

PRESEASON REPORT II
PROPOSED ALTERNATIVES
AND
ENVIRONMENTAL ASSESSMENT PART 2
FOR 2021 OCEAN SALMON FISHERY
REGULATIONS

REGULATION IDENTIFIER NUMBER 0648- BJ97



Pacific Fishery Management Council
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MARCH 2021

PUBLIC HEARINGS ON SALMON ALTERNATIVES

Hearings held on-line

Web link <https://meetings.ringcentral.com/join>

Washington

Tuesday, March 23, 2021, 7:00 p.m.

Meeting ID: 144 199 7052

California

Tuesday, March 23, 2021, 7:00 p.m.

Meeting ID: 144 064 8396

Oregon

Wednesday, March 24, 2021, 7:00 p.m.

Meeting ID: 144 019 6293

Written public comment on the Alternatives may also be submitted to the PFMC (www.pcouncil.org) Public Comment Electronic Portal ([E-Portal](#)). The public comment deadline is 5:00 p.m. Pacific Time, Monday, April 5, 2021.

Public comment on the Alternatives will also be accepted during the April Council meeting (held via webinar) on Thursday, April 8, during the public comment period for Agenda Item D.1.

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LIST OF ACRONYMS AND ABBREVIATIONS

AABM	Aggregate Abundance Based Management
ABC	acceptable biological catch
ACL	annual catch limit
AEQ	adult equivalent
BO	biological opinion
CDFW	California Department of Fish and Wildlife
CFGC	California Fish and Game Commission
CO	central Oregon (South end of Heceta Bank to Humbug Mountain.)
Council	Pacific Fishery Management Council
CPUE	catch per unit effort
CYER	Calendar year exploitation rate
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ENSO	El Niño/Southern Oscillation
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FB	Fort Bragg (southern boundary of California KMZ to Point Arena)
FRAM	Fishery Regulation Assessment Model
FMA	fishery management area
FMP	fishery management plan
FONSI	finding of no significant impact
GSI	genetic stock identification
IPHC	International Pacific Halibut Commission
ISBM	Individual Stock Based Management
KC	California KMZ (OR/CA border to Horse Mountain)
KO	Oregon KMZ (Humbug Mountain to the OR/CA border)
KMZ	Klamath Management Zone
KRFC	Klamath River fall Chinook
LCN	Lower Columbia Natural (wild Columbia River coho below Bonneville Dam)
LCR	Lower Columbia River (wild Col. River tule fall Chinook below Bonneville Dam)
LRH	Lower River Hatchery (hatchery Col. River tule fall Chinook below Bonneville Dam)
LRW	Lower River Wild (Columbia River bright fall wild Chinook below Bonneville Dam)
MT	Makah Tribe
MO	Monterey (Pigeon Point to the U.S./Mexico border)
NEPA	National Environmental Policy Act
MSA	Magnuson-Stevens Act
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NO	northern Oregon (Cape Falcon to south end of Heceta Bank)
NAO	National Oceanic and Atmospheric Administration Administrative Order
NOAA	National Oceanic and Atmospheric Administration
ODFW	Oregon Department of Fish and Wildlife
OCN	Oregon coastal natural (coho)
OFL	overfishing limit
OLE	Office of Law Enforcement (NOAA)

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

OPI	Oregon Production Index
OSP	Oregon State Police
OY	optimum yield
PDO	Pacific (inter) Decadal Oscillation
PSC	Pacific Salmon Commission
PST	Pacific Salmon Treaty
QTA	Quinalt Treaty Area
RER	rebuilding exploitation rate
RMP	Resource Management Plan
RK	Rogue/Klamath (hatchery coho)
S _{ABC}	spawning escapement associated with ABC
S _{ACL}	spawning escapement associated with ACL (= S _{ABC})
SCH	Spring Creek Hatchery (Col. R. tule fall Chinook returning to Spring Creek Hatchery [above Bonneville Dam])
SEAK	Southeast Alaska
S _{MSY}	MSY spawning escapement
SET	spawning escapement target
SF	San Francisco (Point Arena to Pigeon Point)
SONCC	Southern Oregon/Northern California Coast (coho ESU)
SRFC	Sacramento River fall Chinook
SRFI	Snake River fall (Chinook) Index
SRW	Snake River wild (fall Chinook)
SRWC	Sacramento River winter Chinook
STT	Salmon Technical Team
SWO	State Waters Only (fisheries off Oregon south of Cape Falcon)
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
WCVI	West Coast Vancouver Island
WDFW	Washington Department of Fish and Wildlife

1.0 INTRODUCTION

This is the third report in an annual series of four reports prepared by the Salmon Technical Team (STT) of the Pacific Fishery Management Council (Council) to document and help guide ocean salmon fishery management off the coasts of Washington, Oregon, and California. This report describes the Council's proposed ocean salmon management alternatives for 2021 and characterizes the expected impacts on ocean salmon fisheries and the stocks that support them. The Council solicits public comments on the proposed management Alternatives in preparation for adopting final management recommendations at its annual April meeting. Three public hearings are scheduled to provide opportunity for public comments on the proposed Alternatives (information is displayed on the inside front cover of this report). In addition, opportunity for public comments will be provided at the April Council meeting (via webinar). Written public comments can be submitted to the PFMC Public Comment Electronic Portal ([E-Portal](#)). The supplemental public comment deadline is 5:00 p.m. Pacific Time, Monday, April 5, 2021.

This report constitutes the second part of an Environmental Assessment (EA) to comply with National Environmental Policy Act (NEPA) requirements for the 2021 ocean salmon management measures. An EA is used to determine whether an action being considered by a Federal agency has significant impacts. This part of the EA includes an additional description of the affected environment relevant to the alternative management measures considered for 2021 ocean salmon fisheries, a description of the Alternatives, and an analysis of the environmental consequences of the Alternatives. Preseason Report II will also analyze the potential impacts of a reasonable range of alternatives.

The first part of the EA (Preseason Report I; PFMC 2021a) included a statement of the purpose and need, a summary description of the affected environment, a description of the No-Action Alternative, and an analysis of the No-Action Alternative effects on the salmon stocks included in the Council's Salmon Fishery Management Plan (FMP), which is one component of the affected environment. Along with the description and analysis of the Proposed Action including both short term and long term impacts in Preseason Report III (developed after the Council makes a final recommendation in April 2021), these three parts of the EA will provide the necessary components to determine if a finding of no significant impact (FONSI) or Environmental Impact Statement (EIS) is warranted.

2.0 SELECTION OF FINAL MANAGEMENT MEASURES

The Council's final ocean salmon season recommendations will be based on the range of Alternatives presented in this report and guidance received from deliberations at management fora such as the north of Cape Falcon planning process (sponsored by the States of Washington and Oregon and the treaty Indian tribes in that area), Pacific Salmon Commission (PSC), and from public hearings sponsored by the Council and the States of Washington, Oregon, and California. Final recommendations concerning season dates, catch quotas, and exploitation rates may vary from the range of Alternatives presented in this report depending upon determination of allocations, allowable harvest levels, public comment, or the final impact analyses completed by the STT. Elements of the Alternatives may be recombined to alter season patterns and quotas, or measures such as bag limits, days of fishing per week, special landing restrictions, and other specific regulatory details may also change. In addition, inseason modification of management measures may be used to ensure achievement of the Council's management objectives.

Specific details pertaining to season structure and special management measures for the treaty Indian troll fishery north of Cape Falcon are established in tribal regulations. Chinook and coho quota levels for the treaty Indian troll fishery may be adjusted if substantial changes in incidental fishing mortality result from tribal regulations, preseason or inseason.

The impact analyses presented in this document reflect uncertainties and limitations of information available at the time of the March 2021 Council meeting. At this point in the planning cycle, the STT's impact assessments reflect five key assumptions relative to stocks impacted by Canadian and Alaskan fisheries:

- 1) abundance levels for Canadian Chinook and coho stocks identical to 2020 forecasts;
- 2) for Canadian Chinook fisheries managed under the aggregate abundance-based management (AABM) provisions of the 2019 Pacific Salmon Treaty (PST) Agreement, including Northern British Columbia and West Coast Vancouver Island (WCVI) troll and sport fisheries, 2021 fisheries were modeled using fishing effort scalars from the final 2020 preseason model run;
- 3) for Canadian Chinook fisheries managed under individual stock-based management (ISBM) regimes, the 2021 fishery inputs were modeled using recent two-year average catches to reflect anticipated fishing levels consistent with the 2019 PST Agreement;
- 4) for Canadian coho fisheries, all fisheries were modeled using single-year 2019 postseason fishing effort scalars from the Fishery Regulation Assessment Model (FRAM), with the exception of Johnstone Strait troll, which used 2018 postseason scalars, Johnstone Strait net, which used 2016 postseason scalars, northern BC sport and troll, which used scalars approximately half the 2019 postseason scalars, and north Georgia Strait sport in September, which used an increased scalar relative to the 2019 postseason scalar;
- 5) for Southern U.S. inside fisheries for Chinook and inside and coastal terminal fisheries for coho, the 2020 final preseason modeled fisheries were used.

In mid-March, U.S. and Canadian fishery managers exchange information regarding preseason expectations for fisheries and the status of Chinook and coho stocks. In addition, the PSC's Chinook Model will be calibrated by the PSC Chinook Technical Committee to determine the allowable catch ceilings for Canadian AABM fisheries under the 2019 PST Agreement. Abundances and fishery expectations will be adjusted in the Council's fishery planning models prior to the April Council meeting, and inside fisheries will be shaped by state and tribal co-managers both prior to and during the April Council meeting.

Any Alternative considered for adoption that deviates from Salmon FMP objectives or other applicable laws will require implementation by emergency rule. If an emergency rule appears to be necessary, the Council must clearly identify and justify the need for such an action consistent with emergency criteria established by the Council and the National Marine Fisheries Service (NMFS).

3.0 SALMON TECHNICAL TEAM CONCERNS

The Salmon Technical Team has no concerns to report in this document for 2021.

4.0 SALMON FISHERY MANAGEMENT PLAN REQUIREMENTS

The Council's Salmon FMP includes objectives for setting annual management measures to regulate ocean salmon fisheries between the U.S./Canada border and the U.S./Mexico border. The objectives include biological, administrative, and allocation requirements. In recommending final management measures, the Council attempts to meet all objectives in a fair and balanced manner, while maintaining established priorities.

Biological objectives for stocks originating in the Council area and impacted by Council area ocean fisheries are listed in Table 3-1 of the Salmon FMP. The objectives generally consist of meeting spawning escapement numbers associated with maximum sustainable yield (S_{MSY}), overfishing limits (OFL), acceptable biological catch (ABC), and annual catch limits (ACL), or exploitation rate limits designed to

support recovery of depressed stocks or to rebuild overfished stocks, while encompassing a long term average harvest approximating MSY.

Administrative objectives are requirements for meeting other applicable law outside of the Salmon FMP. These requirements include Endangered Species Act (ESA) consultation standards, international treaties, and tribal trust responsibilities. The Salmon FMP defers to NMFS consultation standards for salmon stocks listed under the ESA in regard to biological conservation objectives. Section 5.0 of this document provides greater detail on ESA listed stocks, while impacts of the Council adopted salmon management measures on ESA listed stocks are included in Tables 5a and 5b.

The Salmon FMP requires compliance with relevant terms of the PST. Section 6.0 of this document provides greater detail on PST provisions and stocks, while impacts of the Council adopted salmon management measures on those stocks are included in Tables 5a and 5b.

Treaty trust responsibilities of the Salmon FMP require the Council to abide by Court orders in the *U.S. v. Washington* (Puget Sound), *Hoh v. Baldrige* (Washington coast), and *U.S. v. Oregon* (Columbia River) cases, and the Solicitor General opinion (Klamath River) governing allocation and management of shared salmon resources. Much of the North of Falcon forum is dedicated to annual negotiations establishing allocation among the tribes, non-Indian fishing sectors, and ocean and inside interests. The results of these negotiations allow the Council to complete final management measure recommendations while meeting its biological, administrative, and allocation objectives.

The Columbia River treaty tribes establish periodic management agreements with the state co-managers and Federal agencies. These agreements are approved pursuant to provisions of *U.S. v. Oregon* procedures. Recent agreements have included an entitlement for the treaty tribes of 50 percent of the coho return destined for areas upstream from Bonneville Dam. Council area fisheries are shaped in order to meet this requirement in some years.

The Yurok and Hoopa Valley Tribes are entitled to 50 percent of the total Klamath River fall Chinook (KRFC) harvest, which is calculated as a harvest of KRFC equal to that taken in all non-Indian fisheries. The Council must account for all harvest impacts when assessing the achievement of KRFC conservation objectives.

In addition to the allocation objectives associated with sharing between treaty Indian and non-Indian sectors, the Salmon FMP includes formulas for sharing Chinook and coho quotas. North of Cape Falcon, there are sharing formulas between commercial and recreational sectors, and among recreational port subareas. South of Cape Falcon, there are sharing formulas for coho between commercial and recreational sectors. Alternatives for the 2021 salmon management measures adopted by the Council meet the allocation requirements for Chinook fisheries north of Cape Falcon in the Salmon FMP. Salmon FMP harvest allocation guidelines for north of Cape Falcon also specify the distribution of coho between commercial and recreational sectors and provide for equal recreational harvest opportunity for coho salmon north and south of Leadbetter Point. In response to low stock projections for some coho salmon stocks on the Washington coast, Alternative II reduces impacts in the commercial troll fishery relative to those in the recreational fishery and provides increased allocation of coho within the recreational fishery to the area south of Leadbetter Point (Columbia River Subarea) relative to the FMP sharing formula. As such, Alternative II appears to deviate from the FMP harvest allocation guidelines and therefore may require fisheries north of Cape Falcon to be implemented under a temporary rule for emergency action if this Alternative is selected.

In support of the adoption of these Alternatives for public review, the Council reviewed the criteria used to evaluate requests for emergency action by the Secretary from Council Operating Procedure 10 (*italics*

below) and provided the following preliminary rationale for considering a deviation from the FMP harvest allocation guidelines:

1. *The issue was not anticipated or addressed in the salmon plan, or an error was made.* The issue was not caused by an error. The low abundance of some Washington coastal coho stocks combined with the expected very large return of Columbia River hatchery coho present circumstances that were not anticipated in the FMP. Alternative II allocates a larger share to the recreational fishery in the Columbia River Area than is prescribed by the FMP as a method to allow access to the abundant hatchery return to the Columbia River, while limiting impacts on natural Washington coastal stocks.
2. *Waiting for a plan amendment to be implemented would have substantial adverse biological or economic consequences.* Alternative II is being considered as a method to optimize harvest while meeting conservation objectives, and could provide substantial economic benefit to ports and communities of the Columbia River by providing access to coho quota that would otherwise be lost due to poor expected returns of some Washington coastal stocks. A plan amendment cannot be completed in time.
3. *In the case of allocation issues, the affected user representatives support the proposed emergency action.* Commercial troll and recreational fishery representatives were involved in developing the Alternatives adopted. Their assistance was critical to the development of the Alternatives and there is full support for the Alternatives going out for public review, including the Alternative that deviates from strict adherence to the FMP.
4. *The action is necessary to meet FMP objectives.* The structure of the Alternative and the potential deviation from the strict terms of the FMP will better optimize harvest while meeting conservation goals, and thereby more fully meet FMP objectives.
5. *If the action is taken, long-term yield from the stock complex will not be decreased.* This Alternative will not decrease long-term yield. The potential deviation from the FMP allocation guidelines in Alternative II is intended to optimize harvest while meeting conservation objectives – it would reallocate quota relative to the FMP-prescribed allocations to increase allowable harvest while decreasing the relative impact on constraining stocks; it will not increase allowable impacts on constraining stocks.

5.0 SALMON SPECIES LISTED UNDER THE ENDANGERED SPECIES ACT

Since 1989, NMFS has listed the following 17 Evolutionarily Significant Units (ESUs) of salmon under the ESA:

Species	ESU	Status	Federal Register Notice			
			Most Recent		Original Listing	
Chinook Salmon (<i>O. tshawytscha</i>)	Chinook					
	Sacramento River Winter	Endangered	83 FR 18233	4/26/2018	54 FR 32085	8/1/1989
	Snake River Fall	Threatened	76 FR 50448	8/15/2011	57 FR 14653	4/22/1992
	Snake River Spring/Summer	Threatened	76 FR 50448	8/15/2011	57 FR 14653	4/22/1992
	Puget Sound	Threatened	76 FR 50448	8/15/2011	64 FR 14308	3/24/1999
	Lower Columbia River	Threatened	76 FR 50448	8/15/2011	64 FR 14308	3/24/1999
	Upper Willamette River	Threatened	76 FR 50448	8/15/2011	64 FR 14308	3/24/1999
	Upper Columbia River Spring	Endangered	76 FR 50448	8/15/2011	64 FR 14308	3/24/1999
	Central Valley Spring	Threatened	76 FR 50447	8/15/2011	64 FR 50394	9/16/1999
	California Coastal	Threatened	76 FR 50447	8/15/2011	64 FR 50394	9/16/1999
Chum Salmon (<i>O. keta</i>)	Chum					
	Hood Canal Summer-Run	Threatened	76 FR 50448	8/15/2011	64 FR 14508	3/25/1999
	Columbia River	Threatened	76 FR 50448	8/15/2011	64 FR 14508	3/25/1999
Coho Salmon (<i>O. kisutch</i>)	Coho					
	Central California Coastal	Endangered	76 FR 50447	8/15/2011	61 FR 56138	10/31/1996
	S. Oregon/ N. California Coastal	Threatened	76 FR 50447	8/15/2011	62 FR 24588	5/6/1997
	Oregon Coastal	Threatened	76 FR 50448	8/15/2011	63 FR 42587	8/10/1998
	Lower Columbia River	Threatened	76 FR 50448	8/15/2011	70 FR 37160	6/28/2005
Sockeye Salmon (<i>O. nerka</i>)	Sockeye					
	Snake River	Endangered	76 FR 50448	8/15/2011	56 FR 58619	11/20/1991
	Ozette Lake	Threatened	76 FR 50448	8/15/2011	64 FR 14528	3/25/1999

As the listings have occurred, NMFS has initiated formal consultations and issued biological opinions (BOs) that consider the impacts resulting from implementation of the Salmon FMP, or from annual management measures, to listed salmonid species. NMFS has also reinitiated consultation on certain ESUs when new information has become available on the status of the stocks or on the impacts of the Salmon FMP on the stocks. The consultation standards referred to in this document include: (1) reasonable and prudent alternatives, (2) conservation objectives for which NMFS conducted Section 7 consultations and arrived at a no-jeopardy conclusion, and (3) NMFS requirements under Section 4(d) determinations.

A list of current BOs in effect, the species they apply to, and their duration follows:

Date	Evolutionarily Significant Unit covered and effective period
3/8/1996	Snake River spring/summer and fall Chinook and sockeye (until reinitiated)
4/28/1999	Oregon Coastal natural coho, Southern Oregon/ Northern California coastal coho, Central California coastal coho (until reinitiated)
4/28/2000	Central Valley spring Chinook (until reinitiated)
4/27/2001	Hood Canal summer chum 4(d) limit (until reinitiated)
4/30/2001	Upper Willamette Chinook, Upper Columbia spring Chinook, Lake Ozette sockeye, Columbia River chum, and 10 steelhead ESUs (until reinitiated)
4/30/2004	Puget Sound Chinook (until reinitiated)
6/13/2005	California coastal Chinook (until reinitiated)
4/26/2012	Lower Columbia River Chinook (until reinitiated)
4/9/2015	Lower Columbia River natural coho (until reinitiated)
4/26/2018	Sacramento River winter Chinook (until reinitiated)

Amendment 12 to the Salmon FMP added the generic category “species listed under the ESA” to the list of stocks in the salmon management unit and modified respective escapement goals to include “manage

consistent with NMFS jeopardy standards or recovery plans to meet immediate conservation needs and long-term recovery of the species.” Amendment 14 specified those listed ESUs and clarified which stocks in the FMP management unit were representative of the ESUs.

In a letter received by the Council (dated February 26, 2021), NMFS provided guidance on protective measures for species listed under the ESA during the 2021 fishing season. The letter summarized the requirements of NMFS’ BOs on the effects of potential actions under the salmon FMP on listed salmon and provided the anticipated consultation standards of the BOs in preparation for the 2021 management season, as well as further guidance and recommendations for the 2021 management season.

The ESA consultation standards, exploitation rates, and other criteria in place for the 2021 management season are presented in Tables 5a and 5b. Some listed stocks are either rarely caught in Council fisheries (e.g., spring Chinook from the upper Columbia River) or already receive sufficient protection from other salmon FMP and ESA standards (e.g., Central Valley spring Chinook). 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.

Of the listed Chinook and coho, Council-managed fisheries have substantive impacts on Sacramento River winter Chinook (SRWC), Central Valley spring Chinook, California coastal Chinook (CCC), Snake River wild (SRW) fall Chinook, lower Columbia River (LCR) fall Chinook, and all of the coho stocks.

Additional listed salmonid ESUs found within the Council area, but not substantively impacted by Council managed fisheries, include:

<u>Chinook</u>	<u>Steelhead</u>
Snake River spring/summer (threatened)	Southern California (endangered)
Upper Willamette (threatened)	South-central California coast (threatened)
Puget Sound (threatened)	Upper Columbia River (endangered)
Upper Columbia River spring (endangered)	Middle Columbia River (threatened)
	Snake River Basin (threatened)
<u>Sockeye</u>	Puget Sound (threatened)
Snake River (endangered)	Central Valley, California (threatened)
Ozette Lake Sockeye (threatened)	Central California coast (threatened)
	Upper Willamette River (threatened)
<u>Chum</u>	Lower Columbia River (threatened)
Columbia River (threatened)	Northern California (threatened)
Hood Canal summer (threatened)	

6.0 OBLIGATIONS UNDER THE PACIFIC SALMON TREATY

In 1985 the PST was signed, setting long-term goals for the benefit of the shared salmon resources of the United States and Canada. The PSC is the body formed by the governments of Canada and the United States to implement the PST.

6.1 Chinook Salmon Management

A new ten-year agreement under the PST was adopted by both the U.S. and Canada and implemented beginning with the 2019 fishing year. The new agreement includes reductions to catch ceilings for Southeast Alaska (SEAK) and WCVI AABM fisheries relative to the prior 2009 agreement. For SEAK, the reductions range from 1.5 percent in years of high abundance to 7.5 percent in years of low abundance. For WCVI, the reductions range from 2.4 percent in years of high abundance to 12.5 percent in years of low abundance. Additionally, beginning with the 2019 agreement, while catch ceilings will continue to be

determined using the AI from the PSC Chinook Model for Northern British Columbia and WCVI AABM fisheries, the allowable catches for SEAK fisheries will be set using a catch-per-unit-effort (CPUE) estimate from the early winter power troll fishery (see Tables 1 and 2 in Chapter 3 of the 2019 Agreement for specifics).

Fisheries not subject to AABM regimes, including Council-area fisheries, are subject to a new set of ISBM obligations under the 2019 agreement. These provisions require the calendar year exploitation rate (CYER) by all U.S. fisheries south of the U.S./Canada border on specific indicator stocks to be below some level of the average 2009 – 2015 CYER if they do not achieve their management objectives (see Attachment I in Chapter 3 of the 2019 Agreement for specifics). Similar to previous ISBM obligations, these limits are taken into account during preseason planning processes, however, relative to meeting the provisions of the PST, the CYER limits are evaluated on a postseason basis only. Canadian fisheries that are not included in AABM complexes are managed under ISBM constraints, which, similar to U.S. ISBM fisheries, require the CYER by Canadian ISBM fisheries on specific indicator stocks to be below some level of the average 2009 – 2015 CYER if they do not achieve their management objectives. Expectations for Canadian and Alaskan fisheries harvest and stock abundance forecasts are incorporated into the Chinook FRAM to estimate total exploitation rate impacts from all marine fisheries (Tables 5a and 5b).

Key considerations for Canadian domestic fishery management for Chinook in 2021 include: (1) meeting domestic conservation obligations for WCVI, Lower Strait of Georgia, Fraser River Spring 4.2 and 5.2, Fraser Summer 5.2, Fraser Summer 4.1 and Fraser Fall 4.1 (Harrison River) stocks; (2) meeting First Nations Food, Social and Ceremonial and treaty obligations for Chinook harvests in native fisheries; and (3) monitoring of incidental impacts during commercial and native fisheries directed at sockeye, and chum salmon. It is anticipated that the details of the fishery regulatory package off WCVI and in the Juan de Fuca-Strait of Georgia areas will be driven by levels of allowable impact on WCVI, Lower Strait of Georgia and Fraser River Chinook stocks, in addition to Interior Fraser (Thompson River) coho, and potentially Thompson and/or Chilcotin River Steelhead (depending on a listing decision under Canada's Species at Risk Act). Increasing the availability of Chinook salmon in key foraging areas of Southern Resident Killer Whales in the southern BC region is an additional consideration which will be supported through conservation actions implemented for Fraser River and other Chinook salmon.

6.2 Coho Salmon Management

In 2002, the PSC adopted a management plan for coho salmon originating in Washington and Southern British Columbia river systems. The plan is directed at the conservation of key management units, four from Southern British Columbia (Interior Fraser, Lower Fraser, Strait of Georgia Mainland, and Strait of Georgia Vancouver Island) and nine from Washington (Skagit, Stillaguamish, Snohomish, Hood Canal, Strait of Juan de Fuca, Quillayute, Hoh, Queets, and Grays Harbor). Exploitation rate limits for intercepting fisheries are established for individual management units through formulas specified in the 2019 PST Southern Coho Management Plan, and are based on total allowable fishery exploitation rates.

The categorical status of U.S. coho management units is reported to comply with obligations pursuant to the 2019 PST Southern Coho Management Plan. Categorical status is employed by the PSC under the 2019 PST Southern Coho Management Plan to indicate general ranges of allowable total exploitation rates for U.S. and Canadian coho management units. Three categories are employed: low (total exploitation rate less than 20 percent), moderate (total exploitation rate 20 percent to 40 percent), and abundant (total exploitation rate greater than 40 percent). For the Puget Sound management units, the 2019 PST Southern Coho Management Plan uses the thresholds and stepped harvest rate goals from the Comprehensive Coho Agreement, developed by Washington and the Puget Sound tribes, and adopted by the Council as FMP conservation objectives in November 2009. Actual exploitation rate constraints for Canadian fisheries on U.S. coho management units are determined by formulas that specify sharing of allowable exploitation rates

and a “composite rule.” The composite rule adjusts constraints for Canadian fishery exploitation rates based on the number of U.S. management units which fall in a given category. For example, if only one Washington coastal or Puget Sound coho management unit is in low status, Canadian fisheries are constrained to a total exploitation rate on that unit of 12 percent; if two or more Washington coastal management units are in low status, the constraint becomes 10 percent. The most restrictive exploitation rate limit for Canadian fishery impacts on U.S. coho management units is 10 percent.

For several Washington coastal coho management units, management objectives are expressed as a range of spawning escapements expected to produce MSY. Allowable exploitation rates are calculated from the forecast abundance and the lower end of the escapement range and used to classify the categorical status of the management units. This rate is the maximum allowed under the PST when the management unit is in the moderate or abundant status, but exploitation rates up to 20 percent are allowed if the management unit is in the low abundance status.

For 2021, Puget Sound and Washington coast coho constraints are as follows:

FMP			
FMP Stock	Total Exploitation Rate Constraint ^{a/}	Categorical Status ^{a/}	
Skagit	35%	Low	
Stillaguamish	50%	Normal	
Snohomish	40%	Low	
Hood Canal	45%	Low	
Strait of Juan de Fuca	20%	Critical	
Quillayute Fall	59%		
Hoh	65%		
Queets	65%		
Grays Harbor	65%		

PST Southern Coho Management Plan			
U.S. Management Unit	Total Exploitation Rate Constraint ^{b/}	Categorical Status ^{c/}	
Skagit	35%	Moderate	
Stillaguamish	50%	Abundant	
Snohomish	40%	Moderate	
Hood Canal	45%	Moderate	
Strait of Juan de Fuca	20%	Low	
Quillayute Fall ^{c/}	20%	Low	
Hoh ^{c/}	34%	Moderate	
Queets ^{c/}	20%	Low	
Grays Harbor	21%	Moderate	

a/ Preliminary. For Puget Sound stocks, the exploitation rate constraints and categorical status (Normal, Low, Critical) reflect application of Comprehensive Coho Agreement rules, as adopted in the FMP. For Washington Coast stocks, exploitation rate constraints represent MFMT. Note that under *U.S. v. Washington* and *Hoh v. Baldrige* case law, the management objectives can differ from FMP objectives provided there is an annual agreement among the state and tribal comanagers; therefore, the exploitation rates used to report categorical status do not necessarily represent maximum allowable rates for these stocks.

b/ Preliminary. For Puget Sound and Washington Coast management units, the exploitation rate constraints reflect application of the 2019 PST Southern Coho Management Plan.

c/ Categories (Abundant, Moderate, Low) correspond to the general exploitation rate ranges depicted in paragraph 8(b)(iii) of the 2019 PST Southern Coho Management Plan. For Washington Coast stocks, categorical status is determined by the exploitation rate associated with meeting the escapement goal (or the lower end of the escapement goal range). This also becomes the maximum allowable rate unless the stock is in the "Low" status. In that case, an ER of up to 20% is allowed.

Key considerations for Canadian fishery management for coho in 2021 are expected to include: (1) meeting domestic conservation obligations for Interior Fraser (including Thompson River) coho; (2) coho

harvests by First Nations fisheries; (3) incidental impacts during commercial and First Nations fisheries directed at pink, Chinook, sockeye, and chum salmon; and (4) the desire to provide increased opportunity for sport fisheries through mark-selective retention regulations. The Canadian fishery regimes affecting coho are expected to be driven by Canadian domestic allowable impacts on the Thompson River component of the Interior Fraser management unit.

In years prior to 2014, Canadian fisheries were managed so as not to exceed a three percent maximum exploitation rate. In May 2014, Canada decided to permit up to a 16 percent exploitation rate on upper Fraser coho in Canadian fisheries to allow for impacts in fisheries directed at a record Fraser sockeye forecast. Since 2015, upper Fraser coho in Canadian fisheries have been managed per low status limitations. The projected status of Canadian coho management units in 2021 indicates continuing concerns for the condition of Interior Fraser coho. The Interior Fraser coho management unit is anticipated to remain in low abundance status, resulting in a requirement to constrain the total mortality fishery exploitation rate for 2021 Southern U.S. fisheries to a maximum of 10.0 percent.

7.0 DESCRIPTION OF THE ALTERNATIVES

Detailed information on the proposed ocean salmon regulation Alternatives are presented in Tables 1 (non-Indian commercial), 2 (recreational), and 3 (treaty Indian). Notable changes from recent seasons are highlighted below. Fisheries scheduled to occur prior to May 16, 2021, which were adopted as part of the 2020 management measures, may have been modified by inseason action at the March 2021 Council meeting. Any such modifications are incorporated into the 2021 season alternatives described below. The Alternatives under consideration by the Council only cover the periods beginning May 16.

7.1 Commercial

Alternatives for the area north of Cape Falcon reflect a slightly higher total abundance of Chinook and increased Columbia River hatchery and natural coho compared to 2020 forecasts. In 2021, allowable catch of Chinook will likely be similar to 2020 due to similar expected impacts in northern fisheries, and an identical total exploitation rate limit on LCR natural fall Chinook compared to 2020. Coho catch quotas may be greater than 2020 due to an increased harvestable surplus of Columbia River hatchery coho, but low Washington Coastal coho abundance will limit quotas.

Alternative I north of Cape Falcon assigns 50 percent of the troll Chinook quota to the May-June Chinook directed fishery; Alternative II assigns 60 percent to the May-June Chinook directed fishery. In both Alternatives, the May-June fishery opens May 1 seven days per week, with sub-quotas in the area north of the Queets River and in the area south of Leadbetter Point in place during the May-June time period. In Alternative I, there is a per week (Thursday-Wednesday) landing and possession limit in the area north of the Queets River and in the area south of Leadbetter Point, while Alternative II contains a per trip landing and possession limit in these subareas. The summer all-salmon fishery in both Alternatives opens seven days per week beginning July 1 with coho landing and possession limits per week (Thursday-Wednesday). The Chinook minimum size limit in Alternative I is 27 inches total length; in Alternative II, the Chinook minimum size limit is 28 inches total length. In both Alternatives, all retained coho must be marked with a healed adipose fin clip. In Alternative III the fishery is closed. In all alternatives, the fishery is scheduled to open in 2022 on May 1.

Commercial fisheries south of Cape Falcon will be constrained primarily by KRFC. Sacramento River fall Chinook (SRFC) and KRFC were declared overfished in 2018. KRFC continue to meet the criteria for overfished status while SRFC meet the criteria for rebuilt status in 2021. All Alternatives were structured to achieve the FMP guidance for KRFC under a *de minimis* fishing regime: a maximum allowable harvest rate of 25.0 percent, which results in an expected natural area escapement of 31,574 adults.

For the area between Cape Falcon and the Heceta Bank line the fishery would open on March 20 and run through April in all three Alternatives. For the area between Cape Falcon and Humbug Mountain, in all Alternatives, the fishery would re-open in May and run through August with periodic closures in most months. The entire months of September and October are open. The fisheries under Alternatives I and II consist of days in June that are only open in the Cape Falcon to Heceta Bank line area or the Heceta Bank line to Humbug Mountain area. Under Alternative III in June the Cape Falcon to Heceta Bank line area would be open all days while the area from the Heceta Bank line to Humbug Mountain would have closed periods. Alternative I from Cape Falcon to Humbug Mountain would include the retention of marked coho during the open days in July and August. The fishery would be managed under a 10,000 marked coho quota with a weekly limit of 20 coho and a 1:1 ratio with Chinook.

In the Oregon portion of the Klamath Management Zone (KMZ) under Alternative I, the season would be open March 20 through May with periodic closures in May. June and July would be managed under monthly quotas of 600 and 300 Chinook, respectively, with weekly landing and possession limits of 40 Chinook in May. Under Alternative II, the season would be open March 20 through May with periodic closures. Under Alternative III, the fishery would be open March 20 through May. June and July would be managed under monthly quotas of 300 and 200 Chinook, respectively, with weekly landing and possession limits of 20 Chinook.

The California portion of the KMZ is closed under all three Alternatives.

In the Fort Bragg area, under Alternative I, the fishery would be open for one week at the end of June, late July through early August, and the month of September. Alternative II is open late July through mid-August and the first half of September. Alternative III is limited to July 25-August 11. The minimum size limit is 27 inches under all three Alternatives.

In the San Francisco area under Alternative I, the fishery would be open concurrently with Alternative I in Fort Bragg, but include the Fall Area Target Zone fishery between Point Reyes and Point San Pedro in early October, Monday through Friday. Alternative II includes fisheries of variable duration in late June, late July, and early August. The September fishery would be open for short periods spaced throughout the month. The October Fall Area Target Zone fishery is closed in Alternative II. Under Alternative III, the fishery would be open for portions of May, June, July, and August. The September fishery would be limited to the region between Point Reyes to Point San Pedro with periodic openings across the month. The minimum size limit is 27 inches for each of the Alternatives through August, and 26 inches thereafter.

In the Monterey area, Alternatives I and II would be open for portions of May and June. Alternative III has fishing opportunity May through August, with open periods that vary by month. Differences in the number of days open for each month can be found in Table 1. The minimum size limit is 27 inches for each of the Alternatives.

7.2 Recreational

North of Cape Falcon: In Alternative I, all areas north of Leadbetter Point open June 19 for all salmon species except coho, seven days per week; the area south of Leadbetter point opens June 14 for all salmon species except coho, seven days per week. The daily bag limit in all areas will be one salmon, except in the area between the Queets River and Leadbetter Point, where the bag limit will be two salmon daily. Beginning June 28 south of Leadbetter Point and beginning July 4 north of Leadbetter Point, the fishery will open for all salmon species seven days per week. Daily bag limits will be two salmon in all areas, with only one Chinook allowed in the daily limit south of the Queets River. The closing date in all areas is September 30.

In Alternative II, all areas open June 19 for all salmon species except coho, seven days per week. The daily bag limit north of the Queets River will be two salmon, and the daily bag limit south of the Queets River will be one salmon. Beginning June 26 north of the Queets River and beginning June 27 south of the Queets River, the fishery will open for all salmon species. The area between the Queets River and Leadbetter Point will be open five days per week (Sundays through Thursdays); all other areas will be open seven days per week. Daily bag limits in all areas are identical to Alternative I during the all-species fishery. The closing date in all areas is September 30.

In Alternative III, all areas are closed.

In both Alternatives allowing fishing north of Cape Falcon, all retained coho must be marked with a healed adipose fin clip. In the Westport subarea, the Grays Harbor Control Zone is closed beginning August 9 in all Alternatives.

South of Cape Falcon, for the North and Central Oregon coast Alternatives, Chinook fisheries open March 15 and run through October 31 with the exception of Alternatives II and III. Under Alternative II August 16 through 31 would close to retention of Chinook and under Alternative III all of August would be closed to retention of Chinook. Each Alternative includes a mark-selective coho quota fishery in the summer, with different quota sizes and dates. Each Alternative also includes a non-mark-selective coho fishery from Cape Falcon to Humbug Mountain with different quotas in September with open days of Friday through Sunday beginning September 8.

In the Oregon KMZ, Alternative I would open for Chinook fishing on June 19 and run through August 15. In addition, this area would also be open for mark-selective coho from June 12 to August 28 or attainment of quota. Alternative II would open May 29 with Chinook retention permitted through July 13. Beginning June 19 through August 28 this area would be open for mark-selective coho. Alternative III would open for Chinook fishing from July 1 through August 19.

In the California KMZ, Alternatives I and II would be open from late June through the end of July. Under Alternative III the fishery would be open for the month of July. The minimum size limit is 20 inches under each of the Alternatives.

In the Fort Bragg area, the fishery opens in late June and closes in October under each of the Alternatives, with variable opening and closing dates. The minimum size limit is 20 inches under each of the Alternatives.

Fishery Alternatives in the San Francisco area have opening dates ranging from June 24 through July 1. Seasons would run uninterrupted until October, with closing dates that vary by Alternative. The minimum size limit would be 20 inches under each of the Alternatives.

For the Monterey area, from Pigeon Point to the U.S./Mexico border, the fishery would open on April 3 and run continuously until September, with closing dates that vary by Alternative. The minimum size limit is 24 inches under Alternatives I and III. For Alternative II, the minimum size limit is 24 inches through May 15, and 20 inches thereafter.

7.3 Treaty Indian

Two sets of tribal troll Alternatives were proposed and will be evaluated during the North of Falcon process.

The Quinault Treaty Area (QTA) Tribes, which include the Quinault Indian Nation, Hoh Tribe and the Quileute Tribe, proposed Alternatives with a Chinook directed fishery in the May-June time period and an all-species fishery targeting coho and Chinook from July 1 to September 15. Under the QTA proposal the Chinook Alternative would be split 50/50 between each fishing season.

The Makah Tribe (MT) proposed Alternatives with a Chinook directed fishery in the May-June time period and an all-species fishery targeting coho and Chinook from July 1 to September 15. Under the MT proposal the Chinook Alternative would be split 50/50 between each fishing season.

For both proposals, any balance of fish remaining from the Chinook directed fishery may be transferred to the all-species fishery on an impact neutral basis.

8.0 AFFECTED ENVIRONMENT AND ANALYSIS OF IMPACTS

The affected environment consists of the following components:

- Target (FMP) species
- Social or economic environments
- Non-target species
- Essential Fish Habitat
- Public health or safety
- ESA listed (non-salmon) species or critical habitat
- Marine mammals
- Biodiversity or ecosystem function

8.1 *Salmon Stocks in the Fishery*

Target stocks include Chinook, coho, and pink salmon stocks identified in Appendix A, Table A-1 of Preseason Report I (Part 1 of this EA; PFMC 2021a), which includes several ESA listed Chinook and coho stocks. These ESA listed stocks are not targeted in Council area salmon fisheries, but will be included in the analysis of effects on target species because they are impacted coincidentally with targeted salmon stocks and frequently constrain access to targeted stocks. Environmental impacts to other ESA listed species (e.g., marine mammals) from the Alternatives will be analyzed in a later section of this EA.

A description of the historical baseline for this component of the affected environment is presented in the Review of 2020 Ocean Salmon Fisheries (PFMC 2021b). The current status (2021 ocean abundance forecasts) of the environmental components expected to be affected by the 2021 ocean salmon fisheries regulation Alternatives (FMP salmon stocks) are described in the 2021 Preseason Report I. The criteria used to evaluate whether there are significant effects from the Alternatives on target stocks are achievement of conservation objectives, ACLs, and rebuilding criteria. For ESA listed stocks impacted by the fishery, ESA consultation standards are applied to determine whether there are significant effects. The Salmon FMP conservation objectives are based on the best available science and are intended to prevent overfishing while achieving optimum yield from West Coast salmon fisheries as required by the MSA. The ESA consultation standards are likewise based on the best available science and are intended to ensure that fishery impacts do not appreciably reduce the likelihood of survival and recovery of listed species in the wild. FMP conservation objectives also include criteria for rebuilding overfished stocks. Therefore, conservation objectives and consultation standards are appropriate indicators for determining the significance of fishery management actions.

8.1.1 Chinook Salmon

Fishery quotas under the Alternatives are presented in Tables 4a and 4b. Stock-specific management criteria and their forecast values under the Alternatives are provided in Tables 5a and 5b. Projected fishery

landings, bycatch, and bycatch mortality under the Alternatives are summarized in Tables 6a and 6b. Tables 7a and 7b provide a breakdown of impacts by fishery and area for LCR natural tule Chinook. Appendix A presents tables of adult SRFC impacts, KRFC impacts, and the SRWC age-3 impact rate, stratified by fishery, month, and management area under the three Alternatives.

8.1.1.1 North of Cape Falcon

Abundance projections important to Chinook harvest management north of Cape Falcon in 2021 are:

- *Columbia River hatchery tules.* Combined production of Lower River Hatchery (LRH) and Spring Creek Hatchery (SCH) stocks returning to the Columbia River is forecasted to be 119,900, which is higher than the 2020 preseason expectation of 97,200. The 2021 LRH forecast is 73,100, which is greater than the forecast of 51,000 in 2020. The 2021 SCH forecast is 46,800, which is similar to the 2020 forecast of 46,200.

The primary Chinook salmon management objective shaping the Alternatives north of Cape Falcon is:

- NMFS consultation standards and annual guidance for ESA listed stocks as provided in Section 5.0 above. Relevant stocks for the area north of Cape Falcon include LCR natural tule Chinook, Columbia Lower River Wild (LRW) fall Chinook, and SRW fall Chinook.

Descriptions pertaining to the achievement of key objectives for Chinook salmon management north of Cape Falcon are found below.

- *LCR natural tule fall Chinook.* The Alternatives have exploitation rates on LCR natural tule fall Chinook that range from 31.1 percent to 39.3 percent when combined with preliminary 2021 preseason harvest rates for Columbia River fisheries. In Alternative I under both the QTA and MT treaty troll quotas, the exploitation rate exceeds the 38.0 percent NMFS consultation standard maximum for 2021. Additional shaping of PSC and inriver fisheries prior to the April Council meeting may result in minor changes to the anticipated ERs presented in the Alternatives. LCR tules are the constraining Chinook stock for fisheries north of Cape Falcon in 2021.
- *LRW fall Chinook.* The Alternatives have ocean escapement values ranging from 19,600 to 20,900, which exceeds the ESA consultation standard of 6,900 minimum ocean escapement. LRW Chinook will not constrain ocean fisheries north of Cape Falcon in 2021.
- *SRW fall Chinook.* The Alternatives have ocean exploitation rates ranging from 24.9 percent to 53.5 percent of the base period exploitation rate, which is less than the ESA consultation standard of no more than 70 percent of the 1988-1993 base period exploitation rate for all ocean fisheries. SRW Chinook will not constrain ocean fisheries north of Cape Falcon in 2021.

For Chinook fisheries north of Cape Falcon, Alternatives II and III satisfy NMFS ESA consultation standards and guidance, FMP conservation objectives, and all other objectives for relevant Chinook stocks (Tables 5a and 5b). The NMFS ESA consultation standard for LCR natural tule fall Chinook is exceeded in Alternative I under both the QTA and MT treaty troll quotas.

8.1.1.2 South of Cape Falcon

Status of Chinook stocks important to 2021 Chinook harvest management south of Cape Falcon are:

- *SRFC.* The Sacramento Index forecast is 270,958, which is lower than the 2020 forecast of 473,183.

- *KRFC*. The ocean abundance forecast for this stock is 135,569 age-3, 45,124 age-4, and 815 age-5 fish. These compare to the 2020 forecasts of 149,618 age-3, 36,241 age-4, and 739 age-5 fish.
- *SRWC*. The forecast of age-3 escapement absent fishing is 9,063, which is higher than the 2020 forecast of 3,077.

Key Chinook salmon management objectives shaping the Alternatives south of Cape Falcon are:

- A *KRFC* natural area spawner escapement of at least 31,574 adults, which is produced, in expectation, by a maximum exploitation rate of 25.0 percent (FMP control rule).
- A *SRFC* hatchery and natural area spawner escapement of at least 122,000 adults, which is produced, in expectation, by a maximum exploitation rate of 55.0 percent (FMP control rule).
- NMFS consultation standards and annual guidance for ESA listed stocks as provided in Section 5.0 above. Relevant stocks for the area south of Cape Falcon include *SRWC*, California coastal Chinook, *SRW* fall Chinook, and *LCR* natural tule Chinook.

The maximum allowable exploitation rate for *KRFC* in 2021 is 0.25, which is a de minimis exploitation rate. In such cases, the FMP stipulates:

“When recommending an allowable de minimis exploitation rate in a given year, the Council shall also consider the following circumstances:

- The potential for critically low natural spawner abundance, including considerations for substocks that may fall below crucial genetic thresholds;
- Spawner abundance levels in recent years;
- The status of co-mingled stocks;
- Indicators of marine and freshwater environmental conditions;
- Minimal needs for Tribal fisheries;
- Whether the stock is currently in an approaching overfished condition;
- Whether the stock is currently overfished;
- Other considerations as appropriate”.

The Salmon Technical Team has assessed each of these circumstances, with the exception of minimal needs for Tribal fisheries.

The potential for critically low natural spawner abundance could be considered moderate. The 2021 minimum natural-area spawner escapement of 31,574 adults is slightly larger than the MSST (30,525). A natural-area escapement of 31,574 adults would represent the 20th lowest value over the past 43 years of data.

To assess the potential for critically low abundance of substocks, a statistical model (PFMC 2007, Appendix D) was applied to historical run size data to assess the probability that escapement to either the Salmon, Scott, or Shasta rivers would fall below 720 adults, given a total, basin-wide natural area escapement of 31,574 adults in 2021. The 720 escapement threshold for these substocks was based on effective population size (genetic) considerations. Application of the model suggested that at least one of the substocks would fall below the 720 adult threshold with a probability of 0.22.

The forecast of natural-area spawners in the absence of additional fishing is 42,098, which is above the maximum sustainable yield spawner escapement (S_{MSY}). If fishing seasons are structured such that the maximum allowable exploitation rate of 25 percent is met, the natural-area adult spawner expectation is 31,574, which is slightly larger than the Minimum Stock Size Threshold (MSST) but below S_{MSY} . The natural-area adult spawner escapement has been lower than 31,574 in four of the last five years.

With regard to co-mingled stocks, Sacramento River fall Chinook have a moderate to low abundance forecast but are likely to be less constraining to fisheries than KRFC in 2021.

Indicators of marine and freshwater conditions provided in the California Current Integrated Ecosystem Assessment (CCIEA) California Current Ecosystem Status Report for 2021 suggest a mixed assessment of marine and freshwater conditions that could affect KRFC. Table H.5.3 in the CCIEA report (supplementary material) displays “stoplight” indicators including adult abundance, freshwater indicators, and marine indicators affecting KRFC. Spawners in 2017 and 2018 (whose progeny are age-4 and age-3 in 2021, respectively) appear to have experienced low flows and warm water while juveniles from those broods encountered more mixed conditions. Ocean indicators were poor overall for these broods. Overall, the CCIEA indicates that KRFC experienced below average freshwater and marine conditions for two of the three broods analyzed in the rebuilding plan (2012-2014) and in the years since, both freshwater and marine conditions have generally declined.

The KRFC stock currently meets the criteria for being at risk of approaching an overfished condition. KRFC was declared overfished in 2018 and currently remains overfished.

Descriptions pertaining to the achievement of key objectives for Chinook salmon management south of Cape Falcon are found below.

- *SRFC*. The control rule-defined minimum of 122,000 hatchery and natural area adult spawners is met by each of the Alternatives.
- *KRFC*. The control rule-defined minimum of 31,574 natural area adult spawners is met by each of the Alternatives.
- *SRWC*. The ESA consultation standard that (1) limits the forecast age-3 impact rate in 2021 fisheries south of Point Arena to a maximum of 20.0 percent and (2) specifies time/area closures and minimum size limit constraints south of Point Arena, is met by each of the Alternatives.
- *California coastal Chinook*. The ESA consultation standard that limits the forecast KRFC age-4 ocean harvest rate to a maximum of 16.0 percent is met by each of the Alternatives.
- *SRW fall Chinook*. SRW Chinook will not constrain ocean fisheries south of Cape Falcon in 2021.

Each of the Alternatives for Chinook fisheries south of Cape Falcon satisfies NMFS ESA consultation standards and guidance, FMP conservation objectives, and all other objectives for relevant Chinook stocks (Tables 5a and 5b).

8.1.2 Coho Salmon

Fishery quotas under the Alternatives are presented in Tables 4a and 4b. Stock-specific management criteria and their forecast values under the Alternatives are provided in Tables 5a and 5b. Projected fishery landings, bycatch, and bycatch mortality under the Alternatives are summarized in Tables 6a and 6b. Tables 7a and 7b provide a breakdown of impacts by fishery and area for Lower Columbia Natural (LCN), Oregon

Coastal Natural (OCN), and Rogue/Klamath (RK) coho. Table 8 provides expected coho mark rates for west coast fisheries by month.

Abundance projections important to coho harvest management in Council area fisheries are:

- *Oregon Production Index (OPI) Hatchery coho.* The 2021 forecast for hatchery coho from the Columbia River and the coast south of Cape Falcon of 1,607,900 is substantially higher than the 2020 forecast of 185,700. The Columbia River early coho forecast is 1,014,000 compared to the 2020 forecast of 130,700 and the Columbia River late coho forecast is 576,000, compared to the 2020 forecast of 50,300.
- *OCN coho.* The 2021 OCN forecast is 125,000 compared to the 2020 forecast of 83,000.
- *LCN coho.* The 2021 LCN forecast is 39,200 compared to the 2020 forecast of 24,800.
- *Puget Sound coho.* Among Puget Sound natural stocks, Strait of Juan de Fuca coho are in the critical category in 2021. Skagit, Snohomish, and Hood Canal coho are in the low category, and Stillaguamish coho are in the normal category.
- *Interior Fraser (Thompson River) coho.* This Canadian stock continues to be depressed, and will continue to constrain ocean coho fisheries north of Cape Falcon in 2021.
- *Washington coastal coho.* Forecasts for most Washington coastal coho stocks are lower than in 2020. Forecasts for most Washington coastal coho stocks are lower than in 2020. Among Washington coastal natural stocks, Quillayute fall and Queets coho are in the low category, and Hoh and Grays Harbor coho are in the moderate category under the PST Southern Coho Management Plan in 2021.

Key coho salmon management objectives shaping the Alternatives are:

- NMFS consultation standards and annual guidance for ESA listed stocks as provided in Section 5.0 above. Relevant stocks include Central California Coast coho (south of the Oregon/California border), Southern Oregon/Northern California Coastal (SONCC) coho, OCN coho, and LCN coho. The maximum allowable exploitation rates for 2021 are: (1) a combined marine/freshwater exploitation rate not to exceed 15.0 percent for OCN coho, (2) a combined exploitation rate in marine-area and mainstem Columbia River fisheries not to exceed 30.0 percent for LCN coho, and (3) a marine exploitation rate not to exceed 13.0 percent for RK hatchery coho, used as a surrogate for the SONCC coho ESU. Furthermore, coho retention is prohibited in all California ocean fisheries.
- Salmon FMP conservation objectives and obligations under the PST Southern Coho Management Plan for stocks originating along the Washington coast, Puget Sound, and British Columbia as provided in Section 6.2 above. The forecasts for Washington Coastal coho stocks are low in 2021; these stocks contribute to fisheries off Washington. Forecasts for several Puget Sound and Interior Fraser coho stocks in 2021 are low; however, the majority of the exploitation on these stocks occurs in Puget Sound and will be addressed in development of fishing seasons for inside waters during the North of Falcon co-management process by the state and tribes of Washington prior to the April Council meeting. Because of their abundance status, Interior Fraser coho are subject to an exploitation rate ceiling of 10.0 percent in southern U.S. fisheries under the PST Southern Coho Management Plan.

Descriptions pertaining to the achievement of key objectives for coho salmon management are found below.

- *LCN coho.* All Alternatives satisfy the maximum 30.0 percent exploitation rate when 2021 projected marine impacts are combined with 2020 modeled impacts for mainstem Columbia River

fisheries. In-river fisheries have yet to be shaped for 2021. Marine exploitation rates projected for the 2021 Alternatives range from 7.7 percent to 3.8 percent.

- *Queets natural coho.* The FMP MSY adult spawner objective for Queets natural coho is 5,800; projected ocean escapement values for the 2021 Alternatives range from 3,300 to 3,500. The preseason ocean age 3 forecast for Queets natural coho is 3,900. Queets natural coho are likely to be the constraining coho stock for fisheries north of Cape Falcon in 2021.
- *Interior Fraser coho.* The Southern U.S. exploitation rate is less than the 10.0 percent limit required by the PST Southern Coho Management Plan in all Alternatives when 2021 projected marine impacts are combined with the 2020 preseason modeled impacts for Puget Sound fisheries. Shaping of the State and Tribal inside fisheries will occur during the North of Falcon process, and ocean fisheries may require further shaping before final management measures are adopted in order to comply with the PST limit.
- *Puget Sound coho.* Total exploitation rates for all Puget Sound stocks are less than the maximum allowed under the FMP matrix in all Alternatives when 2021 projected marine impacts are combined with the 2020 preseason modeled impacts for Puget Sound fisheries. Snohomish coho, recently designated as overfished, currently meets the criteria for ‘not overfished/rebuilding’ status. As part of the rebuilding plan, a buffered S_{MSY} is in place, which increases the abundance breakpoint between low/normal status. For 2021, the abundance forecast is below the low/normal breakpoint, limiting the total exploitation rate to 40 percent. Shaping of the State and Tribal inside fisheries will occur during the North of Falcon process, and ocean fisheries may require further shaping before final management measures are adopted in order to comply with the FMP limits.

All of the Alternatives for coho fisheries satisfy NMFS ESA consultation standards and guidance, FMP conservation objectives, and all other objectives for relevant coho stocks other than those listed above (Tables 5a and 5b).

8.1.3 Pink Salmon

Pink salmon merit management consideration in 2021. Impacts on Chinook and coho in pink-directed fisheries may be part of negotiations to reach a final agreement in North of Cape Falcon ocean and Puget Sound fisheries.

8.1.4 Summary of Environmental Impacts on Target Stocks

Stock forecasts for some Canadian Chinook and coho stocks, Oregon Coast Chinook stocks, and the actual PST limits on Canadian AABM Chinook fisheries are not known at this time, and preliminary values have been used in the analyses presented in this report. These forecasts and limits are expected to be available prior to the April Council meeting. Negotiations in the North of Falcon process will not be completed until the April Council meeting. These negotiations affect allocation of stock impacts primarily among inside fisheries (State, Tribal, recreational, various commercial sectors, etc.) but also between inside and ocean fisheries.

Environmental impacts on salmon stocks are assessed based on compliance with conservation objectives, ACLs, rebuilding plans, and ESA consultation standards. As noted in the description of the Alternatives (Tables 1, 2, and 3), if analyses using the updated values and the results of these negotiations do not result in compliance with FMP conservation objectives or ESA consultation standards, some Alternatives will not be viable and impacts in Council-area fisheries will need to be modified to comply with all applicable objectives and standards. If updated values and negotiations result in compliance with applicable objectives and standards, Council area fishery impacts would not increase; therefore, the analysis of effects would include the upper bound of a reasonable range of effects under the Alternatives considered for 2021 Council area ocean salmon fisheries.

8.1.4.1 Targeted Salmon Stocks

Based on current assumptions regarding Canadian, and inside fishery impacts, all target salmon stocks (non-ESA listed) meet their FMP conservation objectives under Alternatives I, II, and III with the exception of Queets coho in all three Alternatives (Tables 5a and 5b).

8.1.4.2 ESA Listed Salmon Stocks

Based on current assumptions regarding Canadian and inside fishery impacts, all ESA listed salmon stocks meet their ESA consultation standards under Alternatives II and III. Under Alternative I, all ESA consultation standards are met, with the exception of the exploitation rate for LCR natural tule Chinook, which exceeds the allowable limit under both the QTA and MT treaty troll quotas when combined with preliminary 2021 preseason harvest rates for Columbia River fisheries (Tables 5a and 5b).

Council-area fisheries have a minor impact on ESA-listed Puget Sound Chinook and on most Chinook stocks subject to the 2019 PST Agreement. At this point there appears to be sufficient flexibility within Council and inside area fisheries as a whole to achieve protection for the Puget Sound Chinook ESU.

8.2 Socioeconomics

In general, Council-area ocean salmon fisheries are managed to meet conservation objectives for stocks that are expected to achieve optimum yields while minimizing impacts on depressed stocks. While analysis of biological impacts is organized around salmon stocks that spawn in particular rivers, socioeconomic impacts under the regulatory alternatives are analyzed by ocean fishery management areas as described in the Salmon FMP. Although most stocks range across several areas, the abundance of individual stocks varies by time and area, thus the use of management areas facilitates more optimal management of each stock than would be possible with coastwide regulations. From north to south, the fishery management areas are: (1) from the U.S./Canada border to Cape Falcon (45°46' N. lat.), which is on the Oregon coast south of the Columbia River mouth; (2) between Cape Falcon and Humbug Mountain (42°40' N. lat.) on Oregon's southern coast; (3) the Oregon KMZ, which covers ocean waters from Humbug Mountain to the Oregon/California border (42° N. lat.); (4) the California KMZ has typically¹ included the area from the Oregon/California border to the southern KMZ boundary in northern California, (5) from the southern KMZ boundary to Point Arena (38°57' N. lat.) in Mendocino County; (6) from Point Arena to Pigeon Point (37°11' N. lat.) north of Santa Cruz; and (7) from Pigeon Point to the U.S./Mexico border. There are also numerous subdivisions within these areas that are used to further balance stock conservation and harvest allocation needs. The following analysis of impacts on users of the resource and fishing communities is organized around these seven broad management areas. Figure 3 provides a map of the boundaries of these areas, also showing the main salmon ports.

Tribal ocean fisheries (including Washington State statistical area 4B) occur only in the area north of Cape Falcon. The Lower Elwha Klallam, Jamestown S'Klallam, Port Gamble S'Kallam, Makah, Quileute, Hoh, and Quinault Tribes all have fishery areas in the northern part of the area north of Cape Falcon (Tables 3a and 3b). Other federally-recognized tribes participate in in-river fisheries.

The Review of 2020 Ocean Salmon Fisheries (PFMC 2021b) provides an historical description of the salmon fishery affected environment. In addition to stock status assessments, the document reports socioeconomic impacts of historical fisheries and analyzes the current socioeconomic status of West Coast salmon fisheries. For the purpose of characterizing the socioeconomic impact of non-tribal Council-area

¹ The location of the southern boundary of the KMZ may change to the Helliwell line (40°10' N. lat) by the time the 2021 regulations are implemented, so it is therefore simply described in this document as "the southern KMZ boundary" pending a determination from NMFS.

ocean salmon fisheries, commercial exvessel value, recreational fishing trips, and community level personal income impacts resulting from both commercial and recreational fishing activities are used.

The short-term economic effects of the regulatory Alternatives for non-Indian fisheries are shown in Tables 9a, 9b, 10a, and 10b. Tables 9a and 9b show projected commercial troll impacts expressed in terms of estimated potential exvessel value by catch area. Tables 10a and 10b show projected recreational fisheries impacts in terms of the number of projected angler-trips and community personal income impacts associated with those activities by port area. Note that exvessel values shown under the Alternatives for the commercial troll fishery in Tables 9a and 9b and income impact values shown for the recreational fishery in Tables 10a and 10b are not directly comparable. More directly comparable measures of short-term economic impacts from commercial and recreational salmon fisheries appear in Figures 1a, 1b, 2a, and 2b, which show estimated community income impacts under the respective sets of commercial troll and recreational fishery Alternatives, compared to historical impacts in real (inflation-adjusted) dollars. Both commercial and recreational income impact estimates provided in these figures are based on landing ports. In general, income impacts are estimates of the amount of income generated by the economic linkages associated with a particular activity (see Chapter IV of the Review of 2020 Ocean Salmon Fisheries for additional description of income impact estimates). Income impacts are a measure of relative economic activity. Differences in income impacts between an Alternative and the value for the 2020 fishery indicate the expected impact of the Alternative compared with taking no action, (i.e., if 2020 regulations were to remain in place). Differences in income impacts between an Alternative and recent inflation-adjusted average values provide a comparison of the current estimates with recent historical trends. While reductions in income impacts associated with an activity may not necessarily reflect net losses, they are likely to indicate losses to businesses and individuals in a community that depends on that activity for their livelihood.

Total economic effects for non-Indian fisheries under the Alternatives may vary more or less than is indicated by the short-term impacts on ocean fisheries reported below. Salmon that are not harvested in the ocean do not necessarily result in an economic loss, as they may become available for additional inside harvest in non-Indian commercial, tribal, and recreational fisheries or may provide additional spawning escapement. Thus, Alternatives that restrict ocean harvests may increase opportunities for inside harvesters (e.g., higher commercial revenue or more angler trips) or contribute to higher inside CPUE (i.e., lower costs for commercial harvesters and/or higher success rates for recreational fishers). Additionally, harvest forgone by both ocean fisheries and inside fisheries may impact future production, although the magnitude of that effect is uncertain depending on the resulting escapement level compared to MSY escapement and the nature of the spawner-recruit relationship, both of which are influenced by habitat conditions in the ocean and in the spawning grounds.

Exvessel revenues in Tables 9a and 9b are based on estimated harvest by catch area while commercial income impacts in Figures 1a and 1b are based on projected deliveries by landing area. Historically, there has been a divergence between these two measures. The difference is due to salmon caught in certain catch areas being delivered to ports in neighboring catch areas. In an attempt to account for this effect and assign income impacts to the “correct” landing area, adjustments are made based on historical patterns. The patterns are typically inferred from the most recent year’s catch and landings data. For example, 2020 data shows there were deliveries of salmon: (1) caught north of Cape Falcon to landing ports between Cape Falcon and Humbug Mountain, (2) caught between Cape Falcon and Humbug Mountain to landing ports in the Oregon KMZ region, (3) caught between Horse Mountain and Point Arena to landing ports in the California KMZ region (Eureka), (4) caught between Point Arena and Pigeon Point to landing ports in the California KMZ region (Eureka), (5) caught between Point Arena and Pigeon Point to landing ports in the Fort Bragg region, and (6) caught south of Pigeon Point to landing ports in the San Francisco region, among others.

The expected harvest levels used to model commercial fishery impacts are taken from Tables 6a and 6b. Estimated harvests do not include a relatively small amount occurring in the state-waters-only (SWO) fishery off southern Oregon as this fishery is not expected to be prosecuted in 2021. These total harvest estimates combined with the prior year's average Chinook weights per fish and exvessel prices per pound were assumed to be the best indicators of expected revenues in the coming season. Coastwide average Chinook weight per fish in 2020 was approximately 13 percent above the prior year and slightly above the recent five-year average; while coastwide average Chinook exvessel prices in 2020 were 13 percent above the prior year but eight percent below the recent five-year average in inflation-adjusted terms. If this year's actual average weight per fish or exvessel prices diverge significantly from what was observed last year, then salmon exvessel revenues and resulting commercial fisheries income impacts projected in this document may prove to be correspondingly biased.

Fishing effort estimates for the recreational fishery south of Cape Falcon are based on measures developed by the STT for modeling biological impacts. STT estimates for south of Cape Falcon use multi-year averages to predict effort for the coming year. Consequently, if the multi-year average for a particular time period and area happens to be higher than last year's effort level, then the model may forecast an increase in effort for the coming year even though management measures may actually be relatively more constraining, or *vice-versa*. Estimated recreational effort does not include a relatively small amount that often occurs in the SWO fishery off southern Oregon as this fishery is not expected to be prosecuted in 2021. Recreational fishery effort north of Cape Falcon was estimated using historical CPUE estimates ("success rates") applied to salmon quotas and expected harvest levels under the Alternatives. Projections of recreational catch north of Cape Falcon were made by multiplying the proposed quotas for the two species under each Alternative by the historic ratios of actual catch to the actual quotas. Effort and economic impacts were then estimated by summing recent year weighted average coho and Chinook angler success rates multiplied by the projected coho and Chinook catch under each Alternative. Unless otherwise noted, the economic effects of the commercial and recreational fisheries Alternatives summarized below are compared in terms of estimated community income impacts

8.2.1 Alternative I

Under Alternative I, overall coastwide community personal income impacts from commercial salmon fisheries are projected to be 34 percent below last year's (2020) level and 23 percent below the recent (2016-2020) inflation-adjusted average. Coastwide income impacts from recreational fishing are projected to be 75 percent above last year's level and 38 percent above the 2016-2020 inflation-adjusted average.

Commercial fishery income impacts north of Cape Falcon are projected to be 125 percent above last year and 26 percent above the 2016-2020 inflation-adjusted average.

South of Cape Falcon, overall commercial fishery income impacts are projected to fall below last year's level by 46 percent and below the 2016-2020 inflation-adjusted average by 30 percent.

A mix of commercial fishery income impacts are projected for areas south of Cape Falcon, with areas between Cape Falcon and Humbug Mountain, between Humbug Mountain and the Oregon/California border, and between the southern KMZ boundary and Point Arena projected to see increases of 213 percent, 143 percent, and 110 percent, respectively, compared with last year. However, areas between Point Arena and Pigeon Point and south of Pigeon Point would see projected decreases of 80 percent and 9 percent, respectively, compared with last year. While areas between the Oregon/California border and the southern KMZ boundary would be closed to commercial fishing, deliveries from catch areas to the south are projected to result in a decrease in income impacts to ports in the region of 12 percent compared with last year. The areas south of Cape Falcon would see projected changes in commercial fishery income impacts compared to the 2016-2020 inflation-adjusted average ranging from an increase of 90 percent (southern

boundary of the KMZ to Point Arena) to a decrease of 93 percent (Oregon/California border to the southern KMZ boundary).

Income impacts from recreational fisheries north of Cape Falcon are projected to be 211 percent above last year and 86 percent above the 2016-2020 inflation-adjusted average.

Overall recreational fishery income impacts south of Cape Falcon are projected to be 38 percent above last year and 19 percent above the 2016-2020 inflation-adjusted average. Recreational income impacts are projected to be above last year's levels and the 2016-2020 inflation-adjusted average in five of the six areas south of Cape Falcon (i.e., all except between Point Arena and Pigeon Point where reductions of 11 percent and 18 percent are projected, respectively). Projected increases compared with last year in the other five areas south of Cape Falcon range from three percent for areas between Humbug Mountain and the Oregon/California border to more than 700 percent for areas south of Pigeon Point.

Under Alternative I overall coastwide income impacts for combined non-Indian commercial and recreational salmon fisheries are projected to be 14 percent above last year's level and 10 percent above the 2016-2020 inflation-adjusted average. Combined income impacts north of Cape Falcon are projected to be 186 percent above last year's level and 68 percent above the 2016-2020 inflation-adjusted average. In aggregate, combined income impacts south of Cape Falcon are projected to be 12 percent below last year's level and six percent below the 2016-2020 inflation-adjusted average.

Tribal ocean fisheries north of Cape Falcon would be allocated 35,000 Chinook and 16,500 coho for ocean area harvest under the QTA Alternative, versus 50,000 Chinook and 50,000 coho under the MT Alternative. These compare with the 2020 actual allocation of 35,000 Chinook and 16,500 coho.

8.2.2 Alternative II

Under Alternative II, overall coastwide community personal income impacts from commercial salmon fisheries are projected to be 38 percent below last year's (2020) level and 27 percent below the recent (2016-2020) inflation-adjusted average. Coastwide income impacts from recreational fishing are projected to be 82 percent above last year's level and 43 percent above the 2016-2020 inflation-adjusted average.

Commercial fishery income impacts north of Cape Falcon are projected to be 92 percent above last year and 8 percent above the 2016-2020 inflation-adjusted average.

South of Cape Falcon, overall commercial fishery income impacts are projected to fall below last year's level by 48 percent and below the 2016-2020 inflation-adjusted average by 33 percent.

Reductions in commercial fisheries income impacts compared with last year's levels are projected for three of the six areas south of Cape Falcon. The areas between Point Arena and Pigeon Point and south of Pigeon Point would see projected decreases of 80 percent and 19 percent, respectively. While areas between the Oregon/California border and the southern KMZ boundary would be closed to commercial fishing, deliveries from catch areas to the south are projected to result in a decrease in income impacts to ports in the region of 29 percent compared with last year. Three areas south of Cape Falcon would see projected increases in income impacts compared with last year: the areas between Cape Falcon and Humbug Mountain, between Humbug Mountain and the Oregon/California border, and between the southern KMZ boundary and Point Arena, where increases of 232 percent, 107 percent, and 48 percent, respectively, are projected. Three of the six areas south of Cape Falcon would see projected decreases in commercial fishery income impacts compared to the 2016-2020 inflation-adjusted average, ranging from decreases of 26 percent (South of Pigeon Point) to 95 percent (Oregon/California border to the southern KMZ boundary). The other three areas south of Cape Falcon would all see projected increases in commercial fishery income

impacts compared to the 2016-2020 inflation-adjusted average ranging from 34 percent (the southern KMZ boundary to Point Arena) to 84 percent (Cape Falcon to Humbug Mountain).

Projected income impacts from recreational fisheries north of Cape Falcon are 280 percent above last year and 127 percent above the 2016-2020 inflation-adjusted average.

Overall recreational fishery income impacts south of Cape Falcon are projected to be 30 percent above last year and 11 percent above the 2016-2020 inflation-adjusted average. Recreational income impacts are projected to be above last year's level in four of the six areas south of Cape Falcon, with projected increases of 22 percent between Cape Falcon and Humbug Mountain, 31 percent for areas between the Oregon/California border and the southern KMZ boundary, 122 percent for areas from the southern KMZ boundary to Point Arena, and 748 percent for the area south of Pigeon Point. In the other two areas south of Cape Falcon, declines from last year of 45 percent for Humbug Mountain to the Oregon/California border and 14 percent for Point Arena to Pigeon Point are projected. Likewise, recreational income impacts are projected to be above the 2016-2020 inflation-adjusted average in four of six areas south of Cape Falcon, with increases ranging from 8 percent for areas between the Oregon/California border and the southern KMZ boundary to 212 percent for areas south of Pigeon Point. In the other two areas south of Cape Falcon, recreational income impacts are projected to be below the 2016-2020 inflation-adjusted average by 27 percent for Humbug Mountain to the Oregon/California border and by 21 percent for Point Arena to Pigeon Point.

Under Alternative II overall coastwide income impacts for combined non-Indian commercial and recreational salmon fisheries are projected to be 15 percent above last year's level and 11 percent above the 2016-2020 inflation-adjusted average. Combined income impacts north of Cape Falcon are projected to be 226 percent above last year's level and 91 percent above the 2016-2020 inflation-adjusted average. In aggregate, combined income impacts south of Cape Falcon are projected to be 17 percent below last year's level and 11 percent below the 2016-2020 inflation-adjusted average.

Tribal ocean fisheries north of Cape Falcon would be allocated 25,000 Chinook and 10,000 coho for ocean area harvest under the QTA Alternative, versus 35,000 Chinook and 35,000 coho under the MT Alternative. These compare with the 2020 actual allocation of 35,000 Chinook and 16,500 coho.

8.2.3 Alternative III

Under Alternative III, overall coastwide community personal income impacts from commercial salmon fisheries are projected to be 49 percent below last year's (2020) level and 39 percent below the recent (2016-2020) inflation-adjusted average. Coastwide income impacts from recreational fishing are projected to be 2 percent below last year's level and 23 percent below the 2016-2020 inflation-adjusted average.

The commercial fishery north of Cape Falcon would be closed under this Alternative thus the associated commercial fishery income impacts north of Cape Falcon are projected to be 100 percent below last year and the 2016-2020 inflation-adjusted average.

South of Cape Falcon, overall commercial fishery income impacts are projected to fall below last year's level by 45 percent and below the 2016-2020 inflation-adjusted average by 29 percent.

Reductions in commercial fisheries income impacts compared with last year's levels are projected for three of the six areas south of Cape Falcon. The areas between Point Arena and Pigeon Point and south of Pigeon Point would see projected decreases of 79 percent and 19 percent, respectively. While areas between the Oregon/California border and the southern KMZ boundary would be closed to commercial fishing, deliveries from catch areas to the south are projected to result in a decrease in income impacts to ports in

the region of 30 percent compared with last year. Three areas south of Cape Falcon would see projected increases in income impacts compared with last year: the areas between Cape Falcon and Humbug Mountain, between Humbug Mountain and the Oregon/California border, and between the southern KMZ boundary and Point Arena, where increases of 262 percent, 171 percent, and 42 percent, respectively, are projected. Three of the six areas south of Cape Falcon would see projected decreases in commercial fishery income impacts compared to the 2016-2020 inflation-adjusted average, ranging from decreases of 27 percent South of Pigeon Point to 95 percent between the Oregon/California border and the southern KMZ boundary. The other three areas south of Cape Falcon would all see projected increases in commercial fishery income impacts compared to the 2016-2020 inflation-adjusted average ranging from 28 percent (southern KMZ boundary to Point Arena) to 101 percent (Cape Falcon to Humbug Mountain).

The recreational fishery north of Cape Falcon would be closed under this Alternative; thus, the associated income impacts from recreational fisheries north of Cape Falcon are projected to be 100 percent below last year and the 2016-2020 inflation-adjusted average.

Overall recreational fishery income impacts south of Cape Falcon are projected to be 24 percent above last year and 7 percent above the 2016-2020 inflation-adjusted average. Recreational income impacts are projected to be above last year's level in four of six areas south of Cape Falcon, with increases of less than one percent projected for areas between Humbug Mountain and the Oregon/California border, 16 percent for areas between the Oregon/California border and the southern KMZ boundary, 126 percent for areas from the southern KMZ boundary to Point Arena, and 746 percent for areas south of Pigeon Point. Projected declines from last year's level in the other two areas south of Cape Falcon range from 12 percent (Cape Falcon to Humbug Mountain) to 14 percent (Point Arena to Pigeon Point). Recreational income impacts are projected to be above the 2016-2020 inflation-adjusted average in three of six areas south of Cape Falcon, with increases ranging from 33 percent between Humbug Mountain and the Oregon/California border to 211 percent for areas south of Pigeon Point. Decreases in recreational income impacts compared with the 2016-2020 inflation-adjusted average projected for the remaining three areas south of Cape Falcon range from four percent (the Oregon/California border to the southern KMZ boundary) to 21 percent (Point Arena to Pigeon Point).

Under Alternative III, overall coastwide income impacts for combined non-Indian commercial and recreational salmon fisheries are projected to be 28 percent below last year's level and 30 percent below the 2016-2020 inflation-adjusted average. Combined income impacts north of Cape Falcon are projected to be 100 percent below last year's level and the 2016-2020 inflation-adjusted average. In aggregate, combined income impacts south of Cape Falcon are projected to be 17 percent below last year's level and 11 percent below the 2016-2020 inflation-adjusted average.

Tribal ocean fisheries north of Cape Falcon would be closed under the QTA and MT Alternative, compared to the 2020 actual allocation of 35,000 Chinook and 16,500 coho.

8.2.4 Summary of Impacts on the Socioeconomic Environment

The commercial salmon fishery Alternatives are projected to generate coastwide income impacts below last year's levels ranging from reductions of 34 percent under Alternative I, 38 percent under Alternative II, to 49 percent under Alternative III. These levels also represent corresponding declines relative to the recent (2016-2020) inflation-adjusted averages of 23 percent, 27 percent, and 39 percent, respectively.

North of Cape Falcon, commercial salmon fisheries income impacts are projected to be above last year and the 2016-2020 inflation-adjusted average under Alternative I and Alternative II, but zero under Alternative III. Compared with last year, the two areas south of Point Arena (Point Arena to Pigeon Point, and south of Pigeon Point) and the area from the Oregon/California border to the southern KMZ boundary would see

decreases under all three alternatives, while the areas between Cape Falcon and Humbug Mountain, between Humbug Mountain and the Oregon/California border, and between the southern KMZ boundary and Point Arena would see increases under all three Alternatives. The area from the Oregon/California border to the southern KMZ boundary would be closed to commercial fishing under all three alternatives (although some landings from areas to the south would be expected), and the area north of Cape Falcon would be closed to commercial fishing under Alternative III.

Relative to the other alternatives, projections for Alternative III include the most negative or least positive commercial fisheries income impacts overall and for four of the seven management areas: North of Cape Falcon, the Oregon/California border to the southern KMZ boundary, the southern KMZ boundary to Point Arena, and south of Pigeon Point. Projections for Alternative I include the most negative or least positive commercial fisheries income impacts for two of the seven management areas: Cape Falcon to Humbug Mountain, and Point Arena to Pigeon Point. Projections for Alternative II include the most negative or least positive commercial fisheries income impacts for one area: Humbug Mountain to the Oregon/California border.

Total coastwide income impacts from recreational salmon fisheries are projected to be lower than last year by 2 percent under Alternative III, but increases over last year are projected under Alternative I and Alternative II of 75 percent and 82 percent, respectively. Compared with the 2016-2020 inflation-adjusted average, a decrease in coastwide recreational fishery income impacts of 23 percent is projected under Alternative III, but relative increases are projected under Alternative I of 38 percent) and Alternative II of 43 percent. Compared with last year, three management areas would see projected increases in recreational fishery income impacts under all three alternatives: the Oregon/California border to the southern KMZ boundary, the southern KMZ boundary to Point Arena, and south of Pigeon Point. Point Arena to Pigeon Point is the only area projected to see decreases in recreational fisheries income impacts compared with last year under all three alternatives. Compared with the 2016-2020 inflation-adjusted average, six of seven areas are projected to see increases in recreational fishery income impacts under Alternative I (i.e., all areas except Point Arena to Pigeon Point), and five of seven are projected to see increases in recreational fishery income impacts under Alternative II (i.e., all areas except Point Arena to Pigeon Point, and Humbug Mountain to the Oregon/California border). Under Alternative III, three areas would see projected increases in recreational fishery income impacts relative to the 2016-2020 inflation-adjusted average: Humbug Mountain to the Oregon/California border, the southern KMZ boundary to Point Arena, and south of Pigeon Point.

Total coastwide income impacts from combined non-Indian commercial and recreational salmon fisheries are projected to be lower than last year by 28 percent under Alternative III, but increases over last year are projected under Alternative I and Alternative II of 14 percent and 15 percent, respectively. Only one of seven management areas (Point Arena to Pigeon Point) would see projected decreases in combined commercial and recreational salmon fishery income impacts compared with last year under all three Alternatives. Combined coastwide income impacts are projected to be below the 2016-2020 inflation-adjusted average by 30 percent under Alternative III, but above the 2016-2020 inflation-adjusted average under Alternative I and Alternative II by 10 percent and 11 percent, respectively.

Two of seven management areas are projected to see decreases in combined commercial and recreational salmon fishery income impacts compared with the 2016-2020 inflation-adjusted averages under all three Alternatives: Point Arena to Pigeon Point, and the Oregon/California border to the southern KMZ boundary. Under Alternative III those two areas would also be joined by the north of Cape Falcon area in showing projected decrease in combined commercial and recreational salmon fishery income impacts relative to the 2016-2020 inflation-adjusted average.

Under the QTA alternatives, ocean tribal fisheries occurring north of Cape Falcon would be allocated a maximum of 35,000 Chinook and 16,500 coho under Alternative I, 25,000 Chinook and 10,000 coho under Alternative II, and would be closed under Alternative III. Under the MT alternatives, ocean tribal fisheries occurring north of Cape Falcon would be allocated a maximum of 50,000 Chinook and 50,000 coho under Alternative I, 35,000 Chinook and 35,000 coho under Alternative II, and would be closed under Alternative III. These compare with the 2020 actual allocation of 35,000 Chinook and 16,500 coho.

8.3 *Non-target Fish Species*

Prior NEPA analyses have considered the effects of the ocean salmon fisheries on non-target fish species. Since then, ocean salmon fisheries have not changed substantially in terms of season length, areas, depth, bag limits, etc. Nor is there any new information to suggest that the incidental nature of encounters of non-target species in ocean salmon fisheries has changed. Therefore, conclusions from previous environmental analyses indicating that effects on non-target fish species are low and not significant are still applicable, as discussed below. The differences between the Alternatives for the 2021 salmon fishery are not discernible with respect to their effect on non-target fish species.

Impacts to groundfish stocks from salmon troll fisheries continue to be managed as part of the open access groundfish fishery sector, and are at similar levels compared to recent years. Previous environmental analysis concluded that the amount of groundfish taken incidentally in the salmon fishery is very low and is not substantially altered by changes in the salmon fishery. The 2021 ocean salmon regulation Alternatives are not expected to differ substantially from fisheries analyzed previously with respect to groundfish impacts; therefore, effects from the Alternatives to groundfish stocks are not significant.

Impacts to Pacific halibut from salmon troll fisheries continue to be managed under limits established through the International Pacific Halibut Commission (IPHC) process and under the Area 2A (Council area) catch sharing plan. Previous environmental analysis stated that data on the commercial segment of salmon fisheries show the co-occurrence rates for salmon and halibut, coastal pelagic species, highly migratory species, and non-Council managed fish species are low. The 2021 ocean salmon regulation Alternatives include Pacific halibut landing restrictions within the range enacted in the past, and are not expected to differ substantially from earlier analyses with respect to Pacific halibut impacts; therefore, effects from the Alternatives to Pacific halibut are not significant. Likewise, there are no changes to the salmon fishery for 2021 that would change impacts to other non-salmon fish species compared to previous analyses, therefore, effects from the Alternatives to these species are not expected to be significant.

8.4 *Marine Mammals*

The commercial salmon troll fisheries off the coasts of Washington, Oregon, and California are classified as Category III fisheries, indicating a remote or no likelihood of causing incidental mortality or serious injury to marine mammals (86 FR 3028, January 14, 2021). Recreational salmon fisheries use similar gear and techniques as the commercial fisheries and are assumed to have similar encounter rates and impacts. The non-ESA listed marine mammal species that are known to interact with ocean salmon fisheries are California sea lion and harbor seals. Populations of both these species are at stable and historically high levels. There is no new information to suggest that the nature of interactions between California sea lions or harbor seals in ocean salmon fisheries has changed since the Category III determination. Therefore, the impacts from the 2021 salmon regulation Alternatives to non-ESA listed marine mammals are not expected to be significant, and there is no discernible difference between the effects of the Alternatives on these resources.

8.5 *ESA Listed Species*

ESA-listed salmonid species present in Council area waters are described in Chapter 5 of this document. ESA-listed sockeye and chum salmon, and steelhead trout are rarely encountered in ocean salmon fisheries,

and the Alternatives for Council area ocean salmon fisheries are in compliance with applicable BOs for listed ESUs of these species as listed in Chapter 5 of this document. Because anticipated impacts are negligible, there are no significant impacts expected on listed sockeye or chum salmon or steelhead trout from the Alternatives analyzed in this EA, and there is no discernible difference between the effects of the Alternatives on these resources.

There is no record of injury or mortality of Guadalupe fur seals in Pacific Coast salmon fisheries. No sea turtles have been reported taken by the ocean salmon fisheries off Washington, Oregon, or California, and NMFS has determined that commercial fishing by Pacific Coast salmon fisheries would pose a negligible threat to Pacific turtle species. There is no discernible difference between the effects of the alternatives on these resources.

Of the ESA-listed marine mammals that occur in Council area waters, only Southern Resident killer whales (SRKW), a distinct population segment (DPS) of *Orcinus orca*, are likely to be affected by salmon fisheries. The “resident” killer whale ecotype is dependent on fish as a prey item; the primary prey for the SRKW DPS is Chinook salmon (SRKW Workgroup 2020). The SRKW DPS occurs regularly throughout the coastal waters of the states of Washington, Oregon, and Vancouver Island, British Columbia, Canada; individuals are known to travel as far south as central California and as far north as Southeast Alaska (SRKW Workgroup 2020).

Salmon fisheries conducted under the FMP may directly affect SRKW through interactions with vessels and gear, and indirectly affect them by reducing prey availability. The risk assessment report, prepared by the Council’s ad hoc workgroup on SRKW/salmon fishery interactions (SRKW Workgroup 2020), presented at the Council’s March 2020 meeting, provides the most current information on SRKW and their predator-prey interaction with Pacific salmon. The report can be found online at: <https://www.pcouncil.org/documents/2020/02/e-3-a-srkw-workgroup-report-1-electronic-only.pdf/>. NMFS completed a consultation on the effects of implementing the Council’s 2020 ocean salmon management measures on SRKW and their current and proposed critical habitat. The biological opinion, dated April 29, 2020, considered interactions with vessels and gear, and effects on prey availability (NMFS 2020). The biological opinion concluded that effects from the Council’s 2020 salmon fisheries were not likely to jeopardize the continued existence of the SRKW DPS or destroy or adversely modify its designated critical or proposed habitat.

At its November 2020 meeting, the Council adopted a final preferred alternative for a subsequent amendment to the FMP to include management provisions responsive to the needs of SRKW (if approved, this will be Amendment 21). NMFS is currently consulting on the effects on SRKW of Amendment 21. Amendment 21, if approved, would set a Chinook salmon annual abundance management threshold below which the Council and NMFS would implement specific steps to limit ocean salmon fishery impacts on Chinook salmon in order to increase salmon prey availability for SRKW.² These steps include time and area closures and temporal shifts in fishing. As mentioned above, the annual management measures for Council salmon fisheries are developed to be consistent with all ESA biological opinions.

8.6 Seabirds

The types of vessels used in ocean salmon fisheries and the conduct of the vessels are not conducive to collisions or the introduction of rats or other non-indigenous species to seabird breeding colonies. Other types of accidental bird encounters are a rare event for commercial and recreational ocean salmon fisheries.

² For details of the Council’s adopted provisions for Amendment 21, see the Council decision document for the November 2020 Council meeting at: <https://www.pcouncil.org/november-2020-decision-summary-document/#Salmon>.

Therefore, there are no significant impacts expected on seabirds from the Alternatives analyzed in this EA, and there is no discernible difference between the effects of the Alternatives on seabirds.

8.7 *Biodiversity and Ecosystem Function*

The removal of adult salmon by the ocean fisheries is not considered to significantly affect the lower trophic levels or the overall marine ecosystem because salmon are not the only or primary predator in the marine environment. Therefore, no significant impacts are expected on biodiversity or ecosystem function from the Alternatives analyzed in this EA, and there is no discernible difference between the effects of the Alternatives on these resources.

8.8 *Ocean and Coastal Habitats*

Council Area salmon fisheries do not employ bottom contact gear, and there is no evidence of direct gear effects on fish habitat from Council-managed salmon fisheries on essential fish habitat (EFH) for salmon or other managed species. Critical habitat for ESA listed salmon does not include Council area ocean water. Because Council area salmon fisheries are conducted at sea and without bottom contact gear, there is no interaction with unique geographic characteristics or other cultural, scientific, or historical resources such as those that might be listed on the National Register of Historical Places.

8.9 *Public Health and Safety*

Fisheries management can affect safety if, for example, season openings make it more likely that fishermen will have to go out in bad weather because fishing opportunities are limited. The Salmon FMP, however, has provisions to adjust management measures if unsafe weather affected fishery access. The Alternatives for 2021 ocean salmon regulations have season structures similar to those employed in previous salmon seasons and are not expected to result in any significant increase in the risk to human health or safety at sea. There are also no discernible differences between the effects of the Alternatives on the risk to human health or safety at sea.

8.10 *Short term and Long Term Impacts*

The purpose of long term and short term impacts analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately.

8.10.1 Consideration of the Affected Resource

The affected resources that relate to the Pacific Coast salmon fishery are described in the Affected Environment sections of Preseason I and in Section 8.0 of this report. The significance of impacts will be discussed in relation to these affected resources listed below.

- Fishery and Fish Resources,
- Protected Resources,
- Biodiversity/Ecosystem Function and Habitats,
- Socioeconomics.

8.10.2 Geographic Boundaries

The analysis focuses on actions related to Council-managed ocean salmon commercial and recreational fisheries. Council-managed ocean fisheries occur in the exclusive economic zone (EEZ), from three to 200 miles offshore, off the coasts of the states of Washington, Oregon, and California as well as the ports in these states that receive landings from the ocean salmon fisheries. Since salmon are anadromous and spend part of their lifecycle in fresh water, the geographic scope also includes internal waters (e.g., Puget Sound) and rivers that salmon use to migrate towards their spawning grounds.

8.10.3 Temporal Boundaries

The temporal scope of past and present actions for the affected resources is primarily focused on actions that have occurred after framework FMP implementation (1984). The temporal scope of future actions for all affected resources extends about five years into the future. This period was chosen because the dynamic nature of resource management and lack of information on future projects make it very difficult to predict impacts beyond this timeframe with any certainty.

8.10.4 Past, Present, and Reasonably Foreseeable Future Actions

Fishery Actions

The Council sets management measures for ocean salmon fisheries annually based on stock forecasts and in accordance with conservation objectives set in the FMP and guidance provided by NMFS for managing impacts to ESA listed stocks. The Council manages ocean salmon fisheries through an intensive preseason analysis process to shape salmon fisheries impacts on salmon stocks within the parameters of the FMP conservation measures and ESA requirements.

Fisheries outside of the Council's jurisdiction also impact the Council-area salmon fishery. The Council considers fisheries managed by the states and treaty Indian tribes in the North of Falcon management process and Columbia River fisheries managed under U.S. v. Oregon Management Plan, as well as obligations for fisheries off Alaska and Canada under the PST. Additionally, the Council and NMFS manage ocean salmon fisheries inseason to keep fisheries impacts within the constraints set preseason. The Council also conducts annual methodology reviews to improve models and other tools for assessing salmon stocks.

Non-Fishing Related Actions

Because salmon spend part of their lifecycle in fresh water, they are more vulnerable to a broad range of human activities (since humans spend most of their time on land) that affect the quantity and quality of these freshwater environments. These effects are generally well known and diverse. They include physical barriers to migration (dams), changes in water flow and temperature (often a secondary effect of dams or water diversion projects), and degradation of spawning environments (such as increased silt in the water from adjacent land use). Non-fishing activities in the marine environment can introduce chemical pollutants and sewage; and result in changes in water temperature, salinity, dissolved oxygen, and suspended sediment which poses a risk to the affected resources. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas. When these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability tends to reduce the tolerance of affected species to the impacts of fishing effort. Mitigation through regulations that would reduce fishing effort could negatively impact human communities. The overall impact to the affected species and their habitats on a population level is unknown, but likely neutral to low negative, since a large portion of these species have a limited or minor exposure to the localized non-fishing perturbations.

For many of the proposed non-fishing activities to be permitted by other Federal agencies, those agencies would examine the potential impacts on the affected resources. The Magnuson-Stevens Act (50 CFR 600.930) imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The eight fishery management councils engage in the review process by making comments and recommendations on any Federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH. In addition, under the Fish and Wildlife Coordination Act (Section 662), "whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or

private agency under Federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the activity is taking place. This act provides another avenue for review of actions by other Federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future. In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS' jurisdiction.

The effects of climate on the biota of the California Current ecosystem have been recognized for some time. The El Niño-Southern Oscillation (ENSO) is widely recognized to be the dominant mode of inter-annual variability in the equatorial Pacific, with impacts throughout the rest of the Pacific basin and the globe. During the negative (El Niño) phase of the ENSO cycle, jet stream winds are typically diverted northward, often resulting in increased exposure of the Pacific Coast of the U.S. to subtropical weather systems. The impacts of these events to the coastal ocean generally include reduced upwelling winds, deepening of the thermocline, intrusion of offshore (subtropical) waters, dramatic declines in primary and secondary production, poor recruitment, reduced growth, and survival of many resident species (such as salmon and groundfish), and northward extensions in the range of many tropical species. Concurrently, top predators such as seabirds and pinnipeds often exhibit reproductive failure. In addition to inter-annual variability in ocean conditions, the North Pacific seems to exhibit substantial inter-decadal variability, which is referred to as the Pacific (inter) Decadal Oscillation (PDO).

Anomalously warm sea surface temperatures in the northeast Pacific Ocean developed in 2013 and continued to persist through much of 2015; this phenomenon was termed "the Blob." During the persistence of the Blob, distribution of marine species was affected (e.g., tropical, and subtropical species were documented far north of their usual ranges), marine mammals and seabirds starved, and a coastwide algal bloom that developed in the summer of 2015 resulted in domoic acid poisoning of animals at various trophic levels, from crustaceans to marine mammals. In 2015-2016, a very strong El Niño event disrupted the Blob, which was declared "dead" by climatologists in December 2015. The extent of the impact of The Blob on salmon and salmon fisheries has not yet been fully determined. It is also uncertain if or when environmental conditions would cause a repeat of this event, although evidence of resurgent blob-like conditions emerged in late 2019. NMFS' Northwest and Southwest Fisheries Science Centers presented information to the Council indicating that the broods that will contribute to 2021 harvest and escapement encountered generally poor to intermediate ocean conditions in the California Current Ecosystem.

Within the California Current itself, scientists have described long-term warming trends in the upper 50 to 75 meters of the water column. Recent paleoecological studies from marine sediments have indicated that 20th century warming trends in the California Current have exceeded natural variability in ocean temperatures over the last 1,400 years. Statistical analyses of past climate data have improved our understanding of how climate has affected North Pacific ecosystems and associated marine species productivities.

In addition, changes in river flows and flow variability may affect population growth of anadromous fishes. Ward et al. (2015) found that increases in variability in freshwater flows may have a more negative effect than any other climate signal included in their model. Some climate change models predict that in the Pacific Northwest, there will be warmer winters and more variable river flows, which may affect the ability of anadromous fishes to recover in the future (Ward et al. 2015). However, our ability to predict future impacts on a large-scale ecosystem stemming from climate forcing events remains uncertain.

8.10.5 Magnitude and Significance of Proposed Action

The following section presents the cumulative effects of past, present, and reasonably foreseeable future actions on each of the managed resources. This is followed by a discussion on the synergistic effects of the proposed action, as well as past, present, and reasonably foreseeable future actions.

8.10.5.1 Fishery and Fish Resources

Past, present, and reasonably foreseeable future actions that affect the salmon fishery and fish resources are considered annually when the Council sets management measures for ocean salmon fisheries based on stock forecasts and in accordance with conservation objectives set in the FMP and guidance provided by NMFS for managing impacts to ESA-listed stocks. The Council also considers fisheries managed by the states and treaty Indian tribes in the North of Falcon management process and Columbia River fisheries managed under *U.S. v. Oregon* Management Plan, as well as obligations under the PST. Additionally, the Council and NMFS manage ocean salmon fisheries inseason to keep fisheries impacts within the constraints set pre-season. The Council also conducts annual methodology reviews to improve models and other tools for assessing salmon stocks. Therefore, the degree of both short term and long term effects, including the proposed action, on the salmon fishery and fish resources are expected to be low positive and not significant.

8.10.5.2 Protected Resources

Past, present, and foreseeable future actions that affect ESA-listed salmon are considered annually when the Council sets management measures for ocean salmon fisheries; NMFS provides guidance for managing impacts to ESA-listed stocks based on BOs and stock productivity information provided by the states and analyzed by the STT. Fishery management actions have been taken to manage impacts on ESA-listed salmon, and the states have developed information to better inform fishery management decisions. Therefore, the magnitude and significance of cumulative effects, including the proposed action on ESA-listed salmon are expected to be low positive and not significant.

8.10.5.3 Biodiversity/Ecosystem Function and Habitats

Past, present, and foreseeable future actions that affect biodiversity/ecosystem function and habitats are considered to the extent practicable annually. When considering the proposed action's removal of adult salmon by the ocean fisheries in addition to past, present, and reasonably foreseeable future actions, such removal of these salmon is not considered to significantly affect the lower trophic levels or the overall marine ecosystem because salmon are not the only primary predator. In addition, Council-area salmon fisheries are conducted at sea with hook-and-line gear and thus, there is no to negligible interactions expected with EFH for salmon or other managed species.

Salmon escapement to fresh water provides for spawning and for carrying marine derived nutrients to freshwater habitats. The importance of salmon carcasses in the transport of marine derived nutrients to freshwater habitats is described in Appendix A of the FMP and the related EA (see Final Environmental Assessment and Regulatory Impact Review; Pacific Coast Salmon Plan Amendment 18: Incorporating Revisions to Pacific Salmon Essential Fish Habitat, available on the Council's website: www.pccouncil.org) and also in the EIS for Puget Sound Chinook Harvest Resource Management Plan (Puget Sound Chinook Harvest Resource Management Plan FEIS. NMFS Northwest Region with Assistance from the Puget Sound Treaty Tribes and Washington Department of Fish and Wildlife. December 2004. 2 volumes, available on the NMFS West Coast Region website: <http://www.westcoast.fisheries.noaa.gov/>). Council fisheries are designed to provide escapement of salmon to provide for natural spawning and transport of marine derived nutrients.

8.10.5.4 Socioeconomic Environment

Each year the Council evaluates the socioeconomic impact of past salmon fisheries in the stock assessment and fishery evaluation document (e.g., PFMC 2021a) and also evaluates foreseeable future impacts in the annual preseason reports; these documents are also used as the basis for the NEPA analysis for the annual management measures. The magnitude and significance of cumulative effects, including the proposed action on the socioeconomic environment, is expected to be low positive, and not significant.

9.0 CONCLUSION

This analysis has identified no significant environmental impacts that would result from the 2021 ocean salmon regulation Alternatives, from final regulations selected from within the range presented in these Alternatives.

10.0 LIST OF AGENCIES AND PERSONS CONSULTED

The following public meetings were held as part of the salmon management process (Council-sponsored meetings in bold):

November 9-10, 12-13, 16-20, 2020: **Pacific Fishery Management Council meeting**, via webinar.
January 20-22, 2021 **Salmon Technical Team meeting (Review preparation)**, on-line.
February 10: California Fish and Game Commission meeting, on-line.
February 16-20: **Salmon Technical Team meeting(Preseason Report I preparation)**, on-line.
February 25: California Department of Fish and Wildlife public meeting, on-line.
February 25: Oregon Ocean Salmon Industry Group meeting, on-line.
February 26: Washington Department of Fish and Wildlife public meeting, on-line.
March 2-5, 8-11: **Pacific Fishery Management Council meeting**, via webinar.
March 16: North of Falcon meeting. Discussion of management objectives and preliminary fishery proposals for sport and commercial fisheries in Puget Sound and coastal Washington, with limited discussion of the Columbia River and ocean fisheries, on-line.
March 19: Oregon Fish and Wildlife Commission meeting, on-line.
March 23-24: **Public hearings on management options**, on-line meetings with focused discussions in Washington; Oregon; California.
March 31: North of Falcon, Puget Sound forum meeting, on-line.
April 1: North of Falcon, Ocean fisheries and Columbia River fisheries meeting, on-line.
April 6-9, 12-15: **Pacific Fishery Management Council meeting**, via webinar.
April 14-15: California Fish and Game Commission meeting, on-line.
April 23: Oregon Fish and Wildlife Commission meeting, on-line.
April 22-24: Washington Fish and Wildlife Commission meeting, on-line.

The following organizations were consulted and/or participated in preparation of supporting documents:

Northwest Indian Fisheries Commission
Columbia River Intertribal Fish Commission
West Coast Indian Tribes

National Marine Fisheries Service, West Coast Region, Sustainable Fisheries Division
National Marine Fisheries Service, Northwest Fisheries Science Center
National Marine Fisheries Service, Southwest Fisheries Science Center
U.S. Fish and Wildlife Service, Columbia River Fisheries Program Office
United States Coast Guard

California Department of Fish and Wildlife
Oregon Department of Fish and Wildlife
Washington Department of Fish and Wildlife

11.0 REFERENCES

- PFMC. 2007. Final Environmental Assessment for Pacific Coast Salmon Plan Amendment 15: An Initiative to Provide for *De Minimis* Fishing Opportunity for Klamath River Fall-run Chinook Salmon. (Document prepared by the Pacific Fishery Management Council and National Marine Fisheries Service.) Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, Oregon 97220-1384.
- PFMC. 2021a. Preseason Report I: Stock abundance analysis and environmental assessment part 1 for 2021 ocean salmon fishery management measures. Pacific Fishery Management Council, Portland, Oregon.
- PFMC. 2021b. Review of 2020 ocean salmon fisheries. Pacific Fishery Management Council, Portland, Oregon.
- SRKW Workgroup. 2020. Pacific Fishery Management Council Salmon Fishery Management Plan Impacts to Southern Resident Killer Whales: Final Draft Risk Assessment. PFMC Briefing Book for March 2020. Available at <https://www.pcouncil.org/documents/2020/02/e-3-a-srkw-workgroup-report-1-electronic-only.pdf> (website accessed November 6, 2020).
- Ward, E.J., J.H. Anderson, T.J. Beechie, G.R. Pess, and M.J. Ford. 2015. Increasing hydrologic variability threatens depleted anadromous fish populations. *Global Change Biology* DOI: 10.1111/gcb.12847

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 1 of 14)

A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	North of Cape Falcon	North of Cape Falcon
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
Model #: Coho-2111, Chinook-1021	Model #: Coho-2112, Chinook-1121	Model #: Coho-2113, Chinook-1221
1. Overall non-Indian TAC: 60,000 Chinook and 80,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 32,000 Chinook and 4,800 marked coho. 3. Trade: commercial troll traded 8,000 marked coho to the recreational fishery for 2,000 Chinook. 4. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries. 5. During May 1-15, 2021: See 2020 management measures, which are subject to inseason action and the 2021 season description described below.	1. Overall non-Indian TAC: 50,000 Chinook and 110,000 coho marked with a healed adipose fin clip (marked). 2. Non-Indian commercial troll TAC: 25,000 Chinook and 14,400 marked coho. 3. Trade: may be considered at the April Council meeting. 4. Same as Alternative 1. 5. Same as Alternative 1.	Closed.

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 2 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> May 16 through the earlier of June 29, or 16,000 Chinook. No more than 5,900 of which may be caught in the area between the U.S./Canada border and the Queets River, and no more than 4,360 of which may be caught in the area between Leadbetter Pt. and Cape Falcon (C.8). <p>In the area between the U.S./Canada border and the Queets River the landing and possession limit is 75 Chinook per vessel per landing week (Thurs.-Wed.) (C.1, C.6).</p> <p>In the area between Leadbetter Pt. and Cape Falcon the landing and possession limit is 75 Chinook per vessel per landing week (Thurs.-Wed.) (C.1, C.6).</p> <p>Open seven days per week (C.1). All salmon, except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>When it is projected that approximately 75% of the overall Chinook guideline has been landed, or approximately 75% of any of the individual Chinook subarea guidelines have been landed, inseason action will be considered to ensure the guideline is not exceeded.</p> <p>In 2022, the season will open May 1 consistent with all preseason regulations in place in this area and subareas during May 16-June 30, 2021, including subarea salmon guidelines and quotas and weekly vessel limits except as described below for vessels fishing or in possession of salmon north of Leadbetter Point. This opening could be modified following Council review at its March and/or April 2022 meetings.</p>	<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> May 16 through the earlier of June 29, or 15,000 Chinook. No more than 5,540 of which may be caught in the area between the U.S./Canada border and the Queets River, and no more than 4,090 of which may be caught in the area between Leadbetter Pt. and Cape Falcon (C.8). <p>In the area between the U.S./Canada border and the Queets River the landing and possession limit is 50 Chinook per vessel <u>per trip</u> (C.1, C.6).</p> <p>In the area between Leadbetter Pt. and Cape Falcon landing and possession limit of 50 Chinook per vessel <u>per trip</u> (C.1, C.6).</p> <p>Open seven days per week (C.1). All salmon, except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>Inseason action may be taken to modify trip limits to landing week (Thurs.-Wed.) limits to ensure the Chinook quota is not exceeded.</p> <p>When it is projected that approximately 60% of the overall Chinook guideline has been landed, or approximately 60% of any of the individual Chinook subarea guidelines have been landed, inseason action will be considered to ensure the guideline is not exceeded.</p> <p>In 2022, same as Alternative 1.</p>	<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> Closed. <p>In 2022, same as Alternative 1.</p>

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 3 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> July 1 through the earlier of September 30, or 16,000 Chinook or 4,800 coho (C.8). <p>Open seven days per week. All salmon. Chinook minimum size limit of 27 inches total length (B, C.1).</p> <p>Coho minimum size limit of 16 inches total length (B, C.1). All coho must be marked with a healed adipose fin clip (C.8.d). No chum retention north of Cape Alava, Washington in August, and September (C.4, C.7). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>Landing and possession limit of 25 marked coho per vessel per landing week (Thurs.-Wed.) (C.1).</p>	<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> July 1 through the earlier of September 30, or 10,000 Chinook or 14,400 coho (C.8). <p>Open seven days per week. All salmon. Chinook minimum size limit of 28 inches total length (B, C.1).</p> <p>Same as Alternative 1.</p> <p>Landing and possession limit of 50 marked coho per vessel per landing week (Thurs.-Wed.) (C.1).</p>	<p>U.S./Canada Border to Cape Falcon</p> <ul style="list-style-type: none"> Closed.
<p>For all commercial troll fisheries north of Cape Falcon:</p> <p>Mandatory closed areas include: Salmon troll Yelloweye Rockfish Conservation Area, Cape Flattery and Columbia Control Zones, and beginning August 9, Grays Harbor Control Zone (C.5). Vessels must land and deliver their salmon within 24 hours of any closure of this fishery.</p> <p>Vessels in possession of salmon <u>north of the Queets River</u> may not cross the Queets River line without first notifying WDFW at 360-249-1215 with area fished, total Chinook, coho and halibut catch aboard, and destination. Vessels in possession of salmon south of the Queets River may not cross the Queets River line without first notifying WDFW at 360-249-1215 with area fished, total Chinook, coho and halibut catch aboard, and destination (C.11).</p> <p>Vessels fishing or in possession of salmon <u>north of Leadbetter Point</u> must land and deliver all species of fish in a Washington port and must possess a Washington troll and/or salmon delivery license. In 2021, vessels may not land fish east of Port Angeles or east of the Megler-Astoria bridge. For delivery to Washington ports east of the Sekiu River, vessels must notify WDFW at 360-249-1215 prior to crossing the Bonilla-Tatoosh line with area fished, total Chinook, coho and halibut catch aboard, and destination with approximate time of delivery. In 2022, vessels may not land fish east of the Sekiu River or east of the Megler-Astoria bridge.</p> <p><u>For delivery to Washington ports south of Leadbetter Point</u>, vessels must notify the Washington Department of Fish and Wildlife at 360-249-1215 prior to crossing the Leadbetter Point line with area fished, total Chinook, coho, and halibut catch aboard, and destination with approximate time of delivery. During any single trip, only one side of the Leadbetter Point line may be fished (C.11).</p> <p>Vessels fishing or in possession of salmon while fishing <u>south of Leadbetter Point</u> must land and deliver all species of fish within the area and south of Leadbetter Point, except that Oregon permitted vessels may also land all species of fish in Garibaldi, Oregon. Under state law, vessels must report their catch on a state fish receiving ticket. Oregon State regulations require all fishers landing salmon into Oregon from any fishery between Leadbetter Point, Washington and Cape Falcon, Oregon to notify ODFW within one hour of delivery or prior to transport away from the port of landing by either calling 541-857-2546 or sending notification via e-mail to nfalcon.trollreport@state.or.us. Notification shall include vessel name and number, number of salmon by species, port of landing and location of delivery, and estimated time of delivery. Inseason actions may modify harvest guidelines in later fisheries to achieve or prevent exceeding the overall allowable troll harvest impacts (C.8).</p>		

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 4 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
South of Cape Falcon	South of Cape Falcon	South of Cape Falcon
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
<ol style="list-style-type: none"> 1. Sacramento River fall Chinook spawning escapement of 131,034 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 51.6%. 3. Klamath River recreational fishery allocation: 1,234 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,152 adult Klamath River fall Chinook. 5. CA/OR share of Klamath River fall Chinook commercial ocean harvest: 64.5% / 35.5%. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission. 7. For fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below. 	<ol style="list-style-type: none"> 1. Sacramento River fall Chinook spawning escapement of 132,221 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 51.2%. 3. Klamath River recreational fishery allocation: 1,227 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,160 adult Klamath River fall Chinook. 5. CA/OR share of Klamath River fall Chinook commercial ocean harvest: 63.1% / 36.9%. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission. 7. For fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below. 	<ol style="list-style-type: none"> 1. Sacramento River fall Chinook spawning escapement of 128,040 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 52.7%. 3. Klamath River recreational fishery allocation: 1,217 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,105 adult Klamath River fall Chinook. 5. CA/OR share of Klamath River fall Chinook commercial ocean harvest: 60.2% / 39.8%. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the California Fish and Game Commission. 7. For fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below.

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 5 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Cape Falcon to Heceta Bank line</p> <ul style="list-style-type: none"> • March 20-April 30; • May 6-10, 13-17, 20-24, 27-31; • June 3-7, 17-21; • July 1-3, 6-8, 11-13, 16-18, 21-23; • August 1-3; 7-8; • September 1-October 31 (C.9.a). <p>All salmon except coho, except as described below (C.4, C.7).</p> <p>Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their salmon in the State of Oregon. See gear restrictions and definitions (C.2, C.3).</p> <p>Beginning September 1, no more than 75 Chinook allowed per vessel per landing week (Thurs.-Wed.).</p> <ul style="list-style-type: none"> • July 1 through the earlier of August 15, or 10,000 marked coho quota for the combined area from Cape Falcon to Humbug Mt. <p>All salmon. All retained coho must be marked with a healed adipose fin clip (C.4, C.7). Salmon trollers may take and retain or possess on board a fishing vessel no more than 20 coho per vessel per week (Thurs.-Wed.). All coho retained, possessed on a vessel, and landed must not exceed a 1:1 ratio with Chinook salmon that are retained and landed at the same time.</p> <p>Coho minimum size limit of 16 inches total length, and Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their salmon in the State of Oregon. See gear restrictions and definitions (C.2, C.3).</p> <p>In 2022, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March 2022 meeting.</p>	<p>Cape Falcon to Heceta Bank line</p> <ul style="list-style-type: none"> • March 20-April 30; • May 6-10, 13-17, 20-24, 27-31; • June 3-7, 17-22; • July 1-2, 6-9, 12-15, 18-21, 24-27; • August 1-3, 6-8; • September 1-October 31 (C.9.a). <p>All salmon except coho (C.4, C.7).</p> <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	<p>Cape Falcon to Heceta Bank line</p> <ul style="list-style-type: none"> • March 20-April 30; • May 1-31; • June 1-30; • July 5-8, 11-14, 23-26; • August 1-3, 6-8, 11-13, 16-17; • September 1-October 31 (C.9.a). <p>All salmon except coho (C.4, C.7).</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 6 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Heceta Bank line to Humbug Mt.</p> <ul style="list-style-type: none"> • May 6-10, 13-17, 20-24, 27-31; • June 10-14, 24-28; • July 1-3, 6-8, 11-13, 16-18, 21-23; • August 1-3, 7-8; • September 1-October 31 (C.9.a). <p>All salmon except coho, except as described below. (C.4, C.7).</p> <p>Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their salmon in the State of Oregon. See gear restrictions and definitions (C.2, C.3).</p> <p>Beginning September 1, no more than 75 Chinook allowed per vessel per landing week (Thurs.-Wed.).</p> <ul style="list-style-type: none"> • July 1 through the earlier of August 15, or 10,000 marked coho quota for the combined area from Cape Falcon to Humbug Mt. <p>All salmon. All retained coho must be marked with a healed adipose fin clip (C.4, C.7). Salmon trollers may take and retain or possess on board a fishing vessel no more than 20 coho per vessel per week (Thurs.-Wed.). All coho retained, possessed on a vessel, and landed must not exceed a 1:1 ratio with Chinook salmon that are retained and landed at the same time.</p> <p>Coho minimum size limit of 16 inches total length, and Chinook minimum size limit of 28 inches total length (B, C.1). All vessels fishing in the area must land their salmon in the State of Oregon. See gear restrictions and definitions (C.2, C.3).</p> <p>In 2022, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March 2022 meeting.</p>	<p>Heceta Bank line to Humbug Mt.</p> <ul style="list-style-type: none"> • May 6-10, 13-17, 20-24, 27-31; • June 10-14, 24-29; • July 1-2, 6-9, 12-15, 18-21, 24-27; • August 1-3, 6-8; • September 1-October 31 (C.9.a). <p>All salmon except coho (C.4, C.7).</p> <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	<p>Heceta Bank line to Humbug Mt.</p> <ul style="list-style-type: none"> • May 1-31; • June 3-6, 9-12, 15-18, 26-29; • July 5-8, 11-14, 23-26; • August 1-3, 6-8, 11-13, 16-17; • September 1-October 31 (C.9.a). <p>All salmon except coho (C.4, C.7).</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted (Page 7 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> • March 20-April 30; • May 6-10, 13-17, 20-24, 27-31; • June 1-30, or the earlier of 600 Chinook quota; • July 1-31, or the earlier of 300 Chinook quota (C.9.a). <p>All salmon except coho (C.4, C.7). Chinook minimum size limit of 28 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>Prior to June 1, all salmon caught in this area must be landed and delivered in the State of Oregon.</p> <p>June 1-July 31 weekly landing and possession limit of 40 Chinook per vessel per week (Thurs.-Wed.). Any remaining portion of Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.b).</p> <p>All vessels fishing in this area during June and July must land and deliver all salmon within this area or into Port Orford within 24 hours of any closure of this fishery and prior to fishing outside of this area.</p> <p>For all quota managed seasons (June and July), Oregon state regulations require fishers to notify ODFW within one hour of landing and prior to transport away from the port of landing by calling 541-857-2538 or sending notification via e-mail to kmzor.trollreport@state.or.us, with vessel name and number, number of salmon by species, location of delivery, and estimated time of delivery.</p> <p>In 2022, the season will open March 15 for all salmon except coho. Chinook minimum size limit of 28 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March 2022 meeting.</p>	<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> • March 20-April 30; • May 6-10, 13-17, 20-24, 27-31 (C.9.a). <p>Same as Alternative 1.</p> <p>All salmon caught in this area must be landed and delivered in the State of Oregon.</p> <p>In 2022, same as Alternative 1.</p>	<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> • March 20-April 30; • May 1-31; • June 1-30, or the earlier of 300 Chinook quota; • July 1-31, or the earlier of 200 Chinook quota (C.9.a). <p>Same as Alternative 1.</p> <p>All salmon caught in this area must be landed and delivered in the State of Oregon.</p> <p>June 1-July 31 weekly landing and possession limit of 20 Chinook per vessel per week (Thurs.-Wed.). Any remaining portion of Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.b).</p> <p>In 2022, same as Alternative 1.</p>

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted (Page 8 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
OR/CA Border to Humboldt South Jetty (California KMZ) <ul style="list-style-type: none">• Closed. <p>In 2022, the season will open May 1 through the earlier of May 31, or a 3,000 Chinook quota. Chinook minimum size limit of 27 inches total length. Landing and possession limit of 20 Chinook per vessel per day (C.8.f). Open five days per week (Fri.-Tue.). All salmon except coho (C.4, C.7). Any remaining portion of Chinook quotas may be transferred inseason on an impact neutral basis to the next open quota period (C.8.b). All fish caught in this area must be landed within the area, within 24 hours of any closure of the fishery (C.6), and prior to fishing outside the area (C.10). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). Klamath Control Zone closed (C.5.e). See California State regulations for an additional closure adjacent to the Smith River. This opening could be modified following Council review at its March or April 2022 meetings.</p>	OR/CA Border to Humboldt South Jetty (California KMZ) <ul style="list-style-type: none">• Closed. <p>In 2022, same as Alternative 1.</p>	OR/CA Border to Humboldt South Jetty (California KMZ) <ul style="list-style-type: none">• Closed. <p>In 2022, same as Alternative 1.</p>
Humboldt South Jetty to Southern KMZ Boundary <ul style="list-style-type: none">• Closed.	Humboldt South Jetty to Southern KMZ Boundary <p>Closed.</p>	Humboldt South Jetty to Southern KMZ Boundary <ul style="list-style-type: none">• Closed.
Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">• June 24-30;• July 25-31;• August 1-12;• September 1-30 (C.9.b). <p>All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>All salmon must be landed in California and north of Point Arena (C.6).</p> <p>In 2022, the season will open April 16 for all salmon except coho. Chinook minimum size limit of 27 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March 2022 meeting.</p>	Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">• July 25-31;• August 1-16;• September 1-15 (C.9.b). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">• July 25-31;• August 1-11 (C.9.b). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>
When the fishery is closed between the OR/CA border and Humbug Mountain and open to the south, vessels with fish on board caught in the open area off California may seek temporary mooring in Brookings, Oregon prior to landing in California only if such vessels first notify the Chetco River Coast Guard Station via VHF channel 22A between the hours of 0500 and 2200 and provide the vessel name, number of fish on board, and estimated time of arrival (C.6).		

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted (Page 9 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Pt. Arena to Pigeon Pt. (San Francisco)</p> <ul style="list-style-type: none"> • June 24-30; • July 25-31; • August 1-12; • September 1-30 (C.9.b). <p>All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length through August, then 26 inches thereafter (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p> <p>All salmon must be landed in California. During September, all salmon must be landed south of Point Arena (C.6, C.11).</p> <p>In 2022, the season will open May 1 for all salmon except coho. Chinook minimum size limit of 27 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March or April 2022 meeting.</p> <p>Point Reyes to Point San Pedro (Fall Area Target Zone)</p> <ul style="list-style-type: none"> • October 1, 4-8, 11-15. <p>Open five days per week (Mon.-Fri.). All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All salmon caught in this area must be landed between Point Arena and Pigeon Point (C.6, C.11). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p>	<p>Pt. Arena to Pigeon Pt. (San Francisco)</p> <ul style="list-style-type: none"> • June 20-30; • July 25-31; • August 1-16; • September 1-2, 6-9, 13-16, 20-23, 27-30 (C.9.b). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p>In 2022, Same as Alternative 1.</p> <p>Point Reyes to Point San Pedro (Fall Area Target Zone)</p> <ul style="list-style-type: none"> • Closed. 	<p>Pt. Arena to Pigeon Pt. (San Francisco)</p> <ul style="list-style-type: none"> • May 1-10, 23-31; • June 20-30; • July 25-31; • August 1-11 (C.9.b). <p>Same as Alternative 1.</p> <p>All salmon must be landed in California (C.6).</p> <p>In 2022, Same as Alternative 1.</p> <p>Point Reyes to Point San Pedro (Fall Area Target Zone)</p> <ul style="list-style-type: none"> • September 1-2, 6-9, 13-16, 20-23, 27-30. <p>All salmon except coho (C.4, C.7). Chinook minimum size limit of 26 inches total length (B, C.1). All salmon caught in this area must be landed between Point Arena and Pigeon Point (C.6, C.11). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3).</p>

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 10 of 14)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Pigeon Point to U.S./Mexico Border (Monterey)</p> <ul style="list-style-type: none"> • May 1-15; 18-31; • June 1-8 (C.9.b). <p>All salmon except coho (C.4, C.7). Chinook minimum size limit of 27 inches total length (B, C.1). See compliance requirements (C.1) and gear restrictions and definitions (C.2, C.3). All salmon must be landed in California (C.6).</p> <p>In 2022, the season will open May 1 for all salmon except coho. Chinook minimum size limit of 27 inches total length. Gear restrictions same as in 2021. This opening could be modified following Council review at its March or April 2022 meeting.</p>	<p>Pigeon Point to U.S./Mexico Border (Monterey)</p> <ul style="list-style-type: none"> • May 1-7, 24-31; • June 1-12, 20-30 (C.9.b). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	<p>Pigeon Point to U.S./Mexico Border (Monterey)</p> <ul style="list-style-type: none"> • May 1-10, 23-31; • June 1-12, 20-30; • July 25-31; • August 1-11 (C.9.b). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>
California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the State (California Fish and Game Code §8226).		

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries - Council Adopted. (Page 11 of 14)

B. MINIMUM SIZE (Inches) (See C.1)					
Area (when open)	Chinook		Coho		Pink
	Total Length	Head-off	Total Length	Head-off	
North of Cape Falcon (Alternative 1)	27	20.5	16	12	None
North of Cape Falcon (Alternatives 2 and 3)	28	21.5	16	12	None
Cape Falcon to Humbug Mt.	28	21.5	16	12	None
Humbug Mt. to OR/CA Border	28	21.5	-	-	None
OR/CA Border to Humboldt South Jetty	-	-	-	-	-
Southern KMZ Boundary to Pt. Arena	27	20.5	-	-	27
Pt. Arena to Pigeon Pt. through August	27	20.5	-	-	27
Pt. Arena to Pigeon Pt. September-October	26	19.5	-	-	26
Pigeon Pt. to U.S./Mexico Border	27	20.5	-	-	27

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Compliance with Minimum Size or Other Special Restrictions: All salmon on board a vessel must meet the minimum size, landing/possession limit, or other special requirements for the area being fished and the area in which they are landed if the area is open or has been closed less than 48 hours for that species of salmon. Salmon may be landed in an area that has been closed for a species of salmon more than 48 hours only if they meet the minimum size, landing/possession limit, or other special requirements for the area in which they were caught. Salmon may not be filleted prior to landing.

Any person who is required to report a salmon landing by applicable state law must include on the state landing receipt for that landing both the number and weight of salmon landed by species. States may require fish landing/receiving tickets be kept on board the vessel for 90 days or more after landing to account for all previous salmon landings.

C.2. Gear Restrictions:

- Salmon may be taken only by hook and line using single point, single shank, barbless hooks.
- Cape Falcon, Oregon, to the OR/CA border: No more than 4 spreads are allowed per line.
- OR/CA border to U.S./Mexico border: No more than 6 lines are allowed per vessel, and barbless circle hooks are required when fishing with bait by any means other than trolling.

C.3. Gear Definitions:

- Trolling defined: Fishing from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.
- Troll fishing gear defined: One or more lines that drag hooks behind a moving fishing vessel engaged in trolling. In that portion of the fishery management area off Oregon and Washington, the line or lines must be affixed to the vessel and must not be intentionally disengaged from the vessel at any time during the fishing operation.
- Spread defined: A single leader connected to an individual lure and/or bait.
- Circle hook defined: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 12 of 14)

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (Continued)**C.4. Vessel Operation in Closed Areas with Salmon on Board:**

- a. Except as provided under C.4.b below, it is unlawful for a vessel to have troll or recreational gear in the water while in any area closed to fishing for a certain species of salmon, while possessing that species of salmon; however, fishing for species other than salmon is not prohibited if the area is open for such species, and no salmon are in possession.
- b. When Genetic Stock Identification (GSI) samples will be collected in an area closed to commercial salmon fishing, the scientific research permit holder shall notify NOAA OLE, USCG, CDFW, WDFW, ODFW, and OSP at least 24 hours prior to sampling and provide the following information: the vessel name, date, location, and time collection activities will be done. Any vessel collecting GSI samples in a closed area shall not possess any salmon other than those from which GSI samples are being collected. Salmon caught for collection of GSI samples must be immediately released in good condition after collection of samples.

C.5. Control Zone Definitions:

- a. *Cape Flattery Control Zone* - The area from Cape Flattery (48°23'00" N. lat.) to the northern boundary of the U.S. EEZ; and the area from Cape Flattery south to Cape Alava (48°10'00" N. lat.) and east of 125°05'00" W. long.
- b. *Mandatory Yelloweye Rockfish Conservation Area* - The area in Washington Marine Catch Area 3 from 48°00.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°14.00' W. long. to 48°02.00' N. lat.; 125°16.50' W. long. to 48°00.00' N. lat.; 125°16.50' W. long. and connecting back to 48°00.00' N. lat.; 125°14.00' W. long.
- c. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).
- d. *Columbia Control Zone* - An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09" N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long.), and then along the north jetty to the point of intersection with the Buoy #10 line; and, on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.
- e. *Klamath Control Zone* - The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately 6 nautical miles north of the Klamath River mouth); on the west by 124°23'00" W. long. (approximately 12 nautical miles offshore); and on the south by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).
- f. Waypoints for the 40 fathom regulatory line from Cape Falcon to Humbug Mt. (50 CFR 660.71 (k) (12)-(70), when in place

45°46.00' N. lat., 124°04.49' W. long.;	44°51.28' N. lat., 124°10.21' W. long.;	44°08.30' N. lat., 124°16.75' W. long.;	43°10.96' N. lat., 124°32.33' W. long.;
45°44.34' N. lat., 124°05.09' W. long.;	44°49.49' N. lat., 124°10.90' W. long.;	44°01.18' N. lat., 124°15.42' W. long.;	43°05.65' N. lat., 124°31.52' W. long.;
45°40.64' N. lat., 124°04.90' W. long.;	44°44.96' N. lat., 124°14.39' W. long.;	43°51.61' N. lat., 124°14.68' W. long.;	42°59.66' N. lat., 124°32.58' W. long.;
45°33.00' N. lat., 124°04.46' W. long.;	44°43.44' N. lat., 124°14.78' W. long.;	43°42.66' N. lat., 124°15.46' W. long.;	42°54.97' N. lat., 124°36.99' W. long.;
45°32.27' N. lat., 124°04.74' W. long.;	44°42.26' N. lat., 124°13.81' W. long.;	43°40.49' N. lat., 124°15.74' W. long.;	42°53.81' N. lat., 124°38.57' W. long.;
45°29.26' N. lat., 124°04.22' W. long.;	44°41.68' N. lat., 124°15.38' W. long.;	43°38.77' N. lat., 124°15.64' W. long.;	42°50.00' N. lat., 124°39.68' W. long.;
45°20.25' N. lat., 124°04.67' W. long.;	44°34.87' N. lat., 124°15.80' W. long.;	43°34.52' N. lat., 124°16.73' W. long.;	42°49.13' N. lat., 124°39.70' W. long.;
45°19.99' N. lat., 124°04.62' W. long.;	44°33.74' N. lat., 124°14.44' W. long.;	43°28.82' N. lat., 124°19.52' W. long.;	42°46.47' N. lat., 124°38.89' W. long.;
45°17.50' N. lat., 124°04.91' W. long.;	44°27.66' N. lat., 124°16.99' W. long.;	43°23.91' N. lat., 124°24.28' W. long.;	42°45.74' N. lat., 124°38.86' W. long.;
45°11.29' N. lat., 124°05.20' W. long.;	44°19.13' N. lat., 124°19.22' W. long.;	43°20.83' N. lat., 124°26.63' W. long.;	42°44.79' N. lat., 124°37.96' W. long.;
45°05.80' N. lat., 124°05.40' W. long.;	44°15.35' N. lat., 124°17.38' W. long.;	43°17.96' N. lat., 124°28.81' W. long.;	42°45.01' N. lat., 124°36.39' W. long.;
45°05.08' N. lat., 124°05.93' W. long.;	44°14.38' N. lat., 124°17.78' W. long.;	43°16.75' N. lat., 124°28.42' W. long.;	42°44.14' N. lat., 124°35.17' W. long.;
45°03.83' N. lat., 124°06.47' W. long.;	44°12.80' N. lat., 124°17.18' W. long.;	43°13.97' N. lat., 124°31.99' W. long.;	42°42.14' N. lat., 124°32.82' W. long.;
45°01.70' N. lat., 124°06.53' W. long.;	44°09.23' N. lat., 124°15.96' W. long.;	43°13.72' N. lat., 124°33.25' W. long.;	42°40.50' N. lat., 124°31.98' W. long.;
44°58.75' N. lat., 124°07.14' W. long.;	44°08.38' N. lat., 124°16.79' W. long.;	43°12.26' N. lat., 124°34.16' W. long.;	

TABLE 1. 2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 13 of 14)

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)

C.6. Notification When Unsafe Conditions Prevent Compliance with Regulations: If prevented by unsafe weather conditions or mechanical problems from meeting special management area landing restrictions, vessels must notify the U.S. Coast Guard and receive acknowledgment of such notification prior to leaving the area. This notification shall include the name of the vessel, port where delivery will be made, approximate number of salmon (by species) on board, the estimated time of arrival, and the specific reason the vessel is not able to meet special management area landing restrictions.

In addition to contacting the U.S. Coast Guard, vessels fishing south of the Oregon/California border must notify CDFW within one hour of leaving the management area by calling 800-889-8346 and providing the same information as reported to the U.S. Coast Guard. All salmon must be offloaded within 24 hours of reaching port.

C.7. Incidental Halibut Harvest: License applications for incidental harvest for halibut during commercial salmon fishing must be obtained from IPHC.

During the 2021 salmon troll season, incidental harvest is authorized only during April, May, and June, and after June 30 if quota remains and if announced on the NMFS hotline (phone: 800-662-9825 or 206-526-6667). WDFW, ODFW, and CDFW will monitor landings. If the landings are projected to exceed the IPHC's preseason allocation or the total Area 2A non-Indian commercial halibut allocation, NMFS will take inseason action to prohibit retention of halibut in the non-Indian salmon troll fishery.

Beginning May 16, 2021 through the end of the 2021 salmon troll fishery, and beginning April 1, 2022, until modified through inseason action or superseded by the 2022 management measures the following applies:

(PENDING) License holders may land no more than X Pacific halibut per each X Chinook, except one Pacific halibut may be landed without meeting the ratio requirement, and no more than XX halibut may be landed per trip.

Incidental Pacific halibut catch regulations in the commercial salmon troll fishery adopted for 2021, prior to any 2021 inseason action, will be in effect when incidental Pacific halibut retention opens on April 1, 2022 unless otherwise modified by inseason action at the March 2022 Council meeting.

- a. "C-shaped" yelloweye rockfish conservation area is an area to be voluntarily avoided for salmon trolling. NMFS and the Council request salmon trollers voluntarily avoid this area in order to protect yelloweye rockfish. The area is defined in the Pacific Council Halibut Catch Sharing Plan in the North Coast subarea (Washington marine area 3), with the following coordinates in the order listed:

48°18' N. lat.; 125°18' W. long.;

48°18' N. lat.; 124°59' W. long.;

48°11' N. lat.; 124°59' W. long.;

48°11' N. lat.; 125°11' W. long.;

48°04' N. lat.; 125°11' W. long.;

48°04' N. lat.; 124°59' W. long.;

48°00' N. lat.; 124°59' W. long.;

48°00' N. lat.; 125°18' W. long.;

and connecting back to 48°18' N. lat.; 125°18' W. long.

TABLE 1.2021 Commercial troll management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 14 of 14)

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)

- C.8. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:
- Chinook remaining from the May through June non-Indian commercial troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline if the transfer would not result in exceeding preseason impact expectations on any stocks.
 - Chinook remaining from May, June, and/or July non-Indian commercial troll quotas in the Oregon or California KMZ may be transferred to the Chinook quota for the next open period if the transfer would not result in exceeding preseason impact expectations on any stocks.
 - NMFS may transfer salmon between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the areas' representatives on the Salmon Advisory Subpanel (SAS), and if the transfer would not result in exceeding preseason impact expectations on any stocks.
 - At the March 2022 meeting, the Council will consider inseason recommendations for special regulations for any experimental fisheries (proposals must meet Council protocol and be received in November 2022).
 - If retention of unmarked coho (adipose fin intact) is permitted by inseason action, the allowable coho quota will be adjusted to ensure preseason projected impacts on all stocks is not exceeded.
 - Landing limits may be modified inseason to sustain season length and keep harvest within overall quotas.
- C.9. State Waters Fisheries: Consistent with Council management objectives:
- The State of Oregon may establish additional late-season fisheries in state waters.
 - The State of California may establish limited fisheries in selected state waters.
 - Check state regulations for details.
- C.10. For the purposes of California Fish and Game Code, Section 8232.5, the definition of the Klamath Management Zone (KMZ) for the ocean salmon season shall be that area from Humbug Mountain, Oregon, to the Southern KMZ Boundary.
- C.11. Latitudes for geographical reference of major landmarks along the west coast. Majority of information from source: 2020 West Coast federal salmon regulations.
<https://www.govinfo.gov/content/pkg/FR-2020-05-08/pdf/2020-09903.pdf>.

Cape Flattery, WA	48°23'00" N lat.	Humboldt South Jetty, CA	40°45'53" N lat.
Cape Alava, WA	48°10'00" N lat.	Helliwell Line, CA	40°10'00" N lat.
Queets River, WA	47°31'42" N lat.	Horse Mountain, CA	40°05'00" N lat.
Leadbetter Point, WA	46°38'10" N lat.	Point Arena, CA	38°57'30" N lat.
Cape Falcon, OR	45°46'00" N lat.	Point Reyes, CA	37°59'44" N lat.
South end Heceta Bank line, OR	43°58'00" N lat.	Point San Pedro, CA	37°35'40" N lat.
Humbug Mountain, OR	42°40'30" N lat.	Pigeon Point, CA	37°11'00" N lat.
Oregon-California border	42°00'00" N lat.	Point Sur, CA	36°18'00" N lat.
		Point Conception, CA	34°27'00" N lat.

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 1 of 10)

A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
North of Cape Falcon	North of Cape Falcon	North of Cape Falcon
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
<p>1. Overall non-Indian TAC: 60,000 Chinook and 80,000 coho marked with a healed adipose fin clip (marked).</p> <p>2. Recreational TAC: 28,000 Chinook and 75,200 marked coho; all retained coho must be marked.</p> <p>3. Various daily limits and species combinations of one and two salmon will be considered. Including one fish, two fish only one of which may be a Chinook, and two fish only one of which may be a coho.</p> <p>4. Trade: commercial troll traded 8,000 marked coho to the recreational fishery for 2,000 Chinook.</p> <p>5. No Area 4B add-on fishery.</p> <p>6. Buoy 10 fishery opens August 1 with an expected landed catch of 70,000 marked coho in August and September.</p> <p>7. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</p>	<p>1. Overall non-Indian TAC: 50,000 Chinook and 110,000 coho marked with a healed adipose fin clip (marked).</p> <p>2. Recreational TAC: 25,000 Chinook and 95,600 marked coho; all retained coho must be marked.</p> <p>3. Various daily limits and species combinations of one and two salmon will be considered. Including one fish, two fish only one of which may be a Chinook, and two fish only one of which may be a coho.</p> <p>4. Trade: May be considered at the April Council meeting.</p> <p>5. No Area 4B add-on fishery.</p> <p>6. Buoy 10 fishery opens August 1 with an expected landed catch of 80,000 marked coho in August and September.</p> <p>7. Same as Alternative I.</p>	<p>Closed.</p> <p>6. Buoy 10 fishery opens August 1 with an expected landed catch of 110,000 marked coho in August and September.</p>

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 2 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>U.S./Canada Border to Cape Alava (Neah Bay)</p> <ul style="list-style-type: none"> • June 19-July 3 (C.5). <p>Open seven days per week. All salmon, except coho; one salmon per day (C.1).</p> <ul style="list-style-type: none"> • July 4 through the earlier of September 30, or 7,820 marked coho subarea quota, with a subarea guideline of 6,000 Chinook (C.5). <p>Open seven days per week. All salmon, except no chum beginning August 1; two salmon per day. All coho must be marked with a healed adipose fin clip (C.1).</p> <p>Beginning August 1, Chinook non-retention east of the Bonilla-Tatoosh line (C.4.a) during Council managed ocean fishery. See gear restrictions and definitions (C.2, C.3). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).</p>	<p>U.S./Canada Border to Cape Alava (Neah Bay)</p> <ul style="list-style-type: none"> • June 19-25 (C.5). <p>Open seven days per week. All salmon, except coho; two salmon per day (C.1).</p> <ul style="list-style-type: none"> • June 26 through the earlier of September 30, or 7,860 marked coho subarea quota, with a subarea guideline of 5,400 Chinook (C.5). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p>	<p>U.S./Canada Border to Cape Alava (Neah Bay)</p> <ul style="list-style-type: none"> • Closed.
<p>Cape Alava to Queets River (La Push Subarea)</p> <ul style="list-style-type: none"> • June 19-July 3 (C.5). <p>Open seven days per week. All salmon, except coho; one salmon per day (C.1).</p> <ul style="list-style-type: none"> • July 4 through the earlier of September 30, or 1,960 marked coho subarea quota, with a subarea guideline of 1,300 Chinook (C.5). <p>Open seven days per week. All salmon, except no chum beginning August 1; two salmon per day. All coho must be marked with a healed adipose fin clip (C.1).</p> <p>Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).</p>	<p>Cape Alava to Queets River (La Push Subarea)</p> <ul style="list-style-type: none"> • June 19-25 (C.5). <p>Open seven days per week. All salmon, except coho; two salmon per day (C.1)</p> <ul style="list-style-type: none"> • June 26 through the earlier of September 30, or 1,970 marked coho subarea quota, with a subarea guideline of 1,200 Chinook (C.5). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p>	<p>Cape Alava to Queets River (La Push Subarea)</p> <ul style="list-style-type: none"> • Closed.

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 3 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Queets River to Leadbetter Point (Westport Subarea)</p> <ul style="list-style-type: none"> • June 19-July 3 (C.5). <p>Open seven days per week. All salmon, except coho; two salmon per day. (C.1). Chinook minimum size limit of 22 inches total length (B).</p> <ul style="list-style-type: none"> • July 4 through the earlier of September 30, or 27,820 marked coho subarea quota, with a subarea guideline of 13,300 Chinook (C.5). <p>Open seven days per week.</p> <p>All salmon; two salmon per day, no more than one of which may be a Chinook. All coho must be marked with a healed adipose fin clip (C.1). Chinook minimum size limit of 22 inches total length (B).</p> <p>See gear restrictions and definitions (C.2, C.3). Grays Harbor Control Zone closed beginning August 9 (C.4.b). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).</p>	<p>Queets River to Leadbetter Point (Westport Subarea)</p> <ul style="list-style-type: none"> • June 19-26 (C.5). <p>Open seven days per week. All salmon, except coho; one salmon per day. (C.1). Chinook minimum size limit of 22 inches total length (B).</p> <ul style="list-style-type: none"> • June 27 through the earlier of September 30, or 27,970 marked coho subarea quota, with a subarea guideline of 11,800 Chinook (C.5). <p>Open five days per week (Sun.–Thurs.).</p> <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p>	<p>Queets River to Leadbetter Point (Westport Subarea)</p> <ul style="list-style-type: none"> • Closed.
<p>Leadbetter Point to Cape Falcon (Columbia River Subarea)</p> <ul style="list-style-type: none"> • June 14-27 (C.5). <p>Open seven days per week. All salmon, except coho; one salmon per day (C.1). Chinook minimum size limit of 22 inches total length (B).</p> <ul style="list-style-type: none"> • June 28 through the earlier of September 30, or 37,600 marked coho subarea quota, with a subarea guideline of 7,400 Chinook (C.5). <p>Open seven days per week. All salmon; two salmon per day, no more than one of which may be a Chinook. All coho must be marked with a healed adipose fin clip (C.1). Chinook minimum size limit of 22 inches total length (B).</p> <p>Columbia Control Zone closed (C.4.c). Inseason management may be used to sustain season length and keep harvest within the overall Chinook and coho recreational TACs for north of Cape Falcon (C.5).</p>	<p>Leadbetter Point to Cape Falcon (Columbia River Subarea)</p> <ul style="list-style-type: none"> • June 19-26 (C.5). <p>Same as Alternative 1.</p> <ul style="list-style-type: none"> • June 27 through the earlier of September 30, or 57,800 marked coho subarea quota, with a subarea guideline of 6,600 Chinook (C.5). <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p>	<p>Leadbetter Point to Cape Falcon (Columbia River Subarea)</p> <ul style="list-style-type: none"> • Closed.

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 4 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
South of Cape Falcon	South of Cape Falcon	South of Cape Falcon
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
1. Sacramento River fall Chinook spawning escapement of 131,034 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 51.6%. 3. Klamath River recreational fishery allocation: 1,234 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,152 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 120,000 coho marked with a healed adipose fin clip (marked), and 14,000 coho in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC. 7. For fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below.	1. Sacramento River fall Chinook spawning escapement of 132,221 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 51.2%. 3. Klamath River recreational fishery allocation: 1,227 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,160 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 115,000 coho marked with a healed adipose fin clip (marked), and 12,000 coho in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC. 7. Fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below.	1. Sacramento River fall Chinook spawning escapement of 128,040 hatchery and natural area adults. 2. Sacramento Index exploitation rate of 52.7%. 3. Klamath River recreational fishery allocation: 1,217 adult Klamath River fall Chinook. 4. Klamath tribal allocation: 8,105 adult Klamath River fall Chinook. 5. Overall recreational coho TAC: 110,000 coho marked with a healed adipose fin clip (marked), and 11,000 coho in the non-mark-selective coho fishery. 6. Fisheries may need to be adjusted to meet NMFS ESA consultation standards, FMP requirements, other management objectives, or upon receipt of new allocation recommendations from the CFGC. 7. Fisheries scheduled prior to May 16, 2021, see 2020 management measures, which are subject to inseason action and the 2021 season description described below.

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted (Page 5 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Cape Falcon to Humbug Mt.</p> <ul style="list-style-type: none"> March 15-October 31 (C.6), except as provided below during the all-salmon mark-selective coho fishery and the non-mark-selective coho fishery (C.5). <p>Open seven days per week. All salmon except coho, two fish per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).</p> <p>In 2022, the season will open March 15 for all salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2021 (C.2, C.3). This opening could be modified following Council review at its March 2022 meeting.</p>	<p>Cape Falcon to Humbug Mt.</p> <ul style="list-style-type: none"> March 15-August 15 and September 1-October 31 (C.6), except as provided below during the all-salmon mark-selective coho fishery and the non-mark-selective coho fishery. Closed to retention of Chinook August 16-31 (C.5). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	<p>Cape Falcon to Humbug Mt.</p> <ul style="list-style-type: none"> March 15-July 31, and September 1-October 31 (C.6), except as provided below during the all-salmon mark-selective coho fishery and the non-mark-selective coho fishery. Closed to retention of Chinook August 1-31 (C.5). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>
<p>Cape Falcon to OR/CA Border.</p> <p>All-salmon mark-selective coho fishery:</p> <ul style="list-style-type: none"> June 12 through the earlier of August 28, or 120,000 marked coho quota. Closed to retention of Chinook from Humbug Mt. to OR/CA Border June 12-18 and August 16-28 (C.6). <p>Open seven days per week. All salmon, two salmon per day. All retained coho must be marked with a healed adipose fin clip (C.1). See minimum size limits (B). See gear restrictions and definitions (C.2, C.3).</p> <p>Any remainder of the mark-selective coho quota may be transferred inseason on an impact neutral basis to the non-selective coho quota from Cape Falcon to Humbug Mountain (C.5).</p> <p><i>(continued next page)</i></p>	<p>Cape Falcon to OR/CA Border</p> <p>All-salmon mark-selective coho fishery:</p> <ul style="list-style-type: none"> June 19 through the earlier of August 28 or the Cape Falcon to OR/CA Border quota of 115,000 marked coho (C.6). Closed to Chinook retention from Cape Falcon to Humbug Mt. from August 16 through August 31. Closed to Chinook retention from Humbug Mt. to OR/CA Border beginning July 14. <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p><i>(continued next page)</i></p>	<p>Cape Falcon to Humbug Mt.</p> <p>All-salmon mark-selective coho fishery:</p> <ul style="list-style-type: none"> June 26 through the earlier of August 28, or 110,000 marked coho quota (C.6). August: closed to retention of Chinook. <p>Same as Alternative 1.</p> <p>Same as Alternative 1.</p> <p><i>(continued next page)</i></p>

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 6 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>Cape Falcon to Humbug Mt. Non-mark-selective coho fishery:</p> <ul style="list-style-type: none"> September 10-12, and open each Friday, Saturday, and Sunday through the earlier of September 30, or 14,000 non-mark-selective coho quota (C.6). Open days may be modified inseason. <p>All salmon, two salmon per day (C.1). See minimum size limits (B). See gear restrictions and definitions (C.2, C.3).</p>	<p>Cape Falcon to Humbug Mt. Non-mark-selective coho fishery:</p> <ul style="list-style-type: none"> September 10-12, and open each Friday, Saturday, and Sunday through the earlier of September 30, or 12,000 non-mark-selective coho quota (C.6). Open days may be modified inseason. <p>Same as Alternative 1.</p>	<p>Cape Falcon to Humbug Mt. Non-mark-selective coho fishery:</p> <ul style="list-style-type: none"> September 10-12, and open each Friday, Saturday, and Sunday through the earlier of September 30, or 11,000 non-mark-selective coho quota (C.6). Open days may be modified inseason. <p>Same as Alternative 1.</p>
<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> June 19-August 15 (C.6). <p>Open seven days per week. All salmon except coho, except as listed above for the mark-selective coho fishery from Cape Falcon to the OR/CA Border (June 12-August 28). Two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).</p> <ul style="list-style-type: none"> June 12-18 and August 16-28 or the earlier of the Cape Falcon to OR/CA Border quota of 120,000 marked coho is reached (C.6); closed to retention of Chinook. <p>Open seven days per week. All salmon except Chinook, two salmon per day. All retained coho must be marked with a healed adipose fin clip (C.1). See minimum size limits (B). See gear restrictions and definitions (C.2, C.3).</p>	<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> May 29-July 13, and July 14-August 28 or the earlier of the Cape Falcon to OR/CA Border quota of 115,000 marked coho; closed to retention of Chinook (C.6). <p>Open seven days per week. All salmon except coho, except as listed above for the mark-selective coho fishery from Cape Falcon to the OR/CA Border (June 19-August 28). Two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).</p>	<p>Humbug Mt. to OR/CA Border (Oregon KMZ)</p> <ul style="list-style-type: none"> July 1-August 19 (C.6). <p>Open seven days per week. All salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B). See gear restrictions and definitions (C.2, C.3).</p>
Fishing in the Stonewall Bank yelloweye rockfish conservation area restricted to trolling only on days the all-depth recreational halibut fishery is open (call the halibut fishing hotline 1-800-662-9825 for specific dates) (C.3.b, C.4.d).		

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 7 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
<p>OR/CA Border to Southern KMZ Boundary</p> <ul style="list-style-type: none"> June 28-July 31 (C.6). <p>Open seven days per week. All salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3). See California State regulations for closures adjacent to the Smith, Eel, and Klamath Rivers.</p> <p>In 2022, season opens May 1 for all salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2021 (C.2, C.3). This opening could be modified following Council review at its March or April 2022 meetings.</p>	<p>OR/CA Border to Southern KMZ Boundary</p> <ul style="list-style-type: none"> June 26-July 31 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	<p>OR/CA Border to Southern KMZ Boundary</p> <ul style="list-style-type: none"> July 1-31 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries – Council adopted. (Page 8 of 10)		
A. SEASON ALTERNATIVE DESCRIPTIONS		
ALTERNATIVE I	ALTERNATIVE II	ALTERNATIVE III
Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">June 28-October 31 (C.6). <p>Open seven days per week. All salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 20 inches total length (B). See gear restrictions and definitions (C.2, C.3).</p> <p>In 2022, season opens April 2 for all salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 20 inches total length (B); and the same gear restrictions as in 2021 (C.2, C.3). This opening could be modified following Council review at its March 2022 meeting.</p>	Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">June 26-October 24 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	Southern KMZ Boundary to Point Arena (Fort Bragg) <ul style="list-style-type: none">June 24-October 3 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>
Point Arena to Pigeon Point (San Francisco) <ul style="list-style-type: none">June 28-October 31 (C.6). <p>Open seven days per week. All salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 20 inches total length. See gear restrictions and definitions (C.2, C.3).</p> <p>In 2022, season opens April 2 for all salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2021 (C.2, C.3). This opening could be modified following Council review at its March 2022 meeting.</p>	Point Arena to Pigeon Point (San Francisco) <ul style="list-style-type: none">July 1-October 24 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>	Point Arena to Pigeon Point (San Francisco) <ul style="list-style-type: none">June 24-October 3 (C.6). <p>Same as Alternative 1.</p> <p>In 2022, same as Alternative 1.</p>
Pigeon Point to U.S./Mexico Border (Monterey) <ul style="list-style-type: none">April 3-September 30 (C.6). <p>Open seven days per week. All salmon except coho, two salmon per day (C.1). See gear restrictions and definitions (C.2, C.3).</p> <p>Chinook minimum size limit of 24 inches total length (B).</p> <p>In 2022, season opens April 2 for all salmon except coho, two salmon per day (C.1). Chinook minimum size limit of 24 inches total length (B); and the same gear restrictions as in 2021 (C.2, C.3). This opening could be modified following Council review at its March 2022 meeting.</p>	Pigeon Point to U.S./Mexico Border (Monterey) <ul style="list-style-type: none">April 3-September 19 (C.6). <p>Same as Alternative 1.</p> <p>Chinook minimum size limit of 24 inches total length through May 15, and 20 inches total length thereafter (B).</p> <p>In 2022, same as Alternative 1.</p>	Pigeon Point to U.S./Mexico Border (Monterey) <ul style="list-style-type: none">April 3-September 6 (C.6). <p>Same as Alternative 1.</p> <p>Chinook minimum size limit of 24 inches total length (B).</p> <p>In 2022, same as Alternative 1.</p>
California State regulations require all salmon be made available to a CDFW representative for sampling immediately at port of landing. Any person in possession of a salmon with a missing adipose fin, upon request by an authorized agent or employee of the CDFW, shall immediately relinquish the head of the salmon to the State (California Code of Regulations Title 14 Section 1.73).		

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries - Council Adopted. (Page 9 of 10)

B. MINIMUM SIZE (Inches) (See C.1)

Area (when open)	Chinook	Coho	Pink
North of Cape Falcon (Alt 1 and Alt 2 Westport and Col R)	22	16	None
North of Cape Falcon (Alt 1 and Alt 2 Neah Bay and La Push)	24	16	None
Cape Falcon to Humbug Mt.	24	16	None
Humbug Mt. to OR/CA Border	24	16	None
OR/CA Border to Southern KMZ Boundary	20	-	20
Southern KMZ Boundary to Pt. Arena	20	-	20
Pt. Arena to Pigeon Pt.	20	-	20
Pigeon Pt. to U.S./Mexico Border (Alt. II after May 15)	20	-	20
Pigeon Pt. to U.S./Mexico Border (Alt I & Alt III. Alt II through May 15)	24	-	24

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

- C.1. Compliance with Minimum Size and Other Special Restrictions: All salmon on board a vessel must meet the minimum size or other special requirements for the area being fished and the area in which they are landed if that area is open. Salmon may be landed in an area that is closed only if they meet the minimum size or other special requirements for the area in which they were caught. Salmon may not be filleted prior to landing.
- Ocean Boat Limits*: Off the coast of Washington, Oregon, and California, each fisher aboard a vessel may continue to use angling gear until the combined daily limits of Chinook and coho salmon for all licensed and juvenile anglers aboard have been attained (additional state restrictions may apply).
- C.2. Gear Restrictions: Salmon may be taken only by hook and line using barbless hooks. All persons fishing for salmon, and all persons fishing from a boat with salmon on board must meet the gear restrictions listed below for specific areas or seasons.
- U.S./Canada Border to Pt. Conception, California*: No more than one rod may be used per angler; and no more than two single point, single shank, barbless hooks are required for all fishing gear.
 - Southern KMZ Boundary to Pt. Conception, California*: Single point, single shank, barbless circle hooks (see gear definitions below) are required when fishing with bait by any means other than trolling, and no more than two such hooks shall be used. When angling with two hooks, the distance between the hooks must not exceed five inches when measured from the top of the eye of the top hook to the inner base of the curve of the lower hook, and both hooks must be permanently tied in place (hard tied). Circle hooks are not required when artificial lures are used without bait.
- C.3. Gear Definitions:
- Recreational fishing gear defined*: Off Oregon and Washington, angling tackle consists of a single line that must be attached to a rod and reel held by hand or closely attended; the rod and reel must be held by hand while playing a hooked fish. No person may use more than one rod and line while fishing off Oregon or Washington. Off California, the line must be attached to a rod and reel held by hand or closely attended; weights directly attached to a line may not exceed four pounds (1.8 kg). While fishing off California north of Pt. Conception, no person fishing for salmon, and no person fishing from a boat with salmon on board, may use more than one rod and line. Fishing includes any activity which can reasonably be expected to result in the catching, taking, or harvesting of fish.
 - Trolling defined*: Angling from a boat or floating device that is making way by means of a source of power, other than drifting by means of the prevailing water current or weather conditions.
 - Circle hook defined*: A hook with a generally circular shape and a point which turns inward, pointing directly to the shank at a 90° angle.

TABLE 2. 2021 Recreational management Alternatives for non-Indian ocean salmon fisheries - Council adopted. (Page 10 of 10)

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS (continued)**C.4. Control Zone Definitions:**

- a. *The Bonilla-Tatoosh Line*: A line running from the western end of Cape Flattery to Tatoosh Island Lighthouse (48°23'30" N. lat., 124°44'12" W. long.) to the buoy adjacent to Duntze Rock (48°24'37" N. lat., 124°44'37" W. long.), then in a straight line to Bonilla Pt. (48°35'39" N. lat., 124°42'58" W. long.) on Vancouver Island, British Columbia.
- b. *Grays Harbor Control Zone* - The area defined by a line drawn from the Westport Lighthouse (46° 53'18" N. lat., 124° 07'01" W. long.) to Buoy #2 (46° 52'42" N. lat., 124°12'42" W. long.) to Buoy #3 (46° 55'00" N. lat., 124°14'48" W. long.) to the Grays Harbor north jetty (46° 55'36" N. lat., 124°10'51" W. long.).
- c. *Columbia Control Zone*: An area at the Columbia River mouth, bounded on the west by a line running northeast/southwest between the red lighted Buoy #4 (46°13'35" N. lat., 124°06'50" W. long.) and the green lighted Buoy #7 (46°15'09' N. lat., 124°06'16" W. long.); on the east, by the Buoy #10 line which bears north/south at 357° true from the south jetty at 46°14'00" N. lat., 124°03'07" W. long. to its intersection with the north jetty; on the north, by a line running northeast/southwest between the green lighted Buoy #7 to the tip of the north jetty (46°15'48" N. lat., 124°05'20" W. long. and then along the north jetty to the point of intersection with the Buoy #10 line; and on the south, by a line running northeast/southwest between the red lighted Buoy #4 and tip of the south jetty (46°14'03" N. lat., 124°04'05" W. long.), and then along the south jetty to the point of intersection with the Buoy #10 line.
- d. *Stonewall Bank Yelloweye Rockfish Conservation Area*: The area defined by the following coordinates in the order listed:
 44°37.46' N. lat.; 124°24.92' W. long.
 44°37.46' N. lat.; 124°23.63' W. long.
 44°28.71' N. lat.; 124°21.80' W. long.
 44°28.71' N. lat.; 124°24.10' W. long.
 44°31.42' N. lat.; 124°25.47' W. long.
 and connecting back to 44°37.46' N. lat.; 124°24.92' W. long.
- e. *Klamath Control Zone*: The ocean area at the Klamath River mouth bounded on the north by 41°38'48" N. lat. (approximately 6 nautical miles north of the Klamath River mouth); on the west by 124°23'00" W. long. (approximately 12 nautical miles offshore); and, on the south by 41°26'48" N. lat. (approximately 6 nautical miles south of the Klamath River mouth).

C.5. Inseason Management: Regulatory modifications may become necessary inseason to meet preseason management objectives such as quotas, harvest guidelines, and season duration. In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

- a. Actions could include modifications to bag limits, or days open to fishing, and extensions or reductions in areas open to fishing.
- b. Coho may be transferred inseason among recreational subareas north of Cape Falcon to help meet the recreational season duration objectives (for each subarea) after conferring with representatives of the affected ports and the Council's SAS recreational representatives north of Cape Falcon, and if the transfer would not result in exceeding preseason impact expectations on any stocks.
- c. Chinook and coho may be transferred between the recreational and commercial fisheries north of Cape Falcon if there is agreement among the representatives of the SAS, and if the transfer would not result in exceeding preseason impact expectations on any stocks.
- d. Fishery managers may consider inseason action modifying regulations restricting retention of unmarked (adipose fin intact) coho. To remain consistent with preseason expectations, any inseason action shall consider, if significant, the difference between observed and preseason forecasted (adipose-clipped) mark rates. Such a consideration may also include a change in bag limit of two salmon, no more than one of which may be a coho.
- e. Marked coho remaining from the Cape Falcon to Humbug Mt. recreational mark-selective coho quota may be transferred inseason to the Cape Falcon to Humbug Mt. non-mark-selective recreational fishery if the transfer would not result in exceeding preseason impact expectations on any stocks.

C.6. Additional Seasons in State Territorial Waters: Consistent with Council management objectives, the States of Washington, Oregon, and California may establish limited seasons in state waters. Check state regulations for details.

TABLE 3a. 2021 Treaty Indian troll management Alternatives for ocean salmon fisheries (QTA Tribes) – Council adopted. (Page 1 of 3)

A. SEASON ALTERNATIVE DESCRIPTIONS		
QTA ALTERNATIVE I	QTA ALTERNATIVE II	QTA ALTERNATIVE III
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
<p>1. Overall Treaty-Indian TAC: 35,000 Chinook and 16,500 coho.</p> <p>2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</p> <p>3. In 2022, the season will open May 1, consistent with all preseason regulations in place for Treaty Indian Troll fisheries during May 16-June 30, 2021. All catch in May 2022 applies against the 2022 Treaty Indian Troll fisheries quota. This opening could be modified following Council review at its March and/or April 2022 meetings.</p>	<p>1. Overall Treaty-Indian TAC: 25,000 Chinook and 10,000 coho.</p> <p>2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</p> <p>3. In 2022, the season will open May 1, consistent with all preseason regulations in place for Treaty Indian Troll fisheries during May 16-June 30, 2021. All catch in May 2022 applies against the 2022 Treaty Indian Troll fisheries quota. This opening could be modified following Council review at its March and/or April 2022 meetings.</p>	Closed
<ul style="list-style-type: none"> May 1 through the earlier of June 30 or 17,500 Chinook quota. <p>All salmon may be retained except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C).</p> <ul style="list-style-type: none"> July 1 through the earlier of September 15, or 17,500 Chinook quota, or 16,500 coho quota. <p>All Salmon. See size limit (B) and other restrictions (C).</p>	<ul style="list-style-type: none"> May 1 through the earlier of June 30 or 12,500 Chinook quota. <p>All salmon may be retained except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C).</p> <ul style="list-style-type: none"> July 1 through the earlier of September 15, or 12,500 Chinook quota or 10,000 coho quota <p>All salmon. See size limit (B) and other restrictions (C).</p>	

TABLE 3b. 2021 Treaty Indian troll management Alternatives for ocean salmon fisheries (Makah Tribe) – Council adopted. (Page 2 of 3)

A. SEASON ALTERNATIVE DESCRIPTIONS		
MAKAH ALTERNATIVE I	MAKAH ALTERNATIVE II	MAKAH ALTERNATIVE III
Supplemental Management Information	Supplemental Management Information	Supplemental Management Information
<p>1. Overall Treaty-Indian TAC: 50,000 Chinook and 50,000 coho.</p> <p>2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</p> <p>3. In 2022, the season will open May 1, consistent with all preseason regulations in place for Treaty Indian Troll fisheries during May 16-June 30, 2021. All catch in May 2022 applies against the 2022 Treaty Indian Troll fisheries quota. This opening could be modified following Council review at its March and/or April 2022 meetings.</p>	<p>1. Overall Treaty-Indian TAC: 35,000 Chinook and 35,000 coho.</p> <p>2. Overall Chinook and/or coho TACs may need to be reduced or fisheries adjusted to meet NMFS ESA guidance, FMP requirements, upon conclusion of negotiations in the North of Falcon forum, or upon receipt of preseason catch and abundance expectations for Canadian and Alaskan fisheries.</p> <p>3. In 2022, the season will open May 1, consistent with all preseason regulations in place for Treaty Indian Troll fisheries during May 16-June 30, 2021. All catch in May 2022 applies against the 2022 Treaty Indian Troll fisheries quota. This opening could be modified following Council review at its March and/or April 2022 meetings.</p>	Closed
<ul style="list-style-type: none"> • May 1 through the earlier of June 30 or 25,000 Chinook quota. <p>All salmon may be retained except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C).</p> <ul style="list-style-type: none"> • July 1 through the earlier of September 15, or 25,000 Chinook quota, or 50,000 coho quota. <p>All Salmon. See size limit (B) and other restrictions (C).</p>	<ul style="list-style-type: none"> • May 1 through the earlier of June 30 or 17,500 Chinook quota. <p>All salmon may be retained except coho. If the Chinook quota is exceeded, the excess will be deducted from the later all-salmon season (C.5). See size limit (B) and other restrictions (C).</p> <ul style="list-style-type: none"> • July 1 through the earlier of September 15, or 17,500 Chinook quota or 35,000 coho quota <p>All salmon. See size limit (B) and other restrictions (C).</p>	

TABLE 3a and 3b. 2021 Treaty Indian troll management Alternatives for ocean salmon fisheries - Council adopted. (Page 3 of 3)

B. Minimum Length (total inches).					
Area (when open)	Chinook		Coho		Pink
	Total Length	Head-off	Total Length	Head-off	
North of Cape Falcon	24.0 (61.0 cm)	18.0 (45.7 cm)	16.0 (40.6 cm)	12.0 (30.5 cm)	None

C. REQUIREMENTS, DEFINITIONS, RESTRICTIONS, OR EXCEPTIONS

C.1. Tribe and Area Boundaries. All boundaries may be changed to include such other areas as may hereafter be authorized by a Federal court for that tribe's treaty fishery.

S'KLALLAM - Washington State Statistical Area 4B (defined to include those waters of Puget Sound easterly of a line projected from the Bonilla Point light on Vancouver Island to the Tatoosh Island light, thence to the most westerly point on Cape Flattery and westerly of a line projected true north from the fishing boundary marker at the mouth of the Sekiu River [WAC 220-301-030]).

MAKAH - Washington State Statistical Area 4B and that portion of the FMA north of 48°02'15" N. lat. (Norwegian Memorial) and east of 125°44'00" W. long.

QUILEUTE - A polygon commencing at Cape Alava, located at latitude 48°10'00" north, longitude 124°43'56.9" west; then proceeding west approximately forty nautical miles at that latitude to a northwestern point located at latitude 48°10'00" north, longitude 125°44'00" west; then proceeding in a southeasterly direction mirroring the coastline at a distance no farther than forty nautical miles from the mainland Pacific coast shoreline at any line of latitude, to a southwestern point at latitude 47°31'42" north, longitude 125°20'26" west; then proceeding east along that line of latitude to the Pacific coast shoreline at latitude 47°31'42" north, longitude 124°21'9.0" west.

HQH - That portion of the FMA between 47°54'18" N. lat. (Quillayute River) and 47°21'00" N. lat. (Quinault River) and east of 125°44'00" W. long.

QUINAULT - A polygon commencing at the Pacific coast shoreline near Destruction Island, located at latitude 47°40'06" north, longitude 124°23'51.362" west; then proceeding west approximately thirty nautical miles at that latitude to a northwestern point located at latitude 47°40'06" north, longitude 125°08'30" west; then proceeding in a southeasterly direction mirroring the coastline no farther than thirty nautical miles from the mainland Pacific coast shoreline at any line of latitude, to a southwestern point at latitude 46°53'18" north, longitude 124°53'53" west; then proceeding east along that line of latitude to the Pacific coast shoreline at latitude 46°53'18" north, longitude 124°7'36.6" west.

C.2. Gear restrictions

- Single point, single shank, barbless hooks are required in all fisheries.
- No more than eight fixed lines per boat.
- No more than four hand held lines per person in the Makah area fishery (Washington State Statistical Area 4B and that portion of the FMA north of 48°02'15" N. lat. (Norwegian Memorial) and east of 125°44'00" W. long.)

C.3. Quotas

- The quotas include troll catches by the S'Klallam and Makah Tribes in Washington State Statistical Area 4B from May 1 through September 15.
- The Quileute Tribe may continue a ceremonial and subsistence fishery during the time frame of October 1 through October 15 in the same manner as in 2004-2015. Fish taken during this fishery are to be counted against treaty troll quotas established for the 2021 season (estimated harvest during the October ceremonial and subsistence fishery: 20 Chinook; 40 coho).

C.4. Area Closures

- The area within a six nautical mile radius of the mouths of the Queets River (47°31'42" N. lat.) and the Hoh River (47°45'12" N. lat.) will be closed to commercial fishing.
- A closure within two nautical miles of the mouth of the Quinault River (47°21'00" N. lat.) may be enacted by the Quinault Nation and/or the State of Washington and will not adversely affect the Secretary of Commerce's management regime.

C.5. Inseason Management: In addition to standard inseason actions or modifications already noted under the season description, the following inseason guidance is provided to NMFS:

- Chinook remaining from the May through June treaty-Indian ocean troll harvest guideline north of Cape Falcon may be transferred to the July through September harvest guideline on a fishery impact equivalent basis.

TABLE 4a. 2021 Chinook and coho harvest quotas and guidelines (*) for ocean salmon fishery management Alternatives (QTA) - Council adopted.

Fishery or Quota Designation	Chinook for Alternative			Coho for Alternative		
	I	II	III	I	II	III
NORTH OF CAPE FALCON						
TREATY INDIAN OCEAN TROLL ^{a/}						
U.S./Canada Border to Cape Falcon (All Except Coho)	17,500	12,500	-	-	-	-
U.S./Canada Border to Cape Falcon (All Species)	17,500	12,500	-	16,500	10,000	-
Subtotal Treaty Indian Ocean Troll	35,000	25,000	-	16,500	10,000	-
NON-INDIAN COMMERCIAL TROLL ^{b/}						
U.S./Canada Border to Cape Falcon (All Except Coho)	16,000	15,000	-	-	-	-
U.S./Canada Border to Cape Falcon (All Species)	16,000	10,000	-	4,800	14,400	-
Subtotal Non-Indian Commercial Troll	32,000	25,000	-	4,800	14,400	-
RECREATIONAL						
U.S./Canada Border to Cape Alava ^{b/}	6,000 *	5,400 *	-	7,820	7,860	-
Cape Alava to Queets River ^{b/}	1,300 *	1,200 *	-	1,960	1,970	-
Queets River to Leadbetter Pt. ^{b/}	13,300 *	11,800 *	-	27,820	27,970	-
Leadbetter Pt. to Cape Falcon ^{b/c/}	7,400 *	6,600 *	-	37,600	57,800	-
Subtotal Recreational	28,000	25,000	-	75,200	95,600	-
TOTAL NORTH OF CAPE FALCON	95,000	75,000	-	96,500	120,000	-
SOUTH OF CAPE FALCON						
COMMERCIAL TROLL ^{a/}						
Cape Falcon to Humbug Mt.	-	-	-	10,000	-	-
Humbug Mt. to OR/CA Border	900	-	500	-	-	-
OR/CA Border to Humboldt South Jetty	-	-	-	-	-	-
Subtotal Commercial Troll	900	-	500	10,000	-	-
RECREATIONAL						
Cape Falcon to OR/CA Border	-	-	-	134,000 ^{d/}	127,000 ^{e/}	121,000 ^{f/}
TOTAL SOUTH OF CAPE FALCON	900	-	500	144,000	127,000	121,000

a/ Quotas are non-mark selective for both Chinook and coho.

b/ Quotas are non-mark-selective for Chinook and mark-selective for coho.

c/ Does not include Buoy 10 fishery. Expected catch in August and September: Alternative I - 70,000 marked coho; Alternative II - 80,000 marked coho; Alternative III - 110,000 marked coho.

d/ The quota consists of both mark-selective and non-mark-selective coho quotas: 120,000 and 14,000 respectively.

e/ The quota consists of both mark-selective and non-mark-selective coho quotas: 115,000 and 12,000 respectively.

f/ The quota consists of both mark-selective and non-mark-selective coho quotas: 110,000 and 11,000 respectively.

TABLE 4b. 2021 Chinook and coho harvest quotas and guidelines (*) for ocean salmon fishery management Alternatives (Makah Tribe) - Council adopted.

Fishery or Quota Designation	Chinook for Alternative			Coho for Alternative		
	I	II	III	I	II	III
NORTH OF CAPE FALCON						
TREATY INDIAN OCEAN TROLL ^{a/}						
U.S./Canada Border to Cape Falcon (All Except Coho)	25,000	17,500	-	-	-	-
U.S./Canada Border to Cape Falcon (All Species)	25,000	17,500	-	50,000	35,000	-
Subtotal Treaty Indian Ocean Troll	50,000	35,000	-	50,000	35,000	-
NON-INDIAN COMMERCIAL TROLL ^{b/}						
U.S./Canada Border to Cape Falcon (All Except Coho)	16,000	15,000	-	-	-	-
U.S./Canada Border to Cape Falcon (All Species)	16,000	10,000	-	4,800	14,400	-
Subtotal Non-Indian Commercial Troll	32,000	25,000	-	4,800	14,400	-
RECREATIONAL						
U.S./Canada Border to Cape Alava ^{b/}	6,000 *	5,400 *	-	7,820	7,860	-
Cape Alava to Queets River ^{b/}	1,300 *	1,200 *	-	1,960	1,970	-
Queets River to Leadbetter Pt. ^{b/}	13,300 *	11,800 *	-	27,820	27,970	-
Leadbetter Pt. to Cape Falcon ^{b/c/}	7,400 *	6,600 *	-	37,600	57,800	-
Subtotal Recreational	28,000	25,000	-	75,200	95,600	-
TOTAL NORTH OF CAPE FALCON	110,000	85,000	-	130,000	145,000	-
SOUTH OF CAPE FALCON						
COMMERCIAL TROLL ^{a/}						
Cape Falcon to Humbug Mt.	-	-	-	10,000	-	-
Humbug Mt. to OR/CA Border	900	-	500	-	-	-
OR/CA Border to Humboldt South Jetty	-	-	-	-	-	-
Subtotal Commercial Troll	900	-	500	10,000	-	-
RECREATIONAL						
Cape Falcon to OR/CA Border	-	-	-	134,000 ^{d/}	127,000 ^{e/}	121,000 ^{f/}
TOTAL SOUTH OF CAPE FALCON	900	-	500	144,000	127,000	121,000

a/ Quotas are non-mark selective for both Chinook and coho.

b/ Quotas are non-mark-selective for Chinook and mark-selective for coho.

c/ Does not include Buoy 10 fishery. Expected catch in August and September: Alternative I - 70,000 marked coho; Alternative II - 80,000 marked coho; Alternative III - 110,000 marked coho.

d/ The quota consists of both mark-selective and non-mark-selective coho quotas: 120,000 and 14,000 respectively.

e/ The quota consists of both mark-selective and non-mark-selective coho quotas: 115,000 and 12,000 respectively.

f/ The quota consists of both mark-selective and non-mark-selective coho quotas: 110,000 and 11,000 respectively.

TABLE 5a. 2021 Projected key stock escapements (thousands of fish) or management criteria for ocean fishery Alternatives (QTA) - Council adopted ^{a/} (Page 1 of 2)

Key Stock/Criteria	PROJECTED			2021
	Alt I	Alt II	Alt III	Criteria
CHINOOK				CHINOOK
Columbia Upriver Brights	348.6	351.4	361.4	74.0 Minimum ocean escapement to attain 40.0 adults over McNary Dam, with normal distribution and no mainstem harvest. The management goal has been increased to 60.0 by Columbia River managers.
Mid-Columbia Brights	84.8	85.5	87.9	14.9 Minimum ocean escapement to attain 7.9 for Little White Salmon egg-take, assuming average conversion and no mainstem harvest.
Columbia Lower River Hatchery Tules	72.6	73.5	77.6	25.0 Minimum ocean escapement to attain 14.8 adults for hatchery egg-take, with average conversion and no lower river mainstem or tributary harvest.
Columbia Lower River Natural Tules ^{c/} (threatened)	38.7%	37.1%	31.1%	≤ 38.0% Total adult equivalent fishery exploitation rate (2021 NMFS ESA guidance).
Columbia Lower River Wild ^{d/} (threatened)	19.8	20.1	20.9	6.9 Minimum ocean escapement to attain MSY spawner goal of 5.7 for N. Lewis River fall Chinook (NMFS ESA consultation standard).
Spring Creek Hatchery Tules	46.4	47.1	51.0	8.2 Minimum ocean escapement to attain 6.0 adults for Spring Creek Hatchery egg-take, assuming average conversion and no mainstem harvest.
Upper Columbia River Summer	77.6	78.1	79.8	29.0 Aggregate escapement to mouth of Columbia River.
Snake River Fall (threatened) SRFI	50.3%	45.5%	24.9%	≤ 70.0% Of 1988-1993 base period exploitation rate for all ocean fisheries (NMFS ESA consultation standard).
Klamath River Fall	31.6	31.6	31.6	≥ 31.574 2021 minimum natural area adult escapement (FMP control rule).
Federally recognized tribal harvest	50.0%	50.0%	50.0%	50.0% Equals 8.2, 8.2, and 8.1 (thousand) adult fish for Yurok and Hoopa Valley tribal fisheries.
Exploitation (spawner reduction) rate	25.0%	25.0%	25.0%	≤ 25.0% FMP control rule.
Adult river mouth return	62.1	62.1	62.1	NA Total adults in thousands.
Age-4 ocean harvest rate	10.4%	10.3%	10.6%	≤ 16.0% NMFS ESA consultation standard for threatened California Coastal Chinook.
KMZ sport fishery share	7.7%	7.9%	6.6%	
River recreational fishery share	15.1%	15.0%	15.0%	NA Equals 1.2, 1.2, and 1.2 (thousand) adult fish for recreational inriver fisheries.
Sacramento River Winter (endangered)	11.7%	14.2%	12.6%	≤ 20.0% Age-3 ocean impact rate in fisheries south of Pt. Arena. In addition, the following season restrictions apply: <u>Recreational</u> - Pt. Arena to Pigeon Pt. between the first Saturday in April and the second Sunday in November; Pigeon Pt. to the U.S./Mexico border between the first Saturday in April and the first Sunday in October. Minimum size limit ≥ 20 inches total length. <u>Commercial</u> - Pt. Arena to the U.S./Mexico border between May 1 and September 30, except Pt. Reyes to Pt. San Pedro between October 1 and 15 (Monday-Friday). Minimum size limit ≥ 26 inches total length (NMFS 2021 ESA Guidance).
Sacramento River Fall	131.0	132.2	128.0	≥ 122.0 2021 minimum hatchery and natural area adult escapement (FMP control rule).
Sacramento Index Exploitation Rate	51.6%	51.2%	52.7%	≤ 55.0% FMP control rule.
Ocean commercial impacts	76.4	76.1	79.8	Includes fall (Sept-Dec) 2020 impacts (9.1 thousand SRFC).
Ocean recreational impacts	42.2	41.0	42.3	Includes fall (Sept-Dec) 2020 impacts (5.2 thousand SRFC).
River recreational impacts	21.3	21.5	20.8	
SRKW Prey Abundance				
North of Falcon	1,364.2	1,364.2	1,364.1	≥ 966.0 Oct 1 starting abundance of age 3+ Chinook from U.S./Canada Border to Cape Falcon
Oregon Coast	1,129.5	1,129.6	1,129.4	NA Oct 1 starting abundance of age 3+ Chinook from Cape Falcon to Horse Mt.
California Coast	463.1	463.3	463.0	NA Oct 1 starting abundance of age 3+ Chinook south of Horse Mt.
Southwest WCVI	734.7	734.7	734.7	NA Oct 1 starting abundance of age 3+ Chinook off Southwest Vancouver Island
Salish Sea	611.4	611.4	611.4	NA Oct 1 starting abundance of age 3+ Chinook in the Salish Sea

TABLE 5a. Projected key stock escapements (thousands of fish) or management criteria for 2021 ocean fishery Alternatives (QTA) - Council adopted.^{a/} (Page 2 of 2)

Key Stock/Criteria	PROJECTED			2021
	Alt I	Alt II	Alt III	Criteria
COHO	COHO			COHO
Interior Fraser (Thompson River)	5.8%(1.6%)	5.5%(1.2%)	4.4%(0.1%)	≤ 10.0% 2021 Southern U.S. exploitation rate ceiling; PSC coho agreement.
Skagit	29.9%(1.4%)	29.7%(1.1%)	28.8%(0.1%)	≤ 35.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Stillaguamish	25.7%(1.0%)	25.6%(0.8%)	24.9%(0.1%)	≤ 50.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Snohomish	20.6%(1.0%)	20.5%(0.8%)	19.8%(0.1%)	≤ 40.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Hood Canal	41.5%(1.7%)	41.2%(1.4%)	40.3%(0.1%)	≤ 45.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Strait of Juan de Fuca	8.4%(1.4%)	8.1%(1.1%)	7.3%(0.4%)	≤ 20.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Quillayute Fall	7.3	7.3	7.4	6.3 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Hoh	2.6	2.6	2.7	2.0 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Queets Wild	3.4	3.4	3.5	5.8 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Grays Harbor	43.0	43.1	43.6	24.4 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Willapa Bay	32.3	32.3	33.4	17.2 FMP MSY natural area adult spaw ner estimate. Value depicted is ocean escapement.
Lower Columbia River Natural (threatened)	6.4%	6.6%	3.8%	≤30.0% Total marine and mainstem Columbia R. fishery exploitation rate (2021 NMFS ESA guidance). Value depicted is marine ER before Buoy 10.
Upper Columbia ^{c/}	79%	78%	82%	≥ 50% Minimum percentage of the run to Bonneville Dam.
Columbia River Hatchery Early	805.2	792.8	820.6	77.2 Minimum ocean escapement to attain hatchery egg-take goal of 21.7 early adult coho, with average conversion and no mainstem or tributary fisheries.
Columbia River Hatchery Late	453.8	442.4	498.3	9.7 Minimum ocean escapement to attain hatchery egg-take goal of 6.4 late adult coho, with average conversion and no mainstem or tributary fisheries.
Oregon Coastal Natural	11.1%	10.5%	9.5%	≤ 15.0% Marine and freshwater fishery exploitation rate (NMFS ESA consultation standard).
Southern Oregon/Northern California Coast (threatened)	3.0%	2.9%	2.5%	≤ 13.0% Marine fishery exploitation rate for R/K hatchery coho (NMFS ESA consultation standard).

a/ Coho projections in the table assume post-season 2019 fishery scalars for Canadian fisheries, except Johnstone Strait troll (postseason 2018), Johnstone Strait net (postseason 2016), and northern BC sport and troll (approximately half postseason 2019) and north Georgia Strait sport in Sept. Model results for Chinook in this table used 2021 allowable catches for SEAK, 2020 preseason effort scalars for NBC and WCVI AABM fisheries, recent 2-yr average catches for BC ISBM fisheries, and 2020 preseason catches for Puget Sound fisheries. Assumptions for these fisheries will be changed prior to the April meeting as new information becomes available.

b/ Ocean escapement is the number of salmon escaping ocean fisheries and entering freshwater with the following clarifications. Ocean escapement for Puget Sound stocks is the estimated number of salmon entering Area 4B that are available to U.S. net fisheries in Puget Sound and spawner escapement after impacts from the Canadian, U.S. ocean, and Puget Sound troll and recreational fisheries have been deducted. Numbers in parentheses represent Council area exploitation rates for Puget Sound coho stocks. For Columbia River early and late coho stocks, ocean escapement represents the number of coho after the Buoy 10 fishery. Values reported for Klamath River fall Chinook are natural area adult spawners. Values reported for Sacramento River fall Chinook are hatchery and natural area adult spawners.

c/ Includes projected impacts of inriver fisheries that have not yet been shaped.

d/ Annual management objectives may be different than FMP goals, and are subject to agreement between WDFW and the treaty tribes under U.S. District Court orders. It is anticipated that fishery management will be adjusted by state and tribal managers during the preseason planning process to comply with stock management objectives.

e/ Includes minor contributions from East Fork Lewis River and Sandy River.

TABLE 5b. 2021 Projected key stock escapements (thousands of fish) or management criteria for ocean fishery Alternatives (Makah Tribe) - Council adopted.^{a/} (Page 1 of 2)

Key Stock/Criteria	PROJECTED			2021
	Alt I	Alt II	Alt III	Criteria
CHINOOK				
Columbia Upriver Brights	347.0	350.3	361.4	74.0 Minimum ocean escapement to attain 40.0 adults over McNary Dam, with normal distribution and no mainstem harvest. The management goal has been increased to 60.0 by Columbia River managers.
Mid-Columbia Brights	84.4	85.3	87.9	14.9 Minimum ocean escapement to attain 7.9 for Little White Salmon egg-take, assuming average conversion and no mainstem harvest.
Columbia Lower River Hatchery Tules	72.1	73.2	77.6	25.0 Minimum ocean escapement to attain 14.8 adults for hatchery egg-take, with average conversion and no lower river mainstem or tributary harvest.
Columbia Lower River Natural Tules ^{c/} (threatened)	39.3%	37.5%	31.1%	≤ 38.0% Total adult equivalent fishery exploitation rate (2021 NMFS ESA guidance).
Columbia Lower River Wild ^{d/} (threatened)	19.6	20.0	20.9	6.9 Minimum ocean escapement to attain MSY spawner goal of 5.7 for N. Lewis River fall Chinook (NMFS ESA consultation standard).
Spring Creek Hatchery Tules	46.1	46.9	51.0	8.2 Minimum ocean escapement to attain 6.0 adults for Spring Creek Hatchery egg-take, assuming average conversion and no mainstem harvest.
Upper Columbia River Summer	77.3	77.8	79.8	29.0 Aggregate escapement to mouth of Columbia River.
Snake River Fall (threatened) SRFI	53.5%	47.7%	24.9%	≤ 70.0% Of 1988-1993 base period exploitation rate for all ocean fisheries (NMFS ESA consultation standard).
Klamath River Fall	31.6	31.6	31.6	≥ 31.574 2021 minimum natural area adult escapement (FMP control rule).
Federally recognized tribal harvest	50.0%	50.0%	50.0%	50.0% Equals 8.2, 8.2, and 8.2 (thousand) adult fish for Yurok and Hoopa Valley tribal fisheries.
Exploitation (spawner reduction) rate	25.0%	25.0%	25.0%	≤ 25.0% FMP control rule.
Adult river mouth return	62.1	62.1	62.1	NA Total adults in thousands.
Age-4 ocean harvest rate	10.4%	10.3%	10.6%	≤ 16.0% NMFS ESA consultation standard for threatened California Coastal Chinook.
KMZ sport fishery share	7.7%	7.9%	6.6%	
River recreational fishery share	15.1%	15.0%	15.0%	NA Equals 1.2, 1.2, and 1.2 (thousand) adult fish for recreational inriver fisheries.
Sacramento River Winter (endangered)	11.7%	14.2%	12.6%	≤ 20.0% Age-3 ocean impact rate in fisheries south of Pt. Arena. In addition, the following season restrictions apply: <u>Recreational</u> - Pt. Arena to Pigeon Pt. between the first Saturday in April and the second Sunday in November; Pigeon Pt. to the U.S./Mexico border between the first Saturday in April and the first Sunday in October. Minimum size limit ≥ 20 inches total length. <u>Commercial</u> - Pt. Arena to the U.S./Mexico border between May 1 and September 30, except Pt. Reyes to Pt. San Pedro between October 1 and 15 (Monday-Friday). Minimum size limit ≥ 26 inches total length (NMFS 2021 ESA Guidance).
Sacramento River Fall	131.0	132.2	128.0	≥ 122.0 2021 minimum hatchery and natural area adult escapement (FMP control rule).
Sacramento Index Exploitation Rate	51.6%	51.2%	52.7%	≤ 55.0% FMP control rule.
Ocean commercial impacts	76.4	76.1	79.8	Includes fall (Sept-Dec) 2020 impacts (9.1 thousand SRFC).
Ocean recreational impacts	42.2	41.0	42.3	Includes fall (Sept-Dec) 2020 impacts (5.2 thousand SRFC).
River recreational impacts	21.3	21.5	20.8	
SRKW Prey Abundance				
North of Falcon	1,364.2	1,364.2	1,364.1	≥ 966.0 Oct 1 starting abundance of age 3+ Chinook from U.S./Canada Border to Cape Falcon
Oregon Coast	1,129.5	1,129.6	1,129.4	NA Oct 1 starting abundance of age 3+ Chinook from Cape Falcon to Horse Mt.
California Coast	463.1	463.3	463.0	NA Oct 1 starting abundance of age 3+ Chinook south of Horse Mt.
Southwest WCVI	734.7	734.7	734.7	NA Oct 1 starting abundance of age 3+ Chinook off Southwest Vancouver Island
Salish Sea	611.4	611.4	611.4	NA Oct 1 starting abundance of age 3+ Chinook in the Salish Sea

TABLE 5b. Projected key stock escapements (thousands of fish) or management criteria for 2021 ocean fishery Alternatives (Makah Tribe) - Council adopted^{a/} (Page 2 of 2)

Key Stock/Criteria	PROJECTED			2021
	Alt I	Alt II	Alt III	Criteria
COHO	COHO			COHO
Interior Fraser (Thompson River)	7.8%(3.6%)	7.0%(2.7%)	4.4%(0.1%)	≤ 10.0% 2021 Southern U.S. exploitation rate ceiling; PSC coho agreement.
Skagit	31.3%(3.3%)	30.8%(2.5%)	28.8%(0.1%)	≤ 35.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Stillaguamish	26.7%(2.3%)	26.3%(1.8%)	24.9%(0.1%)	≤ 50.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Snohomish	21.7%(2.3%)	21.3%(1.8%)	19.8%(0.1%)	≤ 40.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Hood Canal	42.9%(3.7%)	42.3%(2.9%)	40.3%(0.1%)	≤ 45.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Strait of Juan de Fuca	9.9%(3.0%)	9.3%(2.3%)	7.3%(0.4%)	≤ 20.0% 2021 total exploitation rate ceiling; FMP matrix ^{d/}
Quillayute Fall	7.2	7.2	7.4	6.3 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Hoh	2.5	2.5	2.7	2.0 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Queets Wild	3.3	3.4	3.5	5.8 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Grays Harbor	42.4	42.7	43.6	24.4 FMP MSY adult spaw ner estimate. Value depicted is ocean escapement.
Willapa Bay	31.7	31.8	33.4	17.2 FMP MSY natural area adult spaw ner estimate. Value depicted is ocean escapement.
Lower Columbia River Natural (threatened)	7.7%	7.5%	3.8%	≤30.0% Total marine and mainstem Columbia R. fishery exploitation rate (2021 NMFS ESA guidance). Value depicted is marine ER before Buoy 10.
Upper Columbia ^{c/}	79%	78%	82%	≥ 50% Minimum percentage of the run to Bonneville Dam.
Columbia River Hatchery Early	794.6	784.9	820.6	77.2 Minimum ocean escapement to attain hatchery egg-take goal of 21.7 early adult coho, with average conversion and no mainstem or tributary fisheries.
Columbia River Hatchery Late	447.0	437.4	498.3	9.7 Minimum ocean escapement to attain hatchery egg-take goal of 6.4 late adult coho, with average conversion and no mainstem or tributary fisheries.
Oregon Coastal Natural	11.4%	10.7%	9.5%	≤ 15.0% Marine and freshwater fishery exploitation rate (NMFS ESA consultation standard).
Southern Oregon/Northern California Coast (threatened)	3.0%	2.9%	2.5%	≤ 13.0% Marine fishery exploitation rate for R/K hatchery coho (NMFS ESA consultation standard).

a/ Coho projections in the table assume post-season 2019 fishery scalars for Canadian fisheries, except Johnstone Strait troll (postseason 2018), Johnstone Strait net (postseason 2016), and northern BC sport and troll (approximately half postseason 2019) and north Georgia Strait sport in Sept. Model results for Chinook in this table used 2021 allowable catches for SEAK, 2020 preseason effort scalars for NBC and WCVI AABM fisheries, recent 2-yr average catches for BC ISBM fisheries, and 2020 preseason catches for Puget Sound fisheries. Assumptions for these fisheries will be changed prior to the April meeting as new information becomes available.

b/ Ocean escapement is the number of salmon escaping ocean fisheries and entering freshwater with the following clarifications. Ocean escapement for Puget Sound stocks is the estimated number of salmon entering Area 4B that are available to U.S. net fisheries in Puget Sound and spawner escapement after impacts from the Canadian, U.S. ocean, and Puget Sound troll and recreational fisheries have been deducted. Numbers in parentheses represent Council area exploitation rates for Puget Sound coho stocks. For Columbia River early and late coho stocks, ocean escapement represents the number of coho after the Buoy 10 fishery. Values reported for Klamath River fall Chinook are natural area adult spawners. Values reported for Sacramento River fall Chinook are hatchery and natural area adult spawners.

c/ Includes projected impacts of inriver fisheries that have not yet been shaped.

d/ Annual management objectives may be different than FMP goals, and are subject to agreement between WDFW and the treaty tribes under U.S. District Court orders. It is anticipated that fishery management will be adjusted by state and tribal co-managers during the preseason planning process to comply with stock management objectives.

e/ Includes minor contributions from East Fork Lewis River and Sandy River.

TABLE 6a. Preliminary projections of Chinook and coho harvest impacts for 2021 ocean salmon fishery management Alternatives (QTA) - Council adopted. (Page 1 of 2)

Area and Fishery	2021 Bycatch Mortality ^{a/} Projection									Observed in 2020	
	2021 Catch Projection						2021 Bycatch Projection ^{b/}			Catch	Bycatch Mortality
	I	II	III	I	II	III	I	II	III		
CHINOOK (thousands of fish)											
OCEAN FISHERIES:											
NORTH OF CAPE FALCON											
Treaty Indian Ocean Troll	35.0	25.0	-	3.6	2.6	-	9.0	6.4	-	2.4	0.2
Non-Indian Commercial Troll	32.0	25.0	-	13.0	12.0	-	46.4	43.5	-	12.5	5.8
Recreational	28.0	25.0	-	3.4	3.1	-	15.9	14.1	-	7.7	0.9
CAPE FALCON TO HUMBUG MT. ^{c/}											
Commercial Troll	35.3	39.2	42.9	10.2	11.4	12.4	30.4	33.8	37.0	11.7	3.9
Recreational	6.7	4.2	1.6	0.7	0.9	1.2	2.4	3.9	5.8	5.4	0.7
HUMBUG MT. TO OR/CA BORDER											
Commercial Troll	1.5	0.6	1.4	0.4	0.2	0.4	1.3	0.5	1.2	0.8	0.3
Recreational	1.2	1.4	0.8	0.2	0.3	0.1	0.9	1.3	0.3	1.6	0.4 ^{e/}
OR/CA BORDER TO S. KMZ BOUND.											
Commercial Troll	-	-	-	-	-	-	-	-	-	-	-
Recreational ^{d/}	3.0	3.2	2.7	0.3	0.3	0.3	1.1	1.1	1.0	1.8	0.4 ^{e/}
S. KMZ BOUND. TO PT. ARENA											
Commercial Troll	17.5	11.8	11.1	5.1	3.4	3.2	15.1	10.2	9.6	1.8	1.0 ^{e/}
Recreational ^{d/}	6.0	6.1	6.1	0.6	0.6	0.6	2.1	2.2	2.2	1.9	0.2 ^{e/}
PT. ARENA TO PIGEON PT.											
Commercial Troll	28.3	28.8	30.1	8.2	8.4	8.7	24.4	24.9	26.0	145.3	42.3 ^{e/}
Recreational ^{d/}	27.9	26.8	27.4	2.9	2.8	2.9	9.4	9.0	9.2	34.8	3.4 ^{e/}
SOUTH OF PIGEON PT.											
Commercial Troll	27.7	24.4	24.4	8.0	7.1	7.1	23.9	21.1	21.0	30.2	7.0 ^{e/}
Recreational ^{d/}	11.7	11.7	11.7	1.2	1.2	1.2	3.9	3.9	3.9	1.3	0.2 ^{e/}
TOTAL OCEAN FISHERIES											
Commercial Troll	177.2	154.8	109.9	48.6	45.0	31.9	150.4	140.3	94.8	204.8	60.4
Recreational ^{d/}	84.5	78.3	50.2	9.5	9.3	6.3	35.7	35.6	22.4	54.4	6.2
INSIDE FISHERIES:											
Area 4B	-	-	-	-	-	-	-	-	-	-	-
Buoy 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.6	1.8 ^{e/}

TTABLE 6a. Preliminary projections of Chinook and coho harvest impacts for 2021 ocean salmon fishery management Alternatives (QTA) - Council adopted. (Page 2 of 2)

Area and Fishery	2021 Catch Projection			2021 Bycatch Mortality ^{a/} Projection			2021 Bycatch Projection ^{b/}			Observed in 2020	
	I	II	III	I	II	III	I	II	III	Catch	Bycatch Mortality
COHO (thousands of fish)											
<u>OCEAN FISHERIES:</u>											
NORTH OF CAPE FALCON											
Treaty Indian Ocean Troll ^{f/}	16.5	10.0	-	1.5	1.0	-	3.5	2.4	-	14.4	1.3
Non-Indian Commercial Troll	4.8	14.4	-	3.6	5.9	-	12.8	19.1	-	0.8	0.5
Recreational	75.2	95.6	-	11.2	14.0	-	45.4	55.9	-	24.0	4.9
SOUTH OF CAPE FALCON											
Commercial Troll	10.0	-	-	9.8	9.9	12.3	35.4	38.0	47.2	-	0.7
Recreational ^{f/}	134.0	127.0	121.0	25.6	24.9	23.7	114.0	112.3	107.0	17.1	6.8
TOTAL OCEAN FISHERIES											
Commercial Troll	31.3	24.4	-	15.0	16.7	12.3	51.6	59.5	47.2	15.2	2.5
Recreational	209.2	222.6	121.0	36.8	38.9	23.7	159.4	168.2	107.0	41.1	11.7
<u>INSIDE FISHERIES:</u>											
Area 4B											
Buoy 10	-	-	-	-	-	-	-	-	-	-	-
	70.0	80.0	110.0	13.3	15.4	20.4	57.7	66.8	87.6	7.1	1.7 ^{e/}

a/ The bycatch mortality reported in this table consists of drop-off mortality (includes predation on hooked fish) plus hook-and-release mortality of Chinook and coho salmon in Council-area fisheries. Drop-off mortality for both Chinook and coho is assumed to be equal to 5% of total encounters. The hook-and-release mortality (HRM) rates used for both Chinook and coho are:

Commercial: 26%.

Recreational, north of Pt. Arena: 14%.

Recreational, south of Pt. Arena: 15% (based on the expected proportion of fish that will be caught using mooching versus trolling gear, and the HRMs of 42.2% and 14% for these two respective gear types).

b/ Bycatch calculated as dropoff mortality plus fish released.

c/ Includes Oregon territorial water, late season Chinook fisheries.

d/ Catch and bycatch mortality observed in 2020 for the California recreational fishery do not include estimates for May and June due to restrictions on sampling caused by the COVID-19 pandemic.

e/ Based on reported released Chinook or coho. Reported releases in California fisheries are used as a surrogate in Oregon fisheries.

f/ Includes fisheries that allow retention of all legal sized coho.

TABLE 6b. Preliminary projections of Chinook and coho harvest impacts for 2021 ocean salmon fishery management Alternatives (Makah Tribe) - Council adopted. (Page 1 of 2)

Area and Fishery	2021 Catch Projection			2021 Bycatch Mortality ^{a/} Projection			2021 Bycatch Projection ^{b/}			Observed in 2020	
	I	II	III	I	II	III	I	II	III	Catch	Bycatch Mortality
CHINOOK (thousands of fish)											
<u>OCEAN FISHERIES:</u>											
NORTH OF CAPE FALCON											
Treaty Indian Ocean Troll	50.0	35.0	-	5.1	3.6	-	12.8	9.0	-	2.4	0.2
Non-Indian Commercial Troll	32.0	25.0	-	13.0	12.0	-	46.4	43.5	-	12.5	5.8
Recreational	28.0	25.0	-	3.4	3.1	-	15.9	14.1	-	7.7	0.9
CAPE FALCON TO HUMBUG MT. ^{c/}											
Commercial Troll	35.3	39.2	42.9	10.2	11.4	12.4	30.4	33.8	37.0	11.7	3.9
Recreational	6.7	4.2	1.6	0.7	0.9	1.2	2.4	3.9	5.8	5.4	0.7
HUMBUG MT. TO OR/CA BORDER											
Commercial Troll	1.5	0.6	1.4	0.4	0.2	0.4	1.3	0.5	1.2	0.8	0.3
Recreational	1.2	1.4	0.8	0.2	0.3	0.1	0.9	1.3	0.3	1.6	0.4 ^{e/}
OR/CA BORDER TO S. KMZ BOUND.											
Commercial Troll	-	-	-	-	-	-	-	-	-	-	-
Recreational ^{d/}	3.0	3.2	2.7	0.3	0.3	0.3	1.1	1.1	1.0	1.8	0.4 ^{e/}
S. KMZ BOUND. TO PT. ARENA											
Commercial Troll	17.5	11.8	11.1	5.1	3.4	3.2	15.1	10.2	9.6	1.8	1.0 ^{e/}
Recreational ^{d/}	6.0	6.1	6.1	0.6	0.6	0.6	2.1	2.2	2.2	1.9	0.2 ^{e/}
PT. ARENA TO PIGEON PT.											
Commercial Troll	28.3	28.8	30.1	8.2	8.4	8.7	24.4	24.9	26.0	145.3	42.3 ^{e/}
Recreational ^{d/}	27.9	26.8	27.4	2.9	2.8	2.9	9.4	9.0	9.2	34.8	3.4 ^{e/}
SOUTH OF PIGEON PT.											
Commercial Troll	27.7	24.4	24.4	8.0	7.1	7.1	23.9	21.1	21.0	30.2	7.0 ^{e/}
Recreational ^{d/}	11.7	11.7	11.7	1.2	1.2	1.2	3.9	3.9	3.9	1.3	0.2 ^{e/}
TOTAL OCEAN FISHERIES											
Commercial Troll	192.2	164.8	109.9	50.1	46.0	31.9	154.3	142.9	94.8	204.8	60.4
Recreational ^{d/}	84.5	78.3	50.2	9.5	9.3	6.3	35.7	35.6	22.4	54.4	6.2
<u>INSIDE FISHERIES:</u>											
Area 4B	-	-	-	-	-	-	-	-	-	-	-
Buoy 10	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.6	1.8 ^{e/}

Table 6b. Preliminary projections of Chinook and coho harvest impacts for 2021 ocean salmon fishery management Alternatives (Makah Tribe) - Council adopted. (Page 2 of 2)

Area and Fishery	2021 Catch Projection			2021 Bycatch Mortality ^{a/} Projection			2021 Bycatch Projection ^{b/}			Observed in 2020	
	I	II	III	I	II	III	I	II	III	Catch	Bycatch Mortality
OCEAN FISHERIES:											
COHO (thousands of fish)											
NORTH OF CAPE FALCON											
Treaty Indian Ocean Troll ^{f/}	50.0	35.0	-	3.5	2.4	-	6.2	4.4	-	14.4	1.3
Non-Indian Commercial Troll	4.8	14.4	-	3.6	5.9	-	12.8	19.1	-	0.8	0.5
Recreational	75.2	95.6	-	11.2	14.0	-	45.4	55.9	-	24.0	4.9
SOUTH OF CAPE FALCON											
Commercial Troll	10.0	-	-	9.8	9.9	12.3	35.4	38.0	47.2	-	0.7
Recreational ^{f/}	134.0	127.0	121.0	25.6	24.9	23.7	114.1	112.3	107.0	17.1	6.8
TOTAL OCEAN FISHERIES											
Commercial Troll	64.8	49.4	-	16.9	18.2	12.3	54.4	61.5	47.2	15.2	2.5
Recreational	209.2	222.6	121.0	36.8	38.9	23.7	159.5	168.2	107.0	41.1	11.7
INSIDE FISHERIES:											
Area 4B	-	-	-	-	-	-	-	-	-	-	-
Buoy 10	70.0	80.0	110.0	13.3	15.4	20.4	57.8	66.8	87.6	7.1	1.7 ^{e/}

a/ The bycatch mortality reported in this table consists of drop-off mortality (includes predation on hooked fish) plus hook-and-release mortality of Chinook and coho salmon in Council-area fisheries. Drop-off mortality for both Chinook and coho is assumed to be equal to 5% of total encounters. The hook-and-release mortality (HRM) rates used for both Chinook and coho are:

Commercial: 26%.

Recreational, north of Pt. Arena: 14%.

Recreational, south of Pt. Arena: 15% (based on the expected proportion of fish that will be caught using mooching versus trolling gear, and the HRMs of 42.2% and 14% for these two respective gear types).

b/ Bycatch calculated as dropoff mortality plus fish released.

c/ Includes Oregon territorial water, late season Chinook fisheries.

d/ Catch and bycatch mortality observed in 2020 for the California recreational fishery do not include estimates for May and June due to restrictions on sampling caused by the COVID-19 pandemic.

e/ Based on reported released Chinook or coho. Reported releases in California fisheries are used as a surrogate in Oregon fisheries.

f/ Includes fisheries that allow retention of all legal sized coho.

TABLE 7a. Expected coastwide lower Columbia Natural (LCN), Oregon coastal natural (OCN), and Rogue/Klamath (RK) coho, and Lower Columbia River (LCR) natural tule Chinook exploitation rates by fishery for 2021 ocean fisheries management Alternatives (QTA) - Council adopted.

Fishery	Exploitation Rate (Percent)											
	LCN Coho			OCN Coho			RK Coho			LCR Tule Chinook		
	I	II	III	I	II	III	I	II	III	I	II	III
SOUTHEAST ALASKA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	2.2%	2.4%
BRITISH COLUMBIA	0.3%	0.3%	0.3%	0.9%	0.9%	0.9%	0.6%	0.6%	0.6%	13.8%	13.9%	14.7%
PUGET SOUND/STRAIT	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
NORTH OF CAPE FALCON												
Treaty Indian Ocean Troll	0.6%	0.4%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	1.9%	1.4%	0.0%
Recreational	1.4%	1.8%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	3.4%	3.1%	0.0%
Non-Indian Troll	0.3%	0.5%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	5.1%	3.9%	0.0%
SOUTH OF CAPE FALCON												
Recreational:										0.3%	0.2%	0.2%
Cape Falcon to Humbug Mt.	3.0%	2.8%	2.6%	6.4%	5.9%	5.4%	0.4%	0.4%	0.3%	-	-	-
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.1%	0.0%	0.2%	0.2%	0.1%	0.5%	0.5%	0.2%	-	-	-
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%	-	-	-
Fort Bragg	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.4%	0.4%	0.4%	-	-	-
South of Pt. Arena	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	-	-	-
Troll:										0.9%	0.9%	1.3%
Cape Falcon to Humbug Mt.	0.6%	0.5%	0.6%	0.7%	0.6%	0.6%	0.1%	0.1%	0.1%	-	-	-
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	-	-	-
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-
Fort Bragg	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.2%	0.2%	-	-	-
South of Pt. Arena	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	-	-	-
BUOY 10	1.6%	1.8%	2.4%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	10.8%	11.1%	12.2%
ESTUARY/FRESHWATER	NA	NA	NA	1.7%	1.7%	1.7%	0.2%	0.2%	0.2%			
TOTAL^{a/}	6.4%	6.6%	3.8%	11.1%	10.5%	9.5%	3.0%	2.9%	2.5%	38.7%	37.1%	31.1%

a/ Totals do not include Buoy 10 and estuary/freshwater for LCN and RK coho; estuary/freshwater catch is included in the total for OCN. For LCR Tule Chinook, includes projected impacts of inriver fisheries that have not yet been shaped. Bolded values identify ocean exploitation rates that, when combined with freshwater harvest rates, would exceed the total allowable exploitation rate.

TABLE 7b. Expected coastwide lower Columbia Natural (LCN), Oregon coastal natural (OCN), and Rogue/Klamath (RK) coho, and Lower Columbia River (LCR) natural tule Chinook exploitation rates by fishery for 2021 ocean fisheries management Alternatives (Makah Tribe) - Council adopted.

Fishery	Exploitation Rate (Percent)											
	LCN Coho			OCN Coho			RK Coho			LCR Tule Chinook		
	I	II	III	I	II	III	I	II	III	I	II	III
SOUTHEAST ALASKA	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.2%	2.2%	2.4%
BRITISH COLUMBIA	0.3%	0.3%	0.3%	0.9%	0.9%	0.9%	0.6%	0.6%	0.6%	13.7%	13.9%	14.7%
PUGET SOUND/STRAIT	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.4%
NORTH OF CAPE FALCON												
Treaty Indian Ocean Troll	1.9%	1.3%	0.0%	0.4%	0.3%	0.0%	0.0%	0.0%	0.0%	2.7%	1.9%	0.0%
Recreational	1.4%	1.8%	0.0%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	3.4%	3.0%	0.0%
Non-Indian Troll	0.3%	0.5%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	5.1%	3.9%	0.0%
SOUTH OF CAPE FALCON												
Recreational:										0.3%	0.2%	0.2%
Cape Falcon to Humbug Mt.	3.0%	2.8%	2.6%	6.4%	5.9%	5.4%	0.4%	0.4%	0.3%	-	-	-
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.1%	0.0%	0.2%	0.2%	0.1%	0.5%	0.5%	0.2%	-	-	-
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%	-	-	-
Fort Bragg	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.4%	0.4%	0.4%	-	-	-
South of Pt. Arena	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.2%	-	-	-
Troll:										0.9%	0.9%	1.3%
Cape Falcon to Humbug Mt.	0.6%	0.5%	0.6%	0.7%	0.6%	0.6%	0.1%	0.1%	0.1%	-	-	-
Humbug Mt. to OR/CA border (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	-	-	-
OR/CA border to Horse Mt. (KMZ)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	-	-	-
Fort Bragg	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.3%	0.2%	0.2%	-	-	-
South of Pt. Arena	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%	0.1%	0.1%	0.1%	-	-	-
BUOY 10	1.6%	1.8%	2.4%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	10.7%	11.0%	12.2%
ESTUARY/FRESHWATER	NA	NA	NA	1.7%	1.7%	1.7%	0.2%	0.2%	0.2%			
TOTAL^{a/}	7.7%	7.5%	3.8%	11.4%	10.7%	9.5%	3.0%	2.9%	2.5%	39.3%	37.5%	31.1%

a/ Totals do not include Buoy 10 and estuary/freshwater for LCN and RK coho; estuary/freshwater catch is included in the total for OCN. For LCR Tule Chinook, includes projected impacts of inriver fisheries that have not yet been shaped. Bolded values identify ocean exploitation rates that, when combined with freshwater harvest rates, would exceed the total allowable exploitation rate.

TABLE 8. Projected coho mark rates for 2021 fisheries under base period fishing patterns (percent marked).

Area	Fishery	June	July	August	Sept
Canada					
Johnstone Strait	Recreational	--	45%	39%	--
West Coast Vancouver Island	Recreational	54%	47%	50%	49%
North Georgia Strait	Recreational	55%	57%	57%	54%
South Georgia Strait	Recreational	29%	59%	45%	59%
Juan de Fuca Strait	Recreational	53%	51%	53%	50%
Johnstone Strait	Troll	61%	56%	47%	54%
NW Vancouver Island	Troll	54%	46%	48%	25%
SW Vancouver Island	Troll	62%	54%	55%	55%
Georgia Strait	Troll	60%	58%	59%	53%
Puget Sound					
Strait of Juan de Fuca (Area 5)	Recreational	72%	56%	55%	51%
Strait of Juan de Fuca (Area 6)	Recreational	62%	51%	51%	48%
San Juan Island (Area 7)	Recreational	49%	56%	51%	39%
North Puget Sound (Areas 6 & 7A)	Net	--	60%	56%	44%
Council Area					
Neah Bay (Area 4/4B)	Recreational	45%	66%	59%	67%
La Push (Area 3)	Recreational	63%	67%	72%	55%
Westport (Area 2)	Recreational	79%	76%	72%	69%
Columbia River (Area 1)	Recreational	78%	81%	72%	74%
Tillamook	Recreational	72%	67%	63%	62%
Newport	Recreational	67%	63%	62%	56%
Coos Bay	Recreational	61%	58%	53%	43%
Brookings	Recreational	58%	48%	43%	13%
Neah Bay (Area 4/4B)	Troll	61%	60%	61%	65%
La Push (Area 3)	Troll	58%	61%	60%	59%
Westport (Area 2)	Troll	69%	72%	72%	70%
Columbia River (Area 1)	Troll	79%	80%	76%	61%
Tillamook	Troll	68%	67%	65%	64%
Newport	Troll	66%	63%	61%	60%
Coos Bay	Troll	60%	58%	55%	45%
Brookings	Troll	52%	50%	54%	64%
Columbia River					
Buoy 10	Recreational	--	--	--	65%

TABLE 9a. Preliminary projected exvessel value under Council-adopted 2021 non-Indian commercial troll regulatory Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (QTA).

Management Area	Alternative	Exvessel Value (thousands of dollars) ^{a/}				Percent Change From 2016-2020 Average
		2021 Projected ^{b/}	2020 Actual	Percent Change from 2020	2016-2020 Average	
North of Cape Falcon	I	2,682	1,035	+159%	2,140	+25%
	II	2,295		+122%		+7%
	III	0		-100%		-100%
Cape Falcon to Humbug Mt.	I	4,338	1,392	+212%	2,298	+89%
	II	4,610		+231%		+101%
	III	5,045		+262%		+120%
Humbug Mt. to OR/CA Border	I	193	106	+82%	157	+23%
	II	78		-27%		-50%
	III	181		+71%		+15%
OR/CA Border to Southern Boundary of KMZ	I	0	0	-	213	-100%
	II	0		-		-100%
	III	0		-		-100%
Southern Boundary of KMZ to Pt. Arena	I	1,616	172	+837%	703	+130%
	II	1,090		+532%		+55%
	III	1,028		+496%		+46%
Pt. Arena to Pigeon Pt.	I	2,258	11,694	-81%	6,393	-65%
	II	2,303		-80%		-64%
	III	2,404		-79%		-62%
South of Pigeon Pt.	I	2,422	2,665	-9%	2,906	-17%
	II	2,139		-20%		-26%
	III	2,135		-20%		-27%
Total South of Cape Falcon	I	10,826	16,029	-32%	12,669	-15%
	II	10,219		-36%		-19%
	III	10,793		-33%		-15%
West Coast Total	I	13,508	17,064	-21%	14,809	-9%
	II	12,514		-27%		-16%
	III	10,793		-37%		-27%

a/ Values are inflation-adjusted to 2020 dollars. Exvessel values are not comparable to the income impacts shown in Tables 10a and 10b.

b/ Projections are based on expected catches in the Council management area and estimated 2020 average weights and exvessel prices.

TABLE 9b. Preliminary projected exvessel value under Council-adopted 2021 non-Indian commercial troll regulatory Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (Makah Tribe).

Management Area	Alternative	Exvessel Value (thousands of dollars) ^{a/}				Percent Change From 2016-2020 Average
		2021 Projected ^{b/}	2020 Actual	Percent Change from 2020	2016-2020 Average	
North of Cape Falcon	I	2,682	1,035	+159%	2,140	+25%
	II	2,295		+122%		+7%
	III	0		-100%		-100%
Cape Falcon to Humbug Mt.	I	4,338	1,392	+212%	2,298	+89%
	II	4,610		+231%		+101%
	III	5,045		+262%		+120%
Humbug Mt. to OR/CA Border	I	193	106	+82%	157	+23%
	II	78		-27%		-50%
	III	181		+71%		+15%
OR/CA Border to Southern Boundary of KMZ	I	0	0	-	213	-100%
	II	0		-		-100%
	III	0		-		-100%
Southern Boundary of KMZ to Pt. Arena	I	1,616	172	+837%	703	+130%
	II	1,090		+532%		+55%
	III	1,028		+496%		+46%
Pt. Arena to Pigeon Pt.	I	2,258	11,694	-81%	6,393	-65%
	II	2,303		-80%		-64%
	III	2,404		-79%		-62%
South of Pigeon Pt.	I	2,422	2,665	-9%	2,906	-17%
	II	2,139		-20%		-26%
	III	2,135		-20%		-27%
Total South of Cape Falcon	I	10,826	16,029	-32%	12,669	-15%
	II	10,219		-36%		-19%
	III	10,793		-33%		-15%
West Coast Total	I	13,508	17,064	-21%	14,809	-9%
	II	12,514		-27%		-16%
	III	10,793		-37%		-27%

a/ Values are inflation-adjusted to 2020 dollars. Exvessel values are not comparable to the income impacts shown in Tables 10a and 10b.

b/ Projections are based on expected catches in the Council management area and estimated 2020 average weights and exvessel prices.

TABLE 10a. Preliminary projected angler trips and coastal community income impacts generated under Council-adopted 2021 recreational ocean salmon fishery regulatory Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (QTA).

Management Area	Alternative	Angler Trips (thousands)			Community Income Impacts (thousands of dollars) ^{a/}			Percent Change in Income Impacts	
		Estimates Based on the Options	2020 Actual	2016-2020 Avg.	Estimates Based on the Options	2020 Actual	2016-2020 Avg.	Compared to 2020	Compared to 2016-2020 Avg.
North of Cape Falcon ^{b/}	I	94.1	30.2	57.1	14,672	4,710	7,901	+211%	+86%
	II	114.9			17,920			+280%	+127%
	III	0.0			0			-100%	-100%
Cape Falcon to Humbug Mt.	I	73.0	47.3	46.7	5,015	3,248	3,382	+54%	+48%
	II	57.8			3,970			+22%	+17%
	III	41.8			2,872			-12%	-15%
Humbug Mt. to OR/CA Border	I	6.4	6.3	4.8	401	391	295	+3%	+36%
	II	3.5			216			-45%	-27%
	III	6.3			391			+0%	+33%
OR/CA Border to Southern Boundary of KMZ	I	6.3	5.1	5.8	727	583	702	+25%	+3%
	II	6.6			762			+31%	+8%
	III	5.9			675			+16%	-4%
Southern boundary of KMZ to Pt. Arena	I	11.4	5.3	7.4	1,664	766	1,176	+117%	+41%
	II	11.7			1,700			+122%	+45%
	III	11.9			1,733			+126%	+47%
Pt. Arena to Pigeon Pt.	I	45.0	50.6	54.4	10,709	12,037	13,124	-11%	-18%
	II	43.4			10,316			-14%	-21%
	III	43.6			10,370			-14%	-21%
South of Pigeon Pt.	I	40.0	4.7	14.4	6,016	709	1,927	+749%	+212%
	II	39.9			6,009			+748%	+212%
	III	39.9			6,000			+746%	+211%
Total South of Cape Falcon	I	182.2	119.2	133.5	24,532	17,732	20,607	+38%	+19%
	II	162.8			22,972			+30%	+11%
	III	149.3			22,041			+24%	+7%
West Coast Total	I	276.2	149.4	190.6	39,204	22,443	28,508	+75%	+38%
	II	277.7			40,892			+82%	+43%
	III	149.3			22,041			-2%	-23%

a/ Income impacts are not comparable to the exvessel values shown in Tables 9a and 9b. All dollar values are expressed in inflation-adjusted 2020 dollars.

b/ Does not include Buoy 10 fishery.

TABLE 10b. Preliminary projected angler trips and coastal community income impacts generated under Council-adopted 2021 recreational ocean salmon fishery regulatory Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (Makah Tribe).

Management Area	Alternative	Angler Trips (thousands)			Community Income Impacts (thousands of dollars) ^{a/}			Percent Change in Income Impacts	
		Estimates Based on the Options	2020 Actual	2016-2020 Avg.	Estimates Based on the Options	2020 Actual	2016-2020 Avg.	Compared to 2020	Compared to 2016-2020 Avg.
North of Cape Falcon ^{b/}	I	94.1	30.2	57.1	14,672	4,710	7,901	+211%	+86%
	II	114.9			17,920			+280%	+127%
	III	0.0			0			-100%	-100%
Cape Falcon to Humbug Mt.	I	73.0	47.3	46.7	5,015	3,248	3,382	+54%	+48%
	II	57.8			3,970			+22%	+17%
	III	41.8			2,872			-12%	-15%
Humbug Mt. to OR/CA Border	I	6.4	6.3	4.8	401	391	295	+3%	+36%
	II	3.5			216			-45%	-27%
	III	6.3			391			+0%	+33%
OR/CA Border to Southern Boundary of KMZ	I	6.3	5.1	5.8	727	583	702	+25%	+3%
	II	6.6			762			+31%	+8%
	III	5.9			675			+16%	-4%
Southern boundary of KMZ to Pt. Arena	I	11.4	5.3	7.4	1,664	766	1,176	+117%	+41%
	II	11.7			1,700			+122%	+45%
	III	11.9			1,733			+126%	+47%
Pt. Arena to Pigeon Pt.	I	45.0	50.6	54.4	10,709	12,037	13,124	-11%	-18%
	II	43.4			10,316			-14%	-21%
	III	43.6			10,370			-14%	-21%
South of Pigeon Pt.	I	40.0	4.7	14.4	6,016	709	1,927	+749%	+212%
	II	39.9			6,009			+748%	+212%
	III	39.9			6,000			+746%	+211%
Total South of Cape Falcon	I	182.2	119.2	133.5	24,532	17,732	20,607	+38%	+19%
	II	162.8			22,972			+30%	+11%
	III	149.3			22,041			+24%	+7%
West Coast Total	I	276.2	149.4	190.6	39,204	22,443	28,508	+75%	+38%
	II	277.7			40,892			+82%	+43%
	III	149.3			22,041			-2%	-23%

a/ Income impacts are not comparable to the exvessel values shown in Tables 9a and 9b. All dollar values are expressed in inflation-adjusted 2020 dollars.

b/ Does not include Buoy 10 fishery.

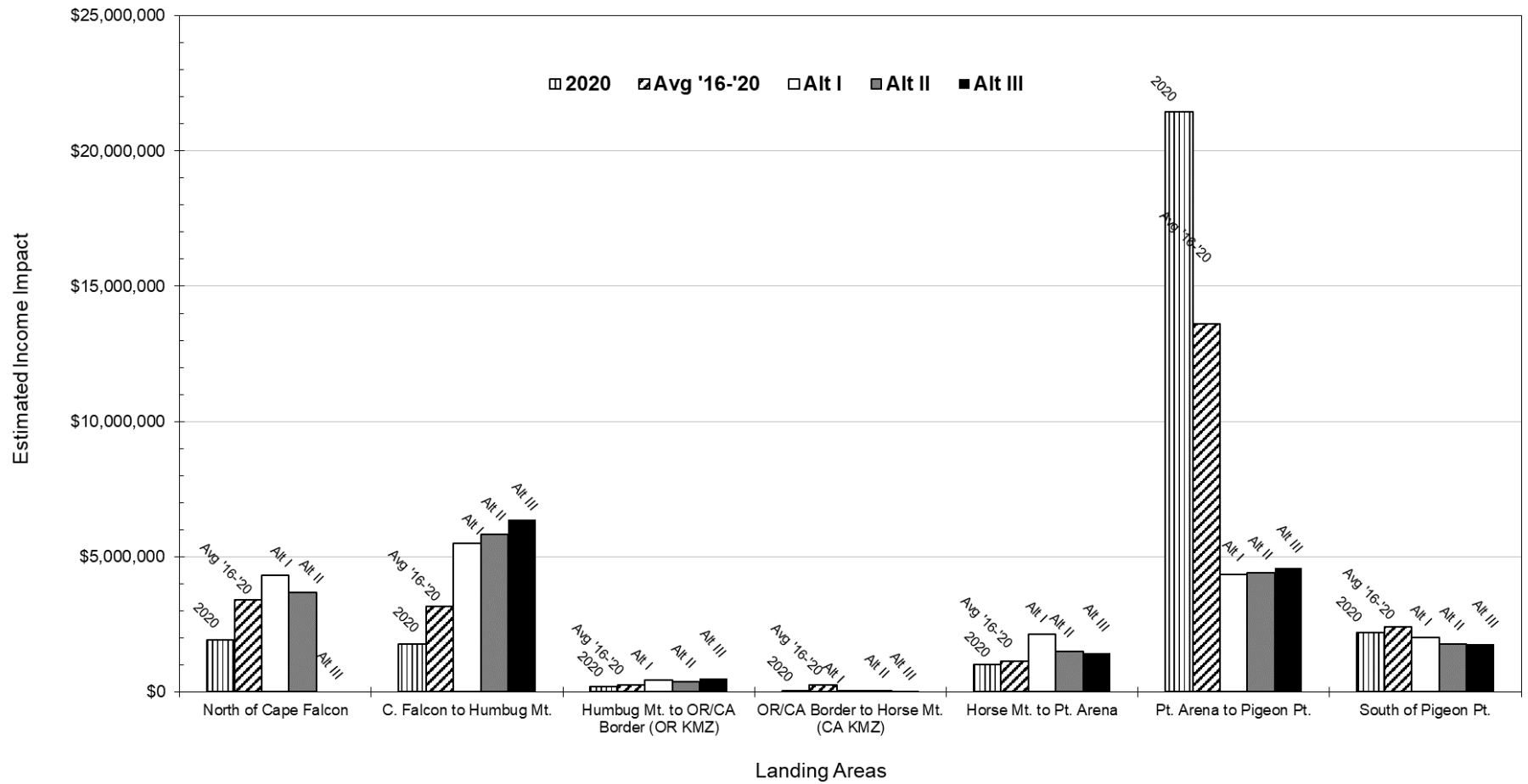


FIGURE 1a. Projected community income impacts associated with landings projected under the Council adopted 2021 commercial fishery Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (QTA).

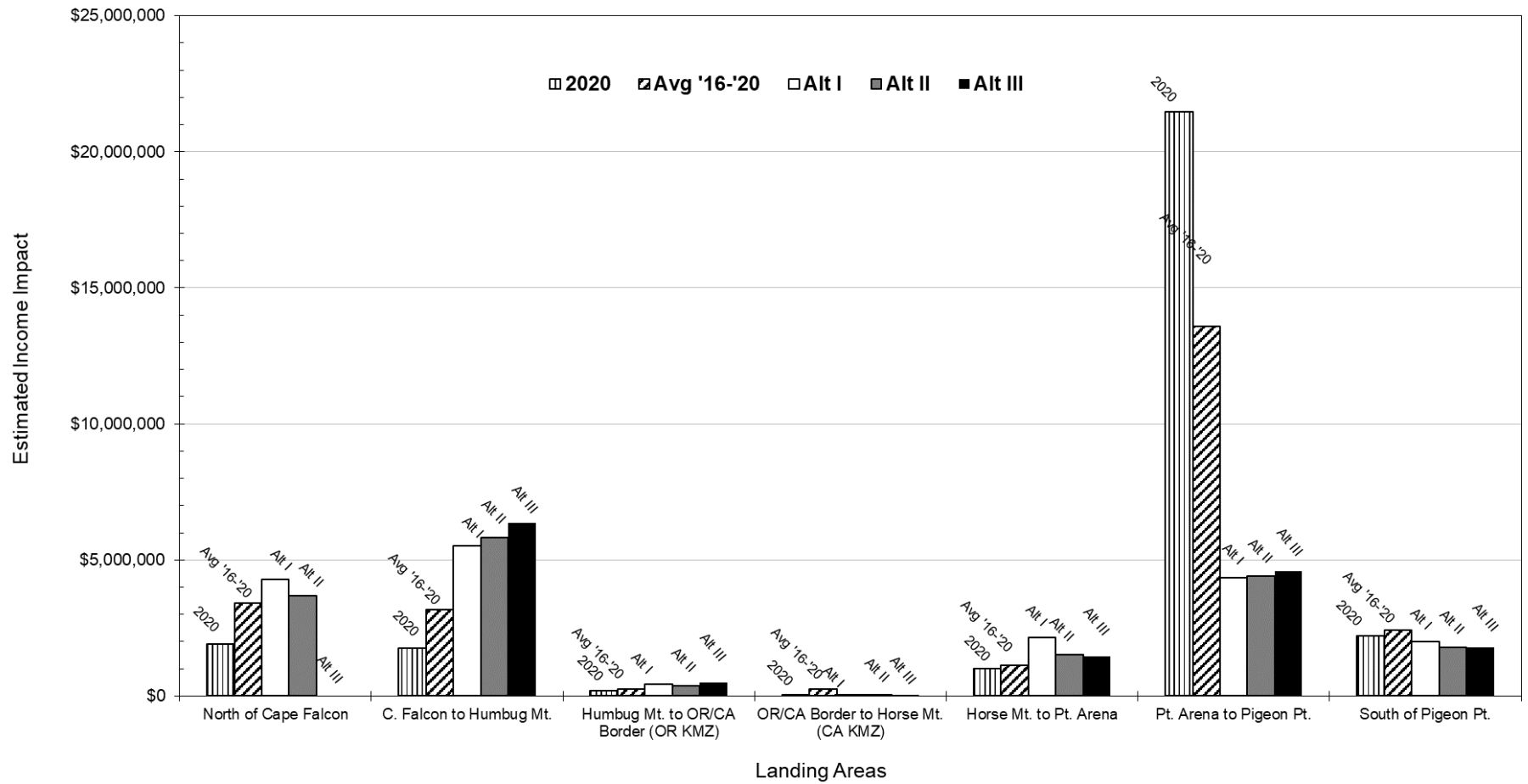


FIGURE 1b. Projected community income impacts associated with landings projected under the Council adopted 2021 commercial fishery Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (Makah Tribe).

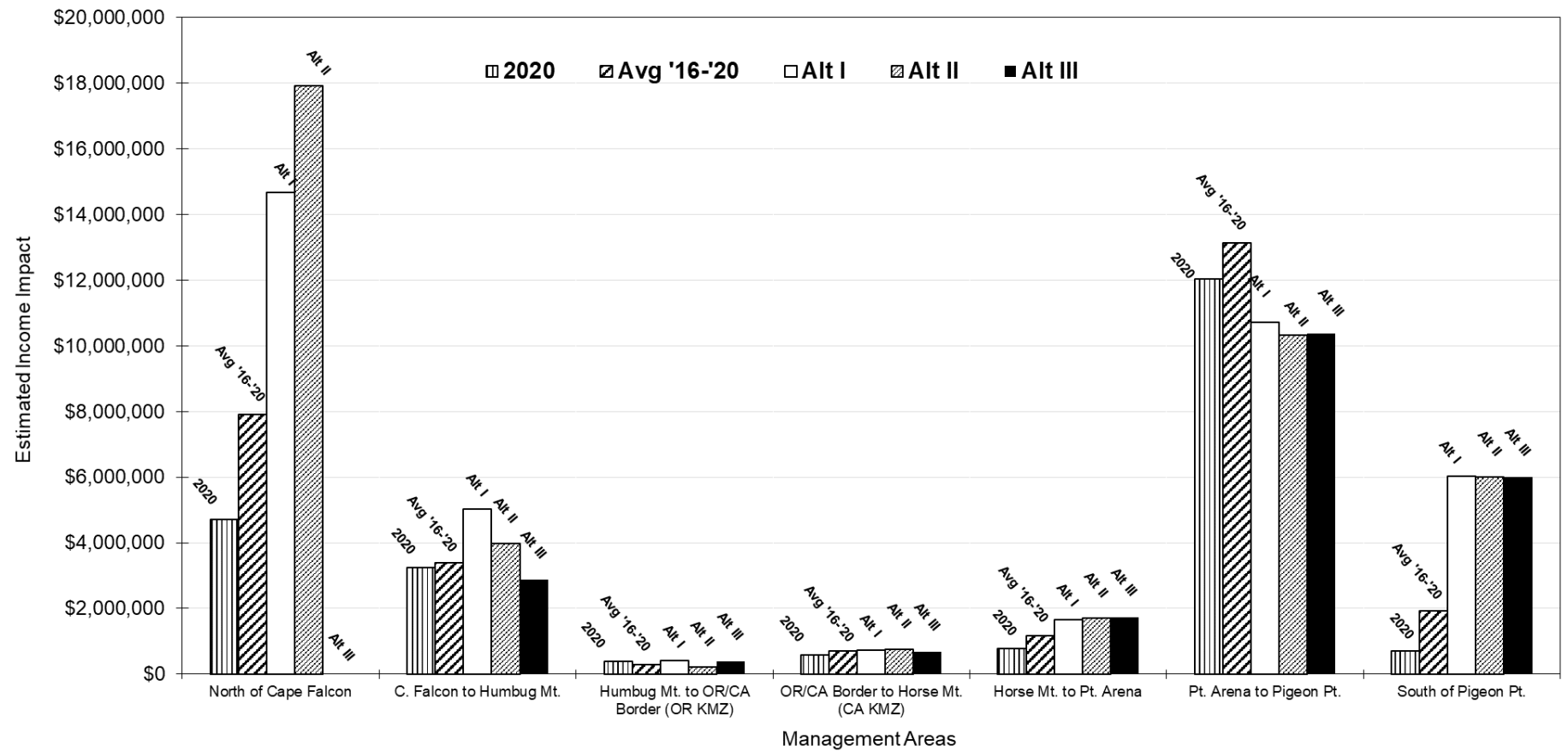


FIGURE 2a. Projected community income impacts associated with angler effort projected under the Council adopted 2021 recreational fishery Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (QTA).

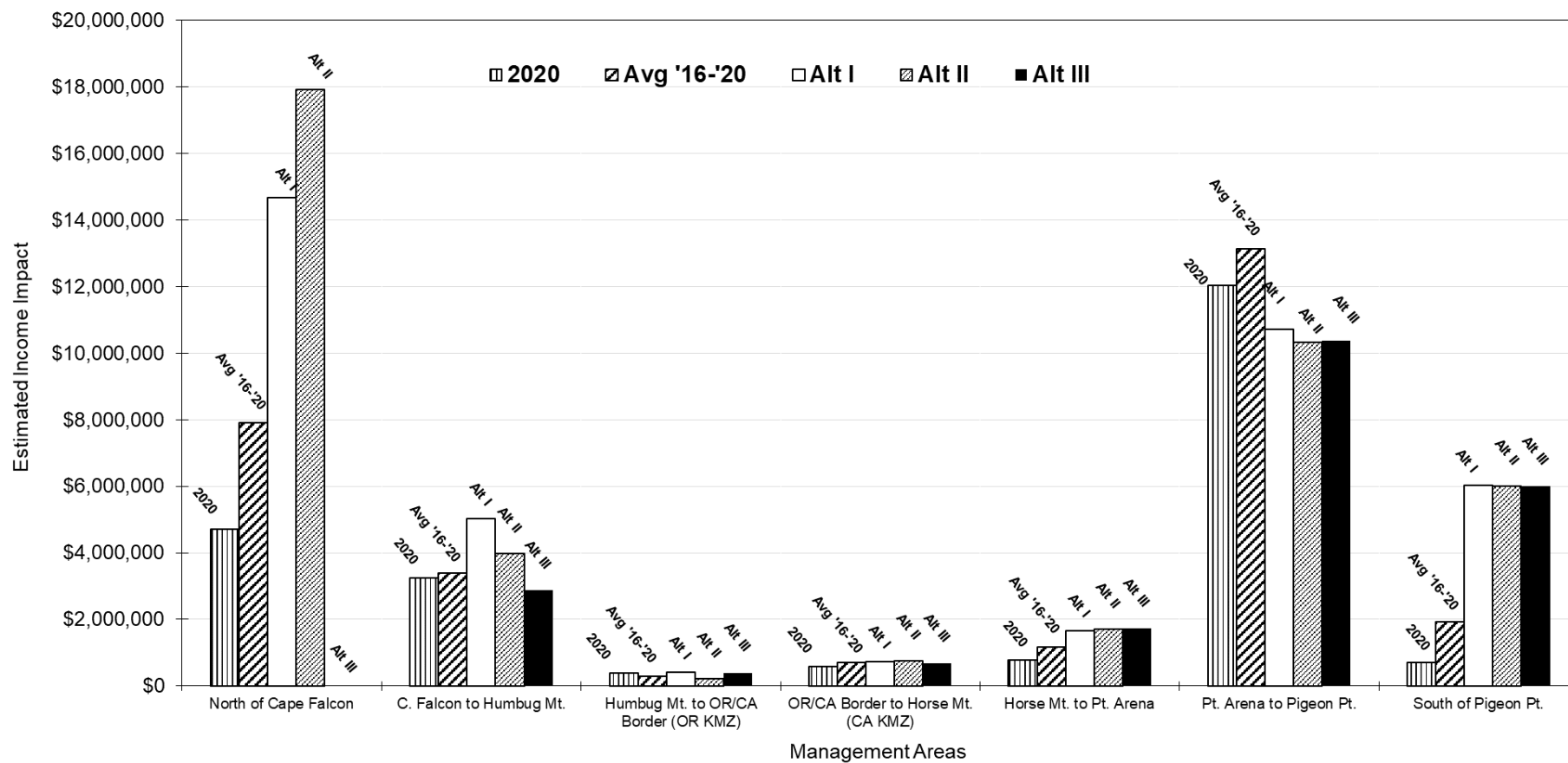


FIGURE 2b. Projected community income impacts associated with angler effort projected under the Council adopted 2021 recreational fishery Alternatives compared to 2020 and the 2016-2020 average (in inflation-adjusted dollars) (Makah Tribe).

APPENDIX A: PROJECTED IMPACTS FOR AGE-3 SACRAMENTO RIVER WINTER CHINOOK, ADULT KLAMATH RIVER FALL CHINOOK, AND ADULT SACRAMENTO RIVER FALL CHINOOK.

Table A-1. Sacramento River winter Chinook age-3 ocean impact rate south of Point Arena by fishery and Alternative. The impacts are displayed as a percent for each Alternative by fishery, port area, and month. Max rate: 20%.

Commercial										Recreational										
Alternative I		11.7 Total								Alternative I										
Port									Year	Port									Year	
Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SF		0.17	0.15	0.26	0.19	0.08			0.87	SF			0.13	1.97	0.72	0.11	0.20			3.13
MO	0.59	0.67							1.26	MO	1.27	0.58	1.05	2.43	1.02	0.07				6.42
Total	0.59	0.85	0.15	0.26	0.19	0.08	0.00	0.00	2.13	Total	1.27	0.58	1.18	4.39	1.75	0.18	0.20	0.00	0.00	9.56
Alternative II		14.2 Total								Alternative II										
Port									Year	Port									Year	
Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SF		0.26	0.15	0.34	0.11				0.86	SF				1.92	0.70	0.11	0.15			2.88
MO	0.31	1.69							2.00	MO	1.27	1.27	1.69	3.06	1.12	0.05				8.46
Total	0.31	1.95	0.15	0.34	0.11	0.00	0.00	0.00	2.86	Total	1.27	1.27	1.69	4.98	1.82	0.15	0.15	0.00	0.00	11.34
Alternative III		12.6 Total								Alternative III										
Port									Year	Port									Year	
Area	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Area	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
SF	0.09	0.26	0.12	0.13	0.12				0.71	SF			0.31	1.94	0.71	0.11	0.02			3.09
MO	0.27	1.70	0.20	0.30					2.48	MO	1.27	0.58	1.05	2.40	1.01	0.02				6.32
Total	0.36	1.97	0.32	0.43	0.12	0.00	0.00	0.00	3.19	Total	1.27	0.58	1.36	4.34	1.72	0.12	0.02	0.00	0.00	9.41

SF Pt. Arena to Pigeon Pt. (San Francisco)
MO Pigeon Pt. to the U.S./Mexico Border (Monterey)

Table A-2. Klamath River fall Chinook ocean impacts in numbers of fish by fishery and Alternative.

Commercial											Recreational										
Alternative I											Alternative I										
31,574 natural area spawners, 25.0% spawner reduction rate, 10.4% age-4 ocean harvest rate																					
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020			Summer 2021					Summer Total	Year Total
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	
NO	0	0	37	46	22	72	294	239	710	710	NO	0	0		0	0	0	0	2	71	73
CO	0	0			109	478	479	209	1,275	1,275	CO	0	0		0	0	0	0	7	184	191
KO			0	0	67	92	66		225	225	KO							63	47	84	194
KC											KC							46	339		385
FB	0					530	543	191	1,264	1,264	FB	0	0	0				6	163	48	217
SF	57	0				670	522	549	1,741	1,798	SF	0	0	0				31	355	90	476
MO					649	173			822	822	MO	0	0			13	0	0	0	0	13
Total	57	0	37	46	847	2,017	1,904	1,188	6,039	6,096	Total	0	0	0	0	13		147	913	478	1,551
Alternative II											Alternative II										
31,574 natural area spawners, 25.0% spawner reduction rate, 10.3% age-4 ocean harvest rate																					
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020			Summer 2021					Summer Total	Year Total
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	
NO	0	0	37	46	22	80	355	287	827	827	NO	0	0		0	0	0	0	2	44	46
CO	0	0			109	530	577	252	1,468	1,468	CO	0	0		0	0	0	0	7	107	114
KO			0	0	67				67	67	KO						1	142	25	25	193
KC											KC							76	340		416
FB	0						544	255	799	799	FB	0	0	0				11	164	48	223
SF	57	0				1,020	525	733	2,278	2,335	SF	0	0	0					355	90	445
MO					336	441			777	777	MO	0	0			13	0	0	0	0	13
Total	57	0	37	46	534	2,071	2,002	1,527	6,217	6,274	Total	0	0	0	0	13	1	229	893	313	1,449
Alternative III											Alternative III										
31,574 natural area spawners, 25.0% spawner reduction rate, 10.6% age-4 ocean harvest rate																					
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020			Summer 2021					Summer Total	Year Total
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug	
NO	0	0	37	46	34	144	235	527	1,023	1,023	NO	0	0		0	0	0	0	2	13	15
CO	0	0			169	373	382	462	1,386	1,386	CO	0	0		0	0	0	0	7	32	39
KO			0	0	104	46	44		194	194	KO								47	92	139
KC											KC								339		339
FB	0						471	312	783	783	FB	0	0	0				15	163	48	226
SF	57	0			452	1,009	403	276	2,140	2,197	SF	0	0	0				73	354	90	517
MO					300	438	43	38	819	819	MO	0	0			13	0	0	0	0	13
Total	57	0	37	46	1,059	2,010	1,578	1,614	6,344	6,401	Total	0	0	0	0	13		88	912	276	1,289

NO Cape Falcon to S. End of Heceta Bank FB Southern KMZ Boundary to Pt. Arena (Fort Bragg)
 CO S. End of Heceta Bank to Humbug Mt. SF Pt. Arena to Pigeon Pt. (San Francisco)
 KO Humbug Mt. to OR/CA Border (Oregon KMZ) MO Pigeon Pt. to U.S./Mexico Border (Monterey)
 KC OR/CA Border to Southern KMZ Boundary (California KMZ)

Table A-3. Sacramento River fall Chinook ocean impacts in numbers of fish by fishery and Alternative.

Commercial											Recreational												
Alternative I 118,594 Total											Alternative I												
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020		Summer 2021						Summer Total	Year Total		
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug			
NO	131	0	2,347	2,803	1,501	1,338	1,779	713	10,481	10,612	NO	71	0		6	0	5	118	225	185	539	610	
CO	0	0			1,607	2,039	608	361	4,615	4,615	CO	13	0		0	0	3	336	302	220	861	874	
KO			0	0	332	208	139		679	679	KO							96	515	149	760	760	
KC											KC							133	1,378		1,511	1,511	
FB	146					3,287	4,231	1,585	9,103	9,249	FB	68	0	0				65	2,655	1,083	3,803	3,871	
SF	6,922	1,867				5,276	4,827	6,272	16,375	25,164	SF	3,187	1,800	12				659	12,237	5,702	18,598	23,597	
MO					21,342	4,743			26,085	26,085	MO	14	0			5,960	1,222	1,276	2,095	397	10,950	10,964	
Total	7,199	1,867	2,347	2,803	24,783	16,892	11,585	8,930	67,340	76,406	Total	3,353	1,800	12	6	5,960	1,230	2,684	19,406	7,737	37,023	42,188	
Alternative II 117,213 Total											Alternative II												
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020		Summer 2021						Summer Total	Year Total		
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug			
NO	131	0	2,347	2,803	1,501	1,472	2,135	856	11,114	11,245	NO	71	0		6	0	5	79	225	109	424	495	
CO	0	0			1,607	2,243	730	433	5,013	5,013	CO	13	0		0	0	3	239	302	123	667	680	
KO			0	0	332				332	332	KO							27	223	258	35	543	543
KC											KC							222	1,378		1,600	1,600	
FB	146						4,231	2,113	6,344	6,490	FB	68	0	0				108	2,655	1,083	3,846	3,914	
SF	6,922	1,867				7,973	4,827	8,362	21,162	29,951	SF	3,187	1,800	12					12,237	5,702	17,939	22,938	
MO					11,039	12,009			23,048	23,048	MO	14	0			5,960	1,222	1,276	2,095	397	10,950	10,964	
Total	7,199	1,867	2,347	2,803	14,479	23,697	11,923	11,764	67,013	76,079	Total	3,353	1,800	12	6	5,960	1,257	2,148	19,149	7,449	35,969	41,134	
Alternative III 122,075 Total											Alternative III												
Port Area	Fall 2020		Summer 2021						Summer Total	Year Total	Port Area	Fall 2020		Summer 2021						Summer Total	Year Total		
	Sep	Oct-Dec	Mar	Apr	May	Jun	Jul	Aug				Sep	Oct	Nov-Dec	Mar	Apr	May	Jun	Jul	Aug			
NO	131	0	2,347	2,803	2,327	2,674	1,423	1,569	13,143	13,274	NO	71	0		6	0	5	41	225	25	302	373	
CO	0	0			2,491	1,596	487	793	5,367	5,367	CO	13	0		0	0	3	143	302	29	477	490	
KO			0	0	515	104	93		712	712	KO								515	169	684	684	
KC											KC								1,378		1,378	1,378	
FB	146						3,674	2,579	6,253	6,399	FB	68	0	0				152	2,655	1,083	3,890	3,958	
SF	6,922	1,867			7,386	7,973	3,732	3,145	22,236	31,025	SF	3,187	1,800	12					1,538	12,237	5,702	19,477	24,476
MO					9,874	12,009	839	254	22,976	22,976	MO	14	0			5,960	1,222	1,276	2,095	397	10,950	10,964	
Total	7,199	1,867	2,347	2,803	22,593	24,356	10,248	8,341	70,688	79,754	Total	3,353	1,800	12	6	5,960	1,230	3,149	19,406	7,405	37,156	42,321	
NO	Cape Falcon to S. End of Heceta Bank					FB	Southern KMZ Boundary to Pt. Arena (Fort Bragg)																
CO	S. End of Heceta Bank to Humbug Mt.					SF	Pt. Arena to Pigeon Pt. (San Francisco)																
KO	Humbug Mt. to OR/CA Border (Oregon KMZ)					MO	Pigeon Pt. to U.S./Mexico Border (Monterey)																
KC	OR/CA Border to Southern KMZ Boundary (California KMZ)																						

APPENDIX B: KLAMATH OCEAN HARVEST MODEL AND SACRAMENTO HARVEST MODEL INPUT DATA RANGE MODIFICATIONS

Ocean harvest rates for Klamath River fall Chinook (KRFC) and Sacramento River fall Chinook (SRFC) have been under-predicted in recent years (Table B-1). The KRFC age-4 ocean harvest rate has been under-predicted for the past eight years (PFMC 2021), and substantially so in the last three years. Age-4 KRFC are the highest contributing age class to ocean harvest for this stock and are also used as a proxy in the consultation standard for ESA-threatened California coastal Chinook. The SRFC ocean harvest rate (all adult ages combined) has been under-predicted in each of the last five years. Given this record of performance, an examination of key components of the Klamath Ocean Harvest Model (KOHM) and Sacramento Harvest Model (SHM) was undertaken.

Table B-1. Preseason forecasts and postseason estimates of ocean harvest rates for Sacramento River fall Chinook (SRFC) and age-4 Klamath River fall Chinook (KRFC).

Year	SRFC ocean harvest rate			KRFC age-4 ocean harvest rate		
	preseason	postseason	post/pre	preseason	postseason	post/pre
2016	0.413	0.447	1.082	0.084	0.091	1.086
2017	0.328	0.516	1.572	0.031	0.041	1.330
2018	0.291	0.448	1.538	0.115	0.238	2.070
2019	0.504	0.637	1.264	0.160	0.356	2.227
2020	0.420	0.566	1.347	0.088	0.226	2.573

The methods used to forecast ocean harvest rates in the KOHM are detailed in Mohr (2006). The components of the KOHM that largely lead to projected harvest rates are (1) forecasts of fishing effort and (2) estimates of contact rates per unit effort. A description of the fishing effort forecasting component can be found in Mohr and O’Farrell (2012). While that report is focused on the SHM, the effort forecasting component is not stock-specific and identical procedures are used to forecast effort in both harvest models. Consistent trends in under- or over-predicting effort have not been observed in recent years, indicating that recent patterns of harvest rate under-prediction are driven primarily by contact rates.

Contact rates per unit effort are KOHM parameters that are estimated at the level of month, management area, fishery (commercial or recreational), and age (age-3 and age-4) using the results from coded wire tag-based cohort reconstructions. For the recreational fishery, contact rates per unit effort are estimated for age-3 and age-4 fish combined in all times and areas except for August in the Oregon and California Klamath Management zones (KO and KC, respectively) where age-specific estimates are employed. For both the commercial and recreational fisheries, contact rates per unit effort have mostly been estimated using the entire data range, from 1983 through the most recent year with data (generally the year prior to the management year). However, for the commercial fishery, contact rates per unit effort have been estimated with a shorter data series (2003-forward) in some months and areas, in response to previous instances of under-prediction of ocean harvest rates (PFMC 2006).

The methods used to project harvest rates in the SHM are detailed in Mohr and O’Farrell (2012). Similar to the KOHM, the SHM forecasts harvest rates using (1) forecasts of fishing effort and (2) estimates of harvest rates per unit effort. Harvest rates per unit effort in the recreational fishery have been estimated using the entire data range (1983-forward). For the commercial fishery, harvest rates per unit effort are estimated from a dataset for 2003-forward, again truncated in response to past instances of under-prediction of ocean harvest rates, as described in PFMC (2016).

To evaluate whether ocean harvest rate prediction could be improved using more contemporary estimates of contact or harvest rates per unit effort, projections of the KRFC age-4 (fully recruited) ocean harvest rate

and the SRFC ocean harvest rate were hindcasted under differing data ranges used to estimate contact (harvest) rates per unit effort. Ocean harvest rates were hindcasted for management years 2016-2020 given the adopted ocean fishery regulations for those years, the KOHM and SHM versions used during the PFMC preseason management process in each year, and under variable data ranges used to estimate the contact (harvest) rates per unit effort in both the commercial and recreational fisheries. We considered the following scenarios: (1) status quo data ranges used to estimate contact (harvest) rates per unit of effort in the year being hindcast, (2) data from 2003-forward, which has already been used in some months and areas for the commercial fishery, (3) five separate scenarios using data from 2011-forward through 2015-forward³.

Figure B-1 displays the relationship between preseason-predicted and postseason-estimated KRFC age-4 ocean harvest rates hindcasted under the seven contact rate per unit effort data range scenarios. Examination of the forecast performance suggested that the best correspondence between predicted and observed harvest rates occurred when contact rates per unit effort were estimated using data from 2013-forward.

Figure B-2 displays the relationship between preseason-predicted and postseason-estimated SRFC total ocean harvest rates hindcasted under the seven harvest rate per unit effort data range scenarios. Examination of the forecast performance suggested that the best correspondence between predicted and observed harvest rates occurred when harvest rates per unit effort were estimated using data from 2014-forward.

Figures B-3 and B-4 illustrate differences between 2021 Klamath River fall Chinook contact rates per unit effort estimates made using data ranges 1983-2020, 2003-2020, and 2013-2020 for the commercial and recreational fisheries, respectively. Most month/area combinations for the commercial fishery show increases in age-4 contact rates per unit effort under more contemporary data range scenarios. Changes in age-3 contact rates per unit effort are more mixed in the commercial fishery. Notable increases in contact rates per unit effort in the recreational fishery are observed for more contemporary data ranges in the California Klamath Management Zone (KC) and San Francisco (SF), while some decreases are observed in Northern and Central Oregon (NO and CO, respectively) and Fort Bragg (FB).

Figures B-5 and B-6 display differences between 2021 Sacramento River fall Chinook harvest rates per unit effort estimates for data ranges of 1983-2020, 2003-2020, and 2014-2020 in commercial and recreational fisheries, respectively. For both fisheries, harvest rate per unit effort estimates have generally increased with use of more contemporary data ranges, sometimes substantially.

Results from the KOHM and SHM presented in Tables 5a and 5b of this report reflect implementation of the following changes to model inputs. In the KOHM, contact rates per unit effort in both the commercial and recreational fisheries are estimated using data from 2013-forward. In the SHM, harvest rates per unit effort in both the commercial and recreational fisheries are estimated using data from 2014-forward. It is anticipated that these data range modifications will be used into the future until a re-evaluation of forecast performance suggests additional changes are necessary (see PFMC 2013, Appendix C, for an example).

Analysis of 2020 commercial and recreational fisheries given these model input data range modifications resulted in increased ocean harvest rate projections. The KOHM-projected age-4 ocean harvest rate increased from 9.9 percent to 19.4 percent following the data range modification to the contact rate per unit

³ Performance of hindcasts could not be assessed for management year 2016 under the 2014-forward data range scenario and management year 2017 under the 2014-forward and 2015-forward data range scenarios as a minimum of three years of contact rate and effort data was enforced for this analysis.

effort estimates. The SHM-projected ocean harvest rate increased from 46.5 percent to 59.7 percent following the data range modification to the harvest rates per unit effort estimates.

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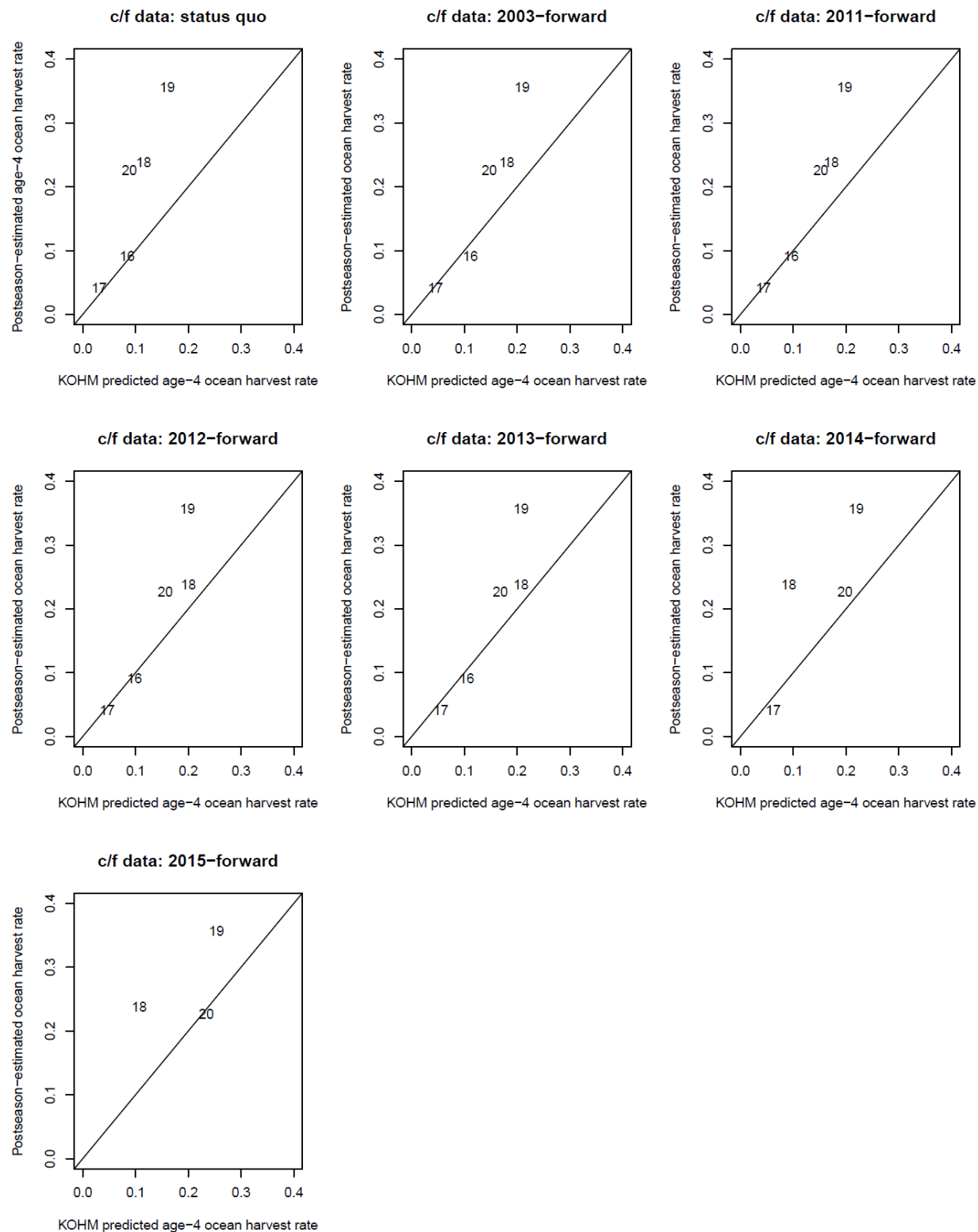


FIGURE B-1. Klamath River fall Chinook hindcasted age-4 ocean harvest rate predictions versus postseason estimates. Individual plots denote the data ranges used to predict contact rates per unit effort (c/f). Numbers in plot denote management years. Solid line represents the 1:1 line.

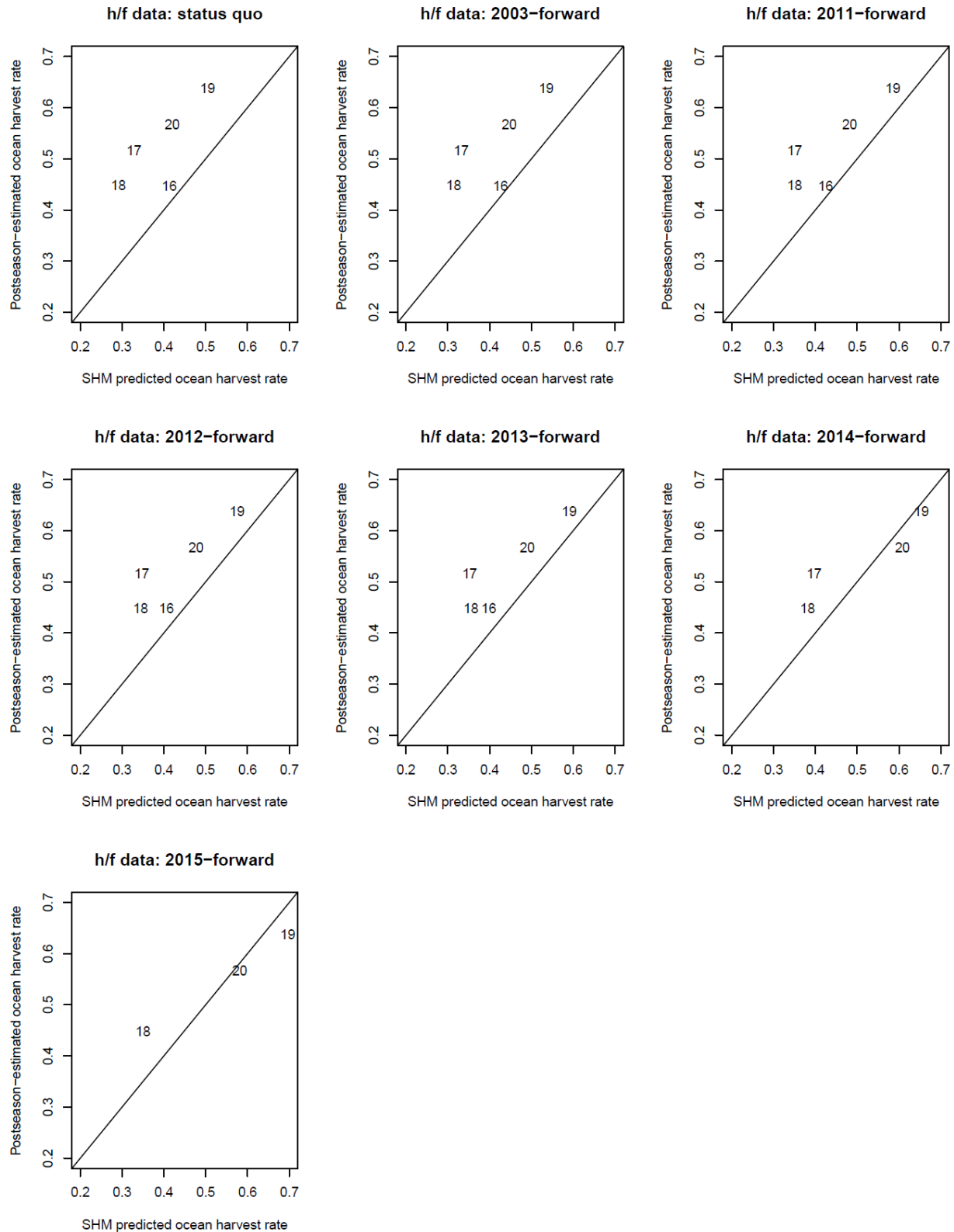


FIGURE B-2. Sacramento River fall Chinook hindcasted total ocean harvest rate predictions versus postseason estimates. Individual plots denote the data ranges used to predict harvest rates per unit effort (h/f). Numbers in plot denote management years. Solid line represents the 1:1 line.

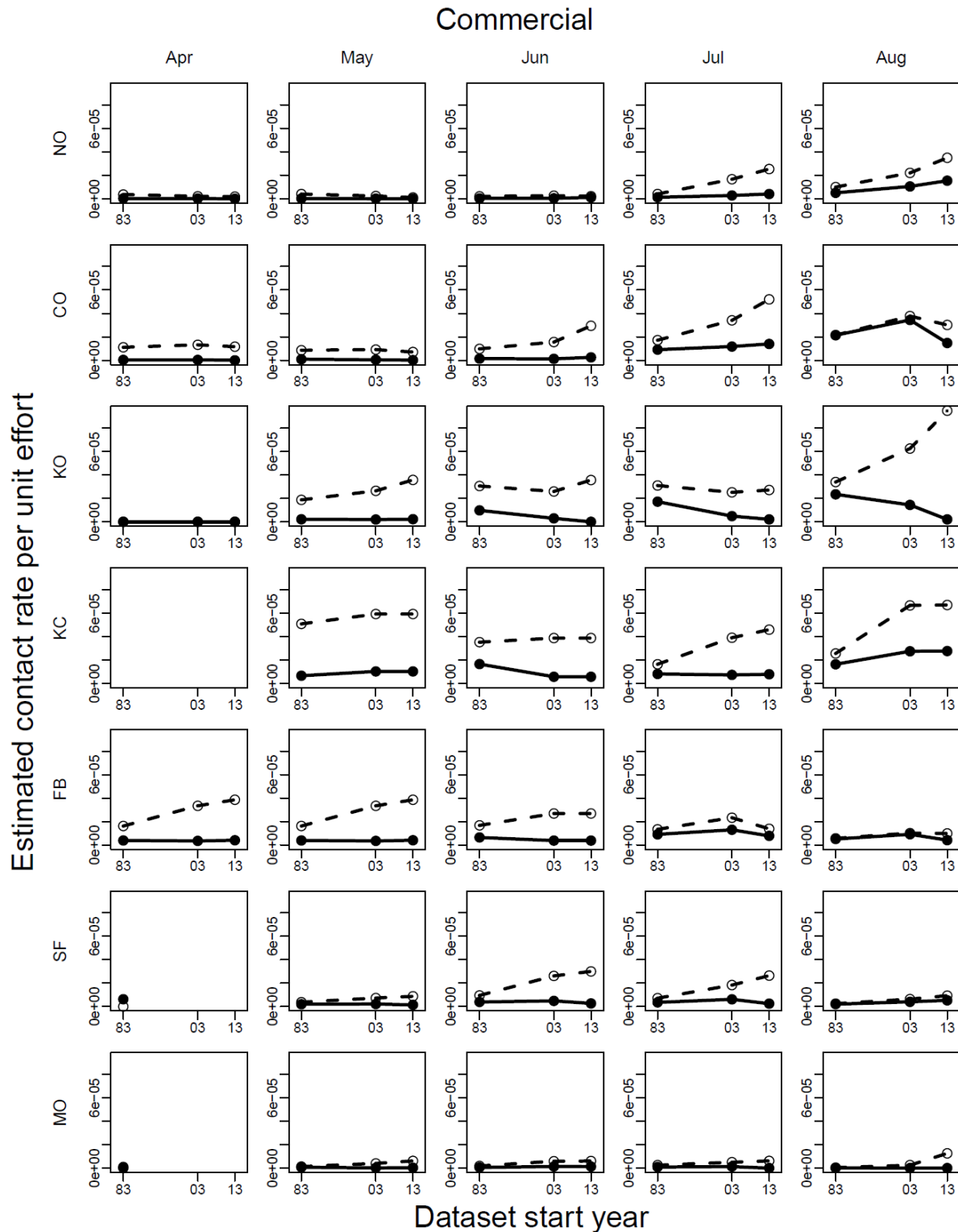


FIGURE B-3. Estimated Klamath River fall Chinook contact rates per unit effort for the commercial fishery given three data ranges: 1983-2020, 2003-2020, and 2013-2020. Solid symbols and lines represent age-3, while open symbols and dashed lines represent age-4 estimates.

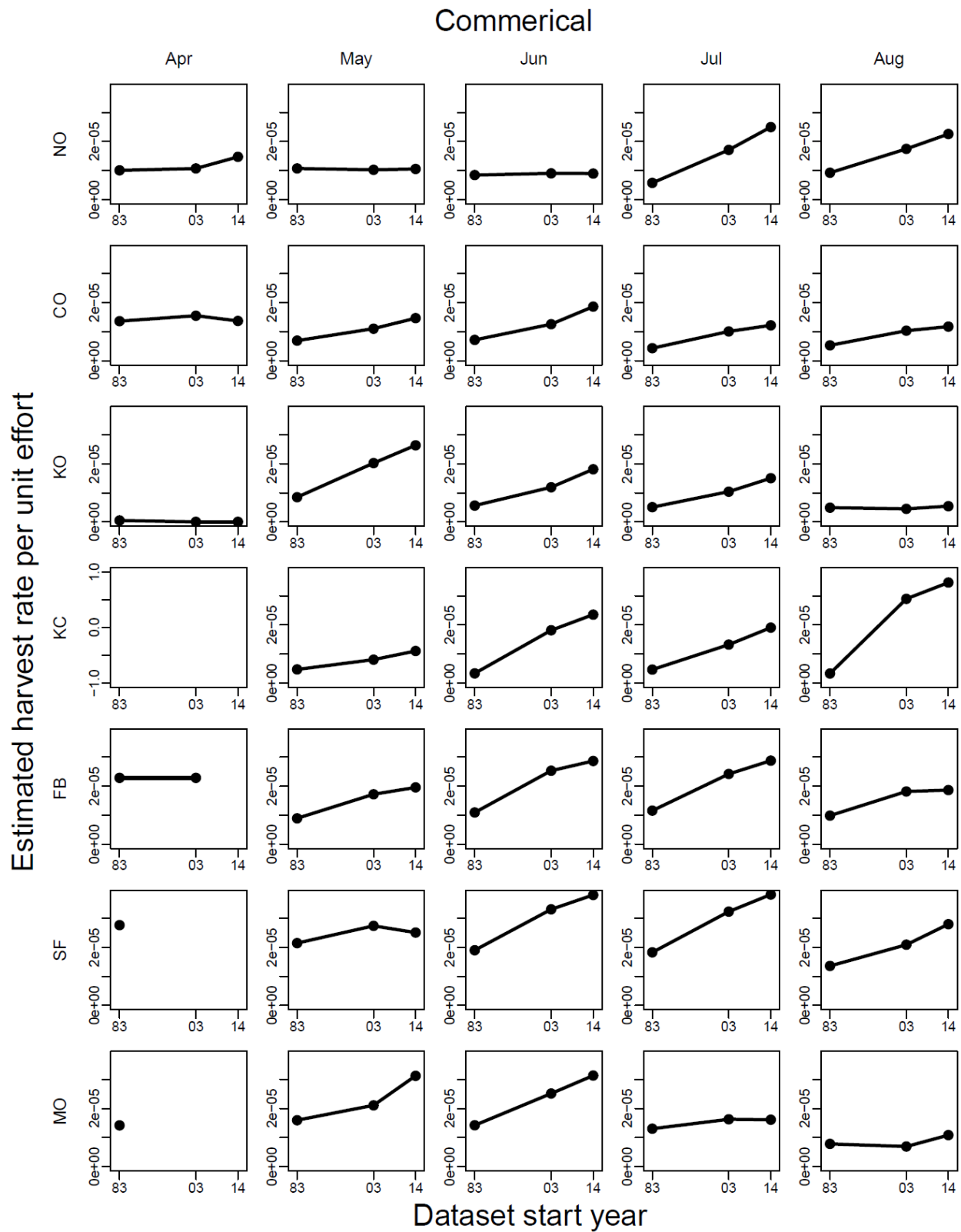


FIGURE B-5. Estimated Sacramento River fall Chinook harvest rates per unit effort for the commercial fishery given three data ranges: 1983-2020, 2003-2020, and 2014-2020.

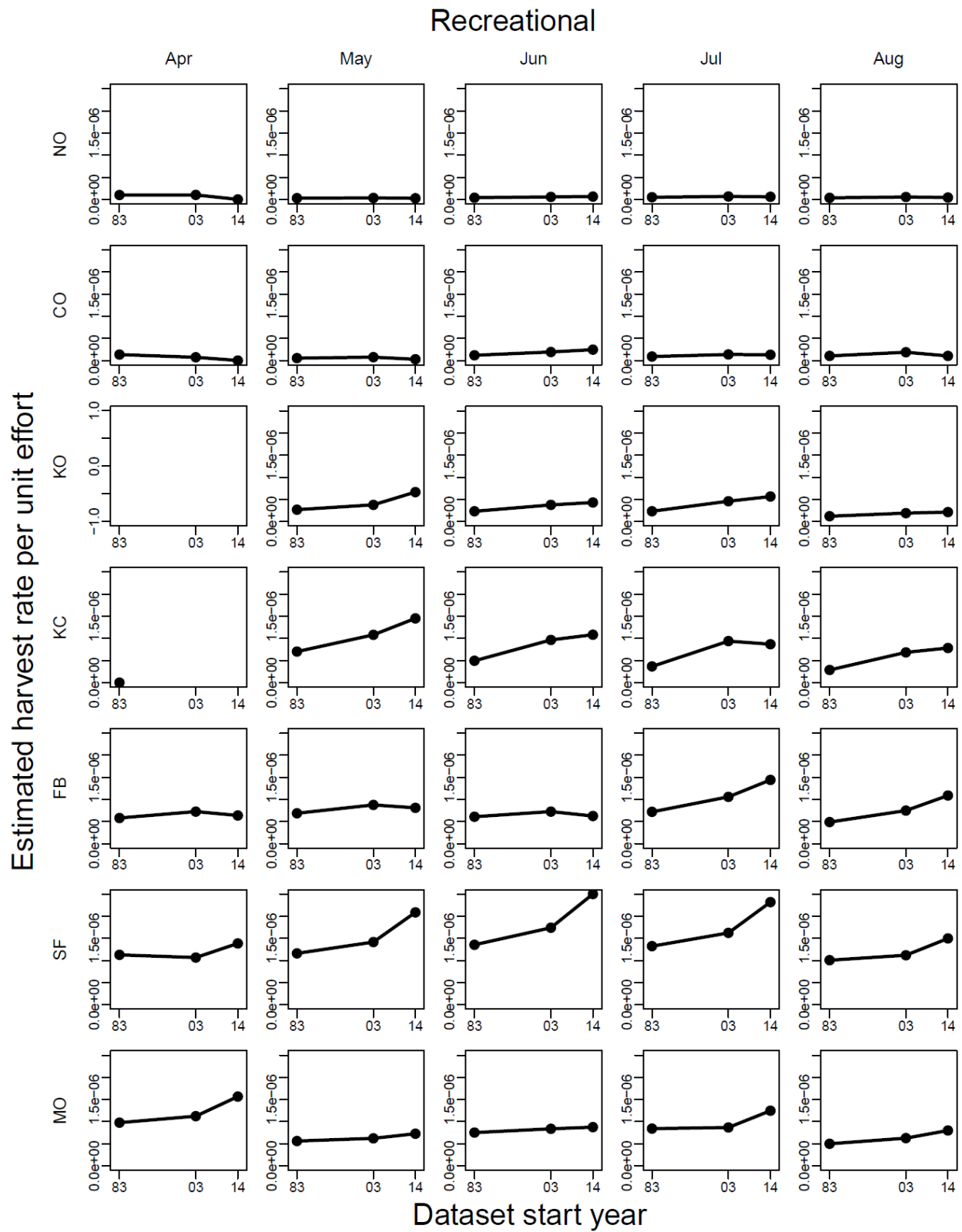


FIGURE B-6. Estimated Sacramento River fall Chinook harvest rates per unit effort for the recreational fishery given three data ranges: 1983-2020, 2003-2020, and 2014-2020.

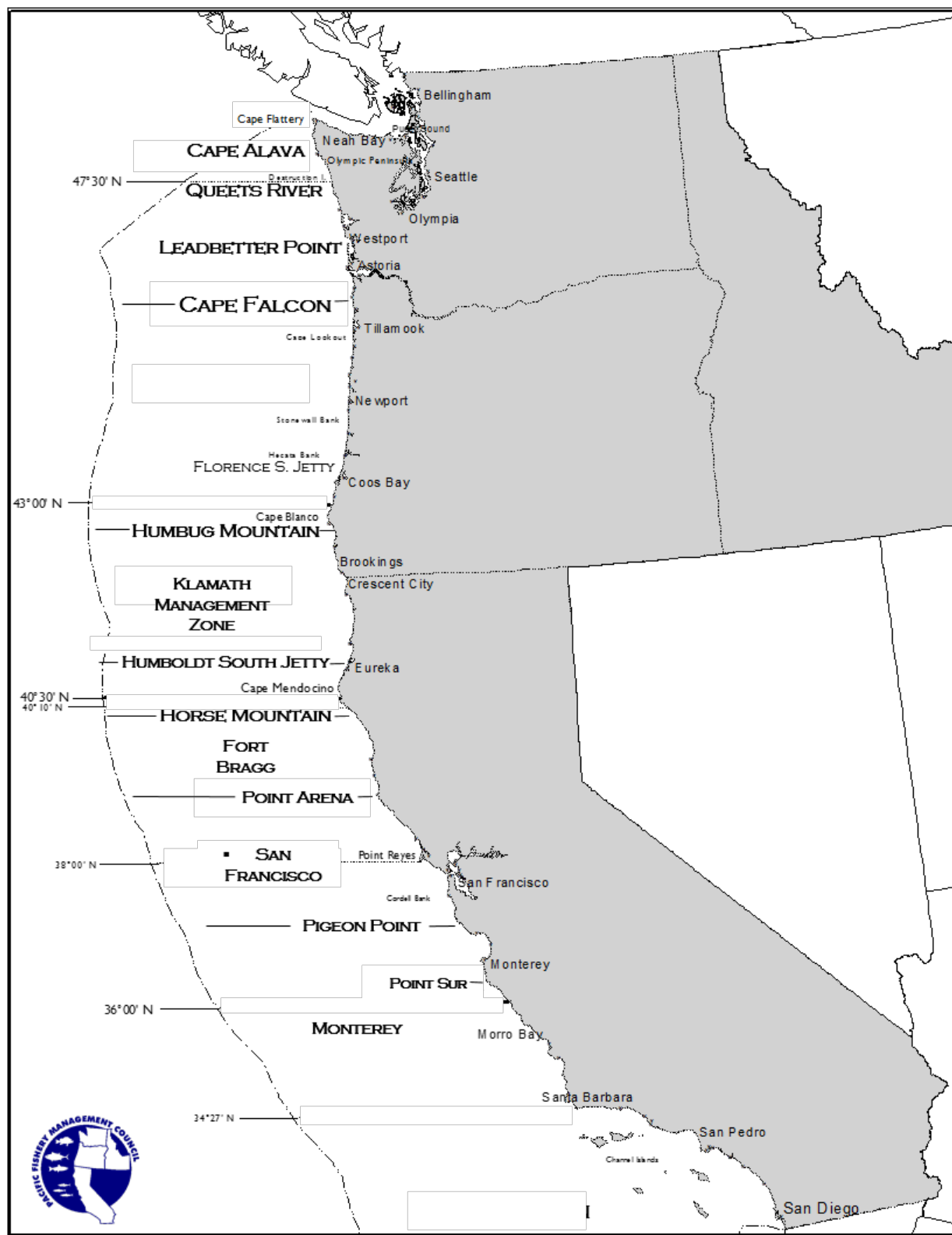


FIGURE 3. Map of Pacific West Coast with major salmon ports and management boundaries. This map is for reference only and is not intended for use in navigation or fishery regulation.