SALMON TECHNICAL TEAM REPORT 1

Excerpts from the Review of 2023 Ocean Salmon Fisheries and 2024 Preseason 1 Report

PFMC
03/05/2024

2023 Review: 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	2018	2019	2020	2021	2022	2023	3-yr Geo Mean	MSST	S_{MSY}	2018	2019	2020	2021	2022	2023	MFMT
Sacramento Fall	105,466	163,767	138,091	105,584	61,862	133,638	95,569	91,500	122,000	0.52	0.68	0.61	0.68	0.52	NA	0.78
Klamath River Fall	52,352	20,022	26,185	29,942	21,956	41,623	**30,134**	30,525	40,700	0.32	0.43	0.30	0.38	0.45	NA	0.71
Southern Oregon	39,507	18,436	29,387	48,979	17,609	29,550	29,428	20,500	34,992	NA	NA	NA	NA	NA	NA	0.78
Central and Northern OR[a/]	92	65	137	85	105	118	102	30 fish/mile	150k-200k	0.66	0.42	0.42	0.49	NA	NA	0.78
Upper River Bright - Fall[a/]	58,540	77,880	98,401	86,644	53,961	109,133	79,908	19,182	39,625	0.34	0.38	0.28	0.40	NA	NA	0.86
Upper River - Summer[a/]	38,816	41,090	70,654	52,076	64,497	49,410	54,954	6,072	12,143	0.44	0.17	0.30	0.40	NA	NA	0.75
Willapa Bay - Fall[b/]	2,847	2,894	3,585	2,966	2,351	NA	2,924	1,696	3,393	0.61	0.65	0.55	0.71	NA	NA	0.78
Grays Harbor Fall[a/b/]	20,741	14,880	20,879	13,207	14,259	NA	15,783	5,694	13,326	0.63	0.64	0.58	0.69	NA	NA	0.78
Grays Harbor Spring	493	983	2,828	2,573	1,348	NA	2,141	546	1,400	NA	NA	NA	NA	NA	NA	0.78
Queets - Fall[a/]	2,207	2,663	3,622	3,364	1,784	NA	2,791	1,250	2,500	0.66	0.73	0.73	0.79	NA	NA	0.87
Queets - Sp/Su	484	322	342	280	434	NA	**346**	350	700	NA	NA	NA	NA	NA	NA	0.78
Hoh - Fall[a/b/]	2,478	1,552	2,273	2,622	1,866	NA	2,232	600	1,200	0.56	0.73	0.68	0.74	NA	NA	0.90
Hoh Sp/Su	793	766	1,248	817	1,055	NA	1,025	450	900	NA	NA	NA	NA	NA	NA	0.78
Quillayute - Fall[a/b/]	3,937	7,765	8,672	5,568	6,761	5,607	5,954	1,500	3,000	0.72	0.65	0.60	0.69	NA	NA	0.87
Quillayute - Sp/Su	990	1,442	942	1,056	1,441	1,791	1,397	600	1,200	NA	NA	NA	NA	NA	NA	0.78
Hoko -Su/Fa[a/]	2,103	1,838	1,316	1,165	1,386	NA	1,285	425	850	0.56	0.37	0.22	NA[c/]	NA	NA	0.78

a/ CWT based exploitation rates from PSC-CTC 2023 Exploitation Rate Analysis (TCCHINOOK (23)-06).

b/ Queets River fall Chinook coded-wire-tag (CWT) exploitation rates used as a proxy. Adjustments made to terminal fishery impacts to account for differential harvest rates.

c/ Calculation of a reliable exploitation rate estimate was not possible due to insufficient CWT information.

2023 Review: 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									Exploitation Rate						
Coho Stock	2018	2019	2020	2021	2022	2023	3-yr Geo Mean	MSST	S_{MSY}	2018	2019	2020	2021	2022	2023	MFMT
Willapa Bay	17,228	15,115	16,476	31,369	24,197	NA	23,212	8,600	17,200	0.35	0.39	0.33	0.24	NA	NA	0.74
Grays Harbor	49,622	30,468	23,814	62,762	65,977	NA	46,200	18,320	24,426	0.22	0.39	0.29	0.23	NA	NA	0.65
Queets	2,631	1,700	4,181	5,752	12,083	NA	6,624	4,350	5,800	0.23	0.57	0.22	0.10	NA	NA	0.65
Hoh	2,463	2,445	2,840	6,396	8,224	NA	5,306	1,890	2,520	0.34	0.57	0.49	0.18	NA	NA	0.65
Quillayute Fall	6,091	6,852	7,695	9,938	13,000	7,245	9,782	4,725	6,300	0.30	0.37	0.16	0.04	NA	NA	0.59
Juan de Fuca[a/]	5,470	4,625	8,548	20,837	16,977	NA	14,461	7,000	11,000	0.08	0.12	0.07	0.07	NA	NA	0.60
Hood Canal	7,512	7,884	16,832	34,388	9,192	NA	17,458	10,750	14,350	0.57	0.46	0.29	0.25	NA	NA	0.65
Skagit	19,047	14,246	23,808	75,532	92,306	NA	54,958	14,875	25,000	0.49	0.48	0.43	0.33	NA	NA	0.60
Stillaguamish	23,937	12,887	21,555	38,176	53,828	NA	35,382	6,100	10,000	0.22	0.20	0.13	0.11	NA	NA	0.50
Snohomish	58,135	40,314	42,675	97,523	85,692	NA	70,915	31,000	50,000	0.25	0.17	0.11	0.11	NA	NA	0.60

2024 Preseason I Report: TABLE I-1. Preseason adult Chinook salmon stock forecasts in thousands of fish. (Page 1 of 3)

Production Source and Stock or Stock Group	2019	2020	2021	2022	2023	2024	Methodology for 2024 Prediction and Source
Sacramento River							
Fall (Sacramento Index)	379.6	473.2	271.0	396.5	169.8	213.6	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)	1.9	3.1	9.1	6.0	4.5	1.1	Gaussian process model applied to a time series of the SRWC age-3 escapement absent fishing. NMFS.
Klamath River (Ocean Abundance)							
Fall	274.2	186.6	181.5	200.1	103.8	180.7	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)							
Cowlitz Spring	1.3	1.4	1.8	4.1	9.0	4.7	Cowlitz, Kalama, and Lewis: Age-specific linear regressions of cohort returns in previous run years. WDFW.
Kalama Spring	1.4	1.0	2.2	2.0	2.4	1.9	
Lewis Spring	1.5	1.4	2.4	2.4	4.7	3.4	
Sandy Spring	5.5	5.2	5.3	5.6	7.8	7.7	Recent 3-year average. ODFW.
Willamette Spring	40.2	40.8	50.1	51.2	71.0	48.7	Age-specific linear regressions of cohort returns in previous run years. ODFW. Forecast includes adult fish only.
Upriver Spring [a/]	99.3	81.7	75.2	122.9	198.6	121.0	Columbia River Upriver Spring and Summer Chinook: RMSE-weighted average of age-specific cohort ratios and sibling regression models. Columbia River TAC subgroup and WDFW.
Upriver Summer[b/]	35.9	38.3	77.6	57.5	84.8	53.0	
LRW Fall	13.7	19.7	20.0	10.8	8.6	10.5	Columbia River Fall Chinook: Root Mean Squared Error (RMSE)-weighted average of age-specific cohort ratios and sibling regression models. Columbia River TAC subgroup and WDFW.
LRH Fall	54.5	51.0	73.1	73.0	77.1	85.5	
SCH Fall	46.0	46.2	46.8	91.2	136.1	129.8	
MCB Fall	64.7	79.7	86.2	78.9	52.6	63.4	
URB Fall	158.4	233.4	354.2	230.4	272.4	258.3	

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

Production Source and Stock or Stock Group		2019	2020	2021	2022	2023	2024	Methodology for 2024 Prediction and Source
Washington Coast								
Willapa Bay Fall	Natural	4.3	2.9	3.9	3.1	2.8	3.5	Total recruit/spawner predictor
	Hatchery	23.6	28.3	30.5	30.1	27.5	27.3	Total recruit/spawner predictor
Grays Harbor Fall	Natural	18.0	15.0	15.5	17.9	15.0	14.3	Combination of geometric mean of recent year returns and linear relationships of sibling recruits per spawner.
	Hatchery	7.7	6.9	7.6	8.6	5.9	5.3	Combination of recent year smolt return rates and log linear regressions of sibling returns per smolt.
Quinault Spring/Summer	Natural	NA	NA	NA	NA	NA	NA	
	Hatchery	NA	NA	NA	NA	NA	NA	
Quinault Fall	Natural	5.3	4.2	6.0	3.2	4.0	4.3	Recent 5-year mean return rates, applied to brood year natural spawning escapements of age 3-6 returns.
	Hatchery	2.7	4.5	4.9	5.6	7.6	3.4	Recent 5-year mean terminal return rates (return/smolt release) for age 3-6 adult returns.
Queets Spring/Sum	Natural	0.6	0.6	0.6	0.6	0.4	0.4	Recent 5-year (2019-2023) mean terminal run size.
Queets Fall	Natural	3.4	4.1	4.3	5.3	4.3	2.6	Recent return/spawner rates; 10-yr mean for age 3, 5-yr mean for age 4+.
	Hatchery	0.8	0.7	0.6	0.5	0.8	0.4	Recent year return/smolt release adjusted by brood performance.
Hoh Spring/Summer	Natural	1.0	0.8	1.0	0.7	1.0	1.1	Spring/Summer: 5-year mean recruit/spawner adjusted by previous
Hoh Fall	Natural	2.5	2.6	2.6	3.4	2.6	3.5	Fall: Recent 3-year mean recruit/spawner adjusted by previous performance.
Quillayute Spring	Hatchery	2.1	2.4	2.6	3.0	2.8	2.5	Recent 2-year mean returns per smolt for age 3-4 and adjusted mean for age 5-6.
Quillayute Sum/Fall	Natural	7.9	9.8	9.6	8.8	11.3	10.1	Summer: Recent 5-year mean adjusted by previous brood performance. Fall: Recent 3-year mean return/spawner adjusted by previous brood performance.
Hoko[c/]	Natural	2.8	2.6	1.3	0.9	2.8	3.9	Escapement without fishing, includes supplemental. Sibling regressions using data from return years 1989-2022.
North Coast Totals								
Spring/Summer	*Natural*	*1.7*	*1.4*	*1.5*	*1.3*	*1.4*	*1.5*	
Fall	*Natural*	*19.2*	*20.6*	*22.5*	*20.7*	*22.1*	*20.5*	
Spring/Summer	*Hatchery*	*2.1*	*2.4*	*2.6*	*3.0*	*2.8*	*2.5*	
Fall	*Hatchery*	*3.5*	*5.2*	*5.5*	*6.1*	*8.4*	*3.8*	

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

Production Source and Stock or Stock Group		2019	2020	2021	2022	2023	2024	Methodology for 2024 Prediction and Source
Puget Sound summer/fall[d/]								
Nooksack/Samish	Hatchery	21.3	18.2	18.9	28.1	41.2	40.9	Three year average return rate
East Sound Bay	Hatchery	0.3	0.3	0.6	0.4	0.2	0.2	Three year average return rate
Skagit	Natural	13.6	12.9	10.5	12.5	12.2	10.4	Natural: Hierarchical Bayesian model to estimate the spawner-recruit dynamics. Hatchery: One year ahead forecasts generated using Chinook run sizes and GAM and ARIMA models.
	Hatchery	0.3	0.5	0.5	0.5	0.5	0.6	
Stillaguamish	Natural	0.9	0.9	0.9	0.9	1.2	0.9	Natural plus hatchery. Multiple regression environmental model (Environmental Model to Predict Adult Returns, EMPAR).
Snohomish[e/]	Natural	3.2	3.0	2.9	2.4	3.4	2.7	Natural fingerling and yearling age-specific return rates predicted with multiple regression environmental models (EMPAR).
	Hatchery	7.0	6.8	6.1	6.0	7.5	8.4	Average return rates by age and life history type of the three most recent completed brood returns (BYs 2016-2018) applied to hatchery releases of age 2-5 fish (BYs 2019-2022) expected to return in 2024.
Tulalip[e/]	Hatchery	12.5	6.0	5.8	7.7	5.5	5.9	Age-specific return rates predicted with multiple regression environmental model (EMPAR).
South Puget Sound	Natural	8.4	5.8	7.0	6.9	7.0	7.3	Natural: Lake Washington; 4-yr avg recruit per spawner for age 3, 3-yr avg sibling ratios for ages 4 & 5. Green; 3-yr average return rates. Puyallup; climate relationship for age 3, sibling relationship for age 4, 5-yr average return per spawner for age 5. Nisqually; smolt to adult return average since 2015 (5-yr avg for age 3, 4-yr avg for age 4, 3-yr avg for age 5). Hatchery: Variety of recent year average return rates or sibling relationships.
	Hatchery	99.9	100.7	78.8	90.3	90.4	90.5	
Hood Canal	Natural	1.2	4.6	5.7	5.4	3.2	4.3	Includes hatchery strays to spawning grounds in Skokomish River. Proportioned using Hood Canal terminal run reconstruction-based relative contribution of the individual management units for 2019-2023 return years. Area 12B returns derived by applying an average proportion of natural origin recruits returning to area 12B for 2019-2023.
	Hatchery	66.0	67.6	64.1	51.9	53.6	56.3	Brood 2019 fingerling lbs released from WDFW facilities in 2020, multiplied by the average of post-season estimated terminal area return rates for the last 5 years (2019-2023).
Strait of Juan de Fuca Including Dungeness spring run	Natural	8.3	5.0	5.5	5.0	3.7	4.3	Natural and hatchery. Elwha estimated by all year average smolt to adult return rate, natural component based on 13-yr average hatchery/wild proportion. Dungeness natural and hatchery estimated using all-year and 3-yr average smolt to adult return rates.

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, Puget Sounds forecasts are in units of terminal run size.
e/ Includes a mixture of runsize types including escapement without fishing and terminal run. 2024 values are terminal runsize.

2024 Preseason I Report: TABLE I-2. Preseason adult coho salmon stock forecasts in thousands of fish. (Page 1 of 2)

Production Source and Stock or Stock Group		2019	2020	2021	2022	2023	2024	Methodology for 2024 Prediction and Source
OPI Area Total Abundance (California, Oregon Coasts, and Columbia River)		1,009.6	268.7	1,732.9	1,225.9	1,135.7	636.3	Abundance of all OPI components based on post-season coho FRAM runs; prior to 2008 only fishery impacts south of Leadbetter Point were used (traditional OPI accounting). OPITT, see Chapter III for details.
OPI Public	Hatchery	933.5	185.7	1607.9	1003.5	896.9	403.1	OPIH: ARIMA-based MAPE weigthed ensemble forecast. Columbia early/late and Coastal proportions based on jacks; Coastal N/S proportions based on smolts.
Columbia River Early		545.0	130.7	1014.0	592.5	481.8	227.5	
Columbia River Late		360.6	50.3	576.0	404.7	404.3	173.6	
Coastal N. of Cape Blanco		12.0	2.4	6.4	1.9	3.0	0.6	
Coastal S. of Cape Blanco		15.9	2.3	11.5	4.4	7.8	1.4	
Lower Columbia River (LCN)	Natural	36.9	24.8	39.2	65.7	45.5	87.8	Oregon: recent three year average return; Washington: natural smolt production multiplied by 2021 brood marine survival rate. Abundance is subset of early/late hatchery abundance above.
Oregon Coast (OCN)	Natural	76.1	83.0	125.0	222.4	238.8	233.2	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 abundance.
Washington Coast								
Willapa	Natural	63.4	17.9	19.0	35.8	42.7	29.5	Washington Coast stocks: A variety of methods were used, primarily based on smolt production and survival. See text in Chapter III for details.
	Hatchery	94.0	51.8	61.6	74.7	111.0	91.5	
Grays Harbor	Natural	71.5	50.0	44.8	120.4	102.8	74.9	
	Hatchery	64.3	42.3	31.7	78.3	111.4	68.2	
Quinault	Natural	13.9	17.5	15.0	19.4	23.6	25.3	
	Hatchery	26.9	27.0	24.6	42.7	30.6	34.7	
Queets	Natural	11.1	7.8	3.9	18.2	12.4	12.8	
	Hatchery	13.2	10.9	11.8	22.2	14.9	18.9	
Hoh	Natural	7.0	4.2	3.0	4.7	6.5	4.9	

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

Production Source and Stock or Stock Group		2019	2020	2021	2022	2023	2024	Methodology for 2024 Prediction and Source
Quillayute Fall	Natural	14.7	9.2	7.5	12.5	13.5	10.2	For all Washington Coast stocks: A variety of methods were used, primarily based on smolt production and survival. See text in Chapter III for details.
	Hatchery	17.0	13.0	15.1	20.3	19.1	10.3	
Quillayute Summer	Natural	1.2	0.8	0.3	0.9	1.6	0.4	
	Hatchery	3.4	3.4	3.4	4.6	3.9	2.3	
North Coast Independent Tributaries	Natural	8.1	5.1	4.7	18.0	13.5	4.9	
	Hatchery	12.5	1.3	0.1	0.1	11.8	9.0	
WA Coast Total	*Natural*	*191.0*	*112.4*	*98.4*	*229.8*	*216.6*	*162.8*	
	Hatchery	*231.3*	*149.6*	*148.2*	*243.0*	*302.7*	*234.9*	
Puget Sound								
Strait of Juan de Fuca	Natural	8.8	7.5	6.7	7.3	15.6	19.7	For all Puget Sound stocks: A variety of methods were used, 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	16.8	20.6	12.5	12.7	21.8	22.6	
Nooksack-Samish	Natural	25.1	15.4	35.3	36.0	29.5	35.1	
	Hatchery	59.8	42.5	54.6	73.8	66.6	72.3	
Skagit	Natural	57.9	31.0	58.4	80.4	43.1	63.4	
	Hatchery	9.9	18.2	22.0	21.3	21.1	27.3	
Stillaguamish	Natural	23.8	19.5	26.8	24.9	30.2	30.8	
	Hatchery	2.2	2.3	4.0	1.9	1.7	0.9	
Snohomish	Natural	62.6	39.0	60.0	64.2	76.5	71.6	
	Hatchery	43.7	26.6	29.9	22.6	64.0	34.7	
South Sound	Natural	30.4	7.3	27.5	31.0	58.3	38.1	
	Hatchery	180.4	164.0	192.7	208.5	218.8	201.9	
Hood Canal	Natural	40.1	35.0	28.8	20.2	37.9	36.5	
	Hatchery	87.9	72.2	55.7	61.4	74.8	67.2	
Puget Sound Total	*Natural*	*248.8*	*154.6*	*243.5*	*264.0*	*291.2*	*295.3*	
	Hatchery	*400.7*	*346.3*	*371.4*	*402.3*	*468.8*	*426.9*	

2024 Preseason I Report: 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**. 2024 spawning escapement and exploitation rate estimates are based on preliminary 2024 preseason abundance forecasts and 2023 Council regulations.

	Estimated Adult Spawning Escapement									Total Exploitation Rate						
	2019	2020	2021	2022	2023[a/]	Forecast 2024[b/]	3-yr Geo Mean	MSST	S_{MSY}	2019	2020	2021	2022[a/]	2023[b/]	2024[b/]	MFMT
Chinook																
Sacramento Fall	163,767	138,091	105,584	61,862	133,638	213,352	120,823	91,500	122,000	0.68	0.61	0.68	0.76	0.04	0.00	0.78
Klamath River Fall	20,022	26,185	29,942	21,956	41,623	42,936	33,981	30,525	40,700	0.43	0.30	0.38	0.46	0.04	0.06	0.71
Southern Oregon[c/]	18,436	29,387	48,979	17,609	29,550	NA	29,428	20,500	34,992	NA	NA	NA	NA	NA	NA	0.78
Central and Northern OR[d/]	65	137	85	105	118	NA	102	30 fish/mi	60 fish/mi	0.42	0.42	0.49	NA	NA	NA	0.78
Upper River Bright - Fall[d/]	77,880	98,401	86,644	53,961	64,450	90,834	68,106	19,182	39,625	0.38	0.28	0.40	NA	NA	NA	0.86
Upper River - Summer[d/]	41,090	70,654	52,076	64,497	49,410	57,677	56,857	6,072	12,143	0.17	0.30	0.40	NA	NA	NA	0.75
Willapa Bay - Fall[e/]	2,894	3,585	2,966	2,351	NA	NA	2,924	1,696	3,393	0.65	0.55	0.71	NA	NA	NA	0.78
Grays Harbor Fall[d/e/]	14,880	20,879	13,207	14,259	NA	NA	15,783	5,694	13,326	0.64	0.58	0.69	NA	NA	NA	0.78
Grays Harbor Spring	983	2,828	2,573	1,348	NA	NA	2,141	700	1,400	NA	NA	NA	NA	NA	NA	0.78
Queets - Fall[d/]	2,663	3,622	3,364	1,784	NA	NA	2,791	1,250	2,500	0.73	0.73	0.79	NA	NA	NA	0.87
Queets - Sp/Su	322	342	280	434	NA	NA	346	350	700	NA	NA	NA	NA	NA	NA	0.78
Hoh - Fall[d/e/]	1,552	2,273	2,622	1,866	NA	NA	2,232	600	1,200	0.73	0.68	0.74	NA	NA	NA	0.90
Hoh Sp/Su	766	1,248	817	1,055	NA	NA	1,025	450	900	NA	NA	NA	NA	NA	NA	0.78
Quillayute - Fall[d/e/]	7,765	8,672	5,568	6,761	5,607	NA	5,954	1,500	3,000	0.65	0.60	0.69	NA	NA	NA	0.87
Quillayute - Sp/Su	1,442	942	1,056	1,441	1,791	NA	1,397	600	1,200	NA	NA	NA	NA	NA	NA	0.78
Hoko -Su/Fa[d/]	1,838	1,316	1,165	1,386	NA	NA	1,285	425	850	0.37	0.22	NA[g/]	NA	NA	NA	0.78
Coho																
Willapa Bay[f/]	15,115	16,476	31,369	24,197	NA	NA	27,551	8,600	17,200	0.39	0.33	0.24	NA	NA	NA	0.74
Grays Harbor[f/]	30,468	23,814	62,762	65,977	NA	NA	64,349	18,320	24,426	0.39	0.29	0.23	NA	NA	NA	0.65
Queets	1,700	4,181	5,752	12,083	NA	NA	8,337	4,350	5,800	0.57	0.22	0.10	NA	NA	NA	0.65
Hoh	2,445	2,840	6,396	8,224	NA	NA	7,253	1,890	2,520	0.57	0.49	0.18	NA	NA	NA	0.65
Quillayute Fall	6,852	7,695	9,938	13,000	7,245	NA	9,705	4,725	6,300	0.37	0.16	0.04	NA	NA	NA	0.59
Juan de Fuca	4,625	8,548	20,837	16,977	NA	NA	18,808	7,000	11,000	0.12	0.07	0.07	NA	NA	NA	0.60
Hood Canal	7,884	16,832	34,388	9,192	NA	NA	17,779	10,750	14,350	0.46	0.29	0.25	NA	NA	NA	0.65
Skagit	14,246	23,808	75,532	92,306	NA	NA	83,499	14,875	25,000	0.48	0.43	0.33	NA	NA	NA	0.60
Stillaguamish	12,887	21,555	38,176	53,828	NA	NA	45,331	6,100	10,000	0.20	0.13	0.11	NA	NA	NA	0.50
Snohomish	40,314	42,675	97,523	85,692	NA	NA	91,416	31,000	50,000	0.17	0.11	0.11	NA	NA	NA	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/ Preliminary CWT based exploitation rates from PSC-CTC 2023 Exploitation Rate Analysis (TCCHINOOK (23)-06).

e/ Queets River fall Chinook coded-wire-tag (CWT) exploitation rates used as a proxy. Adjustments made to terminal fishery impacts to account for differential harvest rates.

f/ Willapa Bay and Grays Harbor coho escapement and exploitation rate estimates based on natural area adult spawners.

g/ Calculation of a reliable exploitation rate estimate was not possible due to insufficient CWT information.

2024 Preseason I Report: TABLE V-5. Postseason S_{ACL}, S_{OFL}, and spawner escapement estimates for Sacramento River fall Chinook (SRFC) and Klamath River fall Chinook (KRFC). For the current year, S_{ACL}, S_{OFL}, and spawner escapements 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	188,378	138,144	285,429	70,922	64,273	121,543	--	--	--
2013	260,798	191,251	406,846	52,032	47,154	59,156	--	--	--
2014	165,355	121,260	212,476	47,674	43,205	95,104	--	--	--
2015	76,485	56,089	113,468	22,202	20,120	28,112	9,440	8,181	17,086
2016	61,595	45,170	89,699	7,056	6,394	13,937	14,839	12,860	30,667
2017	41,119	30,154	44,329	7,113	6,446	19,904	5,180	4,489	11,379
2018	66,110	48,481	105,466	24,468	22,174	52,352	7,903	6,849	17,228
2019	152,115	111,551	163,767	11,314	10,253	20,022	7,458	6,464	15,115
2020	105,737	77,541	138,091	12,005	10,880	26,185	7,399	6,413	16,476
2021	97,095	71,203	105,584	15,624	14,159	29,942	12,432	10,774	31,369
2022	**75,895**	55,656	**61,862**	13,038	11,815	21,956	NA	NA	24,197
2023	41,846	30,687	133,638	13,805	12,511	41,623	NA	NA	NA
2024	64,087	46,997	213,352	14,605	13,235	42,932	12,671	10,981	NA[d/]

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

b/ Hatchery and natural area adult spawners.

c/ Natural area adult spawners.

d/ Analysis of 2023 preseason regulations combined with the substantially lower abundance forecasts for 2024 was beyond the capability of the FRAM model.

2024 Preseason I Report: TABLE V-6. Comparison of projected ocean escapements and exploitation rates for critical natural and Columbia River hatchery coho stocks (thousands of fish) resulting from application of 2023 Council-adopted regulations to 2023 and 2024 ocean abundance forecasts.[a/]

	Ocean Escapement and ER Estimates Under 2023 Regulations[b/]				
	2023 Abundance Forecasts		2024 Abundance Forecasts[c/]		
Stock	Ocean Escapement	Exploitation Rate	Ocean Escapement	Exploitation Rate	2024 FMP Conservation Objective[d/]
Natural Coho Stocks					
Skagit	40.4	35.0%	NA	NA	Exploitation Rate ≤60.0%[e/]
Stillaguamish	75.3	28.5%	NA	NA	Exploitation Rate ≤50.0%[e/]
Snohomish	73.1	32.0%	NA	NA	Exploitation Rate ≤40.0%[e/]
Hood Canal	34.9	42.8%	NA	NA	Exploitation Rate ≤45.0%[e/]
Strait of Juan de Fuca	14.5	12.1%	NA	NA	Exploitation Rate ≤40.0%[e/]
Quillayute Fall	12.5	42.6%	NA	NA	6.3 - 15.8 Spawners
Hoh	5.4	51.0%	NA	NA	2.0 - 5.0 Spawners
Queets	10.3	40.9%	NA	NA	5.8 - 14.5 Spawners
Grays Harbor[g/]	102.1	55.6%	NA	NA	35.4 Spawners
LCN	37.9	19.0%	NA	NA	Exploitation Rate ≤23.0[f/]
OCN	192.4	19.8%	NA	NA	Exploitation Rate ≤30.0%[f/]
SONCC			NA	NA	
Trinity Natural	--	15.0%	NA	NA	Exploitation Rate ≤16.0%[f/]
Klamath Natural	--	7.7%	NA	NA	Exploitation Rate ≤15.0%[f/]
Rogue Natural	--	6.7%	NA	NA	Exploitation Rate ≤15.0%[f/]
Other Natural	--	1.8%	NA	NA	Exploitation Rate ≤15.0%[f/]
Hatchery Coho Stocks					
Columbia Early	318.9	46.6%	NA	NA	6.2 Hatchery Escapement
Columbia Late	230.6	52.0%	NA	NA	14.2 Hatchery Escapement

a/ Quota levels include harvest and hooking mortality estimates used in planning the Council's 2023 ocean fisheries and a coho catch for the Canadian troll fishery off the West Coast of Vancouver Island (WCVI).

b/ 2023 preseason regulations with the following coho quotas: U.S. Canada Border to Cape Falcon: Treaty Indian troll-57,000; non-Indian troll-30,400 selective; recreational-159,600 selective; Cape Falcon to OR/CA border: recreational-110,000 selective and 25,000 non-selective; troll-10,000 selective. 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.

c/Analysis of 2023 preseason regulations combined with the much lower abundance forecasts for 2024 was beyond the capability of the FRAM model. For all stocks, substantially lower ocean escapement estimates and higher exploitation rates compared with 2023 abundances would be expected with 2024 forecast abundance.

d/ Goals represent FMP conservation objectives, ESA consultation standards, or hatchery escapement needs. Spawning escapement

e/ Assumed exploitation rate based on preliminary abundance forecasts.

f/ Pending confirmation of 2024 ESA consultation standard.

g/ Grays Harbor escapements and exploitation rate estimates based on natural area adult spawners.

Stock status for Chinook and coho stocks, including changes from 2023.

Stock	2023 Status	2024 Status
Chinook		
KRFC	Overfished	Overfished
Queets spring/summer	Overfished	Overfished
Coho		
Queets natural coho	Overfished	Rebuilt
Strait of Juan de Fuca natural coho	Not overfished-rebuilding	Rebuilt

Corrections to the Review of 2023 Ocean Salmon Fisheries

- In Review table II-6, the Sacramento River fall Chinook postseason estimate of the 2022 exploitation rate was incorrectly listed as 0.52. The correct exploitation rate for 2022 is 0.76.
- In Review text, on page 35, the Sacramento River fall Chinook postseason estimate of the 2022 exploitation rate was incorrectly listed as 0.52. The correct exploitation rate for 2022 is 0.76.

PFMC
03/05/24