CHAPTER I - ABUNDANCE PROJECTIONS

Abundance expectations in 2006 are summarized for key Chinook and coho salmon stocks in Tables I-1 and I-2, respectively. Information on pink salmon abundance, which is only significant in odd-numbered years, is contained in Chapter IV. Council Salmon Fishery Management Plan (FMP) management goals are presented in Table 1-3 and Appendix A, Table A-1.

In addition to the key stocks with abundance projections listed in Tables I-1 and I-2, Council management decisions for the 2006 ocean salmon fishing seasons may be constrained by other stocks, such as those listed under the ESA or subject to the PSC agreement, which may not have abundance projections made, or do not have abundance projections available in time for inclusion in this report. These include the following ESU's: Sacramento River Winter, Central Valley Spring, California Coastal, Lower Columbia River, and Snake River Fall Chinook; and Central California, Southern Oregon/Northern California, and Columbia River coho, as well as Interior Fraser (including Thompson River) coho.

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group	1999	2000	2001	2002	2003	2004	2005	2006	Methodology for 2006 Prediction and Source
California Central Valley (Index)									
Sacramento and San Joaquin Basins, Fall, Late Fall, Spring, and Winter Run	847.7	790.4	649.4	825.4	1,108.1	831.8	1,678.3	632.5	Linear regression analysis of river age-2 jacks on CVI of the following year. CDFG.
Klamath River (Ocean Abundance)									
Fall Run	165.6	389.9	435.5	362.5	310.2	216.3	239.8	110.0	Linear regression analysis of age-specific ocean abundance estimates on river runs of same cohort. KRTAT.
Oregon Coast									
North and South/Local Migrating	Preseason Estimates not Made								None.
Columbia River (Ocean Escapement)									
Upriver Spring	24.6	134.0	364.6	333.7	145.4	360.7	254.1[a/]	88.4	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Willamette Spring	46.0	59.9	61.0	73.8	109.8	109.4	116.9	46.5	Age-specific linear regressions of cohort returns in previous run years. ODFW staff.
Sandy Spring	4.3	3.8	4.0	4.3	4.8	5.2	7.4	8.2	Recent year average. ODFW staff.
Cowlitz Spring	2.1	2.0	1.0	3.1	4.9	15.9	12.7	3.0	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Kalama Spring	0.3	1.4	1.0	1.6	3.6	6.0	4.5	1.5	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Lewis Spring	1.5	2.6	2.8	2.0	3.1	5.4	7.6	1.8	Age-specific linear regressions of cohort returns in previous run years. WDFW staff.
Upriver Summer	16.5	33.3	24.5	77.7	87.6	102.8	62.4[a/]	49.0	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
URB Fall	147.5	171.1	127.2	281.0	280.4	292.2	352.2	253.9	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
SCH Fall	65.8	21.9	56.6	144.4	96.9	138.0	114.1	50.0	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
LRW Fall	2.6	3.5	16.7	18.7	24.6	24.1	20.2	16.6	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
LRH Fall	34.8	23.7	32.2	137.6	115.9	77.1	74.1	55.8	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
MCB Fall	38.3	50.6	43.5	96.2	104.8	90.4	89.4	88.3	Age-specific average cohort ratios/cohort regressions. Columbia River TAC.
Washington Coast (Ocean Escapement)									
Willapa Bay Natural	4.2	4.2	4.3	3.7	2.4	4.1	3.2	1.9	WDFW.
Hatchery	15.5	18.9	17.8	18.8	14.2	14.7	17.4	29.6	Mean return per release by age class. WDFW staff.
Other Coastal Stocks	Not Available								WDFW and Tribes.

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		1999	2000	2001	2002	2003	2004	2005	2006	Methodology for 2006 Prediction and Source
Puget Sound[b/]										
Nooksack/Samish	Hatchery	27.0	19.0	34.9	52.8	45.8	34.2	19.5	16.9	Brood release times average return-at-age/release. Last two years' R/S to fingerling release.
East Sound Bay	Hatchery	2.3	5.0	1.6	1.6	1.6	0.8	0.4	0.4	1999-2004 average adult return.
Skagit	Natural	7.6	7.3	9.1	13.8	13.7[c/]	20.4[c/]	23.4[c/]	24.1	Age specific average cohort rates. 1999-2003 BY for average at age return.
	Hatchery	0.0	0.0	0.0	0.0	0.0	0.5	0.7	0.6	Product of average brood age return rate (BYs 1994-2000) and appropriate year smolt releases.
Stillaguamish	Natural	1.5	2.0[d/]	1.7[d/]	2.0[d/]	2.0[d/]	3.3[d/]	2.0[d/]	1.6[d/]	Supplemental fish forecast based on observed survival rates for tagged fish (1986-1993). Natural-origin based on recruits per spawner for brood year forecast (2001-2004). Forecast is then supplemented plus natural origin.
Snohomish	Natural	5.6	6.0	5.8[d/]	6.7[d/]	5.5[d/]	15.7[d/]	14.2[d/]	8.7[d/]	Average total recruitment based on TRT A and P tables. For Skykomish used BYs 1994-1998 applied to 2001-2004 BY age returns.
	Hatchery	7.8	6.2	4.1	6.8[d/]	9.4[d/]	10.1[d/]	9.9[d/]	9.6[d/]	Yearlings based on CWT groups for Wallace Hatchery (BYs 1987 and 1992-1996). Fingerlings based on survival estimate from Tulalip Hatchery (BYs 2001-2004).
Tulalip	Hatchery	4.5	5.0	5.5	5.8[d/]	6.0[d/]	7.6[d/]	9.2[d/]	10.0[d/]	CWT survival rates (1986-1991) multiplied by release numbers for brood years 2001-2004.
South Puget Sound	Natural	19.6	17.5	16.2	16.9	19.6	17.5	17.7	21.3	Puyallup-based predicted return at age calculated for return years 1993-2004, multiplied by average difference between forecasts and run sizes from 1999 to 2005. For Nisqually, recent 5-year average (2000-2004).
	Hatchery	59.4	77.5	73.7	90.8	86.6	86.5	83.1	85.8	Average return at age multiplied by cohort release for Green and 10E. Average of two different methods for Carr Inlet, (1) 1980-2004 mean return/smolt released multiplied by 2001 brood smolts released, and (2) 1980-2004 mean return/pound released multiplied by 2002 brood pounds released.
Hood Canal	Natural	14.0	19.2	2.7	2.9[c/]	3.6[c/]	2.4[c/]	3.1[c/]	2.5[c/]	Forecast is the product of brood 2002 fingerling lbs released from WDFW facilities in 2003, multiplied by the average of post-season estimated terminal area return rates (total terminal run / hatchery fingerling lbs released 3 yrs previous) for the last four return years (2002-2005).
	Hatchery			22.6	21.1[c/]	30.2[c/]	27.2[c/]	27.5[c/]	27.7[c/]	Natural fish based on the Hood Canal terminal run reconstruction-based relative contribution of the individual Hood Canal management units in the 2002-2005 return years.
Strait of Juan de Fuca	Natural	0.9	1.1	3.5	3.6[c/]	3.4[c/]	3.6[c/]	4.2[c/]	4.2[c/]	Four year average 2002-2005 of terminal run size. Elwha estimate is a combination of hatchery and wild fish.
	Hatchery	1.9	2.0	0.0	0.0	0.0	0.0	0.0	0.0	

a/ Beginning in 2005, the upriver spring/summer designation was changed, with stream type Snake Basin summer fish being combined with the spring stock.
b/ Forecast is Puget Sound run size available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries.
c/ Terminal run forecast.
d/ Expected spawning escapement without fishing.

TABLE I-2. Preseason adult coho salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		1999	2000	2001	2002	2003	2004	2005	2006	Methodology for 2006 Prediction and Source
OPI Area (Total Abundance) (California and Oregon Coasts and Columbia River)		620.6	727.9	1,758.7	434.1	984.6	777.9	542.9	460.2	Sum of stock component estimates.
OPI Public	Hatchery	559.2	671.4	1,707.6	361.7	863.1	623.9	389.9	398.8	Multiple linear regression of OPI public hatchery jacks to adults adjusted for Columbia River delayed smolt release; 1970-2005 SRS accounting database. Public hatchery prediction is partitioned into Columbia River early and late, and coastal stocks based on the percent of jacks observed and recent year average stock specific maturation rates.
Columbia River Early		325.5	326.3	1,036.5	161.6	440.0	313.6	284.6	245.8	
Columbia River Late		140.9	278.0	491.8	143.5	377.9	274.7	78.0	113.8	
Coastal N. of Cape Blanco		59.4	48.5	127.3	36.6	29.3	16.6	11.5	8.6	
Coastal S. of Cape Blanco		33.4	18.6	52.0	20.0	15.9	19.0	15.8	30.6	
Oregon Coast (OCN)	Natural	60.7	55.9	50.1	71.8	117.9	150.9	152.0	60.8	For river production, relates ocean recruits (SRS accounting) to upwelling, sea surface temperature; data base 1970-2005. Most recent three-year average abundance for lake production.
STEP	Hatchery	0.7	0.6	1.0	0.6	3.6	3.1	1.0	0.6	Smolt production from 2003 brood year with 2002 brood year observed smolt to adult survival rate.
Washington Coast										A variety of methods were used for 2006, primarily based on smolt production and survival. See text in Chapter III for details.
Willapa	Natural	8.3	9.9	21.6	21.6	31.8	36.7	35.9	30.3	
	Hatchery	40.5	19.6	36.1	40.4	57.5	55.0	56.4	37.7	
Grays Harbor	Natural	57.7	47.8	51.3	55.4	58.0	117.9	91.1	67.3	
	Hatchery	30.4	75.8	67.1	56.8	64.0	67.8	54.4	52.4	
Quinault	Natural	7.3	4.4	8.7	29.4	47.7	50.5	44.9	28.8	
	Hatchery	8.2	7.4	10.8	12.3	20.6	18.2	33.6	34.5	
Queets	Natural	4.3	2.7	12.0	12.5	24.0	18.5	17.1	8.3	
	Hatchery	13.8	11.8	10.0	16.0	24.9	17.1	17.4	11.9	
	Supplemental[b/]	3.0	0.8	NA (Flood)	2.0	1.3	2.5	2.4	-	
Hoh	Natural	3.2	3.5	8.5	8.5	12.5	8.1	7.6	6.4	
Quillayute Fall	Natural	14.5	8.7	23.0	22.3	24.9	21.2	18.6	14.6	
	Hatchery	9.4	13.9	15.3	15.0	15.2	20.9	22.1	10.4	
Quillayute Summer	Natural	1.2	1.6	0.6	1.2	1.8	1.1	0.8	1.1	
	Hatchery	3.5	5.4	5.3	4.9	5.4	6.1	6.1	4.0	

TABLE I-2. Preseason adult coho salmon stock forecasts in thousands of fish. (Page 2 of 2)

Production Source and Stock or Stock Group		1999	2000	2001	2002	2003	2004	2005	2006	Methodology for 2006 Prediction and Source
North Coast Independent Tributaries	Natural	3.4	5.1	8.1	6.4	14.8	12.7	8.5	8.1	
	Hatchery	5.8	11.7	8.1	8.1	11.0	4.3	5.6	3.2	
WA Coast Total	Natural	99.9	83.7	133.8	157.3	215.5	266.7	224.5	164.9	
	Hatchery	114.6	146.4	152.7	155.5	199.9	191.9	198.0	154.1	
Puget Sound										A variety of methods were used for 2006, primarily based on smolt production and survival. See text in Chapter III and Joint WDFW and tribal annual reports on Puget Sound Coho Salmon Forecast Methodology for details.
Strait of Juan de Fuca	Natural	14.7	13.5	21.4	21.2	20.1	35.7	20.7	26.1	
	Hatchery	37.7	13.6	14.4	14.0[a/]	24.0[a/]	28.7[a/]	26.5[a/]	20.5	
Nooksack-Samish	Natural	13.8	14.9	12.4	22.0	16.4	27.5	17.0	18.3	
	Hatchery	95.0	65.5	44.4	105.4	66.2	75.5	89.5	81.1	
Skagit	Natural	75.7	30.2	87.2	98.5	116.6	155.8	61.8	106.6	
	Hatchery	10.9	10.3	10.1	14.1	10.4	22.8	9.1	22.5	
Stillaguamish	Natural	35.7	17.7	24.4	19.7	37.8	38.0	56.7	45.0	
	Hatchery	-	-	-	-	1.3	0.5	0.2	1.2	
Snohomish	Natural	141.6	53.0	129.6	123.1	203.0	192.1	241.6	139.5	
	Hatchery	87.8	62.1	60.9	60.3	35.4	48.3	59.1	96.4	
South Sound	Natural	19.4	11.7	29.5	40.4	103.6	61.3	45.7	45.3	
	Hatchery	372.1	121.8	172.6	222.5	315.6	288.4	222.2	256.1	
Hood Canal	Natural	65.1	61.0	62.0	34.9	32.4	98.7	98.4	59.4	
	Hatchery	96.8	38.5	33.5	31.3[a/]	48.0[a/]	43.1[a/]	60.6[a/]	57.9	
Puget Sound Total	Natural	366.0	202.0	366.5	359.8	529.9	609.2	541.9	440.2	
	Hatchery	700.3	311.8	335.9	447.6	501.0	507.3	465.2	535.7	

a/ Strait of Juan de Fuca and Hood Canal Hatchery numbers in 2002-2005 include natural coho from secondary (hatchery) management zones.
b/ Program ended in 2005.

TABLE I-3. Achievement of conservation objectives for natural stocks listed in Table 3-1 of the Pacific Coast Salmon Plan. Bolded numbers indicate a failure to meet the conservation objective. Stocks listed under the Endangered Species Act are not included. (Page 1 of 2)

Stock and Conservation Objective (thousands of spawners; spawners per mile; impact or replacement rate)	**Observed or Projected Conservation Achievement** (postseason estimates of thousands of spawners or spawners per mile; preseason or postseason impact or replacement rate)								**Overfishing Criteria**		
CHINOOK	1999	2000	2001	2002	2003	2004	2005[a/]	2006[b/]	Alert[c/]	Concern[d/]	Exception[e/]
Sacramento River Fall 122.0 - 180.0 adult spawners	395.9	416.8	546.1	775.5	521.6	283.6	383.5	359.2	No	No	No
Klamath River Fall - < 33%-34% avg. spawner reduction rate but no less than 35.0 adult natural spawners annually	**18.5**	82.7	77.8	65.6	87.6	**24.1**	**27.3**	**18.7**	Yes	No	No
Southern, Central and Northern Oregon Coast Spring and Fall No less than 60 adult spawners/mile[f/]	104.4	76.4	165.2	222.4	235.9	177.2	89.1	>60.0	No	No	No
Upper Columbia River Bright Fall 43.5 adults over McNary Dam Council area base period impacts <4%	78.4	66.4	110.5	141.6	173.7	168.9	134.8	>43.5	No	No	Exp. Rate
Columbia River Summer Chinook 80.0 to 90.0 adults over Bonneville Dam Council area base period impacts <2%	**26.2**	**30.6**	**76.2**	127.4	114.8	NA	NA	NA	NA	NA	NA
In 2004 state and tribal co-managers changed the stock definition from Chinook passing Bonneville Dam after May 31 to Chinook passing Bonneville Dam after June 14, and the goal changed to 29,000 at the river mouth	**22.3**	**23.2**	54.9	92.8	83.1	65.4	60.1	>29.0	No	No	Exp. Rate
Grays Harbor Fall - 14.6 adult spawners (MSP)	**10.4**	**9.3**	**9.5**	**11.3**	19.4	31.8	NA[g/]	NA[g/]	No	No	Exp. Rate
Grays Harbor Spring - 1.4 adult spawners	1.3	2.9	2.9	2.6	1.9	5.0	NA[g/]	NA[g/]	No	No	Exp. Rate
Queets Fall - no less than 2.5 adult spawners (MSY)	**1.9**	3.6	2.9	1.9	5.0	3.5	2.1	NA[g/]	No	No	Exp. Rate
Queets Spring/Summer - no less than 0.7 adult spawners	**0.4**	**0.3**	**0.6**	0.7	**0.2**	**0.6**	**0.4**	NA[g/]	Limited[e/]	No	Exp. Rate
Hoh Fall - no less than 1.2 adult spawners (MSY)	1.9	1.7	2.6	4.4	1.6	3.2	1.9	NA[g/]	No	No	Exp. Rate
Hoh Spring/Summer - no less than 0.9 adult spawners	0.9	0.5	1.2	2.5	1.2	1.8	1.2	NA[g/]	No	No	Exp. Rate
Quillayute Fall - no less than 3.0 adult spawners (MSY)	3.3	3.7	5.1	6.1	7.4	3.8	6.7	NA[g/]	No	No	Exp. Rate
Quillayute Spring/Summer - 1.2 adult spawners (MSY)	**0.7**	**1.0**	1.2	**1.0**	1.2	**1.1**	**0.7**	NA[g/]	Limited[e/]	No	Exp. Rate

TABLE I-3. Achievement of conservation objectives for natural stocks listed in Table 3-1 of the Pacific Coast Salmon Plan. Bolded numbers indicate a failure to meet the conservation objective. Stocks listed under the Endangered Species Act are not included. (Page 2 of 2)

Stock and Conservation Objective (thousands of spawners; spawners per mile; impact or replacement rate)	**Observed or Projected Conservation Achievement** (postseason estimates of thousands of spawners or spawners per mile; preseason or postseason impact or replacement rate)								**Overfishing Criteria**		
COHO	1999	2000	2001	2002	2003	2004	2005[a/]	2006[b/]	Alert[c/]	Concern[d/]	Exception[e/]
Grays Harbor - 35.4 adult spawners (MSP)	**33.3**	38.1	79.1	108.0	83.9	NA[g/]	NA[g/]	>35.4	No	No	No
Queets - 5.8 to 14.5 adult spawners (MSY range) Includes supplemental adults	**5.3**	8.6	24.9	13.7	8.6	8.7	9.1	>5.8	No	No	No
Hoh - 2.0 to 5.0 adult spawners (MSY range)	4.6	6.8	10.8	9.0	6.3	4.7	6.4	>2.0	No	No	No
Quillayute Fall - 6.3 to 15.8 adult spawners (MSY range)	9.4	13.3	18.9	23.0	14.8	13.4	11.3	>6.3	No	No	No
Western Strait of Juan de Fuca - 11.9 adult spawners	**8.0**	16.9	34.3	20.6	12.4	12.0	>11.9	>11.9	No	No	No
Eastern Strait of Juan de Fuca - 0.95 adult spawners	1.4	2.1	2.6	2.5	2.9	8.50	>0.95	>0.95	No	No	No
Hood Canal - 21.5 adult spawners (MSP)	**16.6**	27.3	94.7	69.3	170.3	146.1	>21.5	>21.5	No	No	No
Skagit - 30.0 adult spawners (MSP)	**27.3**	62.9	87.0	56.0	69.2	139.2	>30.0	>30.0	No	No	No
Stillaguamish - 17.0 adult spawners (MSP)	**7.0**	28.3	73.6	27.3	45.7	59.2	>17.0	>17.0	No	No	No
Snohomish - 70.0 adult spawners (MSP)	**61.3**	94.2	261.8	161.6	182.7	252.8	>70.0	>70.0	No	No	No

a/ Preliminary data.

b/ Preliminary approximations based on preseason abundance projections and last year's regulations or season structures.

c/ Conservation Alert - triggered during the annual preseason process if a natural stock or stock complex, listed in Table 3-1 of the salmon FMP, is projected to fall short of its conservation objective (MSY, MSY proxy, MSP, or floor in the case of some harvest rate objectives [e.g., 35,000 natural Klamath River fall Chinook spawners]).

Actions for Stocks that are not Exceptions (beginning in 2001) - The Council will close salmon fisheries within its jurisdiction which impact the stocks, except in the case of Washington coastal and Puget Sound salmon stocks and fisheries managed under U.S. District Court orders. In these cases, the Council may allow fisheries which meet annual spawner targets developed through relevant U.S. v. Washington, Hoh v. Baldrige, and subsequent U.S. District Court ordered processes and plans, that may vary from the MSY or MSP conservation objectives. For all natural stocks that meet the conservation alert criteria, the Council will notify pertinent fishery and habitat managers, advising that the stock may be temporarily depressed or approaching an overfishing concern (depending on its recent conservation status), and request state and tribal fishery managers identify the probable causes, if known. If the stock has not met its conservation objective in the previous two years, the Council will request state and tribal managers to do a formal assessment of the primary factors leading to the shortfalls and report to the Council no later than the March meeting prior to the next salmon season.

d/ Overfishing concern - triggered if, in three consecutive years, the postseason estimates indicate a natural stock, listed in Table 3-1 of the salmon FMP, has fallen short of its conservation objective (MSY, MSP, or spawner floor as noted for some harvest rate objectives).

Actions required for Stocks that are not Exceptions - Within one year, the STT to recommend and the Council to adopt management measures to end the overfishing concern and recover the stock in as short a time as possible, preferably within ten years or less. The HC to provide recommendations for habitat restoration and enhancement measures within a suitable time frame.

e/ Exception - strict application of the conservation alert and overfishing criteria and subsequent Council actions do not apply for (1) hatchery stocks, (2) natural stocks with a cumulative adult equivalent exploitation rate limited to less than 5% in ocean fisheries under Council jurisdiction during the FRAM base periods, and (3) stocks listed under the ESA.

Conservation Alert and Overfishing Concern Actions for Natural Stocks that are Exceptions (those with exploitation rates limited to less than 5% in base period Council-area ocean fisheries) - Use the expertise of STT and HC to confirm negligible impacts of proposed Council fisheries, identify factors which have led to the decline or low abundance (e.g., fishery impacts outside Council jurisdiction, or degradation or loss of essential fish habitat) and monitor abundance trends and total harvest impact levels. Council action will focus on advocating measures to improve stock productivity, such as reduced interceptions in non-Council managed fisheries, and improvements in spawning and rearing habitat, fish passage, flows, and other factors affecting overall stock survival.

f/ Based on the sum of south/local and north migrating spawners per mile weighted by the total number of miles surveyed for each of the two components (2.2 miles for south/local and 7.5 miles for northern stocks).

g/ Preseason forecasts are not available for Washington coastal Chinook stocks.