SALMON TECHNICAL TEAM REPORT 1

Excerpts from Review of 2017 Ocean Salmon Fisheries and 2018 Preseason Report I

March 10, 2018

TABLE II-6. Chinook stock status relative to overfished and overfishing criteria. A stock is overfished if the 3-year geometric mean spawning escapement is less than the minimum stock size threshold (MSST); a stock experiences overfishing if the total annual exploitation rate exceeds the maximum fishing mortality threshold (MFMT).

	Spawning Escapement									Exploitation Rate						
Chinook Stock	2012	2013	2014	2015	2016	2017	3-yr Geo Mean	MSST	S_{MSY}	2012	2013	2014	2015	2016	2017	MFMT
Sacramento Fall	285,429	406,200	212,468	112,947	89,674	44,574	**76,714**	91,500	122,000	0.54	0.53	0.62	0.56	0.57	NA	0.78
Klamath River Fall	121,543	59,156	95,104	28,112	13,937	18,514	**19,358**	30,525	40,700	0.45	0.64	0.36	0.59	0.37	NA	0.71
Southern Oregon	69,060	81,655	53,546	30,462	27,278	90,674	42,236	20,500	34,992	NA	NA	NA	NA	NA	NA	0.78
Central and Northern OR[a/]	146	189	157	247	118	114	149	30 fish/mile	150k-200k	0.64	0.46	0.43	NA	NA	NA	0.78
Upper River Bright - Fall[a/]	94,925	305,445	233,934	323,276	151,373	96,026	167,496	19,182	39,625	0.49	0.52	0.53	0.40	NA	NA	0.86
Upper River - Summer[a/]	52,184	68,380	77,982	88,691	79,253	56,265	73,403	6,072	12,143	**0.78**	0.58	0.74	**0.89**	NA	NA	0.75
Willapa Bay - Fall[b/]	2,677	1,904	2,075	2,824	1,887	NA	2,228	1,696	3,393	0.71	0.59	0.49	0.57	NA	NA	0.78
Grays Harbor Fall[b/]	14,032	12,582	11,821	22,200	11,248	NA	14,345	5,694	11,388	0.71	0.59	0.49	0.57	NA	NA	0.78
Grays Harbor Spring	878	2,459	1,583	1,841	926	NA	1,392	546	1,092	NA	NA	NA	NA	NA	NA	0.78
Queets - Fall[a/]	3,707	2,582	3,820	5,313	2,915	NA	3,897	1,250	2,500	0.71	0.59	0.49	0.57	NA	NA	0.87
Queets - Sp/Su	760	520	377	532	704	NA	521	350	700	NA	NA	NA	NA	NA	NA	0.78
Hoh - Fall[b/]	1,937	1,269	1,933	1,795	2,831	1,808	2,094	600	1,200	0.71	0.59	0.49	0.57	NA	NA	0.90
Hoh Sp/Su	915	750	744	1,070	1,144	1,364	1,186	450	900	NA	NA	NA	NA	NA	NA	0.78
Quillayute - Fall[b/]	3,518	3,901	2,782	3,440	3,654	3,391	3,493	1,500	3,000	0.71	0.59	0.49	0.57	NA	NA	0.87
Quillayute - Sp/Su	729	957	608	794	900	1,146	936	600	1,200	NA	NA	NA	NA	NA	NA	0.78
Hoko -Su/Fa[a/]	663	1,406	1,760	2,877	1,324	1,188	1,654	425	850	0.33	0.23	0.42	0.29	NA	NA	0.78

a/ CWT based exploitation rates from PSC-CTC 2017 Exploitation Rate Analysis and Model Calibration.

b/ Queets River fall Chinook coded-wire-tag (CWT) exploitation rates used as a proxy. Exploitation rates in the terminal fisheries will differ from those calculated for Queets fall CWTs.

TABLE III-7. Coho stock status relative to overfished and overfishing criteria. A stock is overfished if the 3-year geometric mean spawning escapement is less than the minimum stock size threshold (MSST); a stock experiences overfishing if the total annual exploitation rate exceeds the maximum fishing mortality threshold (MFMT).

	Spawning Escapement									Total Exploitation Rate						
Coho Stock	2012	2013	2014	2015	2016	2017	3-yr Geo Mean	MSST	S_{MSY}	2012	2013	2014	2015	2016	2017	MFMT
Willapa Bay	18,880	22,638	47,154	10,790	25,290	NA	23,433	8,600	17,200	0.50	0.23	0.50	0.49	NA	NA	0.74
Grays Harbor	66,836	56,785	105,039	21,278	37,849	NA	43,898	18,320	24,426	0.44	0.44	0.46	0.50	NA	NA	0.65
Queets	4,285	5,684	7,557	2,028	5,156	NA	**4,291**	4,350	5,800	0.30	0.39	0.44	0.33	NA	NA	0.65
Hoh	4,072	2,899	4,565	1,794	5,009	4,478	3,427	1,890	2,520	0.46	**0.70**	0.43	0.30	NA	NA	0.65
Quillayute Fall	5,846	7,072	7,425	2,571	9,630	8,745	6,005	4,725	6,300	0.53	0.55	0.50	0.45	NA	NA	0.59
Juan de Fuca	11,021	8,461	11,002	3,779	7,704	NA	**6,842**	7,000	11,000	0.12	0.13	0.17	0.18	NA	NA	0.60
Hood Canal	45,921	16,064	26,776	26,926	24,313	NA	25,977	10,750	14,350	**0.70**	0.58	**0.66**	0.59	NA	NA	0.65
Skagit	92,687	85,751	24,820	5,794	35,823	NA	17,271	14,875	25,000	0.31	0.44	0.50	0.58	NA	NA	0.60
Stillaguamish	45,156	60,387	35,763	2,909	12,933	NA	11,040	6,100	10,000	0.29	0.33	0.40	0.50	NA	NA	0.50
Snohomish	130,637	125,870	46,244	12,804	44,141	NA	**29,677**	31,000	50,000	0.31	0.39	0.43	0.58	NA	NA	0.60

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 1 of 3)

Production Source and Stock or Stock Group	2013	2014	2015	2016	2017	2018	Methodology for 2018 Prediction and Source
Sacramento River							
Fall (Sacramento Index)	834.2	634.7	652.0	299.6	230.7	229.4	Log-log regression of the Sacramento Index on jack escapement from the previous year, accounting for lag-1 autocorrelated errors. STT.
Winter (age-3 absent fishing)	--	--	--	--	--	1.6	Stochastic life cycle model applied to natural- and hatchery-origin production. STT.
Klamath River (Ocean Abundance)							
Fall	727.7	299.3	423.8	142.2	54.2	359.2	Linear regression analysis of age-specific ocean abundance estimates on river runs of same cohort. STT.
Oregon Coast							
North and South/Local Migrating	--	--	--	--	--	--	None.
Columbia River (Ocean Escapement)							
Upriver Spring [a/]	141.4	227.0	232.5	188.8	160.4	166.7	Log-normal sibling regressions of cohort returns in previous run years. Columbia River TAC.
Willamette Spring	59.8	58.7	55.4	68.7	38.1	53.8	Age-specific linear regressions of cohort returns in previous run years. ODFW.
Sandy Spring	6.1	5.5	5.5	NA	3.6	5.3	Recent 3-year average. ODFW.
Cowlitz Spring	5.5	7.8	11.2	25.1	17.1	5.2	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Kalama Spring	0.7	0.5	1.9	4.9	3.1	1.5	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Lewis Spring	1.6	1.1	1.1	1.0	0.7	3.7	Age-specific linear regressions of cohort returns in previous run years. WDFW.
Upriver Summer [b/]	73.5	67.5	73.0	93.3	63.1	67.3	Log-linear brood year sibling regressions or average return (4-ocean fish). Columbia River TAC subgroup.
URB Fall	432.5	973.3	500.3	589.0	260.0	200.1	Columbia River Fall Chinook: Age-specific average cohort ratios or brood year sibling regressions. Columbia River TAC subgroup and WDFW.
SCH Fall	38.0	115.1	160.5	89.6	158.4	50.1	
LRW Fall	14.2	34.2	18.9	22.2	12.5	7.6	
LRH Fall	88.0	110.0	94.9	133.7	92.4	62.4	
MCB Fall	105.2	360.1	113.3	101.0	45.6	36.4	

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 2 of 3)

Production Source and Stock or Stock Group		2013	2014	2015	2016	2017	2018	Methodology for 2018 Prediction and Source
Washington Coast								
Willapa Bay Fall	Natural	4.9	2.9	3.8	3.3	4.2	3.8	Return per spawners applied to 3-6 year olds (brood years 2012-15)
	Hatchery	22.2	29.5	31.0	36.2	34.3	40.3	adjusted by brood year performance.
Grays Harbor Fall	Natural	--	--	--	--	--	16.4	Based on a 4-year average recruits for age-3, and recruits per spawner adjusted by brood performance for age-4, 5, 6.
	Hatchery	--	--	--	--	--	4.8	Based on a 10-year average recruits per spawn for age 3 and log linear regressions for age-4 on Age-2 and 3; age-5 on age-2, 3, and 4 for all stocks; and age- 6 on age-5.
Quinault Spring/Summer	Natural	NA	NA	NA	NA	NA	NA	Hatchery: Based on ten-year average recruits per spawner for age-
	Hatchery	--	--	--	--	--	4.8	3; log linear regressions for age-4 on age-2 and 3; age-5 on age-2, 3, 4 for all stocks; and age-6 on age-5.
Quinault Fall	Natural	4.0	6.0	8.1	5.5	5.9	NA	
	Hatchery	3.1	10.3	4.0	5.3	4.4	NA	
Queets Spring/Sum	Natural	0.4	0.5	0.4	0.5	0.5	0.5	Recent year average.
Queets Fall	Natural	3.8	3.6	4.3	4.9	3.7	3.3	Recruits per spawner adjusted by brood performance.
	Hatchery	0.9	0.9	1.5	1.7	0.9	0.6	Recruits per spawner adjusted by brood performance.
Hoh Spring/Summer	Natural	0.9	0.9	0.8	0.9	1.0	1.1	Spawner/Recruit all years geometric mean for each age class.
Hoh Fall	Natural	3.1	2.5	2.6	1.8	2.7	2.6	Spawner/Recruit of recent 3 years adjusted by previous brood performance for all ages.
Quillayute Spring	Hatchery	2.1	2.0	1.7	1.8	2.2	2.1	Recent 2 year mean adjusted by previous performance.
Quillayute Sum/Fall	Natural	6.6	7.6	8.5	7.5	7.6	8.0	Summer: Recent 5 year mean for all ages except age-3. Used the regression of age-3 to escapement. Fall: Recent 5 year means; adjusted for previous 5 year forecast performance.
Hoko[c/]	Natural	1.2	2.7	3.3	2.9	1.5	1.5	Includes supplemental. 2017 recruits for age-3 is recent 5-year average return, age 4-6 is sibling regression.
North Coast Totals								
Spring/Summer	Natural	1.3	1.4	1.2	1.4	NA	NA	
Fall	Natural	17.5	19.7	23.5	19.7	NA	NA	
Spring/Summer	Hatchery	2.1	2.0	1.7	1.8	NA	NA	
Fall	Hatchery	4.0	11.2	5.5	7.0	NA	NA	

TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 3 of 3)

Production Source and Stock or Stock Group		2013	2014	2015	2016	2017	2018	Methodology for 2018 Prediction and Source
Puget Sound summer/fall[d/]								
Nooksack/Samish	Hatchery	46.3	43.9	38.6	27.9	21.2	24.6	Three year average return rate.
East Sound Bay	Hatchery	1.9	1.2	1.2	0.7	0.8	0.7	Three year average return rate.
Skagit[e/]	Natural	12.9	18.0	11.8	15.1	15.8	13.3	Natural: Hierarchical Bayesian model to estimate the spawner-recruit dynamics. Hatchery: Recent 4-year average terminal smolt to adult return rate to estimate ages 3 -5.
	Hatchery	0.3	0.3	0.6	0.4	0.4	0.3	
Stillaguamish[f/]	Natural	1.3	1.6	0.5	0.5	1.5	1.6	Natural plus Hatchery. Multiple regression environmental model (EMPAR).
Snohomish[f/]	Natural	3.6	5.3	4.2	3.3	3.4	3.5	Multiple regression environmental model (EMPAR).
	Hatchery	6.9	5.4	3.3	5.0	4.8	6.5	Terminal Run (to 8-2), with ocean fishing, Wallace Model Data.
Tulalip[f/]	Hatchery	10.9	4.7	1.3	1.4	5.3	7.5	Three year geomean terminal return.
South Puget Sound	Natural	5.0	4.8	3.8	4.5	4.7	4.8	Natural: Puyallup R. average return per spawner applied to brood years contributing ages 3-5. For Nisqually, 4-year average SAR age specific survival. For Green, 3-year average return/out-migrant rate for each age. Hatchery: Average return at age multiplied by smolt release for Green, Nisqually, Puyallup, Carr Inlet, and Area 10E.
	Hatchery	102.0	96.7	62.4	43.1	80.4	123.6	
Hood Canal[e/]	Natural	3.4	3.5	3.1	2.3	2.5	3.9	Natural fish based on the Hood Canal terminal run reconstruction-based relative contribution of the individual Hood Canal management units in the 2013-2017 return years.
	Hatchery	65.7	80.6	59	42.7	48.3	57.6	Brood 2015 fingerling lbs released from WDFW facilities in 2015, multiplied by the average of post-season estimated terminal area return rates for the last 3 years (2013-2017).
Strait of Juan de Fuca Including Dungeness spring run [e/]	Natural	3.1	3.8	4.9	3.7	3.1	6.0	Natural and hatchery. Dungeness and Elwha hatchery estimated by recent return rates time average releases. Dungeness wild estimated by smolts times average hatchery return rate. Elwha wild estimated using recent 3 year returns from otolith and CWT.

a/ Since 2005, the upriver spring Chinook run includes Snake River summer Chinook.

b/ Since 2005, the upriver summer Chinook run includes only upper Columbia summer Chinook, and not Snake River summer Chinook.

c/ Expected spawning escapement without fishing.

d/ Unless otherwise noted, forecasts are for Puget Sound run size (4B) available to U.S. net fisheries. Does not include fish caught in troll and recreational fisheries.

e/ Terminal run forecast.

f/ 2018 in terminal runsize; 2010-2014 as escapement without fishing; 2015-2017 a mixture of runsize types.

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

Production Source and Stock or Stock Group		2013	2014	2015	2016	2017	2018	Methodology for 2018 Prediction and Source
OPI Area Total Abundance (California, Oregon Coasts, and Columbia River)		716.4	1,213.7	1,015.0	549.2	496.2	349.0	Abundance of all OPI components based on cohort reconstruction including all fishery impacts using Mixed Stock Model (MSM); prior to 2008 only fishery impacts south of Leadbetter Point were used (traditional OPI accounting). OPITT, see Chapter III for details.
OPI Public	Hatchery	525.4	983.1	808.4	396.5	394.3	294.1	OPIH: Columbia River jacks adjusted for delayed smolt releases and total OPI jacks regressed on 1970-2017 adults. Columbia/Coastal proportions based on jacks; Columbia early/late proportions based on jacks; Coastal N/S proportions based on smolts.
Columbia River Early		331.6	526.6	515.2	153.7	231.7	164.7	
Columbia River Late		169.5	437.5	261.8	226.9	154.6	121.5	
Coastal N. of Cape Blanco		5.6	4.8	6.9	5.5	3.5	3.3	
Coastal S. of Cape Blanco		18.7	14.2	24.4	10.4	4.5	4.6	
Lower Columbia River	Natural	46.5	33.4	35.9	40.0	30.1	21.9	Oregon: recent two year average return; Washingtion: natural smolt production multiplied by 2015 brood marine survival rate. Abundance is subset of early/late hatchery abundance above.
Oregon Coast (OCN)	Natural	191.0	230.6	206.6	152.7	101.9	54.9	Rivers: Generalized additive model (GAM) relating ocean recruits to parental spawners and marine environmental variables. See text in Chapter III for details. Lakes: recent three year average return.
Washington Coast								
Willapa	Natural	58.6	58.9	42.9	39.5	36.7	20.6	Washington Coast stocks: A variety of methods were used for 2018, primarily based on smolt production and survival. See text in Chapter III for details.
	Hatchery	37.1	41.0	57.7	28.1	55.0	44.5	
Grays Harbor	Natural	196.8	108.8	142.6	35.7	50.0	42.4	
	Hatchery	85.2	65.4	46.6	22.9	36.4	51.4	
Quinault	Natural	32.1	25.0	44.2	17.1	26.3	25.4	
	Hatchery	42.0	24.7	24.9	19.8	29.4	29.6	
Queets	Natural	24.5	10.3	7.5	3.5	6.5	7.0	
	Hatchery	19.8	15.7	11.3	4.5	13.7	10.8	
Hoh	Natural	8.6	8.9	5.1	2.1	6.2	5.8	

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

Production Source and Stock or Stock Group		2013	2014	2015	2016	2017	2018	Methodology for 2018 Prediction and Source
Quillayute Fall	Natural	17.2	18.4	10.5	4.5	15.8	10.6	
	Hatchery	12.4	12.6	8.0	6.4	17.6	16.5	
Quillayute Summer	Natural	0.5	2.0	1.2	0.3	1.5	2.7	
	Hatchery	3.3	3.2	2.2	1.4	3.4	3.3	
North Coast Independent Tributaries	Natural	17.8	15.2	11.7	1.9	6.5	4.1	
	Hatchery	6.3	11.6	11.9	2.5	0.2	NA	
WA Coast Total	Natural	356.1	247.5	265.6	104.6	149.5	118.7	
	Hatchery	206.1	174.2	162.6	85.6	155.6	NA	
Puget Sound								
Strait of Juan de Fuca	Natural	12.6	12.5	11.1	4.4	13.1	7.2	Puget Sound stocks: A variety of methods were used for 2018, 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.
	Hatchery	17.6	17.3	11.1	3.9	15.4	10.6	
Nooksack-Samish	Natural	45.4	20.8	28.1	9.0	13.2	20.6	
	Hatchery	49.2	61.7	50.8	28.8	45.6	61.3	
Skagit	Natural	137.2	112.4	121.4	8.9	11.2	59.2	
	Hatchery	16.3	15.8	19.5	4.9	7.6	13.1	
Stillaguamish	Natural	33.1	32.5	31.3	2.8	7.6	19.0	
	Hatchery	3.1	6.0	0.0	0.0	1.5	0.0	
Snohomish	Natural	163.8	150.0	151.5	20.6	107.3	65.9	
	Hatchery	111.5	78.2	53.9	16.7	62.0	38.3	
South Sound	Natural	36.0	62.8	63.0	9.9	20.2	11.7	
	Hatchery	151.0	150.7	180.2	27.1	102.4	79.0	
Hood Canal	Natural	36.8	82.8	61.5	35.3	115.6	59.5	
	Hatchery	68.6	47.6	108.4	83.5	74.9	84.5	
Puget Sound Total	Natural	464.9	473.8	467.9	91.0	288.3	243.1	
	Hatchery	417.3	377.3	423.9	165.0	309.3	286.8	

TABLE V-4. Stock status relative to overfished and overfishing criteria. A stock is approaching an overfished condition if the 3-year geometric mean of the most recent two years and the forecast spawning escapement is less than the minimum stock size threshold (MSST); a stock would experience overfishing if the total annual exploitation rate exceeds the maximum fishing mortality threshold (MFMT). Occurrences of stocks *at risk of* approaching an overfished condition or experiencing overfishing are indicated in **bold**. 2018 spawning escapement and exploitation rate estimates are based on preliminary 2018 preseason abundance forecasts and 2017 Council regulations.

	Spawning Escapement									Total Exploitation Rate						
	2013	2014	2015	2016	2017[a/]	Forecast 2018[b/]	3-yr Geo Mean	MSST	S_{MSY}	2013	2014	2015	2016	2017[a/]	2018[b/]	MFMT
Chinook																
Sacramento Fall	406,200	212,468	112,947	89,674	44,574	134,942	**81,401**	91,500	122,000	0.53	0.61	0.56	0.56	0.68	0.41	0.78
Klamath River Fall	59,156	95,104	28,112	13,937	18,514	56,507	**24,430**	30,525	40,700	0.64	0.36	0.59	0.37	0.09	0.05	0.71
Southern Oregon[c/]	81,655	53,546	30,462	27,278	90,674	NA	42,236	20,500	34,992	NA	NA	NA	NA	NA	NA	0.54
Central and Northern OR	189	157	247	118	114	NA	149	30 fish/mi	60 fish/mi	NA	NA	NA	NA	NA	NA	0.78
Upper River Bright - Fall[d/]	305,445	233,934	323,276	151,373	97,789	107,700	116,820	19,182	39,625	0.52	0.53	0.40	NA	NA	NA	0.86
Upper River - Summer[d/]	68,380	77,982	88,691	79,253	56,265	41,100	56,802	6,072	12,143	0.62	0.74	**0.89**	NA	NA	NA	0.75
Willapa Bay - Fall[e/]	1,904	2,075	2,824	1,887	NA	NA	2,228	1,696	3,393	0.59	0.49	0.57	NA	NA	NA	0.78
Grays Harbor Fall[e/]	12,582	11,400	22,200	11,248	NA	NA	14,172	5,694	11,388	0.59	0.49	0.57	NA	NA	NA	0.78
Grays Harbor Spring	2,459	1,583	1,841	926	NA	NA	1,392	546	1,092	NA	NA	NA	NA	NA	NA	0.78
Queets - Fall[d/]	2,582	3,820	5,313	2,915	NA	NA	3,897	1,250	2,500	0.59	0.49	0.57	NA	NA	NA	0.87
Queets - Sp/Su	520	377	532	704	NA	NA	521	350	700	NA	NA	NA	NA	NA	NA	0.78
Hoh - Fall[e/]	1,269	1,933	1,795	2,831	1,808	NA	2,094	600	1,200	0.59	0.49	0.57	NA	NA	NA	0.90
Hoh Sp/Su	750	744	1,070	1,144	1,364	NA	1,186	450	900	NA	NA	NA	NA	NA	NA	0.78
Quillayute - Fall[e/]	4,017	2,782	3,440	3,654	3,391	NA	3,493	1,500	3,000	0.59	0.49	0.57	NA	NA	NA	0.87
Quillayute - Sp/Su	957	608	794	900	1,146	NA	936	600	1,200	NA	NA	NA	NA	NA	NA	0.78
Hoko -Su/Fa[d/]	1,406	1,760	2,877	1,324	1,188	NA	1,654	425	850	0.25	0.42	0.29	NA	NA	NA	0.78
Coho																
Willapa Bay	22,638	47,154	10,790	25,290	NA	11,343	14,574	8,600	17,200	NA	NA	NA	NA	NA	0.51	0.74
Grays Harbor	56,785	105,039	21,278	37,849	NA	29,976	28,901	18,320	24,426	0.44	0.46	0.50	0.11	NA	0.29	0.65
Queets	5,684	7,557	2,028	5,156	NA	5,393	**3,835**	4,350	5,800	0.39	0.44	0.33	0.15	NA	0.23	0.65
Hoh	2,899	4,565	1,794	5,009	4,478	3,731	4,374	1,890	2,520	**0.70**	0.43	0.30	0.07	NA	0.36	0.65
Quillayute Fall	7,072	7,425	2,571	9,630	8,745	6,369	8,125	4,725	6,300	0.55	0.50	0.45	0.17	NA	0.40	0.59
Juan de Fuca	8,461	11,002	3,779	7,704	NA	6,800	**5,828**	7,000	11,000	0.43	0.17	0.18	0.03	NA	0.05	0.60
Hood Canal	16,064	26,776	26,926	24,313	NA	34,893	28,374	10,750	14,350	0.55	**0.66**	0.59	0.36	NA	0.41	0.65
Skagit	88,751	24,820	5,794	35,823	NA	54,292	22,419	14,875	25,000	0.44	0.50	0.58	0.17	NA	0.09	0.60
Stillaguamish	60,387	35,763	2,909	12,933	NA	17,415	8,685	6,100	10,000	0.33	0.40	**0.52**	0.30	NA	0.08	0.50
Snohomish	125,870	46,244	12,804	44,141	NA	53,087	31,074	31,000	50,000	0.39	0.43	0.58	0.32	NA	0.20	0.60

a/ Preliminary.

b/ Preliminary approximations based on preseason forecasts and the previous year fishing regulations.

c/ MSST 18,440 (20,500 as measured at Huntley Park).

d/ CWT based exploitation rates from annual catch and escapement distribution from PSC-CTC 2013 Exploitation Rate Analysis.

e/ Queets River fall Chinook CWT exploitation rates used as a proxy. Exploitation rates in the terminal fisheries will differ from those calculated for Queets fall CWTs.

TABLE V-5. Postseason S_{ACL}, S_{OFL}, and spawner escapement estimates for Sacramento River fall Chinook (SRFC), Klamath River fall Chinook (KRFC) and Willapa Bay coho. For the current year, data are preseason values based on current abundance forecasts and the previous year fishing regulations.

	SRFC			KRFC			Willapa Bay Coho		
Year	S_{ACL}[a/]	S_{OFL}	Escapement[b/]	S_{ACL}[a/]	S_{OFL}	Escapement[c/]	S_{ACL}[a/]	S_{OFL}	Escapement[c/]
2012	187,246	137,314	285,429	70,943	64,292	121,543	--	--	--
2013	260,041	190,696	406,200	52,016	47,140	59,156	--	--	--
2014	165,317	121,232	212,468	47,673	43,203	95,104	--	--	--
2015	76,272	55,933	112,947	22,207	20,126	28,112	9,873	8,643	17,086
2016	61,587	45,164	89,674	7,053	6,392	13,937	NA	NA	NA
2017	41,999	30,799	44,574	6,542	5,929	18,514	10,906	9,547	24,754
2018	68,830	50,475	134,942	19,115	17,323	56,507	6,194	5,368	11,343

a/ $S_{ACL} = S_{ABC}$.

b/ Hatchery and natural area adult spawners.

c/ Natural area adult spawners.

TABLE V-6. Estimated ocean escapements and exploitation rates for critical natural and Columbia River hatchery coho stocks (thousands of fish) based on preliminary 2018 preseason abundance forecasts and 2017 Council management measures.[a/]

	Ocean Escapement and ER Estimates Under 2017 Regulations[b/]				
	2018 Preseason		2017 Final Preseason		
Stock	Ocean Escapement	Exploitation Rate	Ocean Escapement	Exploitation Rate	2017 FMP Conservation Objective[c/]
Natural Coho Stocks					
Skagit	51.8	8.6%	9.5	11.1%	Exploitation Rate ≤35.0%d/
Stillaguamish	16.9	8.1%	6.8	8.5%	Exploitation Rate ≤35.0%d/
Snohomish	51.4	19.5%	88.5	15.2%	Exploitation Rate ≤40.0%d/
Hood Canal	32.4	41.5%	64.4	40.4%	Exploitation Rate ≤65.0%d/
Strait of Juan de Fuca	6.5	5.3%	12.0	4.9%	Exploitation Rate ≤20.0%d/
Quillayute Fall	10.2	39.9%	15.3	39.7%	6.3 - 15.8 Spawners
Hoh	5.3	36.1%	5.7	35.5%	2.0 - 5.0 Spawners
Queets	6.1	23.1%	5.8	22.1%	5.8 - 14.5 Spawners
Grays Harbor	40.3	29.4%	47.9	28.9%	35.4 Spawners
LCN	19.5	14.2%	27.6	11.4%	Exploitation Rate ≤18.0[e/]
OCN	47.5	13.9%	92.7	9.3%	Exploitation Rate ≤15.0%[e/]
R/K	2.5	4.7%	2.4	3.3%	Exploitation Rate ≤13.0%[e/]
Hatchery Coho Stocks					
Columbia Early	121.2	51.1%	183.1	46.7%	6.2 Hatchery Escapement
Columbia Late	85.7	34.7%	119.7	28.6%	14.2 Hatchery Escapement

a/ Quota levels include harvest and hooking mortality estimates used in planning the Council's 2016 ocean fisheries and a coho catch for the Canadian troll fishery off the West Coast of Vancouver Island (WCVI).

b/ 2017 preseason regulations with the following coho quotas: U.S. Canada Border to Cape Falcon: Treaty Indian troll-12,500; non-Indian troll-5,600 selective; recreational-42,000 selective; Cape Falcon to OR/CA border: recreational-18,000 selective and 6,000 non-selective; troll-none. Ocean escapement is generally the estimated number of coho escaping ocean fisheries and entering freshwater. For Puget Sound stocks, ocean escapement is the total abundance minus ocean fisheries (ie outside Puget Sound). For the OCN coho stock, this value represents the estimated spawner escapement in SRS accounting. For Columbia R. hatchery and LCN stocks, ocean escapement represents the number of coho after the Buoy 10 fishery; the LCN exploitation rates shown are total marine and mainstem Columbia R. fishery ERs. The Council fisheries exploitation rates are forecast at 9.3% using 2018 abundances with 2017 fishery regulations and 7.6% in 2017 with the 2017 ESA limit of 18.0% including mainstem Columbia R. fisheries.

c/ Goals represent FMP conservation objectives, ESA consultation standards, or hatchery escapement needs. Spawning escapement goals are not directly comparable to ocean escapement because the latter occur before inside fisheries.

d/ Assumed exploitation rate based on preliminary abundance forecasts.

e/ Pending confirmation of 2017 ESA consultation standard.