners per mile, again, well below the goal of 60 to 90 spawners per mile. Fall Chinook escapement goals are currently under development for the South Umpqua and Coquille basins of the MOC. (*Review of 2007 Ocean Salmon Fisheries*, Appendix B, Table B-11).

South/Local Migrating Chinook

South/local migrating Chinook stocks include Rogue River spring and fall Chinook, fall Chinook from smaller rivers south of the Elk River, and Umpqua River spring Chinook. These stocks are important contributors to ocean fisheries off Oregon and northern California. Umpqua River spring Chinook contributes to a lesser degree to fisheries off Washington, British Columbia, Canada, and southeast Alaska.

Rogue River fall Chinook contribute to ocean fisheries principally as age-3 through age-5 fish. Mature fish enter the river each year from mid-July through October, with the peak of the run occurring during August and September.

Umpqua and Rogue rivers spring Chinook contribute to ocean fisheries primarily as age-3 fish. Mature Chinook enter the rivers primarily during April and May and generally prior to annual ocean fisheries. Quantitative abundance predictions are not made for these stocks.

Natural fall Chinook stocks from river systems south of the Elk River and spring Chinook stocks from the Rogue and Umpqua Rivers dominate production from this subgroup. Also present in lesser numbers are hatchery fall Chinook, primarily from the Chetco River. Substantial releases of hatchery spring Chinook occur in both the Rogue and Umpqua Rivers.

Predictor Description and 2008 Stock Status

Quantitative abundance predictions are not made for these stocks, although an abundance index for Rogue River fall Chinook has been developed. General trends in stock abundance for southern Oregon coastal Chinook stocks are assessed through escapement indices (*Review of 2007 Ocean Salmon Fisheries*, Chapter II, Table II-4 and Figure II-3).

Carcass recovery numbers in Rogue River index surveys that covered a large proportion of the total spawning area were available for 1977-2004. Using Klamath Ocean Harvest Model (KOHM) methodology, these carcass numbers, allocated into age-classes from scale data, were used to estimate the Rogue Ocean Population Index (ROPI) for age-3 to age-5 fish. A linear regression using the escapement estimates (all ages) in year i based on seining at Huntley Park (1976-2003) to predict the ROPI in year $i + 1$ (1977-2004) was developed. The 2007 Huntley Park escapement estimate and the resulting 2008 ROPI forecast was then scaled to the historical carcass survey-based ROPI. The 2008 ROPI forecast (11,600) consisting of age-3 (6,600), age-4 (4,300) and age-5 (700) are based on the average annual age-class strengths of the carcass-based ROPIs from 1991-2004. This data-set was truncated at 1991 because significant harvest restrictions that could affect age structure began that year. The 2008 ROPI is lower than the recent year average of 17,400, Table II-7.

Other Stocks

Information is insufficient to forecast the abundance of fall Chinook from other small systems south of the Elk River. These stocks are minor contributors to general season mixed stock ocean fisheries.

Evaluation of 2007 Regulations on 2008 Stock Abundance

The FMP conservation objective for Oregon coast Chinook is 150,000 to 200,000 natural adult spawners, and attainment of this goal is assessed using peak spawner counts of 60 to 90 fish per mile in nine standard index reaches. The aggregate stock has been meeting or exceeding this goal since 1984 and has been generally increasing. However, since reaching a peak in 2003, the escapement has been declining. In 2007, the stock failed to meet its goal for the first time in 23 years. No forecast is available for this stock, but given recent trends, it seems likely that it would fail to meet its goal again in 2008 under 2007 fishing seasons.

CHINOOK STOCKS NORTH OF CAPE FALCON

Columbia River Fall Chinook

Predictor Description and Past Performance

Columbia River fall Chinook stocks typically form the largest contributing stock group to Council Chinook fisheries north of Cape Falcon. Abundance of these stocks is a major factor in determining impacts of fisheries on weak natural stocks critical to Council area management. Abundance predictions are made for five major fall stock units characterized as being hatchery or natural production, and originating above or below Bonneville Dam. The upriver brights (URB) and lower river wild (LRW) are primarily naturally-produced stocks. The lower river hatchery (LRH) tule, Spring Creek Hatchery (SCH) tule, and mid-Columbia brights (MCB) are primarily hatchery-produced stocks. The MCB include the lower river bright (LRB) stock as a small naturally-produced component. LRB spawn in the mainstem Columbia River near Beacon Rock and are believed to have originated from MCB hatchery strays. The tule stocks generally mature at an earlier age than the bright fall stocks and do not migrate as far north. Minor stocks include the Select Area brights (SAB), a Big Creek Hatchery stock originally from Rogue River stock.

Preseason estimates of Columbia River fall Chinook stock abundance, used by the STT to assess the Council's adopted fishery regulations, are based on age-specific and stock-specific forecasts of annual ocean escapement (return to the Columbia River). These forecasts are developed by the Columbia River Technical Advisory Committee (TAC). Columbia River return forecast methodologies used for Council management are identical to those used for planning Columbia River fall season fisheries, although minor updates to Council estimates of inriver run size may occur prior to finalization of the inriver fishery plans.

The 2008 return of each fall Chinook stock group is estimated using relationships between successive age groups within a cohort. The database for these relationships was constructed by combining age-specific estimates of escapement and inriver fishery catches for years since 1964 (except for MCB, which started in 1980). Typically, only the more recent broods are used in the current predictions. Fall Chinook stock identification in the Columbia River mixed stock fisheries is determined by sampling catch and escapement for such factors as CWT recovery and visual stock identification (VSI). Age composition estimates are based on CWT data and scale reading of fishery and escapement samples, where available. These stock and age data for Columbia River fall Chinook are the basis for the return data presented in the *Review of 2007 Ocean Salmon Fisheries* (Appendix B, Tables B-15 through B-20). The 2007 returns for the five fall Chinook stocks listed in this report may differ somewhat from those provided in the *Review of 2007 Ocean Salmon Fisheries*, since ocean escapement estimates may have been updated after that report was printed.

Performance of the preliminary inriver run size estimation methodology can be assessed, in part, by examining the differences between preseason and postseason estimates (Table II-8). The recent 10-year average March preliminary preseason estimates as a percentage of the postseason estimates for the URB, LRW, LRH, SCH, and MCB stock estimates are 1.02, 1.06, 0.84, 1.03, and 0.98 respectively. The only March preliminary preseason estimate to show a bias was LRH, which has been under predicted between 1994 and 2006. The other four stocks have been both over and under predicted.

Ocean escapement estimates developed for the March Council meeting do not take into account variations in marine harvest. The STT combines the initial inriver run size (ocean escapement; Table II-8) with expected Council area fishery harvest levels and stock distribution patterns to produce adjusted ocean escapement estimates based on the proposed ocean fishing regulations. These revised estimates are available at the end of the Council preseason planning process in April and should provide a more accurate prediction of ocean escapement.

2008 Stock Status

The preliminary forecast for 2008 URB fall Chinook ocean escapement is 162,500 adults. If the forecast is realized, it would be about 144 percent of last year's return and about 70 percent of the recent 10-year average of 232,640.

No preseason forecast for 2008 ocean escapement of ESA-listed Snake River wild fall Chinook is currently available. However, the Columbia River TAC is expected to develop a run size estimate for this stock prior to the April Council meeting.

Ocean escapement of LRW fall Chinook in 2008 is forecast at 3,800 adults. If the forecast is realized, it would be about 88 percent of last year's return, and about 26 percent of the recent 10-year average return of 14,890. The forecast is the third lowest since at least 1984, and less than the spawning escapement goal of 5,700 in the North Fork Lewis River.

The preliminary forecast for 2008 ocean escapement of LRH fall Chinook is for a return of 59,000 adults, which would be 180 percent of last year's return and 74 percent of the recent 10-year average of 79,620.

Ocean escapement of SCH fall Chinook in 2008 is forecast at 87,200 adults. If the forecast is realized, it would be about six times last year's return and near the recent 10-year average of 86,820.

The preliminary forecast for the 2008 ocean escapement of MCB fall Chinook is 54,000 adults. If the forecast is realized, it would be about 115 percent of last year's return and about 67 percent of the recent 10-year average of 80,340.

Evaluation of 2007 Regulations on 2008 Stock Abundance

Applying 2007 regulations to the projected 2008 abundance of Columbia River fall Chinook would result in ocean escapements meeting spawning escapement goals for all major stocks except LRW. Compared to actual 2007 returns, the 2008 ocean escapement forecasts are higher for all stocks except LRW. Compared to 2007 forecast ocean escapement, the 2008 forecasts are higher for LRH and SCH, but lower for LRW, URB, and MCB stocks.

Washington Coastal Chinook

Predictor Description and Past Performance

Council fisheries have only minor impacts on Washington coastal Chinook stocks, and except for Willapa Bay Chinook, Hoh River Chinook and Quillayute River Chinook, forecast data is unavailable at the time this report is published; therefore, preseason abundance estimates are not presented. However, abundance estimates are provided for Washington Coastal stocks in subsequent preseason fishery impact assessment reports prepared by the STT.

2008 Stock Status

The 2008 Willapa Bay hatchery fall Chinook ocean escapement abundance forecast is 27,047, which is slightly less than the 2007 prediction of 29,846. The 2008 natural fall Chinook ocean escapement forecast is 2,516, up from last year's 2,012 prediction.

For the Hoh River, the 2008 natural spring/summer Chinook ocean escapement abundance forecast is 892. The natural fall Chinook forecast is predicted to be 2,873.

The 2008 Quillayute hatchery spring Chinook forecast for ocean escapement abundance is 1,745 and the natural summer/fall Chinook abundance forecast is for a return of 6,264.

Puget Sound Chinook

Run-size expectations for various Puget Sound stock management units are listed in Table I-1. A comparison of preseason and postseason forecasts for recent years is detailed in Table II-9. The STT has not undertaken a review of the methods employed by state and tribal staffs in preparing these abundance forecasts. Methodologies for estimates are described in the annual Puget Sound management reports (starting in 1993, reports are available by Puget Sound management unit, not by individual species). Forecasts for Puget Sound stocks generally assume production is dominated by age-4 adults. Puget Sound Chinook were listed as threatened under the ESA in March 1999. Southern U.S. fisheries that impact Puget Sound Chinook are constrained by terms of a Resource Management Plan (RMP), and are exempted from ESA Section 9 take prohibitions under Limit 6 of the 4(d) rule.

2008 Stock Status

Spring Chinook

Spring Chinook originating in Puget Sound are expected to remain depressed. Runs in the Nooksack, Skagit, White, and Dungeness rivers are of particular concern.

Summer/Fall Chinook

The 2008 preliminary forecast for Puget Sound summer/fall stocks is for a return of 245,268 Chinook, slightly higher than the 2007 preseason forecast of 227,300. The 2008 natural Chinook return forecast of 59,154 is higher than the 2007 forecast of 54,000. Changes in the abundance of individual stocks from various production areas are detailed in Table I-1.

Natural stocks from Puget Sound had experienced improved survival in recent years. However, natural returns to several major populations, including Snohomish and Skagit were significantly lower in 2007 than has been observed for recent years. Fishery management for Puget Sound Chinook has changed from an escapement goal basis to the use of stock specific exploitation rates and “critical abundance thresholds.” This new approach is evaluated on an annual basis through the RMP.

Evaluation of 2007 Regulations on 2008 Stock Abundance

Council fisheries north of Cape Falcon have only a minor impact on most stocks that originate in Washington coastal and Puget Sound rivers. These stocks have northerly marine distribution patterns and are therefore impacted primarily by Canadian and Alaskan fisheries. An evaluation of 2007 Council area regulations on projected 2008 abundance would not provide a useful comparison of ocean escapement.

TABLE II-1. Indices of annual abundance and ocean fishery impacts on California Central Valley Chinook in thousands of fish. (Page 1 of 1)

Year	Ocean Chinook Landings South of Pt. Arena			Hatchery and Natural Escapements of Central Valley Adults			CVI Abundance (Ocean Landings + Escapement)		CVI Harvest Index (%) ^{b/}
	Troll	Sport	Total	Fall	Other ^{a/}	Total			
1970	226.8	111.1	337.9	186.3	55.6	241.9	579.8	58	
1971	150.7	166.3	317.0	196.2	65.4	261.6	578.6	55	
1972	229.8	187.6	417.4	104.6	47.6	152.3	569.7	73	
1973	422.5	180.9	603.4	225.4	34.0	259.4	862.8	70	
1974	282.7	141.6	424.3	207.3	42.3	249.6	673.9	63	
1975	234.4	92.7	327.1	162.3	56.5	218.9	546.0	60	
1976	237.9	68.6	306.4	172.0	45.6	217.7	524.1	58	
1977	263.8	76.6	340.4	165.6	43.0	208.6	549.1	62	
1978	291.0	65.9	356.9	129.8	19.9	149.7	506.6	70	
1979	234.1	108.5	342.6	171.9	10.9	182.9	525.5	65	
1980	294.3	77.1	371.4	148.4	34.0	182.4	553.8	67	
1981	289.9	73.8	363.7	196.9	21.8	218.7	582.4	62	
1982	426.1	122.5	548.6	182.4	38.9	221.3	769.9	71	
1983	178.2	53.0	231.2	129.9	14.4	144.3	375.4	62	
1984	221.7	78.7	300.3	205.8	16.9	222.7	523.0	57	
1985	212.3	121.8	334.1	312.7	20.7	333.4	667.4	50	
1986	502.5	114.8	617.3	262.9	41.3	304.1	921.4	67	
1987	446.8	152.8	599.7	202.8	21.6	224.4	824.1	73	
1988	830.5	130.4	960.9	244.9	26.6	271.5	1,232.4	78	
1989	363.8	130.9	494.7	155.0	18.0	173.0	667.7	74	
1990	336.2	112.6	448.8	105.7	14.0	119.7	568.6	79	
1991	254.6	62.1	316.7	118.3	16.4	134.6	451.3	70	
1992	160.3	66.7	227.0	82.6	4.2	86.8	313.8	72	
1993	259.7	99.3	359.0	139.6	6.0	145.7	504.6	71	
1994	290.4	165.8	456.2	169.5	6.6	176.0	632.2	72	
1995	670.6	354.6	1,025.2	302.2	16.5	318.6	1,343.8	76	
1996	348.8	129.3	478.1	307.6	12.9	320.5	798.6	60	
1997	482.2	208.4	690.6	368.0	46.6	414.6	1,105.2	62	
1998	221.6	114.4	336.0	254.2	55.8	310.0	646.0	52	
1999	259.7	76.4	336.1	408.9	21.4	430.3	766.4	44	
2000	447.6	146.4	594.0	459.9	34.9	494.8	1,088.8	55	
2001	172.6	59.9	232.5	575.6	74.0	649.5	882.0	26	
2002	312.9	134.7	447.6	804.4	40.1	844.5	1,292.0	35	
2003	239.0	69.7	308.7	541.7	46.3	588.0	896.7	34	
2004	362.9	175.1	538.0	296.7	34.9	331.6	869.6	62	
2005	287.9	103.5	391.5	415.3	42.9	458.2	849.7	46	
2006	58.9	65.9	124.8	276.5	33.6	310.1	434.9	29	
2007 ^{c/}	88.6	23.0	111.6	90.4	30.0	120.4	232.0	48	

a/ Spring run of the current calendar year and late fall and winter runs of the following calendar year.

b/ Ocean harvest landed south of Pt. Arena as a percent of the CVI.

c/ Preliminary.

TABLE II-2. Comparisons of preseason forecast and postseason estimates for the CVI in thousands of fish. (Page 1 of 1)

Year	Preseason Forecast	Postseason Estimate	Pre/Postseason
1985	524.8	667.4	0.79
1986	546.5	921.4	0.59
1987	592.9	824.1	0.72
1988	707.1	1,232.4	0.57
1989	625-885	667.7	0.94-1.33
1990	500-900	568.6	0.88-1.58
1991	466.0	451.3	1.03
1992	452.0	313.8	1.44
1993	501.0	504.6	0.99
1994	503.0	632.2	0.80
1995	654.0	1,343.8	0.49
1996	533.0	798.6	0.67
1997	849.0	1,105.2	0.77
1998	1,051.0	646.0	1.63
1999	847.7	766.4	1.11
2000	790.4	1,088.8	0.73
2001	649.4	882.0	0.74
2002	825.4	1,292.0	0.64
2003	1,108.1	896.7	1.24
2004	831.8	869.6	0.96
2005	1,678.3	849.7	1.98
2006	632.5	434.9	1.45
2007	499.9	232.0	2.16
2008	157.1 ^{a/}	-	-

a/ CVI predictor excludes 2005 data point.

TABLE II-3. Klamath River fall Chinook ocean abundance (thousands), harvest rate, and river run size estimates (thousands) by age. (Page 1 of 1)

Year (t)	Ocean Abundance Sept. 1 (t-1)			Annual Ocean Harvest Rate			Klamath Basin River Run (t)					Total Adults
	Age-3	Age-4	Total	Age-3	Age-4	Age-4	Age-2	Age-3	Age-4	Age-5		
	Age-3	Age-4	Total	Age-3	Age-4	Age-4	Age-2	Age-3	Age-4	Age-5		
1981	493.2	57.0	550.2	0.21	0.53	28.2	64.1	14.4	14.4	1.8	80.3	
1982	566.2	133.4	699.6	0.30	0.52	39.4	30.1	33.9	33.9	2.6	66.6	
1983	316.5	116.3	432.9	0.19	0.60	3.8	35.9	20.7	20.7	0.9	57.5	
1984	156.6	83.4	240.0	0.08	0.38	8.3	21.7	24.4	24.4	1.1	47.2	
1985	376.5	56.6	433.1	0.11	0.24	69.4	32.9	25.7	25.7	5.8	64.4	
1986	1,305.8	141.8	1,447.6	0.18	0.46	44.6	162.9	29.8	29.8	2.3	195.0	
1987	782.0	342.6	1,124.6	0.16	0.43	19.1	89.7	112.6	112.6	6.8	209.1	
1988	756.9	235.5	992.4	0.20	0.39	24.1	101.2	86.5	86.5	3.9	191.6	
1989	370.3	177.7	548.0	0.15	0.36	9.1	50.4	69.6	69.6	4.3	124.3	
1990	176.1	104.1	280.3	0.30	0.55	4.4	11.6	22.9	22.9	1.3	35.9	
1991	69.4	37.2	106.6	0.03	0.18	1.8	10.0	21.6	21.6	1.1	32.7	
1992	39.5	28.2	67.7	0.02	0.07	13.7	6.9	18.8	18.8	1.0	26.7	
1993	168.5	15.0	183.5	0.05	0.16	7.6	48.3	8.2	8.2	0.7	57.2	
1994	119.9	41.7	161.6	0.03	0.09	14.4	37.0	26.0	26.0	1.0	64.0	
1995	784.3	28.7	813.0	0.04	0.14	22.8	201.9	18.3	18.3	2.6	222.8	
1996	192.3	225.5	417.8	0.05	0.16	9.5	38.8	136.7	136.7	0.3	175.8	
1997	140.4	62.8	203.3	0.01	0.06	8.0	35.0	44.2	44.2	4.6	83.7	
1998	154.8	44.9	199.7	0.00	0.09	4.6	59.2	29.7	29.7	1.7	90.6	
1999	129.4	30.5	159.8	0.01	0.09	19.2	29.2	20.5	20.5	1.3	51.0	
2000	617.6	44.3	661.9	0.06	0.10	10.2	187.1	30.5	30.5	0.5	218.1	
2001	357.1	133.9	491.0	0.03	0.09	11.3	99.1	88.2	88.2	0.2	187.4	
2002	514.5	99.5	614.0	0.02	0.15	9.2	94.6	62.5	62.5	3.7	160.8	
2003	401.1	192.6	593.7	0.08	0.21	3.8	94.3	96.8	96.8	0.9	191.9	
2004	160.2	105.3	265.6	0.12	0.34	9.7	33.2	40.7	40.7	5.3	79.2	
2005	190.6	38.2	228.8	0.02	0.20	2.3	43.8	17.5	17.5	3.9	65.2	
2006	88.7 ^{a/}	63.4	152.1	0.01 ^{a/}	0.10	26.9	18.5	41.6	41.6	1.3	61.4	
2007	521.4 ^{b/}	32.5 ^{a/}	553.9	NA ^{c/}	0.21 ^{a/}	1.7	112.2	16.7	16.7	1.6	130.5	

a/ Preliminary: incomplete cohort data (age-5 unavailable).

b/ Preliminary: incomplete cohort data (age-4 and age-5 unavailable).

c/ Not estimated: incomplete cohort data (age-4 and age-5 unavailable).

TABLE II-4. Comparisons of preseason forecast and postseason estimates for ocean abundance of adult Klamath River fall Chinook. (Page 1 of 2)

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept. 1 (t-1)	Sept. 1 (t-1)	
Age-3			
1985	113,000	276,000	0.41
1986	426,000 ^{b/}	1,305,782	0.33
1987	511,800	782,032	0.65
1988	370,800	756,908	0.49
1989	450,600	370,328	1.22
1990	479,000	176,133	2.72
1991	176,200	69,442	2.54
1992	50,000	39,485	1.27
1993	294,400	168,473	1.75
1994	138,000	119,913	1.15
1995	269,000	784,279	0.34
1996	479,800	192,290	2.50
1997	224,600	140,421	1.60
1998	176,000	154,819	1.14
1999	84,800	129,355	0.66
2000	349,600	617,573	0.57
2001	187,200	357,085	0.52
2002	209,000	514,524	0.41
2003	171,300	401,092	0.43
2004	72,100	160,243	0.45
2005	185,700	190,568	0.97
2006	44,100	88,652	0.50
2007 ^{c/}	515,400	521,412	0.99
2008	31,600	-	-
Age-4			
1985	56,875	57,500	0.99
1986	66,250	141,772	0.47
1987	206,125	342,555	0.60
1988	186,375	235,535	0.79
1989	215,500	177,655	1.21
1990	50,125	104,131	0.48
1991	44,625	37,172	1.20
1992	44,750	28,181	1.59
1993	39,125	15,028	2.60
1994	86,125	41,736	2.06
1995	47,000	28,725	1.64
1996	268,500	225,526	1.19
1997	53,875	62,830	0.86
1998	46,000	44,889	1.02
1999	78,750	30,468	2.58
2000	38,875	44,346	0.88
2001	247,000	133,869	1.85
2002	143,800	99,464	1.45
2003	132,400	192,598	0.69
2004	134,500	105,346	1.28
2005	48,900	38,239	1.28
2006	63,700	63,446	1.00
2007 ^{c/}	26,100	32,494	0.80
2008	157,200	-	-

TABLE II-4. Comparisons of preseason forecasts and postseason estimates for ocean abundance of adult Klamath River fall Chinook. (Page 2 of 2)

Year (t)	Preseason Forecast ^{a/}	Postseason Estimate	Pre/Postseason
	Sept. 1 (t-1)	Sept. 1 (t-1)	
Age-5			
1985	NA	11,187	NA
1986	NA	5,855	NA
1987	5,250	19,443	0.27
1988	13,250	14,669	0.90
1989	10,125	9,627	1.05
1990	7,625	7,776	0.98
1991	1,500	2,774	0.54
1992	1,250	1,444	0.87
1993	1,125	1,759	0.64
1994	500	1,462	0.34
1995	2,000	3,805	0.53
1996	1,125	787	1.43
1997	7,875	8,859	0.89
1998	3,250	2,389	1.36
1999	2,000	2,106	0.95
2000	1,375	1,051	1.31
2001	1,250	258	4.84
2002	9,700	6,970	1.39
2003	6,500	1,917	3.39
2004	9,700	17,196	0.56
2005	5,200	6,893	0.75
2006	2,200	5,242	0.42
2007 ^{c/}	4,700	2,886	1.63
2008	1,900	-	-
Total Adults			
1985	169,875	344,687	0.49
1986	492,250	1,453,409	0.34
1987	723,175	1,144,030	0.63
1988	570,425	1,007,112	0.57
1989	676,225	557,610	1.21
1990	536,750	288,040	1.86
1991	222,325	109,388	2.03
1992	96,000	69,110	1.39
1993	334,650	185,260	1.81
1994	224,625	163,111	1.38
1995	318,000	816,809	0.39
1996	749,425	418,603	1.79
1997	286,350	212,110	1.35
1998	225,250	202,097	1.11
1999	165,550	161,929	1.02
2000	389,850	662,970	0.59
2001	435,450	491,212	0.89
2002	362,500	620,958	0.58
2003	310,200	595,607	0.52
2004	216,300	282,785	0.76
2005	239,800	235,700	1.02
2006	110,000	157,340	0.70
2007 ^{c/}	546,200	556,792	0.98
2008	190,700	-	-

a/ Original preseason forecasts for years 1985-2001 were for May 1 (t); converted to Sept. 1 (t-1) forecasts by dividing the assumed May 1 (t) number by the Sept. 1 (t-1) through May 1 (t) survival rate in those years: 0.5 age-3, 0.8 age-4, 0.8 age-5.

b/ A scalar of 0.75 was applied to the jack count because, (1) most jacks returned to the Trinity River, and (2) the jack count was outside the database range.

c/ Preliminary.

TABLE II-5. Summary of management objectives and predictor performance for Klamath River fall Chinook. (Page 1 of 1)

Year(t)	Preseason Ocean			Postseason Ocean			Preseason Age-4		Postseason Age-4		Preseason Adult		Postseason Adult	
	Abundance Forecast ^{a/}			Abundance Estimate			Harvest Rate Forecast ^{b/}		Harvest Rate Estimate ^{c/}		Harvest Forecast		Harvest Estimate	
	Sept. 1 (t-1)	Age-4	Age-3	Age-4	Sept. 1 (t-1)	Age-4	Ocean	River	Ocean	River	Ocean	River	Ocean	River
1986	426,000	66,250	1,305,782	141,772	0.28	0.50	0.46	0.67	72,000	37,700	304,512	46,154		
1987	511,800	206,125	782,032	342,555	0.28	0.53	0.43	0.44	121,200	78,200	277,104	73,265		
1988	370,800	186,375	756,908	235,535	0.31	0.53	0.39	0.52	114,100	65,400	254,444	73,854		
1989	450,600	215,500	370,328	177,655	0.30	0.49	0.36	0.70	128,100	67,600	125,523	54,340		
1990	479,000	50,125	176,133	104,131	0.30	0.49	0.55	0.36	85,100	31,200	114,911	11,459		
1991	176,200	44,625	69,442	37,172	0.13	0.28	0.18	0.45	16,700	12,800	9,871	13,581		
1992	50,000	44,750	39,485	28,181	0.06	0.15	0.07	0.27	4,200	4,200	3,140	6,787		
1993	294,400	39,125	168,473	15,028	0.12	0.43	0.16	0.49	20,100	22,500	11,354	12,808		
1994	138,000	86,125	119,913	41,736	0.07	0.20	0.09	0.29	10,400	14,300	8,889	13,524		
1995	269,000	47,000	784,279	28,725	0.07	0.32	0.14	0.19	13,500	18,500	32,230	21,637		
1996	479,800	268,500	192,290	225,526	0.17	0.66	0.16	0.39	88,400	129,100	45,147	69,241		
1997	224,600	53,875	140,421	62,830	0.10	0.43	0.06	0.26	17,600	26,500	8,657	17,764		
1998	176,000	46,000	154,819	44,889	0.07	0.29	0.09	0.30	10,200	14,800	5,012	17,897		
1999	84,800	78,750	129,355	30,468	0.10	0.28	0.09	0.45	12,300	18,100	5,126	16,942		
2000	349,600	38,875	617,573	44,346	0.11	0.53	0.10	0.25	24,000	32,400	42,336	35,066		
2001	187,200	247,000	357,085	133,869	0.14	0.61	0.09	0.29	45,600	105,300	21,783	50,780		
2002	209,000	143,800	514,524	99,464	0.13	0.57	0.15	0.26	30,000	70,900	29,436	35,069		
2003	171,300	132,400	401,092	192,598	0.16	0.50	0.21	0.28	30,600	52,200	71,124	39,715		
2004	72,100	134,500	160,243	105,346	0.15	0.38	0.34	0.48	26,500	35,800	64,264	29,807		
2005	185,700	48,900	190,568	38,239	0.08	0.16	0.20	0.19	7,100	9,600	13,228	10,001		
2006	44,100	63,700	88,652	63,446	0.11	0.23	0.10	0.18	10,000	10,000	10,457	10,345		
2007 ^{d/}	515,400	26,100	521,412	32,494	0.16	0.63	0.21	0.56	30,200	51,400	28,551	33,282		
2008	31,600	157,200	-	-	-	-	-	-	-	-	-	-		

a/ Original preseason forecasts for years 1986-2001 were for May 1 (t); converted to Sept. 1 (t-1) forecasts by dividing the May 1 (t) number by the assumed Sept. 1 (t-1) through May 1 (t) survival rate assumed in those years: 0.5 age-3, 0.8 age-4, 0.8 age-5.

b/ Ocean harvest rate forecast is the fraction of the predicted ocean abundance expected to be harvested Sept. 1 (t-1) through August 31(t). River harvest rate forecast is the fraction of the predicted river run expected to be harvested in river fisheries. Original ocean harvest rate forecasts for year (t), 1986-2001, were based on a May 1 (t) ocean abundance denominator; converted to Sept. 1 (t-1) abundance denominator by multiplying former values by 0.8 (the assumed age-4 survival rate between Sept. 1 (t-1) and May 1 (t) in those years).

c/ Ocean harvest rate is the fraction of the postseason ocean abundance harvested Sept. 1 (t-1) through August 31 (t). River harvest rate is the fraction of the river run harvested by river fisheries.

d/ Postseason estimates are preliminary.

TABLE II-6. Harvest levels and rates of age-3 and age-4 Klamath River fall Chinook. (Page 1 of 2)

Year (t)	Ocean Fisheries (Sept. 1 (t-1) - Aug. 31 (t))							River Fisheries (t)		
	KMZ			North of	South of	Ocean		Net	Sport	Total
	Troll	Sport	Subtotal	KMZ	KMZ	Subtotal	Total			
HARVEST (numbers of fish)										
Age-3										
1986	35,630	4,876	40,506	73,913	122,913	196,826	237,332	8,100	18,100	26,200
1987	17,231	5,083	22,314	42,875	56,362	99,237	121,551	11,400	11,400	22,800
1988	15,996	5,164	21,160	24,312	107,949	132,261	153,421	12,500	15,600	28,100
1989	6,462	11,793	18,255	15,368	23,750	39,118	57,373	2,700	900	3,600
1990	81	4,357	4,438	36,578	11,006	47,584	52,022	1,300	1,400	2,700
1991	0	1,022	1,022	343	810	1,153	2,175	2,123	1,277	3,400
1992	0	0	0	971	0	971	971	970	251	1,221
1993	0	822	822	833	6,424	7,257	8,079	5,426	2,917	8,343
1994	42	604	646	0	3,387	3,387	4,033	4,543	965	5,508
1995	0	999	999	12,211	14,808	27,019	28,018	11,840	5,536	17,376
1996	0	0	0	0	9,312	9,312	9,312	12,363	3,661	16,024
1997	0	232	232	620	1,215	1,835	2,067	2,166	2,736	4,902
1998	0	6	6	298	466	764	770	2,231	5,781	8,012
1999	63	180	243	1,262	433	1,695	1,938	4,981	1,748	6,729
2000	404	3,282	3,686	8,730	25,206	33,936	37,622	22,458	4,893	27,351
2001	113	105	218	2,765	6,088	8,853	9,071	17,885	7,294	25,179
2002	220	783	1,003	1,623	9,912	11,535	12,538	11,734	6,258	17,992
2003	173	679	852	2,026	27,312	29,338	30,190	6,996	5,061	12,057
2004	403	971	1,374	9,902	7,337	17,239	18,613	4,679	2,051	6,730
2005	0	568	568	889	2,381	3,270	3,838	4,394	1,641	6,035
2006 ^{al}	0	465	465	31	332	363	828	2,388	13	2,401
2007 ^{al}	719	7,518	8,237	4,111	8,649	12,760	20,997	17,422	5,356	22,778
Age-4										
1986	7,797	1,120	8,917	23,560	32,131	55,691	64,608	17,000	2,900	19,900
1987	21,727	4,427	26,154	71,123	48,812	119,935	146,089	41,000	8,500	49,500
1988	11,867	3,598	15,465	26,950	50,278	77,228	92,693	38,600	6,200	44,800
1989	6,062	9,735	15,797	32,428	16,608	49,036	64,833	41,000	7,700	48,700
1990	4,000	2,916	6,916	39,760	10,608	50,368	57,284	6,000	2,200	8,200
1991	0	1,001	1,001	1,513	4,135	5,648	6,649	7,593	2,016	9,609
1992	171	55	226	1,781	12	1,793	2,019	4,360	723	5,083
1993	0	0	0	849	1,615	2,464	2,464	3,786	243	4,029
1994	0	1,124	1,124	1,168	1,499	2,667	3,791	6,666	818	7,484
1995	0	242	242	1,879	1,771	3,650	3,892	2,957	480	3,437
1996	773	3,464	4,237	10,336	20,738	31,074	35,311	43,959	9,080	53,039
1997	3	172	175	463	2,995	3,458	3,633	8,734	2,586	11,320
1998	0	105	105	4,062	0	4,062	4,167	7,164	1,822	8,986
1999	15	381	396	1,667	696	2,363	2,759	8,789	494	9,283
2000	117	895	1,012	2,484	1,076	3,560	4,572	6,733	756	7,489
2001	1,312	1,604	2,916	5,830	3,927	9,757	12,673	20,759	4,819	25,578
2002	1,938	827	2,765	3,226	9,416	12,642	15,407	11,929	4,063	15,992
2003	834	918	1,752	8,154	30,002	38,156	39,908	22,754	4,592	27,346
2004	1,422	1,215	2,637	11,667	21,960	33,627	36,264	17,623	1,751	19,374
2005	247	317	564	5,355	1,910	7,265	7,829	3,048	304	3,352
2006	196	725	921	4,267	984	5,251	6,172	7,569	42	7,611
2007 ^{al}	259	2,248	2,507	1,945	2,361	4,306	6,813	8,923	471	9,394

TABLE II-6. Harvest levels and rates of age-3 and age-4 Klamath River fall Chinook. (Page 2 of 2)

Year (t)	Ocean Fisheries (Sept. 1 (t-1) - Aug. 31 (t))						River Fisheries (t)			
	KMZ		Subtotal	North of	South of	Subtotal	Ocean Total	Net	Sport	Total
	Troll	Sport		KMZ	KMZ					
HARVEST RATE^{b/}										
Age-3										
1986	0.03	0.00	0.03	0.06	0.09	0.15	0.18	0.05	0.11	0.16
1987	0.02	0.01	0.03	0.05	0.07	0.13	0.16	0.13	0.13	0.25
1988	0.02	0.01	0.03	0.03	0.14	0.17	0.20	0.12	0.15	0.28
1989	0.02	0.03	0.05	0.04	0.06	0.11	0.15	0.05	0.02	0.07
1990	0.00	0.02	0.03	0.21	0.06	0.27	0.30	0.11	0.12	0.23
1991	0.00	0.01	0.01	0.00	0.01	0.02	0.03	0.21	0.13	0.34
1992	0.00	0.00	0.00	0.02	0.00	0.02	0.02	0.14	0.04	0.18
1993	0.00	0.00	0.00	0.00	0.04	0.04	0.05	0.11	0.06	0.17
1994	0.00	0.01	0.01	0.00	0.03	0.03	0.03	0.12	0.03	0.15
1995	0.00	0.00	0.00	0.02	0.02	0.03	0.04	0.06	0.03	0.09
1996	0.00	0.00	0.00	0.00	0.05	0.05	0.05	0.32	0.09	0.41
1997	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.08	0.14
1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.10	0.14
1999	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.17	0.06	0.23
2000	0.00	0.01	0.01	0.01	0.04	0.05	0.06	0.12	0.03	0.15
2001	0.00	0.00	0.00	0.01	0.02	0.02	0.03	0.18	0.07	0.25
2002	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.12	0.07	0.19
2003	0.00	0.00	0.00	0.01	0.07	0.07	0.08	0.07	0.05	0.13
2004	0.00	0.01	0.01	0.06	0.05	0.11	0.12	0.14	0.06	0.20
2005	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.10	0.04	0.14
2006 ^{a/}	0.00	0.01	0.01	0.00	0.00	0.00	0.01	0.13	0.00	0.13
2007 ^{a/}	0.00	0.01	0.02	0.01	0.02	0.02	0.04	0.16	0.05	0.20
Age-4										
1986	0.05	0.01	0.06	0.17	0.23	0.39	0.46	0.57	0.10	0.67
1987	0.06	0.01	0.08	0.21	0.14	0.35	0.43	0.36	0.08	0.44
1988	0.05	0.02	0.07	0.11	0.21	0.33	0.39	0.45	0.07	0.52
1989	0.03	0.05	0.09	0.18	0.09	0.28	0.36	0.59	0.11	0.70
1990	0.04	0.03	0.07	0.38	0.10	0.48	0.55	0.26	0.10	0.36
1991	0.00	0.03	0.03	0.04	0.11	0.15	0.18	0.35	0.09	0.45
1992	0.01	0.00	0.01	0.06	0.00	0.06	0.07	0.23	0.04	0.27
1993	0.00	0.00	0.00	0.06	0.11	0.16	0.16	0.46	0.03	0.49
1994	0.00	0.03	0.03	0.03	0.04	0.06	0.09	0.26	0.03	0.29
1995	0.00	0.01	0.01	0.07	0.06	0.13	0.14	0.16	0.03	0.19
1996	0.00	0.02	0.02	0.05	0.09	0.14	0.16	0.32	0.07	0.39
1997	0.00	0.00	0.00	0.01	0.05	0.06	0.06	0.20	0.06	0.26
1998	0.00	0.00	0.00	0.09	0.00	0.09	0.09	0.24	0.06	0.30
1999	0.00	0.01	0.01	0.05	0.02	0.08	0.09	0.43	0.02	0.45
2000	0.00	0.02	0.02	0.06	0.02	0.08	0.10	0.22	0.02	0.25
2001	0.01	0.01	0.02	0.04	0.03	0.07	0.09	0.24	0.05	0.29
2002	0.02	0.01	0.03	0.03	0.09	0.13	0.15	0.19	0.06	0.26
2003	0.00	0.00	0.01	0.04	0.16	0.20	0.21	0.24	0.05	0.28
2004	0.01	0.01	0.03	0.11	0.21	0.32	0.34	0.43	0.04	0.48
2005	0.01	0.01	0.01	0.14	0.05	0.19	0.20	0.17	0.02	0.19
2006	0.00	0.01	0.01	0.07	0.02	0.08	0.10	0.18	0.00	0.18
2007 ^{a/}	0.01	0.07	0.08	0.06	0.07	0.13	0.21	0.53	0.03	0.56

a/ Preliminary.

b/ Ocean harvest rates are the fraction of Sept 1(t-1) ocean abundance harvested in these fisheries. River harvest rates are the fraction of the river run (t) harvested in these fisheries.

TABLE II-7. Rogue River fall Chinook inriver run and ocean population indices. (Page 1 of 1)

Return Year	Inriver Run Index in Thousands of Fish ^{a/}					Ocean Impact Rate by Age ^{b/}					Ocean Population Index in Thousands of Fish ^{c/}				
	Age-2	Age-3	Age-4	Age-5	Total ^{d/}	Age-3	Age-4-5	Age-3	Age-4	Age-5	Age-3	Age-4	Age-5	Total	
1977	2.4	1.0	0.3	0.0	3.7	0.23	0.55	9.7	1.4	0.1	9.7	1.4	0.1	11.2	
1978	1.0	6.1	2.3	0.1	9.5	0.23	0.55	38.7	5.2	0.2	38.7	5.2	0.2	44.1	
1979	0.2	1.0	6.5	0.0	7.7	0.23	0.55	7.8	18.8	0.1	7.8	18.8	0.1	26.7	
1980	0.4	0.2	0.9	0.6	2.1	0.23	0.55	5.2	4.0	1.4	5.2	4.0	1.4	10.6	
1981	1.1	3.3	1.0	0.3	5.7	0.21	0.53	9.2	3.0	0.7	9.2	3.0	0.7	12.9	
1982	0.7	1.3	1.3	0.1	3.4	0.30	0.52	9.8	2.9	0.3	9.8	2.9	0.3	13.0	
1983	0.3	1.1	1.5	0.0	2.9	0.19	0.60	8.6	4.4	0.1	8.6	4.4	0.1	13.1	
1984	0.4	1.2	1.8	0.1	3.5	0.08	0.38	9.9	4.7	0.2	9.9	4.7	0.2	14.8	
1985	2.5	1.3	3.5	0.6	7.9	0.11	0.25	9.7	6.3	0.9	9.7	6.3	0.9	16.9	
1986	3.1	12.5	2.3	0.5	18.4	0.18	0.46	71.3	5.9	1.0	71.3	5.9	1.0	78.2	
1987	2.6	7.8	18.1	0.4	28.9	0.16	0.43	80.3	36.3	0.6	80.3	36.3	0.6	117.2	
1988	1.4	4.8	25.2	1.5	32.9	0.20	0.39	17.3	47.9	2.5	17.3	47.9	2.5	67.7	
1989	0.5	1.3	4.0	2.0	7.8	0.15	0.36	8.4	7.2	3.2	8.4	7.2	3.2	18.8	
1990	0.0	0.3	1.4	0.2	1.9	0.30	0.55	6.0	4.7	0.5	6.0	4.7	0.5	11.2	
1991	0.2	0.4	1.9	0.5	3.0	0.03	0.18	3.5	3.2	0.6	3.5	3.2	0.6	7.3	
1992	0.5	0.3	1.5	0.5	2.8	0.02	0.07	4.4	2.4	0.6	4.4	2.4	0.6	7.4	
1993	0.3	3.5	1.5	0.5	5.8	0.05	0.16	16.1	3.2	0.6	16.1	3.2	0.6	19.9	
1994	0.5	0.8	5.8	0.9	8.0	0.03	0.09	3.0	9.5	0.9	3.0	9.5	0.9	13.4	
1995	0.2	0.6	1.4	2.0	4.2	0.04	0.13	4.3	1.7	2.3	4.3	1.7	2.3	8.3	
1996	0.1	0.4	1.8	0.1	2.4	0.05	0.16	2.4	2.8	0.1	2.4	2.8	0.1	5.3	
1997	0.1	0.3	1.0	0.3	1.7	0.01	0.06	5.2	1.5	0.3	5.2	1.5	0.3	7.0	
1998	0.0	0.5	2.8	0.3	3.6	0.00	0.09	3.8	3.9	0.3	3.8	3.9	0.3	8.0	
1999	0.2	0.3	1.6	0.5	2.6	0.01	0.09	1.5	2.7	0.6	1.5	2.7	0.6	4.8	
2000	0.2	2.0	0.8	0.6	3.6	0.06	0.10	9.9	0.9	0.6	9.9	0.9	0.6	11.4	
2001	0.8	2.3	4.2	0.0	7.3	0.03	0.09	14.1	5.9	0.0	14.1	5.9	0.0	20.0	
2002	0.9	4.0	7.1	0.8	12.7	0.02	0.15	32.2	9.1	0.9	32.2	9.1	0.9	42.2	
2003	0.9	2.3	12.0	0.4	15.6	0.08	0.21	14.4	22.1	0.5	14.4	22.1	0.5	37.0	
2004	0.4	0.6	4.9	2.9	8.8	0.12	0.34	3.9	9.7	4.4	3.9	9.7	4.4	18.0	
2005 ^{f/}	NA	NA	NA	NA	NA	0.02	0.20	7.6	5.0	0.8	7.6	5.0	0.8	13.4	
2006 ^{f/}	NA	NA	NA	NA	NA	0.01	0.11	4.9 ^{e/}	3.2	0.5	4.9 ^{e/}	3.2	0.5	8.6 ^{e/}	
2007 ^{f/}	NA	NA	NA	NA	NA	0.04	0.21	5.8 ^{e/}	3.8 ^{e/}	0.6	5.8 ^{e/}	3.8 ^{e/}	0.6	10.2 ^{e/}	
2008 ^{f/}	NA	NA	NA	NA	NA	-	-	6.6 ^{g/}	4.3 ^{g/}	0.7 ^{g/}	6.6 ^{g/}	4.3 ^{g/}	0.7 ^{g/}	11.6 ^{g/}	

a/ Index based on carcass counts in spawning survey index areas. Carcass counts in 1978, 1979, and 1980 adjusted for prespawning mortality. Age composition developed from carcass scale sampling.

b/ Exploitation rates since 1981 are based on Klamath River fall Chinook cohort analysis, 1977-1980 based on 1981-1983 average.

c/ Based on cohort reconstruction methods. Index values for 2008 predicted from regression equations; postseason estimates are not available.

d/ Excludes age-6 fish.

e/ Preliminary, complete cohort not available, mean maturity rate used to derive estimate.

f/ Spawning surveys were discontinued 2005.

g/ Preseason forecast.

TABLE II-8. Predicted and postseason returns of Columbia River adult fall Chinook in thousands of fish. (Page 1 of 3)

Year	March Preseason Forecast ^{a/}	April STT Modeled Forecast ^{b/}	Postseason Return	March Pre/Postseason	April Pre/Postseason
URB					
1984	90.10	93.00	131.40	0.69	0.71
1985	159.10	159.10	196.40	0.81	0.81
1986	285.90	286.10	281.60	1.02	1.02
1987	436.40	436.40	420.70	1.04	1.04
1988	450.70	446.50	339.90	1.33	1.31
1989	234.00	231.80	261.30	0.90	0.89
1990	127.20	126.90	153.60	0.83	0.83
1991	88.80	88.90	103.30	0.86	0.86
1992	68.40	66.30	81.00	0.84	0.82
1993	84.50	82.70	102.90	0.82	0.80
1994	85.40	94.70	132.80	0.64	0.71
1995	103.70	125.00	106.50	0.97	1.17
1996	88.90	94.20	143.20	0.62	0.66
1997	166.40	158.00	161.70	1.03	0.98
1998	150.80	141.80	142.30	1.06	1.00
1999	147.50	102.10	166.10	0.89	0.61
2000	171.10	208.20	155.70	1.10	1.34
2001	127.20	132.70	232.60	0.55	0.57
2002	281.00	273.80	276.90	1.01	0.99
2003	280.40	253.20	373.20	0.75	0.68
2004	292.20	287.00	367.90	0.79	0.78
2005	352.20	354.60	268.70	1.31	1.32
2006	253.90	249.10	230.40	1.10	1.08
2007	182.40	185.20	112.60	1.62	1.64
2008	162.50	-	-	-	-
LRW					
1984	16.70	NA	13.30	1.26	NA
1985	12.90	NA	13.30	0.97	NA
1986	15.70	NA	24.50	0.64	NA
1987	29.20	NA	37.90	0.77	NA
1988	43.30	42.10	41.70	1.04	1.01
1989	27.30	26.90	38.60	0.71	0.70
1990	23.70	23.40	20.30	1.17	1.15
1991	12.70	12.70	19.80	0.64	0.64
1992	17.40	16.70	12.50	1.39	1.34
1993	12.50	11.90	13.30	0.94	0.89
1994	14.70	13.20	12.20	1.20	1.08
1995	12.40	11.50	16.00	0.78	0.72
1996	8.80	8.10	14.60	0.60	0.55
1997	7.50	7.20	12.30	0.61	0.59
1998	8.10	7.00	7.30	1.11	0.96
1999	2.60	2.50	3.30	0.79	0.76
2000	3.50	2.70	10.20	0.34	0.26
2001	16.70	18.50	15.70	1.06	1.18
2002	18.70	18.30	24.90	0.75	0.73
2003	24.60	23.40	26.00	0.95	0.90
2004	24.10	24.20	22.30	1.08	1.09
2005	20.20	21.40	16.80	1.20	1.27
2006	16.60	16.60	18.10	0.92	0.92
2007	10.10	10.00	4.30	2.35	2.33
2008	3.80	-	-	-	-

TABLE II-8. Predicted and postseason returns of Columbia River adult fall Chinook in thousands of fish. (Page 2 of 3)

Year	March Preseason	April STT Modeled	Postseason Return	March	April
	Forecast ^{a/}	Forecast ^{b/}		Pre/Postseason	Pre/Postseason
LRH					
1984	70.40	89.00	102.40	0.69	0.87
1985	81.50	86.70	111.00	0.73	0.78
1986	171.60	173.90	154.80	1.11	1.12
1987	294.90	298.70	344.10	0.86	0.87
1988	267.70	246.50	309.90	0.86	0.80
1989	104.90	97.50	130.90	0.80	0.74
1990	68.50	65.50	60.00	1.14	1.09
1991	71.40	73.10	62.70	1.14	1.17
1992	113.20	121.50	62.60	1.81	1.94
1993	79.30	77.70	52.30	1.52	1.49
1994	36.10	46.50	53.60	0.67	0.87
1995	35.80	42.40	46.40	0.77	0.91
1996	37.70	48.30	75.50	0.50	0.64
1997	54.20	68.70	57.40	0.94	1.20
1998	19.20	22.50	45.30	0.42	0.50
1999	34.80	38.20	40.00	0.87	0.96
2000	23.70	26.40	27.00	0.88	0.98
2001	32.20	30.50	94.30	0.34	0.32
2002	137.60	133.00	156.40	0.88	0.85
2003	115.90	116.90	155.00	0.75	0.75
2004	77.10	79.00	108.90	0.71	0.73
2005	74.10	78.44	78.30	0.95	1.00
2006	55.80	57.50	58.30	0.96	0.99
2007	54.90	54.40	32.70	1.68	1.66
2008	59.00	-	-	-	-
SCH					
1984	21.30	27.00	47.50	0.45	0.57
1985	34.90	37.10	33.20	1.05	1.12
1986	16.00	16.20	16.60	0.96	0.98
1987	9.10	9.20	9.10	1.00	1.01
1988	6.50	5.90	12.00	0.54	0.49
1989	29.50	23.00	26.80	1.10	0.86
1990	27.30	23.70	18.90	1.44	1.25
1991	56.30	61.40	52.40	1.07	1.17
1992	40.90	41.30	29.50	1.39	1.40
1993	19.90	18.20	16.80	1.18	1.08
1994	20.20	28.90	18.50	1.09	1.56
1995	17.50	22.50	33.80	0.52	0.67
1996	27.60	35.40	33.10	0.83	1.07
1997	21.90	25.70	27.40	0.80	0.94
1998	14.20	14.20	20.20	0.70	0.70
1999	65.80	61.00	50.20	1.31	1.22
2000	21.90	26.90	20.50	1.07	1.31
2001	56.60	61.90	125.00	0.45	0.50
2002	144.40	136.00	160.80	0.90	0.85
2003	96.90	101.90	180.60	0.54	0.56
2004	138.00	150.00	175.30	0.79	0.86
2005	114.10	115.79	93.10	1.23	1.24
2006	50.00	51.80	27.90	1.79	1.86
2007	21.80	21.30	14.60	1.49	1.46
2008	87.20	-	-	-	-

TABLE II-8. Predicted and postseason returns of Columbia River adult fall Chinook in thousands of fish. (Page 3 of 3)

Year	March Preseason	April STT Modeled	Postseason Return	March	April
	Forecast ^{a/}	Forecast ^{b/}		Pre/Postseason	Pre/Postseason
	MCB				
1990	69.50	69.30	58.90	1.18	1.18
1991	48.40	48.50	35.40	1.37	1.37
1992	42.50	40.70	31.10	1.37	1.31
1993	33.00	32.30	27.50	1.20	1.17
1994	23.90	26.70	33.70	0.71	0.79
1995	25.00	30.00	34.20	0.73	0.88
1996	40.80	43.20	59.70	0.68	0.72
1997	72.10	61.90	59.00	1.22	1.05
1998	47.80	44.90	36.80	1.30	1.22
1999	38.30	27.70	50.70	0.76	0.55
2000	50.60	61.60	36.80	1.38	1.67
2001	43.50	45.30	76.40	0.57	0.59
2002	96.20	91.80	108.40	0.89	0.85
2003	104.80	94.60	150.20	0.70	0.63
2004	90.40	88.80	117.60	0.77	0.76
2005	89.40	89.73	98.00	0.91	0.92
2006	88.30	86.60	80.40	1.10	1.08
2007	68.00	69.10	46.90	1.45	1.47
2008	54.00	-	-	-	-

a/ March preseason forecasts are ocean escapements based on terminal run size and stock-specific cohort relationships affected by the historical "normal" ocean fisheries, generally between 1979 and the most recent adequately complete broods.

b/ STT modeled forecasts adjust March preseason forecasts for Council-adopted ocean regulations each year and should provide a more accurate estimate of expected ocean escapement.

TABLE II-9. Comparison of preseason and postseason forecasts of Puget Sound run size for summer/fall Chinook. ^{a)} (Page 1 of 2)

Year	Nooksack-Samish Hatchery and Natural			East Sound Bay Hatchery			Skagit Hatchery			Skagit Natural		
	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1993	50.4	32.3	1.53	3.2	3.8	0.84	1.0	1.4	0.71	14.0	6.9	2.00
1994	46.6	28.1	1.66	3.2	0.7	4.00	1.3	5.5	0.30	8.4	5.9	1.27
1995	38.5	22.3	1.73	3.5	0.2	17.50	1.6	3.4	0.48	5.0	9.2	0.52
1996	27.0	29.2	0.92	1.7	0.5	2.43	1.0	1.2	0.83	7.1	10.9	0.58
1997	34.0	41.7	0.99	1.2	1.2	1.00	0.1	0.0	-	6.4	6.1	1.03
1998	28.0	31.5	0.95	0.5	0.3	1.67	0.0	0.0	-	6.6	15.0	0.44
1999	27.0	42.1	0.66	2.3	0.3	7.67	0.0	0.0	-	7.6	5.3	1.46
2000	19.0	32.6	0.57	5.0	0.1	50.00	0.0	0.0	-	7.3	17.3	0.42
2001	34.9	64.7	0.55	1.6	0.9	16.00	0.0	0.0	-	9.1	14.1	0.65
2002	52.8	54.3	0.99	1.6	0.9	2.29	0.0	0.1	-	13.8	20.0	0.69
2003	45.8	30.0	1.51	1.6	0.2	8.00	0.0	0.3	-	13.7	10.3	1.38
2004	34.2	17.9	1.83	0.8	0.0	-	0.5	0.0	-	20.3	24.3	0.83
2005	14.5	15.9	1.07	0.4	0.0	13.30	0.7	0.4	3.50	23.4	23.4	0.99
2006 ^{b)}	16.9	30.7	0.55	0.4	0.0	-	0.6	0.4	1.51	24.1	22.5	1.07
2007	18.8	NA	NA	0.4	NA	NA	1.1	NA	NA	15.0	NA	NA
2008	35.3	-	-	0.8	-	-	0.7	-	-	23.8	-	-
Stillaguamish Natural												
1993	NA	1.3	-	1.6	2.7	0.59	4.9	5.5	0.86	2.8	1.4	2.00
1994	NA	1.3	-	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.8	1.47
1995	1.8	0.9	1.29	2.2	4.0	0.37	4.3	4.0	0.73	2.3	8.5	0.56
1996	1.3	1.2	0.57	6.7	4.6	0.73	4.2	5.9	0.53	2.7	11.5	0.68
1997	1.6	1.2	1.33	7.7	12.0	2.85	5.2	4.4	1.18	4.0	8.7	0.47
1998	1.6	1.6	1.07	6.5	4.7	5.91	5.6	6.4	0.88	2.5	7.2	0.35
1999	1.5	1.1	1.36	7.8	4.7	4.88	5.6	4.8	1.17	4.5	15.2	0.30
2000	2.0	1.7	1.18	6.2	1.9	4.13	6.0	6.1	0.98	5.0	8.3	0.60
2001	1.7	1.4	1.21	4.1	0.9	5.86	5.8	8.4	0.69	5.5	5.1	1.08
2002	2.0	1.6	1.25	6.8	2.6	2.62	6.7	7.3	0.92	5.8	5.2	1.32
2003	2.0	1.0	2.00	9.4	5.8	47.00	5.5	5.6	0.98	6.0	8.7	0.80
2004	2.2	1.5	1.47	10.1	6.2	1.63	15.7	10.7	0.92	7.6	5.7	1.31
2005	2.0	1.0	2.00	9.9	3.7	2.68	14.2	4.6	3.16	9.2	7.4	1.24
2006 ^{b)}	1.6	1.3	1.26	9.6	4.9	1.97	8.7	8.4	1.03	10.0	4.0	2.51
Snohomish Hatchery												
1993	NA	1.3	-	1.6	2.7	0.59	4.9	5.5	0.86	2.8	1.4	2.00
1994	NA	1.3	-	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.8	1.47
1995	1.8	0.9	1.29	2.2	4.0	0.37	4.3	4.0	0.73	2.3	8.5	0.56
1996	1.3	1.2	0.57	6.7	4.6	0.73	4.2	5.9	0.53	2.7	11.5	0.68
1997	1.6	1.2	1.33	7.7	12.0	2.85	5.2	4.4	1.18	4.0	8.7	0.47
1998	1.6	1.6	1.07	6.5	4.7	5.91	5.6	6.4	0.88	2.5	7.2	0.35
1999	1.5	1.1	1.36	7.8	4.7	4.88	5.6	4.8	1.17	4.5	15.2	0.30
2000	2.0	1.7	1.18	6.2	1.9	4.13	6.0	6.1	0.98	5.0	8.3	0.60
2001	1.7	1.4	1.21	4.1	0.9	5.86	5.8	8.4	0.69	5.5	5.1	1.08
2002	2.0	1.6	1.25	6.8	2.6	2.62	6.7	7.3	0.92	5.8	5.2	1.32
2003	2.0	1.0	2.00	9.4	5.8	47.00	5.5	5.6	0.98	6.0	8.7	0.80
2004	2.2	1.5	1.47	10.1	6.2	1.63	15.7	10.7	0.92	7.6	5.7	1.31
2005	2.0	1.0	2.00	9.9	3.7	2.68	14.2	4.6	3.16	9.2	7.4	1.24
2006 ^{b)}	1.6	1.3	1.26	9.6	4.9	1.97	8.7	8.4	1.03	10.0	4.0	2.51
Tulalip Hatchery												
1993	NA	1.3	-	1.6	2.7	0.59	4.9	5.5	0.86	2.8	1.4	2.00
1994	NA	1.3	-	1.8	5.4	0.33	4.5	5.0	0.90	2.8	1.8	1.47
1995	1.8	0.9	1.29	2.2	4.0	0.37	4.3	4.0	0.73	2.3	8.5	0.56
1996	1.3	1.2	0.57	6.7	4.6	0.73	4.2	5.9	0.53	2.7	11.5	0.68
1997	1.6	1.2	1.33	7.7	12.0	2.85	5.2	4.4	1.18	4.0	8.7	0.47
1998	1.6	1.6	1.07	6.5	4.7	5.91	5.6	6.4	0.88	2.5	7.2	0.35
1999	1.5	1.1	1.36	7.8	4.7	4.88	5.6	4.8	1.17	4.5	15.2	0.30
2000	2.0	1.7	1.18	6.2	1.9	4.13	6.0	6.1	0.98	5.0	8.3	0.60
2001	1.7	1.4	1.21	4.1	0.9	5.86	5.8	8.4	0.69	5.5	5.1	1.08
2002	2.0	1.6	1.25	6.8	2.6	2.62	6.7	7.3	0.92	5.8	5.2	1.32
2003	2.0	1.0	2.00	9.4	5.8	47.00	5.5	5.6	0.98	6.0	8.7	0.80
2004	2.2	1.5	1.47	10.1	6.2	1.63	15.7	10.7	0.92	7.6	5.7	1.31
2005	2.0	1.0	2.00	9.9	3.7	2.68	14.2	4.6	3.16	9.2	7.4	1.24
2006 ^{b)}	1.6	1.3	1.26	9.6	4.9	1.97	8.7	8.4	1.03	10.0	4.0	2.51

TABLE II-9. Comparison of preseason and postseason forecasts of Puget Sound run size for summer/fall Chinook.^{a/} (Page 2 of 2)

Year	South Puget Sound Hatchery			South Puget Sound Natural			Strait of Juan de Fuca Hatchery			Strait of Juan de Fuca Natural		
	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason	Preseason Forecast	Postseason Return	Pre/Postseason
1993	61.8	43.1	1.68	26.5	9.6	1.34	0.7	1.0	3.50	3.1	1.6	1.29
1994	52.7	49.9	1.08	18.0	10.5	0.60	3.9	1.2	2.44	1.0	1.0	2.00
1995	49.6	75.4	0.67	21.7	24.9	0.63	3.0	0.7	30.00	0.9	2.3	0.33
1996	51.9	53.2	0.89	19.0	16.5	0.53	2.8	1.4	14.00	0.9	2.0	0.29
1997	65.1	38.3	1.40	18.2	15.9	0.88	2.2	1.0	7.33	0.8	2.9	0.23
1998	67.8	49.6	1.24	21.8	14.6	0.79	1.7	1.7	1.00	0.9	2.1	0.47
1999	59.4	67.3	0.71	19.6	33.5	1.15	1.9	0.7	2.71	0.9	2.7	0.33
2000	77.5	47.4	1.39	17.5	39.5	1.26	2.0	1.2	1.67	1.1	1.7	0.65
2001	73.7	76.6	0.76	16.2	44.6	0.80	0.0	1.7	NA	3.5	2.0	1.75
2002	90.8	69.2	1.07	16.9	58.5	0.79	0.0	1.6	NA	3.6	2.2	0.97
2003	86.6	56.6	1.14	19.6	31.0	1.28	0.0	1.3	NA	3.4	2.8	0.72
2004	86.5	66.4	1.16	17.5	24.5	0.61	0.0	1.4	NA	3.5	4.1	0.85
2005	83.1	73.7	0.95	17.7	19.1	0.46	0.0	1.4	NA	4.2	2.0	2.00
2006 ^{b/}	85.8	105.1	0.82	21.3	29.3	0.73	0.0	1.2	NA	4.2	3.0	1.39
2007	83.0	NA	NA	17.0	NA	NA	0.0	NA	NA	4.4	NA	NA
2008	101.6	-	-	21.1	-	-	0.0	-	-	4.5	-	-
Hood Canal Hatchery and Natural												
1993												
1994	11.7	4.7	2.44									
1995	11.5	3.7	3.03									
1996	3.9	9.9	0.41									
1997	9.0	8.1	1.10									
1998	2.7	7.8	0.34									
1999	6.7	16.3	0.41									
2000	14.0	29.0	0.47									
2001	19.2	20.1	0.90									
2002	25.3	26.6	1.31									
2003	24.0	39.6	0.76									
2004	29.6	36.5	0.86									
2005	30.5	41.1	1.36									
2006 ^{b/}	30.2	68.1	0.44									
2007	47.5	47.7	1.00									
2008	36.8	-	-									

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

b/ Postseason returns are preliminary.

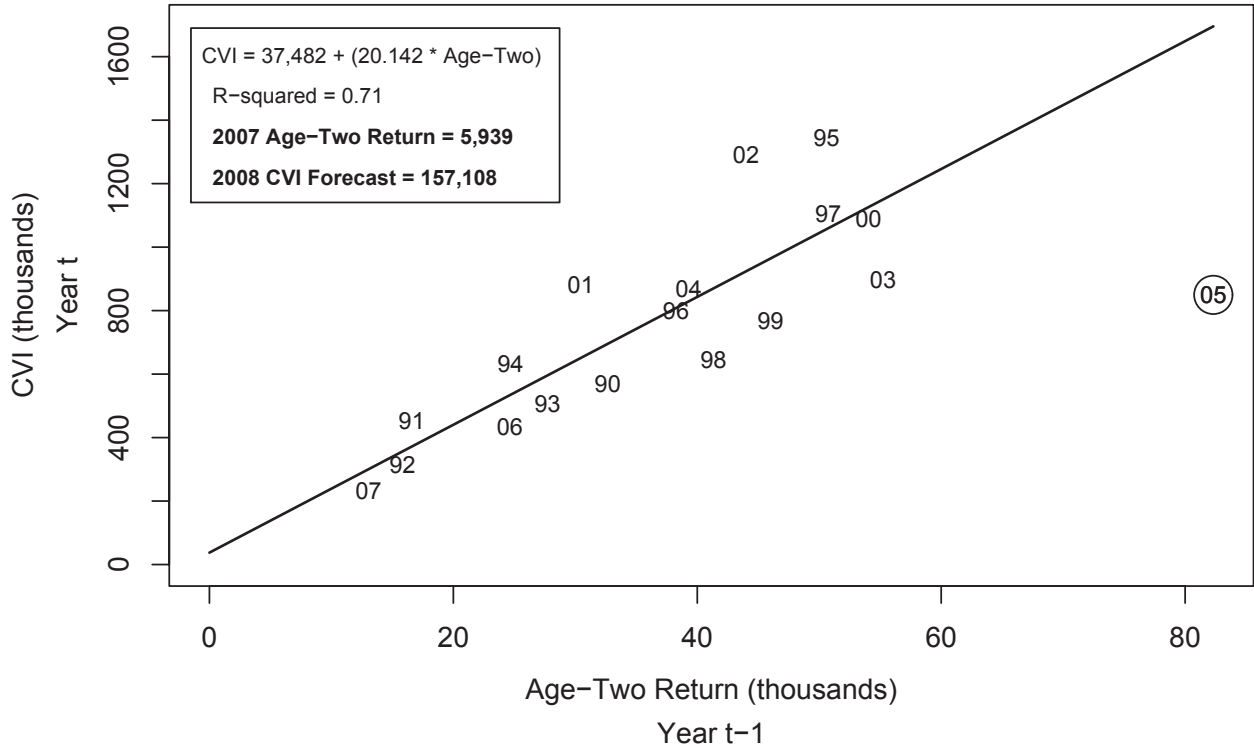


FIGURE II-1. Regression estimator for CVI based on previous year's river return of age-two Central Valley Chinook, 1990-2007 with 2005 data point omitted. Years shown are CVI year. Numbers in plot denote calendar year t.

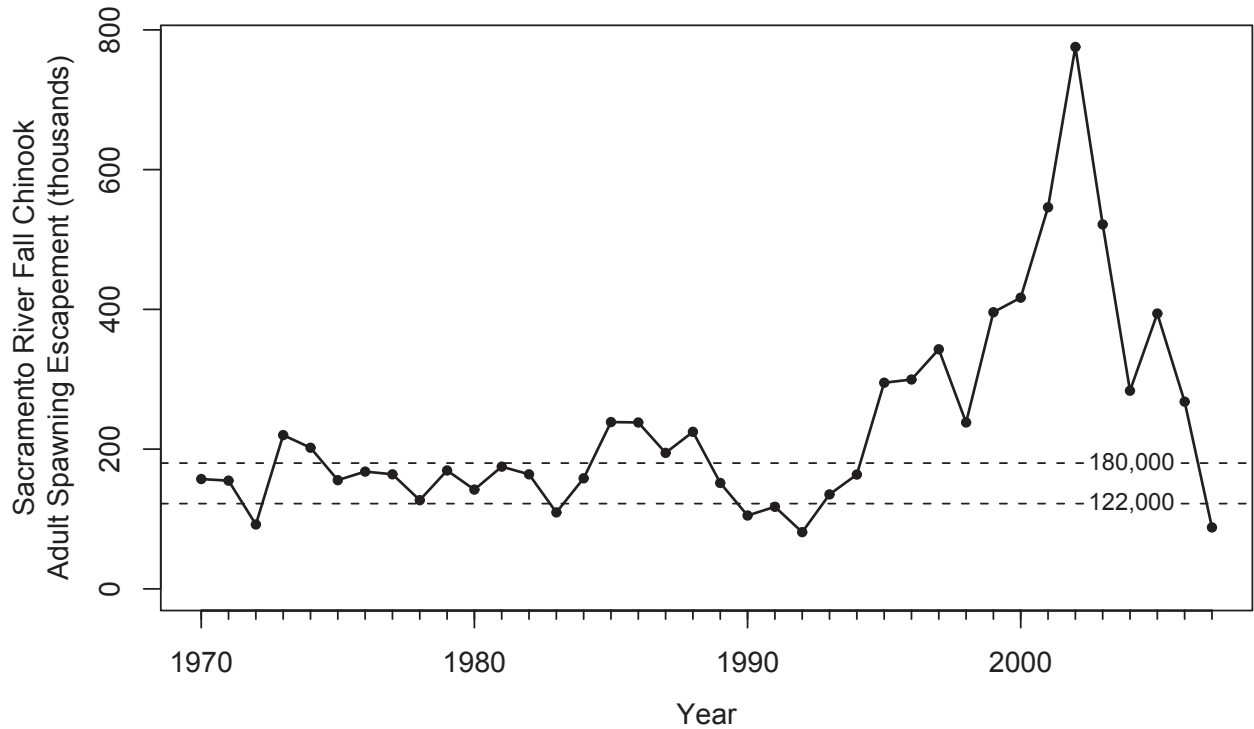


FIGURE II-2. Spawning escapements of adult Sacramento River fall Chinook, 1970-2007, and the goal range for the stock of 122,000 to 180,000 adult fish.

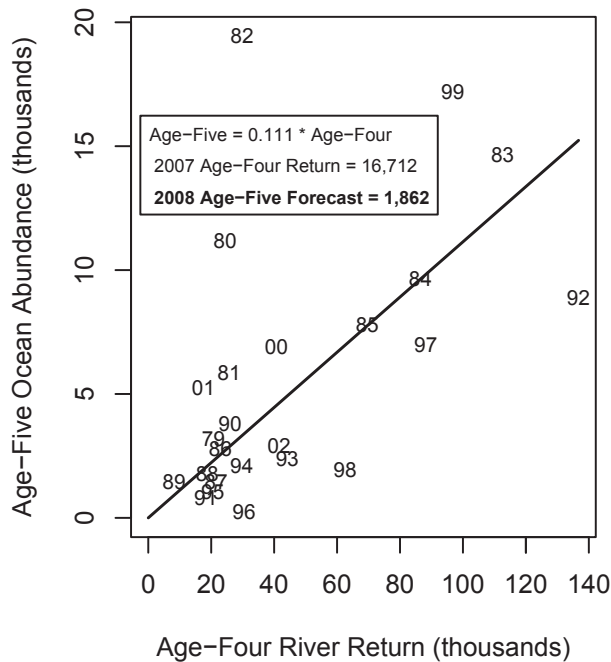
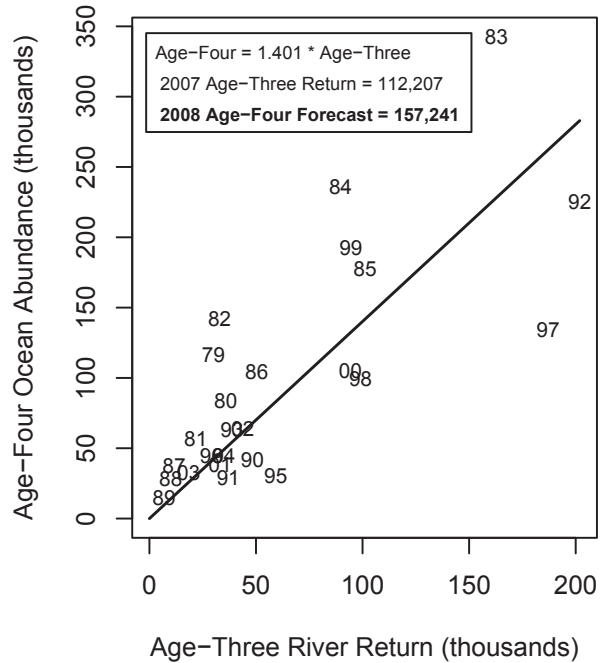
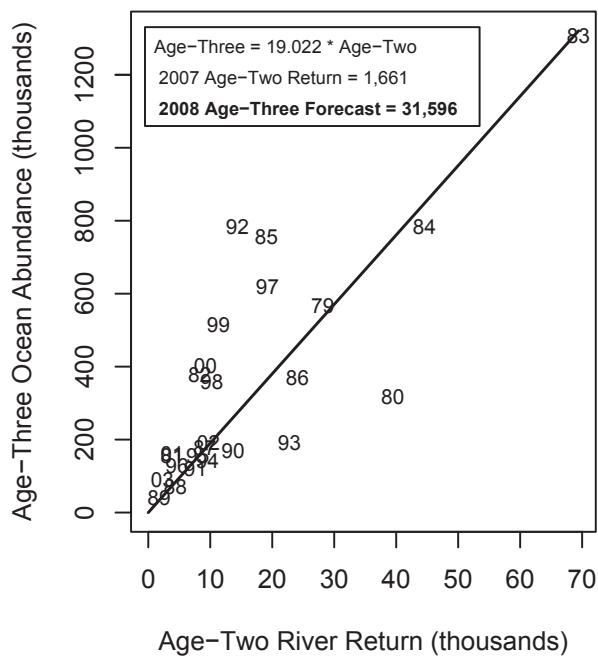


FIGURE II-3. Regression estimators for Klamath River fall Chinook ocean abundance (September 1) based on that year's river return of same cohort. Numbers in plots denote brood years.