

Area	Category	Legal Marked	Legal Unmarked	Sublegal Marked	Sublegal Unmarked	Total Encounters	Total UM Encounters	Criteria
6	Estimated	217	0	217	0	433		
6	FRAM	991	268	599	444	2,302		Season/ 2,302 Total Encounters
	Difference	775	268	383	444	1,869		
	%	22%	0%	36%	0%	19%		
7	Estimated	1,896	829	1,659	474	4,858	1,303	
7	FRAM	4,019	1,504	2,983	1,383	9,889	2,887	Season/3,176 UM &/or 11,865 Total Encounters
	Difference	2,123	675	1,324	909	5,031	1,584	
	%	47%	55%	56%	34%	49%	45%	
8-1 & 8-2	Estimated	608	174	1,651	434	2,867		
8-1 & 8-2	FRAM	1,107	252	3,311	822	5,492		Season/6,650 Total Encounters
	Difference	499	78	1,660	388	2,625		
	%	55%	69%	50%	53%	52%		
9-Nov	Estimated	589	147	2,800	589	4,126		
9-Nov	FRAM	3,008	817	5,296	1,932	11,053		Season
	Difference	2,419	670	2,496	1,343	6,927		
	%	20%	18%	53%	31%	37%		
9-Feb-Apr	Estimated	209	52	993	209	1,464		
9-Feb-Apr	FRAM	3,008	817	5,296	1,932	11,053		Total Encounters
	Difference	2,799	765	4,303	1,723	9,589		
	%	7%	6%	19%	11%	13%		
9-Total	Estimated	799	200	3,793	799	5,590		
9-Total	FRAM	3,008	817	5,296	1,932	11,053		Season/12,264 Total Encounters
	Difference	2,209	617	1,503	1,133	5,463		
	%	27%	24%	72%	41%	51%		
10	Estimated	367	65	2,029	583	3,043		
10	FRAM	476	108	4,101	664	5,349		Season/6,410 Total Encounters
	Difference	109	43	2,072	81	2,306		
	%	77%	60%	49%	88%	57%		
Grand Total	Estimated	3,080	1,120	6,332	1,700	12,232		
Grand Total	FRAM	9,601	2,949	16,290	5,245	34,085		
	Difference	6,521	1,829	9,958	3,545	21,853		
	%	32%	38%	39%	32%	36%		

Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats

During the Area 6 Winter Mark-selective Chinook Fishery, March 1, 2018 - April 15, 2018.

Month	Stat Week	Start Date	End Date	Estimated Chinook Encounters						
				Est. Effort ^{1/}		Retained Chinook ^{1/}		Released Chinook ^{2/}		Est. Total Chinook Encounters
				Boats	Anglers	AD	UM	AD	UM	
March	9	Mar-01	Mar-04	171	318	188	0	245	0	433
	10	Mar-05	Mar-11							
	11	Mar-12	Mar-18							
	12	Mar-19	Mar-25							
	13	Mar-26	Apr-01							
Apr	14	Apr-02	Apr-08							
	15	Apr-09	Apr-15							
Olympic Peninsula Derby	10	Mar-09	Mar-11							
March - April Total:				171	318	188	0	245	0	433
Variance:				157	1,450	13	0	93,665	0	187,372
Standard Error:				13	38	4	0	306	0	433
CV (%):				7%	12%	2%	NaN%	125%	NaN%	100%
95% CI:				146-195	243-392	181-195	0-0	62-844	0-0	122-1,281

^{1/} We used the Murthy estimator method to estimate boats, anglers, retained salmon catch, and released salmon species other than Chinook.

^{2/} Released Chinook were estimated as the difference between total Chinook encounters generated using a bias-corrected "Method 2" estimator (see Conrad and McHugh [2008] for additional details) and creel estimates of retained Chinook.

**Area 6 Selective Chinook Fishery, March 1, 2018 - April 15, 2018
Number Chinook Encounters by Size and Mark Status in STRs**

Table 2. Total Chinook encountered (retained and released) by private-boat anglers logging their trips on salmon trip reports (VTRs) in the Area 6 mark-selective Chinook fishery, March 1, 2018 - April 30, 2018.

Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Number Chin. Encounters on STRs, March 1, 2018 - April 15, 2018:	1	0	1	0	2	100.0%	100.0%
Encounter Rates (LM, LU, SM, SU)^{2/}:	50.0%	0.0%	50.0%	0.0%	100.0%		

^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.

^{2/} STR-based proportions of Chinook encounters by size/mark status (LM, LU, SM, and SU; calculated from pooled Area 6 Chinook encounters on STRs) were applied to estimate total-area Chinook encounters in Area 6 from March 1, 2018 - April 15, 2018 (see previous tab) using the Conrad and McHugh (2008) method.

**Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats
During the Area 7 Winter Mark-selective Chinook Fishery, January 1, 2018 - April 30, 2018.**

Month	Stat Weeks	Stratum Start Date	Stratum End Date	Effort		Retained Chinook		Released Chinook		Chinook Encounters Total
				Boats	Anglers	AD	UM	AD	UM	
Jan	1	Jan-01	Jan-07	416	864	299	0	345	236	880
	2	Jan-08	Jan-14	466	964	376	0	435	297	1,108
	3	Jan-15	Jan-21	53	108	29	0	33	23	85
	4	Jan-22	Jan-28	99	207	49	0	57	39	145
	5	Jan-29	Feb-04	347	704	186	0	215	147	548
Feb	6	Feb-05	Feb-11	453	991	207	0	240	164	611
	7	Feb-12	Feb-18	82	174	53	0	62	42	157
	8	Feb-19	Feb-25	74	153	49	0	57	39	145
	9	Feb-26	Mar-04	200	461	68	0	79	54	201
Mar	10	Mar-05	Mar-11							
	11	Mar-12	Mar-18							
	12	Mar-19	Mar-25							
	13	Mar-26	Apr-01							
Apr	14	Apr-02	Apr-08							
	15	Apr-09	Apr-15							
	16	Apr-16	Apr-22							
	17	Apr-23	Apr-29							
	18	Apr-30	Apr-30							
Resurrection Salmon Derby	1	5-Jan	7-Jan	104	339	53	0	61	42	156
Roche Harbor Salmon Derby	3	19-Jan	20-Jan	100	357	179	0	207	141	527
Friday Harbor Classic	7	8-Feb	10-Feb	100	329	100	0	116	79	295
Jan - Apr Total:				2,494	5,651	1,648	0	1,907	1,303	4,858
Variance:				285,464	1,189,259	133,729	0	758,122	144,102	1,748,864
Standard Error:				534	1,091	366	0	871	380	1,322
CV (%):				24%	24%	28%	NaN%	57%	36%	34%
95% CI:				1,143-3,238	2,490-6,765	601-2,035	0-0	252-3,229	298-1,786	1,290-6,474

**Area 7 Selective Chinook Fishery, January 1, 2018 - April 30, 2017
Number Chinook Encounters by Size and Mark Status in Test Fishing**

Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Total Number Chin. Encounters, January 1, 2018 - April 30, 2018:	16	7	14	4	41	69.6%	73.2%
December - April Encounter Rates (LM, LU, SM, SU)^{2/}:	39.0%	17.1%	34.1%	9.8%	100.0%		

^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.

^{2/} VTR-based proportions of Chinook encounters by size/mark status (LM, LU, SM, and SU; calculated from pooled Area 7 Chinook encounters on VTRs) were applied to estimate total-area Chinook encounters in Area 7 from January 1, 2018 - April 30, 2018 (see previous tab) using the Conrad and McHugh (2008) method.

Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats

During the Area 8-1 Winter Mark-selective Chinook Fishery, November 1- November 12, 2017 and February 16 - April 30, 2018.

Month	Stat Weeks	Stratum Start Date	Stratum End Date	Effort		Retained Chinook		Released Chinook		Chinook Encounters Total
				Boats	Anglers	AD	UM	AD	UM	
Nov	45	Nov-01	Nov-05	40	84	30	2	185	77	294
	46	Nov-06	Nov-12	67	141	24	5	150	59	238
Feb	7	Feb-16	Feb-18	53	114	65	0	214	75	354
	8	Feb-19	Feb-25	42	60	17	0	54	19	90
Mar	9	Feb-26	Mar-04	93	170	41	0	133	47	221
	10	Mar-05	Mar-11							
	11	Mar-12	Mar-18							
	12	Mar-19	Mar-25							
	13	Mar-26	Jan-01							
Apr	14	Apr-02	Apr-08							
	15	Apr-09	Apr-15							
	16	Apr-16	Apr-22							
	17	Apr-23	Apr-29							
	18	Apr-30	Apr-30							
Everett Derby	45	4-Nov	5-Nov	48	69	20	0	126	54	200
Stanwood Derby										
Season Total:				343	638	197	7	862	331	1,397
Variance:				2,892	10,617	1,030	42	62,187	8,155	135,980
Standard Error:				54	103	32	7	249	90	369
CV (%):				18%	18%	18%	91%	43.30%	46.20%	38.60%
95% CI:				190-400	367-771	113-239	1-20	87-1,065	18-372	232-1,677

Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats

During the Area 8-2 Winter Mark-selective Chinook Fishery, November 1 - November 12, 2017 and February 16 - April 30, 2018.

Month	Stat Weeks	Stratum Start Date	Stratum End Date	Effort		Retained Chinook		Released Chinook		Chinook Encounters Total
				Boats	Anglers	AD	UM	AD	UM	
Nov	45	Nov-01	Nov-05	63	115	19	0	62	22	103
	46	Nov-06	Nov-12	131	263	29	0	94	33	156
Feb	7	Feb-16	Feb-18	73	153	51	0	168	59	213
	8	Feb-19	Feb-25	88	184	39	0	127	45	211
Mar	9	Feb-26	Mar-04	221	440	94	0	306	108	508
	10	Mar-05	Mar-11							
	11	Mar-12	Mar-18							
	12	Mar-19	Mar-25							
Apr	13	Mar-26	Jan-01							
	14	Apr-02	Apr-08							
	15	Apr-09	Apr-15							
	16	Apr-16	Apr-22							
	17	Apr-23	Apr-29							
	18	Apr-30	Apr-30							
Everett Derby	45	4-Nov	5-Nov	83	164	28	0	176	75	279
Stanwood Derby										
Season Total:				659	1,319	260	0	933	342	1,470
Variance:				7,558	32,320	1,748	0	106,983	13,985	233,811
Standard Error:				87	180	42	0	327	118	484
CV (%):				15%	16%	18%	NaN%	43%	45%	39%
95% CI:				405-746	803-1,507	149-313	0-0	115-1,398	34-498	306-2,202
8-1 & 8-2 Season Total:				1,002	1,957	457	7	1,795	673	2,867

WDFW Puget Sound Sampling Unit, In-season Test Fishery Results

**Area 8-1 Selective Chinook Fishery, November 1 - November 12, 2017 and February 16 - April 30, 2018
Number Chinook Encounters by Size and Mark Status in STRs**

Table 2. Total Chinook encountered (retained and released) by private-boat anglers logging their trips on salmon trip reports (STRs) in the Area 8-1 mark-selective Chinook fishery, November 1, 2016 - April 30, 2017.							
Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Total Number Chin. Encounters on STRs, November 1, 2017 - April 30, 2018:	4	0	10	3	17	100.0%	82.4%
Encounter Rates (LM, LU, SM, SU)^{2/}:	23.5%	0.0%	58.8%	17.6%	100.0%		
^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.							
^{2/} STR-based proportions of Chinook encounters by size/mark status (LM, LU, SM, and SU; calculated from pooled Area 11 Chinook encounters on STRs) were applied to estimate total-area Chinook encounters in Area 8-1 from November 1, 2017 - April 30, 2018 (see previous tab) using the Conrad and McHugh (2008) method.							

**Area 8-2 Selective Chinook Fishery, November 1 - November 12, 2017 and February 16 - April 30, 2018
Number Chinook Encounters by Size and Mark Status in STRs**

Table 2. Total Chinook encountered (retained and released) by private-boat anglers logging their trips on salmon trip reports (STRs) in the Area 8-2 mark-selective Chinook fishery, November 1, 2016 - April 30, 2017.							
Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Total Number Chin. Encounters on STRs, November 1, 2017 - April 30, 2018:	3	2	9	2	16	60.0%	75.0%
Encounter Rates (LM, LU, SM, SU)^{2/}:	18.8%	12.5%	56.3%	12.5%	100.0%		
^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.							
^{2/} STR-based proportions of Chinook encounters by size/mark status (LM, LU, SM, and SU; calculated from pooled Area 11 Chinook encounters on STRs) were applied to estimate total-area Chinook encounters in Area 8-1 from November 1, 2017 - April 30, 2018 (see previous tab) using the Conrad and McHugh (2008) method.							

8-1 & 8-2 Selective Chinook Fishery, November 1, 2017 - April 30, 2018 Totals							
Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Total Number Chin. Encounters on STRs, November 1, 2017 - April 30, 2018:	7	2	19	5	33	77.8%	78.8%
Encounter Rates (LM, LU, SM, SU)^{2/}:	21.2%	6.1%	57.6%	15.2%	100.0%		
^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.							
^{2/} STR-based proportions of Chinook encounters by size/mark status (LM, LU, SM, and SU; calculated from pooled Area 11 Chinook encounters on STRs) were applied to estimate total-area Chinook encounters in Area 8-1 from November 1, 2017 - April 30, 2018 (see previous tab) using the Conrad and McHugh (2008) method.							

**Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats
During the Area 9 Winter Mark-selective Chinook Fishery, November 1 - November 12, 2017 and February 16 - April 15, 2018.**

Month	Stat Weeks	Stratum Start Date	Stratum End Date	Effort		Retained Chinook		Released Chinook		Chinook Encounters Total
				Boats	Anglers	AD	UM	AD	UM	
Nov	45	Nov-01	Nov-05	310	521	122	0	686	176	984
	46	Nov-06	Nov-12	714	1,365	354	5	1,985	504	2,848
Feb	7	Feb-16	Feb-18	152	323	140	0	208	134	482
	8	Feb-19	Feb-25	115	219	79	0	117	75	271
	9	Feb-26	Mar-04	370	728	206	0	307	198	711
Mar	10	Mar-05	Mar-11							
	11	Mar-12	Mar-18							
	12	Mar-19	Mar-25							
	13	Mar-26	Apr-01							
Apr	14	Apr-02	Apr-08							
	15	Apr-09	Apr-15							
Everett Derby	45	4-Nov	5-Nov	138	273	64	0	161	69	294
Olympic Peninsula Derby	10	9-Mar	11-Mar					0	0	0
Everett Derby	11	17-Mar	18-Mar					0	0	0
Season Total:				1,799	3,429	965	5	3,464	1,156	5,590
Variance:				181,341	639,230	90,055	0	557,389	99,360	1,489,225
Standard Error:				426	800	300	0	747	315	1,220
CV (%):				31%	30%	38%	NaN%	64%	42%	45%
95% CI:				562-2,231	1,071-4,205	197-1,373	0-0	1266-2,633	134-1,369	314-5,098

Area 9 CPUE, Through Week 9:
Retained Chinook/Angler Trip: 0.2829

WDFW Puget Sound Sampling Unit, In-season Test Fishery Results

**Area 9 Selective Chinook Fishery, November 1 - November 12, 2017 and February 16, - April 15, 2018
Number Chinook Encounters by Size and Mark Status in the Test Fishery**

Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Encounters, November 1 - November 12, 2017	4	1	19	4	28	80.0%	82.1%
Encounter Rates, November 1 - November 12, 2017 (LM, LU, SM, SU) ^{2/} :	14.3%	3.6%	67.9%	14.3%	100.0%		
Encounters, February 16 - April 15	12	6	14	4	36	66.7%	72.2%
Encounter Rates, February 16 - April 15 (LM, LU, SM, SU) ^{2/} :	33.3%	16.7%	38.9%	11.1%	100.0%		
Total Encounters	16	7	33	8	64	69.6%	76.6%
Total Encounter Rates (LM, LU, SM, SU)^{2/}:	25.0%	10.9%	51.6%	12.5%	100.0%	p-value: 0.059	

^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.

**Preliminary In-Season Estimates of Effort and Salmon Catch (Retained and Released) from Private Boats
During the Area 10 Winter Mark-selective Chinook Fishery, November 1, 2017 - February 28, 2018.**

Month	Stat Weeks	Stratum Start Date	Stratum End Date	Effort		Retained Chinook		Released Chinook		Chinook Encounters Total
				Boats	Anglers	AD	UM	AD	UM	
Nov	45	Nov-01	Nov-05	46	88	4	0	25	8	37
	46	Nov-06	Nov-12	213	345	17	0	108	34	159
	47	Nov-13	Nov-19	111	118	15	0	101	31	147
	48	Nov-20	Nov-26	21	21	0	0	0	0	0
	49	Nov-27	Dec-03	47	76	0	0	0	0	0
Dec	50	Dec-04	Dec-10	61	99	21	0	134	42	197
	51	Dec-11	Dec-17	48	94	9	0	62	19	90
	52	Dec-18	Dec-24	51	84	0	0	0	0	0
	53	Dec-25	Dec-31	74	154	12	0	76	22	110
Jan	1	Jan-01	Jan-07	47	111	53	0	347	110	510
	2	Jan-08	Jan-14	82	147	36	0	236	93	365
	3	Jan-15	Jan-21	0	0	0	0	0	0	0
	4	Jan-22	Jan-28	28	47	0	0	0	0	0
Feb	5	Jan-29	Feb-04	54	91	18	0	119	37	174
	1	Feb-05	Feb-11	152	222	44	0	286	89	419
	2	Feb-12	Feb-18	70	101	67	0	436	136	639
	3	Feb-19	Feb-25	14	14	12	0	76	24	112
	4	Feb-26	Feb-28	10	10	9	0	57	18	84
Everett Derby	45	4-Nov	5-Nov	7	14	0	0	0	0	0
Season Total:				1,136	1,836	317	0	2,063	663	3,043
Variance:				23,057	74,185	4,912	0	447,548	44,546	922,430
Standard Error:				152	272	70	0	669	211	960
CV (%):				13%	15%	22%	NaN%	32%	33%	32%
95% CI:				831-1,427	1,288-2,356	180-454	0-0	751-3,374	229-1,057	1,140-4,905

Area 10 CPUE, Through Week 5:

Retained Chinook/Angler Trip: 0.1727

WDFW Puget Sound Sampling Unit, In-season Test Fishery Results

**Area 10 Selective Chinook Fishery, November 1, 2017 - February 28, 2018.
Number Chinook Encounters by Size and Mark Status in the Test Fishery**

Data Description	Chinook Encounters by Size/Mark Status ^{1/}					Legal-size Mark Rate	Overall Mark Rate
	LM	LU	SM	SU	Total		
Total Number Chin. Encounters, November 1, 2017 - February 28, 2018:	17	3	94	27	141	85.0%	78.7%
Encounter Rates (LM, LU, SM, SU)^{2/}:	12.1%	2.1%	66.7%	19.1%	100.0%		

^{1/} LM=Legal size (22 inches total length and larger) and marked; LU=Legal size and unmarked; SM=Sublegal size and marked; SU=Sublegal size and unmarked.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

March 6, 2018

Mr. Phil Anderson, Chair
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, Oregon 97220-1384

Dear Chair Anderson:

The Pacific Coast Salmon Fishery Management Plan (Salmon FMP) requires that the Pacific Fishery Management Council (Council) develop management recommendations for fisheries under the Salmon FMP consistent with consultation standards analyzed and/or described in biological opinions on the fishery developed by the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) to protect species listed as threatened or endangered under the Endangered Species Act (ESA). This letter summarizes these ESA consultation standards and provides guidance regarding their implementation for the 2018 ocean salmon fishing season. As in previous years, this letter is intended to offer NMFS' preliminary guidance regarding conservation needs for ESA-listed salmonid species.

We also use this opportunity to comment on other subjects of general interest and provide additional recommendations for non-ESA-listed salmon stocks of particular relevance to Council fisheries. For the 2018 fishing season, these other subjects include recommendations for fisheries affecting Sacramento River fall-run Chinook salmon and Klamath River fall-run Chinook salmon. We also provide an update on the status of work related to effects of fisheries on endangered Southern Resident killer whales.

Southern Resident Killer Whales (Southern Residents)

NMFS and other researchers continue to develop new scientific information and analyses regarding the ecology of Southern Residents, which are listed as endangered under the ESA. This population of whales currently totals 76, the lowest number since 1985. Over the last decade, the population declined from 87 to 76 whales and photogrammetry efforts provide evidence of declining body condition over the same time period. NMFS has identified Southern Residents as a [Species in the Spotlight](#) and is taking many actions to address the three main threats to the whales: prey limitation, vessel traffic and noise, and chemical contaminants.

Following the independent science panel workshops that reviewed the available information about Southern Residents, their feeding habits, and the potential effects of salmon fisheries on the whales through reduction in the abundance of their prey, NMFS and partners have actively

engaged in research and analyses to fill gaps and reduce uncertainties raised by the panel.¹ For example, NMFS' Northwest Fisheries Science Center continues to evaluate changes in fecundity and mortality rates, and has updated their work on population viability analyses. The data now suggest a downward trend in population growth projected over the next 50 years. This downward trend is related to the relatively low fecundity rate observed recently; new studies have linked poor reproduction to nutritional limitation.²

It is clear that Chinook salmon are important to the survival and recovery of Southern Residents. Therefore, any activities that affect the abundance of Chinook salmon available to Southern Residents, such as fisheries that occur within the geographic range of Southern Residents or that affect Chinook salmon abundance and availability throughout their range, have potential impacts on the survival and population growth of the whales. In our ESA consultations we are evaluating impacts and mitigation measures that affect survival and recovery of listed Chinook salmon populations to inform our analysis for these whales. We will continue to incorporate new information regarding the whales' status and a weight-of-evidence approach to assess impacts of actions, including fisheries, on the prey base and risks to the Southern Residents. In addition to addressing the threats posed by contaminants and disturbance by vessel traffic, NMFS is focused on understanding the whales' migration patterns, feeding habits, health conditions, and preference for Chinook salmon as prey to develop and prioritize strategies to increase abundance and availability of Chinook salmon to support population growth for Southern Residents.

In November 2017, a joint Department of Fisheries and Oceans Canada (DFO)-NMFS Prey Availability Workshop was held that focused on identifying short-term management actions that might be taken to immediately increase the abundance and availability of Chinook salmon. Priority management actions identified in the workshop that should be considered include: 1) targeted, area-based fishery management measures designed to improve Chinook salmon availability, and 2) reducing acoustic and vessel disturbance in key Southern Resident foraging areas. Broad scale coast-wide reductions in fishing to increase the prey available to the whales was not supported by the panel, which was consistent with the findings of the previous transboundary panel. For the Canadian 2018 salmon fishing season, DFO has proposed to take additional fishery management measures on a trial basis to increase Chinook salmon availability in specific Southern Resident foraging areas in Canadian waters. We are also in discussions with the National Fish and Wildlife Foundation regarding planning a transboundary workshop in 2018 to focus on identifying ways to prioritize a variety of actions to improve long-term Chinook salmon abundance. For future years, we will consider all available information about the whales and Chinook salmon in evaluating the impacts of fisheries, including actions implemented in Canada, and any measures or mitigation developed as part of a new Southern Resident killer whale recovery task force lead by Governor Inslee's office or developed as part of the Puget Sound and Pacific Salmon Treaty fishery management plans.

¹ Hilborn, R., S.P. Cox, F.M.D. Gulland, D.G. Hankin, N.T. Hobbs, D.E. Schindler, and A.W. Trites. 2012. The Effects of Salmon Fisheries on Southern Resident Killer Whales: Final Report of the Independent Science Panel. Prepared with the assistance of D.R. Marmorek and A.W. Hall, ESSA Technologies Ltd., Vancouver, B.C. for National Marine Fisheries Service (Seattle, WA) and Fisheries and Oceans Canada (Vancouver, BC). xv + 61 pp. + Appendices.

² Wasser SK, Lundin JI, Ayres K, Seely E, Giles D, Balcomb K, et al. (2017) Population growth is limited by nutritional impacts on pregnancy success in endangered Southern Resident killer whales (*Orcinus orca*). PLoS ONE 12(6): e0179824. <https://doi.org/10.1371/journal.pone.0179824>

In addition to considering impacts to the Southern Resident killer whales from fishing and needs for increased abundance of Chinook salmon, we are also working closely with partners to reduce vessel disturbance and interference with foraging, so that the existing Chinook salmon are more accessible to the whales. Working with a variety of partners, we are implementing actions identified in our review of the existing vessel regulations³ to improve compliance with regulations and guidelines to improve habitat conditions for the whales.

For more information about Southern Resident killer whale conservation and recovery actions that are underway, please refer to NMFS' "Species in the Spotlight" Priority Action Plan: http://www.nmfs.noaa.gov/pr/species/Species%20in%20the%20Spotlight/southern_resident_killer_whale_spotlight_species_5-year_action_plan_final_jan_26_2016.pdf.

CHINOOK SALMON

Sacramento River Fall-run Chinook (SRFC) Salmon

SRFC have declined in recent years to the point that the 3-year geometric mean of adult spawners in natural areas is lower than the Minimum Stock Size Threshold (MSST), thereby meeting the criteria for overfished status. When the criteria for overfished status is triggered, the FMP states that the Council shall:

- notify the NMFS West Coast Regional Administrator of this situation;
- notify pertinent management entities;
- structure Council-area fisheries to reduce the likelihood of the stock remaining overfished and to mitigate the effects on stock status;
- direct the Council's Salmon Technical Team (STT) to propose a rebuilding plan for Council consideration within one year.

NMFS will be working closely with the Council this year on a rebuilding plan, which will inform modifications to Council fisheries to improve the status of SRFC. In the meantime, consistent with the FMP as highlighted above, the Council should consider a risk-averse approach for managing fisheries in 2018 that impact SRFC.

Recent information helps inform decisions related to management in 2018. Forecasts of the Sacramento Index and the number of SRFC spawners have been substantially higher than the post-season estimates in each of the last three years (Table 1). The projected exploitation rates have also been lower than the post-season estimates. Spawner abundance has declined by an order of magnitude over the last five years from a high of 406,200 in 2013 to just 44,574 in 2017. The escapement in 2017 is near a record low. The three-year geometric mean of spawners is 76,714 and must increase to at least 122,000 to achieve rebuilt status. An escapement of 454,288 would be required to meet the FMP's criteria for rebuilt status in 2018. It is impractical to expect to achieve rebuilding so quickly, but progress can be made in 2018 toward that end.

³ Ferrara, G.A., T.M. Mongillo, L.M. Barre. 2017. Reducing disturbance from vessels to Southern Resident killer whales: Assessing the effectiveness of the 2011 federal regulations in advancing recovery goals. NOAA Tech. Memo. NMFS-OPR-58, 76 p.

Table 1. SRFC preseason abundance, escapement, and exploitation rate forecasts for 2015-2018, and comparison to postseason estimates.

	2015 Forecast	2015 Post Season	2016 Forecast	2016 Post Season	2017 Forecast	2017 Post Season	2018 Forecast
Sacramento Index	651,985	254,240	299,609	205,289	230,700	139,997	229,432
Spawners	341,017	112,947	151,128	89,674	133,242	44,574	-
Sacramento Index Exploitation Rate	48%	56%	50%	56%	42%	68%	-

The forecast of abundance for SRFC in 2018 is similar to the forecast for 2017. The harvest control rule in the Salmon FMP specifies an exploitation rate that produces an expected escapement of 122,000 adults, corresponding to maximum sustainable yield (S_{MSY}). The Conservation Objective for SRFC in the FMP specifies a range of 122,000 – 180,000 adult spawners. Given the circumstances, NMFS believes that a risk-averse management approach should be adopted for 2018 by structuring potential fisheries to target an escapement around the upper end of the SRFC Conservation Objective range.

Klamath River Fall-run Chinook (KRFC) Salmon

The status of KRFC has also declined to the point that it meets the criteria for a stock that is overfished. When the criteria for overfished status is triggered the FMP states that the Council shall:

- notify the NMFS West Coast Regional Administrator of this situation;
- notify pertinent management entities;
- structure Council area fisheries to reduce the likelihood of the stock remaining overfished and to mitigate the effects on stock status;
- direct the Salmon Technical Team (STT) to propose a rebuilding plan for Council consideration within one year.

As indicated above for SRFC, it is therefore appropriate for the Council to consider the available information and adopt a risk-averse approach for managing fisheries in 2018 that impact KRFC.

Once again, recent information can help inform decisions related to management in 2018. The ocean abundance forecasts and projected number of spawners have been substantially higher than the post-season estimates in two of the last three years. The projected exploitation rate in 2016 was lower than the post-season estimate, but preseason forecasts were quite close to post-season estimates in 2015 and 2017 (Table 2). Natural-area adult spawners have declined, nearing a record low in 2016, and the three-year geometric mean is less than half the S_{MSY} escapement objective of 40,700. An escapement of 261,285 would be required to meet the FMP's criteria for rebuilt status in 2018. It is impractical to expect achieving rebuilt status so quickly, but progress can be made in 2018 toward that end.

Table 2. KRFC preseason abundance, escapement, and exploitation rate forecasts for 2015-2018, and comparison to post-season estimates.

	2015 Forecast	2015 Post Season	2016 Forecast	2016 Post Season	2017 Forecast	2017 Post Season	2018 Forecast
Ocean Abundance	423,753	184,654	142,169	59,400	54,246	124,482	359,231
Spawners	40,700	28,112	30,909	13,937	11,379	18,514	-
Exploitation Rate	59%	59%	25%	37%	8%	9%	-

The harvest control rule specifies maximum allowable exploitation rates that vary with abundance, but generally seeks to provide for an S_{MSY} escapement level of 40,700 *natural-area adults* (i.e., adult fish that spawn in natural areas). The forecast provides for an expected escapement of 59,733 natural-area adult spawners absent fishing and, under the control rule, would allow for an exploitation rate of 31.9 percent. However, given the fact that KRFC have met the criteria for an overfished determination, and the other circumstances described above, NMFS believes that a more risk-averse approach should be adopted for 2018 by targeting a natural-area adult escapement greater than 40,700 to reduce the potential for further decline and promote rebuilding.

California Coastal (CC) Chinook Salmon Evolutionarily Significant Unit (ESU)

The CC Chinook salmon ESU has been listed as threatened under the ESA since 1999. The current consultation standard for CC Chinook, described in the FMP, is based on a NMFS biological opinion dated April 28, 2000. On June 13, 2005, NMFS completed an additional consultation on CC Chinook which specified actions necessary to implement the reasonable and prudent alternatives (RPAs) of the 2000 biological opinion for this ESU.

The RPAs of the 2000 biological opinion stated that to ensure that CC Chinook are not subject to increasing harvest rates in the future, limits on the forecast KRFC age-4 ocean harvest rates would serve as the consultation standard. The 2005 re-initiation of ESA consultation affirmed that management measures shall result in a forecast KRFC age-4 ocean harvest rate of no greater than 16 percent.

Sacramento River Winter-run Chinook Salmon ESU (winter-run)

The winter-run ESU was listed under the ESA as threatened in 1990 and relisted as endangered in 1994. Sacramento winter-run Chinook are one of eight species identified in NMFS' "Species in the Spotlight" initiative. For more information about actions for its conservation and recovery, please refer to its Species in the Spotlight Priority Action Plan: <https://www.fisheries.noaa.gov/resource/document/species-spotlight-priority-actions-2016-2020-sacramento-river-winter-run>.

There have been five biological opinions issued for the ocean salmon fishery's effects on winter-run since listing, with the most recent biological opinion completed on April 30, 2010 (NMFS 2010). The 2010 biological opinion found that the ocean salmon fishery, as managed under the Salmon FMP, was likely to jeopardize the continued existence of the winter-run. NMFS subsequently developed a reasonable and prudent alternative (RPA) which implemented a new abundance-based management framework for winter-run that is responsive

to changes in stock status. The framework was first implemented in the 2012 ocean salmon fishing year in the form of a revised 2012 RPA.

The 2012 RPA was used to set an upper limit on the impact rate for winter-run. However, in recent years the Council recommended and NMFS approved additional measures to reduce the impacts beyond that required by the RPA because of information related to the low abundance of juveniles, and other indicators of low abundance and adverse environmental conditions. Extended drought conditions beginning in 2012 and lasting until 2017 in the Sacramento River basin have increased concern for the status of winter-run.

In November 2015, the Council formed the Ad Hoc Sacramento River Winter-run Chinook Workgroup (Workgroup). The Workgroup was tasked with exploring alternative fishery management frameworks for winter-run that would help address significant annual changes in abundance and explore *de minimis* levels of fishing that could avoid complete salmon fisheries closure without significantly increasing the risk of extinction. The Workgroup focused on three major areas: 1) develop methods for forecasting abundance, 2) develop a suite of potential control rules for Council consideration, and 3) evaluate the performance of these control rules with regard to conservation benefits and fishery costs using a Management Strategy Evaluation (MSE) approach. At the September 2016 Council meeting, the Workgroup presented its results, and the Council approved a draft range of nine alternative control rules for analysis.

During its September 2017 meeting, the Council provided preliminary recommendations on the winter-run harvest policy. The Council adopted four alternative control rules for public review, one of which was a new control rule not previously considered. This new control rule was a blend of two existing alternative control rules. The Council also directed the Workgroup to use the median of the forecast distribution, rather than the mode, in all calculations for control-rule analyses and public review. In November 2017, the Council adopted the revised abundance-based harvest control rule based on the work of the Workgroup and public comments, with the recommendation the harvest control rule be reviewed periodically beginning after the fifth year of implementation. The purpose of the review would be to assess performance, and assumptions and expectations described in the Workgroup's analysis⁴.

In December 2017, the Council formally requested that NMFS consider this new harvest control rule for use in managing fisheries that affect winter-run in 2018 and beyond (Tracy 2017). NMFS is working on a biological opinion and rulemaking that is considering the newly proposed control rule and, at this time, expects to complete the consultation and rulemaking so that the control rule will apply beginning with the 2018 fishery. The proposed harvest control rule uses a forecast of winter-run age-3 escapement in the absence of fisheries (E_3^0) to determine the allowable impact rate⁵. The allowable impact rate for each fishing season is

⁴ SRWC Workgroup. 2017a. Evaluation of Sacramento River winter Chinook salmon control rules: updated Management Strategy Evaluation analysis, dated August 14, 2017. Pacific Fishery Management Council Briefing Book for September 2017, 24 p. and SRWC Workgroup. 2017b. Further evaluation of Sacramento River winter Chinook control rules, dated October 18, 2017. Pacific Fishery Management Council Briefing Book for November 2017, 9 p.

⁵ O'Farrell, M., N. Hendrix, and M. Mohr. 2016. An evaluation of preseason abundance forecasts for Sacramento River winter Chinook salmon. Pacific Fishery Management Council Briefing Book for November 2016, 35 pages.

determined based on the annual median of the E_3^0 distribution. If E_3^0 is above 3,000, a maximum impact rate of 20 percent is allowed. If E_3^0 is between 3,000 and 500 the impact rate ranges from 0.20 to 0.10. If the E_3^0 is below 500, the impact rate has a steeper decline from 10 percent until it reaches zero at an E_3^0 of zero (Figure 1).

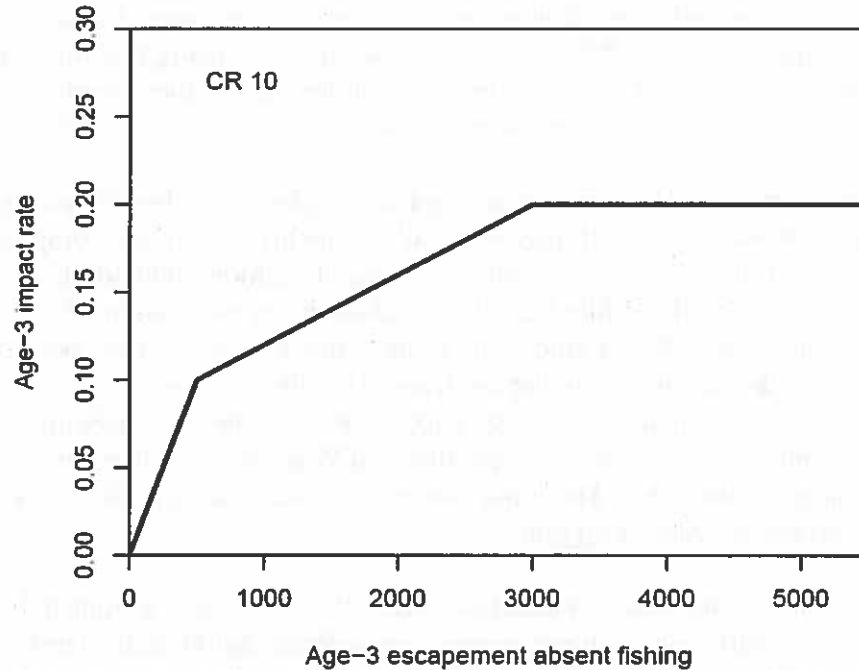


Figure 1. The proposed harvest control rule for management of ocean fisheries that affect Sacramento River winter-run Chinook salmon (Ad Hoc SRWC Workgroup, 2017).

For the 2018 season, the forecast of winter-run age-3 escapement in the absence of fisheries is 1,594. Therefore, based on the new control rule, Council fisheries in 2018 should be managed such that the impact in fisheries south of Point Arena, California does not exceed 14.4 percent.

Central Valley Spring-run Chinook Salmon ESU

The Central Valley spring-run Chinook salmon ESU was first listed as threatened in 1999. Effects of the ocean salmon fishery on Central Valley spring-run Chinook salmon were most recently analyzed in NMFS biological opinion, dated April 28, 2000, which also addresses CC Chinook salmon. The 2000 opinion concluded that the ocean salmon fishery, as regulated under the Salmon FMP and NMFS consultation standards for Sacramento River winter-run Chinook salmon, is not likely to jeopardize the continued existence of Central Valley spring-run Chinook salmon. The 2012 management framework implemented for winter-run offers at least equivalent, and/or additional, restrictions on the ocean salmon fishery than those provided by the previous Sacramento River winter-run Chinook salmon consultation standards. The management framework that includes the updated harvest control rule recommended by the Council in 2017 is more responsive than the 2012 framework to information related to the status of the stock by accounting for changes in freshwater conditions in the Central Valley for Sacramento River winter-run Chinook salmon. As a result, NMFS has concluded that the current management framework, along with other regulatory measures in the Salmon FMP, limits impacts to Central Valley spring-run Chinook salmon for the 2018 fishing year in a

manner that is more protective than anticipated in the 2000 opinion, thus reinitiation of consultation is not required.

Lower Columbia River (LCR) Chinook Salmon ESU

The LCR Chinook salmon ESU was listed as threatened under the ESA on March 24, 1999. In 2011, the Council recommended implementation of an abundance-based framework for limiting impacts on LCR Chinook salmon. NMFS analyzed the effects of using this framework to manage ocean fisheries on LCR Chinook salmon in a biological opinion completed in 2012. The framework and the 2012 opinion provides the basis for our guidance in 2018.

The LCR Chinook salmon ESU includes a spring-run component, a "far-north" migrating bright component, and a component of north-migrating tules. The bright and tule components both have fall run timing. Of nine historical spring-run Chinook salmon populations, two are considered extinct including the White Salmon and Hood River populations, both located in the Columbia River Gorge above Bonneville Dam. Four of the remaining seven populations are targeted to achieve high viability including the Upper Cowlitz, Cispus (a tributary of the Cowlitz), North Fork Lewis, and Sandy River populations. The historic spawning habitat for the Upper Cowlitz, Cispus, and Lewis River populations in Washington is now largely inaccessible to salmon due to impassable dams. These populations are therefore dependent, for the time being, on the associated hatchery programs.

The Lower Columbia Salmon and Steelhead Recovery Plan⁶ specifies actions to be taken to facilitate recovery of spring-run Chinook populations in Washington State. The Cowlitz and Lewis River Hatcheries are being used, for example, for reintroduction of spring-run Chinook salmon into the upper basins above the existing dams. The hatchery programs are therefore critical to the overall recovery effort. Given the circumstances, maintaining the hatchery brood stocks for the Cowlitz and Lewis River Hatcheries is essential for implementation of specified recovery actions. The Cowlitz Hatchery has met its escapement objective regularly. The forecast for 2018 is 5,150 adults which will again meet the minimum hatchery escapement of 1,550 adults. The Lewis River Hatchery met its minimum hatchery escapement goal of 1,500 adults in 2017 with an actual escapement of 2,400 Chinook salmon. Lewis River hatchery escapements have routinely been above goal, but have been declining in recent years. The 2018 forecast for Lewis River hatchery fish is 3,700 adults to the mouth of the Columbia River compared to an escapement goal of 1,380. NMFS understands that the States of Washington and Oregon will manage the mainstem Columbia River spring season fisheries to ensure the escapement goals for the Cowlitz and Lewis River Hatcheries are met. Although additional progress is required to meet the high viability objective for the Sandy River, harvest objectives specified for the population through recovery planning are being met. NMFS expects that the management agencies will continue to manage in-river fisheries to meet hatchery escapement goals.

There are two extant natural-origin bright populations in the LCR Chinook salmon ESU: the North Fork Lewis and Sandy River populations. Both populations are considered to be

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http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/lower_columbia_river/lower_columbia_river_salmon_recovery_sub_domain.html

relatively healthy. The North Fork Lewis River population is used as a harvest indicator for ocean and in-river fisheries. The escapement goal used for management purposes for the North Fork Lewis population is 5,700, based on estimates of maximum sustained yield derived from spawner-recruit analysis. Escapements averaged 10,400 since 2006 and, with few exceptions, have met or exceeded the goal since at least 1980. The Sandy River population is considered to be viable under current harvest conditions in the Lower Columbia River Salmon and Steelhead Recovery Plan (NMFS 2013). Given the long history of healthy returns, and management constraints that will be in place this year for other stocks, NMFS does not anticipate the need to take specific management actions in the ocean to protect the bright component of the LCR Chinook salmon ESU in 2018. NMFS does expect that the states of Washington and Oregon will continue to monitor the status of the LCR Chinook bright populations, and take the specific actions necessary through their usual authorities to deliver spawning escapement through the in-river fisheries they manage sufficient to maintain the health of these populations.

There are twenty-one separate populations within the tule component of the LCR Chinook ESU. Unlike the spring-run or bright populations of the ESU, LCR Chinook tule populations are caught in large numbers in Council fisheries, as well as fisheries to the north and in the Columbia River. The biological opinion completed in 2012 on the abundance-based management (ABM) framework concluded that fisheries managed under this framework are not likely to jeopardize LCR Chinook salmon. The ABM framework sets the annual exploitation rate limit depending on the abundance of Lower River Hatchery (LRH) tule Chinook salmon (Table 3).

Since implementation of the framework, the preseason forecasts for LCR Chinook tule have been high due in large part to favorable ocean survival conditions allowing for an exploitation rate of 0.41. In 2017, the framework allowed for an exploitation rate of 0.41, although the expected exploitation rate was 0.37 because of conservation constraints related to other species and stocks. In 2017, the postseason estimate of abundance was 64,600 Chinook salmon compared with the preseason forecast of 92,400 which, in retrospect, would have limited the exploitation rate to 0.38. The estimated post season exploitation rate for 2017 is not yet available.

Table 3. Variable exploitation rate limits based on the preseason forecast of LCR Hatchery Chinook salmon.

Lower River Hatchery Abundance	Total Exploitation Rate Limit
0-30,000	0.30
30,000-40,000	0.35
40,000-85,000	0.38
> 85,000	0.41

The preseason forecast for LRH Chinook tule in 2018 is 62,400. Therefore, based on the ABM framework, Council fisheries in 2018 should be managed such that the total exploitation rate on LCR Chinook tule in all ocean fisheries and all mainstem Columbia River fisheries below Bonneville Dam does not exceed 0.38.

NMFS will continue to focus on implementing the comprehensive transitional strategy described in the recovery plan that links harvest actions to progress on the suite of actions necessary to achieve long-term recovery. In that regard, NMFS continues to urge that fishery managers focus on all aspects of the overall recovery strategy. Monitoring will be critical to verify that the actions specified in the plan are being taken and that populations are responding as expected. Success on both fronts will be necessary to avoid further constraints on harvest in the future.

The 2012 biological opinion called for a review of the harvest framework every three years which is complimentary to an ongoing review of the recovery strategy. NMFS completed the first three-year review for fisheries implement from 2012 to 2014 in September 2015. NMFS will work with the Council to begin work shortly on the next three-year review related to fisheries implemented from 2015 to 2017. The review will provide a good opportunity to also review the Lower River Hatchery Abundance criteria currently used in the matrix to see if or how recent changes in hatchery production have changed the assumptions about abundance forecasts.

Upper Columbia River Spring-run Chinook Salmon, Upper Willamette River Chinook Salmon, Snake River Spring/Summer-run Chinook Salmon ESUs

NMFS has considered the effects of Council-area fisheries on spring-run Chinook salmon stocks from the Upper Columbia River and Upper Willamette River Basins and spring/summer-run Chinook salmon stocks from the Snake River in prior biological opinions. These stocks are rarely caught in Council fisheries. NMFS has determined that management actions designed to limit catch from these ESUs beyond what will be provided by harvest constraints for other stocks are not necessary.

Snake River Fall-run Chinook Salmon ESU

NMFS completed a biological opinion on the Pacific Salmon Treaty Agreement in 2008 where we considered the effects of fisheries, including Council area fisheries, on Snake River fall-run Chinook. In that opinion, we affirmed that limits for ocean fisheries described in that opinion continued to provide a necessary and appropriate level of protection for Snake River fall-run Chinook salmon. Consistent with that opinion, NMFS requires that the Southeast Alaskan, Canadian, and Council fisheries, in combination, achieve a 30.0 percent reduction in the age-3 and age-4 adult equivalent total exploitation rate relative to the 1988-1993 base period. The Council fisheries in 2018 therefore must be managed to ensure that the 30.0 percent base period reduction criterion for the aggregate of all ocean fisheries is achieved.

Puget Sound Chinook Salmon ESU

The following summarizes guidance for the Puget Sound Chinook salmon ESU. While NMFS is providing guidance for the Council fisheries for 2018, we acknowledge the importance of, and continue to strongly support, the integrated management structure between the Council and North of Falcon planning processes. The Salmon FMP describes conservation objectives for each Puget Sound Chinook salmon stock, although these have evolved over time. The consultation standards for Puget Sound Chinook salmon stocks that NMFS includes in this letter are described in terms of total or southern U.S. impacts rather than Council fisheries specific impacts. Under the current management structure, Council fisheries are included as part of the suite of fisheries

that comprise the fishing regime negotiated each year by the co-managers under *U.S. v. Washington* to meet management objectives for Puget Sound and Washington Coastal salmon stocks. Therefore, in adopting its regulations, the Council must determine that its fisheries, when combined with the suite of other fisheries impacting this ESU, meet the management targets set for populations within this ESU. For that reason, NMFS provides the following guidance for fisheries managed under the Council and describes its expectations for the full suite of southern U.S. fisheries that will affect Puget Sound Chinook salmon stocks in 2018.

NMFS has consulted on a series of proposed harvest plans for the Puget Sound Chinook Salmon ESU since the ESU was listed in 1999. NMFS is currently reviewing a new comprehensive, multi-year joint Resource Management Plan (RMP) developed by the Washington Department of Fish and Wildlife and the Puget Sound Treaty Tribes (collectively the Puget Sound co-managers) submitted for consideration in December 2017 for the 2018-2028 fishing years. However, review of that RMP will not be complete in time for the 2018 fishing season and discussions between NMFS and the Puget Sound co-managers regarding the provisions of the RMP are on-going. Therefore, NMFS expects to conduct a one-year consultation on a Bureau of Indian Affairs proposed action encompassing the 2018 fishing season that considers all of the available information including that provided in the RMP, NMFS' recent five-year status review of the Puget Sound Chinook salmon ESU⁷ and the updated Rebuilding Exploitation Rates⁸. The final ESA determination shall be provided when the biological opinion for the Puget Sound fisheries is completed by early May 2018.

We understand that the Puget Sound co-managers may provide management objectives to the Council for the 2018 season that are derived from various sources including the proposed 2018-2028 RMP, or that are specific to the circumstances in 2018, but that may differ from some of the guidance presented here. The conservation objectives presented in Table 4 were developed utilizing different methodologies and management scale than those of the co-managers. Evaluation of the co-managers' objectives and associated management provisions in comparison to this guidance is ongoing. NMFS and the co-managers are working together on additional technical analysis as we seek to reconcile some or all of the differences in the two sets of objectives. NMFS may provide further guidance to the Council in April pending further discussions with the Puget Sound co-managers and based on information developed through the North of Falcon process.

Although Council and Puget Sound fisheries are intertwined, impacts on Puget Sound Chinook salmon stocks in Council fisheries are generally quite low. In 2004, NMFS issued a biological opinion on the anticipated effects of Council fisheries on the listed Puget Sound Chinook ESU for 2004 and future fishing years (NMFS 2004). The 2004 opinion found that exploitation rates in Council area fisheries within the range observed for brood years 1991-1998 would not jeopardize the continued existence of the species. Consistent with the findings of that opinion,

⁷ http://www.westcoast.fisheries.noaa.gov/publications/status_reviews/salmon_steelhead/2016_status_review.html

⁸ Standards NMFS uses to assess risk to individual populations in the Puget Sound Chinook ESU. The collective risk across populations from that evaluation informs the jeopardy determination in the consultation.

the 2018 Council fisheries should be managed such that exploitation rates on Puget Sound spring- and fall-run Chinook salmon populations do not exceed 3 and 6 percent, respectively. Exploitation rates on Puget Sound spring- and fall-run Chinook stock aggregates in Council fisheries have been less than two percent and five percent on average, respectively, in recent years.

The status of populations in the Puget Sound Chinook salmon ESU varies. However, there is no question that the status of the ESU as-a-whole has declined over the past 10 years. NMFS' most recent five-year status review of West Coast ESA-listed salmonids⁷ in 2016 reported negative trends from 1999 to 2014 in natural-origin spawners for 17 of the 22 populations. The proportion of natural-origin fish on the spawning grounds has decreased steadily over time. Natural-origin escapement of 7 of the 22 populations in the ESU are below their critical thresholds which, for all but one of the populations, means less than 200 natural-origin spawners. Six of those populations are essential to recovery of the ESU. The tenuous status of the ESU in general is not necessarily because of harvest, but consideration of the status of the ESU as-a-whole and the critical populations, in particular, suggests that a more conservative management regime than has been in place is warranted. Our guidance reflects that additional conservatism.

Our guidance for conservation objectives for all Puget Sound Chinook salmon populations is summarized in Table 4. Primary factors considered in developing the guidance were the status of the populations and their various roles in recovery of the ESU, NMFS' updated RERs, the forecast abundance in 2018, and provisions in the proposed RMP. The guidance is a mixture of total and southern U.S. exploitation rates and escapement goals. The objective depends on the forecast abundance of the individual Chinook salmon stocks. Preseason run size information in 2018 indicates that the Dungeness, North and South Fork Nooksack early-run, Mid-Hood Canal, Sammamish, and South Fork Stillaguamish populations will be at very low abundance in 2018.

Table 4. NMFS' guidance for Puget Sound Chinook salmon conservation objectives for the 2018 fishing year.

Management Unit/Population	Exploitation Rate Ceiling	
	Total	Southern U.S.
Nooksack spring NF Nooksack SF Nooksack		10.5%
Skagit Summer/Fall Upper Skagit Lower Skagit Lower Sauk	45%	
Skagit Spring Suiattle Upper Sauk Cascade	23%	
Stillaguamish NF Stillaguamish SF Stillaguamish	24%	13% ^a
Snohomish Skykomish Snoqualmie	18%	
Lake Washington Cedar River		18%
Green	31%	
White River ^b		22%
Puyallup	44%	
Nisqually ^c	49% (47% base + 2% for experimental selective fishery)	
Skokomish ^d	44%	
Mid-Hood Canal		12.0%
Dungeness		10.0%
Elwha		10.0%

^a Provisions of the 2018 RMP state that the total exploitation rate (including AK and Canadian salmon fisheries) cannot exceed 24%. If northern fisheries exceed 11%, Southern U.S. impacts will be lowered to maintain Natural Origin Recruit impacts to not exceed 24% exploitation rate.

^b NMFS expects Canadian fisheries to remain constrained similar to the recent 5 years. Therefore, the total exploitation rate for White River Chinook salmon in 2018 is expected to be 28% or less.

^c Implementation of experimental selective fishery in 2018 is dependent on NMFS receipt of rationale for 2% ceiling and detailed implementation plan for the experimental fishery prior to completion of the biological opinion.

^d Anticipated hatchery or natural escapements below these spawner abundances (800 natural; 500 hatchery) trigger specific additional management actions. Contingent on continued implementation of the provisions of the Addendum to 2014 Plan for Management of Fall Chinook salmon in the Skokomish River (October 31, 2015).

The recent work to update the Fishery Regulation and Assessment Model (FRAM) base period indicates that fisheries have consistently exceeded exploitation-rate ceilings for the Puyallup and Skokomish Chinook populations. Therefore, the guidance in Table 4 incorporates buffers for these populations based on the average exceedance in recent years. The co-managers recently investigated the reasons for this pattern but NMFS is still reviewing that information. NMFS will continue to work with the co-managers during the North of Falcon process to determine the actions that the co-managers will take to ensure exploitation rates in 2018 meet their management objectives. It is essential that fishing plans be designed using the best available scientific information and with an expectation that the conservation objectives will not be exceeded.

In summary, while this document provides guidance for the Council fisheries in 2018, we acknowledge the importance of the integrated management structure between the Council and North of Falcon planning processes. Because impacts in Council fisheries are low, management actions taken to meet conservation objectives will occur primarily in Puget Sound fisheries. However, since impacts in all fisheries are considered in meeting the objectives, NMFS must be assured that the final option adopted at the April 2018 Council meeting when combined with Puget Sound fisheries negotiated during the North of Falcon process are consistent with the conservation objectives for each Puget Sound Chinook management unit included in Table 2 based on the anticipated 2018 abundances. Any delay in reaching the necessary agreements through the North of Falcon process by the end of the April 2018 Council meeting will complicate NMFS ability to approve regulations for Council area fisheries and to complete the biological opinion for Puget Sound fisheries by May 2018.

COHO SALMON

Oregon Coast (OC) Coho Salmon ESU

The ESA listing status of the OC coho ESU has changed over the years. On February 11, 2008, NMFS again listed OC coho as threatened under the ESA. Regardless of their listing status, the Council has managed OC coho consistent with the terms of Amendment 13 of the Salmon FMP as modified by the expert advice of the Council's 2000 ad-hoc OC Natural Coho Workgroup. NMFS approved the management provisions for OC coho in connection with its ESA section 7 consultation on Amendment 13 to the Salmon FMP in 1999, and has since supported use of the related expert advice.

Allowable fishery impact rates for OC coho are set based on measures of parental escapement and marine survival. Impact rates are set for each of the three sub-aggregates with the ocean impacts rate being limited by the lowest of the three. For the 2018 season, the spawner status for the northern and north-central sub-aggregates is low, and for the south-central sub-aggregate medium. The marine survival index is in the low category. Under these circumstances, the Workgroup report requires that the exploitation rate be limited to no more than 15 percent for all of the sub-aggregates. Although the south sub-aggregate is included in the harvest matrix described in Amendment 13 as modified by the 2000 Workgroup, the south

sub-aggregate is part of the Southern Oregon/Northern California Coastal coho ESU and is managed subject to provisions that are described below for that ESU.

Managers should continue to coordinate ocean fishery impacts with desired terminal fishery opportunities for wild coho salmon to ensure that the impacts for each of the sub-aggregates remain within the overall limits specified for the sport fishery consistent with the Fishery Management and Evaluation Plans for the rivers and lakes of the OC coho ESU⁹. For 2018, the ocean fisheries plus the specific river sport fisheries are subject to a limit of 15 percent in each sub-aggregate.

Lower Columbia River (LCR coho) Coho Salmon ESU

The LCR coho ESU was listed as threatened under the ESA on June 28, 2005. In 2014 the Council recommended a harvest management matrix for managing impacts to LCR coho. NMFS' completed a biological opinion concluding that Council fisheries managed using this matrix are not likely to jeopardize LCR coho. The matrix and the 2015 opinion provides the basis for our guidance in 2018.

The total exploitation rate limit for LCR coho is set each year based on measures of parental escapement and marine survival (Table 5). The total exploitation rate on LCR coho salmon in all marine area fisheries and fisheries in the mainstem Columbia River below Bonneville Dam must not exceed the year-specific exploitation rate limit.

Table 5. Harvest management matrix for LCR coho showing allowable fishery exploitation rates based on parental escapement and marine survival index.

Parental Escapement (rate of full seeding)		Marine Survival Index (based on return of jacks per hatchery smolt)					Allowable exploitation rate
		Very Low (≤ 0.06%)	Low (≤ 0.08%)	Medium (≤ 0.17%)	High (≤ 0.40%)	Very High (> 0.40%)	
Normal	≥ 0.30	10%	15%	18%	23%	30%	
Very Low	< 0.30	≤ 10%	≤ 15%	≤ 18%	≤ 23%	≤ 30%	

For the 2018 season, parent escapement is in the normal category. The marine survival index is in the medium category. Therefore, Council fisheries in 2018 should be managed such that the total exploitation rate in all fisheries on LCR coho below Bonneville Dam does not exceed 18 percent.

The 2015 biological opinion called for a review of the abundance-based management framework every three years or as needed to consider new information. The review should include, but is not limited to information about, forecast methods, natural-origin spawner escapement, proportion of hatchery-origin spawners, marine survival, and other information

⁹ NMFS. 2009. Letter from Barry Thom, NMFS, to Ed Bowles, ODFW, dated September 1, 2009, concurring with ODFW's "Oregon Coastal Coho, Coastal Rivers Coho Sports Fishery" Fisheries Management and Evaluation Plan under limit 4 of the 4(d) rule.

used in the Beamesderfer et al. (2014) risk analysis¹⁰. NMFS will work with the Council and initiate the review shortly regarding fisheries implemented from 2015 to 2017.

Southern Oregon/Northern California Coastal (SONCC) Coho Salmon ESU

The SONCC coho ESU has been listed as threatened under the ESA since 1997. The current consultation standard for SONCC coho, described in the FMP, is from a NMFS biological opinion dated April 28, 1999. The Rogue/Klamath coho hatchery stock is used as an indicator of fishery impacts on SONCC coho. The consultation standard requires that management measures developed under the Salmon FMP achieve an ocean exploitation rate on Rogue/Klamath coho hatchery stocks of no more than 0.13.

Central California Coastal (CCC) Coho Salmon ESU

The CCC coho ESU was listed as threatened under the ESA in 1996 and relisted as endangered in 2005. The current consultation standard for CCC coho is from a NMFS biological opinion dated April 28, 1999. Information on past harvest or non-retention mortality rates is lacking for CCC coho. In the absence of more specific information, the consultation standard requires that directed fishing for coho and retention of coho in Chinook salmon-directed fisheries be prohibited off California.

CCC coho salmon are one of eight species recently identified in NMFS' "Species in the Spotlight" initiative. For more information about actions for its conservation and recovery, please refer to its Species in the Spotlight Priority Action Plan:

<https://www.fisheries.noaa.gov/species/coho-salmon-protected/spotlight>.

CHUM SALMON

Hood Canal Summer-run Chum Salmon ESU

Chum salmon are not targeted and are rarely caught in Council salmon fisheries. However, the Salmon FMP requires fisheries to be managed consistent with NMFS' ESA standards for listed species, which includes the Hood Canal summer-run chum salmon ESU. The Summer Chum Salmon Conservation Initiative¹¹, approved by NMFS under Limit 6 of the ESA 4(d) Rule describes the harvest actions that must be taken to protect listed Hood Canal summer-run chum salmon both in Washington fisheries managed under the jurisdiction of the Council and Puget Sound fisheries managed by the state and tribal fishery managers.

Under the terms of the Conservation Initiative, chum salmon must be released in non-treaty sport and troll fisheries in Washington catch Area 4 from August 1 through September 30. The Conservation Initiative does not require release of chum salmon in tribal fisheries in catch Area 4

¹⁰ Beamesderfer, R., S. Ellis, J. Jording, C. Kern, C. LeFleur, D. Milward, E. Patiño, A. Rankis, and J. Whisler. 2014. Allowable Fishery Impacts To Lower Columbia River Natural Coho. A Review of the 2006 Harvest Control Rule for Possible Policy Reconsideration. Pages 53 p in PFMC, editor. Lower Columbia River Natural Coho Workgroup.

¹¹ Washington Department of Fish and Wildlife and Point No Point Treaty Tribes. 2000. Summer Chum Salmon Conservation Initiative: An Implementation Plan to Recover Summer Chum in the Hood Canal and Strait of Juan de Fuca Region. Dated April 2000. 797 p.

during the same period, but does recommend that release provisions be implemented. As in previous years, tribal managers will discuss implementation of these provisions during the North of Falcon planning process.

SOCKEYE SALMON

Snake River Sockeye Salmon and Ozette Lake Sockeye Salmon ESUs

Sockeye salmon are rarely caught in Council salmon fisheries. In previous biological opinions, NMFS determined that Council fisheries were not likely to adversely affect Snake River or Ozette Lake sockeye salmon. Therefore, management constraints in ocean fisheries for the protection of listed sockeye salmon are not considered necessary.

STEELHEAD

One Distinct Population Segment (DPS) of steelhead is currently listed as endangered and ten DPSs are listed as threatened in Washington, Oregon, Idaho, and California. All eleven ESA-listed DPSs have been considered in biological opinions on the effects of Council fisheries.

Steelhead are rarely caught in ocean fisheries and retention of steelhead in non-treaty commercial ocean fisheries is currently prohibited. Based on currently available information, NMFS concludes that no additional measures are required to avoid effects not already considered in prior biological opinions. The Council and states should continue to prohibit the retention of steelhead with intact adipose fins in ocean recreational fisheries and NMFS encourages the same in treaty tribal fisheries to minimize the effect of whatever catch may occur.

The NMFS West Coast Region looks forward to working with the Council to develop fisheries consistent with the conservation and management objectives of the Salmon FMP under the Magnuson-Stevens Fishery Management and Conservation Act and the ESA. We are committed to working with the Council to address the issues outlined in this letter. If you have questions, please contact Ryan Wulff, Assistant Regional Administrator for Sustainable Fisheries at 916-930-3733 or Ryan.Wulff@noaa.gov.

Sincerely,



Barry A. Thom
Regional Administrator

cc: Chuck Tracy, Executive Director, Pacific Fishery Management Council
Ryan Wulff, Assistant Regional Administrator for Sustainable Fisheries, NMFS WCR