Agenda Item C.1
Situation Summary
June 2011

FISHERY MANAGEMENT PLAN AMENDMENT 16, ANNUAL CATCH LIMITS AND ACCOUNTABILITY MEASURES

At its September and November 2010 meetings the Council adopted alternatives, including preliminary preferred alternatives, to release for public review prior to taking final action on Amendment 16 to the Salmon Fishery Management Plan (FMP). The alternatives addressed the following issues: 1) stock classification; 2) status determination criteria (SDC); 3) reference point framework for overfishing limit (OFL), acceptable biological catch (ABC), and annual catch limits (ACL); 4) accountability measures (AMs); and 5) *de minimis* fishery provisions.

Since November, the ad hoc Salmon Amendment Committee (SAC) has completed a draft Environmental Assessment (EA) describing and analyzing the effects of alternatives on the environment, which is intended for public review and as a decision document for use by the Council (Agenda Item C.1.b, SAC Report 1). Appendix H of the draft EA (Agenda Item C.1.b, SAC Report 3) features proposed implementation language for the Salmon FMP reflecting changes to the existing FMP from the preliminary preferred alternatives. This language should be reviewed carefully, and will need to be updated if the Council's final actions differ from the preliminary preferred alternatives; both a fully edited version and a strike-out /underline version are included.

The Council is scheduled to take final action at this meeting and adopt final preferred alternatives for all issues in Amendment 16. Adoption of final preferred alternatives at the June Council meeting should allow sufficient time to have a final rule implementing Amendment 16 (should it be approved) published by December 31, 2011 and regulations in place for the 2012 preseason management process.

Council Task:

1. **Select final preferred alternatives for stock classification, status determination criteria, annual catch limits, accountability measures, and de minimis fishing provisions.**
2. **Provide guidance on incorporating implementing language into the Salmon Fishery Management Plan.**
3. **Provide additional guidance on any outstanding issues relevant to completing Amendment 16 and submitting the draft EA for approval.**

Reference Materials:

1. Agenda Item C.1.b, SAC Report 1: Public Review Draft Environmental Assessment for Pacific Coast Salmon Fishery Management Plan Amendment 16: Classifying Stocks, Revising Status Determination Criteria, Establishing Annual Catch Limits and Accountability Measures, and De Minimis Fishing Provisions.
2. Agenda Item C.1.b, SAC Report 2: Appendices A-G to Amendment 16 Public Review Draft Environmental Assessment.
3. Agenda Item C.1.b, SAC Report 3: Appendix H to Amendment 16 Public Review Draft Environmental Assessment; Draft Proposed FMP Language implementing Amendment 16.
4. Agenda Item C.1.b, U.S. v. Oregon Letter.
5. Agenda Item C.1.b, STT Report.
6. Agenda Item C.1.c, Public Comment.

Agenda Order:

a. Agenda Item Overview — Chuck Tracy
b. Reports and Comments of Advisory Bodies and Management Entities
c. Public Comment
d. **Council Action:** Adopt Final Preferred Alternatives

PFMC
5/23/11

Salmon FMP Amendment 16: Public Review Draft Description of Alternatives

Classifying Stocks in the FMP: Pages 9, 93, 118

Alternative 1 - Status Quo

All stocks currently in FMP remain in the fishery.

Alternative 2

Minor Reorganization and Deletions

Smith River Chinook separated from CA coastal Chinook (ESA listed);
Rogue coho out of OCN, into SONCC;
Mid-Columbia spring Chinook and Fraser pink salmon are removed from the FMP;

Alternative 3

Ecosystem Components, Deletions, and Minor reorganization

Smith River Chinook separated from CA coastal Chinook (ESA listed);
Rogue coho out of OCN, into SONCC;
Canadian coho and Chinook are removed from the FMP;
Columbia River URB fall, Mid-C Spring Chinook, and Puget Sound and Fraser pink salmon are Ecosystem Components

Preliminary Preferred

Blend of Alternatives 2 and 3

Smith River Chinook separated from CA coastal Chinook (ESA listed);
Rogue coho out of OCN, into SONCC;
CVF, SONC, FNMC Chinook complexes;
Mid-Columbia Spring Chinook, Canadian coho, Chinook and pink salmon are removed from the FMP

CA=California; CR=Columbia River; CVF=Central Valley Fall (Chinook); ESA=Endangered Species Act FNMC=Far-North Migrating Coastal (Chinook); FMP=Fishery Management Plan; EC=Ecosystem Components; Mid-C Sp=Mid-Columbia River spring (Chinook); OCN=Oregon Coastal Natural (coho); OR=Oregon; PST=Pacific Salmon Treaty; SONC=Southern Oregon Northern California (Chinook); SONCC=Southern Oregon Northern California Coastal (coho); URB=Upriver Bright (Chinook); WA=Washington

Stock Complexes and Indicator Stocks: Page 14

Alternative 1 - Status Quo

Seven Chinook and four coho complexes currently identified in the FMP
Indicator stocks are all non-ESA natural stocks with defined conservation objectives

Alternative 2 – Preliminary Preferred

Three Complexes

CVF, SONC, FNMC Chinook complexes;
CVF Indicator: SRFC
SONC Indicator: KRFC
FNMC Indicators: Grays Harbor, Queets, Hoh, Quillayute fall, and Hoko summer/fall

Alternative 3

Four Complexes

CVF, SONC, FNMC, Mid-C Sp Chinook complexes;
CVF Indicator: SRFC
SONC Indicator: KRFC
Mid-C Sp Indicator: undefined
FNMC Indicators: Grays Harbor, Queets, Hoh, Quillayute fall, and Hoko summer/fall

International Exceptions: Page 17

Alternative 1 - Status Quo

None Specified

Alternative 2 - Preliminary Preferred

Non-ESA PST stocks

Chinook: URB, CR Summers, FNMC, Canadian;
Coho: WA Coastal, Puget Sound, Canadian;
Pink: Puget Sound

Alternative 3

Non-EC PST stocks

Chinook: CR Summers, FNMC;
Coho: WA Coastal, Puget Sound

CA=California; CR=Columbia River; CVF=Central Valley Fall (Chinook); ESA=Endangered Species Act FNMC=Far-North Migrating Coastal (Chinook); FMP=Fishery Management Plan; EC=Ecosystem Components; Mid-C Sp=Mid-Columbia River spring (Chinook); OCN=Oregon Coastal Natural (coho); OR=Oregon; PST=Pacific Salmon Treaty; SONC=Southern Oregon Northern California (Chinook); SONCC=Southern Oregon Northern California Coastal (coho); URB=Upriver Bright (Chinook); WA=Washington

Status Determination Criteria for Overfishing, Overfished, Approaching Overfished, and Rebuilt: Pages 21, 94, 118

Alternative 1 - Status Quo: Page 21

SDC Not explicit in FMP
Overfishing: STT Assessment
Overfished: STT Assessment, Overfishing Concern triggered (3 consecutive years < objective)
Approaching Overfished: 2-years below conservation objective and Conservation Alert triggered
Rebuilt: Spawning escapement > conservation objective (single year) or rebuilding plan

Alternatives 2 & 2b: Page 24

Single-year; MSST = 0.5* S_{MSY} (Alt 2) & 0.75* S_{MSY} (Alt 2b)
Overfishing: Exploitation rate >F_{MSY}
Overfished: Spawning Escapement < MSST
Approaching Overfished: Projected spawning escapement < MSST
Rebuilt: Spawning Escapement > S_{MSY}

Alternative 3 - Preliminary Preferred: Page 27

3-year Geometric Mean; MSST = 0.5*S_{MSY} (Alt 3)
Overfishing: Exploitation rate >F_{MSY} (single-year)
Overfished: 3-year Geometric Mean Spawning Escapement < MSST
Approaching Overfished: Recent 2-year and projected Geometric Mean spawning escapement < MSST
Rebuilt: 3-year Geometric Mean spawning Escapement > S_{MSY}

Alternatives 3b and 3c: Page 29

3-year Geometric Mean; MSST =0.75* S_{MSY} (Alt 3b) & 0.86* S_{MSY} (Alt 3c)
Overfishing: Exploitation rate >F_{MSY} (single-year)
Overfished: 3-year Geometric Mean Spawning Escapement < MSST
Approaching Overfished: Recent 2-year and projected Geometric Mean spawning escapement < MSST
Rebuilt: 3-year Geometric Mean spawning Escapement > S_{MSY}

Alternatives 4 and 4b: Page 29

3-year Arithmetic Mean; MSST = 0.5* S_{MSY} (Alt 4) & 0.75* S_{MSY} (Alt 4b)
Overfishing: Exploitation rate >F_{MSY} (single-year)
Overfished: 3-year arithmetic mean Spawning Escapement < MSST
Approaching Overfished: Recent 2-year and projected arithmetic mean spawning escapement < MSST
Rebuilt: 3-year arithmetic mean spawning Escapement > S_{MSY}

F_{ABC}=Acceptable Biological Catch Exploitation Rate; F_{MSY} Maximum Sustainable Yield Exploitation Rate; MSST=Minimum Stock Size Threshold; SDC=Status Determination Criteria; S_{MSY}=Maximum Sustainable Yield Spawning Escapement; STT=Salmon Technical Team

OFL, ABC, and ACL Specification: Pages 36, 39, 106, 120

Alternative 1 - Status Quo: Page 38

Not Defined in FMP

None Specified

Alternative 2: Page 43

Catch-Based (C-Based)

OFL: F_{MSY}*N
ABC: F_{ABC}*N: F_{ABC} =F_{MSY}*0.95 (Tier 1 stocks; KRFC) or F_{ABC} =F_{MSY}*0.90 (Tier 2 stocks; SRFC)
ACL: F_{ABC} *N

Alternative 3: Page 47

Spawning escapement-Based (S-Based)

OFL: (1-F_{MSY})*N
ABC: (1- F_{ABC})*N: F_{ABC} =F_{MSY}*0.95 (Tier 1 stocks; KRFC) or F_{ABC} =F_{MSY}*0.90 (Tier 2 stocks; SRFC)
ACL: (1- F_{ABC})*N

Alternative 3b - Preliminary Preferred: Page 53

S-Based with 35,000 management objective for KRFC

Same as Alternative 3 except the harvest control rule would use 35,000 natural area adult spawners rather than S_{MSY} for and annual management objective for KRFC

ACL=Annual Catch Limit; ACT=Annual Catch Target; AM=Accountability Measure; N=Annual Abundance; OFL=Overfishing Limit; F_{ABC}=Acceptable Biological Catch Exploitation Rate; F_{MSY} Maximum Sustainable Yield Exploitation Rate; FMP=(Salmon) Fishery Management Plan; KRFC=Klamath River Fall Chinook; S/R=Stock/Recruitment (analysis); SRFC = Sacramento River Fall Chinook

Accountability Measures: Pages 60, 64, 108, 126

Alternative 1 - Status Quo: Page 61

Identify FMP Measures as AM
No current FMP measures specified as AM.

Alternative 2 - Preliminary Preferred: Page 62

Modify Overfishing Criteria and Identify Other FMP Measures as AM
Target Conservation Objective except at high (ACL) or low (*de minimis*) abundance;
Rename Overfishing Concern to Abundance Alert (delete assessment requirements, retain notification requirements);
Increase flexibility to implement *de minimis* fisheries under Conservation Alert (delete fishery closure requirement, retain notification requirements);
Retain other current FMP measures;
Reevaluate ACL if exceeded more than 1 in 4 years: Uncertainty tiers, S/R update, Methodology Review process;
Consider ACT

Alternative 3: Page 63

Replace Overfishing Criteria and Identify Other FMP Measures as AM
Target Conservation Objective except at high (ACL) or low (*de minimis*) abundance
Eliminate Conservation Alert, Overfishing Concern and associated actions;
Retain other current FMP measures;
Reevaluate ACL if exceeded more than 1 in 4 years: Uncertainty tiers, S/R update, Methodology Review process;
Consider ACT

ACL=Annual Catch Limit; ACT=Annual Catch Target; AM=Accountability Measure; N=Annual Abundance; OFL=Overfishing Limit; F_{ABC}=Acceptable Biological Catch Exploitation Rate; F_{MSY} Maximum Sustainable Yield Exploitation Rate; FMP=(Salmon) Fishery Management Plan; KRFC=Klamath River Fall Chinook; S/R=Stock/Recruitment (analysis); SRFC = Sacramento River Fall Chinook

De minimis Fishing Provisions[a/]: Pages 67, 108, 121

Alternative 1 - Status Quo: Page 68

SRFC: 0% SRR below 122K
KRFC: A-15; 10% Age-4 Ocean Impact Rate (~25% SRR) between 47K and 30K, less below 30K
US v Wash, Hoh v Baldrige: No Change

Alternative 2: Page 69

No fishing below midpoint of S_{MSY}-MSST

SRFC: 25% SRR between 162.7K and 122K, 0% at 91.5K
KRFC: 25% SRR between 54.3K and 40.7K, 0% at 30.5K
US v Wash, Hoh v Baldrige: No Change

Alternative 2b: Page 67

No fishing below midpoint of S_{MSY}-MSST; KRFC management objective = 35K

SRFC: 25% SRR between 162.7K and 122K, 0% at 91.5K
KRFC: 25% SRR between 46.7K and 40.7K, 0% at 30.5K
US v Wash, Hoh v Baldrige: No Change

Alternative 3: Page 70

No fishing below MSST

SRFC: 25% SRR between 162.7K and 81.3K, 0% at 61K
KRFC: 25% SRR between 54.3K and 27.1K, 0% at 20.35K
US v Wash, Hoh v Baldrige: No Change

Alternative 3b: Page 70

No fishing below MSST: KRFC management objective = 35K

SRFC: 25% SRR between 162.7K and 81.3K, 0% at 61K
KRFC: 25% SRR between 46.7K and 27.1K, 0% at 20.35K
US v Wash, Hoh v Baldrige: No Change

Alternative 4: Page 70

No fishing below 1/2 of MSST

SRFC: 25% SRR between 162.7K and 40.7K, 0% at 30.5K
KRFC: 25% SRR between 54.3K and 13.6K, 0% below 10.2K
US v Wash, Hoh v Baldrige: No Change

Alternative 5 - Preliminary Preferred: Page 70

No defined structure for reducing F below 25% when below midpoint of S_{MSY} and MSST; KRFC management objective = 35K

SRFC: 25% SRR between 162.7K and 91.5K, F < 25% below 91.5K
KRFC: 25% SRR between 46.7K and 30.5K, F < 25% below 30.5K
US v Wash, Hoh v Baldrige: No Change

a/ Stock specific abundance levels identified represent approximate examples under the assumption that MSST=0.5*S_{MSY} unless otherwise noted. For the purpose of implementing *de minimis* fishing provisions Cape Falcon will be the northern limit for impacts counted toward SRFC and KRFC allowable F.

F=Exploitation Rate; K=Thousands; MSST=Minimum Stock Size Threshold; KRFC=Klamath River Fall Chinook; S_{MSY}=Maximum Sustainable Yield Spawning Escapement; SRFC=Sacramento River Fall Chinook; SRR=Spawner Reduction Rate (Adult Equivalent Exploitation Rate)

Agenda Item C.1.b
SAC Report 1
June 2011

PUBLIC REVIEW DRAFT ENVIRONMENTAL ASSESSMENT

FOR

PACIFIC COAST SALMON PLAN AMENDMENT 16: CLASSIFYING STOCKS, REVISING STATUS DETERMINATION CRITERIA, ESTABLISHING ANNUAL CATCH LIMITS AND ACCOUNTABILITY MEASURES, AND DE MINIMIS FISHING PROVISIONS

PREPARED BY
THE AD HOC SALMON AMENDMENT COMMITTEE

MAY 2011

Table of Contents

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table of Contents (continued)

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List of Tables

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List of Figures

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

List of Acronyms

ABC	acceptable biological catch
ACL	annual catch limit
AEQ	adult equivalent (exploitation rate [ER])
AM	accountability measure
ACT	annual catch target
BO	biological opinion
C	catch (based reference points)
CA ESA	California (salmon stocks listed under the) Endangered Species Act
CAN	Canadian (coho, Chinook, or pink salmon)
CA/S OR C	California/Southern Oregon Coast (Chinook)
CFR	Code of Federal Regulations
CR ESA	Columbia River (salmon stocks listed under the) Endangered Species Act
CR F	Columbia River fall (upper river bright Chinook)
CR S	Columbia River summer (Chinook)
CVF	Central Valley fall (Chinook complex)
CWT	coded-wire tag
CZMA	Coastal Zone Management Act
EA	Environmental Assessment
EC	Ecosystem Component
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ER	exploitation rate
ESA	Endangered Species Act
ESU	evolutionarily significant unit
F	fishing mortality rate (instantaneous)
FMP	Fisheries Management Plan
FNM	far-north migrating
FNMC	far-north migrating coastal (Chinook complex)
FONSI	Finding Of No Significant Impacts
GM	geometric mean
HAT	Hatchery (origin salmon stocks)
HC	Habitat Committee
IRFA	Initial Regulatory Flexibility Analysis
KOHM	Klamath Ocean Harvest Model
KRFC	Klamath River fall Chinook
MEW	Model Evaluation Workgroup
MFMT	maximum fishery mortality threshold
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Act
MSP	maximum sustained production
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS1Gs	National Standard 1 Guidelines
NWFSC	Northwest Fisheries Science Center

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

List of Acronyms (continued)

NWR	Northwest Region
OCN	Oregon Coast Natural
ODFW	Oregon Department of Fish and Wildlife
OFL	overfishing limit
OR C	Oregon Coast
OY	optimum yield
PFMC	Pacific Fishery Management Council (Council)
PPA	Preliminary Preferred Alternative
PS	Puget Sound
PS ESA	Puget Sound (salmon stocks listed under the) Endangered Species Act
PST	Pacific Salmon Treaty
RIR	Regulatory Impact Review
S	spawning escapement
SAC	(Ad Hoc) Salmon Amendment Committee
SAFE	Stock Assessment Fishery Evaluation
SAS	Salmon Advisory Subpanel
SDC	status determination criteria
Secretary	U.S. Secretary of Commerce
SEIS	Supplemental Environmental Impact Statement
SHM	Sacramento Harvest Model
SI	Sacramento Index (of abundance)
SJFC	San Joaquin River fall Chinook
SONC	Southern Oregon-Northern California (Chinook Complex)
SONCC	Southern Oregon-Northern California Coastal (coho ESU)
SRFC	Sacramento River fall Chinook
SSC	Scientific and Statistical Committee
STT	Salmon Technical Team
SWFSC	Southwest Fisheries Science Center
SWR	Southwest Region
VEWG	Vulnerability Evaluation Work Group
WA C	Washington Coast (coho)
WA/CR Sp/S	Washington/Oregon spring/summer (Chinook)
WA/OR S/F	Washington/Oregon summer/fall (Chinook)
WOC	Washington, Oregon, and California

EXECUTIVE SUMMARY

The purpose of the proposed action is to provide a framework for specifying biological and management reference points and AMs that will meet the requirements of the revised MSA and NS1Gs to account for uncertainty in the fishery management process, reduce the probability of overfishing, and include clear and objective status determination criteria (SDC), while integrating with existing management processes and capabilities to the degree possible.

This action is needed to bring the Salmon FMP into compliance with new requirements to end and prevent overfishing in the MSA, as amended in 2007, and to address the corresponding 2009 revised NS1Gs (CFR § 600.310). The MSA now requires specification of ABC, ACLs, and AMs. The NS1Gs establish a detailed framework that integrates the existing and new biological reference points and AMs. In addition, the proposed action needs to revise SDC and associated actions of the current status determination criteria (SDC) in the Salmon FMP to make them consistent with the NS1Gs and to address issues with ambiguity, timeliness, and implementation of annual management measures.

Specifically the proposed action needs to:

- Classify salmon stocks in the FMP as "in the fishery" or as "ecosystem components";
- Identify the salmon stocks for which the international exception to MSA 303(a)(15) (specification of ACLs and AMs) will apply;
- Revise the SDC for overfishing, overfished, approaching overfished, and rebuilt to be "measurable and objective" as required by the MSA, and establish maximum fishing mortality threshold (MFMT) and minimum stock size threshold (MSST) reference points used for status determinations;
- Establish a framework for the specification of the following reference points: overfishing limit (OFL), ABC (with a corresponding ABC control rule), ACL, and possibly annual catch target (ACT);
- Establish AMs to prevent the ACL from being exceeded, where possible, and establish AMs to address overages of the ACL;
- Explain how and why "flexibility" in the application of the NS1Gs will be applied in the Salmon FMP;
- Clarify any discrepancies with current "exceptions" as identified in the Salmon FMP with new terminology of the MSA; and
- Integrate, to the extent possible, existing management processes and capabilities.

Classification Issues

The first step in the classification process is to determine which stocks are still in need of conservation and management measures in Council-area fisheries; these stocks will be classified as "in the fishery" Examples of target stocks in Council-area fisheries are hatchery stocks and productive natural stocks with ocean distributions primarily within the Council area. Non-target salmon stocks include ESA-listed stocks or depressed natural stocks (e.g., Strait of Juan de Fuca coho).

Stocks currently in the FMP that are not recommended to be classified as "in the fishery" can either be omitted altogether, if determined not to be in need of conservation and management measures; or can be classified as Ecosystem Components (ECs). ECs do not require specification of reference points for SDC or ACLs.

Stock complexes are groups of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impacts of management actions on the stocks are similar. Stock complexes may be formed to facilitate management requirements such as setting ACL, or determining stock status.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

The Magnuson Stevens Act (MSA) provides that stocks subject to an international agreement may be excepted from ACL and AM requirements, but still must have all other MSA Section 303(a) requirements, including specification of SDC and MSY.

Table ES-1. Alternatives for stock classification, stock complexes, and application of the international exception for specifying annual catch limit and accountability measures.

Classification	Stock Category	Alternative 1: Status Quo	Alternative 2	Alternative 3
In the Fishery	Individual Stocks	45 Chinook stocks, 21 coho stocks, and 2 pink stocks currently identified in Table 3-1 of the FMP	46 Chinook stocks, 21 coho stocks, and 2 pink stocks separating Smith River Chinook from Eel, Mattole, Mad Rivers (California Coastal ESU	32 Chinook stocks, 21 coho stocks, and 2 pink stocks: separating Smith River Chinook from Eel, Mattole, Mad Rivers (California Coastal ESU)
	Stock Complexes	7 Chinook and 4 coho complexes currently identified in Table 3-1 of the FMP	3 Chinook complexes: • Central Valley Fall • Southern Oregon/Northern California • Far North Migrating Coastal	4 Chinook complexes: • Central Valley Fall • Southern Oregon/Northern California • Far North Migrating Coastal • Mid-Columbia Spring
	ESA-listed	9 Chinook and 4 coho ESUs currently identified in Table 3-1 of the FMP	9 Chinook and 4 coho ESUs currently identified in Table 3-1 of the FMP	9 Chinook and 4 coho ESUs currently identified in Table 3-1 of the FMP
	Hatchery Stocks	5 Chinook and 6 coho stocks currently identified in Table 3-1 of the FMP	5 Chinook and 6 coho stocks currently identified in Table 3-1 of the FMP	5 Chinook and 6 coho stocks currently identified in Table 3-1 of the FMP
	Exploitation Rate Exceptions	14 Chinook stocks (not ESA-listed or hatchery) currently identified in Table 3-1 of the FMP	NA	NA
	International Exceptions to ACLs and AMs	NA	14 Chinook and 11 coho stocks (not ESA-listed or hatchery) identified in the Pacific Salmon Treaty	1 Chinook and 11 coho stocks (not ESA-listed or hatchery) identified in the Pacific Salmon Treaty
Not In The Fishery	Ecosystem Component Stocks	NA	None	14 Chinook stocks (FNM) and 2 pink stocks (not ESA-listed or hatchery)

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Status Determination Criteria

SDC will be applied to natural stocks for which specification of these reference points is appropriate and possible based on the best available science. SDC will continue to be applied to and specified only for individual stocks, not stock complexes. The status of other stocks in a complex will not change as a result of indicator stock status changes. Stocks managed under an international agreement can be excepted from specification of ABC and ACL reference points, but are still required to have MSY and SDC specified.

The proposed SDC alternatives incorporate the reference points identified in the NS1Gs (e.g., F_{MSY}, MFMT, MSST). However, the proposed definitions of some of these references points differ slightly from those in the NS1Gs to accommodate the life history of Pacific salmon, where reproduction is semelparous and a stock's full reproductive potential can be spread out over a multi-year period. These modified approaches are proposed in accordance with the provision allowing for flexibility in the application of the NS1Gs.

Table ES-2: Overview of SDC alternatives for overfishing, overfished, approaching overfished, and rebuilt (S = Spawning Escapement; C = catch; t = year; GM = Geometric mean)

Status Category	**Alternative 1: Status Quo Determination Based on Three Consecutive Years: MSST = S_{MSY}**	**Alternatives 2 and 2b Determination Based on a Single Year: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (2b)**	**PPA Alternative 3, Determination Based on 3-Year Geometric Mean: MSST = 0.5*S_{MSY}**	**Alternatives 3b and 3c Determination Based on 3-Year Geometric Mean: MSST = 0.75*S_{MSY} (3b) or 0.86*S_{MSY} (3c)**	**Alternative 4 and 4b Determination Based on 3-Year Arithmetic Mean: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (4b)**
Overfishing	S(t,t-1,t-2)<MSST and C(t,t-1,t-2) > MSST-S(t,t-I,t-2) i.e. fishing contributed to triggering Overfishing Concern	F > MFMT in one year, with MFMT = F_{MSY}. F used is most recently available postseason value.	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis
Overfished	S(t,t-1,t-2)<MSST Current NMFS interpretation of Overfishing Concern as defined in FMP.	S < MSST in one year. S used is most recently available postseason value.	GM(S) < MSST over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S) < MSST over three year period. S used are 3 most recently available postseason values.
Approaching overfished	S(t-1,t-2)<MSST and S(t) forecast < MSST	S < MSST in one year. S used is current preseason forecast.	GM(S) < MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S)< MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Rebuilt	S > S_{MSY} in one year or as otherwise determined in rebuilding plan. S used is most recently available postseason value.	S ≥ S_{MSY} in one year. S used is most recently available postseason value.	GM(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3	0(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.

The status categories for overfished, approaching overfished, and rebuilt within each alternative should be considered together, given the need to have comparable metrics among these abundance-based SDC.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Table ES-3. Status determination criteria reference points for coho stocks.

Coho Stock	S_{MSY}		MFMT (F_{MSY})		MSST			
	Est	Basis	Est	Basis	Alt 1 Status Quo Cons Obj	Alt 2, 3, & 4 $0.5*S_{MSY}$	Alt 2b, 3b & 4b $0.75*S_{MSY}$	Alt 3c $0.86*S_{MSY}$
CCC – ESA Endangered	Unk	NA	Unk	NA	0.0 HR in CA: ESA BO	Unk	Unk	Unk
SONCC – ESA Threatened	Unk	NA	Unk	NA	0.13 Ocean ER: ESA BO	Unk	Unk	Unk
OCN – ESA Threatened	Unk	NA	Unk	NA	0.08-0.45 ER: ESA BO	Unk	Unk	Unk
LCN – ESA Threatened	Unk	NA	Unk	NA	Ocean & MS CR ER: ESA BO	Unk	Unk	Unk
Columbia River Late - Hatchery	14,100	TAC	UnDef	NA		NA	NA	NA
Columbia River Early - Hatchery	7,100	TAC	UnDef	NA	7,100	NA	NA	NA
Willapa Bay - Hatchery	6,100	WDFW	UnDef	NA	6,100	NA	NA	NA
Quinault - Hatchery	??	QIN?	UnDef	NA	??	NA	NA	NA
Quillayute Summer - Hatchery	300	WDFW	UnDef	NA	300	NA	NA	NA
S. Puget Sound - Hatchery	52,000	WDFW	UnDef	NA	52,000	NA	NA	NA
Grays Harbor	24,426	S_{MSP} (FMP) $*F_{SMY}$ (App C	0.69	App E	35,400	12,213	18,320	21,007
Queets	5,500	App E	0.68	App E	5,800-14,500	1,125	4,125	4,730
Hoh	2,250	App E	0.69	App E	2,000-5,000	1,125	1,688	1,935
Quillayute Fall	5,873	App E	0.59	App E	6,300-15,800	2,937	4,405	5,051
Strait of JdF	10,978	FMP	0.60	FMP	7,007	5,489	8,234	9,442
Hood Canal	14,350	FMP	0.65	FMP	10,750	7,175	10,762	12,340
Skagit	25,000	FMP	0.60	FMP	14,875	12,500	18,750	21,500
Stillaguamish	10,000	FMP	0.50	FMP	6,100	5,000	7,500	8,600
Snohomish	50,000	FMP	0.60	FMP	31,000	25,000	37,500	43,000
Coastal Stocks	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA
Fraser River	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Table ES-4. Status determination criteria reference points for Chinook stocks.

Chinook Stock	S_{MSY} Est	S_{MSY} Basis	MFMT (F_{MSY}) Est	MFMT (F_{MSY}) Basis	MSST Alt 1 Status Quo Cons Obj	MSST Alt 2, 3, & 4 $0.5*S_{MSY}$	MSST Alt 2b, 3b & 4b $0.75*S_{MSY}$	MSST Alt 3c $0.86*S_{MSY}$
Sacramento River Winter – ESA Endangered	Unk	NA	Unk	NA	Time/Area restrictions in CA: ESA BO	Unk	Unk	Unk
Sacramento River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Northern California Coast (Eel, Mattole, Mad Rivers) -ESA Threatened	Unk	NA	Unk	NA	≤ 0.16 Ocean Age-4 KRFC ER: ESA BO	Unk	Unk	Unk
Upper Willamette Spring – ESA Threatened	Unk	NA	Unk	NA	≤ 0.15 FW ER: ESA BO	Unk	Unk	Unk
Lower Columbia River (LCR) Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.37 Wild Tule ER: ESA BO	Unk	Unk	Unk
North Fork Lewis Fall – Part of LCR ESU	5,700 5,791	FMP CTC	0.76	CTC	5,700: ESA BO	Unk	Unk	Unk
Snake River Fall Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.70 Base Period ER: ESA BO	Unk	Unk	Unk
Snake River Sp/Su Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.055 to 0.17 FW ER: ESA BO	Unk	Unk	Unk
Upper Columbia River Spring Chinook – ESA Endangered	Unk	NA	Unk	NA		Unk	Unk	Unk
Eastern Strait of Juan de Fuca Su/F – ESA Threatened	Unk	NA	Unk	NA	Comp. Chinook ER: ESA 4(d) Rule	Unk	Unk	Unk
Skokomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Nooksack Sp/early Fall – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit - Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit Sp – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Stillaguamish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Snohomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Cedar River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
White River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Green River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Chinook Stock	S_{MSY} Est	S_{MSY} Basis	MFMT (F_{MSY}) Est	MFMT (F_{MSY}) Basis	MSST Alt 1 Status Quo Cons Obj	MSST Alt 2, 3, & 4 $0.5*S_{MSY}$	MSST Alt 2b, 3b & 4b $0.75*S_{MSY}$	MSST Alt 3c $0.86*S_{MSY}$
Nisqually River Su/F – ESA Threatened	Unk	NA	Unk	NA	1,100: ESA 4(d) Rule	Unk	Unk	Unk
Lower Columbia River Fall - Hatchery	15,400	TAC	UnDef	NA	15,400	NA	NA	NA
Lower Columbia River Spring - Hatchery	2,700	TAC	UnDef	NA	2,700	NA	NA	NA
Mid-Columbia River Bright Fall - Hatchery	Unk	TAC	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Spring Creek Fall-Hatchery	7,000	TAC	UnDef	NA	7,000	NA	NA	NA
Willapa Bay Fall-Hatchery	8,200	WDFW	UnDef	NA	8,200	NA	NA	NA
Quinault Fall–Hatchery	Unk	QIN	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Sacramento Fall	122,000	Lower	0.78	App C	122,000	61,000	91,500	104,920
Klamath River Fall	40,700	STT	0.71	STT	35,000 spawner floor: FMP	20,350	30,525	35,000
Smith River Fall	UnDef	NA	0.78	App C	UnDef	UnDef	UnDef	UnDef
Southern Oregon	150,000 to 200,000	FMP	0.78	App C	>60 spawners/ mi: FMP	UnDef	UnDef	UnDef
Central and Northern Oregon		FMP	0.78	App C		UnDef	UnDef	UnDef
Klickitat, Warms Springs, John Day and Yakima River - Spring	Unk	FMP	Unk	NA	<1% ocean impact rate	Unk	Unk	Unk
Upper River Bright - Fall	39,625	CTC	0.86	CTC	<4% ocean impact rate	Unk	Unk	Unk
Upper River - Summer	12,143	CTC	0.75	CTC	<2% ocean impact rate	Unk (6,072)	Unk (9,107)	Unk (10,443)
Willapa Bay - Fall	4,350 (MSP)	WDFW	0.78	App C	Unk	Unk	Unk	Unk
Grays Harbor Fall	14,600 (MSP)	WDFW	0.78	App C	Unk	Unk	Unk	Unk
Grays Harbor Spring	1,400 (MSP)	FMP	0.78	App C	Unk	Unk	Unk	Unk
Queets - Fall	2,500	FMP	0.78	App C	Unk	Unk	Unk	Unk
Queets – Sp/Sur	700	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoh - Fall	1,200	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoh Sp/Su	900	FMP	0.78	App C	Unk	Unk	Unk	Unk
Quillayute - Fall	3,000	FMP	0.78	App C	Unk	Unk	Unk	Unk
Quillayute - Sp/Su	1,200	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoko -Su/F	850	FMP	0.78	App C	Unk	Unk	Unk	Unk
Coastal Stocks	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA
Fraser River	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Annual Catch Limits

Alternatives for specification of OFL, ABC, and ACL reference points will be made on an individual stock basis for all stocks as required based on the best available science. These reference points will not be specified for any stocks that are identified in the FMP as EC species or stocks that are internationally managed. These reference points will not be specified for hatchery stocks and ESA-listed stocks identified in the FMP, consistent with the NS1Gs, which provide the flexibility to consider alternative approaches for specifying ACLs and AMs.

Based on stock classification Alternatives 2 and 3, the relevant stocks for specifying OFL/ABC/ACL reference points are Sacramento River fall Chinook (SRFC) and Klamath River fall Chinook (KRFC) as indicator stocks for the CVF and SONC Chinook complexes, respectively. It is possible that South Oregon Coast Chinook, or some stock components thereof, may also support specification of these reference points after implementation of this FMP amendment. These stocks could then serve either as additional indicator stocks for the SONC complex, form an independent complex, or be managed as individual stocks. Other stocks classified as in the fishery are either included in the CVF or SONC Chinook complexes, or are not required to have ACLs specified because of the international management exception

Alternatives 2, 3, and PPA 3b specify OFL and ABC on the basis of exploitation rate (i.e., F_{MSY} and F_{ABC}) and abundance for each stock. F_{MSY} and F_{ABC} are defined in terms of total exploitation rate across all salmon fisheries (Federal and nonfederal jurisdictions). Impacts in non-salmon fisheries are included in the natural mortality assumptions used to estimate population parameters for salmon stocks; therefore, all fishing mortality sources are accounted for when reference points are specified. Current conservation objectives for all FMP-managed stocks can be expressed as exploitation rate control rules, with exploitation rates dependent on stock abundance.

<u>OFL</u>: OFL would be derived from the stock-specific estimate of F_{MSY}, or an F_{MSY} proxy, and abundance. OFL will be expressed in terms of either catch (C) or spawning escapement (S). Stock-specific estimates of F_{MSY} based on spawner-recruit data will be used if available. Otherwise, proxy values based on species-specific meta-analyses, would be used. The derivation of the F_{MSY} proxy value for Chinook (0.78) is shown in Appendix C.

<u>ABC and the ABC Control Rule</u>: ABC will be derived from an ABC control rule. The first step in determining the annual ABC is to specify $F_{ABC.}$ The second step requires applying F_{ABC} to the abundance to derive the annual ABC value expressed in terms of C or S.

F_{ABC} is a constant exploitation rate which is reduced from F_{MSY} by a buffer that accounts for scientific uncertainty. Two tiers of buffers have been established based on the level of scientific uncertainty associated with stocks having different levels of data-richness. Taking such a tiered approach to specification of the ABC is consistent with the NS1Gs[1] and appropriately accounts for the differences in scientific uncertainty among the stocks (Appendix D).

- <u>Tier-1</u>: For stocks that have sufficient data to conduct a stock-specific spawner-recruit analysis, and for which F_{MSY} has been directly estimated, the buffer level is 5 percent ($F_{ABC} = F_{MSY} \times 0.95$).
- <u>Tier-2</u>: For stocks that have not undergone a spawner-recruit analysis, and F_{MSY} has been determined by proxy, the buffer level is 10 percent ($F_{ABC} = F_{MSY} \times 0.90$).

[1] 50 CFR 600.310 (f)(4)

With regard to SRFC, the control rules assume S_{MSY} = 122,000. For SRFC, the most notable difference between status quo and the control rule incorporating the ABC is the specification of the maximum exploitation rate at F_{ABC}. Without the ABC control rule, the target exploitation rate for SRFC continues to increase with increasing abundance, approaching F = 1 as abundance increases. For KRFC, the status quo maximum allowable exploitation rate is 0.67, and application of the ABC control rule results in a minor change in maximum allowable F from 0.67 to 0.68. Under Alternative 3 the control rule for KRFC would target an escapement of 40,700 natural area adult spawners. This would result in a decrease in the allowable exploitation rate over a portion of the range, because of the target spawner escapement level of S_{MSY} = 40,700 instead of the status quo conservation objective (escapement floor) of 35,000. Under PPA 3b, the control rule for KRFC would target an escapement of 35,000 natural area adult spawners.

Table ES-5. Overview of alternatives for OFL, ABC, ACL, ACT, and the associated framework.

Alternatives	OFL	ABC	ACL	ACT[a/]	Framework
1) Status Quo	Not identified	Not identified	Not identified	Not identified	--NA— Current conservation objectives specified not to exceed (S_{MSY})
2) Catch (C) Based	C_{OFL}	C_{ABC}	C_{ACL}	C_{ACT} [a/]	$C_{OFL} > C_{ABC} = C_{ACL} > C_{ACT}$ $C_{OFL}(t) = N(t) \times F_{MSY}$ $C_{ABC}(t) = N(t) \times F_{ABC}$ F_{ABC} = 95% or 90% F_{MSY}[b/]
3) Spawning Escapement (S) Based	S_{OFL}	S_{ABC}	S_{ACL}	S_{ACT} [a/]	$S_{OFL} < S_{ABC} = S_{ACL} < S_{ACT}$ $S_{OFL}(t) = N(t) \times (1-F_{MSY})$ $S_{ABC}(t) = N(t) \times (1-F_{ABC})$ F_{ABC} = 95% or 90% F_{MSY}[b/]

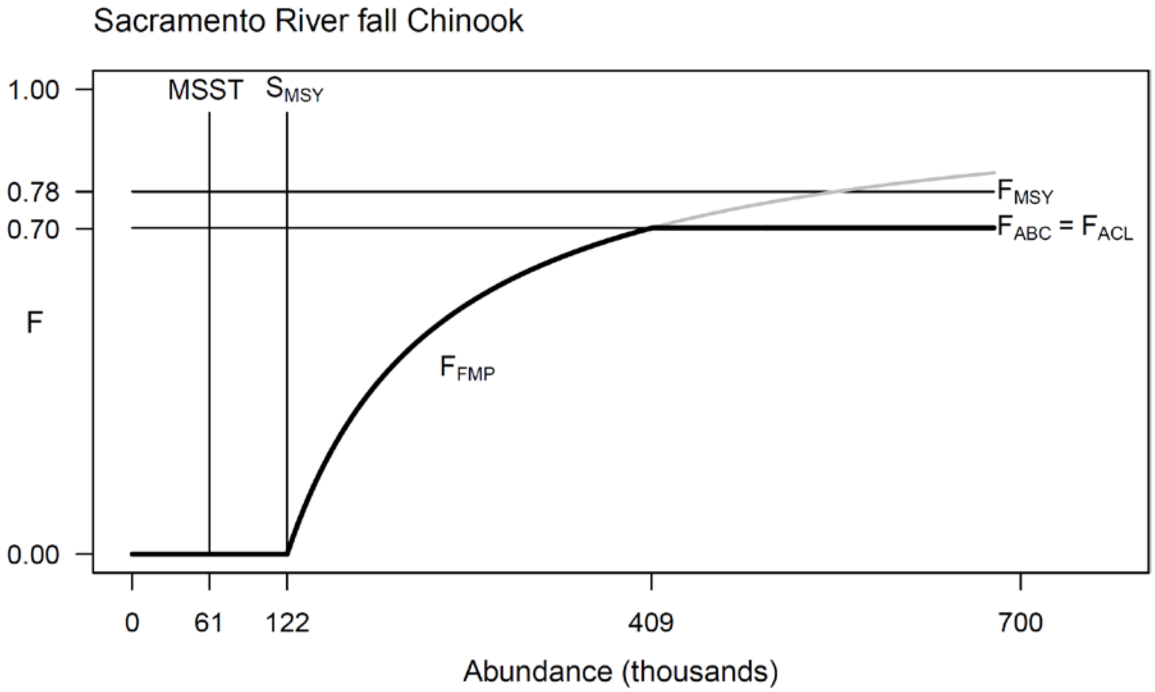
a/ ACT could be used, as needed, but is undefined at this time.

b/ The buffer to account for scientific uncertainty is either 95 percent or 90 percent of F_{MSY}, depending on whether the F_{MSY} value represents a stock-specific estimate (Tier-1) or proxy value (Tier-2), respectively.

In years with low abundance, the C_{ACL} could be specified at a level higher than the conservation objective escapement target. In that situation, the conservation objective escapement target would remain the management target for the fishery. In years with high abundance, the C_{ACL} would be specified at a level less than the catch necessary to reduce abundance to the conservation objective escapement target. In this situation, the fishery would be designed to achieve a catch no more than the C_{ACL} (i.e., less than C allowed to achieve the spawning escapement conservation objective).

In years with low abundance, the S_{ACL} could be specified at a level lower than the conservation objective escapement target. In that situation, the conservation objective escapement target would remain the management target for the fishery. In years with high abundance, the S_{ACL} would be specified at a level that could be greater than the conservation objective escapement target. In that situation, the fishery would be designed to achieve an amount of returning spawners no less than the S_{ACL} (i.e., greater than S specified in the conservation objective).

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California



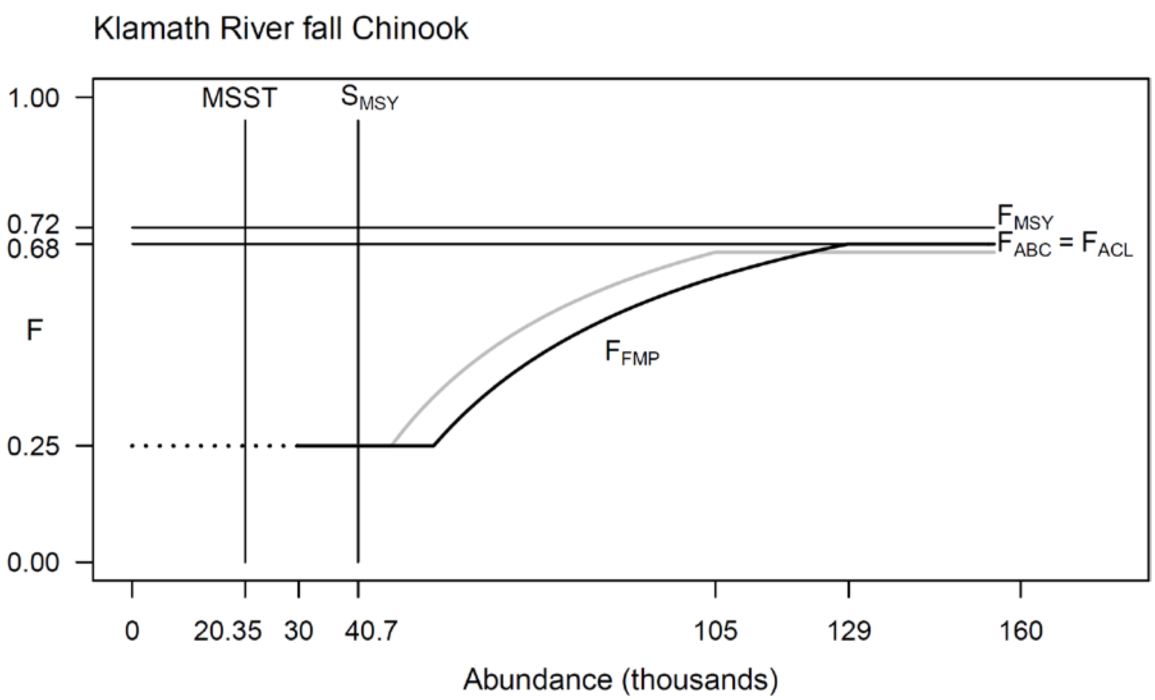


Figure ES-1. Status quo (thick gray line) and Alternative 2 and 3 (thick black line) F-based control rules for SRFC and KRFC. Reference points MSST, S_{MSY}, F_{MSY}, F_{ABC}, and F_{ACL}, are denoted by thin black lines.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Accountability Measures

In addition to ACLs, AMs are required management controls to both prevent ACLs from being exceeded, and to correct or mitigate overages of ACLs if they occur. AMs are intended to minimize the frequency and magnitude of overages of the ACL, and to correct any problems that caused the overage.

A number of current FMP actions meet the intent of AMs. While some of them would not be directly working in combination with an ACL, they are in place to prevent overfishing. However, the "conservation alert" and "overfishing concern" are likely to be modified or replaced, given the proposed new SDC. Therefore, these will need to be eliminated or modified. Alternatives 2 and 3 are similar except for how they treat the conservation alert and overfishing concern. Alternative 2 (described below) retains the triggers but changes the required actions, and changes the name of overfishing concern to abundance alert. Alternative 3 removes both from the FMP entirely.

Alternative 2 In-season (and preseason) AMs

- In-season authority to manage quota fisheries (FMP § 10.1)
- Mixed-stock quota monitoring (FMP § 7.1)
- Quota partitioning (FMP § 5.3 and10.2)
- Quota trading (FMP § 5,3 and 10.2)
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2)
- Boundary modifications (FMP § 6 and 10.2)
- Landing restrictions (FMP § 6), and
- In-season monitoring and reporting requirements. (FMP § 7)
- Conservation alert (FMP § 3.2.2), with modification

  A conservation alert occurs when a stock is projected, during the preseason process, to not meet its conservation objective. The FMP currently requires notification to relevant state, tribal, and Federal managers if a stock is not expected to meet its conservation objective, an assessment of probable causes, and closure of Council-area fisheries impacting the stock. Under this alternative, the only required action would be notification to relevant state, tribal, and Federal managers.

Alternative 2 Post-season AMs

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8)
- Overfishing concern (FMP § 3.2.3), with modification and renaming as **"Abundance Alert"**

  Currently, the FMP defines an overfishing concern as not meeting the conservation objective of a stock for three consecutive years. The FMP does not explicitly associate triggering of an overfishing concern with an "overfished" status determination, although this has been NMFS policy in recent years. As new and/or more explicit SDC are adopted as part of this amendment process, many of the actions currently required when an overfishing concern is triggered will be addressed through other processes. However, preserving the concept of this action as an indicator of a declining trend in stock status or bias in scientific or management methodologies may be desirable. If retained, the indicator should be renamed as an "abundance alert" to avoid any confusion with the formal SDC (i.e., overfishing, overfished, approaching overfished) and modified to remove the formal requirement for an assessment. Additionally, doing so will remove any connotation that fishing is necessarily the cause of a decline in stock abundance.

  Actions associated with this indicator would include, as is currently done, notification to the relevant state, tribal, and Federal managers that a stock may be trending toward a depressed state, and that potential causes should be closely monitored or investigated, particularly with regard to excessive fishing mortality and bias in management models.

- Salmon Methodology Review Process (COP-15; PFMC 2008).

Annual Catch Target (ACT): An ACT may be adopted in any fishing year in which there is increased management uncertainty in the fishery causing increased uncertainty in maintaining compliance with the ACL. The ACT would be specified at a level sufficiently below the ACL to buffer for the management uncertainty it is implemented to address, incorporating uncertainty in the ability to constrain catch for ACL compliance, and uncertainty in quantifying the true catch amounts (i.e., estimation errors)[2].

Re-evaluation of the ACLs and AMs System: The ACL alternatives for the Salmon FMP rely on a postseason evaluation for assessing compliance with ACLs. If the evaluation determines that catch or spawning escapement was not in compliance with the ACL more than once in four consecutive years, the Council will direct the STT to conduct an assessment of the cause. The assessment will include consideration of the tiered buffers used to account for scientific uncertainty, and may include recommendations for changing the buffers to a level that would increase the compliance rate to an appropriate level (e.g., 75 percent compliance rate).

Pending the outcome of the STT re-evaluation of the system of ACLs and AMs, an ACT may be implemented as an interim measure if it was determined that the cause was related to management uncertainty in the fishery and to reduce the likelihood of future non-compliance with the ACL until any new or updated measures are approved. When it is determined that the fishery has been out of compliance with the ACL more than once in four consecutive years, an ACT may be applied to the ABC control rule with an additional 5 percent buffer (in addition to the tiered scientific uncertainty buffers in the ABC control rule). The additional buffer will remain in place until either additional measures are adopted to ensure an appropriate compliance with ACLs, or it has been demonstrated that the buffer is not necessary to achieve an appropriate compliance level.

De Minimis Fishing Provisions

De minimis fishing provisions give more flexibility to the rule-making process when the conservation objectives for limiting stocks are projected not to be met, and provide opportunity to access more abundant salmon stocks that are typically available in the Council management area when the status of one stock may preclude all ocean salmon fishing in a large region. This would reduce the risk of fishery restrictions that impose severe economic consequences to local communities and states. While this action seeks to provide management flexibility in times of scarcity, there is an overriding mandate to preserve the long-term productive capacity of all stocks to ensure meaningful contributions to ocean and river fisheries in the future, and to ensure that the total fishing mortality rate does not exceed F_{MSY}.

Status quo *de minimis* fishing provisions are variable among stocks, and not defined for SRFC. For KRFC, the *de minimis* fishing provision from Amendment 15 to the salmon FMP allows an ocean impact rate of no more than 10 percent on age–4 Klamath River fall Chinook, if the projected natural spawning escapement with a 10 percent age–4 ocean impact rate is between 35,000 and 22,000. If the projected natural escapement is less than 22,000, the Council must further reduce the allowable age– 4 ocean impact rate to reflect the status of the stock. The final rule implementing Amendment 15 states that as escapement falls below approximately 30,000, the impact rate will need to decline automatically.

The general form of *de minimis* alternatives use the F-based control rule, and as stock size declines, the allowable exploitation rate declines from F_{ABC} in order to achieve S_{MSY}, until F = 0.25. A constant exploitation rate of 0.25 is allowed until the point where F must be further reduced in order to achieve a spawner escapement equal to some specified level, defined relative to MSST.

[2] As explained in 50 CFR 600.310(f)(6)(i)

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Alternative 2 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level defined as the midpoint between S_{MSY} and the MSST [(S_{MSY} + MSST)/2].

Alternative 3 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level of MSST.

Alternatives 2b and 3b are similar to Alternatives 2 and 4 except that for KRFC only, the control rule would target the 35,000 natural area spawner floor rather than S_{MSY} (40,700), as is currently done under the status quo alternative.

Alternative 4 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level of one half of MSST (MSST/2).

PPA 5 specifies that as stock size declines, the allowable exploitation rate declines from F_{ABC} until F = 0.25. A constant exploitation rate of 0.25 is allowed until the midpoint between S_{MSY} and MSST, below which F must be further reduced; however, there is no set stock size where F must equal zero. Reduction below F=0.25 would not be structured, but would be in response to year-specific circumstances such as abundance of other stocks, recent spawning escapement performance, in order to achieve a spawner abundance equal to the MSST. PPA 5 would also target the 35,000 natural area spawner floor for KRFC rather than S_{MSY} (40,700).

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

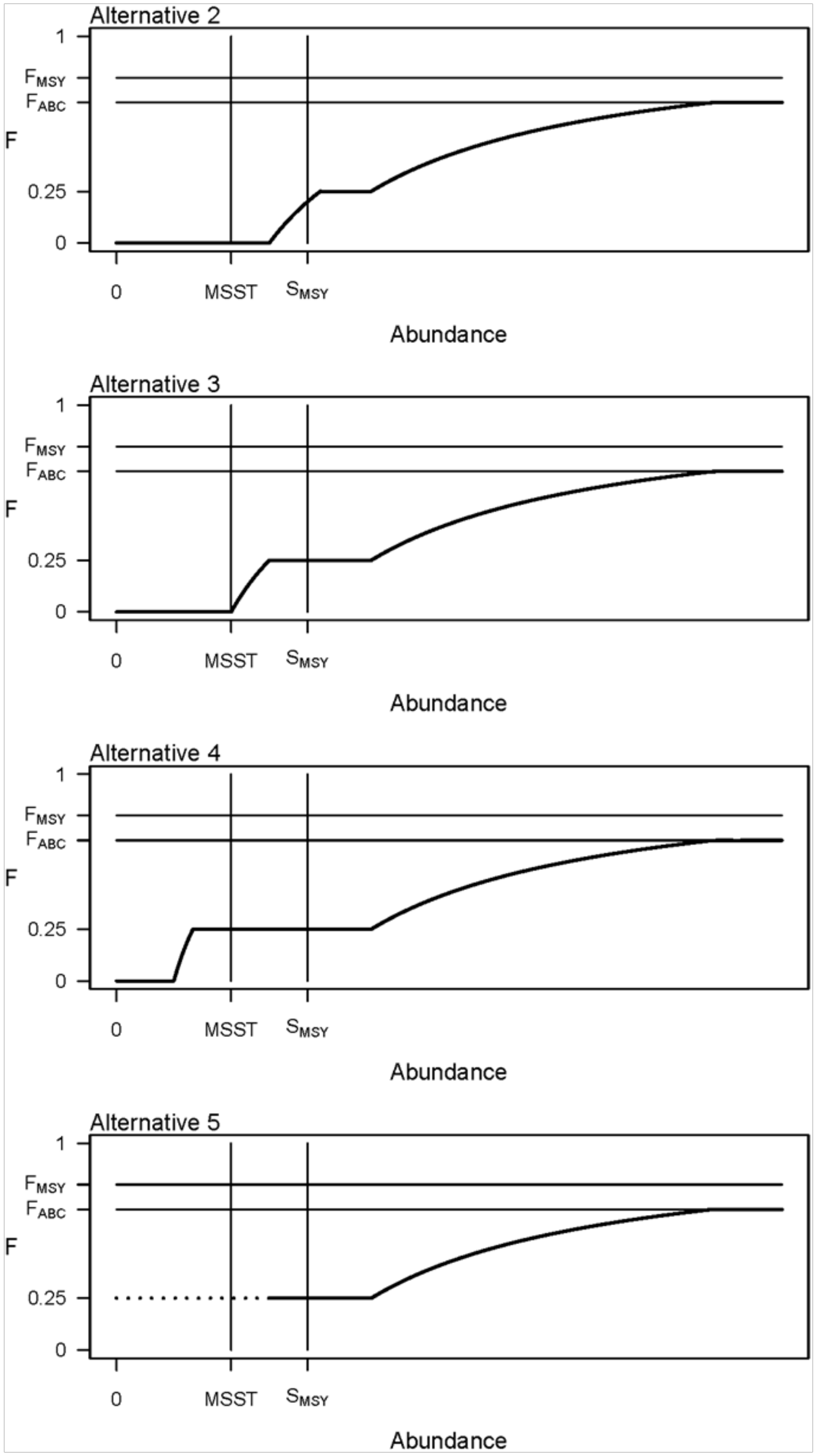


Figure ES-2. *De minimis* fishing Alternatives. Alternative 1 (status quo) is not shown because it is variable among stocks.

Table ES-6. Summary of environmental effects of alternatives.

Alternatives Developed for	Sect.	Table	No. of Alts.	Actions in Alternatives (Alt#)	Biological Impacts in General	Significance of economic Impacts
Stock Classification	2.1	2-1, 2-2, 2-3, 2-4, 2-5, 2-6	Three	Stocks in the fishery or Ecosystem Components Stock Complexes and indicator stocks Stocks subject to the international exception to application of ACLs	Under Alt. 1 all stocks remain in the fishery, no complexes for ACL application, and no international exceptions. Effects not significant Under Alt. 2, Mid-C Sp Chinook and Fraser pinks not in the fishery; Complexes for CVF, SONC, FNMC Chinook; Int. Ex. for PST stocks; No EFH for Mid-C Sp. Effects not significant. Under Alt. 3, Can. Chinook and coho not in the fishery, Mic-C sp, ColR. Fall brights, PS and Fraser pinks are EC; Complexes for CVF, SONC, FNMC, Mid-C Sp Chinook; Int. Ex. for PST stocks; No EFH for EC stocks. Effects not significant.	Not Significant
Status Determination Criteria	2.2	2-7	Eight (*1*, *2/2b*, *3/3b/3c*, *4/4b*)	Different alternatives for the reference points: - Overfishing based on single year exploitation rate Approaching Overfished, Overfished: - Alt 2/2b single year at 50% or 75% of S_{MSY} - Alt 3/3b/3c 3-year geo mean at 50%, 75%, or 86% of S_{MSY} - Alt 4/4b 3-year arith. avg. at 50% or 75% of S_{MSY} Rebuilt: - Alt 2/2b single year at S_{MSY} - Alt 3/3b/3c 3-year geo mean at S_{MSY} - Alt 4/4b 3-year arith. avg. at S_{MSY}	Under Alt. 2, overfishing determination would rarely occur, so negligible impact is expected. Alt. 4 poses greatest risk of negative effects, Alt. 2 the least for overfished SDC. Constraining fisheries to prevent a stock from becoming overfished has a positive effect. A determination of an overfished condition has no direct effects. Overall, the SDC alternatives could mean beneficial or positive impacts in the long-term, but not significant.	Not Significant
OFL/ABC/ACL	2.3		Four 1, 2, 3/ 3b	- Alt. 2 is Catch based (Consistent with NS1G) OFLs, ABLs, ACLs, & ACTs - Alt. 3 is Spawning Escapement-based (currently in place) OFLs, ABCs, ACLs, & ACTs - Alt. 3b is like 3 except KRFC managed for 35,000 rather that 40,700 (S_{MSY}) spawners	For SRFC, there are direct positive effects with Alt. 2&3, given they would limit the exploitation rate to less than F_{MSY}. For KRFC, the effect is small or negligible. Alt 3b would have long-term negative effects on KRFC, but not significant.	Not Significant
AMs	2.4		Three	- Alt. 2: Issue "Abundance or conservation alerts" to managers - Alt. 3: New SDC will replace current conservation alerts and overfishing concerns - In-season and post-season reporting on catch and escapement - ACT can be adopted, if needed, and kept below ACL to buffer against uncertainties. A buffer rate of 5% is suggested..	AMs would have negligible impacts, not significant.	Not Significant

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; CVF-Central Valley fall F-fishing mortality rate; FNMC-Far-north migrating coastal; KRFC-Klamath River Fall Chinook; MFMT-maximum fishery mortality threshold; Mid-C Sp-Mid Columbia spring; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SRFC-Sacramento River fall Chinook; SONC-Southern Oregon Northern California

***De Minimis* fishing provisions**	2.5		Seven (*1, 2/2b, 3, 4/4b, 5*)	*De minimis* exploitation rates of 25% for SRFC and KRFC Alt 2 – F=0 at S_{MSY}-MSST midpoint Alt 3 - F=0 at MSST Alt 4 – F=0 at ½ MSST Alt 5 – F< 25% at S_{MSY}-MSST midpoint. Alts. 2b, 3b, and 5 - KRFC managed for 35,000 rather that 40,700 (S_{MSY}) spawners	No significant impacts from de minimis alternatives, but long-term negative impacts to KRFC from Alts. 2b, 3b, and 5.	None or NS Will be assessed separately based on results of a supplemental analysis on *de minimis* fishing alternatives

Note: NS = Not significant; Although there could be some positive or negative economic impacts associated to different amendment alternatives relative to status quo, the economic significance would be none or not significant, i.e., the value of change expected to be much less than $100 million to the case of the West Coast salmon fishing industry under PFMC.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; CVF-Central Valley fall F-fishing mortality rate; FNMC-Far-north migrating coastal; KRFC-Klamath River Fall Chinook; MFMT-maximum fishery mortality threshold; Mid-C Sp-Mid Columbia spring; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SRFC-Sacramento River fall Chinook; SONC-Southern Oregon Northern California

1.0 INTRODUCTION

The reauthorization of the Magnuson-Stevens Act (MSA) in 2006 established new requirements to end and prevent overfishing through the use of annual catch limits (ACLs) and accountability measures (AMs). The reauthorization also contained new requirements for the Scientific and Statistical Committee (SSC) to recommend acceptable biological catch (ABC) levels to the Council. On January 16, 2009, National Marine Fisheries Service (NMFS) published amended guidelines for National Standard 1 (NS1Gs) to provide guidance on how to comply with new provisions of the MSA. In order to comply with these new requirements and guidelines, the Salmon Fishery Management Plan (FMP) would have to be amended.

This process began in March 2009 for the purpose of initiating scoping of an FMP amendment to address the new MSA requirements and NS1Gs. At that time the Council also identified some related issues that should be considered in the amendment process, including *de minimis* fishing provisions and updates to stock conservation objectives. The Council was interested in alternatives to complete fishery closures when stock projections were below objectives. Most salmon stocks had some form of allowance for these circumstances, but a few did not, resulting in situations like 2008-2009 (fishery closures) and 2006 (emergency rule promulgation).

1.1 Document Organization

This is an integrated document in regard to the assessments required for an FMP amendment. The Council decision process for this initiative is outlined in Section 1.3. The description of the proposed amendment and impacts in Sections 2.0, 4.0 and 5.0 contain key elements necessary for a Regulatory Impact Review/Initial Regulatory Flexibility Analysis (RIR/IRFA) and Environmental Assessment (EA). Section 5.0 summarizes the relationship of this amendment to other existing laws and policies. Section 5.5 contains or references the information required for a structurally complete RIR/IRFA. The proposed FMP wording changes necessary to implement the amendment appears in Section 6.0.

1.2 Purpose and Need for Action

The purpose of the proposed action is to provide a framework for specifying biological and management reference points and AMs that will meet the requirements of the revised MSA and NS1Gs to account for uncertainty in the fishery management process, reduce the probability of overfishing, and include clear and objective status determination criteria (SDC), while integrating with existing management processes and capabilities to the degree possible.

This action is needed to bring the Salmon FMP into compliance with new requirements to end and prevent overfishing in the MSA, as amended in 2007, and to address the corresponding 2009 revised NS1Gs (CFR § 600.310). The MSA now requires specification of ABC, ACLs, and AMs. The NS1Gs establish a detailed framework that integrates the existing and new biological reference points and AMs. In addition, the proposed action needs to revise SDC and associated actions of the current status determination criteria (SDC) in the Salmon FMP to make them consistent with the NS1Gs and to address issues with ambiguity, timeliness, and implementation of annual management measures.

Specifically the proposed action needs to:

- Classify salmon stocks in the FMP as “in the fishery” or as “ecosystem components”;
- Identify the salmon stocks for which the international exception to MSA 303(a)(15) (specification of ACLs and AMs) will apply;

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

- Revise the SDC for overfishing, overfished, approaching overfished, and rebuilt to be "measurable and objective" as required by the MSA, and establish maximum fishing mortality threshold (MFMT) and minimum stock size threshold (MSST) reference points used for status determinations;
- Establish a framework for the specification of the following reference points: overfishing limit (OFL), ABC (with a corresponding ABC control rule), ACL, and possibly annual catch target (ACT);
- Establish AMs to prevent the ACL from being exceeded, where possible, and establish AMs to address overages of the ACL;
- Explain how and why "flexibility" in the application of the NS1Gs will be applied in the Salmon FMP;
- Clarify any discrepancies with current "exceptions" as identified in the Salmon FMP with new terminology of the MSA; and
- Integrate, to the extent possible, existing management processes and capabilities.

1.3 Plan Development Schedule and Council Advisory Committee Participation

The expectation for this action was that the Council would recommend to the U.S. Secretary of Commerce (Secretary) adoption of an amended Salmon FMP in time for implementation of regulations affecting ocean salmon fisheries commencing May 1, 2011. However, the exact form and wording of the final recommendations depended on the results of the analyses and findings that are presented in this document. To facilitate this effort an *ad hoc* Salmon Amendment Committee (SAC) was appointed to develop and analyze alternatives and to report to the Council on the progress of the overall initiative.

The committee structure included representatives from NMFS Northwest Region (NWR), Southwest Region (SWR), Northwest Fisheries Science Center (NWFSC), Southwest Fisheries Science Center (SWFSC), and General Counsel, plus members of the Salmon Technical Team (STT) representing state and tribal agencies, and a member of the SSC. The committee was responsible for preparing the draft amendment and Council/public review documents, including modeling and analytical components and written narratives, and for Federal regulatory streamlining responsibilities, including the Council/NMFS interface and Federal internal policies to allow for timely Secretarial review and an approval/disapproval decision of the final Council action at the November 2010 meeting. Individual SAC members were called upon to prepare or submit report sections depending on their particular area of expertise and availability to assist in Council activities. The names of committee members and their affiliations appear in Appendix A.

1.3.1 Council Decision Process

The Council recommendations for amending the FMP were based on findings using a stepwise process, as follows:

1. Thorough review of the history, management framework, scientific literature, pertinent regulatory documents and administrative orders, and social and economic data as they relate to the management of Pacific Coast Chinook, coho, and pink salmon stocks;
2. Development of a set of alternatives using the Council meeting process to solicit input from the public and Council advisory groups;
3. Analysis and evaluation of alternatives relative to i) National Oceanic and Atmospheric Administration (NOAA) Environmental Review Procedures, ii) the National Standards of the MSA, iii) the long-term productivity of the stock, iv) protection of ESA-listed species, v) community economic impacts, and vi) other applicable law; and
4. Establishment of the biological conditions, regulatory timeframe, and associated regulatory considerations for implementation of regulations as part of the Council's annual ocean salmon management process.

1.4 Background and Related Documents

1.4.1 Scoping Summary

The Council initiated the FMP amendment process in March 2009, after NMFS had published the final rule for NS1Gs. The Council initially identified the following topics for tentative inclusion in the amendment process:

- ACL and AM;
- Revised SDC for overfishing and overfished designations;
- Revising stock conservation objectives to include updated maximum sustainable yield (MSY) values, exploitation rate approaches, and *de minimis* fishing provisions for stocks without such measures;
- Exceptions for stocks managed under the Pacific Salmon Treaty (PST), and ;
- Sector ACL/AM for multi-jurisdictional fisheries.

The Council directed that preliminary alternatives be developed to facilitate further scoping of issues at the September 2009 meeting. The SAC held a meeting in August 2009, which was open to the public, to discuss and further develop issues for Council consideration, and to consider possible alternatives that could exemplify approaches to those issues.

At the September 2009 Council meeting, the SAC presented its scoping summary to the Council and its advisory bodies (SSC, STT, SAS). After receiving the SAC report, statements from the advisory bodies, and providing an opportunity for public comment, the Council directed that the amendment process focus on issues directly related to the MSA requirements and NS1Gs related to ACL/AM and SDC, including:

- Determine which stocks or stock complexes would be subject to ACLs and AMs;
- Establish ACLs and AMs for appropriate stocks or stock complexes;
- Revising SDC for Overfishing and Overfished designations;
- Characterization of stock conservation objectives relative to specified reference points (MSY, ABC, ACL, and ACT), and;
- Council action required under the FMP overfishing criteria relating to *de minimis* fishery provisions and fishery closures.

The Council directed the SAC to develop suites of alternatives that would encompass the range of options for the above topics. Alternatives were to include formation of stock complexes with indicator stocks to facilitate setting ACL/AM, with options for quota management in salmon fisheries south of Cape Falcon, and options for using buffers to facilitate traditional time/area salmon fisheries south of Cape Falcon.

The SAC met several times between the September 2009 and June 2010 Council meetings to develop alternatives for presentation to the Council at its June 2010. All meetings of the SAC were noticed in the Federal Register, were open to the public, and provided formal opportunity for public comment.

At the June 2010 Council meeting, the Council recommended preliminary preferred alternatives (PPAs) for stock classification and application of the international exception to the ACL and AM requirements for salmon stocks currently identified in the Salmon FMP. The Council also recommended including the alternatives presented in the SAC Progress Report (PFMC 2010e) for SDC, OFL/ABC/AC frameworks, and *de minimis* fishery provision for the range of alternatives analyzed during preparation of this EA. The Council also recommended a variation on the SDC alternatives be developed, and directed the SAC to structure *de minimis* fishing provisions to decrease fishing mortality rates to zero before stock abundance approached zero.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

At the September 2010 Council meeting the Council provided additional guidance on the Alternatives, including specifying PPAs for stock classification, SDC, ACLs, AM, and *de minimi*s fishing provisions. The Council accepted the alternatives developed by the SAC, and added a new stock classification alternative and new alternatives for Klamath River fall Chinook (KRFC) affecting MSST and *de minimis* fishing provisions. The Council also requested the state and tribal co-managers provide input to the SAC regarding appropriate choices for SDC reference points for Washington coastal and Puget Sound coho stocks to facilitate analyses of the Alternatives.

At its November meeting the SAC presented an update on development of the Alternatives and requested clarification and changes on a number of issues, including formation of a stock complex(s) to address far-north migrating (FNM) Chinook stocks, consistency in use of annual and 3-year mean SDC, and schedule for taking final Council action on Amendment 16, which was delayed until June 2011.

The SAC met May 16-17, 2011 to finalize the draft EA, which was released for public comment with the Council's June 2011 briefing materials.

1.4.2 Related Documents

There are numerous documents available related to Council-area salmon management, which have been used in the analyses in this EA and support the decision at hand. These documents are briefly described below and their relevance to the analysis is explained.

1.4.2.1 Pacific Coast Salmon Plan (Salmon FMP)

The Salmon FMP (PFMC 2007) establishes conservation and allocation guidelines for annual management. This framework allows the Council to develop measures responsive to stock status in a given year. Section 3 of the current Salmon FMP describes the conservation objectives for Salmon FMP stocks necessary to meet the dual MSA objectives of obtaining optimum yield (OY) from a fishery while preventing overfishing. Each stock has a specific objective, generally designed to achieve MSY, maximum sustained production (MSP), or in some cases, an exploitation rate to serve as an MSY proxy. The Salmon FMP also specifies criteria to determine when overfishing may be occurring and when a stock may have become overfished. These conditions are referred to as a Conservation Alert and an Overfishing Concern, respectively. In addition, the Salmon FMP also specifies required actions when these conditions are triggered. The alternatives described in Section 2 are structured around the actions required when a Conservation Alert is triggered.

The annual management regime has been subject to several previous environmental impact analyses. From 1976 through 1983, the Council prepared an environmental impact statement (EIS) or supplemental EIS (SEIS) for each year's salmon fishing season. In 1984 an EIS was prepared when the Salmon FMP was comprehensively amended to implement the framework process for annual management. This resulted in a much more efficient management process and obviated the substantial staff burden of preparing an EIS or SEIS annually. A still more recent 2000 SEIS accompanied Amendment 14, implemented in 2001, which set the current Salmon FMP conservation objectives, and described the criteria and actions for a Conservation Alert and an Overfishing Concern. These EISs also represent information and analytical resources that, as appropriate, are incorporated into this document.

1.4.2.2 Review of Ocean Salmon Fisheries

This Stock Assessment and Fishery Evaluation (SAFE) document is the first in a series of annual documents prepared by the STT. It provides an historical context for fishery impacts, spawning escapement, and management performance for Salmon FMP stocks, annual regulations governing Council-area salmon fisheries, and economic factors associated with Council-area salmon fisheries. Information on inland marine and freshwater fisheries, as well as ocean fisheries in Canada and Alaska, are also presented. The Review of 2010 Ocean Salmon Fisheries (PFMC 2011a) SAFE document provides a baseline for fishery impacts and economic assessments used in this EA. The most recent version of the review report for the previous year is available from the Council office beginning in late February.

1.4.2.3 Preseason Reports I, II, and III

Preseason Report I is the second in the series prepared by the STT and presents projected stock abundances for Salmon FMP stocks, including the methodology and performance of predictors. The most recent version of the report is available from the Council office beginning in late February (PFMC 2011b).

Preseason Report II presents the range of regulatory ocean fishery alternatives that the Council was considering for the coming salmon season. It is distributed to the public and reviewed in public hearings to solicit public input of preferred management measures. This document, along with Preseason Report I and the Review of Ocean Salmon Fisheries, also constitutes an EA describing and analyzing the effects of the annual regulation alternatives on the environment. The most recent version of the report is available from the Council office beginning in late March (PFMC 2011c).

Preseason Report III is the final document in the series prepared by the STT. It details the final management measures adopted by the Council for recommendation to NMFS for the coming season's regulations. It includes an analysis of the effects of the management measures on conservation objectives for key salmon stocks. The most recent version of the report is available from the Council office beginning in late April. (PFMC 2011d)

1.4.2.4 2006 Ocean Salmon Regulations EA (2006 Regulations EA)

The 2006 regulations EA analyzes the environmental and socioeconomic impacts of proposed management measures for ocean salmon fisheries occurring off the coasts of Washington, Oregon, and California. The document evaluated the 2006 annual salmon ocean harvest management measures with respect to compliance with the terms of the Salmon FMP, obligations under the PST, and the level of protection required by all consultation standards for salmon species listed under the ESA. The range of alternatives analyzed in the 2006 Regulations EA included the effects of three levels of *de minimis* fishing strategies on KRFC when the stock was projected to fall below the 35,000 natural spawner floor for the third consecutive year. The 2006 EA supported NMFS' Finding of No Significant Impacts (FONSI) for the 2006 ocean salmon regulations. The affected environment Section and socioeconomic analysis of the 2006 Regulations EA represent the current environmental baseline and a reasonable expectation of economic impacts for recent years, and are incorporated by reference in this EA.

1.5 Relevant Issues

The alternatives in this EA were initially screened to determine if they deserved further consideration and analysis. The criteria used for the initial screening were based on feasibility, and meeting the purpose and need statement, including requirements of MSA and NS1Gs. Specific criteria evaluated included:

- OFL/ABC/ACL framework includes catch (C) or spawning escapement (S) based reference points such that OFL>ABC≥ACL, or escapement-based reference points such that OFL<ABC≤ACL
- SDC are measurable and objective
- The probability of overfishing is less than 50 percent
- The probability of becoming overfished is less than 50 percent

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Viable alternatives were then analyzed to provide a basis for comparing and contrasting alternatives and selecting a preferred alternative. In addition to the above criteria, the analysis consisted of evaluating the following:

A*dministrative implementation feasibility*. Factors affecting administrative implementation include the ability of management agencies to:

- Monitor fisheries in-season
- Take in-season action to close fisheries
- Take in-season action to modify management measures necessary to meet preseason objectives
- Assess fisheries and compliance with objectives and standards

Scientific assessment capability. Factors affecting scientific assessment include:

- Preseason forecasting of exploitation rates, abundance, and harvest impacts used to develop annual management measures
- Postseason assessment of those factors to determine compliance with achieving reference points
- Relative uncertainty of methods for estimating reference points

In order to analyze the environmental impacts of the alternatives (Chapter 4 of this EA), the following criteria were evaluated:
The relative short and long-term economic effects on the fishery. Factors affecting economic impacts include:

- Coastal community impacts
- Angler Trips
- Foregone opportunity
- Allocation of resources among fishing sectors

The effects on cultural resources and activities. Factors affecting cultural resources include:

- Tribal access to harvestable surplus
- Potential for full utilization

The relative effects on biological factors. Biological factors include:

- Risk of overfishing
- Risk to long-term stock productivity

Section 6.02 of the NOAA Administrative Order 216-6 also enumerates a specific set of guidelines for identifying potentially significant environmental impacts resulting from a fishery management action. During the scoping process several of the factors were dropped from further consideration based on the conclusion that they would not be affected by the action. The remaining factors for this EA are:

- The relative effects of the Alternatives to jeopardize the sustainability of any target species that may be affected by the action.
- The relative effects of the Alternatives to jeopardize the sustainability of any non-target species.
- The proposed action may be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the MSA and identified in FMPs.
- The relative effects of the Alternatives to have a substantial adverse impact on public health or safety.
- The relative effects of the Alternatives to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species.
- The relative effects of the Alternatives to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species.

2.0 DESCRIPTION OF ALTERNATIVES

This Section provides a description of the alternatives considered under this EA. Alternatives were developed for:

- Stock classification and application of the MSA international exception (Section 2.1)
- SDC (Section 2.2)
- OFL/ABC/ACL frameworks (Section 2.3)
- AMs (Section 2.5)
- *De minimis* fishing provisions (Section 2.5)

Alternatives were then evaluated relative to meeting the purpose and need of the proposed action (Section 1.2) using the criteria established in Section 1.5. Additional analysis of the effects of the alternatives on the socioeconomic and biological environments is presented in Chapter 4.

2.1 Stock Classification

The MSA requires that an FMP describe the stocks of fish involved in the fishery. The NS1Gs provide a structure for classifying stocks in and around the fishery, and organizing stock complexes. These organizing principles are an important first step in developing an FMP that is consistent with the NS1Gs since they affect how other key provisions of the MSA and NS1Gs may be applied including, for example, SDC, ACLs, and AMs. The NS1Gs recommend that stocks identified in an FMP be classified as in or out of the fishery. Target stocks are in the fishery and some non-target stocks could also be in the fishery; ECs stocks are not. Individual stocks can also be formed into stock complexes so that, for example, data-poor stocks can be managed in association with data-rich stocks with similar characteristics. This classification scheme helps conceptualize how the fishery operates, which stocks are affected by various fishery sectors, and how SDC and ACL provisions, among other MSA Section 303(a) provisions, may be applied.

This Section identifies alternatives for how salmon stocks currently listed in the FMP could be classified in the FMP consistent with the NS1Gs § 600.310(d). It includes alternatives for designating several Chinook and pink stocks as EC and establishing complexes for some Chinook stocks. The Section also provides alternatives for application of the international exception to MSA Section 303(a)(15) (i.e., ACLs and AMs).

Criteria Used to Evaluate the Alternatives

The criteria used to evaluate alternatives related to stock classification and application of the international exception are consistency with the MSA and NS1Gs, and feasibility of implementation.

Considerations within the criterion for MSA and NS1Gs consistency include:

- Providing a description of the fishery including the species and stocks involved[3]
- Classifying the stocks in the FMP[4]
- Applying the international exception to the requirement to establish ACL mechanisms and AMs as part of the overall classification scheme where appropriate[5]

2.1.1 Classification Issues

The first step in the classification process is to review the stocks currently listed in the FMP and determine which stocks are still in need of conservation and management measures in Council-area

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[3] MSA §303(a)(2)
[4] NS1Gs § 600.310(d)
[5] NS1Gs § 600.310(h)(2)

fisheries; these stocks will be classified as “in the fishery” (i.e., for which MSA Section 303(a) requirements apply), consistent with the NS1Gs § 600.310(d). Stocks “in the fishery” will include target stocks (stocks that fishers seek to catch for sale or personal use, including “economic discards”), and non-target stocks (fish caught incidentally during the pursuit of target stocks in a fishery, including “regulatory discards”) in need of conservation and management. Examples of target stocks in Council-area fisheries are hatchery stocks and productive natural stocks with ocean distributions primarily within the Council area. Non-target salmon stocks include ESA-listed stocks or depressed natural stocks (e.g., Strait of Juan de Fuca coho).

Stocks currently in the FMP that are not recommended to be classified as “in the fishery” can either be omitted altogether, if determined not to be in need of conservation and management measures; or can be classified as ECs (see NS1Gs § 600.310(d)(5)). If classified as an EC, they would be assessed as to their vulnerability to the fishery and monitored, but not actively managed in Council-area fisheries under the Pacific Salmon FMP. ECs do not require specification of reference points for SDC or ACLs.

The NS1Gs suggest that stock complexes may be identified, but they have a particular purpose. Stock complexes are groups of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impacts of management actions on the stocks are similar. Stock complexes may be formed to facilitate management requirements such as setting ACL, or determining stock status.

Although the international exception to ACLs and AMs is not directly related to how the fishery is classified, addressing it in this Section helps simplify the subsequent consideration of alternatives for reference points. Stocks that are subject to an international agreement may be excepted from ACL and AM requirements, but still must have all other MSA Section 303(a) requirements, including specification of SDC and MSY.

2.1.2 Alternatives for Stock Classification

In this Section, the following alternatives are described:

- Alternatives for stocks currently included in the FMP that will be classified as “in the fishery”
- Alternatives for stocks currently included in the FMP that will be classified as ECs
- Alternatives for designating stock complexes and indicator stocks to facilitate management of data-poor stocks
- Alternatives for application of the international exception to the ACL requirements.

The proposed alternatives are broken out separately for coho, Chinook, and pink stocks. To simplify the presentation of the proposed alternatives for stock classification, current stocks listed in the FMP have been organized into groups based on the following characteristics: similar geographic area, life history, ESA-listed, and hatchery-produced (Table 2-1). Some of these stock groupings correspond to complexes identified in the current FMP, although the intent of displaying these stock groupings here is not to reference or establish stock complexes; only to simplify the presentation of alternatives. There are only two pink stocks, so no further simplification was required. Canadian Chinook, coho, and pink stocks are included in the current FMP. The alternatives include proposals to remove Canadian stocks from the FMP. Proposed alternatives also consider removing Mid-Columbia River spring Chinook from the FMP.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 2-1. Coho and Chinook stock groups and abbreviations used in classification alternative descriptions.

Coho			Chinook		
Stock Group	**Abbreviation**	**# Stocks**	**Stock Group**	**Abbreviation**	**# Stocks**
Endangered Species Act	ESA	4	Endangered Species Act – California origin	CA ESA	3
Hatchery	HAT	6	Endangered Species Act – Columbia River origin	CR ESA	5
Puget Sound	PS	5	Endangered Species Act – Puget Sound origin	PS ESA	13
Washington Coastal	WA C	4	Hatchery	HAT	6
Canadian	CAN	2	Columbia River Summer	CR S	1
			Columbia River Fall	CR F	1
			Mid-Columbia River Far-North Migrating Spring (non-ESA-listed)	Mid-C Sp	1
			Far-North Migrating Coastal Washington and Central-Northern Oregon Spring/Summer and Fall (non-ESA-listed)	FNMC	10
			S. Oregon/N. California	SONC	3(4)[a/]
			California Central Valley Fall	CVF	1
			Canadian	CAN	2
Totals		21			47

a/ The three stocks currently listed in the FMP are South Oregon Coast, Klamath River fall and Klamath River spring. Under Classification Alternatives 2 and 3, Smith River (CA) Chinook would be moved to the SONC stock group from the Eel, Mad, Mattole, and Smith rivers stock group so that the stock groups are aligned with ESA listing designations. The Smith River is not part of the California Coastal Chinook ESU which is listed as threatened.

Alternative 1 in the Tables 2-2, 2-3, and 2-4 generally represents status quo, or an adaptation of status quo to conform as closely as possible to the new MSA requirements and NS1Gs.

2.1.2.1 Classification Alternatives for Coho Stocks

All of the U.S. origin coho stocks have ocean distributions primarily in Council waters and are substantially affected by Council-area fisheries. Canadian coho stocks are also affected by U.S. fisheries. No EC stocks are proposed. Under Alternative 2 all coho stocks currently listed in the FMP would remain in the fishery, however, the Southern Oregon Coast Natural (OCN) stock component would be moved to the Northern California coho stock, which would be renamed to the Southern Oregon Northern California Coastal (SONCC) coho stock, consistent with the ESU designation (Table 2-2). The OCN fishery impact matrix could then be modified to use only the Northern, North Central and South Central OCN stock components. Approval of a modified OCN matrix may initiate ESA reconsultation for OCN coho, and possibly a new Biological Opinion; however, the modified matrix would be consistent with the ESU designation for coho stocks along the Oregon Coast. The FMP classification would then be consistent with the current ESA consultation standard for SONCC coho, which uses Rogue/Klamath hatchery coho as a surrogate for that ESU. Alternative 3 in the PPA would remove Canadian coho stocks from the FMP. Conservation and management of Canadian stocks is not necessary for these stocks as they are managed under the PST, and their status is assessed under Canadian authority, outside of the Council. However, Council-area fisheries would still be managed to comply with terms of the PST with regard to these Canadian stocks.

Table 2-2. Alternatives for classification of coho stocks.

Classification	Alternative 1 – Status Quo	Alternative 2	PPA Alternative 3[d/]
In the Fishery	HAT – 6 ESA – 4 WA C – 4 PS – 5 CAN – 2	HAT – 6[a/] ESA– 4[a/b/] WA C – 4[c/] PS – 5[c/] CAN – 2[c/]	HAT – 6[a/] ESA– 4[a/b/] WA C – 4[c/] PS – 5[c/]
Ecosystem Component Stocks	None	None	None

a/ Reference points would be based on hatchery goals and ESA consultation standards. (50 CFR 600.310(h)(3)).
b/ Places the Southern OCN stock component with the Northern California stock to conform with current ESU designations.
c/ Stocks to which the MSA international exception to specification of ACL will be applied. Specification of ABC will also not be required, but specification of SDC reference points is required.
d/ Canadian stocks would be removed from the fishery.

2.1.2.2 Classification Alternatives for Chinook Stocks

Chinook stocks have more diverse ocean distribution and life history characteristics than coho, and therefore require different management approaches. While all coho stocks in the FMP are available to Council-area fisheries, many Chinook stocks originating in the Southern U.S. are largely unavailable due to a combination of ocean migration patterns and run timing. Therefore, Chinook stocks can be classified to reflect the management capability and characteristics of the stocks.

Alternative 1 reflects status quo, and all stocks currently identified in the FMP remain in the fishery. Alternatives 2 and 3 would identify Smith River Chinook as a separate stock, rather than associating it with the ESA-listed Eel, Mattole, and Mad rivers stock group as it is currently represented in the FMP (Table 2-3). Alternative 2 removes Mid-Columbia River spring stocks from the fishery because they are not caught in Council-area fisheries (Appendix G, LaVoy 2010). Alternative 3 is the PPA and classifies non-ESA-listed Columbia River fall and Mid-Columbia River springs stocks as EC stocks (not in the fishery) because they are non-target stocks of the fishery, and have low vulnerability to Council-area fisheries (see Appendix B); exploitation rates on these stocks in Council-area fisheries are less than 5 percent and do not affect stock status. PPA Alternative 3 would also remove Canadian Chinook stocks from the FMP. Conservation and management of Canadian stocks is not necessary for these stocks as they are managed under the PST, and their status is assessed under Canadian authority, outside of the Council. However, Council-area fisheries would still be managed to comply with terms of the PST with regard to these Canadian stocks.

Table 2-3. Alternatives for classification of Chinook stocks.

Classification	Alternative 1 – Status Quo	Alternative 2	PPA Alternative 3[c/]
In the Fishery	CVF – 1 SONC - 3 HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 CR F[a/] – 1 Mid-C Sp [a/] – 1 FNMC [a/] – 11 CAN – 2	CVF – 1 SONC - 4[b/] HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 CR F[a/] – 1 FNMC [a/] – 11 CAN – 2 ~~Mid-C Sp [a/] – 1~~	CVF – 1 SONC – 4[b/] HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 FNMC [a/] – 10 ~~CAN – 2~~
Ecosystem Component Stocks	None	None	CR F [a/] – 1 Mid-C Sp [a/] – 1

a/ Far north migrating (FNM) stocks.
b/ Includes Smith River Chinook, which was included with the ESA-listed Eel, Mattole, and Mad rivers group in the status quo alternative.
c/ Canadian stocks would be removed from the fishery.

2.1.2.3 Classification Alternatives for Pink Stocks

Pink salmon are generally abundant in odd numbered years only. Council-area fisheries frequently provide additional opportunity to retain pink salmon (e.g., increased bag limits), but overall impacts are negligible, generally fractions of 1 percent over the last 20 years, and occur only in the northern part of the Washington coastal fishery.

Alternative 1 reflects status quo, including both pink stocks in the fishery as they are in the current FMP. Alternative 2 is the PPA, and would remove Canadian pink stocks from the FMP. Conservation and management of Canadian stocks is not necessary for these stocks as they are managed under the PST, and their status is assessed under Canadian authority, outside of the Council. However, Council-area fisheries would still be managed to comply with terms of the PST with regard to these Canadian stocks. Alternative 3 reflects the low vulnerability of pink stocks to Council-area fisheries (see Appendix B), and classifies them as EC, because they are non-target stocks and retention in Council-area fisheries does not affect stock status (Table 2-4).

Table 2-4. Alternatives for classification of pink salmon stocks.

Classification	Alternative 1-Status Quo	PPA Alternative 2	Alternative 3[a/]
In the Fishery	PS Fraser (CAN)	PS ~~Fraser (CAN)~~	None
Ecosystem Component Species	None		PS Fraser (CAN)

a/ The Canadian stock would be removed from the fishery.

2.1.2.4 Rationale for Ecosystem Components

Ecosystem component stocks are not considered to be "in the fishery," and do not require specification of reference points. Section (d)(5) of the NS1Gs provides criteria for classification of EC stocks. Such stocks should:

- Be a non-target species or non-target stock;
- Not be determined to be subject to overfishing, approaching overfished, or overfished;

- Not be likely to become subject to overfishing or overfished, according to the best available information, in the absence of conservation and management measures; and
- Not generally be retained for sale or personal use.

However, The NS1Gs also indicate that occasional retention of the stock would not, in and of itself, preclude consideration of the species under the EC classification. A stock's vulnerability to fisheries is also an important consideration when designating EC stocks; stocks that are highly vulnerable to Council-area ocean salmon fisheries would not be good candidates for EC classification under the Salmon FMP.

For this FMP amendment, Stock Classification Alternative 3 includes designating 2 Chinook stocks and both pink stocks as EC. Unique circumstances related to salmon are such that there are some ambiguities related to criteria for classifying EC stocks, but their classification as ECs is consistent with the intent of the NS1Gs and the overall MSA conservation and management requirements related to preventing overfishing and achieving OY.

Individual salmon caught during the ocean fishery can be distinguished at the species level (e.g., Chinook can be distinguished from coho), but stocks within a species cannot otherwise be identified and selectively released. Mid-Columbia River spring and Columbia River fall stocks are distinguished from many other Chinook stocks in the fishery by their low contribution to Council-area fisheries. Other far north migrating stocks in the FNMC stock are also caught at low rates in Council-area fisheries, however, because not all of the stocks in the FNMC group have low contribution rates, they are not proposed to be EC stocks. In the current Salmon FMP, these stocks were identified as having minimal harvest impacts if the cumulative exploitation rate in Council fisheries during the 1979-1982 base period was less than 5 percent. Fisheries are now much reduced relative to what they were 30 years ago so Council fishery exploitation rates on these stocks are generally at the low end of the 0 to 5 percent range. A more contemporary analysis of the vulnerability of these far north migrating stocks is provided in Appendix B. The vulnerability analysis shows that these stocks have low vulnerability relative to other Chinook stocks that are in the fishery, and are very low on the vulnerability scale relative to all stocks and species considered in that overall vulnerability analysis.

Another consideration for an EC designation relates to whether they are retained in the fishery. The near absence of the Mid-Columbia River spring and Columbia River fall stocks in the fishery is such that they cannot be targeted. Far north migrating Chinook are instead caught incidentally while targeting the abundant hatchery and natural-origin stocks that drive the fishery. Although these stocks are retained if caught, the NS1Gs provide that occasional retention does not itself preclude consideration of the species for EC classification.

Although Council fisheries have little impact on the Mid-Columbia River spring and Columbia River fall stocks, they are subject to management and related protections by other management jurisdictions. Columbia River fall stocks are substantially impacted in fisheries north of the U.S. Canadian border and are managed under the PST. Columbia River fall and Mid-Columbia spring Chinook stocks are caught in inland fisheries and are thus subject to management controls provided by the states of Washington and Oregon and treaty tribes. However, these stocks would not be subject to determinations for overfishing, overfished, or approaching an overfished condition if designated as EC stocks. Impacts are such that the reduced attention to stock-specific conservation and management measures in Council fisheries associated with an EC designation would have no material effect on whether the stocks become overfished or subject to overfishing in the future.

For similar reasons, Alternative 3 designates the Fraser River and Puget Sound pink stocks as ECs. Pink salmon have a two-year life cycle and are abundant only in odd numbered years. Because the pink stocks are returning to Puget Sound and the Fraser River, they are only caught in Council fisheries in the

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

northern catch areas off Washington. The catch in Council fisheries in odd numbered years totals a few hundred or at most a few thousand fish relative to run sizes of hundreds of thousands or millions. Exploitation rates in Council-area fisheries are therefore fractions of one percent. The vulnerability analysis indicates that pink salmon are one of the least vulnerable species of all the species and stocks in the overall analysis (Appendix B).

Pink salmon are caught incidentally in the fisheries directed at other species, and retention is allowed because of the absence of any conservation constraints in Council-area fisheries. As indicated above, retention of a stock does not necessarily preclude consideration of an EC designation. Pink salmon are generally not targeted in the fishery. Recreational fishermen target Chinook and coho salmon which are larger and greatly preferred in terms of table fare. Pink salmon are also not targeted in the Council-area commercial fishery because of their low value (cents per pound). Commercial pink salmon fisheries are viable only in cases where there is localized, high volume opportunity. The inland fisheries where these stocks are caught are managed under the PST. The pink salmon stocks are also not subject to overfishing, and are not overfished or approaching an overfished condition. Impacts are such that the reduced attention to stock-specific conservation and management measures in Council fisheries associated with an EC designation would have no material effect on whether the stocks become overfished or subject to overfishing in the future.

The overriding consideration when making an EC designation is whether they are in need of conservation and management under the MSA, especially if conservation and management is necessary to prevent overfishing. Designating the Chinook and pink stocks as proposed is consistent with these requirements. The fisheries that do affect these stocks to the north and in inland areas are managed responsibly. The state, tribal, and Federal entities involved with Council-area management are also directly involved in the PST and inland management processes. Since all of these stocks return to Washington and Oregon, except Fraser pinks, the interest in protecting them is clear. Impacts to these stocks in Council fisheries are low, to the point where Council fisheries have no material effect on the status of pink stocks or to achieving OY for the other stocks in the fishery. Impacts are too low to cause overfishing or contribute to rebuilding if needed. Designating these stocks as ECs does not diminish their protection, it simply defers it to those with the ability and responsibility for their direct management. Because the EC stocks would remain in the FMP, they would continue to be monitored in order to evaluate their status. If circumstances change, their classification as ECs could be reconsidered.

Consistency with the MSA and NS1Gs: The MSA §303(a)(2) requires that an FMP contain a description of the species involved in the fishery. The NS1Gs § 600.310(d) further requires that the FMP identify target and non-target stocks in the fishery. Non-target stocks may be designated as EC species if appropriate. All of the alternatives satisfy these requirements.

Feasibility of Implementation: All of the alternatives are feasible to the extent that they classify stocks in the fishery with the level of specificity required by the MSA and NS1Gs.

2.1.3 Alternatives for Stock Complexes and Indicator Stocks

The MSA requires ACLs be specified for each stock or stock complex in the fishery, unless subject to the international exception to MSA Section 303(a)(15) (see MSA Section 303 note). Some stocks currently listed in the FMP have insufficient information to develop individual catch based ACLs, such as Klamath River spring Chinook; therefore, formation of stock complexes may be necessary to address the intent of the NS1Gs and prevent overfishing of these data-poor stocks. Each stock complex would need one or more indicator stocks to establish annual harvest constraints (e.g., ACLs) based on status of those indicator stocks.

As mentioned above, stock complexes in the current Salmon FMP were identified for organizational purposes rather than for management at the complex level as described in the NS1Gs. Some alternatives propose reorganizing stock complexes for management purposes in order to analyze alternatives for catch-based ACLs for Council-area salmon stocks. In Section 2.3, ACL alternatives describe the basis of annual catch limits as spawning escapement or catch. In order to consider a catch- or spawning escapement-based ACL for a stock, a preseason (before fishing) forecast of its abundance would be necessary, and a post season estimate of adult equivalent (AEQ) catch in all fisheries or spawning escapement would be necessary to assess compliance. A postseason estimate of catch in all fisheries for a specific stock requires a data-intensive accounting process, generally involving coded-wire tag (CWT) analysis. While tagging programs and CWT analyses are routinely conducted for many large stocks, most small stocks are not as well-analyzed, if at all. Some stocks also lack escapement monitoring programs and forecasts sufficient to support individual escapement-based ACLs. Therefore, ACLs cannot be established for some individual stocks. These stocks may be formed into complexes with more data-rich stocks of similar characteristics to facilitate meeting the requirements for specifying ACLs for all stocks in the fishery. This Section describes alternatives for forming the stock complexes that would be necessary to consider a catch- or spawning escapement-based ACL.

2.1.3.1 Stock Complexes for Chinook

Four Chinook complexes could be established to facilitate compliance with ACL requirements for data-poor stocks that are in the fishery. These complexes would represent stocks with similar ocean distribution patterns and vulnerability in Council-area fisheries. ACLs would be specified for indicator stocks within the complexes. As information becomes available for data-poor stocks, they could be included as indicator stocks for the complex, or managed independently. Information necessary to serve as an indicator stock includes a preseason forecast of abundance available by April, the ability to model fishery impacts on the stock so that fisheries can be structured to achieve the ACL, and the ability to estimate postseason AEQ catch and exploitation rates (for catch-based ACLs) or spawning escapement (for escapement-based ACLs).

The first complex, designated Central Valley fall (CVF) complex, would consist of fall and late fall Chinook from the Sacramento and San Joaquin basins, and the indicator stock would be Sacramento River fall Chinook (SRFC). The stocks in this complex are the non-ESA-listed stocks currently identified in the FMP as the California Central Valley complex. All stocks in this complex have similar vulnerability to Council-area fisheries, being distributed primarily south of Cape Falcon, Oregon. Only SRFC have a defined conservation objective, but the objective is intended to provide adequate hatchery and natural escapement of San Joaquin fall and Sacramento late fall stocks as well (PFMC 2007). Because of the close genetic similarity, these stocks were placed in the same evolutionarily significant unit (ESU) (Central Valley Fall and Late Fall-Run Chinook Salmon ESU; Myers et al. 1998). The SRFC stock has made up at least 69 percent of the returning adults in the stock complex since 1971, and has averaged 88 percent (PFMC 2010a). Both San Joaquin fall Chinook and Sacramento River late fall Chinook have averaged 6 percent of the total return over the same period. SRFC is an appropriate indicator stock for this complex because of the large fraction of the total population represented, and the similar vulnerability to other stocks in the complex. In addition, the stock is currently used as an indicator stock for this complex and its conservation objective includes the needs of the other stocks in the complex. Currently, SDC for San Joaquin fall Chinook and Sacramento River late fall Chinook is undefined, and until separate objectives for those stocks are developed, they would not be acceptable indicator stocks.

The second complex, designated Southern Oregon and Northern California (SONC) complex, would consist of Chinook stocks south of the Elk River, Oregon to, and including, the Klamath River, plus Umpqua River spring Chinook. The indicator stock for this complex would be KRFC. Stocks in this complex would include Klamath River spring and fall Chinook, Smith River Chinook (currently associated with the ESA-listed group of Eel, Mattole, and Mad Rivers), Rogue River spring and fall Chinook, Umpqua River spring Chinook, and Chinook from smaller systems along the Southern Oregon Coast. Because of the close genetic similarity, most of these stocks were placed in the Southern Oregon and Northern California Coastal Chinook Salmon ESU (Myers et al. 1998). Upper Klamath and Trinity River stocks are in their own ESU, and Umpqua River spring Chinook are in the Oregon Coast ESU. Umpqua River spring Chinook were included in the SONC complex because they have an ocean distribution (and therefore vulnerability) more similar to the other stocks in the SONC complex than to fall Umpqua stocks and mid- northern-Oregon Coast Chinook ESU stocks, which are considered FNM stocks. All stocks in the SONC complex have similar vulnerability to Council-area fisheries, being distributed primarily south of Cape Falcon, Oregon. There is insufficient abundance information to assess the relative proportions of the stocks in the SONC complex, but ocean genetic stock identification studies indicate that Klamath and Rogue stocks have comparable contributions to ocean fisheries in Oregon, with other southern Oregon and Northern California stocks contributing less. Of the stocks in the SONC complex, only KRFC and Southern Oregon Chinook have conservation objectives specified in the FMP; however, the Southern Oregon Coast Chinook conservation objective is part of an aggregate that includes Central and Northern Oregon Coast stocks. The aggregate conservation objective is assessed through spawning densities in index streams and no forecasts of abundance or exploitation rate in fisheries are available preseason. ODFW is currently reviewing available information with the intent of developing stock-specific objectives, but until that process is complete, only KRFC have adequate information available to serve as an indicator stock for the SONC complex. The FMP specifies that the productive potential for Klamath River spring and southern Oregon Coast Chinook are protected by management objectives for KRFC, at least in part because of the relatively large allocation of KRFC impacts to river tribal and recreational fisheries (PFMC 2007).

The third complex, designated FNMC complex would consist of spring/summer and fall Chinook stocks from the Central and Northern Oregon Coast (from the Elk River north, except Umpqua River spring Chinook), and spring/summer and fall coastal Chinook stocks north of the Columbia River. Indicator stocks for this complex would be Hoko, Quillayute, Hoh, Queets, and Grays Harbor fall Chinook. The stocks in this complex are grouped together because of their similar ocean distribution patterns, which results in low vulnerability to Council-area fisheries and greater susceptibility to Canadian and Alaskan fisheries (Appendices B and G). These stocks are not ESA-listed, but the indicator stocks are subject to terms of the PST. Stock proportions of the complex are not readily available.

The fourth complex, designated as the Mid-Columbia River spring complex (Mid-C Sp), would include four spring stocks from the middle Columbia River between Bonneville and McNary dams. All of these stocks have similar vulnerability to Council-area fisheries. These stocks are similar to other ESA-listed spring stocks in the upper Columbia River that have little or no impact in Council-area fisheries (Appendix G, LaVoy 2010 provides an example of the distribution of CWT recoveries for the Yakima stock). Because of their close genetic similarity, these stocks are placed in the same ESU. These stocks have similar ocean distributions, but are caught almost entirely in in-river fisheries. None of these stocks currently has an FMP conservation objective, although there is likely sufficient data to develop a conservation objective for one or more of the stocks in the complex. Developing a conservation objective for one or more of the stocks in the complex would be a high priority, but their status would presumably be undefined until that occurred. Mid-Columbia River spring Chinook are currently defined as a complex under Status Quo, Alternative 1. Under Alternative 2 the complex would be removed from the fishery, and under Alternative 3 it would be designated as an EC.

Table 2-5. Alternatives for identifying Chinook stock complexes and indicator stocks. Stock classification alternatives that the complex would be associated with are also identified (see Table 2-3).

Stock Complex	Component Stocks	Indicator Stocks	Stock Classification Alternative
Central Valley Fall Chinook (CVF)	Sacramento River fall San Joaquin River fall Sacramento River late fall	Sacramento River fall	Alternative 2 Alternative 3
Southern Oregon northern California Chinook (SONC)	Rogue River fall and spring Umpqua River spring Smith River fall and spring Klamath River fall and spring Other small basins in Oregon south of the Elk River	Klamath River fall	Alternative 2 Alternative 3
Far-North-Migrating Coastal Chinook (FNMC)	Spring and fall stocks from Oregon tributaries north of and including the Elk River (except Umpqua spring) Willapa fall Grays Harbor spring and fall Queets Spring/summer and fall Hoh spring and fall Quillayute summer and fall Hoko summer/fall	Grays Harbor fall Queets fall Hoh fall Quillayute fall Hoko summer/fall	Alternative 2 Alternative 3
Mid-Columbia River spring (Mid-C Sp)	Klickitat Warm Springs John Day Yakima	None currently available	Alternative 3

Consistency with the MSA and NS1Gs: The MSA §303(a)(2) requires that an FMP provide a description of the species or stocks involved in the fishery. The NS1Gs § 600.310(d) further indicate that the FMP may identify stock complexes and associated indicator stocks. No stock complexes are proposed for coho or pink salmon, but four complexes are proposed for Chinook. The Status Quo, Alternative 1 identifies stock complexes for Chinook, but these were formed for organizational purposes rather than for management at the complex level as specified in the NS1Gs. The complexes identified in the FMP are not all formed based on common distributions, life histories, or vulnerabilities, and do not have associated indicator stocks. The Status Quo, Alternative 1 is therefore inconsistent with the MSA and NS1Gs. The four Chinook stock complexes that are proposed were formed based on their common geographical distributions, life histories, and fishery vulnerabilities. Indicator stocks are identified for three of the four complexes. The indicators stocks are relatively data-rich and have associated reference points and SDC that can be used for managing the stock complexes. The Mid-Columbia River Spring Chinook complex does not currently have an associated indicator, but it appears that there is sufficient data for one or more of the stocks in the complex to develop the conservation objectives and other reference points that would be required. Classification Alternative 2 proposes to remove the Mid-C Spring Chinook stock from the fishery, in which case development of reference points would not be required.

Feasibility of Implementation: The Status Quo, Alternative 1 is feasible as it is based on the current FMP. However, as identified above, it is not consistent with the MSA or NS1Gs. Alternatives 2 and 3 propose development of four Chinook stock complexes, all of which are feasible and could be implemented.

2.1.4 The International Exception

The MSA requires that FMPs establish ACL mechanisms and AMs for all stocks and stock complexes in the fishery, but provides an exception from the requirement for stocks or stock complexes that are managed under an international agreement in which the U.S. participates. Several coho, Chinook, and pink stocks in the Salmon FMP are subject to management under the PST. The PST is a bilateral treaty between the U.S. and Canada that relates to the management of salmon stocks affected by the fisheries of both nations. Under MSA Section 3(24) "The term 'international fishery agreement' means any bilateral or multilateral treaty, convention or agreement which relates to fishing and to which the United States is a party." The PST clearly meets the criteria specified in the MSA and NS1Gs related to international agreements. Although FMP stocks (i.e., stocks in the fishery) managed under an international agreement may be excepted from the ACL and AM requirements (and including exception to specification of ABC according to the NS1Gs), these stocks still require the specification of SDC.

Application of the international exception depends to a degree on how stocks are classified – i.e., its application is only relevant to stocks in the fishery that would otherwise require ACLs and AMs. In the preceding Section, Alternative 3 classified two Chinook stocks and two pink stocks as ECs (Tables 2-3 and 2-4). Ecosystem components are "out of the fishery," and as a result, do not require specification of ACLs or other reference points and MSA Section 303(a) requirements. These stocks might have been considered for the international exception if classified as stocks in the fishery, but such a designation is moot since none of the MSA Section 303(a) requirements apply to EC stocks. Because of the close relationship between stock classification and application of the international exception, the alternatives for use of the international exception are combined with the alternatives for stock classification described below (Table 2-6).

There are currently no stocks to which the MSA international exception (from the 2007 MSA amendments) has been applied, as reflected in the Status Quo Alternative (Table 2-6). Under Classification Alternative 2, the PPA, the international exception to specification of ABC, ACLs, and AMs would be applied to Puget Sound, Washington Coastal and Canadian coho stocks, Columbia River summer Chinook, the FNMC Chinook complex, Columbia upriver fall Chinook, and Canadian Chinook, and Puget Sound pink stocks. If Fraser River pink salmon remain in the fishery, they also would be designated as international exceptions under the PPA. These are all the non-ESA-listed stocks subject to the PST. Under stock Classification Alternative 3, the international exception would not be applied to Chinook stocks classified as EC (Columbia upriver fall, Mid-Columbia River spring Chinook); otherwise application of the international exception would be similar.

Table 2-6. Proposed Application of the MSA international exception to specification of ABC and ACLs to stocks managed under the Pacific Salmon Treaty and associated stock classification alternatives.

	Stock Classification Alternative		
Stocks	**Alternative 1 - Status Quo**	**PPA Alternative 2**	**Alternative 3**
Coho	None	PS - 5 WA C - 5 CAN - 2	PS - 5 WA C - 5
Chinook	None	CR S – 1 FNMC – 11 CR F – 1 CAN -2	CR S – 1 FNMC – 11
Pink	None	PS	None

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Consistency with the MSA and NS1Gs: The MSA requires that FMPs establish ACL mechanisms and AMs for all stocks and stock complexes in the fishery, but provides an exception from the requirement for stocks or stock complexes that are managed under an international agreement in which the U.S. participates. The use and applicability of the international exception depends to a large degree on how stocks are classified. So, as discussed above, alternatives for use of the international exception are described in conjunction with those related to classification.

Several coho, Chinook, and pink stocks are managed under the PST. The PST is consistent with the definition of an "international fishery agreement" provided in MSA Section 3(24). NS1G 300 (h)(2)(ii) provides that stocks managed under an international agreement may be excepted from the ACL and AM requirements. The Status Quo Alternative does not apply the international exception to any stocks. Alternatives 2 and 3 propose use of the international exception for several coho, Chinook, and pink stocks depending on how those stocks are otherwise classified. Application of the international exception in Alternatives 2 and 3 is consistent with the MSA and NS1Gs.

Feasibility of Implementation: All of the alternatives related to application of the international exception are feasible and could be implemented.

2.2 Alternatives for Reference Points – Status Determination Criteria

Status Determination Criteria must be specified in fishery management plans to determine the status of a stock or complex.[6] This Section presents alternatives to use as SDC to determine:

- Overfishing
- Overfished
- Approaching overfished
- Rebuilt

SDC will be applied to natural stocks for which specification of these reference points is appropriate and possible based on the best available science. These reference points will not be specified for any stocks that are identified in the FMP as EC. NS1Gs § 600.310(d)(5)(iii) specify that EC stocks are not considered in the fishery, and are thus not subject to any of the MSA 303(a) requirements.

The NS1Gs' provision on flexibility[7] explains that there are limited circumstances that may not fit the standard approaches set forth in the NS1Gs and cites hatchery and ESA-listed stocks as examples where alternative approaches may be appropriate. For ESA-listed stocks in the FMP, the NS1G's flexibility provision will be utilized and ESA consultation standards will serve as all required reference points, including SDC reference points and ACLs. For hatchery stocks as defined in Table 3-1 of the FMP, hatchery goals will continue to serve as their conservation objective and will serve as alternative approaches to specification of all required reference points, including SDC reference points and ACLs.

Some natural stocks listed in the FMP currently are managed on the basis of indicator stocks. SDC will continue to be applied to and specified only for individual stocks, and not for stock complexes as a whole. The status of other stocks will not change as a result of indicator stock status changes. Stock complexes primarily reflect similar ocean distribution and exploitation patterns, and are therefore suitable for establishing ACLs and managing Council-area ocean fisheries. However, most stocks experience different fishing and non-fishing impacts in the freshwater environment than other stocks, even within the same stock complex, and may have different productivities. Therefore, status of stocks within the complex are not necessarily well-correlated.

[6] See MSA §303(a)(10) and 50 CFR 600.310(e)(2)
[7] 50 CFR 600.310(h)(3)

Stocks managed under an international agreement can be excepted from specification of ABC and ACL reference points (50 CFR 600.310(e)(2)(ii)), but they are still required to have MSY and SDC specified. Based on the Stock Classification Alternative 3 (Section 2.1 of this EA), the relevant stocks for specifying SDC reference points include KRFC, SRFC, Columbia Upper River summer Chinook, and indicator stocks in the FNM Chinook complex, and Washington Coast and Puget Sound coho. Based on the Stock Classification Alternative 2, Columbia Upper River fall Chinook would also require specification of SDC. These stocks are relatively data-rich, having age-structured information and models to assess compliance with both S- and F-based SDC. If Mid-Columbia River spring Chinook remain in the fishery as proposed in Alternative 1, they would also require SDC; although this would require development of new information that is not currently available for the stock. For pink stocks, classification alternatives include designating them as ECs or applying the international exception. SDC would not be required if designated as ECs; SDC would be required for Puget Sound pink stocks if it remains in the fishery even if under the international exception.

2.2.1 Criteria Used to Evaluate the Alternatives

The criteria used to evaluate SDC alternatives were consistency with the MSA and NS1Gs, and feasibility of implementation. Considerations within the criterion for MSA and NS1Gs consistency include:

- The SDC should be objective and measurable[8]
- The SDC should be assessed annually[9], if possible
- The SDC to determine overfishing[10] should be based on either:
    1. the fishing mortality rate (F) exceeding the maximum fishing mortality threshold[11] (MFMT), i.e., **F > MFMT**, or
    2. the annual catch exceeding the overfishing limit (OFL), i.e., **annual catch > OFL**
- The SDC to determine overfished[12] should be based on the minimum stock size threshold[13] (MSST) and must be expressed in terms of spawning biomass or other measures of reproductive potential, and should equal whichever of the following is greater: One-half (½) the MSY stock size (S_{MSY})[14], or the minimum stock size at which rebuilding to S_{MSY} would be expected to occur within 10 years, if the stock or complex were exploited at the MFMT.
- SDC to determine approaching overfished[15] are when a stock is projected to have more than a 50 percent chance that the stock size (S)[16] will decline below the MSST within two years.

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[8] MSA §303(a)(10)

[9] 50 CFR 600.310(e)(2)(ii) explains that if SDC should be specified and expressed in a way that enables monitoring of each stock or complex to determine annually, if possible, whether overfishing has occurred or if a stock or complex is overfished.

[10] 50 CFR 600.310(e)(2)(ii)(A)

[11] MFMT is the level of fishing mortality (F), on an annual basis, above which overfishing is occurring. The MFMT or reasonable proxy may be expressed either as a single number (a fishing mortality rate or F value), or as a function of spawning biomass or other measure of reproductive potential. 50 CFR 600.310(e)(2)(i)(C)

[12] 50 CFR 600.310(e)(2)(ii)(B)

[13] MSST means the size below which the stock or stock complex is considered to be overfished. 50 CFR 600.310(e)(2)(i)(F)

[14] MSY stock size (S_{MSY}) means the long-term average size of the stock or stock complex, measured in terms of spawning biomass or other appropriate measure of the stock's reproductive potential that would be achieved by fishing at F_{MSY}. 50 CRF 600.310(e)(1)(i)(C). For salmon, the appropriate measure of the stock's reproductive potential is the number of adult spawners (S).

[15] 50 CFR 600.310(e)(2)(i)(G)

[16] Size (S) of the stock or complex for salmon is the number of adult spawners.

- SDC to determine when a stock is rebuilt should be based on a stock achieving S_{MSY}.[17]

2.2.2 Overview of Alternatives

For all of the alternatives:

- SDC are specified for each stock, as opposed to a stock complex;
- all determinations, except approaching overfished, are made postseason; and
- all status determinations are made annually.

Table 2-7 provides a description of the SDC alternatives, including formulaic representations. More detailed descriptions of the alternatives and assessment relative to the evaluation criteria above are provided in subsequent sections.

The proposed alternatives to the status quo all incorporate the reference points identified in the NS1Gs (e.g., F_{MSY}, MFMT, MSST). However, the proposed definitions of some of these references points differ slightly from those in the NS1Gs to accommodate the life history of Pacific salmon, where reproduction is semelparous and a stock's full reproductive potential can be spread out over a multi-year period. These modified approaches are proposed in accordance with the provision allowing for flexibility in the application of the NS1Gs.[18]

[17] 50 CFR 600.310(j)(3)(i)

[18] 50 CFR 600.310(h)(3)

Table 2-7: Overview of SDC alternatives for overfishing, overfished, approaching overfished, and rebuilt (S = Spawning Escapement; C = catch; t = year; GM = Geometric mean)

Status Category	**Alternative 1: Status Quo Determination Based on Three Consecutive Years: MSST = S_{MSY}**	**Alternatives 2 and 2b Determination Based on a Single Year: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (2b)**	**PPA Alternative 3, Determination Based on 3-Year Geometric Mean: MSST = 0.5*S_{MSY}**	**Alternatives 3b and 3c Determination Based on 3-Year Geometric Mean: MSST = 0.75*S_{MSY} (3b) or 0.86*S_{MSY} (3c)**	**Alternative 4 and 4b Determination Based on 3-Year Arithmetic Mean: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (4b)**
Overfishing	S(t,t-1,t-2)<MSST and C(t,t-1,t-2) > MSST-S(t,t-I,t-2) i.e. fishing contributed to triggering Overfishing Concern	F > MFMT in one year, with MFMT = F_{MSY}. F used is most recently available postseason value.	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis
Overfished	S(t,t-1,t-2)<MSST Current NMFS interpretation of Overfishing Concern as defined in FMP.	S < MSST in one year. S used is most recently available postseason value.	GM(S) < MSST over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S) < MSST over three year period. S used are 3 most recently available postseason values.
Approaching overfished	S(t-1,t-2)<MSST and S(t) forecast < MSST	S < MSST in one year. S used is current preseason forecast.	GM(S) < MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S)< MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.
Rebuilt	S > S_{MSY} in one year or as otherwise determined in rebuilding plan. S used is most recently available postseason value.	S ≥ S_{MSY} in one year. S used is most recently available postseason value.	GM(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3	0(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.

The status categories for overfished, approaching overfished, and rebuilt within each alternative should be considered together, given the need to have comparable metrics among these abundance-based SDC.

2.2.3 SDC Alternative 1: Status Quo

The current Salmon FMP does not explicitly define when a stock is considered to be experiencing overfishing, overfished, or is approaching overfished. While SDC are not currently specified, the FMP has identified indicators of a declining status for a stock that trigger Council action (see below). However, triggering of the status indicators has resulted in status determinations of overfished, approaching overfished, and rebuilt, as indicated in the Report to Congress on Status of U.S. Fisheries (NMFS 2010).

A **"conservation alert"** is triggered during the annual preseason process if a stock is projected to fall short of its conservation objective (MSY, MSY proxy, MSP, or spawning escapement floor).

An **"overfishing concern"** is triggered if a stock fails to meet its conservation objective (evaluated postseason) for three consecutive years. If an overfishing concern is triggered, the FMP requires an assessment of factors that led to the shortfall. The Council directs its STT to work with state and tribal fishery managers to complete an assessment of factors that led to the overfishing concern within one year. Based on the results of the assessment, the STT will recommend management actions (i.e., a rebuilding plan) that will result in recovery of the stock in as short a time as possible, preferably within ten years or less, and provide criteria for identifying stock recovery and the end of the overfishing concern. In addition the Council directs its Habitat Committee (HC) to work with Federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame. The timing of this process is described in Figure 2-1 below.

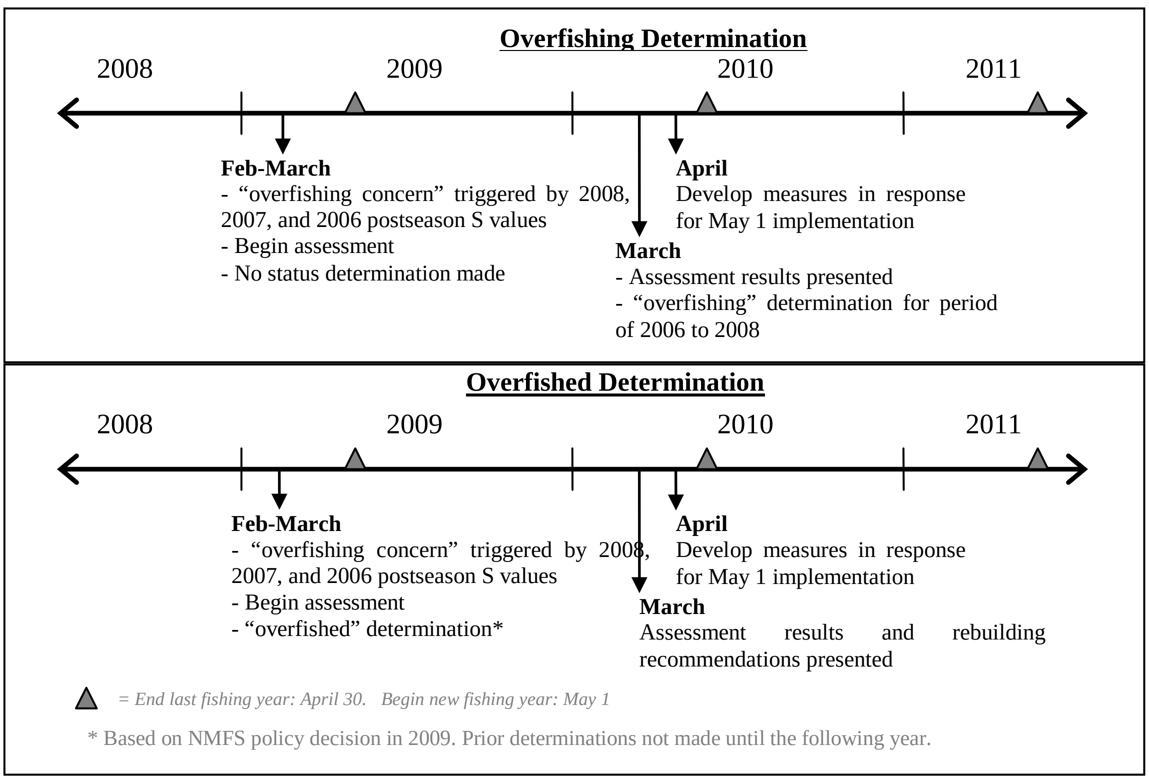

Figure 2-1. Timeline for overfishing concern process, making status determinations, and implementation of management response. Example timeline assumes "overfishing concern" is triggered in 2009.

Because the FMP provides no specific guidance about when or under what circumstances a stock should be considered subject to overfishing or overfished, it has resulted in confusion and inconsistent status determinations. Absent clearly defined SDC, NMFS made a policy decision in 2009 to declare a stock "overfished" if it triggers an "overfishing concern" under the FMP.

2.2.3.1 Status quo definition of overfishing.

After the triggering of an overfishing concern, the STT conducts an assessment to determine whether overfishing occurred. If the STT assessment concludes that excessive fishing contributed to a stock not meeting its conservation objective for three consecutive years, overfishing is said to have occurred.

2.2.3.2 Status quo definition of overfished

As of 2009, a NMFS policy decision was made to interpret a stock that has not met its conservation objective for three consecutive years (i.e., an overfishing concern under the FMP) to be overfished.

2.2.3.3 Status quo definition of approaching overfished

When a stock has failed to achieve its conservation objective for two consecutive years and is projected not to meet the objective in the third year, the FMP requires some specific action by the Council. The Council must notify pertinent fishery and habitat managers, advising them the stock may be temporarily depressed or approaching an overfishing concern and request the pertinent state and tribal managers to do a formal assessment of the primary factors leading to the shortfalls and report their conclusions and recommendations to the Council no later than the March meeting prior to the next salmon season.

2.2.3.4 Status quo definition of rebuilt

The default criterion in the FMP for when a stock is considered rebuilt is when its conservation objective is met for one year. In cases where a rebuilding plan has been adopted, the stock is considered rebuilt when the criteria defined in the rebuilding plan have been met.

2.2.3.5 Evaluation of Status Quo SDC Alternatives

Consistency with the MSA and NS1Gs: The status quo alternative is partially consistent with NS1Gs, but is deficient in several important areas.

Overfishing: Determination if overfishing occurred is not measurable for some stocks and is not objective. Overfishing determinations are case-specific; based on the STT assessments made after a stock has triggered an overfishing concern, not on an annual basis. Overfishing has generally been determined based on an amount of catch (analogous to an OFL) as opposed to a rate of fishing (analogous to a MFMT), and specification of the catch amount that results in overfishing has been determined differently for various STT overfishing assessments. There is also a time lag of up to one year after the overfishing concern is triggered to conduct an assessment. During the interim, no status determination is made. This process has not resulted in a consistent definition of overfishing across stocks and is ambiguous.

Overfished: Overfished status, while not defined in the FMP, is interpreted by NMFS as a stock subject to an overfishing concern. The NMFS interpretation of overfished is both objective and measurable. The assessments of whether stocks have met conservation objectives are made annually during the preseason planning process, and are made in the year immediately following triggering of an overfishing concern. The overfished status is based on the MSY conservation objective, which in this case is equivalent to an MSST.

Approaching Overfished: The status quo alternative is consistent with NS1Gs in that there are specific objective and measurable criteria to use for determining when a stock is approaching an overfishing concern, which has been interpreted as overfished. Approaching overfished determinations are made annually during the preseason planning process. If the stock has failed to meet its conservation objective for the two previous years, and the forecast of S equals the conservation objective, the probability of becoming overfished in the current year is 0.5, assuming an unbiased predictor. If the forecast of S is

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

lower than the conservation objective, the probability of becoming overfished in the current year is greater than 0.5, assuming an unbiased predictor.

Rebuilt: The default criterion in this alternative is compatible with the NS1Gs because it requires a stock to achieve its MSY-based conservation objective. The overfishing assessment process, which includes specifying rebuilt criteria in a formal rebuilding plan, could result in criteria that are not consistent with the NS1Gs because rebuilding benchmarks may not be measurable or objective. It is also unclear when the default rebuilding plan should be implemented versus development of a separate rebuilding plan.

Feasibility of Implementation: Implementation is feasible as status quo is the current status determination process. However, the requirement for STT overfishing assessments, including development of criteria for overfishing, overfished, and rebuilt, can be burdensome given time constraints and can lead to inconsistencies in status determination.

The combination of terminologies used under the status quo has also proven very confusing. Even though a stock is determined as "overfished" under the status quo, an "overfishing concern" under the FMP is nevertheless triggered, leading to a great deal of confusion among stakeholders and the public about the true status of the stock. For instance, the stock might be determined as "overfished" but not "subject to overfishing," yet it has triggered an "overfishing concern."

2.2.4 Alternative 2: Single Year Basis SDC, MSST = $0.5*S_{MSY}$

Single year based SDC are used for many fish species, and the NS1Gs recommend a default overfished criteria (MSST) of $0.5*S_{MSY}$. This alternative would require determination of overfishing, overfished, approaching an overfished condition, and rebuilt based on annual evaluations. Status determinations would be predicated upon meeting various fishing mortality (F) or escapement (S) benchmarks in the previous year only (current year for approaching overfished).

2.2.4.1 Overfishing

A stock would be considered subject to overfishing when the postseason estimate of F exceeds the MFMT, where the MFMT is defined as $F_{MSY.}$ Stock-specific estimates of F_{MSY} based on spawner-recruit data would be used if available. Otherwise, proxy values based on species-specific meta-analyses, would be used. A meta-analysis for Chinook is shown in Appendix C. Stock-specific overfishing determinations would be made annually and based on exploitation during a single biological year. Figure 2-2 illustrates alternative SDC reference points for KRFC and SRFC relative to the current conservation objectives and the estimated and proxy values for F_{MSY} and S_{MSY}.

2.2.4.2 Overfished

A stock would be considered overfished if S falls below its MSST in a single year, with MSST defined as $0.5*S_{MSY}$. Stock-specific overfished determinations would be made annually.

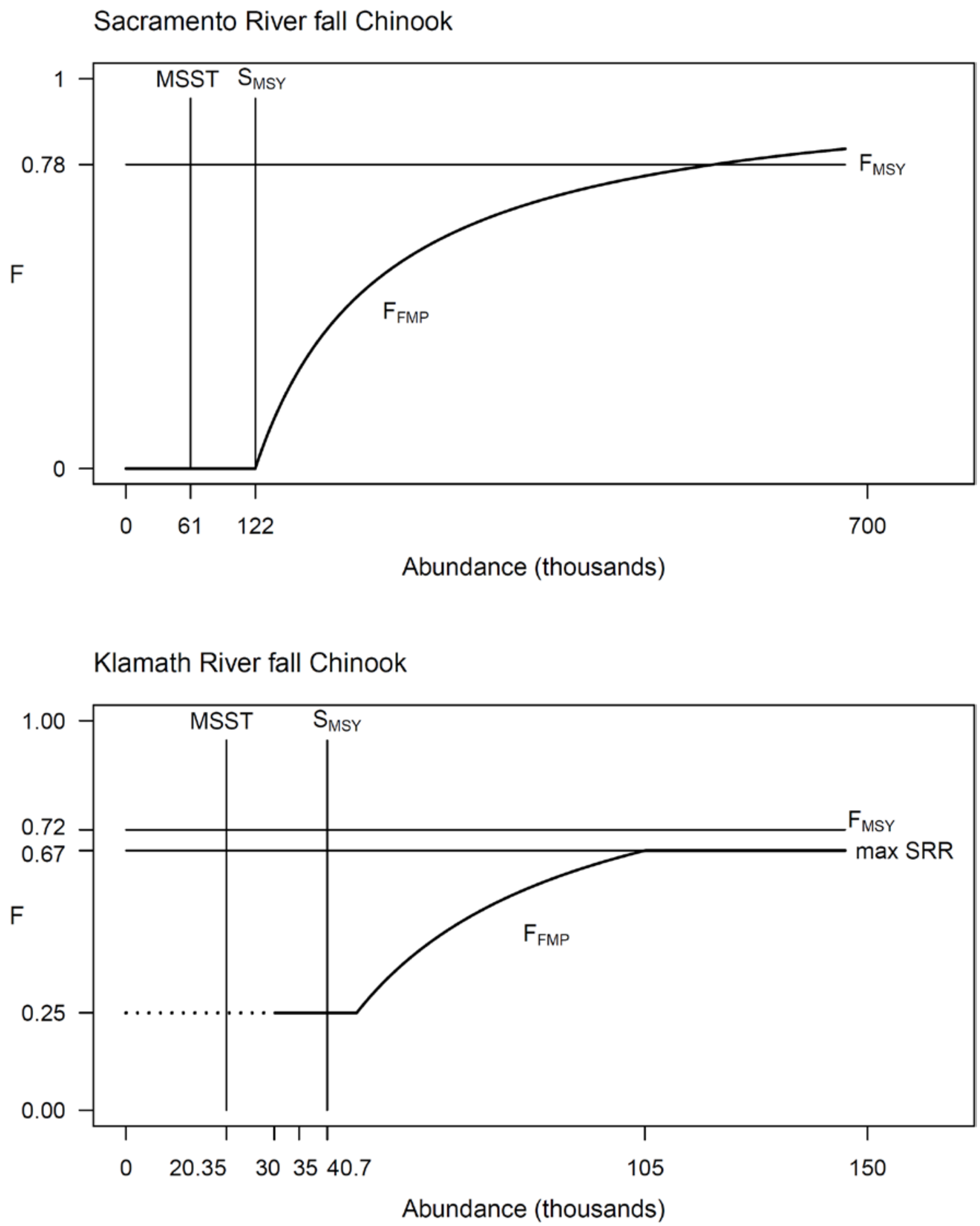

Figure 2-2. Current conservation objective control rules for Sacramento River fall Chinook and Klamath River fall Chinook. Proposed SDC reference points are superimposed on the control rules. MSST is assumed to be equal to $0.5*S_{MSY}$ in this figure.

2.2.4.3 Approaching an Overfished Condition

An approaching overfished determination would be made when the preseason forecast of S falls below MSST in a single year. Stock-specific determinations would be made each year during the preseason planning process.

2.2.4.4 Rebuilt

A stock would be rebuilt when S exceeds S_{MSY} for one year. The determination would be made annually during the preseason process.

2.2.4.5 Evaluation of Single Year SDC Alternatives

Consistency with the MSA and NS1Gs: The Alternative 2 SDC are consistent with NS1Gs.

Overfishing: Alternative 2 SDC to determine overfishing are based on MFMT, which is objective and measurable. Determinations would be made annually, and for some stocks could be made in the year immediately following the year in which exploitation may have occurred. However, estimating fishing mortality rate (F) for other stocks may take longer due to the availability of stock-specific run reconstruction information. An overfishing SDC based on MFMT is consistent with one of the definitions in the NS1Gs.

Overfished: Alternative 2 SDC to determine overfished are based on MSST, which is objective and measurable. Determinations would be made annually, and generally could be made during the preseason planning process following the most recent return year. Defining MSST in terms of S is consistent with the NS1Gs' requirement to define MSST as a measure of reproductive potential. The MSST level of $0.5*S_{MSY}$ is also identified in the NS1Gs as an appropriate level, provided the stock would be capable of rebuilding to S_{MSY} within 10 years if exploited at MFMT. Defining MSST as $0.5*S_{MSY}$ for salmon is appropriate because salmon populations are relatively productive compared to other managed fish species (Appendix B), and have demonstrated many times the ability to rebuild quickly, well within 10 years.

Approaching Overfished: Alternative 2 SDC to determine approaching overfished are objective and measurable. The criterion would be determined annually during the preseason planning process. If the preseason forecast of S equals the MSST, the probability of becoming overfished in the current year is 0.5, assuming an unbiased predictor. If the forecast of S is lower than the MSST, the probability of becoming overfished in the current year is greater than 0.5, assuming an unbiased predictor. The NS1Gs define approaching overfished to occur when a stock is projected to fall below the MSST within two years. The short life history of salmon is such that it is not possible to predict stock size beyond the current forecast year. Nonetheless, Alternative 2 allows us to assess whether a stock is approaching an overfished condition annually based on the best available science. The NS1Gs provide some flexibility in the specification of references points and specifically references Pacific salmon in this context. Alternative 2 is tailored to unique life history of salmon, but is otherwise consistent with the intent of NS1Gs.

Rebuilt: Alternative 2 SDC to determine rebuilt are objective and measurable; benchmarks would be clearly identifiable. Rebuilt status determinations would be made annually during the preseason planning process. The NS1Gs generally refer to a rebuilt condition as achieving a stock or complex's S_{MSY}.

Feasibility of Implementation: Implementation of Alternative 2 is generally feasible. Postseason estimates of both F and S are routinely made for many stocks, though new methods may be needed for some stocks to obtain postseason estimates for these quantities in the immediately previous year. In some cases, postseason estimates of F made in the following year may be of lower quality than estimates made

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

two or three years later. This alternative will also streamline the process for assessing SDC and reporting to Congress.

Other Considerations: While it is, or can be, possible to make an overfished determination based on metrics estimated one year prior, it is not clear whether this accurately represents the status of salmon stocks. Salmon stock abundances can be quite variable, owing in part to the semelparous nature of reproduction and short generation times. Hence, falling below the MSST in a single year may not be indicative of a longer-term trend toward depressed abundance or the ability of the stock to produce MSY on a continuing basis. This reasoning also applies to the rebuilt determination. A single strong year-class resulting in one year of exceeding S_{MSY} for a severely depressed stock may not truly represent that the stock is rebuilt.

This alternative would likely increase the frequency that overfished determinations are made compared to status quo since an overfished determination would be based on a single year of low return ($0.5*S_{MSY}$) rather than three consecutive years of return below S_{MSY}. Overfished determinations normally involve conducting an assessment of the cause of the overfished condition, and development and implementation of a rebuilding plan may be required. Conducting assessments and developing rebuilding plans impact management agency workload and funding needed to support processes like Council meetings and advisory body meetings (e.g., STT). In addition, other tasks have to be delayed, resulting in indirect effects to other administrative programs, which could impact the biological and socioeconomic environments at some level.

2.2.5 Alternative 2b: Single Year SDC, MSST = $0.75*S_{MSY}$

Alternative 2b SDC would be identical to Alternative 2 SDC except that Overfished and Approaching Overfished would be based on a value of 0.75 S_{MSY} rather than $0.5*S_{MSY}$.

2.2.6 PPA Alternative 3: 3-Year Geometric Mean Basis SDC, MSST = $0.5*S_{MSY}$

Salmon are relatively short-lived species with spawning escapements of coho and pink salmon dominated by a single year-class, and Chinook spawning escapements dominated by no more than two year-classes. The abundance of year-classes can fluctuate dramatically with combinations of natural and human-caused environmental variation. Therefore, it is not unusual for a healthy and relatively abundant salmon stock to produce occasional spawning escapements which, even with little or no fishing impacts, may be significantly below the long-term average associated with the production of MSY. Therefore, low stock size in one year is not necessarily a cause for concern; however, longer-term stock depression could signal the beginning of a critical downward trend, which may jeopardize the capacity of the stock to produce MSY over the long-term if appropriate actions are not taken.

Alternative 3 would require determination of overfished, overfishing, approaching overfished, and rebuilt based on annual postseason evaluations. The definition of overfishing in Alternative 3 is equivalent to Alternative 2. However, the definitions of overfished, approaching overfished, and rebuilt are different in that they require multi-year postseason estimates of S to be assessed. The multi-year alternatives use a 3-year geometric mean to determine overfished, approaching overfished, and rebuilt status.

2.2.5.1 Overfishing

Same as Alternative 2: A stock would be considered subject to overfishing when the postseason estimate of F exceeds the MFMT, where the MFMT is defined as $F_{MSY.}$ Stock-specific estimates of F_{MSY} based on spawner-recruit data will be used if available. Otherwise, proxy values based on species-specific meta-analyses would be used. A meta-analysis for Chinook is shown in Appendix C. Stock-specific overfishing determinations are made annually and based on exploitation during a single biological year.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

2.2.5.2 Overfished

A stock would be considered overfished if the 3-year geometric mean of S fell below the MSST, defined as $0.5*S_{MSY}$. Overfished determinations would be made annually using the three most recently available postseason estimates of S.

2.2.5.3 Approaching an Overfished Condition

An approaching overfished determination would be made if the geometric mean of the two most recent postseason estimates of S, and the current preseason forecast of S, are below the MSST.

2.2.5.4 Rebuilt

A stock would be rebuilt when the 3-year geometric mean of S exceeds S_{MSY}.

2.2.5.5 Evaluation of 3-Year Geometric Mean SDC Alternatives

Consistency with the MSA and NS1Gs: The Alternative 3 SDC are consistent with NS1Gs.

Overfishing: Same comments as Alternative 2.

Overfished: Alternative 3 SDC to determine overfished are based on MSST, which is objective and measurable. Determinations would be made annually, and generally could be made during the preseason planning process following the most recent return year. MSST is not defined in a single year as in the NS1Gs (CFR 600.310 (e)(2)(ii)(B); however, the multi-year criterion does more accurately reflect the risk to reproductive potential as discussed above. Defining MSST in terms of S is consistent with the NS1Gs' requirement to define MSST as a measure of reproductive potential. The MSST level of $0.5*S_{MSY}$ is also identified in the NS1Gs as an appropriate level, provided the stock would be capable of rebuilding to S_{MSY} within 10 years if exploited at MFMT. Defining MSST as $0.5*S_{MSY}$ for salmon is appropriate because salmon populations are relatively productive compared to other managed fish species (Appendix B), and have demonstrated many times the ability to rebuild quickly, well within 10 years.

Approaching Overfished: Alternative 3 SDC to determine approaching overfished are objective and measurable. The criterion would be determined annually during the preseason planning process. If the stock failed to meet the MSST for the two previous years, and the forecast of S equals the MSST, the probability of becoming overfished in the current year is 0.5, assuming an unbiased predictor. If the forecast of S is lower than the MSST, the probability of becoming overfished in the current year is greater than 0.5, assuming an unbiased predictor.

Rebuilt: Alternative 3 SDC to determine rebuilt are objective and measurable; benchmarks would be clearly identifiable. Rebuilt status determinations would be made annually during the preseason planning process. The NS1Gs generally refer to a rebuilt condition as achieving a stock or complex's S_{MSY}.

Feasibility of Implementation: Same comments as Alternative 2.

Other Considerations: Overfished, approaching overfished, and rebuilt status defined in Alternative 3 are designed to acknowledge the variability common in salmon populations. Salmon stock abundances can be quite variable owing in part to the semelparous nature of reproduction and short generation times. Reproductive potential of a stock, given the inherent variability of salmon populations, may best be described using a multi-year metric. Use of the geometric mean of the most recently available 3-year postseason estimates of S would decrease the probability of a stock being declared overfished as a result of a single weak year-class. Conversely, a single strong year-class would be unlikely to result in a rebuilt status for an otherwise severely depressed stock. Survival processes lead to variability in adult abundance that is approximately lognormally distributed. Lognormally distributed data have a skewed distribution where large values are possible, but the lower end the distribution is bounded by zero. The geometric mean was chosen instead of the arithmetic mean because the geometric mean is less sensitive to large values. For similar reasons, geometric means are routinely used rather than arithmetic means to assess the status of ESA-listed species. The multi-year approach to status determination is currently used in the FMP to identify an overfishing concern for the same reasons, although the metric is different.

2.2.6 Alternative 3b: 3-Year Geometric Mean Basis SDC, MSST = 0.75*S_{MSY}

Alternative 3b SDC would be identical to Alternative 3 SDC except that Overfished and Approaching Overfished would be based on a value of 0.75*S_{MSY} rather than 0.5*S_{MSY}.

2.2.7 Alternative 3c: 3-Year Geometric Mean Basis SDC, MSST = 0.86*S_{MSY}

Alternative 3c SDC would be identical to Alternative 3 SDC except that overfished and approaching overfished would be based on a value of 0.86*S_{MSY} rather than 0.5*S_{MSY}. This alternative would result in an MSST for KRFC of 35,000 natural area adult spawners, and would therefore provide some consistency with the status quo spawning escapement floor (conservation objective) for that stock.

2.2.8 Alternative 4: 3-Year Arithmetic Mean Basis SDC, MSST = 0.5*S_{MSY}

Alternative 4 SDC would be similar to Alternative 3 SDC except that overfished and approaching overfished, and rebuilt would be based on a 3-year arithmetic mean rather than a 3-year geometric mean.

Salmon abundance over time follows a log-normal distribution. The geometric mean is appropriate for describing the most likely value of such distributions and is most sensitive to low values. For salmon abundance distributions, the arithmetic mean will generally be higher than the geometric mean, and more than half the observations will be below the arithmetic mean. High values have more influence on the arithmetic mean. The choice of which mean to use will affect how often stocks are determined to be overfished, and levels needed to achieve rebuilt status, with the geometric mean being more precautionary. The geometric mean is currently used in other aspects of salmon assessment and management, including the ongoing status reviews of all ESA-listed species being conducted by NMFS.

2.2.9 Alternative 4b: 3-Year Arithmetic Mean Basis SDC, MSST = 0.75*S_{MSY}

Alternative 4b SDC would be identical to Alternative 4 SDC except that Overfished and Approaching Overfished would be based on a value of 0.75*S_{MSY} rather than 0.5*S_{MSY}.

2.2.10 Stock-Specific Considerations

Specification of SDC are dependent on identifying S_{MSY} reference points for individual stocks. The specification of S_{MSY} may also establish a conservation objective, (annual management constraint) for that stock. The individual S_{MSY} values identified in the SDC alternatives are, in some cases, different than those currently used as conservation objectives and management targets.

For example, SRFC have a range of 122,000-180,000 natural and hatchery spawners as their conservation objective. The SDC alternatives specify a single S_{MSY} value of 122,000, and yet other levels of S within the goal range have been targeted by the Council. The choice to specify S_{MSY} = 122,000 stems from it presently serving as the trigger value for an overfishing concern (Table 2-9).

Puget Sound coho have conservation objectives based on stepped exploitation rates associated with abundance break points. These objectives were established through the *U.S. v. Washington* process, and subsequently adopted into the PST and the Salmon FMP. The abundance break points correspond to S_{MSY} under average and low survival conditions and range from 0.59*S_{MSY} to 0.75*S_{MSY}. Using an SDC of 0.5*S_{MSY} would result in overfished status criteria at stock sizes that are less than the lower break point estimate of S for all Puget Sound coho stocks. Using an SDC of $0.75*S_{MSY}$ would result in overfished status criteria at stock sizes that are greater than the lower break point estimate of S for most Puget Sound coho stocks (Table 2-8).

Washington Coastal coho have FMP conservation objectives based on a range of S_{MSY} associated with high and low smolts per female and marine survival. The status quo control rule uses the lower end of the range as MSST. The mid-point of the range could also be for S_{MSY} with $0.5*S_{MSY}$ or $0.75*S_{MSY}$ for MSST. The mid-point of the S_{MSY} range is also used to categorize annual stock status for the PSC management process (Table 2-8). Analysis of stock-recruitment data provides additional estimates of S_{MSY} and F_{MSY} for these stocks (Appendix E), which were used in analyzing SDC in this FMP amendment process.

The current conservation objective and control rule for Oregon South Coast Chinook could allow for S-based SDC; however, there is insufficient information to directly assess F-based SDC. Oregon South Coast Chinook, or some stock components thereof, may soon have new objectives that would facilitate setting F-based SDC, pending an ongoing review/revision of management objectives for that stock complex (Table 2-9).

The Canadian Chinook and coho stocks identified in the FMP are actually large stock management units made up of many individual stocks. The Canadian management agencies are responsible for determining the status of these individual stocks as they relate to provisions of the PST and other Canadian statutes. The Council has no authority to monitor or assess status of these individual stocks, or to specify their management objectives. The Council also has no authority to establish reference points for the larger stock units. Therefore, specification of SDC for Canadian stocks in the Council's Salmon FMP is not feasible (Tables 2-8, 2-9). The Council will continue to abide by the terms of the PST and manage its fisheries accordingly.

Table 2-8. Status determination criteria reference points, assumptions and issues for coho stocks.

Coho Stock	S_{MSY}		MFMT (F_{MSY})		MSST			
	Est	**Basis**	**Est**	**Basis**	**Alt 1 Status Quo Cons Obj**	**Alt 2, 3, & 4 0.5*S_{MSY}**	**Alt 2b, 3b & 4b 0.75*S_{MSY}**	**Alt 3c 0.86*S_{MSY}**
CCC – ESA Endangered	Unk	NA	Unk	NA	0.0 HR in CA: ESA BO	Unk	Unk	Unk
SONCC – ESA Threatened	Unk	NA	Unk	NA	0.13 Ocean ER: ESA BO	Unk	Unk	Unk
OCN – ESA Threatened	Unk	NA	Unk	NA	0.08-0.45 ER: ESA BO	Unk	Unk	Unk
LCN – ESA Threatened	Unk	NA	Unk	NA	Ocean & MS CR ER: ESA BO	Unk	Unk	Unk
Columbia River Late - Hatchery	14,100	TAC	UnDef	NA		NA	NA	NA
Columbia River Early - Hatchery	7,100	TAC	UnDef	NA	7,100	NA	NA	NA
Willapa Bay - Hatchery	6,100	WDFW	UnDef	NA	6,100	NA	NA	NA
Quinault - Hatchery	??	QIN?	UnDef	NA	??	NA	NA	NA
Quillayute Summer - Hatchery	300	WDFW	UnDef	NA	300	NA	NA	NA
S. Puget Sound - Hatchery	52,000	WDFW	UnDef	NA	52,000	NA	NA	NA
Grays Harbor	24,426	S_{MSP} (FMP) *F_{SMY} (App C	0.69	App E	35,400	12,213	18,320	21,007
Queets	5,500	App E	0.68	App E	5,800-14,500	1,125	4,125	4,730
Hoh	2,250	App E	0.69	App E	2,000-5,000	1,125	1,688	1,935
Quillayute Fall	5,873	App E	0.59	App E	6,300-15,800	2,937	4,405	5,051
Strait of JdF	10,978	FMP	0.60	FMP	7,007	5,489	8,234	9,442
Hood Canal	14,350	FMP	0.65	FMP	10,750	7,175	10,762	12,340
Skagit	25,000	FMP	0.60	FMP	14,875	12,500	18,750	21,500
Stillaguamish	10,000	FMP	0.50	FMP	6,100	5,000	7,500	8,600
Snohomish	50,000	FMP	0.60	FMP	31,000	25,000	37,500	43,000
Coastal Stocks	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA
Fraser River	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 2-9. Status determination criteria reference points, assumptions and issues for Chinook stocks. Sp/Su = Spring/Summer, Su/F = Summer/Fall.

	S_{MSY}		MFMT (F_{MSY})		MSST			
Chinook Stock	Est	Basis	Est	Basis	Alt 1 Status Quo Cons Obj	Alt 2, 3, & 4 $0.5*S_{MSY}$	Alt 2b, 3b & 4b $0.75*S_{MSY}$	Alt 3c $0.86*S_{MSY}$
Sacramento River Winter – ESA Endangered	Unk	NA	Unk	NA	Time/Area restrictions in CA: ESA BO	Unk	Unk	Unk
Sacramento River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Northern California Coast (Eel, Mattole, Mad Rivers) -ESA Threatened	Unk	NA	Unk	NA	≤ 0.16 Ocean Age-4 KRFC ER: ESA BO	Unk	Unk	Unk
Upper Willamette Spring – ESA Threatened	Unk	NA	Unk	NA	≤ 0.15 FW ER: ESA BO	Unk	Unk	Unk
Lower Columbia River (LCR) Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.37 Wild Tule ER: ESA BO	Unk	Unk	Unk
North Fork Lewis Fall – Part of LCR ESU	5,700 5,791	FMP CTC	0.76	CTC	5,700: ESA BO	Unk	Unk	Unk
Snake River Fall Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.70 Base Period ER: ESA BO	Unk	Unk	Unk
Snake River Sp/Su Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.055 to 0.17 FW ER: ESA BO	Unk	Unk	Unk
Upper Columbia River Spring Chinook – ESA Endangered	Unk	NA	Unk	NA		Unk	Unk	Unk
Eastern Strait of Juan de Fuca Su/F – ESA Threatened	Unk	NA	Unk	NA	Comp. Chinook ER: ESA 4(d) Rule	Unk	Unk	Unk
Skokomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Nooksack Sp/early Fall – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit - Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit Sp – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Stillaguamish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Snohomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Cedar River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
White River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Green River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk

	S_{MSY}		MFMT (F_{MSY})		MSST			
Chinook Stock	**Est**	**Basis**	**Est**	**Basis**	**Alt 1 Status Quo Cons Obj**	**Alt 2, 3, & 4 0.5*S_{MSY}**	**Alt 2b, 3b & 4b 0.75*S_{MSY}**	**Alt 3c 0.86*S_{MSY}**
Nisqually River Su/F – ESA Threatened	Unk	NA	Unk	NA	1,100: ESA 4(d) Rule	Unk	Unk	Unk
Lower Columbia River Fall - Hatchery	15,400	TAC	UnDef	NA	15,400	NA	NA	NA
Lower Columbia River Spring - Hatchery	2,700	TAC	UnDef	NA	2,700	NA	NA	NA
Mid-Columbia River Bright Fall - Hatchery	Unk	TAC	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Spring Creek Fall-Hatchery	7,000	TAC	UnDef	NA	7,000	NA	NA	NA
Willapa Bay Fall-Hatchery	8,200	WDFW	UnDef	NA	8,200	NA	NA	NA
Quinault Fall–Hatchery	Unk	QIN	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Sacramento Fall	122,000	Lower	0.78	App C	122,000	61,000	91,500	104,920
Klamath River Fall	40,700	STT	0.71	STT	35,000 spawner floor: FMP	20,350	30,525	35,000
Smith River Fall	UnDef	NA	0.78	App C	UnDef	UnDef	UnDef	UnDef
Southern Oregon	150,000 to 200,000	FMP	0.78	App C	>60 spawners/ mi: FMP	UnDef	UnDef	UnDef
Central and Northern Oregon		FMP	0.78	App C		UnDef	UnDef	UnDef
Klickitat, Warms Springs, John Day and Yakima River - Spring	Unk	FMP	Unk	NA	<1% ocean impact rate	Unk	Unk	Unk
Upper River Bright - Fall	39,625	CTC	0.86	CTC	<4% ocean impact rate	Unk	Unk	Unk
Upper River - Summer	12,143	CTC	0.75	CTC	<2% ocean impact rate	Unk (6,072)	Unk (9,107)	Unk (10,443)
Willapa Bay - Fall	4,350 (MSP)	WDFW	0.78	App C	Unk	Unk	Unk	Unk
Grays Harbor Fall	14,600 (MSP)	WDFW	0.78	App C	Unk	Unk	Unk	Unk
Grays Harbor Spring	1,400 (MSP)	FMP	0.78	App C	Unk	Unk	Unk	Unk
Queets - Fall	2,500	FMP	0.78	App C	Unk	Unk	Unk	Unk
Queets – Sp/Sur	700	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoh - Fall	1,200	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoh Sp/Su	900	FMP	0.78	App C	Unk	Unk	Unk	Unk
Quillayute - Fall	3,000	FMP	0.78	App C	Unk	Unk	Unk	Unk
Quillayute - Sp/Su	1,200	FMP	0.78	App C	Unk	Unk	Unk	Unk
Hoko -Su/F	850	FMP	0.78	App C	Unk	Unk	Unk	Unk
Coastal Stocks	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA
Fraser River	UnDef	FMP	UnDef	FMP	UnDef	NA	NA	NA

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

2.2.11 Council Response to Triggering SDC

Under the status quo SDC Alternative the FMP prescribes actions that the Council must take when a conservation alert or overfishing concern are triggered, including notifying relevant management agencies of stock status, developing assessments of stock status and causes of triggering SDC, implementing management responses, adopting criteria for ending an overfishing concern (PFMC 2007). Under SDC Alternatives 2-4, these actions would need to be revised and/or associated with new SDC thresholds. The following actions are proposed for Alternatives 2-4 for each SDC category, and are extracted from the proposed FMP language presented in Appendix H.

2.2.11.1 Overfishing

The STT will report postseason exploitation rates in the annual SAFE document, and when overfishing occurs, the Council shall:

1. notify the NMFS NWR administrator of the STT's findings;
2. direct the STT to assess the mortality rates in fisheries impacting the stock of concern and report their findings;
3. immediately take action to ensure Council area fisheries are not contributing to overfishing, and;
4. notify pertinent management agencies of the stock's status and the contribution of various fisheries to the total exploitation rate.

2.2.11.2 Overfished

When the overfished status determination criteria set forth in this FMP have been triggered, the Council shall:

1. notify the NMFS NWR administrator of this situation;
2. notify pertinent management entities;
3. structure Council area fisheries to reduce the likelihood of the stock remaining overfished and to mitigate the effects on stock status, and;
4. direct the STT to propose a rebuilding plan for Council consideration within one year.

Upon formal notification from NMFS to the Council of the overfished status of a stock, a rebuilding plan must be developed and implemented within two years.

The STT's proposed rebuilding plan will include:

1. an evaluation of the roles of fishing, marine and freshwater survival in the determination;
2. any modifications to the criteria set forth [in EA section 2.2.11.4] below for determining when the stock has rebuilt,
3. recommendations for actions the Council could take to rebuild the stock to S_{MSY}, including modification of control rules and;
4. a specified rebuilding period.

In addition, the STT may consider and make recommendations to the Council or other management entities for reevaluating the current estimate of S_{MSY}, modifying methods used to forecast stock abundance or fishing impacts, improving sampling and monitoring programs, or improving hatchery practices.

Based on the results of the STT proposed rebuilding plan, , the Council will implement (subject to Secretarial approval) a rebuilding plan with appropriate actions to ensure the stock is rebuilt in as short a time as possible based on the biology of the stock but not to exceed ten years, while taking into consideration the needs of the commercial, recreational and tribal fishing interests and coastal communities. The existing control rules provide a default rebuilding plan that targets spawning escapement at or above MSY provided sufficient recruits are available and targets a rebuilding period of one generation (two years for pink salmon, 3 years for coho, and 5 years for Chinook). If sufficient recruits are not available to achieve MSA spawning escapement in a particular year, the control rules provide for *de minimis* exploitation rates that allow continued participation of fishing communities while minimizing risk of overfishing. However, the Council should consider the specific circumstances surrounding an overfished determination and endure that whatever rebuilding plan is adopted addresses all relevant issues.

Even if fishing is not the primary factor in the depression of the stock, the Council must act to limit the exploitation rate of fisheries within its jurisdiction so as not to limit rebuilding of the stock or fisheries. In cases where no action within Council authority can be identified which has a reasonable expectation of contributing to the rebuilding of the stock in question, the Council will identify the actions required by other entities to recover the depressed stock. Due to a lack of data for some stocks, environmental variation, economic and social impacts, and habitat losses or problems beyond the control or management authority of the Council, it is possible that rebuilding of depressed stocks in some cases could take much longer than ten years. The Council may change analytical or procedural methodologies to improve the accuracy of estimates for abundance, harvest impacts, and MSY escapement levels, and/or reduce ocean harvest impacts when it may be effective in stock recovery. For those causes beyond Council control or expertise, the Council may make recommendations to those entities which have the authority and expertise to change preseason prediction methodology, improve habitat, modify enhancement activities, and re-evaluate management and conservation objectives for potential modification through the appropriate Council process.

In addition to the STT assessment, the Council may direct its Habitat Committee (HC) to work with federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame. However, this action would be a priority only if the STT evaluation concluded that freshwater survival was a significant factor leading to the overfished determination. Upon review of the report from the HC, the Council will take actions to promote any solutions to the identified habitat problems.

2.2.11.3 Approaching an Overfished Condition

When a stock is approaching an overfished condition the Council shall:

1. notify the NMFS NWR administrator of this situation;
2. notify pertinent management entities, and;
3. structure Council area fisheries to avoid the stock becoming overfished and to mitigate the effects on stock status.

2.2.11.4 Rebuilt

When a stock is determined to be rebuilt, the Council shall:

1. notify the NMFS NWR administrator of its finding, and;
2. notify pertinent management entities.

2.2.11.5 Evaluation of Council Response to Triggering SDC

Consistency with MSA and NS1Gs: The Council responses to triggering SDC are consistent with the MSA and NS1Gs. The MSA requires FMPs to contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery if the fishery is overfished or approaching an overfished condition[19], and rebuild overfished fisheries[20] 304(e). The NS1Gs recommend Councils

[19] MSA §303(a)(10)
[20] MSA §304(e)

submit a rebuilding plan to NMFS within 15 months of notice that a fishery is overfished[21], and specify a rebuilding time period not to exceed 10 years[22]. The actions specified under Sections 2.2.11.1 and 2.2.11.3 require the Council to end any overfishing immediately, consistent with the MSA and NS1Gs. Actions under 2.2.11.2 require development of a rebuilding plan, consistent with the MSA and NS1Gs.

Feasibility of Implementation: The actions specified under Sections 2.2.11.2-4 relating to notifications, assignments, and content of assessments and rebuilding plans are within the Council's authority and will ensure that administrative processes are clear and efficient. All these actions are feasible to implement.

2.3 Alternatives for Reference Points: OFL, ABC, ACL, ACT, and Associated Frameworks

Alternatives for specification of OFL, ABC, and ACL reference points will be made on an individual stock basis for all stocks as required based on the best available science. These reference points will not be specified for any stocks that are identified in the FMP as EC species[23] or stocks that are internationally managed. A statutory exception exists to the requirement for specification of an ACL where they are "otherwise provided for under an international agreement…"[24]. The NS1Gs state that for internationally-assessed stocks, an ABC as defined in the NS1Gs is not required if they meet this international exception (see Section 2.1.4 for a list of salmon stocks proposed for classification as EC and stocks proposed as meeting the international exception). ACT…

The reference points identified in this Section will not be specified for hatchery stocks and ESA-listed stocks identified in the FMP. This is consistent with the NS1Gs, which provide the flexibility to consider alternative approaches for specifying ACLs and AMs. The NS1Gs generally allow for flexibility for stocks with unusual life history characteristics like Pacific salmon, and particularly for species listed under the ESA and hatchery stocks[25]. For stocks classified as hatchery stocks (Table 2-8), hatchery escapement goals will continue to serve as conservation objectives rather than specifying MSY-based reference points (see Section 2.3.5.3 of this EA). For stocks classified as ESA stocks (Table 2-8), ESA biological opinions and associated consultation standards will continue to provide necessary controls to ensure their long-term conservation (see Section 2.3.5.4 of this EA).

Based on stock classification Alternatives 2 and 3 in Section 2.1 of this EA, the relevant stocks for specifying OFL/ABC/ACL reference points are SRFC and KRFC. It is possible that South Oregon Coast Chinook, or some stock components thereof, may also support specification of these reference points prior to or shortly after implementation of this FMP amendment, depending on the outcome of an ongoing review/revision of management objectives for that stock complex. These stocks could then serve either as additional indicator stocks for the SONC complex, form an independent complex, or be managed as individual stocks.

2.3.1 Criteria Used to Evaluate the Alternatives

The criteria used to evaluate reference point alternatives were consistency with the MSA and NS1Gs, and feasibility of implementation.

Considerations within the criterion for MSA and NS1Gs consistency include:

[21] 50 CFR 600.310(j)(2)(ii)(B)
[22] 50 CFR 600.310(j)(3)(i)(B)
[23] 50 CFR 600.310(d)(5)
[24] MSRA§104(b)(1)
[25] 50 CFR 600 310(h)(3)

- Establishing a mechanism for specifying Annual Catch Limits[26]. ACLs must be specified in the FMP, implementing regulations, or annual specifications. The process should describe timeframes and address application to indicator and individual stocks. Use of exceptions (i.e., international fishery agreements) and flexibility provisions should be described.
- Describing the role of the SSC in recommending MSY and ABC[27]. The SSC must provide recommendations for ABC, and a process for applying the ABC control rule must be established.
- Accounting for uncertainty. ACLs are intended to reduce the risk of overfishing by accounting for scientific uncertainty in the fishery management process. Acceptable levels of risk reduction are not specified in the NS1Gs so alternatives will be evaluated for simple compliance, and ranked if there are differences in risk reduction.
- Consistency with approaches in the NS1Gs for each reference point. The NS1Gs define OFL, ABC, and ACL reference points as values that will be specified annually (or multiple years, if necessary) based on catch, expressed in terms of numbers or weight of fish and including all sources of fishing mortality from all fisheries (Federal and nonfederal). The reason for this is because the two statutorily required reference points (ABC and ACL) include the term "catch," which is most frequently defined in fisheries management in those terms.

2.3.2 Alternative Reference Points for OFL, ABC, and ACL

The stock classification alternatives affect the viability of approaches for specifying these reference points, as will the specification of SDC for overfishing. Regarding the latter, implementation feasibility and assessment capability are of particular interest. Based on the classification alternatives presented in Sections 2.1, Table 2-10 presents a conceptual view of stock-specific-based alternatives to be further considered.

Table 2-10. Overview of alternatives for OFL, ABC, ACL, ACT, and the associated framework.

Alternatives	**OFL**	**ABC**	**ACL**	**ACT**[a/]	**Framework**
1) Status Quo	Not identified	Not identified	Not identified	Not identified	--NA— Current conservation objectives specified to achieve S_{MSY} annually
2) Catch (C) Based	C_{OFL}	C_{ABC}	C_{ACL}	C_{ACT} [a/]	$C_{OFL} > C_{ABC} = C_{ACL} > C_{ACT}$ $C_{OFL}(t) = N(t) \times F_{MSY}$ $C_{ABC}(t) = N(t) \times F_{ABC}$ F_{ABC} = 95% or 90% F_{MSY} [b/]
3) PPA Spawning Escapement (S) Based	S_{OFL}	S_{ABC}	S_{ACL}	S_{ACT} [a/]	$S_{OFL} < S_{ABC} = S_{ACL} < S_{ACT}$ $S_{OFL}(t) = N(t) \times (1-F_{MSY})$ $S_{ABC}(t) = N(t) \times (1-F_{ABC})$ F_{ABC} = 95% or 90% F_{MSY} [b/]

a/ ACT could be used, as needed, but is undefined at this time.
b/ The buffer to account for scientific uncertainty is either 95 percent or 90 percent of F_{MSY}, depending on whether the F_{MSY} value represents a stock-specific estimate (Tier-1) or proxy value (Tier-2), respectively.

F_{MSY} is defined as the constant value of the total annual exploitation rate (independent of stock abundance) that would result in MSY over the long-term under prevailing ecological and environmental conditions.

[26] MSA Section 303(a)(15); 50 CFR 600 310(h)
[27] MSA Section 302(g)(1)(B); 50 CFR 600 310(f)(3-4)

All of the N, C, and F quantities in Table 2-10 are defined in terms of adult spawner equivalents (AEQ). For salmon, AEQ spawner units are biologically the most meaningful metric to use for these quantities, and are used as the basis of current conservation objective control rules. AEQ units are the number of would-be spawners represented by the respective quantity, absent further fishing. Thus, S by definition is expressed in AEQ units. For C, an adult fish caught in freshwater has an adult spawner equivalence of one, but a fish caught in the ocean has an adult spawner equivalence of less than one. A fish in the ocean may or may not have survived natural mortality, and may or may not have matured in the current year to return to freshwater to spawn. Thus, ocean catch, in AEQ units, is discounted for natural mortality and maturation. N is pre-fishery ocean abundance also discounted for natural mortality and maturation. F is the total exploitation rate of AEQ spawners, C/N.

For succinctness, in the following sections the quantities N, C, and F will be simply referred to as "abundance," "catch," and "exploitation rate," without the AEQ spawner qualifier except as necessary to discuss issues specifically pertaining to that concept.

2.3.3 Alternative 1: Status Quo – Not defined

Under the status quo, each stock is managed according to its individual conservation objectives. Current conservation objectives are based on exploitation rates or escapement goals. OFL, ABC, ACL, and ACT are not reference points that are currently specified for any stock.

Description: All current FMP conservation objectives can be translated into exploitation rate control rules, which specify the allowable total exploitation rate (i.e., includes all mortality from Federal and nonfederal fisheries) on the basis of the abundance of the stock. The four control rule types are:

- constant escapement
  Example: Columbia River summer Chinook
- escapement range
  Example: Sacramento River fall Chinook. 122,000 – 180,000 natural and hatchery adult spawners
- exploitation rate with floor level of escapement
  Example: Klamath River fall Chinook. 33-34 percent total exploitation rate on potential adult natural area spawners, but no fewer than 35,000 naturally spawning adults in any one year
- stepped exploitation rate
  Example: Skagit Coho. ≤60 percent total exploitation rate at pre-fishing abundance ≥62,500; ≤35 percent total exploitation rate at pre-fishing abundance ≤62,500 and ≥22,857; ≤20 percent total exploitation rate at pre-fishing abundance ≤22,857

Exploitation rate-based models are coupled with annual stock abundance forecasts to evaluate whether proposed fishery management measures are simultaneously consistent with the control rules of all FMP-managed stocks, the ESA consultation standards of all ESA-listed stocks, requirements of meeting PST obligations, and giving due consideration to hatchery stock goals (egg-take needs).

The ocean salmon fishery is a mixed-stock fishery; therefore, total Federal ocean harvest is managed to a level not to exceed the allowable ocean harvest of the most limiting stocks in the fishery. The potential ocean harvest of some stocks is often forgone in a given year, although overfishing still could occur on those stocks due to fishing mortality from nonfederal fisheries. While the management paradigm for ocean salmon harvest has been termed "weak-stock management," the resulting harvest is achieving optimum yield for the fishery each year.

Currently, ocean salmon harvest along the west coast is managed using either catch limits (quotas) or catch expectations (based on time and area closures). Off the Washington coast mixed-stock quotas (not to be confused with complexes) are used to control the ocean harvest. Off the Oregon coast, both mixed-stock quotas and time/area closures (effort control) are used. The quotas off Washington and Oregon are monitored in-season and have rarely been exceeded (Appendix F). Off the California coast, time/area closures are primarily used to manage ocean harvest and are based on an expected effort and catch associated with achieving stock-specific conservation objectives.

Consistency with MSA and NS1Gs: Because the Status Quo Alternative does not specify ACLs, it is not consistent with the MSA or NS1Gs, does not meet the purpose and need of the proposed action, and is not a viable alternative.

Accounting for Uncertainty: While OFL, ABC, and ACL are not currently specified in the Status Quo Alternative, this does not imply that the risk of overfishing is, or has been, high. Compared to the F_{MSY} approach described in the NS1Gs, however, it is not readily apparent whether or how the current set of control rules governing the exploitation of FMP-managed stocks account for scientific uncertainty. By overlaying the estimated F_{MSY} value onto the current control rules, it can be demonstrated that the current exploitation rate control rules are generally conservative (buffered) relative to F_{MSY}, with the exception of SRFC at high abundance levels (Figure 2-3).

Feasibility of Implementation: The Status Quo Alternative is currently implemented.

2.3.4 Overview of Alternatives 2, 3 and PPA 3b

Alternatives 2, 3, and PPA 3b specify OFL and ABC on the basis of exploitation rate (i.e., F_{MSY} and F_{ABC}) and abundance for each stock. F_{MSY} and F_{ABC} are defined in terms of total exploitation rate across all salmon fisheries (Federal and nonfederal jurisdictions). Impacts in non-salmon fisheries are included in the natural mortality assumptions used to estimate population parameters for salmon stocks; therefore, all fishing mortality sources are accounted for when reference points are specified. Current conservation objectives for all FMP-managed stocks can be expressed as exploitation rate control rules, with exploitation rates dependent on stock abundance.

OFL: OFL would be derived from the stock-specific estimate of F_{MSY}, or an F_{MSY} proxy, and abundance. OFL will be expressed in terms of either catch (C) or spawning escapement (S). Stock-specific estimates of F_{MSY} based on spawner-recruit data will be used if available. Otherwise, proxy values based on species-specific meta-analyses, would be used. The derivation of the F_{MSY} proxy value for Chinook (0.78) is shown in Appendix C.

ABC and the ABC Control Rule: ABC will be derived from an ABC control rule. The first step in determining the annual ABC is to specify $F_{ABC.}$ The second step requires applying F_{ABC} to the abundance to derive the annual ABC value expressed in terms of C or S.

F_{ABC} is a constant exploitation rate which is reduced from F_{MSY} by a buffer that accounts for scientific uncertainty. Two tiers of buffers have been established based on the level of scientific uncertainty associated with stocks having different levels of data-richness. Taking such a tiered approach to specification of the ABC is consistent with the NS1Gs[28] and appropriately accounts for the differences in scientific uncertainty among the stocks (Appendix D).

- Tier-1: For stocks that have sufficient data to conduct a stock-specific spawner-recruit analysis, and for which F_{MSY} has been directly estimated, the buffer level is 5 percent ($F_{ABC} = F_{MSY} \times 0.95$).

[28] 50 CFR 600.310 (f)(4)

- Tier-2: For stocks that have not undergone a spawner-recruit analysis, and F_{MSY} has been determined by proxy, the buffer level is 10 percent ($F_{ABC} = F_{MSY} \times 0.90$).

The resulting SRFC and KRFC F-based control rules, both the status quo forms and with incorporation of the ABC control rule, are displayed in Figure 2-3. With regard to SRFC, the control rules depicted assume S_{MSY} = 122,000. For SRFC, the most notable difference between status quo and the control rule incorporating the ABC is the specification of the maximum exploitation rate at F_{ABC}. Without the ABC control rule, the target exploitation rate for SRFC continues to increase with increasing abundance, approaching F = 1 as abundance increases. For KRFC, the status quo maximum allowable exploitation rate is 0.67, and application of the ABC control rule results in a minor change in maximum allowable F from 0.67 to 0.68. Under Alternative 3 the control rule for KRFC would target an escapement of 40,700 natural area adult spawners. This would result in a decrease in the allowable exploitation rate over a portion of the range, because of the target spawner escapement level of S_{MSY} = 40,700 instead of the status quo conservation objective (escapement floor) of 35,000. Under PPA 3b, the control rule for KRFC would target an escapement of 35,000 natural area adult spawners.

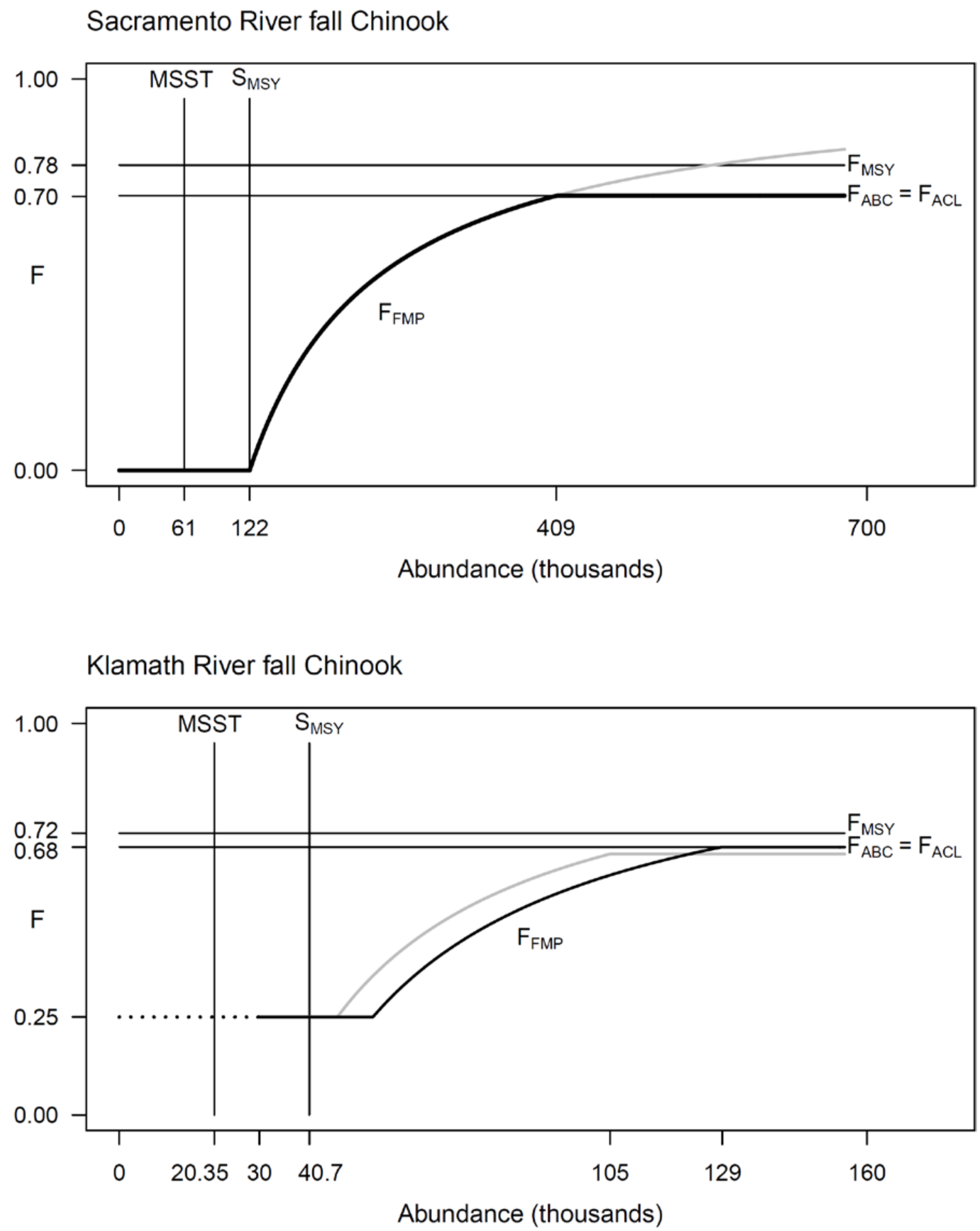

Figure 2-3. Status quo (thick gray line) and Alternative 2 and 3 (thick black line) F-based control rules for SRFC and KRFC. Reference points MSST, S_{MSY}, F_{MSY}, F_{ABC}, and F_{ACL}, are denoted by thin black lines.

Scientific Uncertainty and Specification of ABC: For both the C-based alternative and the S-based alternative, the ABC is buffered from the OFL (i.e., reduced from the OFL under the C-based alternative and increased from the OFL under the S-based alternative) to account for scientific uncertainty as described in the NS1Gs. For Alternative 2, the ABC is determined preseason by multiplying the F_{ABC} by the abundance forecast. For Alternative 3, the ABC is determined preseason by multiplying 1-F_{ABC} by the abundance forecast.

However, the determination of whether the ABC is exceeded on an annual basis will be made using *postseason* estimates of abundance and the specified value of F_{ABC} (or its complement). Since the ABC will be evaluated on a postseason basis, with postseason estimates of abundance, the probability of overfishing is exclusively dependent on whether F_{ABC} exceeds the true value of $F_{MSY.}$ Hence, the focal source of scientific uncertainty is uncertainty in the true value of $F_{MSY.}$

Preseason salmon abundance forecasts are imprecise, and comprise a large share of the uncertainty in annual preseason forecasts of catch and escapement. However, the methods used for salmon abundance forecasting and assessment are generally unbiased. The STT routinely reviews forecast methodologies looking for evidence of bias in particular, and makes necessary revisions when appropriate. Although forecast errors may be large in any particular year, the forecasting methods used result in a balancing of errors across years. The combination of (1) unbiased abundance forecasts and assessment variability, (2) the ABC control rule that specifies F_{ABC} as the maximum allowable exploitation rate, and (3) the buffer between F_{ABC} and F_{MSY} to account for scientific uncertainty in the true value of F_{MSY}, combines to result in an annual probability of overfishing of less than 50 percent.

The tiered approach to setting the ABC control rule reflects the expectation of different levels of uncertainty in F_{MSY} for salmon stocks with differing levels of data-richness. Appendix D quantifies uncertainty in the true value of $F_{MSY,}$ both in the case where F_{MSY} is directly estimated, and for the case where an F_{MSY} proxy is relied upon. The 5 and 10 percent buffers for Tier-1 and Tier-2 stocks, respectively, were chosen to be general buffer levels that could be applied to all salmon stocks when necessary for specifying the ABC control rule. The results presented in Appendix D demonstrate that the buffers associated with both tiers substantially reduce the likelihood of the F_{ABC} exceeding the true F_{MSY}. These results are interpreted as describing the degree to which the F_{ABC} control rule reduces the probability of overfishing.

In practice, the probability of overfishing will usually be less than the probability that F_{ABC} exceeds F_{MSY} because the target F (F_{FMP}) will be less than F_{ABC} at low to moderate abundance. From a single stock perspective, individual stock conservation objectives require target exploitation rates lower than F_{ABC} as abundance declines (Figure 2-3). This clearly meets the intent of the NS1Gs, which state that consideration should be given in the ABC control rule to reducing fishing mortality as stock size declines, but this is done through the conservation objective exploitation rate control rule rather than the F_{ABC} control rule. The conservation objective exploitation rate control rule thus provides a substantial amount of additional buffering beyond the F_{ABC} buffer at mid- and low-levels of abundance. From the perspective of the mixed-stock ocean fishery, meeting conservation objectives for ESA-listed and weak target stocks may further restrict the exploitation rate on the remaining stocks. Both of these factors frequently result in an exploitation rate that is substantially lower than the F_{ABC} value.

The retrospective analysis of overfishing (Table 4-1) demonstrates that overfishing has rarely occurred since the mid 1990s. Note that the control rules determining allowable F in past years does not include an F_{ABC} control rule with a maximum allowable exploitation rate specified at $F_{ABC.}$ Nevertheless, the salmon management system described in the retrospective analysis clearly has been effective in controlling exploitation rates since the mid 1990s. Reductions in exploitation rates that occurred at this time were

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

due to management constraints on fisheries to meet conservation objectives for both ESA-listed and weak target stocks. This management scenario, where ESA-listed and weak target stocks constrain fisheries, is not likely to change in the future. Thus, the buffer defining the ABC control rule sufficiently accounts for scientific uncertainty, and when coupled with the additional buffers present in the salmon management system, reduces the probability of overfishing to something well below 50 percent at all abundance levels.

Process of ABC Specification and SSC Approval: The NS1Gs state that Councils should "identify the body that will apply the ABC control rule (i.e., calculates the ABC) and identify the review process that will evaluate the resulting ABC," and that "the SSC must recommend the ABC to the Council."[29]

The SSC will be involved in the review and approval of the ABC control rule initially through this plan amendment, and subsequently as it reviews annual preseason forecasts. The ABC control rule itself will be fixed, but the year-specific ABC for a given stock varies depending on the preseason forecast. The SSC will have an ongoing role in setting ABCs through their existing responsibility to review these forecasts. Forecast methods are periodically revised and these too are routinely reviewed by the SSC through the existing methodology review process. The Council's Salmon Technical Team (STT) would develop the preseason forecasts, subject to the SSCs review, and apply the SSC-approved ABC control rule each year. The annual ABC recommendations will be reported to the SSC and Council in STT Preseason Report I (PFMC 2011b). This process would follow the current preseason report process and Salmon Methodology Review process. The SSC could revisit the ABC control rule annually or as needed in the fall when salmon methodologies are reviewed in preparation for the preseason process.

The STT forecasts fishery impacts using harvest models, which have been developed and documented by the STT, Model Evaluation Workgroup (MEW), state, tribal, and Federal management agencies, reviewed by the SSC, and approved by the Council. These models generally use stock-specific abundance estimates, historical fishery exploitation patterns, and a combination of effort estimates and quotas to project impacts. The model algorithms generally do not change substantially from year to year, but any changes that are proposed must be reviewed by the SSC and approved by the Council. The abundance forecasts used in the harvest models are calculated annually based on methods documented in Preseason Report I, which is also reviewed by the SSC and approved by the Council. Other model inputs may be updated, such as adding another year of catch and effort data, without additional review and approval. During the preseason planning process, the STT uses the models to compare impacts from proposed management measures to that allowed under the control rules (determined by the FMP conservation objectives), so that the Council can adopt appropriate management specifications for the upcoming season.

This process allows the SSC to recommend to the Council control rules for salmon stocks that are adopted into the FMP either through formal FMP amendment or through technical review of updated conservation objectives (FMP §3.2.1). The SSC also recommends to the Council the methods used to project compliance with the control rules, and the significant annual model input data (Preseason Report I). The STT is delegated the responsibility of applying the control rule to develop annual management specifications, but in all other respects, the SSC is responsible for review and oversight of the process, and making recommendations to the Council for approval.

2.3.4.1 Alternative 2: Catch (C) Based ACL Framework

Under this alternative, C_{OFL}, C_{ABC}, and C_{ACL} are specified for each stock considering all catch expected from Federal and nonfederal fisheries. These catch-based reference points would be derived each year by

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[29] 50 CFR 600.310 (f)(3)

applying the corresponding exploitation rate-based values (i.e., F_{MSY} and F_{ABC}), as described above, to the forecast abundance of the stock that year.

- **C_{OFL}** is the annual catch, derived by multiplying a stock's F_{MSY} with the stock's abundance (N) in a given year (t).

$$C_{OFL}(t) = N(t) \times F_{MSY}$$

- **C_{ABC}** is the annual catch derived by multiplying a stock's F_{ABC} with the stock's abundance (N) in a given year (t).

$$C_{ABC}(t) = N(t) \times F_{ABC}$$

  As described above, F_{ABC} is reduced from F_{MSY} to account for scientific uncertainty.

- **C_{ACL}** is equal to C_{ABC}, which could be greater than allowed by stocks' conservation objectives or other factors, such as constraints to protect ESA-listed stocks (Figure 2-4). As such, the C_{ACL} would generally be considered an upper limit associated with preventing overfishing only, rather than a harvest objective.

In years with low abundance, the C_{ACL} could be specified at a level higher than the conservation objective escapement target. In that situation, the conservation objective escapement target would remain the management target for the fishery. In years with high abundance, the C_{ACL} would be specified at a level less than the catch necessary to reduce abundance to the conservation objective escapement target. In this situation, the fishery would be designed to achieve a catch no more than the C_{ACL} (i.e., less than C allowed to achieve the spawning escapement conservation objective).

Actual computation of the C-based reference points are typically more complicated than the examples above and in Figure 2-4 owing to the age structure and time-dependence of various fishery and biological parameters, which differs among stocks and by the nature of the conservation objective. These reference points will be used in the preseason process, along with stocks' conservation objectives, to design the fishery such that any specified C_{ACL} for a stock or complex is not exceeded. During the fishing year, an individual stock's or complex's C_{ACL} cannot be monitored in-season, but is assessed early in the year following the fishery.

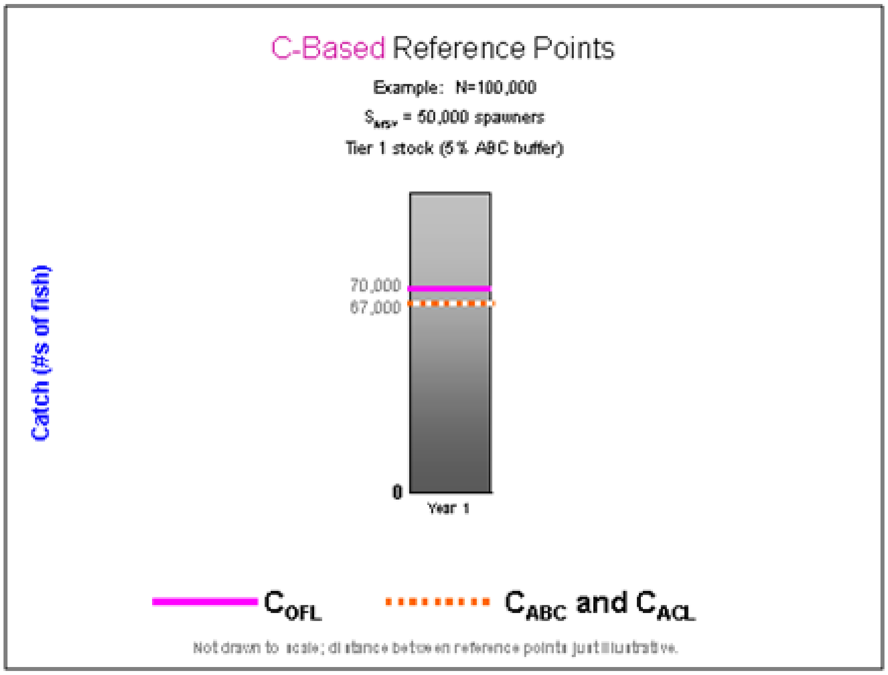

Figure 2-4: Example of C-based reference points assuming F_{MSY} = 0.70. Note that C_{ACL} is greater than allowed under management for the stock's conservation objective (S_{MSY}, 50,000 fish).

Implementation of the C-based Alternative would require that F_{MSY} and F_{ABC} be explicitly defined for all stocks and complexes (i.e., for the indicator stocks) in the fishery requiring ACLs (SRFC and KRFC). F-based reference points are all independent of stock abundance, and would thus be fixed values across years unless the value of F_{MSY} was revised based on additional information. Implementation of this alternative would also require that current year abundance forecasts be made for the indicator stocks subject to ACL requirements prior to the preseason management planning process. This already occurs as part of the annual Council assessment and management process. No further work would be required to implement the C-based Alternative into the preseason planning process beyond what is currently done.

Implementation of the C-based Alternative would require comparing the actual catch of the stock to the C_{ACL} estimated from postseason estimates of abundance and catch each year. This appears to be technically feasible (estimation methods vary by stock), though additional methods will need to be developed to estimate the AEQ catch for some stocks. The STT would conduct this work and report results annually prior to the development of Council management measures for the following year's fisheries. Determinations would be made annually, and for SRFC could be made in the year immediately following the year in which exploitation may have occurred. However, estimating fishing mortality rate (F) for KRFC would be preliminary in the year following exploitation and near final the following year due to the availability of brood specific run reconstruction information.

Current conservation objectives and control rules could change somewhat from the status quo under the C-based Alternative. For SRFC, in years of high abundance, harvest would be capped by the C_{ACL}. For KRFC, the F_{ABC} level would be slightly higher than the maximum allowed under the current conservation objective due to specification of F_{MSY} and the Tier-1 buffer defining the ABC control rule. Furthermore, the F-based conservation objective control rule for Alternatives 2 and 3 specify allowable exploitation rates that result in a target spawner abundance of S_{MSY} (40,700), which is higher than floor spawner abundance levels in the Status Quo Alternative (35,000, Figure 2-3).

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

The C-based Alternative would not require any change in the customary management measures used by the Council either north or south of Cape Falcon. In particular, it does not require that all salmon fisheries be managed by quota.

Consistency with the MSA and NS1Gs: This alternative is most obviously consistent with the statutory requirements and intent for ACLs and ABC because these reference points are expressed in terms of catch. This alternative also provides for an annual limit on catch. However, as in the S-based alternative, this limit will only be used preseason for providing an upper limit for each stock when planning fisheries and for postseason compliance assessment. Due to the nature of the mixed-stock ocean fishery and the inability to identify individual stocks caught in the ocean, even the C-based ACL cannot currently be monitored in-season. Nevertheless, designing the fishery within each year's constraints will continue to prevent overfishing in the fishery consistent with the MSA requirements.

- **NS1Gs definitions and expression of reference points**: This alternative is most obviously consistent with the NS1Gs' definitions of these reference points in that they will be expressed in terms of catch and specified annually.

- **NS1Gs' framework relationship of reference points**: This alternative is consistent with the framework established by the NS1Gs because C_{ABC} is specified at a level below $C_{OFL,}$ and C_{ACL} will be specified at a level that does not exceed C_{ABC}, specifically it will be set equal to C_{ABC}.

- **Scientific uncertainty and specification of ABC**: This alternative is consistent with requirements that the SSC recommend ABC and describes the process for application of the ABC control rule (see discussion in Section 2.3.4 above).

- **Management uncertainty**: An ACT is not, at this time, proposed for use but could be implemented, if necessary (see Section 2.4.2.4 of this EA).

- **Relationship of the ACL to accountability measures (AMs)**: The NS1Gs identify "AMs for when the ACL is exceeded."[30] Under this alternative, such AMs would be characterized as "AMs for when the C_{ACL} is exceeded." For purposes of triggering "AMs for when the ACL is exceeded" a post-season C_{ACL} will be used. The C_{ACL} will be recalculated using post-season estimates of abundance and compared with the post-season catch. "AMs for when the ACL is exceeded" would be triggered if the post-season C_{ACL} value is exceeded, not if the post-season catch exceeded the preseason $C_{ACL.}$ alternatives for specifying AMs are discussed in Section 2.4 below.

- **Performance standard for exceeding the ACL**: The NS1Gs include a performance standard that requires a re-evaluation of this framework if the ACL is exceeded more than once in four years. This performance standard will apply if the postseason catch exceeds the C_{ACL} calculated with postseason estimated abundance, rather than the preseason $C_{ACL,}$ to ensure the performance measure is biologically meaningful. For example, if the postseason catch exceeded the preseason C_{ACL} because the actual abundance was greater than was forecast, it would not present a biological concern. It would only be a biological concern if the actual catch exceeded the postseason C_{ACL}, i.e., calculated with the updated, actual abundance estimate. The use of postseason estimates of C_{ACL} rather than preseason forecasts of this reference point is uniquely appropriate for salmon management because high quality postseason abundance estimates are able to be made each year. This allows for the

[30] 50 CFR 600.310 (g)(3)

biologically relevant comparison between catch and the $C_{ACL,}$ as determined using high quality abundance estimates and to obviate the need to account for preseason forecast uncertainty in N.

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Feasibility of Implementation: Implementation of the C-based Alternative would require that F_{MSY} and F_{ABC} be explicitly defined for all stocks and complexes in the fishery (i.e., all indicator stocks) that are subject to the ACL requirements (SRFC and KRFC). F-based reference points are all independent of stock abundance, and would thus be fixed values across years unless the value of F_{MSY} was revised based on additional information. Implementation of this alternative would also require that current year abundance forecasts be made for these stocks prior to the preseason management planning process. This is already done as part of the Council annual management process. No additional work would be required to implement the C-based Alternative into the preseason management planning process.

Implementation of the C-based Alternative would require postseason estimates of abundance and AEQ catch each year so that C_{ACL} and other reference points could be compared with their postseason values, based on the actual abundance. This appears to be technically feasible (estimation methods vary by stock), and it could be done without a great deal of additional effort. The Salmon Technical Team would conduct this work and report results annually prior to the development of Council management measures for the following year's fisheries.

Current conservation objectives and control rules may change somewhat from the Status Quo under the C-based Alternative. For SRFC, in years of high abundance, target spawner catch would be lower than that specified by the Status Quo control rule, owing to the capping of the allowable exploitation rate at F_{ABC}. For KRFC, the F_{ABC} level would be slightly higher than the maximum allowed under the conservation objective due to specification of F_{MSY} and the Tier-1 buffer defining the ABC control rule, which would result in very minor changes to target catch levels at high abundances. Furthermore, the F-based conservation objective control rule for Alternative 2specify allowable exploitation rates that result in a target spawner abundance of S_{MSY} (40,700), which is higher than floor spawner abundance level in the Status Quo Alternative (35,000, Figure 2-3).

The C-based Alternative would not require any change in the customary management measures used by the Council both north and south of Cape Falcon.

2.3.4.2 PPA Alternative 3: Spawning Escapement (S) Based ACL Framework

Under PPA Alternative 3, OFL, ABC, ACL, and ACT are specified on the basis of spawning escapement (S), which is the metric most commonly used for assessing the status of salmon stocks.

- S_{OFL}, S_{ABC}, and S_{ACL} are specified for each stock.
- The framework is: $S_{OFL} < S_{ABC} = S_{ACL} < S_{ACT}$. S_{ACT} is undefined at this time, but if ever specified, it would be at a level greater than S_{ACL}.

Under this alternative, S_{OFL}, S_{ABC}, and S_{ACL} are specified for each stock individually. These S-based reference points are derived each year by applying the corresponding exploitation rate-based values (i.e., F_{MSY} and F_{ABC}), as described above, to the pre-fishery abundance of the stock that year.

- **S_{OFL}** is the annual spawning escapement that is derived by subtracting a stock's estimate of F_{MSY} from 1 (which translates the mortality rate into a survival rate) and then multiplying that by the stock's abundance (N) in a given year (t).

$$S_{OFL}(t) = N(t) \times (1-F_{MSY})$$

- $\mathbf{S_{ABC}}$ is the annual spawning escapement that is derived by subtracting a stock's F_{ABC} from 1 (which translates the mortality rate into a survival rate) and then multiplying that by the stock's abundance (N) in a given year (t).

$$S_{ABC}(t) = N(t) \times (1\text{-}F_{ABC})$$

As described in Section 2.3.4, F_{ABC} is reduced from F_{MSY} to account for scientific uncertainty. This same approach is used for this Alternative.

  - Tier-1: For stocks for which F_{MSY} has been directly estimated the buffer level is 5 percent ($F_{ABC} = F_{MSY} \times 0.95$).
  - Tier-2: For stocks for which F_{MSY} has been determined by proxy the buffer level is 10 percent ($F_{ABC} = F_{MSY} \times 0.90$).

- $\mathbf{S_{ACL}}$ will be equal to S_{ABC}

The S_{ACL} will fluctuate above or below the conservation objective depending on abundance forecasts (Figure 2-5).

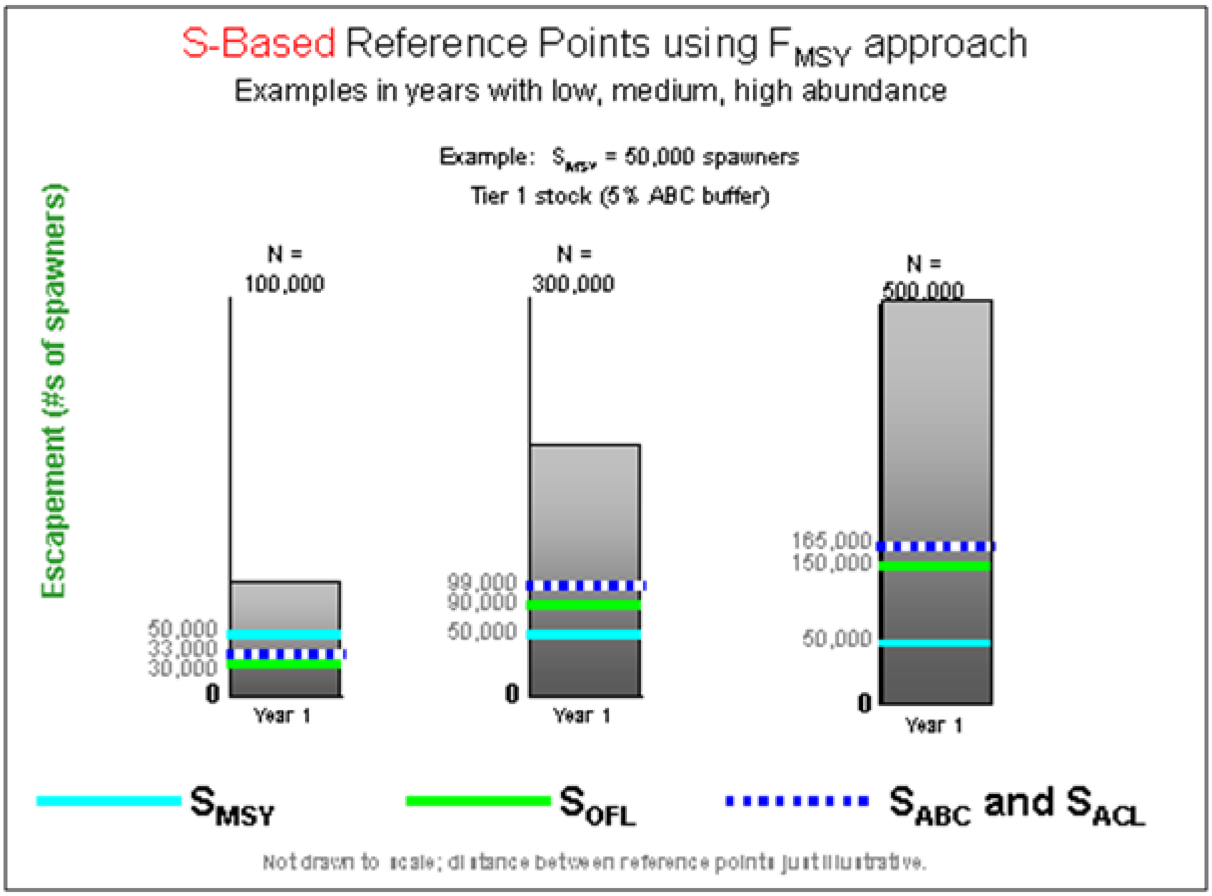


Figure 2-5. Example of S-based reference points assuming F_{MSY} = 0.70. Note that S_{ACL} is less than the objective in low abundance years and greater than the spawning objective under management for the stock's conservation objective (S_{MSY}, 50,000 fish).

In years with low abundance, the S_{ACL} could be specified at a level lower than the conservation objective escapement target. In that situation, the conservation objective escapement target would remain the management target for the fishery. In years with high abundance, the S_{ACL} would be specified at a level that could be greater than the conservation objective escapement target. In that situation, the fishery

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

would be designed to achieve an amount of returning spawners no less than the S_{ACL} (i.e., greater than S specified in the conservation objective).

Actual computation of the S-based reference points above are typically more complicated than in the above examples and Figure 2-5, owing to the age composition and time-dependence of various fishery and biological parameters. Computation of S-based reference points can also vary among stocks depending on the nature of the conservation objective. These reference points will be used in the preseason process, along with stocks' conservation objectives, to design the fishery such that the number of spawners meets or exceeds any specified S_{ACL} for a stock or complex. During the fishing year, an individual stock's or complex's S_{ACL} cannot be monitored in-season, but is assessed early in the year following the fishery.

Consistency with the MSA and NS1Gs: While Alternatives 3 and 3b do not directly define annual limits in terms of catch, they do define such limits in terms of spawner escapement, and therefore, in effect, limits catch. By designing the fishery within each year's constraints and no lower than each stock's S_{ACL}, they will continue to prevent overfishing in the fishery consistent with the MSA. However, Alternative 3b is inconsistent with the MSA requirement to manage for OY, which must be based on MSY, a reduced by relevant factors. Managing for an annual target of 35,000 natural area adult spawners would be managing for something greater than MSY.

- **NS1Gs definitions and expression of reference points**: This alternative is also generally consistent with the NS1Gs' definitions of these reference points. Although they will not be expressed in terms of catch, they will be specified in terms of numbers of fish and specified annually. The NS1G's allow for "flexibility" in achieving the goals of the guidelines for species with unique life histories such as salmon. The S-based alternative is consistent with the long-standing practice of using spawning escapement to assess the status of salmon stocks. The biology of salmon is such that escapement is the point in the species life history best suited to routine assessment and long-term monitoring.

- **Specification of ABC**: This alternative is consistent with requirements that the SSC recommend ABC and describes the process for application of the ABC control rule (see discussion in Section 2.3.4 above).

- **Management uncertainty**: An ACT is not, at this time, proposed for use but could be implemented, if necessary.

- **Relationship of the ACL to accountability measures (AMs)**: The NS1Gs identify "AMs for when the ACL is exceeded." Under this alternative, such AMs would be characterized as "AMs for when the S_{ACL} is not achieved." For purposes of triggering these postseason spawner escapement-based AMs, a postseason S_{ACL} will be used. The S_{ACL} will be recalculated using postseason estimates of abundance and compared to the postseason escapement. These AMs would only be triggered if the postseason S_{ACL} is not achieved, not if the postseason escapement fell below the preseason S_{ACL}. Alternatives for specifying AM are discussed in Section 2.4 below.

- **Performance standard for exceeding the ACL**: The NS1Gs include a performance standard that requires a re-evaluation of this framework if the ACL is exceeded more than one in four years. This performance standard would be triggered if the S_{ACL}, calculated with postseason abundance estimates, is not achieved in more than one in four years. This performance standard will only apply if the actual postseason escapement falls below the S_{ACL}, calculated with postseason estimated abundance, to ensure the performance measure is biologically meaningful. For example, if the postseason escapement estimate was lower than the preseason S_{ACL} because the actual abundance was lower than

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

was forecast, it may not present a biological concern. It would only be a biological concern if the actual escapement was lower than the postseason S_{ACL}, i.e., calculated with actual abundance estimate. The use of postseason estimates of S_{ACL} rather than preseason forecasts of this reference point is uniquely appropriate for salmon management because high quality postseason abundance estimates are able to be made each year. This allows for the biologically relevant comparison between observed escapement and the $S_{ACL,}$ estimated with high quality abundance estimates and to obviate the need to account for preseason forecast uncertainty in N.

Accounting for Uncertainty: This alternative is consistent with the framework established by the NS1Gs because S_{ABC} is specified with a buffer to account for scientific uncertainty in the $S_{OFL,}$ and S_{ACL} will be specified at a level equal to the S_{ABC}.

Feasibility of Implementation: Implementation of the S-based Alternative would require that F_{MSY} and F_{ABC} be explicitly defined for all stocks and complexes in the fishery (i.e., all indicator stocks) that are subject to the ACL requirements (SRFC and KRFC). F-based reference points are all independent of stock abundance, and would thus be fixed values across years unless the value of F_{MSY} was revised based on additional information. Implementation of this alternative would also require that current year abundance forecasts be made for these stocks prior to the preseason management planning process. This is already done as part of the Council annual management process. No additional work would be required to implement the S-based Alternative into the preseason management planning process.

Implementation of the S-based Alternative would require postseason estimates of abundance and escapement each year so that S_{ACL} and other reference points could be compared with their postseason values, based on the actual abundance. This appears to be technically feasible (estimation methods vary by stock), and it could be done without a great deal of additional effort. The Salmon Technical Team would conduct this work and report results annually prior to the development of Council management measures for the following year's fisheries.

Current conservation objectives and control rules may change somewhat from the Status Quo under the S-based Alternative. For SRFC, in years of high abundance, target spawner abundance would be higher than that specified by the Status Quo control rule, owing to the capping of the allowable exploitation rate at F_{ABC}. For KRFC, the F_{ABC} level would be slightly higher than the maximum allowed under the conservation objective due to specification of F_{MSY} and the Tier-1 buffer defining the ABC control rule, which would result in very minor changes to target spawner abundance levels at high abundances. Furthermore, the F-based conservation objective control rule for Alternatives 2 and 3 specify allowable exploitation rates that result in a target spawner abundance of S_{MSY} (40,700), which is higher than floor spawner abundance level in the Status Quo Alternative (35,000, Figure 2-3). Under PPA 3b the control rule for KRFC would target an escapement of 35,000 natural area adult spawners.

The S-based Alternative would not require any change in the customary management measures used by the Council both north and south of Cape Falcon.

Comparison to Status Quo: Current conservation objectives expressed as escapement control rules will be overlaid on the above S-based framework. The Council will continue to manage according to current conservation objective control rules except as limited by the S_{ACL} value. Fisheries would be managed to limit the expected value of spawning escapement to no less than the S_{ACL} value. However, escapement itself would not be directly controlled in-season so as not to fall below the S_{ACL} because this cannot be readily done with salmon fisheries. Spawners encounter the ocean fisheries often months before reaching their river of origin and in areas far from the river mouths, thus, escapement can only be monitored after the ocean fisheries have occurred. It is expected that the lack of direct control of the stock-specific escapement values in-season will not be an issue given other constraints on the fisheries.

2.3.4.3 Summary of Evaluation Criteria for Alternatives 2 and PPA 3

The primary difference between catch-based (Alternatives 2) and spawning escapement-based (Alternatives 3 and 3b) ACL frameworks relative to the evaluation criteria (Section 4.1.3 of this EA) are the metrics used to express the ACL framework. Alternative 2 uses catch, which is more directly consistent with the NS1Gs, whereas Alternatives 3 and 3b uses spawning escapement, which is more consistent with the FMP conservation objectives, the biology of the species, and the current structure of the salmon management system. It would require invoking the flexibility provisions of the NS1Gs (Table 2-11).

Table 2-11. Pros and cons of Alternatives 2 and 3 relative to the evaluation criteria.

Considerations	Alternative 2: C-Based	PPA Alternative 3: S-Based
Similarity to Status Quo Processes and Terminology	**CON**: Current conservation objectives expressed in terms of spawning escapement, not catch	**PRO**: Current conservation objectives expressed in terms of spawning escapement, so will be easier to relate to current thresholds that are familiar
Risk of overfishing	No difference	No difference
Feasibility of Implementation	**CON**: Catch specified in terms of spawner equivalents, which does not necessarily equal total catch. Additional methods need development to estimate catch of spawner equivalents	**PRO**: Spawning escapement estimated directly on an annual basis. Escapement clearly interpretable and does not require further methods to comply with the framework
MSA and NS1Gs definitions and expression of reference points*	**PRO**: More obviously consistent because reference points are expressed in catch, as in the NS1Gs	**CON**: Generally consistent, but requires invoking “flexibility provision” in the NS1Gs to express the reference points in spawner escapement rather than catch
NS1Gs framework relationship of reference points*	**PRO**: More obviously consistent because reference points are expressed in catch, thus the relationship follows that identified in the NS1Gs where OFL would be greater than ABC, and ABC is greater than or equal to ACL	**CON**: Generally consistent but requires invoking “flexibility provision” in the NS1Gs so that the relationship would be OFL is less than ABC, and ABC is less than or equal to ACL (i.e., the inverse)
Scientific uncertainty and specification of ABC*	No difference (buffer between OFL and ABC)	No difference (buffer between OFL and ABC)
Management uncertainty*	No difference (No ACT specified at this time)	No difference (No ACT specified at this time)
Relationship of the ACL to AMs*	No difference (AMs triggered using post-season C_{ACL})	No difference (AMs triggered using post-season S_{ACL})
Performance standard for exceeding the ACL*	No difference (use post-season C_{ACL})	No difference (use post-season S_{ACL})

2.3.5 Specification of Frameworks for Stock Complexes

Application of the Alternative OFL/ABC/ACL frameworks will be necessary for CVF and SONC Chinook stock complexes using SRFC and KRFC (respectively) as indicator stocks (based on Classification Alternative 3 in Section 2.1 of this EA). Other stocks classified as in the fishery are either included in the CVF or SONC Chinook complexes, or are not required to have ACLs specified because of the international management exception (Section 2.1 of this EA).

2.3.5.1 Sacramento River Fall Chinook

The status quo control rule specifies an exploitation rate limit, F_{FMP} that depends on abundance, i.e., the Sacramento Index (SI) (See Figure 2-3, gray line). The current conservation objective for SRFC is a combined hatchery and natural-area escapement goal range of 122,000 to 180,000 adults. In past years, the Council has targeted various SRFC escapement levels within this range. However, for the graphical presentation in Figure 2-3, the FMP control rule depicted represents an S_{MSY} level of 122,000 (Table 2-9). Under the current control rule, the F_{FMP} is zero when the SI is less than or equal to the lower end of the escapement goal range of 122,000-180,000 adults (see Section 2.5 of this EA for possible modification of the SRFC conservation objective control rule). If the Sacramento Index exceeds 122,000, when 122,000 is the escapement objective, then the allowable exploitation rate, F_{FMP} is equal to the value that would result in a forecast SRFC escapement of 122,000.

For the C-based and S-based control rules $F_{MSY} = 0.78$, the proxy value for Chinook stocks which do not have estimates of this rate is derived from stock-specific spawner-recruit analysis. This proxy value was determined to be the average F_{MSY} from Chinook stocks for which spawner-recruit analyses have been performed (Appendix C). For SRFC, therefore, $F_{ABC} = F_{MSY} \times 0.90 = 0.70$, and $F_{ACL} = F_{ABC}$. For abundance less than approximately 409,000, $F_{FMP} \leq F_{ACL}$ and for abundance greater than approximately 409,000, $F_{FMP} > F_{ACL}$. Under the C-based, and S-based Alternatives, the F_{FMP} control rule would be capped at the F_{ACL} value for SI greater than approximately 409,000 (Figure 2-3).

Figure 2-6 displays the C-based and S-based ACL control rules and the FMP conservation objective control rule as catch or escapement plotted as a function of abundance. The C-based and S-based control rules in Figure 2-6 are a direct product of the F-based control rule (Figure 2-3).

2.3.5.2 Klamath River Fall Chinook

The status quo control rule specifies an exploitation rate limit, F_{FMP} (i.e., the spawner reduction rate) that depends on the abundance, i.e., the expected number of natural area adult spawners absent fishing (see Figure 2-3, gray line). As defined in the current conservation objective, the maximum F_{FMP} is 67 percent. At an abundance of approximately 105,000, F_{FMP} is reduced from the maximum level to an F_{FMP} that results in 35,000 natural-area adult spawners, the escapement floor component of the conservation objective. Amendment 15 of the FMP allows for a *de minimis* harvest of KRFC, $F \approx 0.25$, which is enacted at an abundance of approximately 47,000 (see Section 2.5 of this EA for possible modification of the KRFC *de minimis* control rule).

For Alternatives 2 and 3, the C-based and S-based control rules $F_{MSY} = 0.72$ and $S_{MSY} = 40{,}700$. These values are based on stock-specific spawner-recruit data and analyses (STT 2005) and considered the best available science for KRFC and result in $F_{ABC} = F_{MSY} \times 0.95 = 0.68$, and $F_{ACL} = F_{ABC}$. The F_{FMP} below an abundance of approximately 129,000 is lower than the $F_{ABC,}$ similar to the Status Quo control rule where target F is lower than the maximum F as abundance decreases. However, the control rule for Alternatives 2 and 3 specify a target spawner abundance level of 40,700, which results in a different control rule relative to the Status Quo, where the target spawner abundance level is 35,000 natural-area spawners (Figure 2-3). In all cases, $F_{FMP} \leq F_{ACL;}$ that is, the current F control rule is uniformly more conservative than that allowed under a constant F_{MSY} framework.

Alternative 3b is the PPA. Alternative 3b is similar to Alternative 3 except that for KRFC only, the control rule would target the 35,000 natural area spawner floor rather than SMSY (40,700), as is currently done under status quo management.

The C-based and S-based control rules in Figure 2-6 are a direct product of the F-based control rule (Figure 2-3).

2.3.5.3 Hatchery Origin Stocks

A number of hatchery stocks in the fishery are targeted and are important contributors to Council-area fisheries. Hatchery stocks are fundamentally different from natural stocks because hatcheries are man-made facilities designed with specified production capacities. Conservation objectives for hatchery stocks are based on egg take needs, usually translated in the number of adult spawners needed to meet the egg take goal. The salmon FMP recognizes these objectives and strives to meet them; however, these artificially produced stocks generally do not need the additional protection associated with ACL and AM to insure their conservation or maintain long-term production. Spawning escapement goals are set to meet broodstock needs that are limited by the capacity of the hatcheries. The purpose of most production hatcheries is to produce large numbers of fish for harvest while conservation hatcheries assist with the recovery of weak stocks. Because of protections and management provided in the hatchery environment, egg-to-smolt survival rates are much higher for hatchery stocks than for naturally produced stocks. As a consequence, stock/production relationships and MSY concepts that are fundamental to the management of natural stocks do not apply to hatchery stocks. Hatchery stocks are able to sustain exploitation rates that are much higher than natural stocks. Conservation constraints for natural stocks and ESA-listed species are such that hatchery escapement objectives are generally met with large surpluses. In the rare event that hatchery goals are not met, there are alternatives for collecting additional broodstock at alternative sites or using more active collection techniques. The NS1Gs provide flexibility in establishing ACLs under certain circumstances and specifically refer to hatchery stocks and Pacific salmon in that context.[31] Because of the unique circumstance related to hatchery stocks and the flexibility provided for by the NS1Gs, hatchery escapement goals will be used as ACLs. Accountability will be achieved through the annual review and reporting of escapement relative to these goals.

2.3.5.4 Stocks Listed Under the ESA

Species that are listed as threatened or endangered under the ESA are subject to ESA Section 7 consultation. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the FMP. NMFS has completed a consultation for each of the ESA-listed salmon species on the effects of ocean harvest including Council-area fisheries. The resulting biological opinions set limits on incidental take, referred to as consultation standards, which are consistent with expectations for the survival and recovery of those species. NMFS periodically reviews and updates those biological opinions as required in response to new and developing information, including information developed through the ongoing recovery planning process. Each year NMFS summarizes the current consultation standard for each of the ESA-listed species and provides those to the Council in their annual guidance letter. The FMP obligates the Council to manage their fisheries subject to these standards. The standards are generally in the form of exploitation rate limits, or when necessary, time/area closures and other management regime limitations. The ESA consultation standards serve the function of ACLs for ESA-listed species. The NS1Gs provide flexibility in establishing ACLs under certain circumstances and specifically refer to ESA-listed species and Pacific salmon in that context. The biological opinions require that consultation be reinitiated if consultation standards are exceeded, or in response to new information regarding the species' status or the effects of the action on the species; therefore, the biological opinion also provides for annual accountability and ongoing review.

The purpose of the ESA is to conserve listed species and achieve their recovery to the point where the protections of the ESA are no longer required. The purpose of the MSA is to maintain stocks or rebuild stocks when necessary to levels at or above MSY, and requires the Council to identify and develop rebuilding plans for stocks that are overfished. For many fish stocks regulated under the MSA, the

[31] 50 CFR 600.310 (h)(3)

elimination of excess fishing pressure is the only action needed to recover the stocks. However, this is not the case for salmon stocks that are listed under the ESA.

Although harvest has certainly contributed to the depletion of west coast salmon populations, the primary reason for their decline has been the degradation and loss of freshwater spawning, rearing and migration habitats. The quality and quantity of freshwater habitat are key factors in determining the MSY of salmon populations. The Council has no control over the destruction or recovery of freshwater habitat nor is it able to predict the length of time that may be required to implement the habitat improvements necessary to recover species. Species-specific salmon recovery plans commonly assume that recovery will take decades. While the Council could theoretically establish new MSY escapement goals consistent with the limited or degraded habitat available to listed species, adoption of revised goals would potentially result in an Endangered Species Act- (ESA) listed species being classified as producing at MSY and, therefore, not being overfished under the MSA. The Council believes that the intent of the ESA and the MSA is the recovery of stocks to MSY levels associated with restored habitat conditions.

As species are delisted, the Council will establish new conservation objectives and reference points comparable to those for current non-listed stocks, and manage the stocks to sustain them at or above MSY levels.

2.3.6 Alternatives Eliminated From Detailed Study

Consistent with 40 CFR 1502.14(a), several alternatives were eliminated from detailed study.

2.3.6.1 Conservation Objective Based ACL Framework

The Council considered, but did not develop an alternative ACL framework that sought to account for uncertainty by adding buffers to the current escapement-based conservation objectives. For the S-based Alternative described in Section 2.3.4.2, F-based reference points were used rather than the existing S-based conservation objectives. Introducing additional buffers into the current escapement-based conservation objectives to define stock-specific OFL, ABC, and ACL reference points, is overly conservative because the current conservation objectives are already generally more conservative than what is allowed under an MSY framework (Figure 2-7). Section 4.1.2.1 of this EA includes a brief discussion of this issue as well.

A key distinction between the two approaches is that the S_{OFL}, S_{ABC}, and S_{ACL} would remain fixed under the buffered escapement approach, while the S_{OFL}, S_{ABC}, and S_{ACL} would fluctuate every year with changing abundance under Alternatives 2 and 3 approaches and could be either below or above the conservation objective (Figure 2-8).

Implications for *de minimis* fishing: Using a buffered escapement framework has implications for adopting and implementing *de minimis* fishing provisions. Specifically, if the S_{ACL} is specified at a level above the minimum escapement objective as shown on the left side of Figure 2-7, then *de minimis* fisheries that reduced escapement below the S_{ACL} would be problematic even though escapements may still be above or close to S_{MSY} levels.

Currently, the FMP requires that if a stock is projected to fall below S_{MSY}, all fisheries impacting the stock are to be closed (as was the case in 2008 for SRFC). Amendment 15 created a *de minimis* fishing mortality rate for KRFC that prescribed how fisheries should be reduced as abundance declines below S_{MSY} levels. Notably, no other Federal fisheries are entirely closed as soon as the stock drops below the S_{MSY} level.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

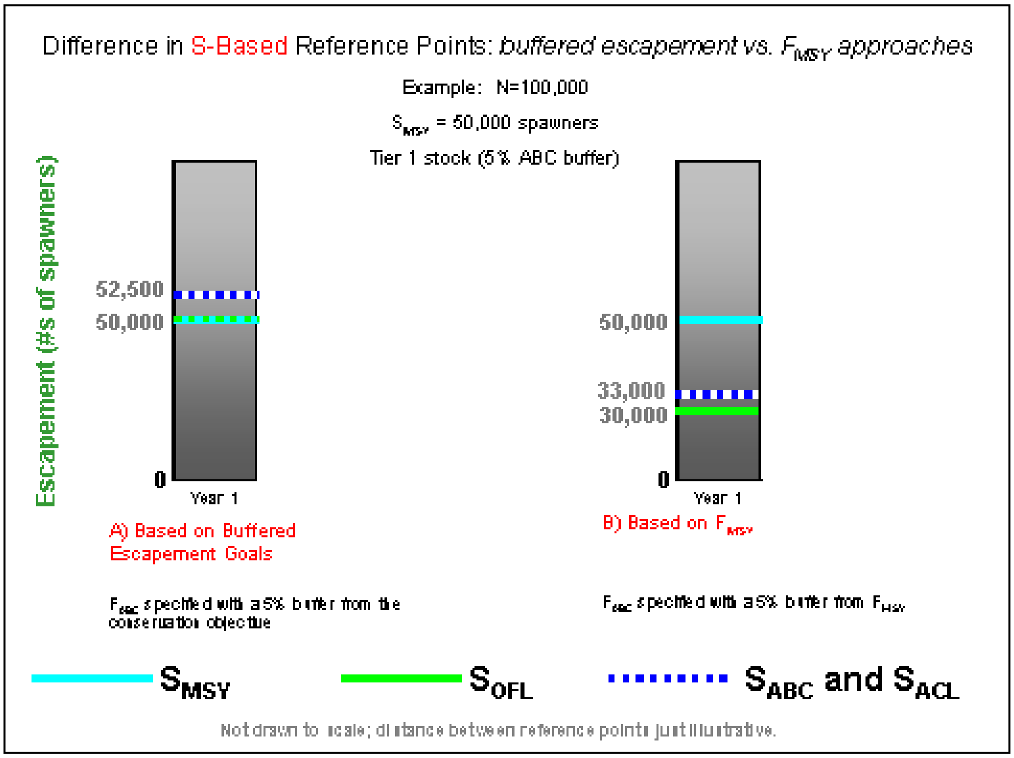
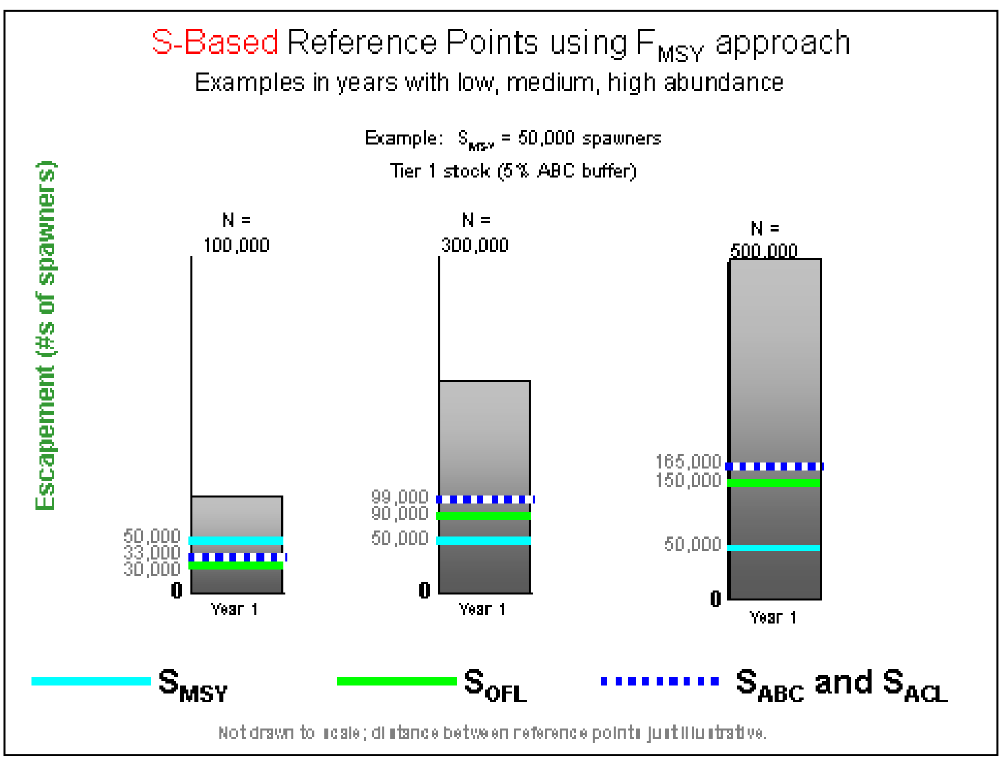


Figure 2-7. Comparison of S-based reference points with buffered escapement-based reference points and an F_{MSY} of 0.70.



ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Figure 2-8. Examples of fluctuating S-based reference points in years of low and high abundance assuming F_{MSY} = 0.70.

2.3.6.2 F-Based ACL Framework

The Council considered, but did not develop an alternative that would have defined the ACLs and related reference points in terms of exploitation rates. Such an F-based approach was considered but determined not to be consistent with the MSA Section 303(a)(15) and NS1Gs, and thus the purpose and need for this action, because it did not specify ACLs in terms of "catch."

2.3.6.3 Coastwide Species Based ACL Framework

The Council considered, but did not develop an alternative that would have defined ACLs and related reference points by forming species-level complexes and setting new limits on species-specific quotas that were designed to account for uncertainty. The NS1Gs allow specification of ACLs for stock complexes, and provide Pacific salmon as an example of an appropriate application of stock complex management[32]. Stock complexes are being proposed for Chinook stocks based on geography and other biological factors. No stock complexes are proposed that would group various coho stocks. Species-level complexes were considered inappropriate or impractical for several reasons. The diversity of life histories and migration patterns of the many stocks that would be in a species-level complex is inconsistent with the NS1G's requirements for forming stock complexes. If species-level quotas were formed, then reference point could, conceptually, be developed around species-level quotas. Although quotas are commonly used in fisheries north of Cape Falcon, they are generally not used in management areas south of Cape Falcon, particularly off California. These fisheries have been managed for the most part by time-area specific regulations on the number of days open to fishing, with small, mixed-stock quotas used occasionally in some areas. The harvest management models used by the Council for south of Cape Falcon Chinook fisheries, the Klamath Ocean Harvest Model (KOHM) and Sacramento Harvest Model (SHM), would require new, currently unavailable data, as well as extensive structural modifications to be successfully used to forecast harvest and escapement of KRFC and SRFC exclusively from large mixed-stock quota fisheries. In particular, the data-richness differences between KRFC (data-rich; age-structured catch and escapement data available) and SRFC (data-poor; age-structured catch and escapement data not available) results in different model structures, which does not allow for direct translation of catch expectations into large-scale mixed-stock quotas. The models, however, are well-suited for forecasting catch and escapement of their respective stocks given the current and historic blend of days-open and mixed-stock quota fisheries for Chinook, and have performed well as assessment tools for Council management in the area South of Cape Falcon.

2.3.6.4 Framework ACL Approach

Another alternative is a frameworked approach to determining F_{ABC}, which would require Council consideration on an annual basis. This alternative, referred to as the P* approach, involves the recommendation of a quantification of scientific uncertainty or sigma value for each "tier" of salmon stocks, and Council selection of a preferred overfishing risk policy, or P*. Based on these two values, the SSC would recommend the amount of reduction from F_{MSY} to F_{ABC} for each tier. This would have to be accomplished each year, before F_{ABC} could be determined and ACL alternatives could be described for each stock.

The P* alternative does not appear to be feasible or advantageous for salmon. First, there is likely not time available in the Council's schedule for adopting the annual salmon management measures to accommodate the extra process involved in implementing the P* approach. The salmon annual

[32] 50 CFR 600.310(d)(8)

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

management measures are developed each year on an extremely short schedule, at two Council meetings in March and April. Annual abundance information is not available until February. The Council and its advisory bodies therefore have essentially a 2-month window, including two Council meetings, in which to 1) evaluate the effects of the prior season's management measures given the current year's abundance projections, 2) develop and evaluate the effects of action alternatives for the current year's management measures, including the ability of those measures to ensure that ACLs and consultation standards for ESA listed stocks are not exceeded, and 3) evaluate the effects of the Council's preferred alternative, usually a modified version of one or more of the action alternatives. The P* approach would require the analysis of ABC alternatives in an annual NEPA document, and would thus add to the existing workload. A straight percentage ABC control rule does not require modification on an annual basis, therefore changes to the control rule can be accomplished independent from the season-setting process, on a schedule that accommodates the necessary analysis.

For groundfish there is significant new information about the status of assessed stocks every biennium, sometimes there are new overfished species, sometimes there are species being assessed for the first time, stock complexes can get reorganized, or stocks can get taken out of complexes because there is new scientific information to support stock-specific management; in other words, there are a number of factors that can change significantly from one biennium to the next. And it's a biennium, so the Council only has to revisit the "buffers" between OFL and ABC every 2 years.

2.4 Accountability Measures

In addition to ACLs, AMs are required by MSA Section 303(a)(15). The NS1Gs describe AMs as management controls to both prevent ACLs from being exceeded, and to correct or mitigate overages of ACLs if they occur.[33] AMs are intended to minimize the frequency and magnitude of overages of the ACL, and to correct any problems that caused the overage.

AMs are required for all stocks and stock complexes in the Salmon FMP that are required to have ACLs. Additional AMs may be considered for the other stocks and stock complexes in the fishery that are excepted from the ACL requirements. In this latter case, the AMs would not correspond directly to an ACL but instead to other management measures used to prevent overfishing, such as mixed-stock quotas, SDC, and conservation objectives.

2.4.1 Criteria Used to Evaluate the AM Alternatives

The criteria used to evaluate AM alternatives were consistency with the MSA and NS1Gs, and feasibility of implementation.

Considerations within the criterion for MSA and NS1Gs consistency include:

- Establishing a mechanism for specifying ACLs, including measures to ensure accountability[34]
- The NS1Gs require that AMs in a fishery be adequate to prevent ACLs from being exceeded, and that additional AMs are invoked if the ACL is exceeded. The NS1Gs identify two types of AMs:
  - In-season AMs[35], and
  - AMs for when the ACL is exceeded[36]

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[33] 50 CFR 600.310 (g)(1)
[34] MSA Section 303(a)(15), 50 CFR 600.310 (g)
[35] 50 CFR 600.310 (g)(2)
[36] 50 CFR 600.310 (g)(3)

The NS1Gs suggest that Councils may consider using an ACT, a reference point specified at a level below an ACL, to reduce the probability of exceeding an ACL due to management uncertainty. The ACT is a type of in-season AM, although it would be specified during the preseason process and monitored in-season, as possible. NMFS stated that whether or not an ACT is explicitly specified, the AMs must address the management uncertainty in the fishery in order to avoid exceeding the ACL.[37] If an ACL has been exceeded, the NS1Gs suggest considering overage adjustments and requires them in the following year if the stock is overfished, unless the best scientific information available indicates that it is not necessary to mitigate for the overage.[38]

For the Salmon FMP, two alternatives are being considered for the ACL, a C-based ACL and an S-based ACL. In the latter, the objective is to achieve spawning escapement above the ACL. Therefore, "AMs for when the ACL is exceeded" will apply to C-based ACLs, and "AMs for when the ACL is not met" will apply to S-based ACLs.

The NS1Gs require that if catch exceeds the ACL for a given stock or stock complex more than once in the last four years, the system of ACLs and AMs should be re-evaluated, and modified if necessary, to improve its performance and effectiveness.[39]

2.4.2 Alternative 1: Status Quo

There are no measures in the FMP identified currently as AMs; however, a number of actions meet the general intent of AMs. Some of these are implemented during the preseason planning process and in-season management. Others are implemented postseason through monitoring and reporting requirements.

In-season (and preseason) actions

- In-season authority to manage quota fisheries (FMP § 10.1) – allows NMFS to close fisheries on short notice when mixed-stock quotas are projected to be met.
- Mixed-stock quota monitoring (FMP § 7.1) – collection of data on a daily basis during the season allows projection of when quotas will be met.
- Quota partitioning (FMP § 5.3 and 10.2) – partitioning overall quota among fishery sectors and port areas and time periods allows finer scale management, thereby reducing the chance that overall quota will be exceeded.
- Quota trading (FMP § 5.3 and 10.2) – quota trading allows overages in one sector/time/area to be made up by reductions in others.
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2) – allow a measure of control over catch rates to reduce the chance of quotas being exceeded.
- Boundary modifications (FMP § 6 and 10.2) – allow limited control over catch composition to limit impacts on constraining stocks.
- Landing restrictions(FMP § 6 and 10.2) - allow better accounting of the location of catches and thus better estimates of catch composition.
- In-season monitoring and reporting requirements. (FMP § 7) – collection of data on a daily basis during the season allows projection of when quotas will be met.
- Conservation alert (FMP § 3.2.2) – requires closure of fisheries impacting a stock that is projected to not meet its conservation objective, and assessment of the causes of the projected failure.

Post-season actions

[37] Final NS1Gs published Jan 16, 2009 (74 FR 3193), NMFS response to comment # 44, pg 3192.
[38] 50 CFR 600.310 (g)(3)
[39] 50 CFR 600.310 (g)(3)

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8) – allows postseason assessment of objectives and performance.
- Overfishing concern assessment (FMP § 3.2.3) – identifies causes of, and remedies for, triggering an overfishing concern.
- Notice to state/tribal managers (FMP § 3.2.2) – requests evaluation of causes for a stock projected to trigger an overfishing concern.
- Salmon Methodology Review Process (COP-15; PFMC 2008). – provides a process for re-evaluation of management objectives, reference points, and modification of models that relate mixed-stock impacts to stock-specific objectives and reference points.

Although they are not associated with an ACL at this time and are not identified as AMs, most of these actions fit the intent of AMs as they are in place to minimize instances in which the mixed-stock quotas or other preseason expectations are exceeded, or individual stocks' conservation objectives are not met, and to identify and correct any problems that caused either circumstance.

Consistency with MSA and NS1Gs: Because the Status Quo Alternative does not specify these actions as AMs and currently none of the actions correspond to an ACL, it is not a viable alternative and does not meet the purpose and need of the proposed action.

Feasibility of Implementation: As these are currently being implemented, feasibility is not an issue.

2.4.3 PPA Alternative 2 – Classify Current Measures in the FMP as AMs

As described above, a number of current FMP actions meet the intent of AMs. While some of them would not be directly working in combination with an ACL, they are in place to prevent overfishing. However, the "conservation alert" and "overfishing concern" are likely to be modified or replaced, given the proposed new SDC (see Section 2.2 of this EA). Therefore, these will need some modification. Under this alternative, all of these AMs would both apply to stocks subject to the ACL requirements, and provide protections for other stocks that are not subject to the ACL requirements.

Alternatives for In-season (and preseason) AMs

- In-season authority to manage quota fisheries (FMP § 10.1)
- Mixed-stock quota monitoring (FMP § 7.1)
- Quota partitioning (FMP § 5.3 and10.2)
- Quota trading (FMP § 5,3 and 10.2)
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2)
- Boundary modifications (FMP § 6 and 10.2)
- Landing restrictions (FMP § 6), and
- In-season monitoring and reporting requirements. (FMP § 7)
- Conservation alert (FMP § 3.2.2), with modification

    A conservation alert occurs when a stock is projected, during the preseason process, to not meet its conservation objective. The FMP currently requires notification to relevant state, tribal, and Federal managers if a stock is not expected to meet its conservation objective, an assessment of probable causes, and closure of Council-area fisheries impacting the stock. Under this alternative, the only required action would be notification to relevant state, tribal, and Federal managers.

Alternatives for Post-season AMs

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8)

- Overfishing concern (FMP § 3.2.3), with modification and renaming as **“Abundance Alert”**

  Currently, the FMP defines an overfishing concern as not meeting the conservation objective of a stock for three consecutive years. The FMP does not explicitly associate triggering of an overfishing concern with an “overfished” status determination, although this has been NMFS policy in recent years. As new and/or more explicit SDC are adopted as part of this amendment process, many of the actions currently required when an overfishing concern is triggered will be addressed through other processes. However, preserving the concept of this action as an indicator of a declining trend in stock status or bias in scientific or management methodologies may be desirable. If retained, the indicator should be renamed as an “abundance alert” to avoid any confusion with the formal SDC (i.e., overfishing, overfished, approaching overfished) and modified to remove the formal requirement for an assessment. Additionally, doing so will remove any connotation that fishing is necessarily the cause of a decline in stock abundance.

  Actions associated with this indicator would include, as is currently done, notification to the relevant state, tribal, and Federal managers that a stock may be trending toward a depressed state, and that potential causes should be closely monitored or investigated, particularly with regard to excessive fishing mortality and bias in management models.
- Salmon Methodology Review Process (COP-15; PFMC 2008).

2.4.3 Alternative 3 – Classify Current Measures in the FMP as AMs, Except “Conservation Alert” and “Overfishing Concern”

Alternative 3 is similar to Alternative 2, with the exception that the current “conservation alert” and “overfishing concern” actions would not be considered AMs and would also no longer be retained in the FMP. The conservation alert and overfishing concern processes in the current FMP were designed to address requirements related to overfishing and overfished status determinations and provide associated remedies. In practice, they proved to be inadequate in part because the criteria for making overfished and overfishing determinations were not sufficiently specific. New SDC described in Section 2.2 would replace the current conservation alert and overfishing concern requirements.

Alternatives for In-season (and preseason) AMs

- In-season authority to manage quota fisheries (FMP § 10.1)
- Mixed-stock quota monitoring (FMP § 7.1)
- Quota partitioning (FMP § 5.3 and 10.2)
- Quota trading (FMP § 5.3 and 10.2)
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2)
- Boundary modifications (FMP § 6 and 10.2)
- Landing restrictions (FMP § 6)
- In-season monitoring and reporting requirements (FMP § 7)

Alternatives for Post-season AMs

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8)
- Notice to state/tribal managers (FMP § 3.2.3)
- Salmon Methodology Review Process (COP-15; PFMC 2008).

Under this alternative, "conservation alert" and "overfishing concern" actions would be removed from the FMP for two reasons: to avoid potential confusion with new SDC and because they may be redundant with other actions. These actions were put in the current FMP in order to assess the causes of the stocks not meeting their conservation objectives, to determine if fishing was a factor, and to determine if the stock was subject to overfishing, overfished, or approaching overfished. With new measurable and objective SDC (i.e., with clear abundance thresholds), such assessments are not necessary to determine status. However, the Council may still want to investigate the causes of a stock not meeting its conservation objective. Eliminating these actions would not preclude the Council requesting the STT to conduct such an assessment when necessary. Preseason and postseason reporting requirements will continue to provide the Council with information relevant to stock status. Preseason Report I will continue to provide the Council with an assessment of stock status relative to their conservation objectives and new SDCs. The annual SAFE document provides a similar postseason accounting.

2.4.4 Other AMs Associated with Both Alternatives 2 and 3

Annual Catch Target (ACT): An ACT may be adopted in any fishing year in which there is increased management uncertainty in the fishery causing increased uncertainty in maintaining compliance with the ACL. The ACT would be specified at a level sufficiently below the ACL to buffer for the management uncertainty it is implemented to address, incorporating uncertainty in the ability to constrain catch for ACL compliance, and uncertainty in quantifying the true catch amounts (i.e., estimation errors)[40].

AMs for When the ACL is Exceeded: There are no post-season actions currently identified that would address a situation of an ACL overage (or underage under the spawning escapement-based ACL alternative). All of these post-season AMs are currently implemented on an individual stock basis and are directly tied to each stock's conservation objective, which under both ACL alternatives would be at different levels (or rates) than the proposed ACLs. For stocks not subject to the ACL requirements, these AMs would be triggered around the conservation objective. However, for those stocks and complexes subject to the ACL requirements, some of the proposed AMs above could easily be tied to the ACL, in addition to the conservation objective:

- Annual SAFE document (FMP § 8): Add reporting on the level of abundance in relationship to the ACL.

[40] As explained in 50 CFR 600.310(f)(6)(i)

- Notice to state/tribal managers (FMP § 3.2.3): Notification when the stock has triggered a "conservation alert" and "abundance concern," if applicable, and when there was noncompliance with the ACL.
- Salmon Methodology Review Process (COP-15; PFMC 2008): Review methods when there are concerns with the assessment (e.g., abundance forecasts), when the stock has triggered a "conservation alert" and "abundance concern," if applicable, and when there was noncompliance with the ACL.

Re-evaluation of the ACLs and AMs System: The ACL alternatives for the Salmon FMP rely on a postseason evaluation for assessing compliance with ACLs. If the evaluation determines that catch or spawning escapement was not in compliance with the ACL more than once in four consecutive years, the Council will direct the STT to conduct an assessment of the cause. The assessment will include consideration of the tiered buffers used to account for scientific uncertainty, and may include recommendations for changing the buffers to a level that would increase the compliance rate to an appropriate level (e.g., 75 percent compliance rate). Any recommendations for changing the buffer between the ABC and OFL (i.e., ABC control rule) should be included, along with supporting analyses, in the annual Salmon Methodology Review process. The Salmon Methodology Review process includes an opportunity for review and comment by the SSC. Recommendations on changes to AMs or adding new AMs, including whether an ACT should be implemented, should also be provided in this report.

Pending the outcome of the STT re-evaluation of the system of ACLs and AMs, an ACT may be implemented as an interim measure if it was determined that the cause was related to management uncertainty in the fishery and to reduce the likelihood of future non-compliance with the ACL until any new or updated measures are approved. When it is determined that the fishery has been out of compliance with the ACL more than once in four consecutive years, an ACT may be applied to the ABC control rule with an additional 5 percent buffer (in addition to the tiered scientific uncertainty buffers in the ABC control rule). The additional buffer will remain in place until either additional measures are adopted to ensure an appropriate compliance with ACLs, or it has been demonstrated that the buffer is not necessary to achieve an appropriate compliance level.

Consistency of Alternatives 2 and 3 with MSA and NS1Gs: Under these alternatives, all or most current actions would be reclassified as AMs and are consistent with the intent of MSA and NS1Gs. Because of the unique circumstances of salmon, in-season AMs are applied at the species level rather than being applied directly to stock-specific ACLs. In-season AMs nonetheless provide for monitoring and close control of the fisheries as intended by the NS1Gs, particularly for quota-managed fisheries. Post-season AMs provide a mechanism for assessing ACLs and other conservation objectives, and taking remedial action as required. AMs designed to address the circumstance of non-compliance with ACLs do not include overage adjustments that would be applied in the following year since such adjustments would be ineffective given the life history of salmon. However, procedural steps are described that are designed to identify the cause of non-compliance and develop appropriate remedies.

- **In-season AMs:** To the extent possible, there are in-season AMs. Their purpose is consistent with the NS1Gs that explain that in-season AMs "should include in-season monitoring and management measures to prevent catch from exceeding ACLs."[41] To date, the purpose of these actions has been to monitor and manage the mixed-stock fishery in-season to prevent overfishing, and in some cases, to keep the fishery consistent with allocation agreements. However, as mentioned above, in-season AMs would be implemented at the species level for the mixed-stock ocean fisheries, rather than at the

[41] 50 CFR 600.310 (g)(2)

individual stock level. Under both ACL alternatives, the ACL would be specified at the individual stock level. Although these AMs would not be directly tied to an individual stock ACL due to the nature of the fishery, this current system of in-season actions have proven to prevent overfishing (see section 4.1.2.1 and Appendix F). It should be noted that mixed-stock quotas for the stocks and complexes requiring ACLs are not consistently used south of Cape Falcon, but may be used as necessary (e.g., during the 2010 fishing year off Fort Bragg, CA).

- **ACT**: Currently, an ACT, or similar reference point, is not used in the ocean salmon fishery. While an ACT is not required by the MSA or NS1Gs, under this alternative, use of an ACT is proposed in situations where there is an increase in management uncertainty that would warrant its implementation. This is consistent with the NS1Gs to address management uncertainty if it is a factor leading to noncompliance with the ACL.
- **AMs for when the ACL is exceeded**[42]: Under these alternatives, there are additional post-season management actions proposed as AMs that will be directly tied to all ACLs specified, consistent with the NS1Gs. However, for Council salmon fisheries, adjustments to ACLs or ACT in the year following an overage (underage) would not generally be effective in mitigating the overage. For coho salmon, all fish vulnerable to the fisheries are 3-year-old fish. In the year following an overage, the cohort in which the overage occurred has spawned, and fisheries impact a new cohort. For Chinook salmon, fish vulnerable to fisheries are nearly all age-3 and age-4 fish. Each year approximately half of the 3-year-old fish mature and leave the ocean, or suffer natural mortality. Fishery-related mortality may reduce their abundance by another 50 percent or more. As a result of this, Chinook salmon vulnerable to Council fisheries are typically 70 to 80 percent 3-year-old fish. In the year following an overage, the majority of fish are new recruits and adjustments because of an overage in the previous year would not be effective in mitigating the overage.
- **Re-evaluation of the ACLs and AMs System:** Under these alternatives, there is an explicit process outlined for re-evaluating the system of ACLs and AMs if there is non-compliance with the ACL more than one in four consecutive years. This is consistent with the performance standard and requirement in the NS1Gs.

Feasibility of Implementation: For those currently being implemented, feasibility of implementation is not an issue. However, it should be noted that all in-season actions are currently based on the species (e.g., mixed-stock quotas), rather than individual stock. As discussed above, it is not feasible to implement in-season actions on a stock-by-stock basis due to the inability to identify fish at the stock level during ocean fishing. For the proposed new AMs that are tied to an ACL, these can be feasibly implemented.

2.5 De Minimis Fishing Provisions

The FMP conservation alert currently requires closure of all Council-area salmon fisheries affecting stocks that are projected not to meet their conservation objective. This provision has in some cases resulted in the closure of fisheries and foregone harvest of more abundant stocks, and in other cases resulted in the promulgation of emergency rules to gain access to more abundant stocks. However, for a number of reasons, this provision is not applied uniformly to all salmon stocks. Stocks that are subject to U.S. Court orders under *U.S. v. Washington* and *Hoh v. Baldrige* may be exempt if the parties agree on annual management objectives that differ from those of the FMP. Stocks that have exploitation rate (ER) based management objectives are permitted a minimum exploitation rate regardless of stock status. KRFC have an explicit *de minimis* fishing provision as a result of Amendment 15 (Figure 2-2). FNM stocks with minimal impacts (less than 5 percent base period exploitation rate) in Council-area fisheries

[42] Under the escapement based ACL alternative, these will be referred to as “AMs for when the ACL is not met.”

are currently exempt from the conservation alert provisions in the FMP under the Status Quo Alternative, as are ESA-listed and hatchery stocks. In Classification Alternatives 2 and 3, FNMC stocks are proposed to be subject to the international exception to the ACL and AM provisions. These stocks would be managed subject to the requirements of the PST. Under the Status Quo Classification Alternative, fishery closures were not contemplated because FNMC stocks were exempt from the conservation alert process. Under Classification Alternatives 2 and 3 fishery closures would also not occur, but because application of the international exception would permit management under PST provisions, which allow harvest at lower stock abundance. As a consequence, there is no need for the development of *de minimis* fishery provisions for FNMC stocks.

KRFC are already subject to *de minimis* provisions. SRFC is currently the only other stock that must either comply with the conservation alert provision resulting in fishery closures or require an emergency rule to implement fisheries. This is by virtue of having both a spawning escapement-based conservation objective and an abundance forecast available preseason. Oregon South Coast Chinook may also soon be subject to the provision, pending completion and adoption of new conservation objectives and development of preseason forecasts for those stocks.

De minimis fishing provisions give more flexibility to the rule-making process when the conservation objectives for limiting stocks are projected not to be met, and provide opportunity to access more abundant salmon stocks that are typically available in the Council management area when the status of one stock may preclude all ocean salmon fishing in a large region. At a minimum, this flexibility should allow for Council action without the need for NMFS to approve an emergency rule while providing for *de minimis* salmon fishery opportunity. This would reduce the risk of fishery restrictions that impose severe economic consequences to local communities and states. While this action seeks to provide management flexibility in times of scarcity, there is an overriding mandate to preserve the long-term productive capacity of all stocks to ensure meaningful contributions to ocean and river fisheries in the future, and to ensure that the total fishing mortality rate does not exceed F_{MSY}.

The criteria used to evaluate the *de minimis* alternatives were consistency with the MSA and NSGs and feasibility of implementation.

Considerations within the criteria include:

- Consistency with NS1Gs: Each Alternative will be evaluated as to whether the specified *de minimis* provisions reduce fishing mortality as stock size declines[43], and whether OY is achieved by managing for something less than MSY[44].
- Consistency with National Standard 8 (NS8): The MSA promotes the sustained participation of fishing communities, within conservation constraints[45]. *De minimis* fishing Alternatives will be evaluated qualitatively as to the relative degree that they promote the sustained participation of fishing communities.

2.5.1 *De minimis* Fishing Alternatives

For stocks that are managed for a spawner escapement objective, such as SRFC, *de minimis* fishing provisions would modify the conservation objective control rule to permit limited exploitation at low abundance levels (see Figure 2-2 for examples of conservation objective control rules with [KRFC] and without [SRFC] *de minimis* provisions). For stocks that currently have a *de minimis* fishing mechanism

[43] 50 CFR 600.310(f)(4)
[44] 50 CFR 600.310(e)(3)(v)(E)
[45] MSA §301(a)(8)

through the *Hoh v. Baldrige* or *U.S. v. Washington* processes, any additional *de minimis* fishing provisions would not affect the ability of the Parties to exercise their options.

Currently, *de minimis* fishing provisions are either undefined, as with SRFC, or defined inconsistently among stocks. Furthermore, *de minimis* exploitation rates for KRFC established in Amendment 15 are not explicitly defined at low abundance levels. This Section defines four *de minimis* fishing alternatives (not including status quo) that are based primarily on the S_{MSY} and MSST reference points. The generic nature of these *de minimis* provisions allows them to be applied to any stock with defined S_{MSY} and MSST reference points, and can be applied regardless of the relationship between S_{MSY} and MSST. Each of the *de minimis* fishing alternatives can be applied as extensions to the current F-based conservation objective control rules at low stock abundances (Figure 2-9).

2.5.1.1 Alternative 1: Status Quo- Variable Among Stocks

Status quo *de minimis* fishing provisions are variable among stocks, and not defined for SRFC. For KRFC, the *de minimis* fishing provision from Amendment 15 to the salmon FMP are as follows:

> Within the Cape Falcon to Point Sur area, the Council may allow *de minimis* fisheries which: permit an ocean impact rate of no more than 10 percent on age–4 Klamath River fall Chinook, if the projected natural spawning escapement associated with a 10 percent age–4 ocean impact rate, including river recreational and tribal impacts, is between the conservation objective (35,000) and 22,000. If the projected natural escapement associated with a 10 percent age–4 ocean impact rate is less than 22,000, the Council shall further reduce the allowable age– 4 ocean impact rate to reflect the status of the stock[46]. When recommending an allowable age–4 ocean impact rate, the Council shall consider the following year-specific circumstances:
>
> (i) The potential for critically low natural spawner abundance, including the risk of Klamath Basin substocks dropping below crucial genetic thresholds;
> (ii) A series of low spawner abundance in recent years;
> (iii) The status of co-mingled stocks;
> (iv) The occurrence of *El Niño* or other adverse environmental conditions;
> (v) Endangered Species Act (ESA) considerations; and
> (vi) Other considerations as appropriate.
>
> The KRFC age–4 ocean impact rate must not jeopardize the long-term capacity of the stock to produce maximum sustainable yield on a continuing basis. Implementation of *de minimis* fisheries will depend on year-specific estimates of ocean abundance and age composition, and will be determined by the STT prior to the March Council meeting. Ocean fishery impacts to the returning brood incurred during the previous fall/winter fisheries will be counted against the allowable age-4 ocean impact rate.

The final rule implementing Amendment 15 states: NMFS interprets that, consistent with the *de minimis* provisions of the FMP, the maximum allowable 10 percent age-4 ocean impact rate may be implemented only when the anticipated escapement is near the 35,000 natural spawner floor. As escapement falls below approximately 30,000, the impact rate will need to decline automatically.

Feasibility of implementation: The Status Quo Alternative is currently implemented.

[46] NMFS interprets that, consistent with the *de minimis* provisions of the FMP, the maximum allowable 10 percent age-4 ocean impact rate may be implemented only when the anticipated escapement is near the 35,000 natural spawner floor. As escapement falls below approximately 30,000, the impact rate will need to decline automatically.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Consistency with NS1Gs: For SRFC, the lack of *de minimis* provisions in the status quo results in an exploitation rate of zero at abundance levels less than or equal to S_{MSY}, which is consistent with the NS1Gs. For KRFC, the status quo *de minimis* provisions do not explicitly define how F will be reduced as stock abundance approaches zero. However, the current *de minimis* provisions identify that F must be reduced when the projected escapement of adults to natural areas is below 22,000 (0r 30,000; NMFS 2007). Because of this qualitative specification that F must be reduced at lower abundance levels, the status quo *de minimis* Alternative is consistent with the NSIGs. However, managing for an annual target of 35,000 natural area adult KRFC spawners (less than S_{MSY}) would not achieve OY in the long-term, which is inconsistent with MSA and NS1Gs.

Consistency with NS8: Status quo *de minimis* Alternatives are variably consistent with NS8. For SRFC, there are no *de minimis* provisions, which results in fishery closures (absent an emergency rule) if the stock is projected to fall below S_{MSY} in the absence of fishing. The lack of *de minimis* provisions for SRFC is not consistent with NS 8 because sustained participation would be unlikely given the lack of fishing opportunity allowed when the abundance forecast is less than S_{MSY}. KRFC status quo *de minimis* provisions are consistent with NS8 as they provide for limited KRFC impacts to occur while fisheries target other, more abundant, stocks.

2.5.1.2 Alternative 2 and 2b: F = 0 at midpoint between S_{MSY} and MSST

Alternative 2 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level defined as the midpoint between S_{MSY} and the MSST [(S_{MSY} + MSST)/2].

The F-based control rule with the Alternative 2 *de minimis* provision is displayed in Figure 2-9, top panel. As stock size declines, the allowable exploitation rate declines from F_{ABC} in order to achieve S_{MSY}, until F = 0.25. A constant exploitation rate of 0.25 is then allowed until the point where F must be further reduced in order to achieve a spawner escapement equal to the midpoint between S_{MSY} and MSST. The constant exploitation rate of 0.25 is derived from results in the FMP Amendment 15 analysis, and closely approximates the total exploitation rate on KRFC when the age-4 ocean exploitation rate equals 0.10 (PFMC and NMFS 2007). A *de minimis* total exploitation rate of 0.25 is specified rather than the ocean exploitation rate of 0.10 because the total exploitation rate accounts for mortality from all fisheries. This rate has been adopted for the other *de minimis* Alternatives because it is very likely that other Chinook stocks will be affected in a similar manner as KRFC, given the relative consistency in salmon productivity (Appendices C and D). At abundances less than or equal to the midpoint between S_{MSY} and MSST, the allowable exploitation rate is zero.

Alternative 2b is similar except that for KRFC only the control rule would target the 35,000 natural area spawner floor rather than S_{MSY} (40,700), as is currently done under the Status Quo Alternative.

Feasibility of implementation: Implementation is feasible, as the *de minimis* provision in this alternative is an extension of the current F-based control rule.

Consistency with NS1Gs: Alternative 2 explicitly decreases allowable exploitation as stock abundance decreases. This alternative would achieve OY because spawning escapement would not fall below S_{MSY} more than 50 percent of the time. At at typical abundance levels the control rule targets S_{MSY}, and higher abundance levels greater escapements are targeted. Therefore, Alternative 2 is consistent with the NS1Gs.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Consistency with NS8: Alternative 2 is consistent with NS8 because it provides for some *de minimis* fishing opportunity, and therefore does not force closure of the fishery if one stock is projected to fall short of its conservation objective.

Alternative 2b: Alternative 2b would be consistent with NS8 and with the NS1G requirement to decrease exploitation rate as abundance declines; however, managing for a an annual target of 35,000 natural area adult KRFC spawners would not achieve OY in the long-term, which is inconsistent with MSA and NS1Gs. .

2.5.1.3 Alternative 3 and 3b: F = 0 at MSST

Alternative 3 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level of MSST.

The F-based control rule with the Alternative 3 *de minimis* provision is displayed in Figure 2-9, second panel. As stock size declines, the allowable exploitation rate declines from F_{ABC} in order to achieve S_{MSY}, until F = 0.25. A constant exploitation rate of 0.25 is allowed until the point where F must be further reduced in order to achieve a spawner escapement equal to the MSST. The description of Alternative 2 details the justification for the *de minimis* exploitation rate of 0.25. At abundances less than or equal to MSST, the allowable exploitation rate is zero.

Alternative 3b is similar except that for KRFC only, the control rule would target the 35,000 natural area spawner floor rather than S_{MSY} (40,700), as is currently done under the status quo alternative.

Consistency with NS1Gs: Same comments as Alternative 2.

Consistency with NS8: Same comments as Alternative 2.

Alternative 3b: Same comments as Alternative 2b.

2.5.1.4 Alternative 4: F = 0 at 0.5*MSST

Alternative 4 specifies a *de minimis* exploitation rate of 0.25, subject to a minimum spawner abundance level of one half of MSST (MSST/2).

The F-based control rule with the Alternative 4 *de minimis* provision is displayed in Figure 2-9, third panel. As stock size declines, the allowable exploitation rate declines from F_{ABC} in order to achieve S_{MSY}, until F = 0.25. A constant exploitation rate of 0.25 is allowed until the point where F must be further reduced in order to achieve a spawner escapement equal to MSST/2. The description of Alternative 2 details the justification for the *de minimis* exploitation rate of 0.25. At abundance less than or equal to one half of MSST, the allowable exploitation rate is zero.

Feasibility of Implementation: Same comments as Alternative 2.

Consistency with NS1Gs: Same comments as Alternative 2.

Consistency with NS8: Same comments as Alternative 2.

2.5.1.5 PPA Alternative 5: F <0.25 below midpoint between S_{MSY} and MSST

The F-based control rule with the Alternative 5 *de minimis* provision is displayed in Figure 2-9, bottom panel. As stock size declines, the allowable exploitation rate declines from F_{ABC} until F = 0.25. A

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

constant exploitation rate of 0.25 is allowed until the midpoint between S_{MSY} and MSST, below which F must be further reduced; however, there is no set stock size where F must equal zero. Reduction below F=0.25 would not be structured, but would be in response to year-specific circumstances such as abundance of other stocks, recent spawning escapement performance, in order to achieve a spawner abundance equal to the MSST. The description of Alternative 2 details the justification for the *de minimis* exploitation rate of 0.25.

Feasibility of implementation: Implementation is feasible. The current KRFC *de minimis* fishing provision has a similar structure to Alternative 5, and is currently implemented.
Consistency with NS1Gs: PPA 5 *de minimis* provisions do not explicitly define how F will be reduced as stock abundance approaches zero. However, they do specify that F must be reduced when the projected escapement of adults to natural areas is below the midpoint between S_{MSY} and MSST. Requiring F to be reduced at lower abundance level is consistent with the NSIGs; however, managing for an annual target of 35,000 natural area adult KRFC spawners (less than S_{MSY}) would not achieve OY in the long-term, which is inconsistent with MSA and NS1Gs.

Consistency with NS8: PPA 5 is consistent with NS8 because it provides for some *de minimis* fishing opportunity, and therefore does not force closure of the fishery if one stock is projected to fall short of its conservation objective.

2.5.3 *De Minimis* Fishing Provisions and Stock Rebuilding

De minimis fishing provisions could also serve as default rebuilding plans for stocks that become overfished (or depleted). This would provide management guidance for the stock immediately, rather than waiting a year or more for an assessment and/or formal rebuilding plan to be developed; however, this would not preclude development of a formal rebuilding plan through the current Overfishing Concern assessment process, or other processes resulting from this FMP Amendment. Under the current process, when an Overfishing Concern is triggered the STT must complete an assessment of the cause, including the role of fishing and estimation error, within one year. Based on the recommendations in the Overfishing Assessment, the Council determines necessary steps to rebuild the stock, including establishing criteria and any necessary changes to management. These steps may take the form of a formal rebuilding plan, or simply implementing the default rebuilding feature of the FMP (i.e., managing to meet the conservation objectives for all stocks annually).

The Council is usually informed that an Overfishing Concern has been triggered at the March meeting, the same time as it is beginning the preseason management process. Thus, the Council does not have the benefit of the Overfishing Assessment in the first year of rebuilding an overfished stock. If the stock is projected to again fall short of its conservation objective, the Council must close its fisheries that impact the stock. However, if a formal rebuilding plan were in place, it is likely that there would be some level of fishing allowed that would not jeopardize the stock's rebuilding requirements. Providing a similar opportunity through *de minimis* fishing provisions in the first year of rebuilding would temper the impact to fishing communities, and provide a more stable transition to management under a formal rebuilding plan, if necessary.

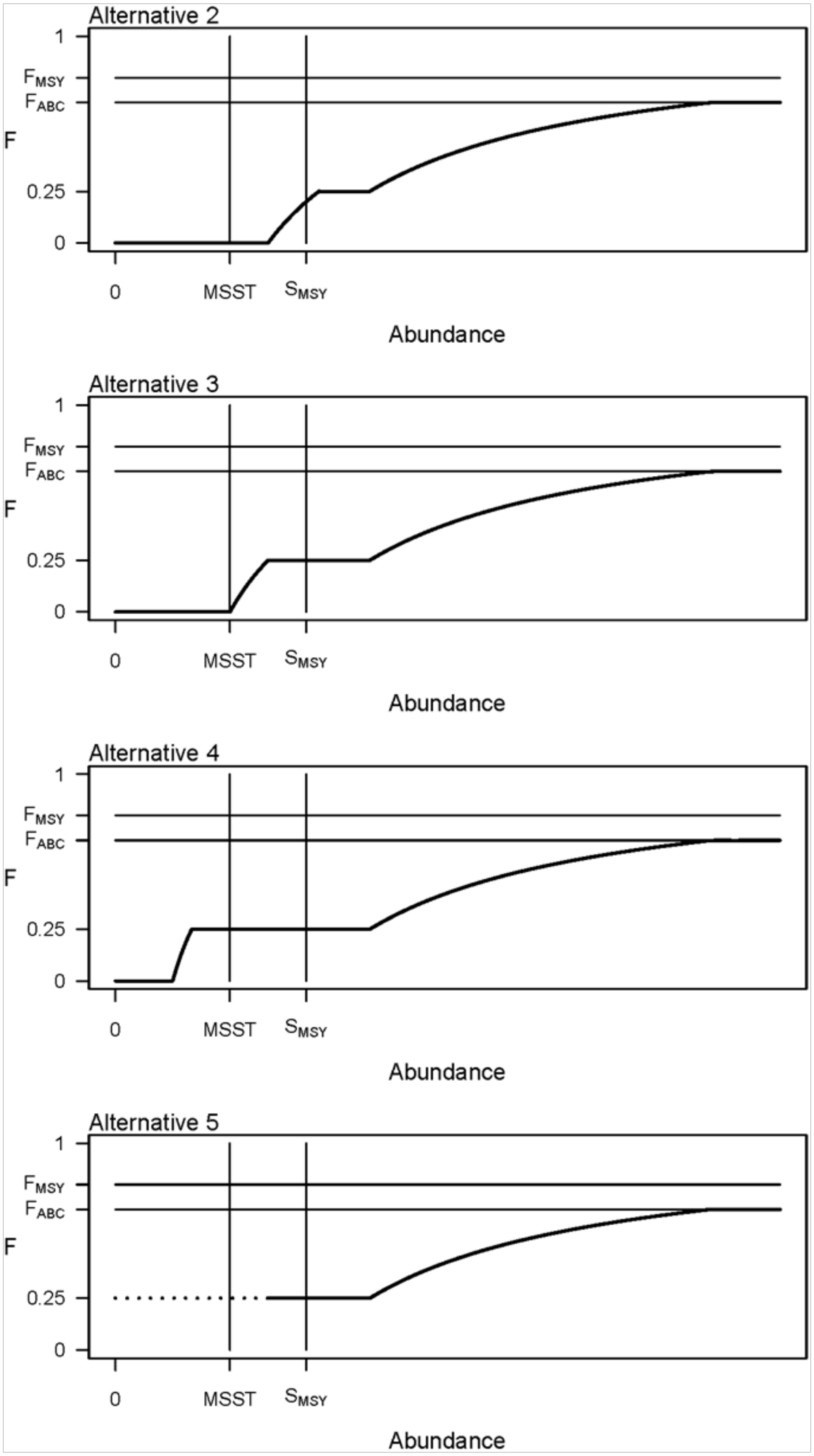


Figure 2-9. *De minimis* fishing Alternatives. Alternative 1 (status quo) is not shown because it is variable among stocks.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

3.0 AFFECTED ENVIRONMENT

For the purposes of this action, the general action area is between Point Conception and the U.S./Canada border, and includes the EEZ (which is directly affected by the Federal action), and the marine and internal waters of the states of Washington, Oregon, and California (which may be indirectly affected by the Federal action). Based on NOAA Administrative Order (NAO) 216-6 Section 6.02, 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

In this EA several of these components have been combined into categories to reduce duplication in the descriptions and to facilitate analyses of environmental effects. Thus, target and non-target species, including ESA-listed Chinook and coho salmon, will be covered in the fish resources Section, marine mammals and other ESA-listed species will be covered in the protected resources Section, biodiversity and ecosystem function and EFH will be covered in the Habitat Section, and social, economic, and public health and safety will be covered in the socioeconomic Section.

3.1 Fish Resources

Fish stocks targeted in Council-area salmon fisheries include Chinook, coho, and pink salmon stocks identified in Tables 3-1, 3-2, and 3-3 of this EA, 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. A description of the historical baseline for affected salmon stocks is presented in the Review of 2010 Ocean Salmon Fisheries (PFMC 2011a). A more general description of salmon life history and population characteristics is presented in PFMC 2006.

Other non-target Council-managed species such as groundfish, halibut, and highly migratory species are also landed jointly with salmon. For all of these stocks, fish caught on the same trip with salmon are documented.

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.

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.

Impacts to highly migratory species, primarily albacore, are managed under the Council's Highly Migratory Species FMP.

3.2 Protected Resources

Protected species include those protected by three Federal laws, the ESA, the Marine Mammal Protection Act (MMPA), and the Migratory Bird Treaty Act (MBTA).

Other ESA-listed salmonid species present in Council-area waters include sockeye and chum salmon, and steelhead trout. These species are rarely encountered in ocean salmon fisheries. ESA-listed marine mammals that are potentially affected by salmon fisheries include Stellar sea lion, Guadalupe fur seal, and Southern Resident killer whales. Direct interaction with Stellar sea lions, Guadalupe fur seals, and killer whales are rare in salmon fisheries; however, there is new evidence suggesting salmon abundance in Puget Sound may correlate with killer whale population growth rate. Therefore there may be some indirect effects of salmon harvest on killer whale populations.

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.

A number of non-ESA-listed marine mammals may also occur in the affected area, these include: northern fur seal, California sea lion, harbor seal, northern elephant seal, bottlenose dolphin, Pacific white-sided dolphin, common dolphin, harbor porpoise, Dall's porpoise, and minke whale. These species, like all marine mammals, are protected under the MMPA. 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 pinniped species are at stable and historically high levels.

In addition, a number of non-ESA-listed sea birds have been identified that forage in areas coincident with Pacific salmon. These sea birds include grebes and loons, petrels and albatrosses, pelicans and cormorants, gulls, terns, auks, auklets, and some raptors (PFMC 1998).

3.3 Habitat, Biodiversity, and Ecosystem Function

Salmon EFH encompasses EFH for other Council-managed species north of Point Conception, California, and includes all waters extending from the seaward EEZ boundary into most currently occupied or historically accessible freshwater habitat. Appendix A of Amendment 14 (EFH Appendix A) describes salmon EFH and fishing and non-fishing impacts to this habitat. Critical habitat for ESA-listed salmon does not include Council-area ocean water.

Salmon FMP stocks interact with a number of ecosystems along the Pacific Coast, including the California Current Large Marine Ecosystem, numerous estuary and freshwater areas and associated riparian habitats. Salmon contribute to ecosystem function as predators on lower trophic level species, as prey for higher trophic level species, and as nutrient transportation from marine ecosystems to inland ecosystems.

Table 3-1. Coho stocks and complexes listed in the current Pacific Salmon FMP.

Coho Complexes	Coho Stocks	ESA Status
Oregon Production Index All Washington, Oregon, and California natural and hatchery coho stocks from streams south of Leadbetter Pt., WA.	Central California Coast	Threatened
	Southern Oregon-Northern California Coastal	Threatened
	Oregon Coastal Natural	Threatened
	Columbia River Late - Hatchery	
	Columbia River Early - Hatchery	
	Lower Columbia River - Natural	Threatened
Washington Coastal All pertinent natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western Strait of Juan de Fuca (West of the Elwha and south of the Sekiu River).	Willapa Bay - Hatchery	
	Grays Harbor	
	Quinault - Hatchery	
	Queets	
	Hoh	
	Quillayute - Fall	
	Quillayute - Summer - Hatchery	
Puget Sound All pertinent natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek).	Strait of Juan de Fuca	
	Hood Canal	
	Skagit	
	Stillaguamish	
	Snohomish	
	South Puget Sound -Hatchery	
Southern British Columbia Coast	Coastal Stocks	
	Fraser River	
4	21	4

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 3-2. Chinook stocks and complexes listed in the current Pacific Salmon FMP.

Chinook Complex	Chinook Stocks	ESA Status
California Central Valley All fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin Basins	Sacramento River - Fall	
	Sacramento River - Spring	Threatened
	Sacramento River - Winter	Endangered
Northern California Coast All fall and spring stocks of California streams north of the entrance to San Francisco Bay	Eel, Mattole, Mad, and Smith Rivers - Fall and Spring	Eel, Mattole and Mad River - Threatened
	Klamath River - Fall	
	Klamath River - Spring	
Oregon Coast All Oregon fall and spring stocks south of the Columbia River	Southern Oregon	
	Central and Northern Oregon	
Columbia River Basin All pertinent fall, summer, and spring stocks of the Columbia River and its tributaries	North Lewis River - Fall	Threatened
	Lower River Hatchery - Fall	
	Lower River Hatchery - Spring	
	Upper Willamette - Spring	Threatened
	Mid-River Bright Hatchery - Fall	
	Spring Creek Hatchery - Fall	
	Klickitat, Warm Springs, John Day, and Yakima	
	Snake River - Fall	Threatened
	Snake River - Spring/Summer	Threatened
	Upper River Bright - Fall	
	Upper River - Summer	
	Upper River - Spring	Endangered
Washington Coast All pertinent fall, summer and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of the Elwha River)	Willapa Bay Fall (natural)	
	Willapa Bay Fall (hatchery)	
	Grays Harbor Fall	
	Grays Harbor Spring	
	Quinault Fall (Hatchery)	
	Queets Fall	
	Queets Spring/Summer	
	Hoh Fall	
	Hoh Spring/Summer	
	Quillayute Fall	
	Quillayute Spring/Summer	
	Hoko Summer/Fall	
Puget Sound All fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek)	Eastern Strait of Juan de Fuca Summer/Fall	Threatened
	Skokomish Summer/Fall	Threatened
	Nooksack Spring - early	Threatened
	Skagit - Summer/Fall	Threatened
	Skagit - Spring	Threatened
	Stillaguamish - Summer/Fall	Threatened
	Snohomish - Summer/Fall	Threatened
	Cedar River - Summer/Fall	Threatened
	White River - Spring	Threatened
	Green River - Summer/Fall	Threatened
	Nisqually River -Summer/Fall	Threatened
Southern British Columbia Fall and spring stocks of B.C. coastal streams and the Fraser River	Coastal Stocks	
	Fraser River	
7	45	19

Table 3-3. Pink stocks and complexes listed in the current Pacific Salmon FMP.

Pink Complex		ESA Status
Puget Sound		
Fraser		

3.4 Socioeconomic Environment

This Section describes the socioeconomic conditions of the 2010 fishing year, with comparisons to the most recent fishing years and recent historical averages. This Section describes the commercial and recreational ocean salmon fishery in terms of number and/or pounds of Chinook and coho salmon landed, number of charter and private vessel trips or number of days fished, number of vessels making landings, catch per unit of effort, exvessel value of catch, economic impact information, price per pound, and Klamath tribal harvest. These estimates are stratified by state, management zone, and/or port of landing.

3.4.1 Introduction

Chapter IV in the *Review of 2010 Ocean Salmon Fisheries* (*Review*; PFMC 2011a) provides information on the socioeconomic impacts of the ocean salmon fisheries. More extensive information on the ocean salmon fisheries and social and economic characteristics is provided in Appendix B to the Salmon FMP (PFMC 2007). Information on fishing communities and recommended conservation measures is provided in Appendices A and B to the Council's description of West Coast fishing communities (PFMC 2007).

Most values in the Socioeconomic Environment Section of this draft EA have been rounded to the nearest hundredth (or tenth, when applicable). All averages have been reported as the arithmetic mean of individual values. Averages in California and Oregon are inclusive through the year 2007, which is the period before widespread fisheries closures occurred mainly off California in 2008-2009, and through the year 2009 for Washington. For California and Oregon, 2007 was used as the most recent fishing year to compare 2010 values. For Washington, 2009 was used as the most recent fishing year to compare 2010 values. For California and southern Oregon, data values often were zero or close to zero during 2008-2009, therefore averages up to the year 2007 was used and seen as more representative of historical fishing conditions. Most tables in this Section were derived from the *Review*. A dashed entry (-) in tables in the *Review* were interpreted as a zero value, and only included in averages when the year with a zero value is within the date range specified; most dashed values indicate the season was closed. Multi-year averages for zones consisting of multiple ports were calculated by summing all the port values for each year, then dividing the sums by the number of years represented.

3.4.2 State-Level Trends: Commercial Ocean Salmon Fishery

The most substantial trend in the non-Indian commercial troll fishery is the steep decline in the real exvessel value of landings from the 1980s to the late 1990s, a modest increase in the 2000s, and an increase of Chinook exvessel values in 2010 (see Table IV-4 in the *Review*). The declining trends reflect both declining landings and the real exvessel prices for coho and Chinook salmon during those periods. Prices increased sharply in the 2000s, which contributed to overall revenue increase (see Figure IV-3 in the *Review*). Coastwide, the number of commercial vessels landing salmon has steadily declined (from Tables D-4, D-5, D-6 in the *Review*).

In 2010, there was a decline in the number of vessels landing salmon (216) in California compared to 2007 (601), and a 66 percent decline compared to the 2001-2007 average (640) (Table 3-4). In Oregon, there was a 15 percent decline in vessels landing salmon in 2010 (369) compared to 2007 (436 vessels), and a 23 percent decline compared to the 2001-2007 average (481 vessels). In Washington, there was a

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

20 percent increase in vessels landing salmon in 2010 (116 vessels) compared to 2009 (97 vessels), and a 41 percent increase compared to the 2001-2009 average (82). Similar trends were apparent for the number of vessels landing 90 percent of total pounds of salmon troll catch by state (from Table D-12, D-13, and D-14 in the *Review*).

Table 3-4. Number of registered vessels making commercial salmon landings.[47]

	California		Oregon		Washington	
	Total vessels	Vessels landing 90 percent of total lbs. of salmon troll catch	Total vessels	Vessels landing 90 percent of total lbs. of salmon troll catch	Total vessels	Vessels landing 90 percent of total lbs. of salmon troll catch
2010	216	84	369	139	116	73
Most recent fishing year	601	293	436	232	97	61
Average	640	299	481	252	82	49

3.4.3 State-Level Trends: Recreational Ocean Salmon Fishery

Recreational ocean salmon fishing estimates include mainly private vessels and charter boats. Some shore-based fishing occurs, although this component accounts for a low amount of the recreational ocean salmon catch. In 2010, a combined total of 48,800 estimated trips occurred in California, and 27 percent of these trips were charter boat trips (13,100) (Table 3-26-5; Tables IV-11, IV-12, IV-13 in the *Review*). The total number of estimated recreational trips in 2010 (48,800) reflects a 70 percent decline, compared to the 2001-2007 average in California (161,900 trips). The 2010 trip estimate is also substantially less than the number of trips in California in 2007 (105,900). Over the long-term, there has been a decline in the number of recreational ocean trips in California.

In Oregon, the combined total of estimated recreational trips also declined to 53,300 trips in 2010, down 50 percent from the 2001-2007 average (106,400), and substantially less than 2007 (88,300). In Washington, the decline was less pronounced than in California and Oregon; the combined number of estimated recreational trips in 2010 (80,800) experienced a 9 percent decline from the 2001-2009 average (88,900), and was less than the previous year (98,900) but more than the estimated number of trips in 2006, 2007, and 2008. In recent years, recreational ocean trips have been supported in Washington and Oregon by the implementation of mark-selective fisheries for coho. Council-area wide, the number of charter trips was estimated to be about 44,600 trips in 2010, and the number of private vessel trips was estimated to be about 138,300 trips (a total of about 182,900 trips).

[47] The most recent fishing year for California and Oregon is 2007, and for Washington the most recent fishing year is 2009. Averages for California and Oregon include years 2001-2007 (before widespread Chinook closures); averages for Washington include years 2001-2009.

Table 3-5. Estimated number of recreational ocean salmon angler trips by state.[48]

	California	Oregon	Washington
2010	48,800	53,300	80,800
Previous fishing year	105,900	88,300	98,900
Average	161,900	106,400	88,900

While fishing impacts are calculated on a stock-specific basis, the social dimension, including management measures, is organized around ocean management areas, as described in the Salmon FMP. These areas also correspond to some extent with the ocean distribution of salmon stocks, although stocks are mixed in offshore waters. Broadly, from north to south these 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' 30" N. lat.) on Oregon's north and central coast; (3) the Klamath Management Zone (KMZ), which covers ocean waters from Humbug Mountain in southern Oregon to Horse Mountain (40°05' N. lat.) in northern California; (4) from Horse Mountain to Point Arena; and (5) Point Arena to the U.S./Mexico border. There are also numerous subdivisions within these areas used to further balance stock conservation and harvest allocation considerations (Figure 3-1). The following description of the fisheries and fishing communities is organized around these areas and is derived from the *Review*. For the purpose of characterizing the economic impact of Council-area salmon fisheries, coastal community level personal income impacts were used.

As salmon seasons become more restrictive, the potential for effort transfer into other fisheries increases, particularly for commercial groundfish, albacore, and crab fisheries, and recreational groundfish, halibut, and inside fisheries. Commercial and recreational charter businesses may seek other opportunities to generate income by participating in other fisheries, which could accelerate quota attainment and increase competition. Private recreational fishermen also may seek alternate fishing activities with similar results.

3.4.4 U.S./Canada Border to Cape Falcon, Oregon

Ports between the U.S./Canada border to Cape Falcon, Oregon include Neah Bay, La Push, Westport, Ilwaco, and Astoria (Figure 3-1). This management zone is the furthest north of all salmon areas under the Council jurisdiction. Fisheries management in this area is guided by ESA consultation standards for LCR natural tule, Lower Columbia River Wild, and Snake River wild fall Chinook.

3.4.4.1 Stocks on Which the Fisheries Rely

Fisheries in this Council management zone are heavily dependent on the production of Tule fall Chinook and coho from Columbia River hatcheries which can comprise over half of the catch for each species in a typical year. Other stocks that in aggregate contribute a significant portion of the remaining catch include Columbia River summer and "bright" fall Chinook, Fraser River Chinook, Puget Sound Chinook and coho, and Washington and Oregon coast coho. In some years, Sacramento River fall Chinook can also comprise a moderate portion of this catch. In recent years, the fisheries in this area have been constrained by the impact limits on ESA listed natural Tule Chinook and coho from the lower Columbia River.

3.4.4.2 Non-Indian Commercial Fisheries

In 2010, about 51 percent (638,000 pounds) of Chinook landed in the non-Indian ocean salmon troll fishery occurred at ports between the U.S./Canada Border to Cape Falcon, compared to 1,256,000 pounds in the entire Council area in 2010 (from Table IV-6, IV-7, IV-8 in the *Review*), a 29 percent increase from

[48] Averages for California and Oregon include years 2001-2007 (before widespread Chinook closures); averages for Washington include years 2001-2009. The most recent fishing year for California and Oregon is 2007, and for Washington the most recent fishing year is 2009.

the 2001-2009 average (493,700) in this area (Table 3-6). About 63 percent (402,000 pounds) of Chinook landed by the commercial troll ocean fishery in this area were made at Westport.

Table 3-6. Pounds of Chinook and coho salmon landed by the commercial troll ocean fishery by port area.

	Chinook			Coho		
	2010	2009	01-09 Average	2010	2009	01-09 Average
U.S./Canada Border to Cape Falcon	**638,000**	**158,000**	**493,700**	**22,000**	**179,00**	**70,300**
Neah Bay	48,000	31,000	158,200	1,000	29,000	7,100
La Push	62,000	25,000	45,700	2,000	34,000	8,400
Westport	402,000	92,000	147,600	12,000	54,000	21,000
Ilwaco	10,000	3,000	20,100	1,000	14,000	6,700
Astoria	116,000	7,000	122,100	6,000	48,000	26,700

The number of Chinook and coho salmon landed by commercial troll salmon fishing by catch area is reported below (Table 3-7; from Tables A-1, A-6, and A-11 in the *Review*). Ilwaco had the least amount (2 percent) of Chinook caught in this management zone.

Table 3-7. Number of Chinook and coho landed by commercial troll fishermen by catch area.

	Chinook			Coho		
	2010	2009	01-09 Average	2010	2009	01-09 Average
U.S./Canada Border to Cape Falcon	**56,200**	**13,000**	**34,700**	**3,100**	**32,700**	**12,900**
Neah Bay	4,100	1,200	10,300	100	600	700
La Push	5,900	2,700	4,500	200	7,200	2,000
Westport	34,200	8,100	12,200	1,700	10,100	3,300
Ilwaco	900	300	1,200	150	2,300	1,100
Astoria	11,100	700	7,500	1,000	12,700	6,100

3.4.4.3 Recreational Fisheries

About 68 percent of Chinook (38,700 fish) were landed north of Cape Falcon in 2010, compared with Council-area recreational fisheries (56,500 Chinook), which represented a 45 percent increase from the 2001-2009 average in this area (26,600 Chinook) (Table 3-8; from Tables A-5, A-10, A-18 in the *Review*).

Table 3-8. Estimated number of Chinook landed by port area between the U.S./Canada border to Cape Falcon in the ocean recreational fishery.

	Chinook			Coho		
	2010	2009	01-09 Average	2010	2009	01-09 Average
U.S./Canada Border to Cape Falcon	**38,700**	**13,300**	**26,600**	**42,400**	**157,900**	**109,400**
Neah Bay	3,300	2,400	2,900	3,700	13,300	13,100
La Push	1,200	700	1,300	1,200	6,900	2,900
Westport	27,000	5,000	15,500	12,600	53,900	29,000
Ilwaco	5,400	4,200	5,000	18,800	64,400	46,500
Astoria	1,800	1,000	1,800	6,100	19,400	17,900

North of Cape Falcon recreational fisheries accounted for about 50 percent (91,100 trips) of all recreational trips in Council-area recreational fisheries (182,900 total trips) in 2010 (Table 3-9; from Tables IV-11, IV-12, IV-13 in the *Review*). About 69 percent of total recreational trips in this area were on private boats (62,900 trips), substantially greater than charter boat trips in 2010 (28,200). In 2010, Most charter trips in this area originated from Westport i(18,400). The number of private trips in 2010 was similar for Westport (20,000) and Ilwaco (20,100).

Table 3-9. Estimated number of angler trips in the recreational ocean fisheries.

	Charter boats, 2010	Charter boats, 2001-2009 average	Private boats, 2010	Private boats, 2001-2009 average
U.S./Canada Border to Cape Falcon	**28,200**	**34,500**	**62,900**	**68,100**
Neah Bay	400	1,100	11,100	15,100
La Push	600	500	3,200	3,400
Westport	18,400	20,000	20,000	15,500
Ilwaco	7,000	10,100	20,100	23,200
Astoria	1,800	2,700	8,500	10,900

3.4.5 Cape Falcon to Humbug Mountain, Oregon

The major ports between Cape Falcon and Humbug Mountain include Tillamook, Newport, and Coos Bay (Figure 3-1). This area covers the majority of the Oregon waters.

3.4.5.1 Stocks on Which the Fisheries Rely

Fisheries between Cape Falcon and Humbug Mountain, Oregon catch a mix of stocks, which varies from year to year in response to the status of individual stocks and environmental conditions. Southern Oregon Coast Chinook, Central Valley, and Klamath River fall Chinook stocks contribute substantially to these fisheries. Chinook stocks from the Columbia River and northern Oregon coast are minor contributors to fisheries in this area. Coho stocks contributing to fisheries are primarily OPI stocks.

3.4.5.2 Commercial Fisheries

Oregon port areas between Cape Falcon and Humbug Mountain include Tillamook, Newport, and Coos Bay; these ports are major contributors to Chinook landings in Council-area fisheries. In 2010, about 28 percent of total pounds of Chinook landed (347,000) in the ocean salmon troll fishery occurred at Oregon ports between Cape Falcon and Humbug Mountain, compared to 1,256,000 pounds landed by commercial troll fishermen in the entire Council area (Table 3-10; from Table IV-6, IV-7, IV-8 in the *Review*). This was an 83 percent decline from the 2001-2007 average (2,040,000) in this area. About 53 percent of total pounds of Chinook landed by the commercial troll ocean fishery between Cape Falcon and Humbug Mountain were made at Newport (185,000). Coho landings were large between Cape Falcon and Humbug Mountain until 1992, when stock declines and subsequent regulatory actions eliminated most coho fisheries south of Cape Falcon. Some mortality on coho still occurs as bycatch in Chinook directed fisheries. In the Chinook directed fisheries (non-coho retention) incidental coho mortality estimates are accounted for. Mortality estimates include both drop-off and hook-and-release of coho encountered.

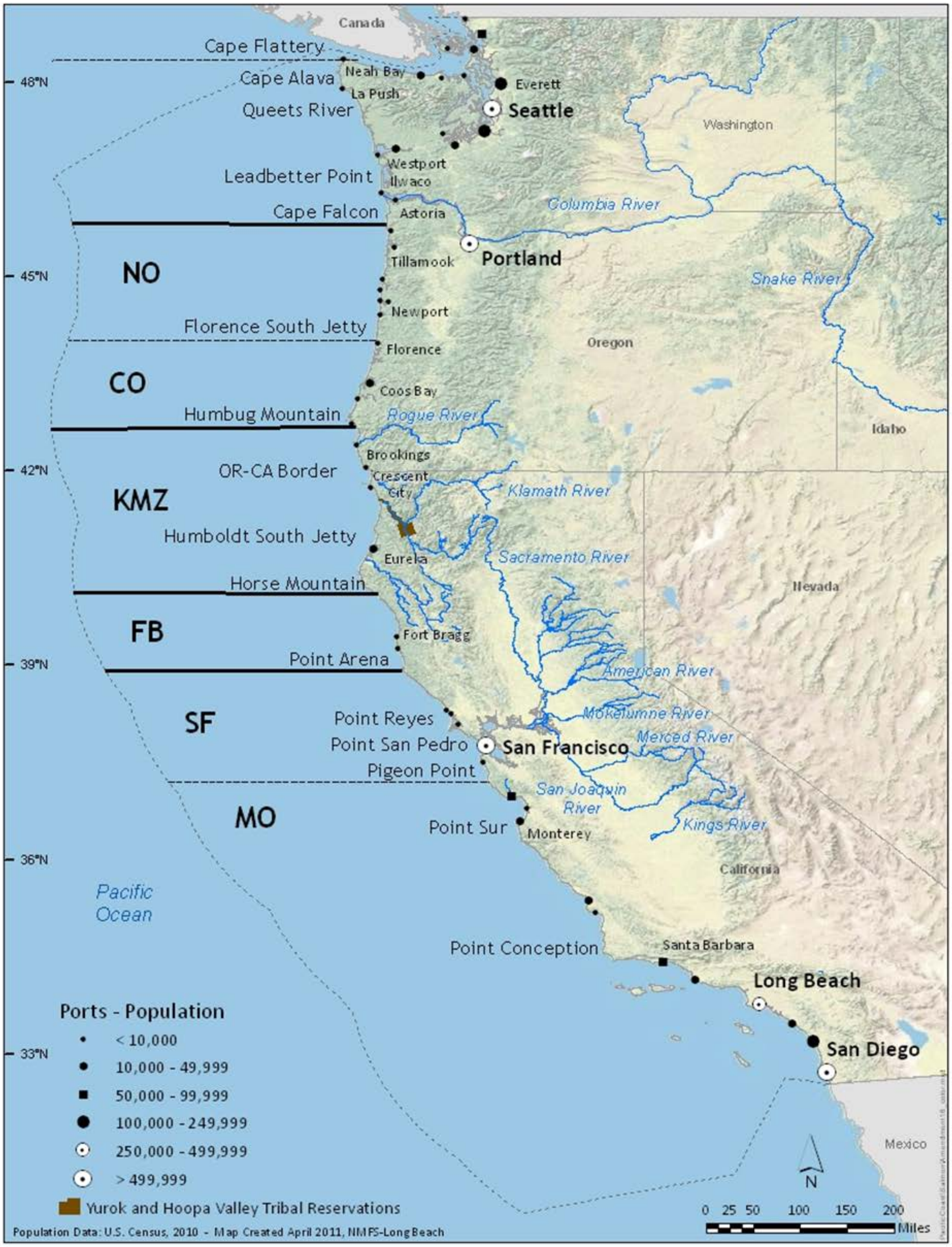


Figure 3-1. Map of West Coast ocean salmon fishery management areas.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 3-10. Pounds of Chinook landed by the commercial troll ocean fishery by port area.

	Chinook			Coho		
	Total pounds, 2010	Total pounds, 2007	Average pounds, 2001-2007	Total pounds, 2010	Total pounds, 2007	Average pounds, 2001-2007
Cape Falcon to Humbug Mountain	**347,000**	**345,000**	**2,040,000**	**1,000**	**61,000**	**17,000**
Tillamook	40,000	37,000	167,700	1,000	34,000	13,000
Newport	185,000	76,000	1,028,000	0	13,000	2,100
Coos Bay	122,000	232,000	844,000	0	14,000	2,000

The number of Chinook landed by commercial troll salmon fishing by catch area is reported below (Table 3-11; from Tables A-1, A-6, and A-11 in the *Review*). Tillamook reported the least amount (13 percent) of Chinook caught in this management zone.

Table 3-11. Number of Chinook and coho landed by commercial troll fishermen by catch area.

	Chinook			Coho		
	2010	2007	Average, 2001-2007	2010	2007	Average, 2001-2007
Cape Falcon to Humbug Mountain	**27,400**	**29,900**	**200,000**	**0**	**5,500**	**800**
Tillamook	3,600	4,200	19,300	0	1,300	200
Newport	12,400	4,100	93,400	0	1,900	300
Coos Bay	11,400	21,700	87,300	0	2,400	300

3.4.5.3 Recreational Fisheries

About 4 percent (2,300 fish) of the 56,500 Chinook harvested in all Council-area recreational fisheries was landed in this management zone in 2010. This catch represented a 90 percent decline from the 2001-2007 average in this area (23,400 Chinook). A quota fishery for marked coho was allowed between Cape Falcon and Humbug Mountain in 2010. About 22 percent (12,100 fish) of the 54,700 coho harvested in Council-area recreational fisheries h) were landed in this area in 2010. (Table 3-12; from Tables A-5, A-10, A-18 in the *Review*).

Table 3-12. Estimated number of Chinook and coho landed in ports between Cape Falcon and Humbug Mountain.

	Chinook			Coho		
	2010	2007	2001-2007 average	2010	2007	2001-2007 average
Cape Falcon to Humbug Mountain	**2,300**	**3,300**	**23,400**	**12,100**	**40,700**	**37,500**
Tillamook	800	1,400	4,700	3,400	12,600	9,800
Newport	800	500	6,800	7,800	15,400	16,800
Coos Bay	700	1,400	11,800	900	12,700	10,900

Oregon recreational effort in Tillamook, Newport, and Coos Bay port areas accounted for about 20 percent of all recreational trips (37,100), compared with 182,900 trips in Council-area recreational fisheries in 2010 (Table 3-13; from Tables IV-11, IV-12, IV-13 in the *Review*). About 91 percent of total recreational trips in this area were on private boats in 2010 (33,900 trips), substantially more than charter boat trips (3,300). In 2010 and on average, most charter trips originated in Newport whereas most private trips use Tillamook.. While Newport is an important center for charter fishing, recreational fishing on private boats is important at all three port areas between Cape Falcon and Humbug Mountain.

Table 3-13. Estimated number of angler trips in the recreational ocean fisheries.

	Charter boats, 2010	Charter boats, 2001-2007 average	Private boats, 2010	Private boats, 2001-2007 average
Cape Falcon to Humbug Mountain	**3,300**	**11,900**	**33,900**	**63,100**
Tillamook	400	1,500	13,100	19,600
Newport	2,800	7,500	12,200	16,100
Coos Bay	100	3,000	8,600	27,400

3.4.6 Humbug Mountain, Oregon to Horse Mountain, California (KMZ)

The KMZ covers waters in southern Oregon and northern California around the mouth of the Klamath River (Figure 3-1). A substantial and important component of allocation issues in this area are harvest needs and treaty rights of Klamath River tribes and sport fisheries. Major ports in the KMZ include Brookings, Oregon and Crescent City and Eureka, California. Coho retention is prohibited off California (NMFS ESA consultation standard for SONCC and CCC coho ESUs, NMFS 1999).

3.4.6.1 Stocks on Which the Fisheries Rely

The KMZ was created to focus management on KRFC because ocean fishery impacts have predominantly occurred in this area. Other major contributors to the harvest in this area include SRFC and southern Oregon coast Chinook stocks. Occasionally, recreational coho fisheries occur in the Oregon portion of the KMZ concurrent with fisheries to the north. Coho stocks present in this area are primarily OPI stocks. Retention of coho is prohibited in California (NMFS ESA consultation standard for southern Oregon/northern California coastal [SONCC] and central California coastal [CCC] coho ESUs; NMFS 1999).

3.4.6.2 Commercial Fishery

The KMZ accounts for a small proportion of Council-area commercial landings. In 2010, only about 4 percent (47,000 Chinook) of Council-area commercial Chinook landings (1,256,000) were made at two major ports in this zone (Table 3-14; from Tables IV-6, IV-7, IV-8 in the *Review*), an 84 percent decline from the 2001-2007 average (288,900). No commercial landings were made in Crescent City in 2010. Landings in Eureka were from catch areas farther south.

Table 3-14. Pounds of Chinook and coho salmon landed in the commercial troll fishery by port area in 2010.

	Chinook			Coho		
	2010	2007	2001-2007 average	2010	2007	2001-2007 average
Humbug Mountain to Horse Mountain	**47,000**	**213,000**	**288,900**	**0**	**3,000**	**400**
Brookings	43,000	98,000	165,900	0	3,000	400
Crescent City	0	34,000	66,000	0	0	0
Eureka	4,000	81,000	57,000	0	0	0

The number of Chinook landed by commercial troll salmon fishing by catch area is reported below (Table 3-15; from Tables A-1, A-6, and A-11 in the *Review*). Both Eureka and Crescent City have no reports of Chinook caught in these areas, as there were no open seasons in the California portion of the KMZ.

Table 3-15. Number of Chinook landed by commercial troll fishermen by catch area.

	2010	2007	2001-2007 average
Humbug Mountain to Horse Mountain	**900**	**12,900**	**10,500**
Brookings	900	4,100	4,400
Crescent City	0	2,400	1,300
Eureka	0	6,400	4,700

3.4.6.3 Recreational Fishery

In 2010, the KMZ accounted for a small portion of recreational landings; about 3 percent (1,500 fish) of total Chinook landings were made in this area, compared to total Council-area Chinook recreational landings (56,500 fish). The amount of fish landed in 2010 represented a 93 percent decline compared with the 2001-2007 average in this area (21,900 Chinook) (Table 3-16; from Tables A-5, A-10, A-18 in the *Review*). Although open, no recreational landings were made in Crescent City in 2010.

Table 3-16. Number of Chinook landed in the recreational ocean fishery.

	2010	2007	2001-2007 average
Humbug Mountain to Horse Mountain	**1,500**	**22,000**	**25,100**
Brookings	800	3,100	5,700
Crescent City	0	900	1,200
Eureka	700	18,000	15,000

About 6 percent (10,200) of all recreational trips occurred in the KMZ in 2010, compared to total Council-area recreational trips (182,900), and 96 percent of these trips were made on private vessels (9,800 trips) (Table 3-17; from Tables IV-11, IV-12, IV-13 in the *Review*). In 2010, the number of charter trips in Brookings and Eureka (400) accounted for less than one percent, compared with the total Council-area wide charter trips (44,600).

Table 3-17. Number of estimated trips in the recreational ocean salmon fishery.

	Charter trips, 2010	Charter trips, 2001-2007 average	Private trips, 2010	Private trips, 2001-2007 average
Humbug Mountain to Horse Mountain	**400**	**1,700**	**9,800**	**34,700**
Brookings	100	400	5,900	15,800
Crescent City	0	0	200	3,400
Eureka	300	1,300	3,700	15,500

3.4.7 South of Horse Mountain, California

Although this area extends as far south as the United States southern border, ocean salmon fishing generally occurs only as far south as Point Conception, California due to spatial limits in the ocean abundance of salmon stocks southward. Major port areas in this area include Fort Bragg, San Francisco, and Monterey, California (Figure 1). This Section also presents estimates for the area South of Point Arena, California, which includes San Francisco and Monterey port areas. The area from south of Horse Mountain to Point Arena exclusively includes the port in Fort Bragg.

3.4.7.1 Stocks on Which the Fisheries Rely

Central Valley Chinook stocks are important throughout this area, particularly south of Fort Bragg near Point Arena. Southern Oregon Chinook stocks contribute to fisheries in the northern portion of this area.

KRFC, California Coastal Chinook, and Sacramento River winter run Chinook are also landed in this area, and conservation concerns for these stocks often have substantial effects on ocean harvest management measures. Coho retention is prohibited off California (NMFS ESA consultation standard for SONCC and CCC coho ESUs; NMFS 1999).

3.4.7.2 Commercial Fisheries

Only 18 percent of total pounds landed in the Council-area commercial troll fishery occurred in California ports in 2010 (228,000 pounds). Ninety eight percent of the California landings were in ports south of Horse Mountain (223,000) (Table 3-18; from Table IV-6, IV-7, IV-8 in the *Review*). For the area south of Horse Mountain, the 2010 landings of Chinook (223,000) represented a 94 percent decline, compared with the 2001-2007 average (3,727,000 Chinook); the area south of Point Arena (36,000) represents a 99 percent decline in 2010, compared with the 2001-2007 average (2,732,000). Coho retention in commercial fisheries south of the Oregon/California border has not been allowed since 1993 to reduce impacts on OCN and other depressed and ESA-listed coho stocks; therefore, coho estimates are not presented in this Section.

In 2010, 82 percent of pounds of salmon landed by the California commercial troll ocean fishery occurred in Fort Bragg (187,000 pounds). This was an 81 percent decline compared to the 2001-2007 average in Fort Bragg (996,000). Opportunity in Fort Bragg was reduced starting in 1990 to reduce impacts on KRFC. In 2010, Monterey and San Francisco landings were reduced primarily due to measures designed to protect SRFC. In 2010, as a result of SRFC failing to meet the lower end of the FMP conservation objective goal range (122,000 to 180,000) for three consecutive years (2007-2009), an “overfishing concern” under the FMP was triggered for the stock and NMFS notified the Council that the stock was “overfished.” Landings in San Francisco historically were substantially more than landings at Fort Bragg, especially in recent past years.

Table 3-18. Pounds of Chinook landed in the commercial troll ocean salmon fishery by port area in California.

	2010	2007	2001-2007 average
All California ports	**228,000**	**1,525,000**	**3,850,000**
South of Horse Mountain	**223,000**	**1,410,000**	**3,727,000**
Fort Bragg	187,000	357,000	996,000
San Francisco	16,000	888,000	2,156,000
Monterey	20,000	165,000	575,900
South of Point Arena (San Francisco and Monterey)	**36,000**	**1,053,000**	**2,732,000**

The number of Chinook landed in the commercial troll salmon fishery by catch area is presented below (Table 3-19; from Tables A-1, A-6, and A-11 in the *Review*). San Francisco reported the least amount of Chinook caught in this management zone.

Table 3-19. Number of Chinook landed by commercial troll fishery by catch area.

	2010	2007	2001-2007 average
All California ports	**15,100**	**114,100**	**296,400**
South of Horse Mountain	**15,100**	**105,400**	**290,400**
Fort Bragg	12,600	16,100	72,800
San Francisco	1,100	75,300	167,700
Monterey	1,400	14,000	49,900
South of Point Arena (San Francisco and Monterey)	**2,500**	**89,300**	**217,600**

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

3.4.7.3 Recreational Fisheries

Fort Bragg, San Francisco, and Monterey represented 25 percent (14,000 fish) of the Council-area recreational Chinook landings (56,500 fish) in 2010, an 87 percent decline compared with the 2001-2007 average (110,100 Chinook).

Table 3-20. Number of Chinook landed south of Horse Mountain.

	2010	2007	2001-2007 average
South of Horse Mountain	**14,000**	**28,800**	**110,100**
Fort Bragg	1,700	5,800	19,800
San Francisco	5,900	16,800	65,500
Monterey	6,300	6,300	24,800
South of Point Arena (San Francisco and Monterey)	**12,300**	**23,100**	**90,300**

The number of recreational trips in California is typically greater in the area south of Horse Mountain, although trips have steadily decreased coast-wide. In 2010, 29 percent of recreational trips south of Horse Mountain were made by charter vessels (12,900) (Table 3-21; from Tables IV-11, IV-12, IV-13 in the *Review*). In 2010, charter trips were most common in San Francisco (7,500), while private recreational trips were most common in Monterey (15,100). Recreational trips made south of Horse Mountain represented 24 percent (44,500) of all trips made coast-wide (182,900), a 48 percent decline from the number of recreational trips made in this area in 2007 (85,400).

Table 3-21. Number of recreational Chinook trips.

	Charter trips, 2010	Charter trips, 2001-2007 average	Private trips, 2010	Private trips, 2001-2007 average
South of Horse Mountain	**12,900**	**64,200**	**31,600**	**77,400**
Fort Bragg	1,800	8,600	4,900	17,000
San Francisco	7,500	42,300	11,600	32,300
Monterey	3,600	13,200	15,100	28,100
South of Point Arena (San Francisco and Monterey)	**11,100**	**55,600**	**26,700**	**60,400**

3.4.8 Catch, Effort and Economic Impact Data for Ocean Salmon Fisheries

Catch and effort data for 2010 and average landings and effort during 2000-2007 or 2000-2009 were used to describe and compare commercial troll and recreational ocean salmon fisheries off Washington, Oregon, and California. In 2010, catch per unit of effort was highest in fisheries from the U.S./Canada border to Cape Falcon in the treaty commercial troll ocean salmon fisheries (35.1) (Tables 3-22 and 3-23; from Table I-5 in the *Review*). Non-treaty troll catch was limited in 2010 by landing limits and possession limits. The estimates of Chinook dressed pounds were taken from Tables IV-6, IV-7, IV-8 in the *Review.*

During the 2000s, average Chinook effort and landings were highest from Horse Mountain south to the U.S. border, before widespread fishery closures in that area during 2008 and 2009. The least average commercial troll catch and effort during the 2000s occurred from Humbug Mountain to Horse Mountain.

Table 3-22. Commercial troll ocean salmon fishing effort and number of Chinook and coho landed by management area.[49]

	# of Days fished, 2010	# of Chinook landed, 2010	Lbs. of dressed Chinook, 2010[50]	Chinook catch per unit effort, 2010	# of Coho landed, 2010	Average # of days fished	Average # of Chinook landed	Average # of coho landed
U.S./Canada Border to Cape Falcon (treaty)	1,000	33,400		35.1	11,500	600	30,500	34,800
U.S./Canada Border to Cape Falcon (non-treaty)	3,100	56,200	638,000	18.3	3,100	2,000	31,500	13,800
Cape Falcon to Humbug Mountain	3,500	27,400	347,000	7.9	0	8,500	169,600	1,100
Humbug Mountain to Horse Mountain	200	900	47,000	4.8	0	700	14,500	0
Horse Mountain south to U.S. Border	2,000	15,100	223,000	7.6	0	14,500	293,400	0

[49] Averages include years 2003-2009 north of Cape Falcon, and years 2003-2007 south of Cape Falcon to exclude years of widespread fishery closures off California in 2008 and 2009.

[50] Pounds dressed from Tables IV-6, IV-7, IV-8 in the *Review*.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; C-catch; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; N-Abundance; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 3-23. Recreational ocean salmon fishing effort and number of Chinook landed by management area[51].

	# of Angler trips, 2010	# of Chinook landed, 2010	# of Coho landed, 2010	Chinook catch per unit effort, 2010	Average # of angler trips	Average # of Chinook landed	Average # of coho landed
U.S./Canada border to Cape Falcon (non-treaty)	91,200	38,700	42,400	0.4	99,000	21,900	98,400
Cape Falcon to Humbug Mountain	37,100	2,300	12,100	0.1	75,500	22,300	37,100
Humbug Mountain to Horse Mountain	10,200	1,500	100	0.2	32,600	21,500	1,000
Horse Mountain south to U.S. Border	44,500	14,000	100	0.3	132,500	103,700	700

Coastal community and state personal income impacts of the non-Indian commercial troll and recreational ocean salmon fishery were compared coast-wide (Table 3-24; from Tables IV-16, IV-17, IV-18 in the *Review*). Economic impact estimate averages in the 2000s indicate the most economic impact occurred in port areas south of Horse Mountain ($12,800,000 in San Francisco alone), while the least impact occurred in port areas from Humbug Mountain to Horse Mountain.

[51] Averages include years 2003-2009 north of Cape Falcon, and years 2003-2007 south of Cape Falcon to exclude years of widespread fishery closures off California in 2008 and 2009.

Table 3-24. Coastal community and personal income impacts in real, inflation-adjusted 2010 dollars of the commercial troll and recreational ocean salmon fishery for major port areas [52].

	Ocean troll, 2010	Average ocean troll	Recreational, 2010	Average recreational
U.S./Canada Border to Cape Falcon	**5,593,000**	**2,391,000**	**7,412,000**	**8,731,000**
Neah Bay	319,000	528,700	428,000	672,300
La Push	502,000	229,600	214,000	198,700
Westport	3,792,000	854,900	4,183,000	4,331,200
Ilwaco	82,000	130,800	2,001,000	2,708,100
Astoria	898,000	647,900	586,000	821,000
Cape Falcon to Humbug Mountain	**2,449,000**	**8,962,000**	**1,666,000**	**3,918,000**
Tillamook	260,000	781,100	522,000	902,400
Newport	1,304,000	4,320,400	819,000	1,595,400
Coos Bay	885,000	3,860,600	325,000	1,420,300
Humbug Mountain to Horse Mountain	**383,000**	**1,580,100**	**424,000**	**1,537,600**
Crescent City	0	401,000	8,000	136,700
Eureka	34,000	350,700	185,000	776,000
Brookings	349,000	828,400	220,000	624,900
South of Horse Mountain	**1,977,000**	**21,363,000**	**3,037,000**	**11,904,000**
Fort Bragg	1,689,000	5,288,100	410,000	1,723,000
San Francisco	135,000	12,799,700	1,540,000	7,311,100
Monterey	153,000	3,274,700	1,087,000	2,869,900

Average price per pound has increased over the past ten years. Washington had the highest average price per pound for Chinook in 2010, and California had the lowest average price per pound in 2010 (Table 3-25; from Table IV-2, IV-3, and IV-4 in the *Review*).

[52] Averages include the years 2001-2009 north of Cape Falcon, and 2001-2007 south of Cape Falcon.

Table 3-25. Real price per pound for Chinook landed in the commercial troll fishery.

	California[53]		Oregon		Washington	
	Chinook	Coho	Chinook	Coho	Chinook	Coho
2001	2.42	Closed	1.97	0.97	1.76	0.84
2002	1.87	Closed	1.85	0.90	1.33	1.90
2003	2.25	Closed	2.32	1.00	1.35	0.87
2004	3.29	Closed	3.95	1.42	2.45	1.33
2005	3.29	Closed	3.51	2.07	2.99	1.83
2006	5.50	Closed	5.88	3.11	4.98	1.81
2007	5.40	Closed	5.90	1.98	5.11	1.52
2008	Closed	Closed	7.45	2.88	6.86	2.54
2009	NClosed	Closed	5.11	2.06	5.82	2.04
2010	5.47	Closed	5.49	2.23	5.61	2.14

Non-Indian ocean troll exvessel revenue information from Table IV-2 from the *Review* is presented in the table below. Ocean troll exvessel revenues are represented as thousands of real, inflation-adjusted, 2010 dollars. Coastal community and state personal income impacts are expressed in thousands of nominal and real, inflation-adjusted, 2010 dollars of the troll ocean salmon fishery (Table 3-26; from Tables IV-16, IV-17, IV-18,I-2, I-3, and I-4 in the *Review*)

Table 3-26. Non-Indian troll Chinook salmon estimates of exvessel value in real dollars, coastal community and state personal income impacts in thousands of real (inflation adjusted, 2010) dollars of the troll ocean salmon fishery, and economic multiplier.

	California			Oregon			Washington		
Year	Real value	Economic impact	Economic multiplier	Real value	Economic impact	Economic multiplier	Real value	Economic impact	Economic multiplier
2001	4,773	14,477	3.03	4,680	12,615	2.70	349	1,056	3.03
2002	7,776	24,705	3.18	5,383	14,347	2.67	756	2,191	2.90
2003	12,181	35,939	2.95	7,186	17,648	2.46	951	2,784	2.93
2004	17,895	37,573	2.10	9,832	17,183	1.75	1,079	2,588	2.40
2005	12,913	26,064	2.02	8,466	14,429	1.70	1,273	2,570	2.02
2006	5,350	9,693	1.81	2,663	4,126	1.55	1,029	1,870	1.82
2007	7,902	13,910	1.76	2,630	4,206	1.60	905	1,663	1.84
2008	0	0	0.00	484	691	1.43	673	1,167	1.73
2009	0	0	0.00	77	537	6.97	893	1,981	2.22
2010	1,246	2,090	1.68	2,774	3,968	1.43	3,083	4,904	1.59
Avg.	7,004	16,445	1.85	4,418	8,975	2.42	1,099	2,277	2.25

3.4.9 Klamath River Fisheries

Data on Klamath River Chinook salmon harvest in river tribal and non-tribal recreational fisheries are available at: http://www.pcouncil.org/salmon/salbluebook/salbluebook.html.

3.4.9.1 Tribal Fisheries

The Klamath and Trinity Rivers are considered a lifeline to tribal groups such as the Yurok and Hoopa Valley Tribe. Salmon are not only integral to the health and wellness of tribal members, but also serve important purposes during cultural and religious ceremonies that are deeply rooted in tradition and belief, including in storytelling and the traditional fishing, processing, and cooking of salmon. Tribes have a

[53] NA = Coho retention and directed fishing has been prohibited off California. Widespread Chinook fishery closures occurred in 2008 and 2009.

spiritual connection to their homelands and ceremonies, and salmon are a vital part of their identity and subsistence as a culture. Ensuring the sustainability of salmon is extremely important to tribes.

In 2010, a total of 32,400 Chinook salmon were harvested by the Yurok and Hoopa Valley reservation Indian gillnet fishermen, of which 94 percent were fall-run fish (30,400). During 2004-2009, the tribal gillnet fishermen harvested an average of 26,200 Chinook salmon annually, which includes an average of 5,500 spring-run fish and an average of 20,600 fall-run fish annually (Table 3-27; from Table B-5 in the *Review*). The average value of a commercial caught KRFC is worth about $45 per fish to the tribal fisherman (Yurok Tribe report 2006).

Table 3-27. Yurok and Hoopa Valley tribal fishery harvest of spring and fall-run Chinook salmon in the Klamath and Trinity River Basin.

	Spring-run	Fall-Run	Subsistence	Total
2004	8,700	26,000	19,400	34,700
2005	7,300	8,100	12,300	15,400
2006	4,400	10,700	15,100	15,100
2007	5,800	27,600	10,000	33,400
2008	3,400	22,900	13,800	26,300
2009	3,600	28,600	16,400	32,100
2010	2,000	30,400	16,900	32,400
Average, 2004-2009	**5,500**	**20,600**	**14,500**	**26,200**

4.0 ANALYSIS OF ALTERNATIVES

The alternatives considered in this EA address five issues:

1. Stock classification
2. SDC
3. OFL/ABC/ACL frameworks
4. AMs
5. *De minimis* fishing provisions

Alternatives for each of these issues will be analyzed to determine if there are significant effects on the environment, and assessed for the relative effects among the alternatives.

Most of the Alternatives considered in this EA will only affect administrative functions and not biological or socioeconomic environments. For example, the classification and SDC alternatives do not affect how many fish of a particular stock are harvested, merely how they are categorized and reported in status updates. AM alternatives largely designate existing FMP provisions, and otherwise dictate administrative responses to stock status in the unlikely event that ACL alternatives do not affect harvest when they should have. Only those alternatives that affect harvest control rules, specifically conservation objectives and *de minimis* fishing provisions, have the potential to result in allowable harvest that is different than under status quo management. This in turn has the potential to affect fish resources (e.g., numbers of fish spawning), protected resources, and socioeconomic (e.g., numbers of fish sold) environments.

4.1 Analysis of Environmental Impacts on Fish Resources

4.1.1 Effects on Target Species from Stock Classification Alternatives

Stock classification issues can be divided into three components:

1. Determining if stocks are in the fishery or not in the fishery.
2. Formation of stock complexes and indentifying indicator stocks.
3. Application of the international exception for ACLs to stocks or stock complexes managed under an international agreement.

4.1.1.1 Direct and Indirect Impacts

Stock classification is generally an administrative exercise that is descriptive in nature and does not directly impact target species. Alternatives 2 and 3 result in stocks no longer being in the fishery (Canadian stocks, Mid-Columbia spring and Upper Columbia River fall Chinook, and Puget Sound pink salmon). Classifying Mid-C Sp and Columbia River fall Chinook, and Fraser and Puget Sound pink salmon as ECs or omitting them from the FMP would not substantively change fishery management as these stocks are currently excepted from the FMP overfishing criteria due to low impacts in Council-area fisheries. The basis for the current treatment of these stocks is that changes to Council-area management would have negligible effect on stock status. Therefore, removing these stocks from Council management authority would have no significant impacts to these stocks. Other stocks that are currently excepted from the FMP overfishing criteria because of low impacts in Council-area fisheries could became subject to actions associated with SDC triggers for overfishing, overfished, etc. These indirect impacts to Council-area fisheries and other target stocks would be negligible since such actions would be unlikely to significantly affect Council-area fisheries; only fisheries that have substantive impacts on a stock would likely be affected by changes in stock status. These stocks would still be managed by the relevant agencies currently responsible for maintaining their status; therefore, no change in impacts to target species and no significant impacts to target species would be expected under any of the Classification Alternatives.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

The formation of stock complexes would not result in any changes to Council-area fishery management as the complexes being proposed reflect current management practices. KRFC and SRFC currently function as indicator stocks for ocean Chinook fishery management south of Cape Falcon because of a lack of information for other stocks. Stocks in the FNMC and Mid-C Sp Chinook complexes are currently exempt from FMP overfishing criteria due to their low impacts in Council-area fisheries. The FNMC stocks are generally subject to management under the PST, and the Mid-C Sp is proposed as either an EC or for omission from the FMP. Describing these stocks as a complex would not change the manner in which these stocks were managed relative to the status quo Alternative, and no significant impacts would result from formation of stocks complexes.

Application of the international exception for ACLs would allow stocks subject to the PST to continue under that management authority. Stocks that do not have the international exception applied are currently not managed under the PST, and therefore no change in management for those stocks and no significant impacts to Council-managed stocks classified would result from the International Exception Alternatives.

Stock classification alternatives would not have direct impacts on target species. Management of the stocks and constraints on the fisheries would not change relative to status quo because the stock classification Alternatives do not propose changes to conservation objectives; stocks subject to the PST would continue to be managed as such; ESA-listed stocks would continue to have their management deferred to consultation standards; and hatchery stocks would not constrain fisheries. Revising or forming new stock complexes would not change the indicator stocks currently used to manage fisheries. Therefore, no significant impacts to target species would be expected from any of the Classification alternatives.

4.1.1.2 Cumulative Impacts

The classification alternatives are not likely to result in cumulative impacts to target species when added to other past, present, and reasonably foreseeable future actions.

4.1.2 Effects on Target Species from SDC Alternatives

Categorizing stock status according to SDC is generally an administrative exercise that is descriptive in nature. Changing the criteria, therefore, will not directly affect target species; however, there may be some indirect effects associated with Council actions to SDC triggers. For example, when overfishing is identified, the Council is required to take action to end overfishing immediately. If SDC would result in more timely detection and identification of overfishing, management actions to prevent stocks from becoming overfished could be implemented sooner, increasing the probability of achieving MSY in the long-term.

4.1.2.1 Overfishing

To evaluate the effects of the overfishing SDC alternatives on target species, annual exploitation rates from 1983 to 1986-forward for SRFC, KRFC, Columbia River summer Chinook, Washington Coastal coho, and Puget Sound coho were judged against the SDC in order to retrospectively determine the relative frequency of years that each stock would have been designated as subjected to overfishing. The analysis used the best currently available estimate of F_{MSY} for each of these stocks in making this determination; if a direct estimate of F_{MSY} was unavailable, the proxy values of 0.78 for Chinook was used (see Appendix C). F_{MSY} for Puget Sound coho represent the normal exploitation rates used in the FMP conservation objectives. F_{MSY} for Washington Coastal coho were obtained from stock recruitment data used in Coho FRAM (Appendix E). The analysis assumes that the stocks were managed to achieve conservation and management objectives in place at the time, and that exploitation rates were not adjusted

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

to reflect how stocks might have been managed had updated estimates of F_{MSY}, alternative SDC, or other alternative management requirements been in place (e.g., ACLs, rebuilding measures).

Results: Based on the comparison of historical exploitation rates to F_{MSY}, it appears that many stocks experienced exploitation rates exceeding F_{MSY} (Alternative 2 overfishing SDC) frequently prior to the mid-early 1990's. Since that time, overfishing has not been observed for the stocks analyzed (Table 4-1). The lower exploitation rates observed since the mid 1990's were largely the result of ocean fishery constraints for ESA-listed stocks, adoption of exploitation rate management for PST stocks, constraints in Canadian fisheries to address stock depression for several Canadian stocks, and management constraints on KRFC. The assessment of effects assumes that management under the overfishing SDC Alternative 2 would have similar frequencies of overfishing determinations as those observed since the late-1990s (after the most recent ESA listings). Compared to the status quo Alternative, it is expected that overfishing would be determined less frequently, in fact rarely, under Alternative 2 (Table 4-1). This is because the status quo Alternative depends on abundance, influenced by environmental factors, and is more likely to result in a determination of overfishing than Alternative 2, which is based on F alone.

With respect to target species, Alternative 2 overfishing SDC should have indirect positive effects compared with the status quo Alternative because the SDC are more objective than the status quo Alternative and criteria are assessed annually rather than only after the stock is determined to be overfished. As a result, management actions would be more responsive, and overfishing would end sooner; however, based on the results in Table 4-1 since the mid-1990's, the need for such actions would be expected only rarely.

The difference in frequency of overfishing determinations between the Alternative 2 and the status quo Alternative would have positive, but negligible, impacts to target species; therefore, impacts on target species from Alternative 2 overfishing SDC would not be significant

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 4-1. Retrospective analysis of overfishing occurrences based on status determination criteria alternatives for select stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the Alternatives.

		Rel Freq. OF'ing
SRFC: F_{MSY} =	0.78	
Alt 1-Status Quo: S(t,t-1,t-2)<122,000&C+S>122,000		7.4%
Alt 2: F(t) > F_{MSY}		22.2%
KRFC: F_{MSY} =	0.72	
Alt 1-Status Quo: S(t,t-1,t-2)<35,000&C+S>35,000		17.4%
Alt 2: F(t) > F_{MSY}		4.0%
CRSu: S_{MSY} =	0.75	
Alt 1-Status Quo: S(t,t-1,t-2)<37,041&C+S>37,041		27.3%
Alt 2: F(t) > F_{MSY}		0.0%
Grays Harbor Coho: F_{MSY} =	0.69	
Alt 1-Status Quo: S(t,t-1,t-2)<35,400&C+S>35,400		3.7%
Alt 2: F(t) > F_{MSY}		8.7%
Queets Coho: F_{MSY} =	0.68	
Alt 1-Status Quo: S(t,t-1,t-2)<5,800&C+S>5,800		18.5%
Alt 2: F(t) > F_{MSY}		21.7%
Hoh Coho: F_{MSY} =	0.69	
Alt 1-Status Quo: S(t,t-1,t-2)<2,000&C+S>2,000		0.0%
Alt 2: F(t) > F_{MSY}		21.7%
Quillayute Fall Coho: F_{MSY} =	0.59	
Alt 1-Status Quo: S(t,t-1,t-2)<6,300&C+S>6,300		0.0%
Alt 2: F(t) > F_{MSY}		17.4%
Strait JDF: F_{MSY} =	0.60	
Alt 1-Status Quo: S(t,t-1,t-2)<14,800&C+S>14,800		21.7%
Alt 2: F(t) > F_{MSY}		13.0%
Skagit: F_{MSY} =	0.60	
Alt 1-Status Quo: S(t,t-1,t-2)<30,000&C+S>30,000		17.4%
Alt 2: F(t) > F_{MSY}		21.7%
Hood Canal: F_{MSY} =	0.65	
Alt 1-Status Quo: S(t,t-1,t-2)<21,500&C+S>21,500		26.1%
Alt 2: F(t) > F_{MSY}		34.8%
Stilliguamish: F_{MSY} =	0.50	
Alt 1-Status Quo: S(t,t-1,t-2)<17,000&C+S>17,000		26.1%
Alt 2: F(t) > F_{MSY}		43.5%
Snohomish: S_{MSY} =	0.60	
Alt 1-Status Quo: S(t,t-1,t-2)<70,000&C+S>70,000		0.0%
Alt 2: F(t) > F_{MSY}		34.8%
Year	1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009	

4.1.2.2 Overfished

To evaluate the effects of the overfished SDC alternatives on target species, annual spawning escapements from 1970-forward (STT 2011a) for six Chinook and nine coho stocks were judged against the SDC in order to retrospectively determine the relative frequency of years that each stock would have been designated as overfished. In making this determination, Alternatives 2 through 4 were based on the best currently available estimate of S_{MSY}; Alternative 1 (status quo) used the current conservation objective value, or if a range, the low end of the range. The analysis assumes that the stocks were managed to achieve conservation and management objectives in place at the time, and that spawning

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

escapements were not adjusted to reflect how stocks might have been managed had updated estimates of S_{MSY}, alternative SDC, or other alternative management requirements been in place (e.g., ACLs, rebuilding measures).

Chinook: the Chinook stocks assessed include:

- SRFC,
- KRFC,
- Columbia River summer,
- Hoh fall,
- Queets spring/summer, and
- Quillayute summer.

All of the Chinook stocks analyzed would be in the fishery under all classification Alternatives, and KRFC, SRFC, and Hoh fall Chinook would serve as indicator stocks for the SONC, CVF, and FNMC complexes, respectively. The three FNM Chinook stocks are not all-inclusive, but represent the range of results that could be expected from other FNMC Chinook complex stocks.

The bases of Chinook S_{MSY} used for this analysis were as follows:

- SRFC: S_{MSY} corresponding to the lower end of the current conservation objective range of 122,000-180,000.
- KRFC: an S_{MSY} estimate of 40,700 natural area adult spawners (STT 2005).
- Columbia River summer Chinook: an S_{MSY} estimate of 12,143 (CTC 1999).
- Hoh fall and Quillayute summer Chinook: S_{MSY} estimates of 1,200 and 1,200, respectively (Cooney 1984).
- Queets spring/summer Chinook: an S_{MSY} estimate of 700 as listed in the Salmon FMP (PFMC 2007).

Coho: The Coho stocks assessed include:

- Grays Harbor,
- Queets,
- Hoh,
- Quillayute,
- Strait of Juan de Fuca,
- Skagit,
- Hood Canal,
- Stillaguamish, and
- Snohomish.

All of the coho stocks would be in the fishery under all classification Alternatives.

The bases of Coho S_{MSY} and S_{MSP} used for this analysis were as follows:

- Grays Harbor: A direct estimate of S_{MSY} was not available for Grays Harbor coho, but the FMP conservation objective is based on an estimate of S_{MSP}. Therefore, S_{MSY} for Grays Harbor coho was calculated using the following relationship: $S_{MSY} = S_{MSP} \times F_{MSY}$. F_{MSY} for Grays Harbor coho was estimated at 0.69 (Appendix E), resulting in an S_{MSY} estimate of 24,436.
- Queets, Hoh, and Quillayute: an estimate of S_{MSY} derived from the stock recruitment analysis in Appendix E. The status quo conservation alert criteria use the lower end of the range of S_{MSP} estimates identified in the current FMP (Lestelle et al. 1984).
- Puget Sound stocks: S_{MSY} estimates derived from the allowable normal exploitation rate applied to the normal/low preseason abundance breakpoint.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Results: The results of the analysis indicate that for most stocks, overfished status would have occurred periodically, and that the stocks would have remained depressed for a few years before rebuilding (Tables 4-2, 4-3, 4-4). Three periods of general stock depression were observed in the analysis: one in the early 1980's, one in the early 1990's, and one in the mid 2000's. The duration of stock depression was generally ranged from three to six years. While the pattern was not observed in all stocks, it was prevalent enough to suggest that cyclical, broad-scale changes in environmental conditions likely underlie these periods of stock depression, e.g., shifts in ocean productivity regimes or extended droughts. The analysis of effects assumes that management under the overfished SDC Alternatives would have similar frequencies and durations of overfished determinations as those observed since the late-1990s (see Section 4.2.1 of this EA).

The Alternatives based on multi-year means or consecutive years would have less frequent overfished determinations than those based on single a year for a given MSST percentage of S_{MSY}. They also would tend to start later and end no earlier than the annual Alternatives, meaning the duration of the overfished status would generally be longer for the annual Alternatives. Annual Alternatives also exhibited more of a tendency for short (single year) determinations to occur, as expected, due to the natural variability of salmon abundance. This feature of annual Alternatives would necessitate frequent assessments, which may not be completed before the stock recovers. If the cause of such frequent determinations was natural variability in population abundance, the determination would not represent a real risk to the capacity of the stock to produce MSY on a continuing basis.

In terms of the relative frequency of overfished determinations, status quo (Alternative 1) was most similar to Alternative 4b, a 3-year arithmetic mean < $0.75*S_{MSY}$ (Figure 4-1). Ranking the Alternatives by the relative frequency of overfished determinations indicates that Alternative 4 had the lowest frequency, followed by Alternative 3, then Alternative 2, then Alternative 1, then Alternatives 4b, 3b, and 2b with the highest frequency.

Effects on target species would reflect these ranks, with Alternative 4 having the greatest risk of negative effects to target species; Alternative 2b would have the least risk to target species; however, the difference in risk to target species between Alternatives 2b and 4 should be negligible if Alternative 4 accurately reflects abundance from which salmon stocks can recover to MSY levels without reduction in the long-term stock reproductive potential. Based on the patterns observed in Tables 4-2, 4-3, and 4-4, it appears that this is the case, since most stocks have had 3-year (or longer) mean spawning escapements less than $0.5*S_{MSY}$ and have subsequently recovered. The NS1Gs also recommend $0.5*S_{MSY}$ as an appropriate reference point for overfished SDC, particularly given the high productivity and short life-cycle of salmon. Use of the multi-year mean also helps ensure that overfished determinations represent more than natural variation in stock abundance, and thus reduces potential negative effects on the socioeconomic environments. The most appropriate metric for lognormally distributed abundance data is the geometric mean, not the arithmetic mean; therefore, Alternatives 3 and 3b are better suited to assessing salmon abundance status than Alternatives 4 and 4b. The geometric mean is currently used in other aspects of salmon assessment and management, including the ongoing status reviews of all ESA-listed species being conducted by NMFS.

The determination of stock status would not have significant effects on target species or fisheries since there are no required actions associated with the overfished determination that would automatically change conservation objectives or control rules. In the event of an overfished determination, the Council will direct the STT to propose a rebuilding plan which could include temporary changes in the control rule designed to help rebuild the stock.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 4-2. Retrospective analysis of overfished and rebuilt (R) occurrences based on status determination criteria alternatives for select Chinook stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 1 of 2)

SRFC: S_{MSY} =	122,000																																									Rel Freq. OF'd
Alt 1-Status Quo: S(t,t-1,t-2)<122,000																										R																5.3%
Alt 2: S(t) < 0.5*S_{MSY}																																										2.5%
Alt 2b: S(t) < 0.75*S_{MSY}																										R																10.0%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																										**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																																										2.6%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																										0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																										2.6%
KRFC: S_{MSY} =	40,700																																									
Alt 1-Status QuoS(t,t-1,t-2)<35,000																		R										R												R			30.0%
Alt 1b: S(t,t-1,t-2)<S_{MSY}																		R										R												R			30.0%
Alt 2: S(t) < 0.5*S_{MSY}																		R										R					R										15.6%
Alt 2b: S(t) < 0.75*S_{MSY}																		R										R					R							R			34.4%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																												R															**10.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																			R									R														R	30.0%
Alt 3c: 3-Yr GeoMean < 0.86*S_{MSY}																			R									R						R								R	40.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																												R															6.7%
Alt 4b: 3-Yr average < 0.75*S_{MSY}																												R														R	30.0%
CRSu: S_{MSY} =	12,143																																									
Alt 1: S(t,t-1,t-2)<S_{MSY}																R																										3.4%
Alt 2: S(t) < 0.5*S_{MSY}																																										0.0%
Alt 2b: S(t) < 0.75*S_{MSY}																R										R																9.7%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																										**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																																										0.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																										0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																										0.0%
Year		1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	

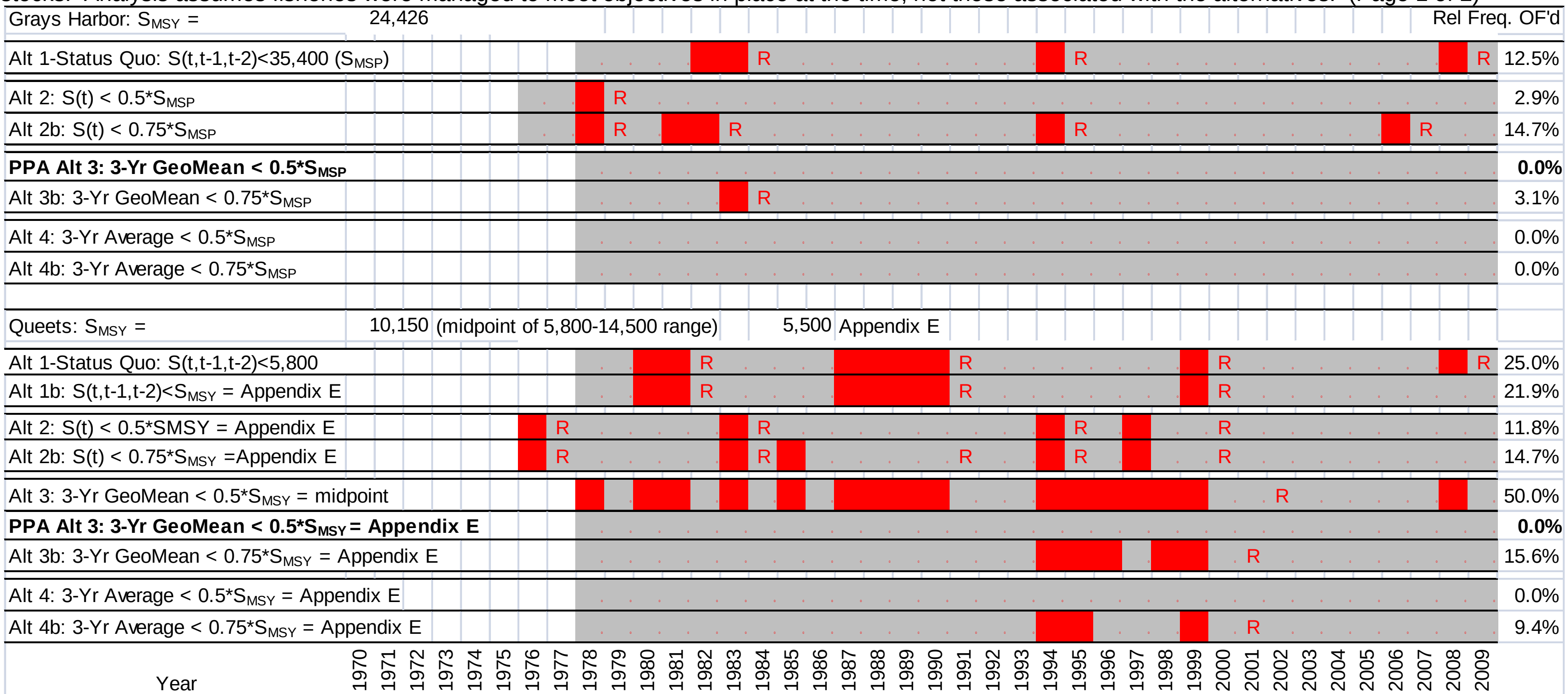
F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 4-2. Retrospective analysis of overfished and rebuilt (R) occurrences based on status determination criteria alternatives for select Chinook stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 2 of 2)

Stock / Criterion	S_{MSY}	Rebuilt (R) years	Rel Freq. OF'd
Hoh Fall: S_{MSY} =	1,200		
Alt 1: S(t,t-1,t-2)<S_{MSY}			0.0%
Alt 2: S(t) < 0.5*S_{MSY}			0.0%
Alt 2b: S(t) < 0.75*S_{MSY}			0.0%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}			**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}			0.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY}			0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}			0.0%
Queets Spring/Summer: S_{MSY} =	700		
Alt 1: S(t,t-1,t-2)<S_{MSY}		R (2002)	25.0%
Alt 2: S(t) < 0.5*S_{MSY}		R (2002)	15.2%
Alt 2b: S(t) < 0.75*S_{MSY}		R (1977), R (1993), R (2002)	32.4%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}			**9.4%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}			34.4%
Alt 4: 3-Yr Average < 0.5*S_{MSY}			6.3%
Alt 4: 3-Yr Average < 0.75*S_{MSY}			34.4%
Quillayute Summer: S_{MSY} =	1,200		
Alt 1: S(t,t-1,t-2)<S_{MSY}		R (1988)	31.3%
Alt 2: S(t) < 0.5*S_{MSY}		R (1988)	11.8%
Alt 2b: S(t) < 0.75*S_{MSY}		R (1988), R (1998), R (2001)	35.3%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}		R (1989)	**3.1%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}		R (1989)	28.1%
Alt 4: 3-Yr Average < 0.5*S_{MSY}		R (1988)	3.1%
Alt 4: 3-Yr Average < 0.75*S_{MSY}		R (1988)	28.1%
Year		1970–2009	

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 4-3. Retrospective analysis of overfished and rebuilt (R) occurrences based on status determination criteria alternatives for Washington Coastal coho stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 1 of 2)



F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table 4-3. Retrospective analysis of overfished and rebuilt (R) occurrences based on status determination criteria alternatives for Washington Coastal coho stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 2 of 2)

Hoh: S_{MSY} =	3,500	(midpoint of 2,000-5,000 range)	2,520	Appendix E																																					
Alt 1-Status Quo: S(t,t-1,t-2)<2,000																																									0.0%
Alt 1b: S(t,t-1,t-2)<S_{MSY}										R												R																		R	9.4%
Alt 2: S(t) < 0.5*S_{MSY} = Appendix E																										R															2.9%
Alt 2b: S(t) < 0.75*S_{MSY} =Appendix E													R													R			R									R			17.6%
Alt 3: 3-Yr GeoMean < 0.5*S_{MSY} = midpoint																																									**0.0%**
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY} = Appendix E																																									**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY} = Appendix E																											R														3.1%
Alt 4: 3-Yr Average < 0.5*S_{MSY} = Appendix E																																									0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY} = Appendix E																																									0.0%
Quillayute: S_{MSY} =	11,050	(midpoint of 6,300-15,800 range)	5,873	Appendix E																																					
Alt 1-Status Quo: S(t,t-1,t-2)<6,300																																									0.0%
Alt 1b: S(t,t-1,t-2)<S_{MSY}										R								R											R											R	46.9%
Alt 2: S(t) < 0.5*S_{MSY} = Appendix E															R																										2.9%
Alt 2b: S(t) < 0.75*S_{MSY} =Appendix E									R						R																										11.8%
Alt 3: 3-Yr GeoMean < 0.5*S_{MSY} = midpoint											R																				R										**6.3%**
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY} = Appendix E																																									**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY} = Appendix E																																									0.0%
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY} = midpoint											R																				R										50.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY} = Appendix E																																									0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY} = Appendix E																																									0.0%
Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	

Table 4-4. Retrospective analysis of overfished and rebuilt (R) occurrences based on status determination criteria alternatives for Puget Sound coho stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 1 of 2)

Strait JDF: S_{MSY} =	10,978	7,007 (low S_{MSY} [a/])	64% S_{MSY}																																									Rel Freq. OF'd
Alt 1: S(t,t-1,t-2)<S_{MSY}																														R													R	25.9%
Alt 2: S(t) < 0.5*S_{MSY}																														R													R	10.3%
Alt 2b: S(t) < 0.75*S_{MSY}																														R													R	24.1%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																												**0.0%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																																R												22.2%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																												0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																R											R	18.5%
Skagit: S_{MSY} =	25,000	14,857 (low S_{MSY} [a/])	59% S_{MSY}																																									
Alt 1: S(t,t-1,t-2)<S_{MSY}																		R										R																18.5%
Alt 2: S(t) < 0.5*S_{MSY}																		R										R			R									R				17.2%
Alt 2b: S(t) < 0.75*S_{MSY}																		R										R			R									R				37.9%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																	R											**7.4%**
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																				R													R											33.3%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																	R											7.4%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																				R													R											29.6%
Hood Canal: S_{MSY} =	14,350	10,750 (low S_{MSY} [a/])	75% S_{MSY}																																									
Alt 1: S(t,t-1,t-2)<S_{MSY}																																												0.0%
Alt 2: S(t) < 0.5*S_{MSY}																										R																		3.4%
Alt 2b: S(t) < 0.75*S_{MSY}																										R																		3.4%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																												0.0%
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																											R																	3.7%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																												0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																												0.0%
Year				1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table4-4. Retrospective analysis of overfished occurrances based on overfished status determination criteria alternatives for Puget Sound coho stocks. Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives. (Page 2 of 2)

Stilliguamish: S_{MSY} =	10,000					6,100		(low S_{MSY} [a/])				61%	S_{MSY}																												
Alt 1: $S(t,t-1,t-2)<S_{MSY}$																																									0.0%
Alt 2: $S(t) < 0.5*S_{MSY}$																																									0.0%
Alt 2b: $S(t) < 0.75*S_{MSY}$																					R		R								R										8.1%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																									0.0%
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																																									0.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																									0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																									0.0%
Snohomish: S_{MSY} =	50,000					31,000		(low S_{MSY} [a/])				62%	S_{MSY}																												
Alt 1: $S(t,t-1,t-2)<S_{MSY}$																																									0.0%
Alt 2: $S(t) < 0.5*S_{MSY}$																																									0.0%
Alt 2b: $S(t) < 0.75*S_{MSY}$													R																											R	5.4%
PPA Alt 3: 3-Yr GeoMean < 0.5*S_{MSY}																																									0.0%
Alt 3b: 3-Yr GeoMean < 0.75*S_{MSY}																																									0.0%
Alt 4: 3-Yr Average < 0.5*S_{MSY}																																									0.0%
Alt 4b: 3-Yr Average < 0.75*S_{MSY}																																									0.0%
Year	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	

a/ Low MSY refers to the spawning escapement associated with the low/critical abundance break-point multiplied by the low exploitation rate as represneted in the FMP conservation objective matrix of allowable exploitation rates (i.e., Comprehensive Coho Agreement). This represents S_{MSY} at low stock specific productivity levels.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

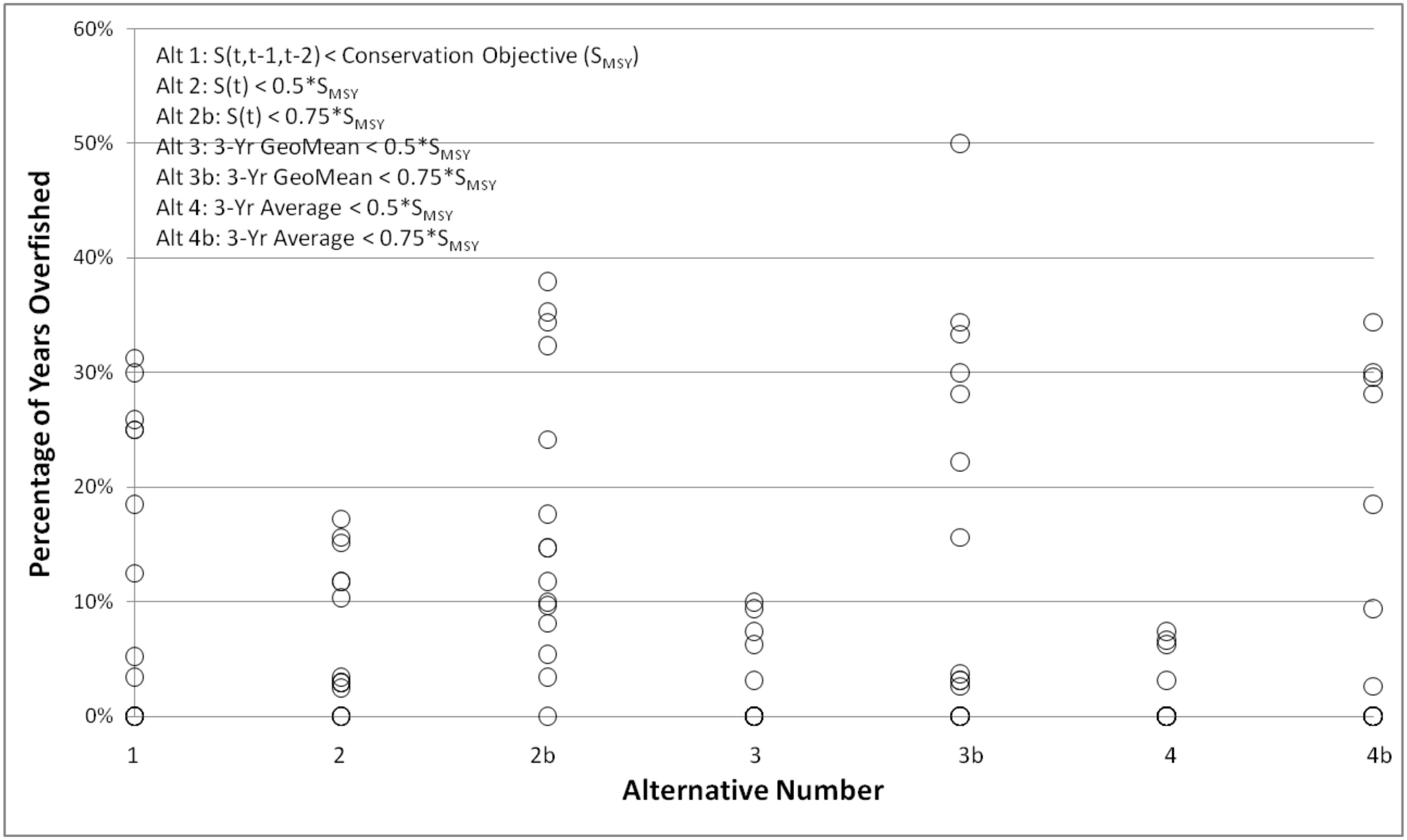


Figure 4-1. Relative frequency of overfished occurrences for status determination criteria alternatives for various Chinook and coho stocks presented in Tables 4-2, 4-3, and 4-4.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

4.1.2.3 Approaching Overfished

The analysis of environmental effects on target species from the approaching overfished SDC alternatives would follow the same pattern as the overfished SDC alternatives in terms of expected frequency and relative differences between alternatives. Similarly, there would be no significant effects on target species or fisheries since there are no required actions associated with the approaching overfished determination that would change conservation objectives or control rules.

4.1.2.4 Rebuilt

To evaluate the effects of the rebuilt SDC alternatives on target species, annual spawning escapements from 1986-forward (STT 2011a) for six Chinook and nine coho stocks were judged against the SDC in order to retrospectively determine the year in which rebuilding would have been achieved given the corresponding overfished SDC. In making this determination, Alternatives 2 through 4 were based on the best currently available estimate of S_{MSY}; Alternative 1 (status quo) used the current conservation objective value, or if a range, the low end of the range. The analysis assumes that the stocks were managed to achieve conservation and management objectives in place at the time, and that spawning escapements were not adjusted to reflect how stocks might have been managed had updated estimates of S_{MSY}, alternative SDC, or other alternative management requirements been in place (e.g., ACLs, rebuilding measures).

Results: Rebuilt status would be achieved at about the same time for all single-year SDC alternatives, usually the year following the overfished status determination, and almost always within three years (Tables 4-2, 4-3, and 4-4). The results were similar for multi-year SDC alternatives, although the rebuilt status was generally achieved two years after the Overfished status ended. These rapid rebuilding times are indicative of the relatively high productivity and resilience of salmon populations and because from one year to the next, spawning returns are largely independent of each other, relying on separate broods.

The status quo Alternative showed rebuilding occurring the year after the overfished status ended, as expected, since there was no difference between the overfished and rebuilt reference points (Tables 4-2, 4-3, and 4-4). The other single-year SDC alternatives (2, and 2b) would usually result in rebuilt status the year after the overfished status ended, but not always. Rebuilt alternatives relying on achieving a multi-year mean (3, 3b, 4, and 4b) would most often be rebuilt two years after the overfished status ended, but occasionally up to four or five years. The longer rebuilding period compared to single year SDC Alternatives would be expected because the criteria was intended to require multiple broods contribute to the rebuilt status. However, there was evidence that one strong return year could compel rebuilt status across all Alternatives. This was exemplified by the 1995 return year of KRFC, which would have resulted in rebuilt status for all Alternatives, regardless of when the overfished status ended.

Impacts to target species from the multi-year SDC Alternatives could have a beneficial effect compared to single year Alternatives if a rebuilding plan was adopted that changed the conservation objective or control rule because a longer rebuilding period could increase the genetic diversity of the population by ensuring that more than one strong brood contributes to the rebuilt population. However, there are no requirements to change conservation objectives or control rules during a rebuilding period, and to assume that action would be speculative; therefore, no significant effects from the rebuilt criteria Alternatives would be expected absent such a rebuilding plan.

4.1.3 Effects on Target Species from ACL Framework Alternatives

The ACL framework alternatives are based on establishing limits on F (F_{ABC}/F_{ACL}), as a percentage of F_{MSY}. Therefore, an analysis similar to that presented in Section 4.1.2.1 for overfishing SDC was used to assess impacts to the environment.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

ACL Alternatives only affect target stocks for which ACL provisions of the MSA are applicable (Section 2.3). For the Salmon FMP these are SRFC and KRFC, indicator stocks for the CVF and SONC Chinook complexes, respectively.

4.1.3.1 Direct and Indirect Effects

To evaluate the effects of the ACL alternatives on target species, annual exploitation rates for SRFC and KRFC were judged against the ACL in order to retrospectively determine the relative frequency of years that each stock would have exceeded the ACL. The analysis used the best currently available estimate of F_{MSY} for each of these stocks in making this determination; for SRFC a direct estimate of F_{MSY} was unavailable, and the proxy value of 0.78 for Chinook was used (Appendix C). The analysis assumes that the stocks were managed to achieve conservation and management objectives in place at the time, and that exploitation rates were not adjusted to reflect how stocks might have been managed had updated estimates of F_{MSY}, alternative SDC, or other alternative management requirements been in place (e.g., rebuilding measures).

Results: Based on the comparison of historical catch to C_{ACL} (Alternative 2), it appears that SRFC experienced excessive exploitation rates frequently prior to the mid-early 1990's. Since that time, catch exceeding C_{ACL} was observed only once, in 2004 (Table 4-5). The lower catch rates observed since the mid 1990's are largely the result of ocean fishery constraints for ESA-listed stocks and management constraints on KRFC. Catch exceeding C_{ACL} for KRFC was observed only once, in 1990.

Assuming future frequency of exceeding ACLs would be similar to those since the mid-1990s in the retrospective analysis (Table 4-5), the impacts to salmon populations compared to status quo would be essentially the same as overfishing SDC Alternative 2 (Section 4.2.1 of this EA), which was determined to not be significant.

The analysis for S_{ACL} (Alternatives 3 and PPA 3b) is parallel to that of C_{ACL}. The S-based alternative would require a full run-reconstruction analysis to estimate annual exploitation rates, which would include estimates of S and C; therefore, there would be no advantage of one alternative over the other with respect to assessing compliance with the ACL. The results of the analysis for S_{ACL} for Alternatives 3 and PPA 3b are identical relative to the probability of failing to achieve S_{ACL}, and no significant impacts would be expected (Table 4-5).

Alternatives 2, 3, and PPA 3b for ACLs could have direct positive effects compared to the status quo Alternative because it would limit exploitation rates on SRFC to something (10 percent) less than F_{MSY}. Compared to the status quo Alternative, overfishing determinations would occur on an annual basis rather than only as the need arose (e.g., after the stock was determined to be overfished or the Sacramento Harvest Model performed poorly). As a result, management actions would be more responsive, and overfishing would end sooner, and the risk to stock productivity would decrease. However, because the expected frequency limiting fisheries to comply with the F_{ACL} is extremely low, any long-term impacts to the stocks would not be significant.

For this analysis, comparison to the status quo Alternative assumes no action in the existing SDC framework (i.e., Alternative 1 SDC, status quo). As a result of this assumption, the analysis of effects from implementing an ACL framework differs from the analysis of overfishing SDC Alternative 2 only by a matter of degree because both actions propose to use exploitation rates to limit impacts to stocks, one at F_{MSY} and one at a buffered level of F_{MSY} (F_{ABC}). Additionally, the ACL control rules proposed for KRFC are nearly identical to the current F limit in the FMP conservation objective. Assuming the more

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

conservative management framework is maintained, there would be small effects to target species associated with the proposed ACL Alternatives for KRFC.

Table 4-5. Retrospective analysis of ACL compliance for C- and S-based alternatives for SRFC and KRFC (indicator stocks for CVF and SONC Chinook complexes, respectively). Analysis assumes fisheries were managed to meet objectives in place at the time, not those associated with the alternatives.

SRFC: F_{ABC} =	0.70		Rel Freq. > ACL
Alt 2 & 3: C(t) > C_{ACL}; S(t) < S_{ACL}			51.9%
KRFC: F_{ABC} =	0.68		
Alt 2, 3, & 3b: C(t) > C_{ACL}; S(t) < S_{ACL}			4.0%
Year		1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009	

4.1.3.2 Cumulative Impacts

The ACL Alternatives are not likely to result in cumulative impacts to target species when added to other past, present, and reasonably foreseeable future actions.

4.1.4 Effects on Target Species from Accountability Measures

Most of the AMs considered are administrative in nature and do not directly impact target species. For example, AM alternatives, if triggered, require reevaluation of the ACL framework without requiring any actions that would change fishery impacts on salmon populations. Some AMs such as in-season action authority facilitate administration of fishery regulations, while others require such things as notification of status, development of assessments. One currently required action in the FMP that could be classified as an AM requires closing Council-area fisheries if a stock is projected to not meet its conservation objective, triggering an overfishing concern.

Alternative 1, status quo, would retain the conservation alert action for stocks not excepted from the provision (e.g., KRFC *de minimis* fishing provision). Based on the current salmon FMP, the conservation alert action would be required only for SRFC. The conservation alert action directly affects salmon populations south of Cape Falcon by substantively reducing harvest rates in ocean fisheries in some years. These effects would be a benefit to the target population (SRFC). The effects to other stocks would depend on their status in the year of the conservation alert. If other targets stocks are also depressed, they may benefit from the protections provided through the conservation alert. If stocks are relatively healthy and expected to exceed their S_{MSY} escapement levels, the protections would provide negligible benefits to the target stocks, but could allow for higher harvest rates in other fisheries.

Alternatives 2 and 3 would remove the required action under a conservation alert, and therefore, harvest of SRFC (and other stocks in a mixed-stock ocean fishery) could occur when SRFC are projected to fall short of their spawning escapement conservation objective. However, based on *de minimis* fishing alternatives (Sections 2.5 and 4.1.5 of this EA), by definition, any fishing impacts occurring at stock abundance that would trigger a conservation alert would have no effect on long-term productivity of the stock. Therefore, effects on target species under AM Alternatives 2 and 3 are not expected to be significant. There would be no difference in the effects on target species between Alternatives 2 and 3.

4.1.5 Effects on Target Species from *De Minimis* Fishing Alternatives

De minimis fishing provisions are intended to allow harvest at low stock abundance in exchange for reduced future production; however, by definition, *de minimis* means lacking significance or importance. Therefore, the effects on target species from the alternatives should not be significant. Any harvest strategy that reduces abundance to less than S_{MSY} will, nonetheless, increase risks of negative population

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

effects. Because SRFC and KRFC are indicator stocks for the CVF and SONC complexes, the risks associated with those stocks could potentially affect risk to the other component stocks within the complex. The potential negative effects were analyzed as follows:

- Risk of overfishing: A quantitative risk assessment was not available, so risk from the alternative *de minimis* fishing alternatives will be ranked qualitatively.
- Risk of becoming overfished: The initial criterion will be a probability greater than 50 percent of falling below MSST for any given abundance projection. Alternatives will be ranked qualitatively.
- Risk of low abundance to non-indicator stocks within complexes. Alternatives will be ranked qualitatively.

4.1.5.1 Direct Effects: Risk of Overfishing

The risk of overfishing when stock abundance is at levels that would trigger *de minimis* fishing provisions is low for all the Alternatives because the allowable exploitation rates are much lower than $F_{MSY.}$ There would be slight but negligible differences among the Alternatives.

Alternatives 1 (Status Quo), 2b, 3b, and PPA 5 for KRFC implement a harvest control rule with a lower spawning escapement objective (35,000 natural area adult spawners) compared to Alternatives 2, 3, and 4 (40,700; S_{MSY}). The higher escapement objective increases the interval between the conservation objective control rule and MFMT at moderate abundance levels and at higher abundance levels reduces the range of stock abundance subject to the F_{ABC} (ACL) limit (Figure 2-3). This decreases the probability that variation between projected and actual exploitation rates will result in F exceeding MFMT. Therefore, the risk of overfishing for KRFC would decrease under Alternatives 2, 3, and 4 relative to Status Quo Alternative 1 (and 2b, 3b, and PPA5); however, based on historical and expected exploitation rates, the likelihood of overfishing under Status Quo Alternative 1 is very low (see Section 4.1.2.1 above). Therefore, no significant effects on target species are expected from implementing any of the *de minimis* fishing Alternatives relative to the risks from overfishing.

4.1.5.2 Direct Effects: Risk of Becoming Overfished

The risk of negative impacts among the Alternatives increases as the harvest thresholds become lower. Thus, in general Alternative 3 has greater risk with a lower threshold at MSST than Alternative 2 with a threshold at the midpoint between S_{MSY} and MSST. Alternative 4 would have still greater risk, and like Alternative 5, allow exploitation at stock sizes less than MSST, which further increases the risk to long-term stock productivity.

Status Quo Alternative 1: The risk of becoming overfished is variable among stocks with different *de minimis* fishery provisions. Allowable *de minimis* exploitation rates specified in this alternative do not result in the expected long-term stock abundance falling below MSST more than 50 percent of the time for either SRFC or KRFC, but for KRFC would, at abundances levels near MSST, allow fishing mortality to reduce abundance below MSST more than 50 percent of the time. For KRFC, the risk of becoming overfished under this Alternative is the greatest among the Alternatives. Risk of becoming overfished is lowest for SRFC since the allowable exploitation rate is zero at abundance levels less than $S_{MSY.}$

Alternative 2: Allowable exploitation rates are zero at abundance levels greater than the MSST. *De minimis* fishing, as described for Alternative 2, would result in a spawner abundance being higher than the MSST more than 50 percent of the time, assuming unbiased assessments and abundance greater than the MSST in the absence of fishing. The risk of becoming overfished ranks second lowest for SRFC and lowest for KRFC among the Alternatives.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Alternative 2b: Lowering the annual spawning escapement objective for KRFC from 40,700 to 35,000 natural area adult spawners reduces the interval between the annual management objective and MSST. This increases the probability that variation between projected and actual spawning escapement will result in S, or a multi-year mean of S, falling below MSST and the stock being declared overfished. The risk of becoming overfished would increase for KRFC relative to Alternative 2.

Alternative 3: At low stock abundance (i.e., at abundance levels resulting in exploitation rates in the range of $0 < F < 0.25$), the allowable exploitation rate is specified at a level resulting in an expected spawner abundance greater than or equal to the MSST. For years in which abundance is low, and fishery regulations result in an expected spawner escapement equal to the MSST, the realized spawner escapement would be expected to be at the MSST with a probability of 50 percent, assuming assessments are unbiased and abundance is greater than the MSST in the absence of fishing. The risk of becoming overfished ranks third lowest for SRFC and second lowest for KRFC among the Alternatives.

Alternative 3b: Same comments as Alternative 2b; the risk of becoming overfished would increase for KRFC relative to Alternative 3.

Alternative 4: At abundance levels resulting in exploitation rates in the range of $0 < F < 0.25$, the allowable exploitation rate is specified at a level resulting in an expected spawner escapement greater than or equal to 0.5*MSST. For years in which abundance is low, and fisheries regulations result in an expected spawner abundance between MSST and 0.5*MSST, the realized spawner abundance would be expected to be below the MSST with a probability greater than 50 percent, assuming assessments are unbiased. The risk of becoming overfished ranks fourth lowest for SRFC and third lowest for KRFC among the Alternatives.

PPA Alternative 5: At stock abundance where the allowable *de minimis* rate is $F \leq 0.25$, the allowable exploitation rate is specified at a level resulting in an expected spawner abundance greater than MSST. At lower abundance levels where $F < 0.25$, and fishery regulations result in an expected spawner abundance less than or equal to the MSST, the expected spawner abundance could be below the MSST with a probability of 50 percent, assuming assessments are unbiased and abundance is greater than the MSST in the absence of fishing.

Alternatives that allow exploitation at *de minimis* rates ($F \leq 0.25$) would have no significant direct effects on the target stocks. In addition to the analysis in this EA, this conclusion is supported by the analysis in Amendment 15 (PFMC and NMFS 2007).

4.1.5.3 Indirect Effects on CVF Complex Stocks

De minimis fishing Alternatives 2, 3, 4, and 5 for SRFC depicted in Figure 4-2 assume that S_{MSY} = 122,000 and MSST = 0.5*S_{MSY} for SRFC. Alternatives 2, 3, 4, and 5 allow for some level of fishing when abundance is lower than S_{MSY}. Alternative 2 would allow *de minimis* fishing down to spawner abundance levels observed in prior years for SRFC. Alternative 3 would allow *de minimis* fisheries resulting in an expected spawner level lower than all observed escapement estimates for SRFC, with the exception of 2009. Only Alternatives 4 and 5 would allow *de minimis* fishing at spawner abundance levels not yet observed for SRFC.

The productivity of the SRFC stock is likely sufficient for some level of *de minimis* fisheries. While a SRFC-specific spawner-recruit analysis has not been performed, estimates of the Ricker α parameter (a measure of stock productivity in terms of recruits per spawner at low spawner abundance) for other Chinook stocks suggest high productivity at low stock sizes (Appendix C). Furthermore, the *de minimis* fishing rate of 0.25, developed for KRFC in Amendment 15, is likely to be appropriate for SRFC. The estimate of F_{MSY} for KRFC of 0.72 is lower than the proxy F_{MSY} level of 0.78 used for SRFC, which suggests similar levels of productivity at low stock sizes for these two stocks.

Available evidence suggests that SRFC are heavily subsidized by hatchery production (Barnett-Johnson et al. 2007). Hatchery stocks can be highly productive and are generally able to support very high exploitation rates. A key concern for this stock is whether *de minimis* fisheries would allow for adequate escapement to meet hatchery egg take goals. The minimum aggregate number of hatchery spawners necessary to meet egg take goals at the three Basin hatcheries is estimated to be 22,000 adults (PFMC 2011d). Using the 2006-2010 average proportion of adult SRFC escapement to hatcheries (mean ratio of hatchery SRFC escapement to total SRFC escapement = 0.31), and the hatchery escapement goal of 22,000, a total SRFC escapement of approximately 71,000 adults would be needed to achieve Basin egg take goals. Only Alternatives 1 and 2 specify an exploitation rate of zero at spawner levels greater than 71,000 (assuming S_{MSY} = 122,000 and MSST = 0.5*S_{MSY}). However, it should be noted that in 2009, when SRFC escapement was the lowest on record, and hatchery escapement was approximately 17,500 adults, egg take goals were met at each of the Basin hatcheries (PFMC 2011a).

Concerns also exist over other Central Valley Chinook stocks with spawner abundance that co-varies with SRFC. In particular, San Joaquin River fall Chinook (SJFC) have consistently exhibited spawner abundances of 10 percent or less than SRFC over the past 20 years (mean ratio of SJFC to SRFC = 0.04 between 1990 and 2009; PFMC 2011a). If SRFC spawner levels are allowed to be fished to low levels as a result of *de minimis* fisheries, the abundance of San Joaquin fall Chinook could be reduced to extremely low levels. For example, Alternative 4 (and potentially Alternative 5) *de minimis* provisions allow fishing down to a SRFC spawner abundance level of 30,500, which would result in an expected SJFC abundance of 30,500 × 0.04 = 1,220 spawners, given the average ratio of SJFC to SRFC over the last 20 years. While this is a low abundance of SJFC spawners, escapement levels below 1,220 have been observed in previous years, and egg take have been supplemented through transfer from other Central Valley hatchery facilities.

The indirect effects on hatchery egg take from the *de minimis* fishing Alternatives are not significant because of the ability to mitigate shortfalls through in-basin transfers.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

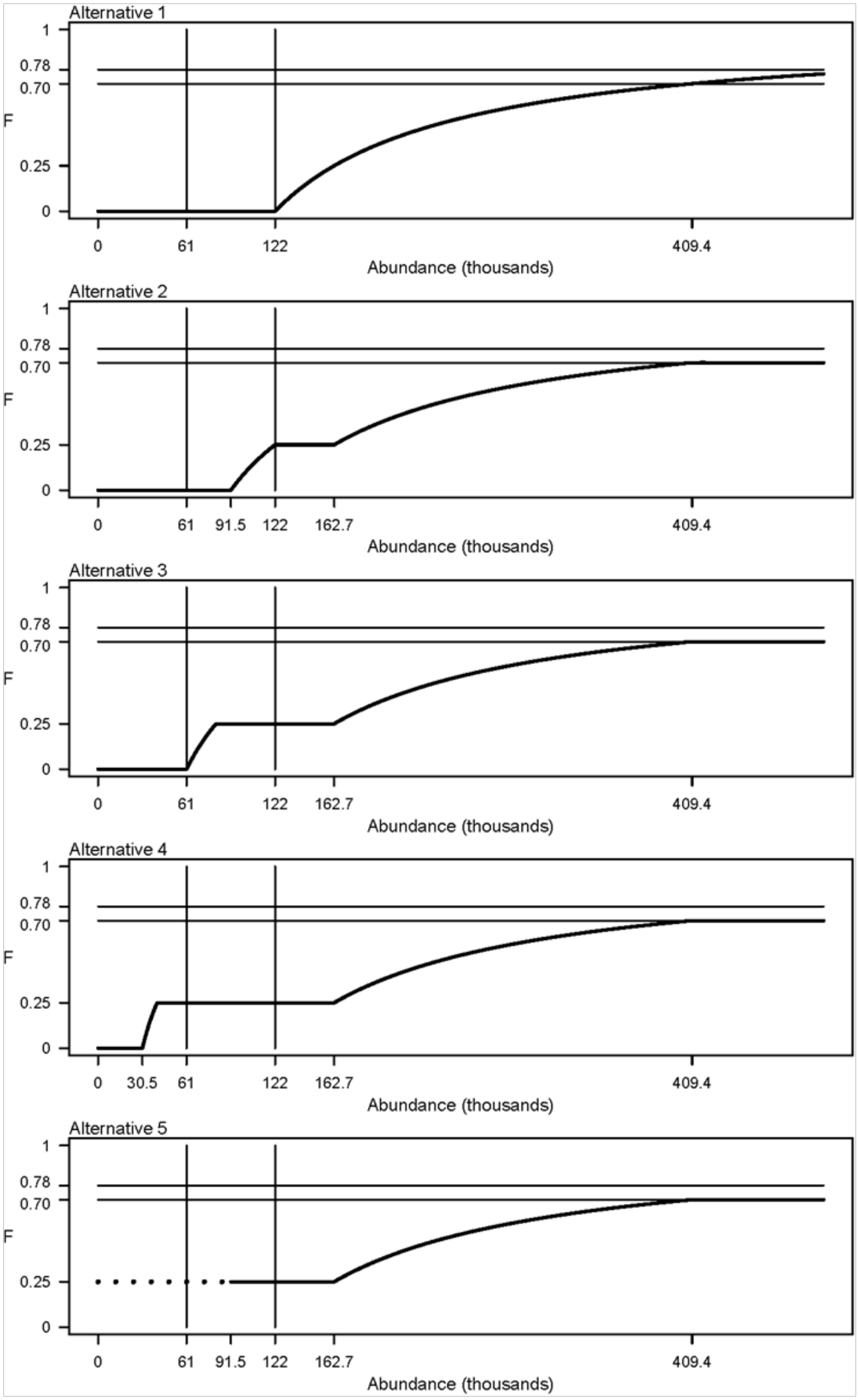


Figure 4-2. *De minimis* fishing Alternatives for Sacramento River fall Chinook.

4.1.5.4 Indirect Effects on SONC Complex Stocks

Amendment 15 to the salmon FMP established *de minimis* fishing provisions for KRFC (FR 73-9960). The top panel of Figure 4-3 displays the current KRFC F-based control rule including the Amendment 15 *de minimis* fishing provisions. For abundance less than 30,000, the allowable exploitation rate of 0.25 is denoted by a dotted line. The dotted line in this figure is meant to portray the exploitation rate as a maximum rate. Amendment 15 states that if the projected natural-area escapement associated with a 10 percent age-4 ocean exploitation rate (0.25 total exploitation rate, approximately) is less than 22,000, the Council should further reduce the allowable exploitation rate. NMFS[54] interprets this as requiring the exploitation rate to decline from 0.25 as abundance declines below approximately 30,000. The exact nature of how F should be reduced as abundance decreases below 30,000 is not articulated.

Alternatives 2, 3, 4, and 5, displayed graphically in Figure 4-3 share many of the attributes of the Status Quo Alternative 1 F-based control rule with some exceptions. First, for the status quo control rule, the exploitation rate is capped at a maximum level of 0.67. For Alternatives 2, 3, 4, and 5 the maximum allowable exploitation rate is capped at the F_{ABC} level of 0.68. Second, for exploitation rates between the maximum rate and the 0.25 *de minimis* rate, the status quo Alternative 1 and Alternative 5 (and 2b and 3b) specify an exploitation rate that would result in 35,000 natural-area adult spawners. For Alternatives 2, 3, and 4, exploitation rates in this range are specified to result in S_{MSY} = 40,700 natural area adult spawners. Finally, Alternatives 1 and 5 do not specify how exploitation rates will decrease as abundance declines. Alternatives 2, 3, and 4 (and 2b and 3b) prescribe target exploitation rates as a function of potential spawner abundance, as described in Section 2.5.1.

In Amendment 15, a focal concern was the risk level associated with KRFC substocks crossing abundance thresholds considered crucial for genetic integrity. Analysis in the Amendment 15 EA identified a natural area adult spawner abundance of 22,000 as a benchmark that would help provide assurance that the long-term productivity of KRFC would not be jeopardized. In part this benchmark was developed based on the aggregate number of KRFC spawners necessary to reduce the probability that spawning abundance in the Salmon, Scott, and Shasta Rivers would not drop below the genetic threshold of 720 adults in each tributary.

Alternatives 2 and 2b specify an exploitation rate of zero at a spawner level greater than 22,000. Alternatives 3 and 3b specify that exploitation rate will be zero at a level slightly lower than 22,000 spawners. Finally, Alternative 4 specifies F > 0 for abundance levels greater than approximately 10,000. Alternatives 1 and 5 do not specify a zero exploitation rate spawner level. Under low abundance conditions, Alternatives 1, 4, and 5 allow fishing that could reduce spawner abundance to levels never before observed for KRFC, and well below escapement levels deemed necessary for the genetic integrity of key substocks. The indirect effects from Alternatives 1, 4, and 5 on Klamath Basin Chinook subpopulations could be significant. The indirect effects from Alternatives 2, 2b, 3, and 3b are unlikely to be significant.

[54] NMFS NWR letter to PFMC, March 22, 2007

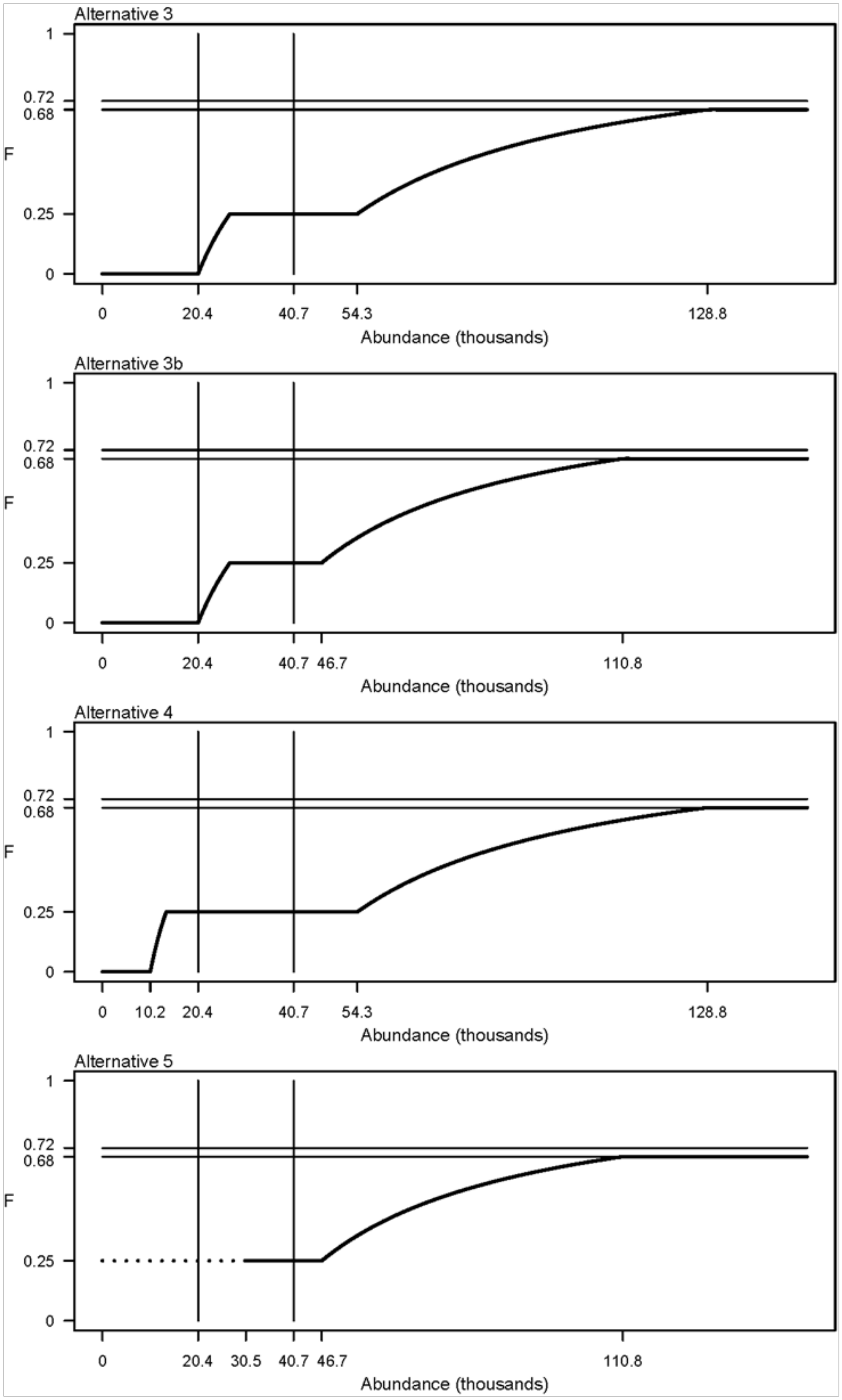


Figure 4-3. *De minimis* fishing Alternatives for Klamath River fall Chinook.

4.1.5.5 Cumulative Effects

The selection of MSST as a percentage of S_{MSY} will affect the relative risk associated with the Alternatives. For example, SDC Overfished Alternatives 3, 3b, and 3c result in different lower threshold levels for *de minimis* Alternatives 2, 3, and 4. The risks assessment for the *de minimis* Alternatives assumed the PPA of $MSST=0.5*S_{MSY}$, which would reflect the greatest risk. Therefore, selection of other SDC Alternatives would reduce the overall risks of the *de minimis* Alternatives, although the relative risks among alternatives would remain similar.

4.1.6 Effects on Non-Target Species

The current implementation of the status quo salmon management framework was found to have no significant impact on non-target fish species (PFMC 2011c). The Alternatives considered in this EA are not expected to result in substantial changes to ocean salmon fisheries 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 would change. Therefore, the Alternatives considered in this EA are not expected to have significant impacts, or significantly different impacts from the status quo alternative, on non-target species such as groundfish, Pacific halibut, highly migratory species, and coastal pelagic species, and there are no discernable differences between the effects of the Alternatives on these resources.

4.1.7 Effects on ESA-listed Chinook and Coho Stocks

The current implementation of the status quo salmon management framework was found to have no significant impact on ESA-listed salmon stocks (PFMC 2011c). Chinook and coho salmon stocks listed under the ESA that are currently in the fishery would remain in the fishery under all Alternatives considered in this EA. Furthermore, all management of ESA-listed stocks would continue to be deferred to ESA consultation standards or recovery plans, and new measures such as ACLs are not proposed. Therefore, the Alternatives considered in this EA are not expected to have significant impacts, or significantly different impacts from the status quo Alternative, on ESA-listed Chinook or coho salmon stocks, and there are no discernable differences between the effects of the Alternatives on these resources.

4.1.8 Effects on Hatchery Produced Salmon Stocks

Hatchery-produced salmon stocks and those listed under the ESA that are currently in the fishery would remain in the fishery under all Alternatives considered in this EA. Additional management constraints such as ACL are neither proposed nor necessary; therefore, the Alternatives considered in this EA are not expected to have significantly different impacts from the status quo Alternative on hatchery-produced or ESA-listed salmon stocks, and there are no discernable differences between the effects of the Alternatives on these resources.

4.2 Analysis of Environmental Impacts on Protected Resources

4.2.1 Direct and Indirect Effects

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 (75 FR 68468). 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. ESA-listed Steller sea lion interaction with the Pacific Coast salmon fisheries is rare and NMFS has determined mortality and serious injury incidental to commercial salmon troll fishing operations have a negligible effect on this species (NMFS 2003; Appendix B). Available information indicates that Pacific Coast salmon fisheries are not likely to jeopardize the existence of the Guadalupe fur seal.

The Alternatives considered in this EA are not expected to result in substantial changes to ocean salmon fisheries in terms of season length, areas, depth, bag limits, etc. Nor is there any new information to suggest that the nature of interactions between pinnipeds in ocean salmon fisheries has changed. Therefore, the impacts from the Alternatives to non-ESA-listed marine mammals are not expected to be significant, and there is no discernable difference between the effects of the Alternatives on these resources.

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.

The NMFS BO on Southern Resident killer whale Distinct Population Segment (NMFS 2008; Appendix B) concluded that ocean salmon fisheries were not likely to jeopardize the continued existence of the Southern Resident killer whales or adversely modify their critical habitat. NMFS has initiated a five-year review of the Southern Resident killer whale ESA listing. There is new information that indicates Chinook abundance in Puget Sound may correlate with killer whale population growth rate, and while this information is under review, it is possible that future consultation standards for Puget Sound and possibly Council-area fisheries will change as a result of this new information. The Alternatives considered in this EA would have no direct or indirect effects on management or abundance of Puget Sound Chinook as those stocks are ESA-listed (see Section 4.1.7 above), and other U.S. Chinook stocks are a minor component of total Puget Sound Chinook abundance; therefore it is unlikely that the Alternatives would have any significant impacts to Southern Resident killer whales.

Other ESA-listed salmonid species present in Council-area waters include sockeye and chum salmon, and steelhead trout. These species are rarely encountered in ocean salmon fisheries, and the Alternatives analyzed in this EA are not expected to result in changes to those encounter rates. 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 discernable difference between the effects of the Alternatives on these resources.

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 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 (NMFS 2003; Appendix B). Therefore, there are no significant impacts expected on seabirds from the Alternatives analyzed in this EA, and there is no discernable difference between the effects of the Alternatives on these resources.

4.2.2 Cumulative Effects

The Alternatives analyzed in this EA are not likely to result in cumulative impacts to protected resources when added to other past, present, and reasonably foreseeable future actions.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

4.3 *Analysis of Environmental Impacts on Habitat, Biodiversity, and Ecosystem Function*

4.3.1 Direct and Indirect Effects

Salmon fisheries potentially affect ecosystem function by the reduction of predators on lower trophic levels, reduction of prey available to higher trophic levels, and reduction of nutrients delivered to freshwater and terrestrial ecosystems from salmon carcasses. 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. Effects from the Alternatives on higher trophic level predators such as sea lions and killer whales are not likely to be significant (see section 4.2.1 above). Effects from the Alternatives on nutrient transport are not likely to differ significantly from historical levels as only minor modifications to control rules are being considered.

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 EFH for salmon or other managed species (PFMC 2006; Appendix B). 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, and significant impacts are not anticipated.

Classification Alternative 3 proposes classifying mid-Columbia spring and Columbia upper river fall Chinook, Puget Sound pink salmon as ECs, and Alternative 2 proposes omitting mid-Columbia spring Chinook and Puget Sound pink salmon from the FMP. EFH is currently designated for these stocks; however, stocks that are not in the fishery may not have EFH designations. Designation of EFH, in accordance with Section 303(a)(7) of the Magnuson-Stevens Act, does not in and of itself have any direct environmental or socioeconomic impacts. However, EFH designation could result in indirect environmental and/or socioeconomic impacts.

Whether EFH protections for mid-Columbia spring and Columbia upper river fall Chinook are lost or diminished depends on the basin-specific circumstances. There are three potential scenarios:

1. In sub-basins where these Chinook salmon co-occur with other Chinook or ESA-listed Chinook salmon, EFH designations would remain intact and there would be no change in the EFH consultation requirements or the species covered by these consultations;
2. In sub-basins where these Chinook salmon co-occur with coho salmon, but not other Chinook salmon, EFH designations would remain intact, consultation requirements will remain in effect, but NMFS conservation recommendations would apply only to coho salmon;
3. In sub-basins where these Chinook salmon are the only salmon with currently described EFH, EFH descriptions would be removed and EFH consultations would no longer occur.

Most EFH areas are described as such for both coho and Chinook; however, there are a few that are only described as Chinook EFH. These areas are limited to mid-Columbia River spring Chinook. If the stocks that occupy such areas are not classified as in the fishery, the EFH description could be revoked. Specific basins affected would be the Walla Walla, Umatilla, Upper Deschutes, Lower Crooked, Upper and Lower John Day, and North Fork and Middle Fork John Day rivers.

Another consideration in this matter is the range overlap of ESA-listed steelhead and the conservation benefits of ESA Section 7 consultations. Except for the lower Crooked River and Upper Deschutes where experimental reintroduction efforts are underway, all of the affected mid-Columbia sub-basins are also occupied by ESA-listed steelhead, and most have critical habitat designated. The ranges of steelhead and Chinook salmon overlap, but are not completely coincident. Federal actions in these areas are subject to the consultation requirements of ESA Section 7 which, like the MSA EFH provisions, are also designed to protect habitat. As with the EFH consultations for coho salmon, some incidental protection for Chinook salmon habitats from ESA consultations on steelhead would be expected, but the conservation measures would not target Chinook habitats or life stages. As a result, some erosion of regulatory capabilities to protect Chinook salmon habitat in these sub-basins would be expected with the loss of EFH descriptions.

If the Puget Sound pink stock is designated as an EC or removed from the fishery, the associated EFH description would no longer apply. However, EFH for Puget Sound Chinook and coho would remain, which includes all of the sub-basins occupied by Puget Sound pinks. Conservation recommendations for EFH would no longer consider the specific needs of pink salmon, but would be diminished only to the degree that the habitat needs and associated conservations for Chinook and coho salmon differ. Since Puget Sound Chinook salmon are also ESA-listed, habitat protections are also provided through ESA Section 7 consultations related to critical habitat.

Indirect impacts to target species from Classification Alternatives that would result in no longer designating EFH for mid-Columbia spring and Columbia upper river fall Chinook, and Puget Sound pink salmon would be negligible because of overlap with other EFH designations and critical habitat designations. Only two basins would be left without either EFH or Critical habitat designations, and both of these areas have no current Chinook distribution. Therefore, the effects on salmon EFH from classification Alternatives 2 and 3 would not be significant.

4.3.2 Cumulative Effects

The Alternatives analyzed in this EA are not likely to result in cumulative impacts to habitat, biodiversity, or ecosystem function when added to other past, present, and reasonably foreseeable future actions.

4.4 Analysis of Economic Impacts

4.4.1 Stock classification

Stock classification alternatives do not have significant impact on the affected biological environment, and therefore, there are also no economic impacts..

4.4.2 Status determination criteria – overfishing

From the analysis of SDC alternatives, the overall economic impact is also negligible. A retrospective analysis of overfishing occurrences to determine the relative frequency of years that stocks would have been designated as subjected to <u>overfishing</u> under the alternatives proposed suggests that most stocks experienced exploitation rates exceeding F_{MSY} (Alternative 2 overfishing SDC) frequently prior to the mid-early 1990's, as documented in this draft EA. Since that time, no overfishing events have been (Table 4.1). The assessment of effects on the biological environment assumes that management under the overfishing SDC Alternative 2 (Alternatives 3 to 5 are identical to Alternative 2) would have similar frequencies of overfishing determinations as those observed since the late-1990s. It is expected that overfishing would be determined less frequently or rarely under Alternative 2, compared to the status quo. Alternative 2 for overfishing SDC should have direct positive effects on the biological environment, given the SDC are more objective than the status quo alternative and the criteria are assessed on an annual basis rather than only after the stock is determined to be overfished. As a result, management actions would be more responsive to end overfishing sooner (i.e., each year versus after three consecutive years when the stock hasn't met its escapement goal). A quantified assessment of the net change in the harvest

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

due to the new management plan is not available. However, the corresponding economic effect of Alternative 2 for the overfishing SDC should have long-term positive economic effects because the SDC will help to ensure the stock is exploited at levels less than F_{MSY} and sustainable harvest would prevail with minimal harvest uncertainties because of less frequent overfishing conditions. Short-term economic effects could be negative, resulting in the reduction of consumer surplus if exploitation or harvest rates and access to production in excess of spawning escapement goals are constrained, but such constraints have not occurred since the mid-1990's.

4.4.3 Status Determination Criteria – Overfished

With respect to the socio-economic environment, the primary direct effect of an overfished determination is that it may result in market-driven forces that reduce exvessel value in the fishery, as occurred with the 2010 SRFC overfished designation which caused the Monterey Bay Aquarium Seafood Watch program to change its rating of California and Oregon commercially caught Chinook salmon from "Good Alternative" to "Avoid."

To evaluate the effects of the overfished SDC alternatives, annual spawning escapements for selected Chinook and coho stocks were analyzed against the SDC retrospectively from 1970 or later depending on the stock to 2009 to determine the relative frequency of years that each stock would have been designated as overfished. The results indicate that for most stocks, overfished status would have occurred periodically, and that the stocks would have remained depressed for a few years (duration of stock depression was generally 3 to 6 years) before rebuilding. Although the pattern was not observed in all stocks, it was prevalent enough to suggest that cyclical, broad-scale changes in environmental conditions (e.g., shifts in ocean productivity regimes or extended droughts) likely underlie these periods of stock depression. In terms of the relative frequency of overfished determinations, the status quo (Alternative 1) was most similar to a 3-year arithmetic mean < $0.75*S_{MSY}$ (Alternative 4b). Ranking the alternatives by the relative frequency of overfished determinations indicates that SDC Alt. 4 < Alt. 3 < Alt. 2 < Alt. 1 and then alternatives 4b , 3b and 2b, suggesting Alternative 4 had the lowest frequency of overfished determinations, and Alternative 2b with the highest frequency of overfished determinations (Section 4.2.2). Correspondingly, Alternative 4 would have the fewest negative effects on the economic environment, but could pose the greatest risk of negative effects to the biological environment.

Alternative 2b would have the greatest negative effects on the economic environment, but the least risk to the biological environment. Alternative 2b would incur higher administrative cost to rebuild from the overfished conditions, resulting in the lower producer/consumer surpluses and thereby a negative economic impact until the stock(s) is rebuilt. The primary direct economic effect of an overfished determination is that it may result in reduction in exvessel value in the fishery, also due to reduction in consumer demand for the overfished stocks. The depression in price resulting from the reduction in consumer demand (for reasons like consumers' reluctance to consume overfished stocks as a result of increased consumer consciousness and environmental concerns) would reduce the producer surplus. But, the indirect economic effect would result in higher consumer and producer surpluses from the higher harvest levels due to more abundant stocks in the long run. However, the indirect biological effects potentially include reduced long-term reproductive potential of the stock, foregone opportunity to harvest more abundant stocks due to the additional fishery controls enacted because of the overfished stock, and potential listing of the stock under the ESA if abundance declined to such low levels warranting ESA listing.

For example, in 2010 fisheries off California were highly constrained and the community and personal impact of the commercial troll salmon fishery south of Horse Mountain was reduced to $1.98 million, a 91% decline compared to the 2001-2007 average ($21.36 million) (Table 3.24). The landings of Chinook

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

in the commercial ocean troll salmon fishery south of Point Arena in 2010 (36,000 lbs.; 2,500 Chinook) were substantially less than in 2007 (1,053,000 lbs.; 89,300 Chinook) and much less than the 2001-2007 average (2,732,000 lbs.; 217,600 Chinook) (Tables 3-18, 3-19).

4.4.4 Status Determination Criteria – Approaching Overfished

The effects from the approaching overfished SDC alternatives would be similar to the overfished SDC alternatives for expected frequency and relative differences between the alternatives (Table 4-12). Constraining fisheries to prevent a stock from becoming overfished would have positive biological effects as a result of reduced harvest on weak stocks, a less prolonged overfished condition, and the stock rebuilding quicker in the long-term; however, negative economic effects could occur in the short-term from reduced harvest of healthy stocks. The magnitude of economic effects would be similar to that of an overfished determination, but likely short lived. This is because an approaching overfished determination normally ends after one year with either the stock becoming overfished or rebounding.

4.4.5 Status Determination Criteria – Rebuilt

For the rebuilt SDC alternatives, the status quo annual spawning escapements for selected Chinook and coho stocks were evaluated against the SDC alternatives retrospectively from 1970 or later depending on the stock through 2009, to determine the year in which rebuilding would have been achieved, given the corresponding overfished SDC (Tables 4-2, 4-3, and 4-4). The results presented show that rebuilt status would be achieved at about the same time for all alternatives, usually the year following the overfished status determination, and almost always within three years, indicating the relatively high productivity and resilience of salmon populations (Table 4-12). The status quo alternative showed rebuilding occurring the year after the overfished status ended. The other single year SDC alternatives (Alternative 2 and 2b) would usually be rebuilt the year after the overfished status ended, but not always. The multi-year rebuilt alternatives (Alternatives 3 and 4) rely on achieving a 3-year geometric or arithmetic mean and would most often be rebuilt two years after the overfished status ended, but could be up to four or five years. Biological impacts from the 3-year mean alternatives would have more beneficial effects than the single year alternatives, as the longer rebuilding period could reduce allowable exploitation rates and also increase the genetic diversity of the rebuilt population. However, the economic impacts from the 3-year geometric mean alternatives would be the reverse of the biological impacts, since a longer rebuilding period may reduce allowable harvest and exvessel revenue. The economic effect of the multiple year rebuilt criterion as compared to single year rebuilt criterion could be lower (i.e., lower consumer and producer surpluses due to lower harvests and higher prices) until the stock is rebuilt. However, the effects are similar for the single year SDC rebuilt alternatives, compared to the status quo.

4.4.6 ACL Alternatives

For the ACL alternatives, annual exploitation rates for SRFC and KRFC were evaluated retrospectively to determine the relative frequency of years that catch of each stock would have been out of compliance with the ACL. Comparing historical catch to C_{ACL} (Alternative 2), it appears that SRFC experienced excessive exploitation rates frequently prior to the early to mid 1990s. However, catch exceeding C_{ACL} was observed only once for SRFC in 2004 and did not occur in recent years for KRFC (Table 4.5). Assuming future frequency of exceeding ACLs would be similar to those since the mid-1990s (i.e., rare occurrences), the long term economic impacts of the Alternatives 2 and 3 for ACLs would be positive because the ACL framework would help ensure the stock is exploited at levels that do not exceed F_{MSY}, thereby contributing to a sustainable fishery (Table 4-12). Short-term economic effects may be negative if exploitation rates are constrained and access to production in excess of spawning escapement goals or access to other stocks is constrained. The welfare effect (producer and consumer surpluses) of the ACL alternatives would be positive in the long run, but may decline in the short run due to harvest constraints.

With respect to the socioeconomic environment, Alternatives 2 and 3 for ACLs should have long-term positive effects because the ACL framework would help ensure the stock is exploited at levels that do not exceed F_{MSY}. Short-term effects will be negative, but only to the extent that fisheries have to be constrained to avoid exceeding the ACL and access to production in excess of spawning escapement goals or access to other stocks is constrained. However, because the expected frequency of such limitations is low (Section 4.1.3.1), the long term effects are also not expected to be significant. For KRFC, Alternatives 2 and 3 may have a short-term negative effect because these alternatives specify a spawner escapement goal of S_{MSY} = 40,700, as opposed to the status quo which specifies a spawner escapement goal of 35,000. When translated into an F-based control rule, this change results in a lower allowable exploitation rate for abundance levels between 46,700 and 122,000. However, over the long-term, achieving S_{MSY} escapement should increase production and help achieve optimum yield for the stock and the fishery as whole.

4.4.7 *De Minimis* Provisions

With respect to the economic effect of *de minimis* alternative provisions for SRFC, all of the alternatives Alternative 1 should provide short-term positive effects relative to the Status Quo because complete fishery closures owing to low abundance of SRFC should become less frequent (Table 4-12). However, these Alternatives may have long term negative effects because SRFC could become overfished more frequently, which could lead to more restrictions on future fisheries. For KRFC, Alternatives 2, and 3 may have a short-term negative effect on harvest because these alternatives specify a spawner escapement goal of S_{MSY} = 40,700, as opposed to the status quo spawner escapement floor of 35,000 that is also used in alternatives 2b and 3b. This change results in a lower allowable exploitation rate for potential spawner abundances between 46,700 and 122,000, as explained in this draft EA. However, as described in the preceding section, managing for an S_{MSY} of 40,700 compared to 35,000 should increase production over the long term.

Evaluation of the proposed Amendment 16 alternatives were made by comparing the present values of the streams of annual vessel exvessel values from 2002 to 2010. The present values are compared across alternatives by MSST convention and geographic strata (Table 4-6). In Table 4-7, the percentage changes in present values relative to the status quo are summarized for all the proposed Amendment 16 Alternatives. The percentage changes in the present values of commercial Chinook value relative to status quo were generated for the comparison of changes as a result of different Amendment 16 Alternatives. Compared to the status quo (Alternative 1) and other alternatives, the preliminary preferred alternative (PPA) in general yielded the highest present values or highest percentage changes relative to status quo for all MSST conventions and geographic strata.

Table 4-6. Present Value of Exvessel Sales (Nominal) of Commercial Fishery Chinook Catch (September t-1 through August t) Under Different Alternatives by MSST Convention and Geographic Strata.

MSST = 0.50 * Smsy	Alt 1 (Status Quo)	Alt 2	Alt 2b	Alt 3	Alt 3b	Alt 4	Alt PPA
Falcon-Hum	$25,701,757	$26,365,173	$26,927,931	$26,365,173	$26,927,931	$27,507,660	**$28,070,417**
Hum-Horse	2,610,338	2,736,699	2,736,699	2,736,699	2,736,699	**2,763,151**	**2,763,151**
Horse-Arena	11,097,323	11,425,812	11,973,774	11,425,812	11,973,774	11,425,812	**11,973,774**
So. Arena	**30,189,050**	30,352,038	**30,381,971**	30,352,038	**30,381,971**	30,352,038	**30,381,971**
MSST = 0.75 * Smsy							
Falcon-Hum	25,701,757	24,674,844	25,237,602	26,365,173	26,927,931	27,507,660	**28,070,417**
Hum-Horse	2,610,338	2,610,338	2,610,338	2,736,699	2,736,699	**2,763,151**	**2,763,151**
Horse-Arena	11,097,323	10,270,089	10,818,051	11,425,812	11,973,774	11,425,812	**11,973,774**
So. Arena	30,189,050	29,980,361	30,010,294	30,352,038	30,381,971	30,352,038	**30,381,971**
MSST = 0.86 * Smsy							
Falcon-Hum	**25,577,437**	23,304,261	23,867,019	24,351,608	24,914,366	25,014,680	**25,577,437**
Hum-Horse	**2,120,044**	**2,120,044**	**2,120,044**	**2,120,044**	**2,120,044**	**2,120,044**	**2,120,044**
Horse-Arena	**11,087,110**	10,259,875	10,807,838	10,259,875	10,807,838	10,539,148	**11,087,110**
So. Arena	**30,056,280**	28,512,451	28,542,384	30,168,063	30,197,996	30,026,347	**30,056,280**

Note: 1) Discount factor of i=7% was used in computing PVs;
2) The alternatives that have the highest PVs are highlighted in bold.

Table 4-7. Percent Changes in Present Value of Ocean Commercial Sales for the i[th] Alternative Relative to Status Quo Alternative.

MSST=0.50*Smsy		Alt 2	Alt 2b	Alt 3	Alt 3b	Alt 4	Alt PPA
	Falcon-Hum	2.58%	4.77%	2.58%	5%	7.03%	9.22%
	Hum-Horse	4.84%	4.84%	4.84%	5%	5.85%	5.85%
	Horse-Arena	2.96%	7.90%	2.96%	8%	2.96%	7.90%
	So. Arena	0.54%	0.64%	0.54%	1%	0.54%	0.64%
MSST = 0.75 * Smsy							
	Falcon-Hum	-4.00%	-1.81%	2.58%	5%	7.03%	9.22%
	Hum-Horse	0.00%	0.00%	4.84%	5%	5.85%	5.85%
	Horse-Arena	-7.45%	-2.52%	2.96%	8%	2.96%	7.90%
	So. Arena	-0.69%	-0.59%	0.54%	1%	0.54%	0.64%
MSST = 0.86 * Smsy							
	Falcon-Hum	-8.89%	-6.69%	-4.79%	-3%	-2.20%	0.00%
	Hum-Horse	0.00%	0.00%	0.00%	0%	0.00%	0.00%
	Horse-Arena	-7.46%	-2.52%	-7.46%	-3%	-4.94%	0.00%
	So. Arena	-5.14%	-5.04%	0.37%	0%	-0.10%	0.00%

The present values of the annual income impacts are compared across alternatives by MSST specification and geographic strata (Table 4-8). Compared to the status quo (Alternative 1) and other alternatives, the preliminary preferred alternative (PPA) in general yielded the highest present values of income impacts in real terms for all MSST convention and geographic strata except for the MSST (0.86*Smsy) in South

Arena where Alternative 3b is better than the rest other alternatives.

Table 4-8. Present Value of Income Impacts (Real) from Ocean Commercial Chinook Catch (Sept t-1 through August t) for Amendment 16 Alternatives during 2002 to 2010.

	Alt 1 (Status Quo)	Alt 2	Alt 2b	Alt 3	Alt 3b	Alt 4	Alt PPA
MSST = 0.50 * Smsy							
Falcon-Hum	$53,307,400	$54,645,424	$55,707,131	$54,645,424	$55,707,131	$56,595,472	**$57,657,178**
Hum-Horse	6,105,532	6,352,831	6,352,831	6,352,831	6,352,831	**6,397,981**	**6,397,981**
Horse-Arena	25,833,267	26,295,581	**27,548,559**	26,295,581	**27,548,559**	26,295,581	**27,548,559**
So. Arena	72,639,618	72,948,737	**73,017,182**	72,948,737	**73,017,182**	72,948,737	**73,017,182**
MSST = 0.75 * Smsy							
Falcon-Hum	53,307,400	51,396,680	52,458,386	54,645,424	55,707,131	56,595,472	**57,657,178**
Hum-Horse	6,105,532	6,105,532	6,105,532	6,352,831	6,352,831	**6,397,981**	**6,397,981**
Horse-Arena	25,833,267	23,948,677	25,201,655	26,295,581	**27,548,559**	26,295,581	**27,548,559**
So. Arena	72,639,618	72,166,894	72,235,339	72,948,737	**73,017,182**	72,948,737	**73,017,182**
MSST = 0.86 * Smsy							
Falcon-Hum	53,092,210	48,778,388	49,840,094	50,769,768	51,831,474	52,030,503	**53,092,210**
Hum-Horse	**5,266,743**	**5,266,743**	**5,266,743**	**5,266,743**	**5,266,743**	**5,266,743**	**5,266,743**
Horse-Arena	25,815,835	23,931,245	25,184,223	23,931,245	25,184,223	24,562,857	**25,815,835**
So. Arena	72,413,000	68,920,678	68,989,123	72,665,065	**72,733,511**	72,344,555	72,413,000

Note: 1) Discount factor of r=4% was used in computing PVs;
2) The alternatives that have the highest PVs are highlighted in bold.

Recreational trips during 2002-2010 were transformed into the income impacts (real) that these trips potentially could have made assuming that the Amendment 16 alternatives were there since 2002. Compared to the status quo (Alternative 1) and other alternatives, the preliminary preferred alternative (PPA) in general yielded the highest present values for all MSST convention and geographic strata (Table 4-9).

Table 4-9. Present Value of Income Impacts (Real) from Ocean Recreational Trips for Amendment 16 Alternatives during 2002 to 2010.

MSST = 0.50 * Smsy	Alt 1 (Status Quo)	Alt 2	Alt 2b	Alt 3	Alt 3b	Alt 4	Alt PPA
Falcon-Hum	$30,712,094	$26,641,634	$27,609,553	$27,762,783	$27,762,783	**$30,586,445**	**$30,586,445**
Hum-Horse	26,549,436	24,234,866	27,201,619	26,187,550	26,934,171	28,643,318	**29,389,939**
Horse-Arena	12,069,334	10,564,250	11,757,876	13,132,805	13,132,805	14,591,887	**14,591,887**
So. Arena	61,065,099	48,848,220	56,725,977	64,971,855	64,971,855	70,029,483	**70,029,483**
MSST = 0.75 * Smsy							
Falcon-Hum	**30,712,094**	26,750,142	27,735,203	27,609,553	27,609,553	30,586,445	30,586,445
Hum-Horse	26,549,436	22,772,914	25,971,399	26,454,998	27,201,619	28,643,318	**29,389,939**
Horse-Arena	12,069,334	10,296,125	11,561,969	11,757,876	11,757,876	**14,591,887**	**14,591,887**
So. Arena	61,065,099	47,163,132	55,494,761	56,725,977	56,725,977	70,029,483	**70,029,483**
MSST = 0.86 * Smsy							
Falcon-Hum	**24,552,511**	20,471,433	21,575,620	21,575,620	21,575,620	**24,552,511**	**24,552,511**
Hum-Horse	**24,746,228**	18,601,512	22,534,545	22,588,773	23,335,394	23,999,607	**24,746,228**
Horse-Arena	**12,030,965**	9,069,491	10,656,036	10,656,036	10,656,036	**12,030,965**	**12,030,965**
So. Arena	**61,065,099**	43,501,290	52,819,222	52,819,222	52,819,222	**61,065,099**	**61,065,099**

Note: 1) Discount factor of r=4% was used in computing PVs;
2) The alternatives that have the highest PVs are highlighted in bold.

An economic analysis was carried for the forecast data generated for the past ten years on the expected KRFC river tribal and recreational harvest under each MSST convention and Amendment 16 alternative. Evaluation of the Amendment 16 Alternatives indicates that the PPA Alternative had the highest income impact for the river tribal fisheries (Table 4-10). However, Status Quo Alternative had a better outcome in terms of the income impact from the river recreational catches (Table 4-11). This result has to be cautiously used as the recreational catches are in fact not allowed to be sold.

Table 4-10. River Tribal Income Impact (Real).

MSST = 0.50 * Smsy

Alts.	2002	2003	2004	2005	2006	2007	2008	2009	2010	**Present Value**
Pre III	$2470251	$2056902	$2270558	$507836	$1173774	$4651565	$3096606	$3196662	3855533	$18,768,319
1	2470251	2056902	2270558	644772	813071	4651565	3586709	3642715	4427491	19,689,116
2	2255016	1846997	1920074	644772	717429	4078433	3104979	3767602	3982313	17,857,349
2b	2470251	2056902	2270558	644772	717429	4651565	3586709	4213758	4427491	20,027,761
3	2255016	1846997	1920074	644772	813071	4078433	3104979	3767602	3982313	17,935,959
3b	2470251	2056902	2270558	644772	813071	4651565	3586709	4213758	4427491	20,106,372
4	2255016	1846997	1920074	644772	813071	4078433	3165195	3767602	3982313	17,981,719
PPA	2470251	2056902	2270558	644772	813071	4651565	3643369	4213758	4427491	**20,149,429**
MSST = 0.75 * Smsy										
Pre III	2470251	2056902	2270558	507836	1173774	4651565	3096606	3196662	3855533	18,768,319
1	2470251	2056902	2270558	644772	813071	4651565	3586709	3642715	4427491	19,689,116
2	2255016	1846997	1920074	475188	717429	4078433	3104979	3408255	3982313	17,449,817
2b	2470251	2056902	2270558	475188	717429	4651565	3586709	3854309	4427491	19,620,154
3	2255016	1846997	1920074	644772	717429	4078433	3104979	3767602	3982313	17,857,349
3b	2470251	2056902	2270558	644772	717429	4651565	3586709	4213758	4427491	20,027,761
4	2255016	1846997	1920074	644772	813071	4078433	3165195	3767602	3982313	17,981,719
PPA	2470251	2056902	2270558	644772	813071	4651565	3643369	4213758	4427491	**20,149,429**
MSST = 0.86 * Smsy										
Pre III	2470251	2056902	2270558	507836	1173774	4651565	3096606	0	3855533	16,432,549
1	2470251	2056902	2270558	644772	813071.6	4651565	3586709	0	4427491	17,027,419
2	2255016	1846997	1920074	342401	717429.8	4078433	3104979	0	3982313	14,845,931
2b	2470251	2056902	2270558	342401	717429.8	4651565	3586709	0	4427491	16,690,341
3	2255016	1846997	1920074	507836	717429.8	4078433	3104979	0	3982313	14,987,345
3b	2470251	2056902	2270558	507836	717429.8	4651565	3586709	0	4427491	16,831,755
4	2255016	1846997	1920074	644772	813071.6	4078433	3165195	0	3982313	15,228,769
PPA	2470251	2056902	2270558	644772	813071.6	4651565	3643369	0	4427491	**$17,070,477**

Note: 1) Discount factor of r=4% was used in computing PVs;
2) The alternatives that have the highest PVs are highlighted in bold.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Table 4-11. River Recreational Income Impact (Real).

Alts.	2002	2003	2004	2005	2006	2007	2008	2009	2010	Present Values
MSST = 0.50 * Smsy										
Pre III	$1001767	$536767	$340562	$76157	$0	$1209350	$2578058	$3184039	$1334308	$8006258
1	1001767	536767	340562	96722	0	1209350	3068161	3630092	1197390	**8626005**
2	786532	326862	288033	96722	0	636218	2586431	1403138	752324	5419340
2b	1001767	536767	340562	96722	0	1209350	3068161	1849398	1197390	7324869
3	786532	326862	288033	96722	0	636218	2586431	1403138	752324	5419340
3b	1001767	536767	340562	96722	0	1209350	3068161	1849398	1197390	7324869
4	786532	326862	288033	96722	0	636218	1838947	1403138	752324	4851313
PPA	1001767	536767	340562	96722	0	1209350	2317236	1849398	1197390	6754227
MSST = 0.75 * Smsy										
Pre III	1001767	536767	340562	76157	0	1209350	2578058	3184039	1334308	8006258
1	1001767	536767	340562	96722	0	1209350	3068161	3630092	1197390	**8626005**
2	786532	326862	288033	71275	0	636218	2586431	2572022	752324	6251681
2b	1001767	536767	340562	71275	0	1209350	3068161	3018075	1197390	8157058
3	786532	326862	288033	96722	0	636218	2586431	1403138	752324	5419340
3b	1001767	536767	340562	96722	0	1209350	3068161	1849398	1197390	7324869
4	786532	326862	288033	96722	0	636218	1838947	1403138	752324	4851313
PPA	1001767	536767	340562	96722	0	1209350	2317236	1849398	1197390	6754227
MSST = 0.86 * Smsy										
Pre III	1001767	536767	340562	76157	0	1209350	2578058	0	1334308	5679712
1	1001767	536767	340562	96722	0	1209350	3068161	0	1197390	**5973532**
2	786532	326862	288033	51382	0	636218	2586431	0	752324	4355324
2b	1001767	536767	340562	51382	0	1209350	3068161	0	1197390	5934775
3	786532	326862	288033	76157	0	636218	2586431	0	752324	4376502
3b	1001767	536767	340562	76157	0	1209350	3068161	0	1197390	5955953
4	786532	326862	288033	96722	0	636218	1838947	0	752324	3826054
PPA	1001767	536767	340562	96722	0	1209350	2317236	0	1197390	5402891

Note: River Recreational Income Impact (Real) (if catches from recreational trips if are allowed to be sold); Discount factor r=4%

In conclusion, the economic analysis of ocean commercial, recreational and river tribal fishing activities with the Amendment 16 Alternatives in place in retrospective over the past ten years indicates that preliminary preferred alternative (PPA) resulted better outcome relative to the status quo (Alternative 1) and rest other alternatives for all MSST convention and geographic strata. However, none of the alternatives have impact economically significant enough to make a net change of amount $100 million or more.

4.4.8 Accountability Measures

Proposed alternatives for accountability measures would help to manage the fisheries consistent with ACLs to prevent overfishing and address non-compliance with the ACL. The alternatives are expected to have some level of direct or indirect economic impacts, but none of the accountability measures will have significant economic impacts (Table 4-12).

With respect to the socio-economic environment, Alternatives 2–4 should provide short-term positive effects because complete fishery closures owing to low abundance of SRFC should become less frequent. Alternatives 2–4 may have long term negative effects because stocks could become overfished more frequently, which could lead to rebuilding plans that restrict fisheries further than the FMP control rules.

For example, after SRFC was declared “overfished” in 2010, California commercial fisheries were heavily constrained, primarily to allow for attainment of the upper end of the SRFC conservation objective (180,000). Consequently, only eight days were open to commercial fishing south of Point Arena in 2010. The California portion of the KMZ was entirely closed, and the Oregon portion of the KMZ was closed during June 2010. The number of commercial troll days fished south of Horse Mountain in 2010 amounted to 2,000 days, an 86% decline compared with the 2003-2007 average (14,5000 days) (Table 3-22). The number of Chinook landed in the commercial troll ocean salmon fishery south of Horse Mountain was 15,100 Chinook, substantially less than the 2003-2007 average (293,400 Chinook) (Table 3-22). The real value of the commercial ocean salmon troll fishery in California was $1,246,000 in 2010, a 85% decline compared with 2007 ($8,235,000) and an 89% decline compared with the 2001-2007 average ($11,183,000) (Table 3-26). For KRFC, Alternatives 2–4 may have a direct short-term negative effect because these alternatives specify a spawner escapement goal of S_{MSY} = 40,700, as opposed to the status quo which specifies a spawner escapement goal of 35,000. When translated into an F-based control rule, this change results in a lower allowable exploitation rate for potential spawner abundances between 46,700 and 122,000. However, adherence to MSY based management should provide long-term benefits by maximizing yield.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SONC-Southern Oregon Northern California

Table 4-12. Summary of environmental effects of alternatives.

Alternatives Developed for	Sect.	Table	No. of Alts.	Actions in Alternatives (Alt#)	Biological Impacts in General	Significance of economic Impacts
Stock Classification	2.1	2-1, 2-2, 2-3, 2-4, 2-5, 2-6	Three	Stocks in the fishery or Ecosystem Components Stock Complexes and indicator stocks Stocks subject to the international exception to application of ACLs	Under Alt. 1 all stocks remain in the fishery, no complexes for ACL application, and no international exceptions. Effects not significant Under Alt. 2, Mid-C Sp Chinook and Fraser pinks not in the fishery; Complexes for CVF, SONC, FNMC Chinook; Int. Ex. for PST stocks; No EFH for Mid-C Sp. Effects not significant. Under Alt. 3, Can. Chinook and coho not in the fishery, Mic-C sp, ColR. Fall brights, PS and Fraser pinks are EC; Complexes for CVF, SONC, FNMC, Mid-C Sp Chinook; Int. Ex. for PST stocks; No EFH for EC stocks. Effects not significant.	Not Significant
Status Determination Criteria	2.2	2-7	Eight (*1*, *2/2b*, *3/3b/3c*, *4/4b*)	Different alternatives for the reference points: - Overfishing based on single year exploitation rate Approaching Overfished, Overfished: - Alt 2/2b single year at 50% or 75% of S_{MSY} - Alt 3/3b/3c 3-year geo mean at 50%, 75%, or 86% of S_{MSY} - Alt 4/4b 3-year arith. avg. at 50% or 75% of S_{MSY} Rebuilt: - Alt 2/2b single year at S_{MSY} - Alt 3/3b/3c 3-year geo mean at S_{MSY} - Alt 4/4b 3-year arith. avg. at S_{MSY}	Under Alt. 2, overfishing determination would rarely occur, so negligible impact is expected. Alt. 4 poses greatest risk of negative effects, Alt. 2 the least for overfished SDC. Constraining fisheries to prevent a stock from becoming overfished has a positive effect. A determination of an overfished condition has no direct effects. Overall, the SDC alternatives could mean beneficial or positive impacts in the long-term, but not significant.	Not Significant
OFL/ABC/ACL	2.3		Four 1, 2, 3/ 3b	- Alt. 2 is Catch based (Consistent with NS1G) OFLs, ABLs, ACLs, & ACTs - Alt. 3 is Spawning Escapement-based (currently in place) OFLs, ABCs, ACLs, & ACTs - Alt. 3b is like 3 except KRFC managed for 35,000 rather that 40,700 (S_{MSY}) spawners	For SRFC, there are direct positive effects with Alt. 2&3, given they would limit the exploitation rate to less than F_{MSY}. For KRFC, the effect is small or negligible. Alt 3b would have long-term negative effects on KRFC, but not significant.	Not Significant
AMs	2.4		Three	- Alt. 2: Issue "Abundance or conservation alerts" to managers - Alt. 3: New SDC will replace current conservation alerts and overfishing concerns - In-season and post-season reporting on catch and escapement - ACT can be adopted, if needed, and kept below ACL to buffer against uncertainties. A buffer rate of 5% is suggested..	AMs would have negligible impacts, not significant.	Not Significant

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***De Minimis* fishing provisions**	2.5		Seven (*1, 2/2b, 3, 4/4b, 5*)	*De minimis* exploitation rates of 25% for SRFC and KRFC Alt 2 – F=0 at S_{MSY}-MSST midpoint Alt 3 - F=0 at MSST Alt 4 – F=0 at ½ MSST Alt 5 – F< 25% at S_{MSY}-MSST midpoint. Alts. 2b, 3b, and 5 - KRFC managed for 35,000 rather that 40,700 (S_{MSY}) spawners	No significant impacts from de minimis alternatives, but long-term negative impacts to KRFC from Alts. 2b, 3b, and 5.	None or NS Will be assessed separately based on results of a supplemental analysis on *de minimis* fishing alternatives

Note: NS = Not significant; Although there could be some positive or negative economic impacts associated to different amendment alternatives relative to status quo, the economic significance would be none or not significant, i.e., the value of change expected to be much less than $100 million to the case of the West Coast salmon fishing industry under PFMC.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; CVF-Central Valley fall F-fishing mortality rate; FNMC-Far-north migrating coastal; KRFC-Klamath River Fall Chinook; MFMT-maximum fishery mortality threshold; Mid-C Sp-Mid Columbia spring; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SRFC-Sacramento River fall Chinook; SONC-Southern Oregon Northern California

5.0 CONSISTENCY WITH OTHER APPLICABLE LAW

5.1 Magnuson-Stevens Conservation and Management Act

The MSA provides parameters and guidance for Federal fisheries management. Overarching principles for fisheries management are found in the MSA's National Standards, which articulate a broad set of policies governing fisheries management. In crafting fisheries management regimes, the Councils and NMFS must balance their recommendations to meet these different national standards.

As discussed previously, the purpose of this action is to amend the salmon FMP to implement the 2009 revisions to National Standard 1, which provide guidance on the implementation of the requirement for annual catch limits (ACLs) and other aspects of the 2006 amendments to the MSA. National Standard 1 requires that "Conservation and management measures shall prevent overfishing while achieving on a continuing basis, the optimum yield from each fishery for the United States fishing industry." .

National Standard 2 requires the use of the best available scientific information. The analyses of impacts to Salmon FMU stocks are based on models that have undergone review by the Council=s Scientific and Statistical Committee and been approved for use by the Council. Input data are obtained from scientifically designed surveys and data recording systems administered by state, Federal, and tribal agencies, and verified during the preseason planning process by the STT. Most stock forecasts are reviewed by multiagency scientific bodies to ensure accurate and appropriate methodologies are used and to facilitate agreement between the relevant parties. All alternatives are subject to this same level of scientific analysis.

National Standard 3 requires individual stocks of fish to be managed as a unit throughout their ranges and interrelated stocks of fish to be managed as a unit. The conservation objectives are established for individual stocks in the Salmon FMP and are based on either escapement or on total exploitation rate, both of which account for impacts to stocks throughout their range. All Salmon FMU stocks are managed as a unit in Council-area fisheries to ensure all conservation objectives are met.

National Standard 4 requires that "Conservation and management measures shall not discriminate between residents of different States." And that "allocation shall be: (A) fair and equitable…; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no…entity acquires an excessive share…" All alternatives meet this standard.

National Standard 5 requires efficiency, where practicable, in the utilization of fishery resources. All alternatives meet this standard.

National Standard 6 requires conservation objectives and management measures to take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches. All alternatives allow for inseason management of Council-area salmon fisheries to meet conservation objectives and preseason management objectives.

National Standard 7 requires that conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication. All alternatives meet this standard.

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National Standard 8 requires that conservation and management measures shall, consistent with the conservation requirements of the MSA, take into account the importance of fishery resources to fishing communities in order to “(A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.” Fishing communities could be negatively affected by Option III, which has substantially lower short term economic benefits than the Preferred Alternative, and by Options I, II, and the No Action Alternative, which could have reduced long term economic benefits associated with overharvest of stocks of concern. The Preferred Alternative may also negatively affect fishing communities, but represents a balance between the short term needs of the communities and the long term needs of the communities, needs which rely on long term health of the salmon stocks.

National Standard 9 requires the reduction, to the extent practicable, of bycatch or bycatch mortality. All alternatives have specifications that reduce both bycatch and bycatch mortality of non-target and sublegal target species.

National Standard 10 requires, to the extent practicable, conservation and management measures to promote the safety of human life at sea. Salmon seasons in all alternatives provide for extended openings through staggered days on and off or weekly possession limits to provide flexibility with respect to weather considerations. The Council’s recommendations are consistent with Council Operating Procedure #16, Weather-related Adjustment to Salmon Fishery. All alternatives are consistent with National Standard 10.

The emergency rule modifying the conservation objective for Klamath River fall Chinook is consistent with NMFS policy on use of emergency actions under the Magnuson-Stevens Act published at 62 FR 44422. The emergency, in this case, is a consequence of a KRFC predicted run size that is less than the Salmon FMP conservation objective of 35,000 natural spawners. The run size forecast was not available until February of 2006 and was thus unforeseen. The emergency circumstances present serious conservation and management problems. The emergency regulations provide the opportunity to address the conservation problem consistent with the requirement to manage, on a continuing basis, for optimum yield, and still provide some limited harvest opportunity. Without use of emergency regulations, the Salmon FMP would require closure of all salmon fishing between Cape Falcon, Oregon, and Point Sur, California, causing severe social and economic hardship in the coastal communities.

The SEIS for the Salmon FMP concluded that Council-area salmon fisheries would have no significant effects on EFH. Further, NMFS conducted an EFH consultation and prepared an EFH Assessment that was incorporated into the NMFS BO on the effects of the Salmon FMP on ESA listed salmon dated April 30, 2001. The consultation concluded that the Council had adopted appropriate conservation measures related to fishing actions that occur under the Salmon FMP.

The alternatives considered in this EA are within the scope of impacts considered in the SEIS and the NMFS BO, and therefore, are not expected to have any additional effects on EFH.

5.3 Paperwork Reduction Act

The purposes of the Paperwork Reduction Act (PRA) are to minimize the burden of information collection by the Federal Government on the public; maximize the utility of any information thus collected; improve the quality of information used in Federal decision making, minimize the cost of collection, use and dissemination of such information; and improve accountability. The PRA requires

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Federal agencies to obtain clearance from the Office of Management and Budget before collecting information. This clearance requirement is triggered if certain conditions are met. "Collection of information" is defined broadly. In summary it means obtaining information from third parties or the public by or for an agency through a standardized method imposed on 10 or more persons. Collection of information need not be mandatory to meet the trigger definition. Even information collected by a third party, if at the behest of a Federal agency, may trigger the clearance requirement. Within NMFS the Office of the Chief Information Officer is responsible for PRA compliance. Obtaining clearance can take up to 9 months and is one aspect of NMFS review and approval of Council decisions.

The proposed action does not include any collection of information. Information is collected through mechanisms already present in the FMP and salmon regulations. Specific requirements on when and where to land fish is being imposed to ensure timely and accurate assessment of catches in specific regulatory areas. If fishermen are unable to comply with this landing requirement because of unsafe weather or mechanical problems, they must notify the Coast Guard of their problem, and advise of the name of the vessel, the port where delivery will be made, the approximate amount of salmon on board, and the estimated time of arrival. This provision is important to be retained for safety purposes.

5.4 Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) of 1972 is the principle federal legislation that guides marine mammal species protection and conservation policy in the United States. Under the MMPA, NMFS is responsible for the management and conservation of 153 stocks of whales, dolphins, porpoise, as well as seals, sea lions, and fur seals, while the U.S. Fish and Wildlife Service is responsible for walrus, sea otters, and the West Indian manatee.

Off the West Coast, the Steller sea lion (*Eumetopias jubatus*) Eastern stock, Guadalupe fur seal (*Arctocephalus townsendi*), and Southern sea otter (*Enhydra lutris*) California stock are listed as threatened under the ESA, and the sperm whale (*Physeter macrocephalus*) Washington, Oregon, and California (WOC) Stock, humpback whale (*Megaptera novaeangliae*) WOC - Mexico Stock, blue whale (*Balaenoptera musculus*) Eastern north Pacific stock, and Fin whale (*Balaenoptera physalus*) WOC Stock are listed as depleted under the MMPA. Any species listed as endangered or threatened under the ESA is automatically considered depleted under the MMPA.

The proposed action revises the framework for setting annual salmon specifications and management measures, and therefore does not directly affect marine mammals. The West Coast ocean salmon fisheries are considered a Category III fishery, indicating a remote likelihood of or no known serious injuries or mortalities to marine mammals, in the annual list of fisheries published in the *Federal Register*. Based on its Category III status, the incidental take of marine mammals in the West Coast salmon fisheries does not significantly impact marine mammal stocks.

5.5 NEPA

This EA is intended to meet the NEPA requirements that apply to the proposed action.

5.6 Endangered Species Act (ESA)

This action does not directly affect any species listed under the ESA, as it creates the framework for adoption of annual management measures that govern fishing, which does affect ESA-listed species. As discussed elsewhere in this document, several ESA-listed salmon stocks are impacted by Council-

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managed salmon fisheries. The FMP, as amended by any of the alternatives described in this document, calls for managing fisheries to ensure that the standards set forth in biological opinions for listed salmon stocks are met. Thus, fisheries adopted under this FMP will meet the consultation standards for affected listed salmon stocks.

Council-managed fisheries also impact listed Southern Resident Killer Whales. Fisheries are managed consistent with the biological opinion for killer whales.
The following BOs and Section 4(d) determinations have been prepared for West Coast stocks by NMFS.

NMFS' Endangered Species Act consultations and Section 4(d) determinations on ocean fisheries implemented under the Salmon FMP and their duration.

Date	Evolutionarily Significant Unit covered and effective period
March 8, 1996	Snake River Chinook and sockeye (until reinitiated)
April 28, 1999	Oregon coastal coho, Southern Oregon/ Northern California coastal coho, Central California coastal coho (until reinitiated)[1/]
April 28, 2000	Central Valley spring Chinook and California coastal Chinook (until reinitiated)
April 27, 2001	Hood Canal summer chum 4(d) limit (until reinitiated)
April 30, 2001	Upper Columbia River spring Chinook and Upper Willamette River Chinook (until reinitiated)
April 30, 2001	Lower Columbia River Chinook, Upper Willamette Chinook, Upper Columbia spring Chinook, Lake Ozette sockeye, ten steelhead ESUs and Columbia River chum (until reinitiated)
April 27, 2004	Sacramento River winter Chinook (April 30, 2010)
April 29, 2004	Puget Sound and Lower Columbia River Chinook (until reinitiated)
Expected Prior to May 1, 2006	Lower Columbia River natural coho (through April 30, 2007)

Many of these documents are available from the NMFS Northwest Region website at:
http://www.nwr.noaa.gov/1publcat/allbiops.htm

5.7 Coastal Zone Management Act

Section 307(c)(1) of the Federal Coastal Zone Management Act (CZMA) of 1972 requires all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Under the CZMA, each state develops its own coastal zone management program, which is then submitted for Federal approval. This has resulted in programs which vary widely from one state to the next. The Proposed Action would be implemented in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved coastal zone management programs of Washington, Oregon, and California. This determination has been submitted to the responsible state agencies for review under section 307(c)(1) of the CZMA.

5.8 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 was designed to end the commercial trade of migratory birds and their feathers that, by the early years of the 20th century, had diminished populations of many native bird species. The act states it is unlawful to take, kill, or possess migratory birds and their parts (including eggs, nests, and feathers) and is a shared agreement between the United States, Canada, Japan, Mexico, and Russia to protect a common migratory bird resource. The Migratory Bird Treaty Act prohibits the directed take of seabirds, but the incidental take of seabirds does occur. The proposed action does not

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directly affect any seabirds protected by the Migratory Bird Treaty Act, as it affects only the framework for determining the annual salmon specifications and management measures.

5.9 Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

Executive Order 13175 is intended to ensure regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes.

The Secretary recognizes the sovereign status and co-manager role of Indian tribes over shared Federal and tribal fishery resources. At Section 302(b)(5), the MSA reserves a seat on the Council for a representative of an Indian tribe with Federally-recognized fishing rights from California, Oregon, Washington, or Idaho.

The U.S. government formally recognizes that the four Washington Coastal Tribes (Makah, Quileute, Hoh, and Quinault) have treaty rights to fish for salmon within the Council-managed area. Each of the treaty tribes has the discretion to administer their fisheries and to establish their own policies to achieve program objectives. In addition, other tribes with Federally-recognized fishing rights may be impacted by Council-area fisheries, including tribes from Puget Sound, the Columbia River, and the Klamath River. Accordingly, effects of the proposed action and other alternatives have been developed in consultation with the affected tribe(s) and, insofar as possible, with tribal consensus.

5.11 Executive Order 12898: Environmental Justice

Executive Order 12898 obligates Federal agencies to identify and address “disproportionately high adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations in the United States” as part of any overall environmental analysis associated with an action. NOAA guidance, NAO 216-6, at 7.02, states that “consideration of Executive Order 12898 should be specifically included in the NEPA documentation for decision making purposes.” Agencies should also encourage public participation “especially by affected communities” as part of a broader strategy to address environmental justice issues.

The environmental justice analysis must first identify minority and low-income groups that live in the project area and may be affected by the action. Typically, census data are used to document the occurrence and distribution of these groups. Agencies should be cognizant of distinct cultural, social, economic or occupational factor that could amplify the adverse effects of the proposed action. (For example, if a particular kind of fish is an important dietary component, fishery management actions affecting the availability or price of that fish could have a disproportionate effect.) In the case of Indian tribes, pertinent treaty or other special rights should be considered. Once communities have been identified and characterized, and potential adverse impacts of the alternatives are identified, the analysis must determine whether these impacts are disproportionate. Because of the context in which environmental justice developed, health effects are usually considered and three factors may be used in an evaluation: whether the effects are deemed significant, as the term is employed by NEPA; whether the rate or risk of exposure to the effect appreciably exceeds the rate for the general population or some other comparison group; and whether the group in question may be affected by cumulative or multiple sources

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of exposure. If disproportionately high adverse effects are identified, mitigation measures should be proposed. Community input into appropriate mitigation is encouraged.

This action is not expected to affect minority and low-income communities, because it does not directly affect fishing practices. It modifies the framework for determining the annual salmon management measures and specifications with the goal of preventing overfishing and ensuring long-term stock productivity. Further, fisheries conducted under the FMP, are not expected to affect minority and low-income communities. West Coast Indian tribes are part of the Council's decision-making process on salmon management issues, and tribes with treaty rights to salmon, groundfish, or halibut have a seat on the Council. Available demographic data detailed in the Salmon FMP Amendment 14, Appendix B show that coastal counties where fishing communities are located are variable in terms of social indicators like income, employment, and race and ethnic composition. As a result, the alternatives are not expected to have notable effects on fishing communities in general, nor on minority and low income groups in particular.

5.12 Executive Order 13132: Federalism

Executive Order 13132 enumerates eight "fundamental federalism principles." The first of these principles states "Federalism is rooted in the belief that issues that are not national in scope or significance are most appropriately addressed by the level of government closest to the people." In this spirit, the Executive Order directs agencies to consider the implications of policies that may limit the scope of or preempt states' legal authority. Preemptive action having such "federalism implications" is subject to a consultation process with the states; such actions should not create unfunded mandates for the states; and any final rule published must be accompanied by a "federalism summary impact statement."

The Council and process offers many opportunities for states and Indian tribes (through their agencies, Council appointees, consultations, and meetings) to participate in the formulation of management measures. This process encourages states and tribes to institute complementary measures to manage fisheries under their jurisdiction that may affect federally managed stocks.

The proposed actions would not have federalism implications subject to Executive Order 13132.

5.12 Regulatory Impact Review

Executive Order 12866, Regulatory Planning and Review, was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. The Executive Order covers a variety of regulatory policy considerations and establishes procedural requirements for analysis of the benefits and costs of regulatory actions. Section 1 of the Order deals with the regulatory philosophy and principles that are to guide agency development of regulations. It stresses that in deciding whether and how to regulate, agencies should assess all of the costs and benefits across all regulatory alternatives. Based on this analysis, approaches should be chosen that maximize net benefits to society, unless a statute requires another regulatory approach.

The regulatory principles in Executive Order 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives such as user fees or marketable permits, to encourage the desired behavior. Each agency is to assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only after reasoned determination the

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benefits of the intended regulation justify the costs. In reaching its decision agency must use the best reasonably obtainable information, including scientific, technical and economic data, about the need for and consequences of the intended regulation. The regulatory impact review (RIR) provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure the regulatory agency systematically and comprehensively considers all available alternatives, so the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of Executive Order 12866.

The RIR analysis and an environmental analyses required by NEPA have many common elements and they have been combined in this document. The following table shows where the elements of an RIR, as required by Executive Order 12866, are located.

Required RIR Elements	Corresponding Sections
Description of management objectives	Sections 1.2 & 1.3, Tables 2-1 and 4-1d
Description of the fishery[i]	Chapter 3
Statement of the problem	Section 1.2.2
Description of each alternative considered in the analysis	Chapter 2
An analysis of the expected economic effects of each alternative	Sections 4.1.4, 4.2.4, and 4.3.4

The RIR is designed to determine whether the proposed actions could be considered “significant regulatory actions” according to Executive Order 12866. The Executive Order 12866 test requirements used to assess whether or not an action would be a “significant regulatory action” and the expected outcomes of the proposed management alternative are discussed below. A regulatory program is “economically significant” if it is likely to result in the following effects:

1. Have a annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local, or tribal governments or communities.

   This action is not expected to affect the economy as it is a framework action modifying the process for determining annual specifications and management measures.

2. Create a serious inconsistency or otherwise interfere with action taken or planned by another agency.

   None identified under any of the alternatives.

3. Materially alter the budgetary impact of entitlement, grants, user fees, or loan programs or the rights and obligations of recipients thereof.

   None identified under any of the alternatives.

4. Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

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None identified under any of the alternatives.

ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; CVF-Central Valley fall F-fishing mortality rate; FNMC-Far-north migrating coastal; KRFC-Klamath River Fall Chinook; MFMT-maximum fishery mortality threshold; Mid-C Sp-Mid Columbia spring; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SRFC-Sacramento River fall Chinook; SONC-Southern Oregon Northern California

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ABC-acceptable biological catch; ACL-annual catch limit; ACT-annual catch target; AM-accountability measures; CVF-Central Valley fall F-fishing mortality rate; FNMC-Far-north migrating coastal; KRFC-Klamath River Fall Chinook; MFMT-maximum fishery mortality threshold; Mid-C Sp-Mid Columbia spring; MSST-minimum stock size threshold; MSY-maximum sustainable yield; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria; SRFC-Sacramento River fall Chinook; SONC-Southern Oregon Northern California

Appendices A-G to Amendment 16 Public Review Draft Environmental Assessment

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F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX A: COMMITTEE MEMBER NAMES AND AFFILIATIONS

Chuck Tracy, Council staff	Document management and committee staffing
Craig Foster, ODFW, STT	Fishery management and policy analysis
Doug Milward, WDFW, STT	Fishery management and policy analysis
Henry Yuen, USFWS, STT	Population dynamics analysis
Jennifer Stanford, NMFS SWR.	Fishery management and policy analysis
Jennifer Isé, NMFS SWR.	Fishery management and policy analysis
Keith Lutz, NWIFC, STT	Fishery management and policy analysis
Larrie LaVoy, NMFS NWR	Population dynamics analysis
Michael Mohr, NMFS-SWFSC	Population dynamics analysis
Mike O'Farrell, NMFS SWFSC, STT	Population dynamics analysis
Peggy Mundy, NMFS NWR	Fishery management and policy analysis
Peter Dygert, NMFS NWR	Fishery management and policy analysis
Pete Lawson, NMFS-NWFSC, SSC	Population dynamics analysis, scientific oversight
Sheila Lynch, NOAA GC, NWR	Legal compliance
Shelby Mendez, NMFS SWR	NEPA coordination
Robert Kope, NMFS-NWFSC, STT	Population dynamics analysis
Ron Boyce, ODFW	Fishery management and policy analysis

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX B: VULNERABILITY OF SALMON FMP STOCKS TO COUNCIL AREA FISHERIES

In the National Standard 1 (NS1) guidelines, the "vulnerability" of fish stocks is referenced as one of the bases for differentiating between stocks that are "in the fishery" versus those that are "ecosystem components." To clarify the definition of "vulnerability" a Vulnerability Evaluation Work Group (VEWG) was established to develop a methodology for determining the vulnerability of stocks managed under a fishery management plan (FMP) (Patrick et al. 2010). We applied the methodology developed by the VEWG to three salmon stock groups to help establish a basis for distinguishing stocks that can reasonably be considered "ecosystem components" in Council fisheries.

In general, stocks "in the fishery" include target stocks (those that are directly pursued by commercial fisheries) and non-target stocks (fish species that are not targeted but are caught incidentally in target fisheries). Stocks may be managed as single species or in stock complexes. All stocks "in the fishery" are generally retained for sale or personal use and/or are vulnerable to overfishing, being overfished, or could become so in the future based on the best available information. As a default, NMFS declares that all stocks and stock complexes currently listed in FMPs are considered "in the fishery." Because ecosystem component stocks are a type of non-target stock, occasional retention of the stock is not in and of itself a reason to classify it as "in the fishery. In addition, ecosystem component stocks must not be subject to overfishing, becoming overfished, or likely to become so in the future in the absence of conservation and management measures.

The vulnerability of a stock to becoming overfished was described by the VEWG as the potential for the productivity of the stock to be diminished by direct or indirect fishing pressure. Vulnerability is expected to differ among stocks based on their life history characteristics and susceptibility to the fishery. The definition developed by the VEWG followed Stobutzki (2001) and includes two key elements: 1) stock productivity (a function of the stock's life history characteristics) and 2) stock susceptibility (the degree to which the fishery can negatively impact the stock.) Stocks with low productivity are not necessarily vulnerable to overfishing unless they have some level of susceptibility to the fishery. The methodology developed to assess vulnerability is termed a "productivity and sensitivity analysis" (PSA).

The PSA was originally developed to classify differences in bycatch sustainability in the Australian prawn fishery (Stobutzki et al. 2001) and has been modified and adapted to include habitat and community components (Hobday et al. 2004). Both methods create numerical indexes of productivity (p) and susceptibility (s) separately using a variety of ranking factors. Based largely on these two studies the VEWG created a PSA designed to accommodate a wide variety of U.S. fisheries ranging from long-line tuna and swordfish to trawl groundfish.

The PSA adaptation developed by the VEWG included ten productivity attributes and twelve susceptibility attributes. Each attribute was scored from 1 (low productivity, low susceptibility) to 3 (high productivity, high susceptibility) and weighted from 0 to 4 (with a default of 2). Note that the least vulnerable stocks have high productivity (3) and low susceptibility (1). Factors can be weighted to emphasize those most relevant to a class of fishery and to de-emphasize factors that are uninformative or, even misleading. The weighed factors are combined in to an index for p and an index for s. These can then be combined to calculate a vulnerability score (v) or plotted to show p and s relative to other stocks and fisheries. Guidelines are provided for scoring, but ultimately there is an element of expert opinion involved in the evaluation. The VEWG also provided a data quality index to aid in evaluating data-poor stocks. Salmon, in general, are data rich, so we did not consider data quality in this analysis. More

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

information and a spreadsheet for doing the evaluation can be obtained at: http://www.nmfs.noaa.gov/msa2007/vulnerability.htm.

The Vulnerability Analysis Working Group assessed productivity and susceptibility scores for 166 non-salmonid species in U.S. fisheries. These included Atlantic sharks, Bering Sea and Aleutian Island Skates, California nearshore groundfish, California Current pelagics, Northeast groundfish, Hawaii pelagic longline swordfish, Hawaii pelagic longline tuna, and South Atlantic and Gulf of Mexico longline species (Patrick et al. 2010). Overall vulnerability can be visualized in a plot of productivity vs. susceptibility (Figure B-1.) Since the least vulnerable stocks have high productivity and low susceptibility the x-axis in Figure B-1 is reversed so that the stocks closest to the origin have the lowest vulnerability.

We applied PSA analysis to Pacific salmon to evaluate their vulnerability to Council-area fisheries in the context of other fish and fisheries. In the context of all U.S. fisheries, most Pacific salmon stocks are quite similar in productivity and susceptibility, so PSA analysis is not useful for differentiating individual stocks for management purposes. There are, however, two groups of stocks that differ from what might be considered generic salmon in the Eastern Pacific. These are Far North Migrating (FNM) Chinook stocks, with migration timings and patterns that separate them from southern U.S. Fisheries, and Fraser River and Puget Sound pink salmon, somewhat more productive, and caught at very low rates in Council-area fisheries. We developed a PSA for three salmon stock groups; 1) generic salmon, 2) FNM salmon, and 3) pink salmon. Generic salmon include most Chinook and coho salmon from Washington, Oregon, and California. These fish share productivity characteristics and are effectively targeted in Council-area fisheries. FNM Chinook stocks migrate north to Alaska as juveniles and have low susceptibility to Council-area fisheries. Pink stocks mature at a younger age and also have low susceptibility to Council-area fisheries.

Attribute scores were determined based on the criteria in the VEWG spreadsheet and discussion among several scientists knowledgeable about salmon biology and Council-area fisheries. Most factors were scored directly using the quantitative criteria specified by the VEWG. All weights were left at the default of 2 except for "r," intrinsic rate of increase, weighted at 4. We felt that this was one of the defining properties of Pacific salmon, and warranted stronger consideration.

Productivity for Pacific salmon stocks is quite high, with scores of 2.409 for generic and FNM salmon, and 2.455 for pink salmon (Table B-1). Susceptibility was moderate to low, with scores of 2.208 (generic), 1.875 (FNM), and 1.708 (pink). In relation to other U.S. fisheries, these productivity scores are among the highest. Susceptibility scores range from average to low. Overall vulnerability scores (distance from the origin in Figure B-1) were 1.345 (generic), 1.056 (FNM), and 0.894 (pink). Pink salmon and FNM salmon are among the least vulnerable to overfishing of all the stocks analyzed by the VEWG. Generic salmon are more vulnerable because, despite their high productivity they are susceptible to highly effective fisheries.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table B-1. The VEWG worksheet, including productivity and susceptibility attributes, with definitions, and attribute scores for three salmon stocks. "Generic Salmon" includes most Chinook and coho salmon in Council-area fisheries, "Far North Migrate" includes stocks of spring Chinook that migrate out of Council fisheries, and "Pink Salmon" includes mostly Fraser River pink salmon that are caught at very low rates in the Strait of Juan de Fuca and Puget Sound. Attributes that differ for individual stocks are in bold.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

					Generic Salmon		Far North Migrate		Pink Salmon	
Productivity Attributes	**High (3)**	**Moderate (2)**	**Low (1)**	**Weight**	**Attribute Score**	**Weighted Attribute Score**	**Attribute Score**	**Weighted Attribute Score**	**Attribute Score**	**Weighted Attribute Score**
r	>0.5	0.5-0.16 (mid-point 0.10)	<0.16	4	3.0	12.0	3.0	12.0	3.0	12.0
Maximum Age	< 10 years	10 - 30 years (mid-point 20)	> 30 years	2	3.0	6.0	3.0	6.0	3.0	6.0
Maximum Size	< 60 cm	60-150 cm (mid-point 105)	> 150 cm	2	2.0	4.0	2.0	4.0	**3.0**	**6.0**
von Bertalanffy Growth Coefficient (k)	> 0.25	0.15-0.25 (mid-point 0.20)	< 0.15	2	3.0	6.0	3.0	6.0	3.0	6.0
Estimated Natural Mortality	> 0.40	0.20-0.40 (mid-point 0.30)	< 0.20	2	2.0	4.0	2.0	4.0	2.0	4.0
Measured Fecundity	> 10e4	10e2-10e3	< 10e2	2	2.0	4.0	2.0	4.0	2.0	4.0
Breeding Strategy	0	between 1 and 3	≥4	2	2.0	4.0	2.0	4.0	2.0	4.0
Recruitment Pattern	highly frequent recruitment success (> 75% of year classes are successful)	moderately frequent recruitment success (between 10% and 75% of year classes are successful)	infrequent recruitment success (< 10% of year classes are successful)	2	3.0	6.0	3.0	6.0	3.0	6.0
Age at Maturity	< 2 years	2-4 years (mid-point 3.0)	> 4 years	2	2.5	5.0	2.5	5.0	**2.0**	**4.0**
Mean Trophic Level	<2.5	2.5-3.5 (mid-point 3)	>3.5	2	1.0	2.0	1.0	2.0	1.0	2.0
	Overall Productivity Scores					**2.409**		**2.409**		**2.455**
Susceptibility Attributes	**Low (1)**	**Moderate (2)**	**High (3)**	**Weight**						
Management Strategy	Targeted stocks have catch limits and proactive accountability measures; Non-target stocks are closely monitored.	Targeted stocks have catch limits and reactive accountability measures	Targeted stocks do not have catch limits or accountability measures; Non-target stocks are not closely monitored.	2	1.0	2.0	1.0	2.0	1.0	2.0
Areal Overlap	< 25% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	> 50% of stock occurs in the area fished	2	3.0	6.0	**1.0**	**2.0**	**1.0**	**2.0**
Geographic Concentration	stock is distributed in > 50% of its total range	stock is distributed in 25% to 50% of its total range	stock is distributed in < 25% of its total range	2	1.0	2.0	1.0	2.0	1.0	2.0
Vertical Overlap	< 25% of stock occurs in the depths fished	Between 25% and 50% of the stock occurs in the depths fished	> 50% of stock occurs in the depths fished	2	3.0	6.0	3.0	6.0	3.0	6.0
Fishing rate relative to M	<0.5	0.5 - 1.0	>1	2	3.0	6.0	**1.0**	**2.0**	**1.0**	**2.0**
Biomass of Spawners (SSB) or other proxies	B is > 40% of B0 (or maximum observed from time series of biomass estimates)	B is between 25% and 40% of B0 (or maximum observed from time series of biomass estimates)	B is < 25% of B0 (or maximum observed from time series of biomass estimates)	2	3.0	6.0	3.0	6.0	3.0	6.0
Seasonal Migrations	Seasonal migrations decrease overlap with the fishery	Seasonal migrations do not substantially affect the overlap with the fishery	Seasonal migrations increase overlap with the fishery	2	1.0	2.0	1.0	2.0	1.0	2.0
Schooling/Aggregation and Other Behavioral Responses	Behavioral responses decrease the catchability of the gear	Behavioral responses do not substantially affect the catchability of the gear	Behavioral responses increase the catchability of the gear [i.e., hyperstability of CPUE with schooling behavior]	2	3.0	6.0	3.0	6.0	3.0	6.0
Morphology Affecting Capture	Species shows low selectivity to the fishing gear.	Species shows moderate selectivity to the fishing gear.	Species shows high selectivity to the fishing gear.	2	3.0	6.0	3.0	6.0	3.0	6.0
Survival After Capture and Release	Probability of survival > 67%	33% < probability of survival < 67%	Probability of survival < 33%	2	1.5	3.0	1.5	3.0	1.5	3.0
Desirability/Value of the Fishery	stock is not highly valued or desired by the fishery	stock is moderately valued or desired by the fishery	stock is highly valued or desired by the fishery	2	3.0	6.0	3.0	6.0	**1.0**	**2.0**
Fishery Impact to EFH or Habitat in General for Non-targets	Adverse effects absent, minimal or temporary	Adverse effects more than minimal or temporary but are mitigated	Adverse effects more than minimal or temporary and are not mitigated	2	1.0	2.0	1.0	2.0	1.0	2.0
	Overall Susceptibility Scores					**2.208**		**1.875**		**1.708**
				Vulnerability		**1.345**		**1.056**		**0.894**

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

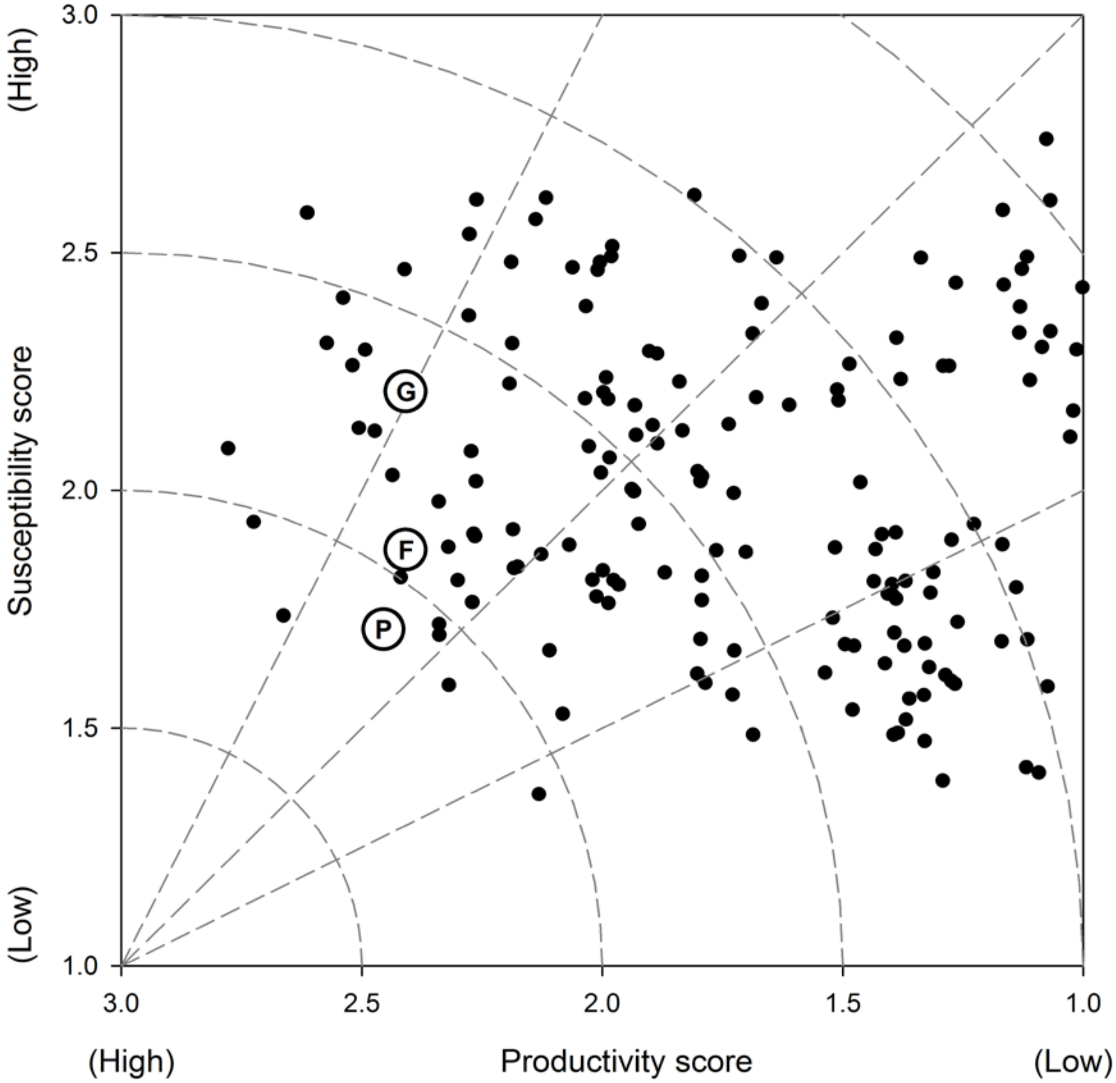

Figure B-1. Productivity and susceptibility scores for three Pacific salmon stocks (open circles) and 166 other species of fish (solid dots) in U.S. fisheries. Vulnerability is interpreted as distance from the origin, as indicated by the arcs, with higher vulnerability in the upper right and lower vulnerability in the lower left. The three salmon stocks are; G: generic, F: far north migrating, and P: pink. Figure is adapted from Patrick et al. 2010, Figure 2, using data from Table 5.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

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APPENDIX C: CHINOOK F_{MSY} PROXY DEVELOPMENT

The development of a proxy F_{MSY} value is necessary for Chinook salmon since direct estimates of this rate are not available for all stocks in the fishery. F_{MSY} is defined as the fixed annual exploitation rate (e.g., harvest fraction or spawner reduction rate) that results in MSY over the long-term, under prevailing ecological and environmental conditions. An estimate of F_{MSY} can be readily computed given the estimated parameters from a stock-recruitment analysis. However, because many stocks do not have adequate data to perform such an analysis, the development of an F_{MSY} proxy is necessary for determining required reference points such as OFL and ABC for all stocks in the fishery.

We began by amassing all stock-recruitment analyses that we could find for California, Oregon, and Washington stocks. The data sets underlying these analyses varied both in quantity (number of spawner-recruit data points) and quality (contrast in spawner abundance, measurement error). It was also evident that some data sets would not be appropriate to include in the development of the F_{MSY} proxy, which lead to the following rules for eliminating data sets from further consideration.

1. Data sets from British Columbia and Alaska were omitted. In particular, many British Columbia Chinook stocks have obligate "stream-type" life histories, where freshwater emigration occurs at the yearling stage. This life history type is by and large not present in Chinook stocks managed by the PFMC.

2. Data sets were omitted if they were very old and characterized an era very different than the present one. For example, data sets from pre-dam periods on the Columbia River were omitted.

3. Data sets were omitted if grilse (age-2) escapement was included with adult (> age-2) escapement in the estimate of "spawner" abundance. Grilse contribute little to the reproductive potential of a stock.

4. Data sets were omitted if they were not the most recent one available for a given stock.

Twenty data sets remained for F_{MSY} proxy development, which included a broad spatial representation of stocks, from northern Washington to the Sacramento River basin, and included spring-, summer-, and fall-run life history types.

For the retained data sets, the Ricker stock-recruitment model (Ricker 1975), most commonly expressed as

$$R = \alpha \cdot S \cdot \exp(-\beta S),$$

was used in the original analyses to characterize the relationship between recruitment, R, and spawner abundance, S, where the parameter α reflects stock productivity (recruits per spawner at low spawner abundance), and the parameter β reflects stock habitat capacity. For this model, F_{MSY} depends only on a stock's productivity, and it can be estimated by solving (iteratively)

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

$$(1\text{-}F_{MSY})\cdot\alpha\cdot\exp(\text{-}F_{MSY}) = 1$$

for F_{MSY} given the α estimate from the original stock-recruitment analysis (Ricker 1975, Appendix III, Curve No. 1, equations 17 and 20).

Table C-1 displays the 20 independent estimates of α and the corresponding F_{MSY} estimates. The F_{MSY} estimates ranged from 0.62 to 0.90, with a mean value of 0.78. We therefore set

$$F_{MSY} \text{ proxy} = 0.78.$$

Currently, this F_{MSY} proxy value will be applied only to Sacramento River fall Chinook because it is the only tier 2 Chinook stock in the fishery which requires SDC and ACLs.

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F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table C-1. Independent estimates of F_{MSY} used in the development of the Chinook F_{MSY} proxy.

Run	Location	Brood years	α	F_{MSY}	Source
Fall	Hoh River	1968-1982	23.57	0.90	Cooney (1984)
Fall	Queets River	1968-1982	18.27	0.87	Cooney (1984)
Fall	Quillayute River	1968-1982	17.71	0.87	Cooney (1984)
Fall	Columbia River	1947-1959	7.40	0.72	Chapman et al. (1982), from Reisenbichler (1987)
Spring	Columbia River	1957-1972	8.70	0.76	Chapman et al. (1982), from Reisenbichler (1987)
Summer	Columbia River	1979-1995	8.60	0.75	CTC (1999)
Fall	Columbia River bright	1964-1991	16.75	0.86	Langness and Reidinger (2003)
Fall	North Lewis River	1964-1991	8.93	0.76	CTC (1999)
Fall	Deschutes River	1977-1998	4.85	0.62	Sharma et al. (2010)
Fall	Nehalem River	1967-1991	6.54	0.69	CTC (1999)
Fall	Siletz River	1973-1991	12.10	0.81	CTC (1999)
Fall	Siuslaw River	1965-1991	4.84	0.62	CTC (1999)
Spring	Umpqua River	1946-1977	7.20	0.72	ODFW (Pers. Comm.), from Reisenbichler (1987)
Spring	Rogue River	1960-1979	11.80	0.81	ODFW (Pers. Comm.), from Reisenbichler (1987)
Fall	Klamath River	1979-2000	7.19	0.72	STT (2005)
Fall	Shasta River	1955-1978	9.70	0.78	Reisenbichler (1986)
Fall	South Fork Eel River	1963-1972	11.80	0.81	Reisenbichler (1986)
Fall	Upper Sacramento River	1967-1979	10.40	0.79	Reisenbichler (1986)
Fall	Feather River	1955-1966	13.20	0.83	Reisenbichler (1986)
Fall	San Joaquin River	1955-1976	16.40	0.86	Reisenbichler (1986)
				0.78	mean

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX D: F_{MSY} SCIENTIFIC UNCERTAINTY AND THE LIKELIHOOD OF OVERFISHING

For salmon fishery management, F_{MSY} and F_{ABC} estimates are needed for setting OFLs, ABCs, and ACLs as well as determining stock status on an annual basis. As specified in the Alternatives, $F_{ABC} < F_{MSY,}$ where the buffer between F_{ABC} and F_{MSY} accounts for scientific uncertainty. In particular, buffers applied to F_{MSY} as presented herein account for scientific uncertainty about the true value of F_{MSY}.

Two levels of buffers are proposed for the two "tiers" of salmon stocks that differ in the level of information associated with them. Tier 1 stocks include those for which an estimate of F_{MSY} has been obtained directly from a stock-specific spawner-recruit analysis. The Tier 1 buffer between F_{MSY} and F_{ABC} is 5%. Tier 2 stocks include those for which there isn't a stock-specific estimate of F_{MSY} from a spawner-recruit analysis, and a proxy F_{MSY} value is used instead (see Appendix C for derivation of proxy F_{MSY} values for Chinook). The Tier 2 buffer between F_{MSY} and F_{ABC} is 10%. In the next sections, we describe and quantify how the Tier 1 and Tier 2 buffers reduce the likelihood of overfishing.

<u>Tier 1</u>

For Tier 1 stocks, where a spawner-recruit model has been fitted to stock-specific data, the uncertainty of the F_{MSY} estimate can be readily characterized using standard statistical methods, assuming the model is in fact appropriate. Because Klamath River fall Chinook (KRFC) is presently the only Tier 1 stock in the FMP (see Stock Classification section 2.1), our analysis of the effect of a 5% buffer between the F_{MSY} and F_{ABC} values given this uncertainty is restricted to KRFC.

In 2005, a spawner-recruit analysis for KRFC was completed by the PFMC Salmon Technical Team (STT 2005), and endorsed by the PFMC Scientific and Statistical Committee as the best available science on the subject. Model 2 in that analysis (a Ricker model that includes an early-life survival covariate) was found to have the greatest statistical support of the alternative models considered, and was adopted for the present analysis. The STT did not report the corresponding F_{MSY} point estimate (the focus of the report was on S_{MSY}), but it can be readily computed from the β and S_{MSY} point estimates (STT 2005, Table 2): $F_{MSY} = \beta \cdot S_{MSY} = 0.72$.

To quantify the uncertainty of this F_{MSY} estimate, we used the same bootstrap model-based resampling of errors procedure employed by the STT (2005). Denoting spawner abundance as S and recruitment as R, a bootstrap dataset was created by sampling with replacement the log(R/S) fitted model residuals and adding them to the log(R/S) fitted model values at the observed covariate values. Model 2 was fit to each dataset as described by the STT (2005), and F_{MSY} estimated. The number of bootstrap replications was 100,000.

The resulting bootstrap distribution of F_{MSY} estimates is shown in Figure D-1. The bootstrap 0.90 percentile interval for the true F_{MSY} is [0.62, 0.78]. Moreover, $F_{ABC} = F_{MSY}(1\text{-buffer}) = 0.68$ corresponds to the 0.26 percentile. For KRFC then, we can state with confidence level 74% that the true $F_{MSY} \geq F_{ABC}$. Thus, use of the Tier 1 5% buffer substantially reduces the likelihood that the F_{ABC} value in fact exceeds the true F_{MSY} level, and thereby substantially reduces the probability of overfishing assuming that the fishery was being managed to achieve $F = F_{ABC}$.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Figure D-1. Distribution of bootstrap F_{MSY} estimates for Klamath River fall Chinook (100,000 replications). Vertical dashed lines reference point estimates of F_{MSY} (0.72) and F_{ABC} (0.68).

More generally, for any Tier 1 stock, the scientific uncertainty associated with the F_{MSY} estimate will depend on the inherent variation in the spawner-recruit relationship for that stock, along with the data quantity and quality. Thus, the degree to which the 5% buffer between F_{MSY} and F_{ABC} reduces the likelihood of overfishing will vary among the Tier 1 stocks.

<u>Tier 2</u>

For Tier 2 stocks, where a spawner-recruit model has not been fitted to stock-specific data, a proxy F_{MSY} value is relied upon. The proxy F_{MSY} value is 0.78 for Chinook (Appendix C). While the proxy F_{MSY} value used for Tier 2 stocks is species-specific, it is not stock-specific, and therefore likely more uncertain than F_{MSY} for Tier 1 stocks. For this reason, the buffer between F_{MSY} and F_{ABC} for Tier 2 stocks was doubled to 10%.

To quantify the uncertainty of these proxy F_{MSY} values, we first characterized the distribution of the stock-specific F_{MSY} estimates that were used to derive the proxy value for each species, and then evaluated the probability that an F_{MSY} value for an individual stock would exceed the F_{ABC} level. The analysis does not directly take into account the estimation error contained in the individual stock-specific F_{MSY} estimates. A beta(*a*, *b*) distribution was used to characterize the species-specific estimates because, like F, it is defined on the (0, 1) interval, and because it fit the histogram of F_{MSY} estimates fairly well. The distribution parameters *a* and *b* were estimated by the method-of-moments (Johnson et al. 1995, Chapter 25), which insured that the mean value of the fitted distribution, *a/(a+b)*, was equal to the proxy F_{MSY} value (the arithmetic mean of the stock-specific F_{MSY} estimates).

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

For Chinook, the histogram of the 20 stock-specific F_{MSY} estimates used to develop the proxy F_{MSY} (Appendix C, Table C-1) along with the fitted beta (21.84, 6.30) distribution[1] is shown in Figure D-2. With the Tier 2 10% buffer, F_{ABC} = proxy F_{MSY} * (1-0.10) = 0.70. The probability that an F_{MSY} value for an individual stock would exceed this F_{ABC} level (the proportion of the beta distribution to the right of the F_{ABC} value) was thus estimated to be 0.84, and compared favorably to the empirical estimate of 17/20 = 0.85. Thus, use of the Tier 2 10% buffer substantially reduces the likelihood that the F_{ABC} value in fact exceeds a stock's F_{MSY} level, and thereby substantially reduces the probability of overfishing assuming that the fishery was being managed to achieve $F = F_{ABC}$.

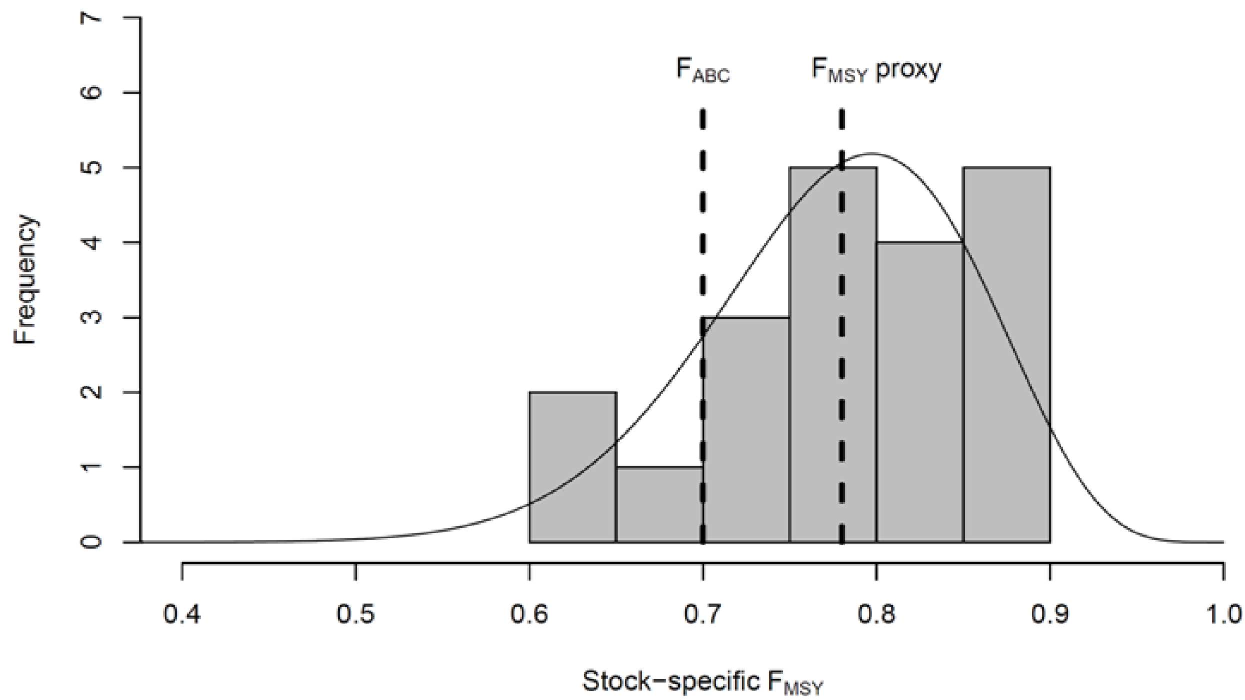


Figure D-2. Histogram of 20 stock-specific Chinook F_{MSY} estimates (Appendix C, Table C-1) and fitted beta(21.84, 6.30) distribution. Vertical dashed lines reference Tier 2 Chinook proxy F_{MSY} (0.78) and F_{ABC} (0.70) values.

A summary of the Tier 2 proxy F_{MSY} analysis results for Chinook are provided in Table D-1.

Table D-1. Summary of Tier 2 proxy F_{MSY} analysis results.

	Chinook
N	20
a	21.84
b	6.30
F_{MSY} proxy	0.78
F_{ABC}	0.70
$Pr(F_{MSY} \geq F_{ABC})$	0.84

[1] Estimation by maximum likelihood yielded essentially equivalent results.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

References

Johnson, N.L., S. Kotz, and N. Balakrishnan. 1995. Continuous univariate distributions, volume 2, second edition. John Wiley, New York.

STT (Salmon Technical Team) 2005. Klamath River fall Chinook stock-recruitment analysis. Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 200, Portland, Oregon.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX E: DEVELOPMENT OF REFERENCE POINTS FOR WASHINGTON COASTAL COHO STOCKS

Estimates of biological reference points (F_{MSY} and S_{MSY}) are lacking for Washington coastal coho stocks. These reference points are needed to develop needed to develop required status determination criteria (SDC) for Amendment 16 to the Salmon Fishery Management Plan. Required SDC include a maximum fishing mortality threshold (MFMT) and a minimum stock size threshold (MSST). One solution to this problem is to use a proxy value for F_{MSY} derived from other stocks to develop MFMTs and to develop MSSTs from the current conservation objectives for Washington coastal coho. However, data are available to derive stock specific estimates of the necessary reference points for Washington coastal stocks, eliminating the need for a proxy.

Methods

Spawning escapement estimates and reconstructed ocean abundance for natural coho stocks were extracted from outputs of backward coho FRAM runs for each individual year from 1986-2008. The initial ocean abundances were scaled by a factor of 0.812, which is the product of natural survival (1-natural mortality) over the 5 time periods used in the coho FRAM, and represents the probability of a fish at the beginning of the first time period surviving to spawn in the absence of fishing. This scales the initial ocean abundance to adult-equivalent (AEQ) recruits, with the result that exploitation rates are also in terms of AEQ.

Beverton-Holt (equation 1) and Ricker (equation 2) SRRs were fitted to the data for each stock. In the analyses done in support of current FMP reference points for Puget Sound stocks, Beverton-Holt SRRs were used. There is some evidence to support this form of relationship, but this SRR always produced higher intrinsic productivity than a Ricker SRR fitted to the same data, with a consequently higher estimate of F_{MSY}, and in some cases the best fit of a Beverton-Holt SRR was spawner independent (i.e., F_{MSY} = 1.0 and S_{MSY} = 0). For this reason, and the fact that Ricker SRRs were used in developing F_{MSY} values for Chinook, both forms were examined for coho.

$$R = \frac{aS}{(b+S)} \tag{1}$$

$$R = Se^{(\alpha-\beta S)} \tag{2}$$

Beverton-Holt SRRs were fitted by non-linear least-squares regression of recruits on spawning escapement. For the Beverton-Holt SRR S_{MSY} was calculated using equation (3).

$$S_{MSY} = \sqrt{ab} - b \tag{3}$$

F_{MSY} was calculated as (R_{MSY}-S_{MSY})/R_{MSY}, and R_{MSY} was calculated by substituting S_{MSY} from equation (3) into equation (1).
Ricker SRR were fitted using the procedures described in STT (2005), including correction for process error.

Results and Discussion

Fits of Beverton-Holt SRRs (Table E-1) do not appear to provide meaningful results. With the exception of the Skagit management unit, all estimates of S_{MSY} are below current goals (Tables E-2 and E-3) and all estimates of F_{MSY} are greater than 0.8. For the Snohomish, Big Beef Creek, and Quillayute fall stocks, the best fits are independent of spawning escapement and expected yield is maximized by harvesting 100% of

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

the abundance. For these reasons, results from fitting Beverton-Holt SRRs are excluded from further consideration.

The Ricker SRRs appear to be much more reasonable fits of the data than those of the Beverton-Holt (Figure E-1). For Quillayute fall, Queets, and Hoh stocks, all estimates of S_{MSY} (Table E-4) are within the range of estimates used to develop current management objectives (Table E-3) (Lestelle, et al. 1984). Estimates of F_{MSY} range from 0.59 for Quillayute fall coho to 0.69 for the Hoh and Grays Harbor.

Recommendations

In light of these results, we recommend that reference points in Table E-4 be used as SDC for Washington Coastal stocks with MFMT = F_{MSY} and MSST = $0.5*S_{MSY}$.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table E-1. Parameters and associated reference points from fitting Beverton-Holt SRRs to Puget Sound and Washington coast coho stocks, and MSST calculated as $0.5*S_{MSY}$. Big Beef Creek, Dungeness, and Chehalis do not encompass the entire management unit, so the S_{MSY} and MSST are not applicable to the FMP stock.

Stock	a	b	F_{MSY}	S_{MSY}	MSST
Skagit	146286	41734.4	0.47	36,401	18,201
Stillaguamish	39568	700.5	0.87	4,564	2,282
Snohomish	185475	0.0	1.00	0	0
Big Beef Creek (Hood Canal)	34523	0.0	1.00	0	0
Dungeness (Strait of Juan de Fuca)	3291	87.2	0.84	448	224
Quillayute Fall	14592	0.0	1.00	0	0
Hoh	7421	107.6	0.88	786	393
Queets	14647	254.8	0.87	1,677	839
Chehalis (Grays Harbor)	67623	1792.4	0.84	9,217	4,609

Table E-2. Current proposed FMP reference points for Puget Sound Management units.

Management Unit	MFMT	S_{MSY}	MSST
Skagit	0.60	25,000	14,857
Stillaguamish	0.50	10,000	6,100
Snohomish	0.60	50,000	31,000
Hood Canal	0.65	14,362	10,217
Strait of Juan de Fuca	0.60	11,000	7,007

Table E-3. Current proposed reference points for Washington coastal coho stocks.

Management Unit	MFMT	Escapement goal	S_{MSY}
Quillayute fall	F_{MSY} proxy	6,300-15,800	4,700-9,600
Hoh	F_{MSY} proxy	2,000-5,000	1,500-3,100
Queets	F_{MSY} proxy	5,800-14,500	4,200-9,400
Grays Harbor	F_{MSY} proxy	35,400	-

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Table E-4. Parameters and associated reference points from fitting Ricker SRRs to Washington Coast coho stocks. Chehalis does not encompass the entire management unit, so the S_{MSY} and MSST are not applicable to the FMP stock.

Stock	α’	β	F_{MSY}	S_{MSY}	MSST
Quillayute Fall	4.36	0.0000987	0.59	5,873	2,937
Hoh	6.34	0.0002729	0.69	2,520	1,260
Queets	6.10	0.0001232	0.68	5,500	2,750
Chehalis (Grays Harbor)	6.43	0.0000303	0.69	22,802	11,401

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

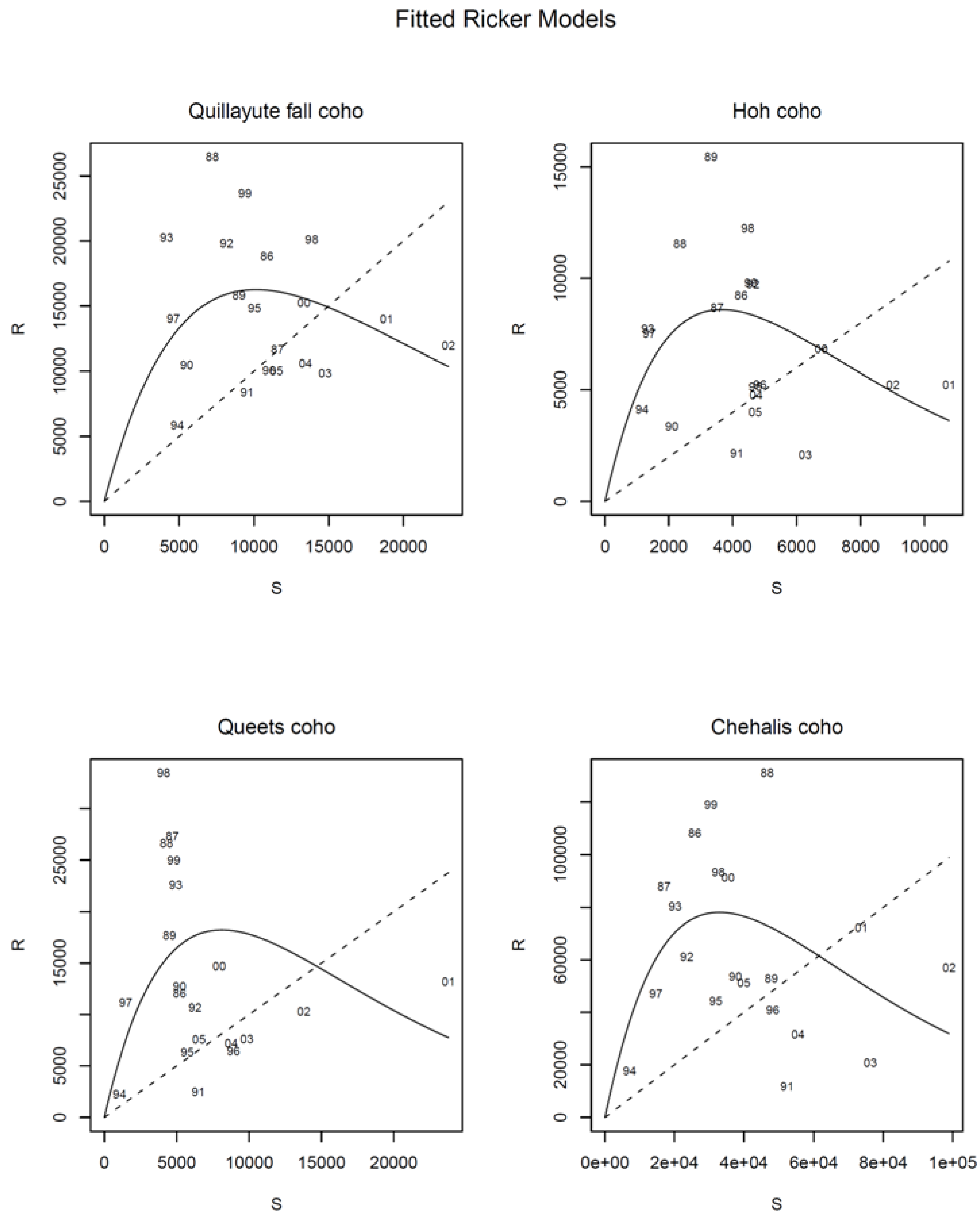


Figure E-1. Fit of Ricker spawner-recruit models to Washington coast coho stocks. Recruitment is expressed in adult equivalents. Data points are represented by brood year.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

References

Lestelle, L.C., G.S. Morishima, and T.D. Cooney. 1984. Determining spawning escapement goals for wild coho salmon on the Washington north coast. Pp 243-254 In: J.M Walton, and D.B. Houston, eds. Proceedings of the Olympic Wild Fish Conference. Peninsula College, Port Angeles, Washington. 1984. 308 p.

STT (Salmon Technical Team) 2005. Klamath River fall Chinook stock-recruitment analysis. Pacific Fishery Management Council, 7700 NE Ambassador Place, Suite 101, Portland, Oregon 97220-1384. 31p.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX F: COMPLIANCE WITH QUOTAS AND CATCH EXPECTATIONS FOR COUNCIL AREA FISHERIES

Quota Fisheries

Quota fisheries require inseason monitoring and closure authority to prevent overages. They also require models that account for the majority of stocks composing the catch to accurately predict stock specific impacts and total catch. Chinook and Coho FRAM have extensive stock representation and therefore lend themselves to quota management in areas north of Cape Falcon (NOF). The States of Oregon and Washington have intensive monitoring programs for both recreational and commercial sectors to track effort and catch. The FMP also has allocation provisions for both sectors, and the flexibility to allow quota transfers within and between sectors NOF. As a result, quota fisheries have been used exclusively since the early 1980s. The management system NOF has performed well, with a 92 percent and 96 percent compliance rate since 1996 for non-Indian commercial and recreational quota fisheries, respectively (Figure F-1). More than half of quota fisheries evaluated were managed to within 75 percent of the quota, which implies that management was able to monitor and constrain fisheries effectively, and the high compliance rate was not generally the result of quotas set beyond the fishery capacity, or of lower than expected stock abundance. The apparent exception is non-Indian commercial coho quotas, which rarely achieve more than 50 percent of the quota. However, this is not surprising because the commercial fleet targets Chinook stocks due to their relatively higher economic value. The emphasis on commercial Chinook targeting is also reflected in the FMPs fishery objectives and allocation formulas.

One reason for the high compliance rate in NOF commercial fisheries is the structured format used in recent years with weekly open and closed periods. This format allows more accurate monitoring and provides managers with more reaction time to implement closures or season modifications. This format has also been combined with weekly landing limits to control effort (e.g., open Thursday through Sunday with a landing limit of no more than 100 salmon per vessel per open period). This combined format has had benefits to both fishers and processors by maintaining a more consistent supply of fish over time while preventing market gluts, as well as providing more structured notice to the public and stakeholders of management actions. Establishing per vessel landing limits also reduces the tendency for a derby type approach to quota fisheries by creating a form of individual quota (IQ) program. This allows individual harvesters to plan their weeks' activities according to weather forecasts and the cost/benefits of pursuing a given allocation of fish. It also improves safety-at-sea for the fleet in comparison to unconstrained quota fisheries. There are, however, associated costs for management agencies in terms of enforcement, monitoring fisheries, more frequent inseason management actions, and additional notice requirements.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

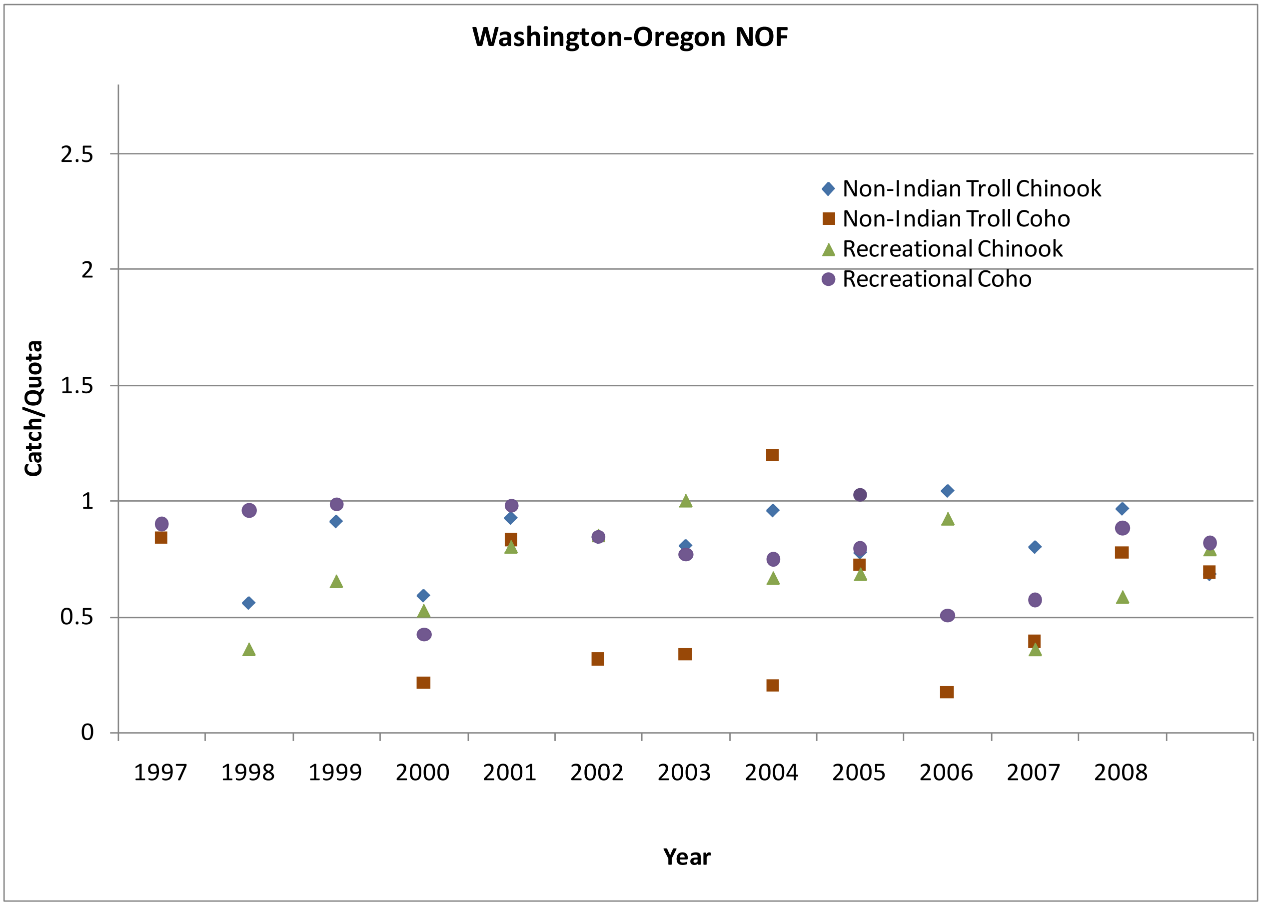


Figure F-1. Quota compliance rates for non-Indian commercial and recreational fisheries in the ocean north of Cape Falcon. Only post-season total allowable catch quotas were evaluated for each sector due to frequent inseason trades among sectors and port areas.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

The treaty Indian fisheries NOF are also primarily quota managed for the same reasons as the non-Indian fisheries. The Treaty Indian fisheries have had a 78 percent compliance rate, and about half of the quota fisheries were managed to within 75 percent or more of the quota (Figure F-2).

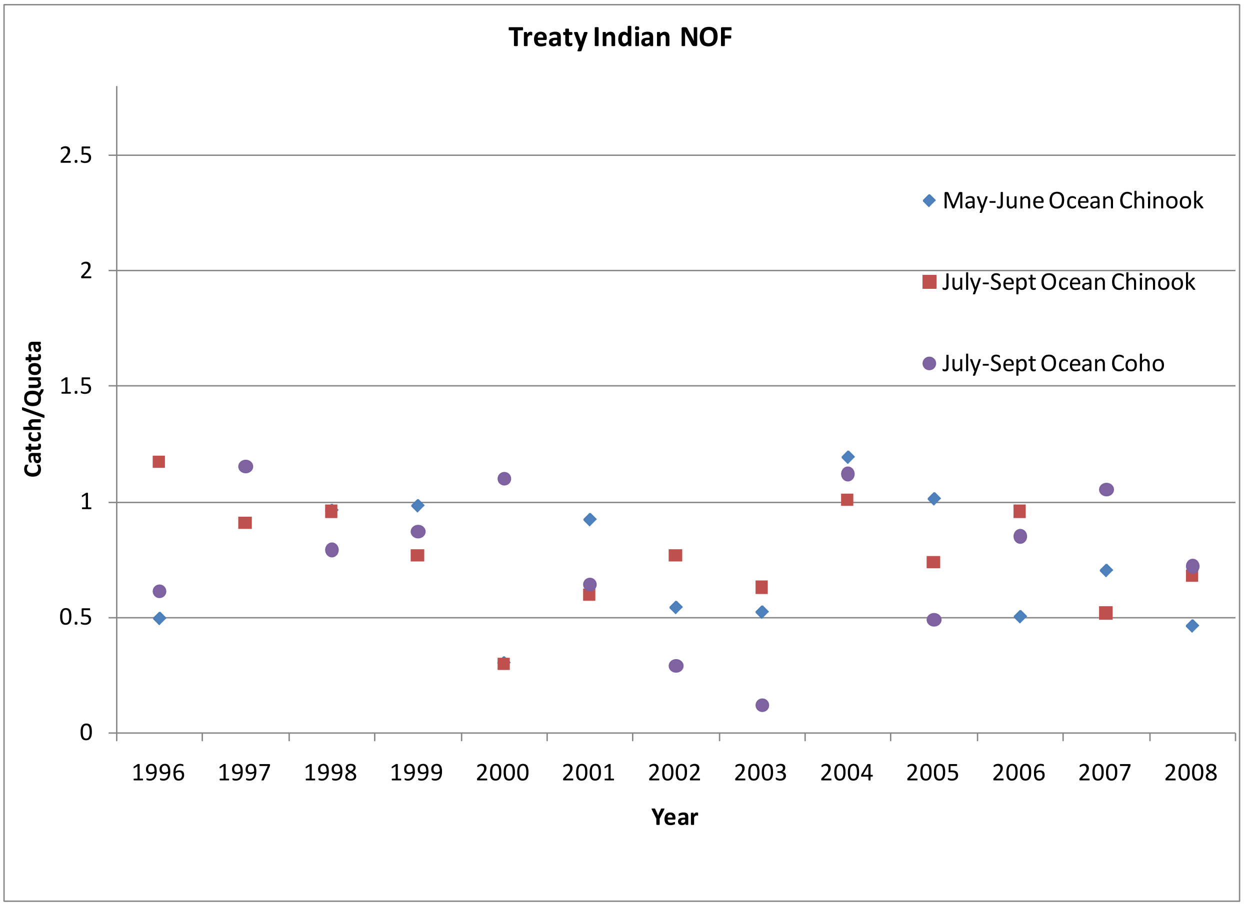


Figure F-2. Quota compliance rates for treaty Indian commercial fisheries in the ocean north of Cape Falcon. Separate evaluations for May-June and July-September fishery periods were possible because carry-over of unused quota was generally prohibited.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Oregon fisheries south of Cape Falcon (SOF) are managed with quotas primarily for commercial Chinook fisheries in the KMZ and recreational coho fisheries coast wide, plus some small state-waters only fisheries. Oregon commercial quota fisheries have had an 83 percent compliance rate and recreational quota fisheries have had a 90 percent compliance rate. About 40 percent have been managed to within 75 percent or more of their quota. Three of the four fisheries to exceed their quota were KMZ commercial fisheries, which typically have three or four month long quota fisheries per year, with most coming in well below the quota, and the occasional high success month resulting in an overage (Figure F-3).

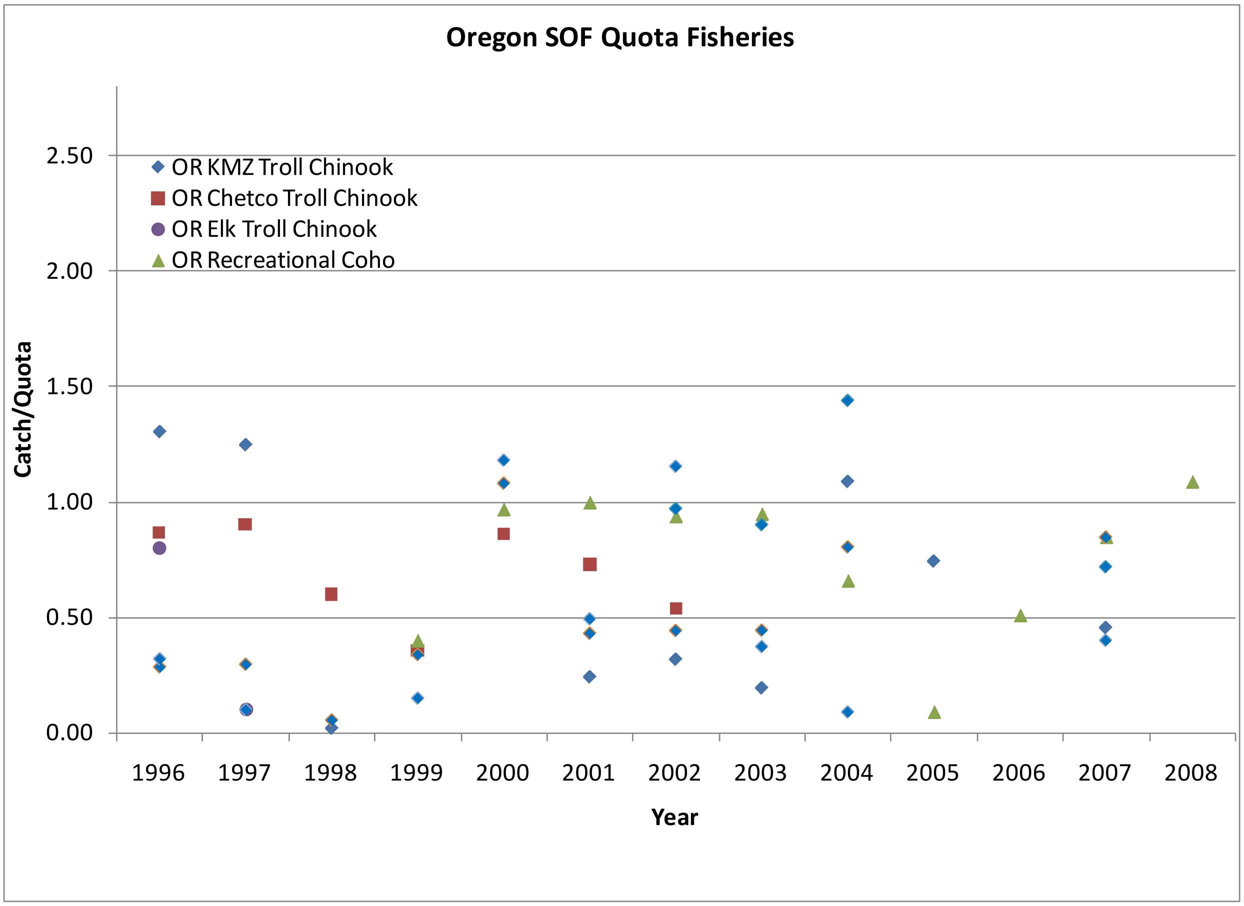


Figure F-3. Quota compliance rates for commercial fisheries in the ocean between of Cape Falcon and the Oregon/California border. KMZ troll fisheries also included some quota fisheries that extended up to Cape Arago in 1996 and 1997.

California fisheries are primarily managed by time-area seasons, with commercial quota fisheries used in the KMZ, occasionally in the Fort Bragg area, and rarely south of Fort Bragg. California quota fisheries have a 52 percent compliance rate, with about 55 percent managed to within 75 percent or more of their quota. Quota fisheries in all areas had similar compliance rates (Figure F-4).

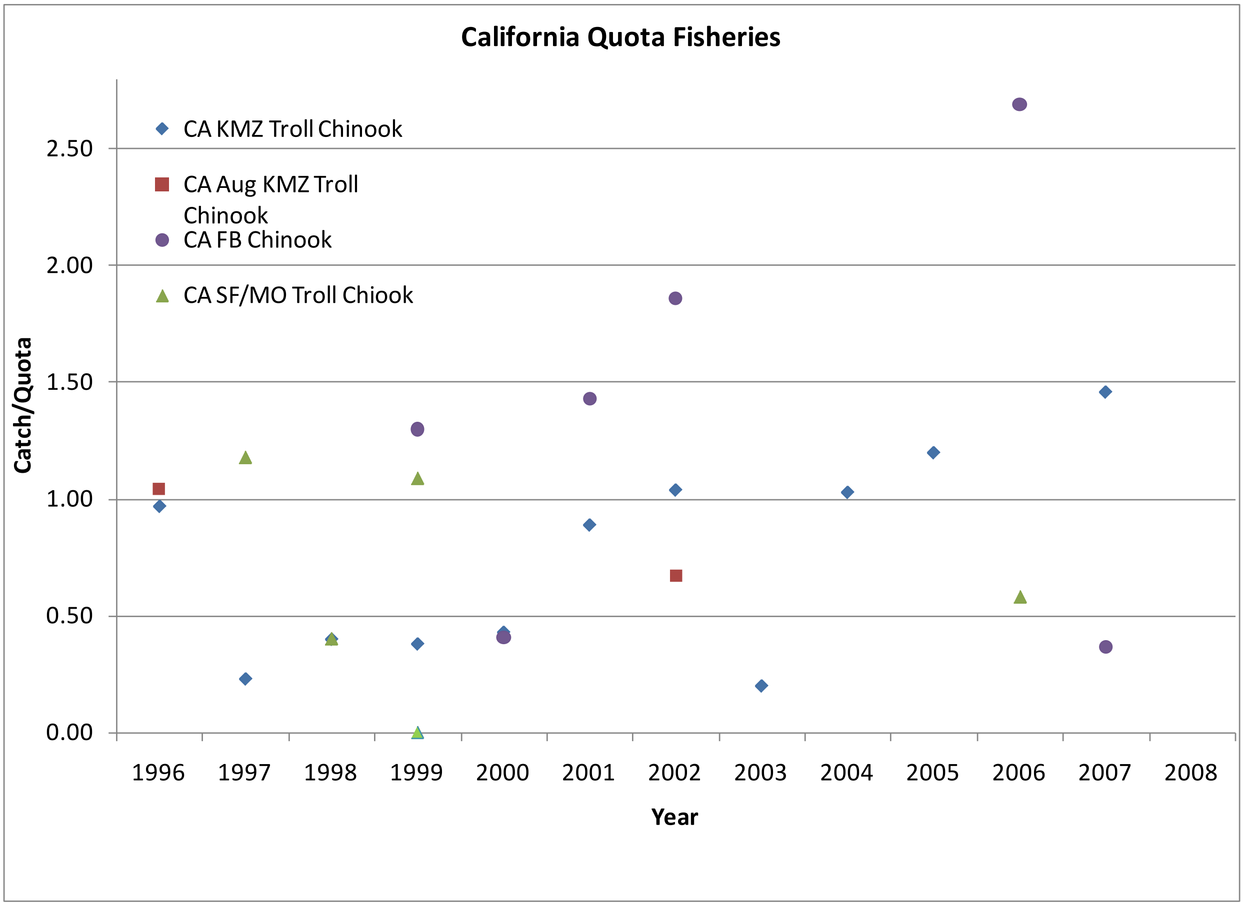


Figure F-4. Quota compliance rates for commercial fisheries in the ocean south of the Oregon/California border.

Most Chinook fisheries SOF have not been managed by quotas, partly because the KOHM was the primary harvest model used for ocean Chinook fisheries SOF. The KOHM is a single stock model and was only considered adequate to model quota fisheries in the KMZ where KRFC make up the majority of the catch. Other quota fisheries SOF were set to constrain catch below historical levels during conservation concerns (e.g., 2006 when an emergency rule was required to prosecute fisheries due to KRFC concerns), or to collect information on new or recently reopened time/area strata (e.g., April 2007 Fort Bragg commercial fishery). With the development of the Sacramento Harvest Model (SHM), the use of quota fisheries SOF may be more practible given that SRFC and KRFC constitute the majority of catch in most fishery strata.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Time-Area Fisheries

The majority of Chinook catch in Oregon and California occurs in time-area managed fisheries. The STT develops an expected catch for both commercial and recreational fisheries in areas NOF Falcon, Cape Falcon to Humbug Mt., the KMZ, and south of the KMZ. Their forecasts include quota fisheries in those areas, but those make up a small portion of the total expected catch SOF, except for KMZ commercial fisheries. Since 2000, about 52 percent of time-area fisheries had an actual catch less than the preseason expectation, as would be expected given unbiased projections. (Figure F-5). However, the Oregon fisheries exhibited a declining trend of in the ratio of catch-to-expectations over the time series. The expectations are based on historical fishery patterns and most were adjusted for preseason abundance forecasts; however, the early part of the decade had near record high abundance of SRFC, and contact rates for KRFC were greater than the historical data range. Since 2006, catch has been generally below expectations, which coincides with record low SRFC abundance. It is possible that abundance relative to average conditions affects the catch-to-expectation ratio, but it may also be a result of improving forecast methods since the trend was not observed in California fisheries or the KMZ recreational fishery.

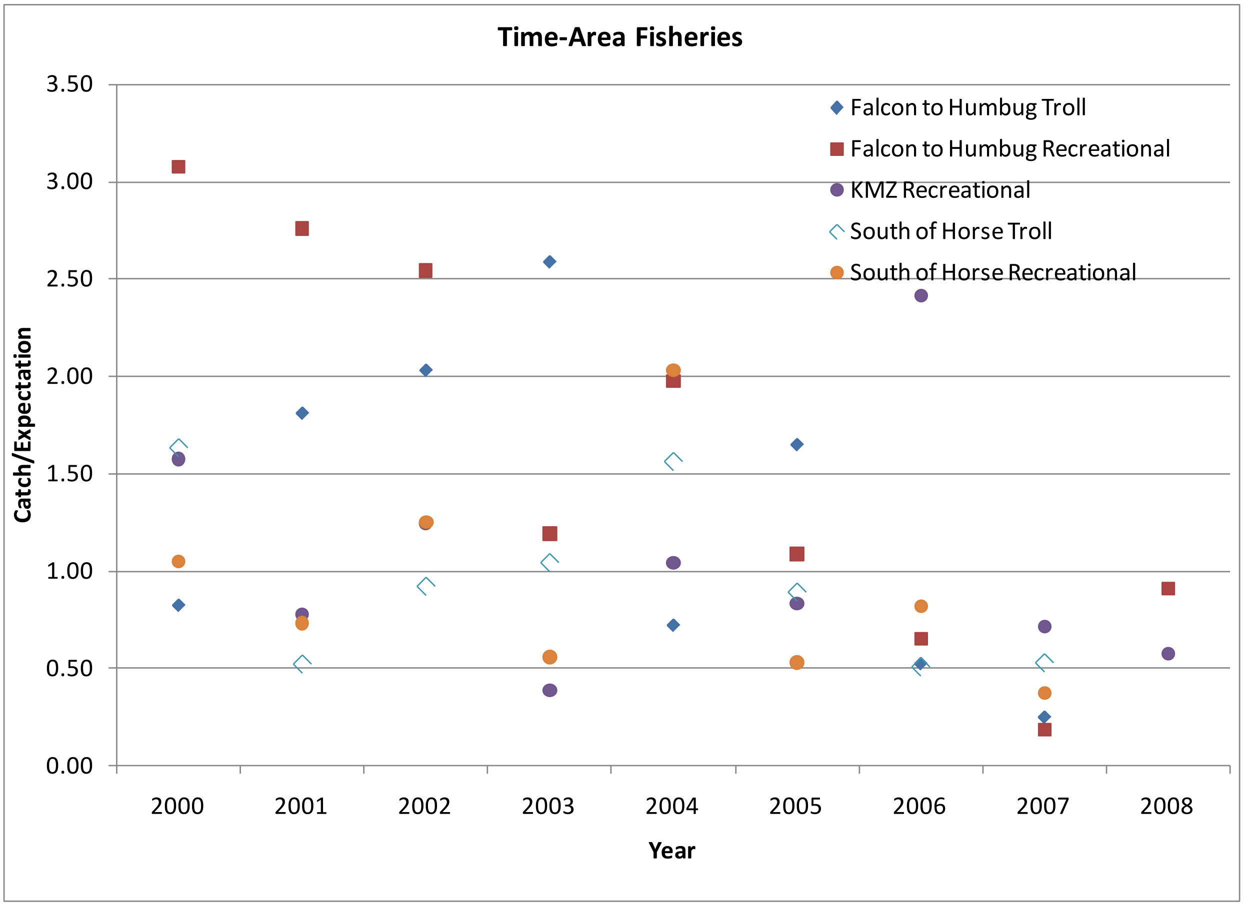


Figure F-5. Time-Area fisheries south of Cape Falcon. Actual catch compared with preseason expectations.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX G: IMPACTS TO COUNCIL SALMON STOCKS IN OCEAN FISHERIES

LaVoy, L. 2010. Memorandum to P. Dygert. CWT recovery distribution for WA coast, OR coast and Mid-Columbia spring run Chinook. November 15, 2010. 3 pp.

November 15, 2010

To: Peter Dygert

From: Larrie La Voy

Subject: CWT recovery distribution for WA coast, OR coast and Mid-Columbia spring run Chinook.

The tables below show distribution of estimated recoveries of CWTs from Chinook originating from WA and OR coast and Mid-Columbia hatchery facilities and identified in PSMFC-RMIS as "spring run". The WA coast tag groups were almost exclusively from the Quillayute River and Sol Duc rivers except for one small release group from the Hoh River. The OR coast tag groups were primarily from the Trask and Nestucca rivers in the north, to the Umpqua and Rogue-Cole rivers in the south. Tag groups from the Yakima basin were used to represent Mid-Columbia spring Chinook.

The tables contain estimated CWTs landed in fisheries and escapement from expansion of observed recoveries by a mark sampling rate. The percent distribution into fisheries and escapement should not be used to calculate an exploitation rate for the stock for three primary reasons: 1) recoveries only represent landed fish and not total fishery related mortalities, 2) recoveries are not adjusted for "adult equivalency" as is the normal procedure for calculating exploitation rates, and 3) recoveries especially in terminal fisheries and escapement areas is oftentimes inadequate or lacks expansion for sampling rates. Commonly, natural spawning areas are not adequately sampled and/or sampling rate expansions are not applied to the observed recoveries and will show few escapement recoveries relative to the number of fishery recoveries. In most cases, using CWT recovery data directly from RMIS as-is without manually adjusting some fisheries and most escapements will most likely result in overestimating the exploitation rates. Before undertaking a normal exploitation rate analysis, these tag groups would require recovery-year specific scrutiny of the observed-to-estimated expansions (especially in the terminal areas) and the status of whether likely recovery locations were even sampled.

The impacts in Council fisheries can be compared to those in other areas to get a relative measure of fishery related mortality. As expected, impacts in Council fisheries are much lower compared to northern fisheries in Alaska and Canada for WA coast spring Chinook. For northern OR coast spring Chinook, a higher portion is taken in Council fisheries but still less than in northern fisheries. Spring Chinook from the Umpqua and Rogue are taken primarily in Council fisheries south of Cape Falcon. Mid-Columbia spring Chinook are rarely caught in ocean fisheries anywhere.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

WA Coast Combined Quillayute-Sol Duc- Hoh	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2007	2008	2009	Total		Fishery Distribution
AK	3	11	121	52	43	79	54	23	15	6	12	9				428	7%	10%
BC	17	220	597	261	322	53	61	53	8	5		5		9	9	1620	28%	39%
Council	3	23	134	57	77	17	2		5	10	7			3	5	343	6%	8%
High Seas	2	2	7													11	0%	0%
WA Inside		94	98	104	140	46	3	12			16			1		514	9%	12%
Term. Fishery	5	23	155	314	193	307	137	116	31							1281	22%	31%
Escapement a/		4	129	384	454	209	112	155	45	19	23					1534	27%	--
Total	30	377	1241	1172	1229	711	369	359	104	40	58	14		13	14	5731	100%	100%

a/ Escapement should be considered minimum value; spawning ground recoveries not expanded for sampling rates.

Trask and Nestucca Recovery Area	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total		Fishery Distribution
AK		6	14	15	38	47	28	9	30	18	89	48	69	54	59	26	9	9	568	13%	21%
BC		6	8	2	2	5		7	14	11	92	162	255	171	68	40	23		866	20%	33%
Council-NoF		7	3			2		9	7	14	76	55	69	33	20	25	7	4	331	8%	12%
Council-SoF			52	59	46	16	39	28	12	53	105	80	99	79	38	17	3		726	17%	27%
High Seas					6			4			0	1			13				24	1%	1%
Terminal Spt		2	6	10	10	20	11	12	6	9	5		11	6	8	6	8	4	134	3%	5%
Escapement a/	1	6	53	96	88	120	107	91	58	74	63	72	165	151	225	124	155		1649	38%	--
Total	1	27	136	182	190	210	185	160	127	179	430	418	668	494	431	238	205	17	4298	100%	100%

a/ Escapement should be considered a minimum value; no recoveries on spawning grounds before 2005 and samples thereafter imply 100% sampling rate.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Umpqua Recovery Area	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total		Fishery Distribution
AK		2			9	9				3	2	7	7	4			43	1%	1%
BC	13	4	2			2		14	18	17	18	17	16	44	7	9	181	6%	6%
Council-NoF	6		2	2		2	17	9	30	44	34	21	16	32	22		237	8%	8%
Council-SoF	25	60	82	181	135	66	50	160	360	272	440	318	71	6	65		2291	73%	78%
High Seas	4	8	16		3			21	26	4	6	2			15	10	115	4%	4%
Terminal Spt			2	1	6	5	18	28	1		6	1					68	2%	2%
Escapement a/	2	16	14	14	24	13		30	39	3	6	12	3	14	13		203	6%	--
Total	50	90	118	198	177	97	85	262	474	343	512	378	113	100	122	19	3138	100%	100%

a/ Escapement should be considered a minimum value due to limited or no spawning ground sampling and few hatchery rack recoveries.

Rogue-Cole Rivers Recovery Area	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total		Fishery Distribution
AK							17	26	5									48	0%	1%
BC							5	5		5			6	2	4			27	0%	0%
Council-NoF		2						11	2	7			12	1	3			38	0%	0%
Council-SoF	5	265	777	857	694	121	99	204	346	224	756	1401	2037	433	49	143		8411	26%	96%
High Seas		4	28	29		3			8	3	41	21	1	3				141	0%	2%
Terminal Spt	1		1	23	25	7	6	23	10	3	1	2		1		2		105	0%	1%
Escapement a/	47	337	278	4205	2406	2217	879	1298	1686	1706	2866	2870	1450	534	376	411	269	23835	73%	--
Total	53	608	1084	5114	3125	2348	1006	1567	2057	1948	3664	4294	3506	974	432	556	269	32605	100%	100%

a/ Escapement should be considered a minimum value: only hatchery rack recoveries except in 1997 and 2007-08 which also show spawning ground recoveries.

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

Yakima Recovery Area	2000	2001	2002	2003	2004	2005	2006	2007	Total		Fishery Distribution
Council		5							5	1%	1%
High Seas	2								2	0%	0%
Terminal	5	215	214	15	26	2	36	10	523	74%	99%
Escapement	13	160	2		2				177	25%	--
Total	20	380	216	15	28	2	36	10	707	100%	100%

Table 1. Average 1999-2008 distribution of fishing mortality and escapement from PSC Chinook Technical Committee CWT analysis.

	Alaska	Canada	So. US Marine	Terminal	Esc
Col URB	16.5%	9.2%	1.9%	24.4%	48.0%
Snake R-Lyons F	3.4%	5.6%	7.1%	10.3%	73.6%
Col Summer	18.1%	17.1%	8.4%	12.2%	44.2%
Willamette Sp	5.6%	3.0%	0.9%	28.0%	62.4%
OR No Cst-Salmon R	20.1%	12.2%	2.6%	27.1%	37.8%
OR mid Cst-Elk R	7.0%	6.4%	18.0%	14.0%	54.5%
Queets Fall	27.4%	14.2%	1.1%	17.1%	40.2%
Hoko Fall	16.8%	13.9%	0.9%	0.0%	68.3%

F-fishing mortality rate; MFMT-maximum fishery mortality threshold; MSST-minimum stock size threshold; MSY-maximum sustainable yield; NS1Gs-National Standard 1 Guidelines; OFL-overfishing limit; S-spawning escapement; SDC-status determination criteria

APPENDIX H: CHANGES TO THE PACIFIC COAST SALMON FISHERY MANAGEMENT PLAN IMPLEMENTING THE PRELIMINARY PREFERRED ALTERNATIVES FOR AMENDMENT 16

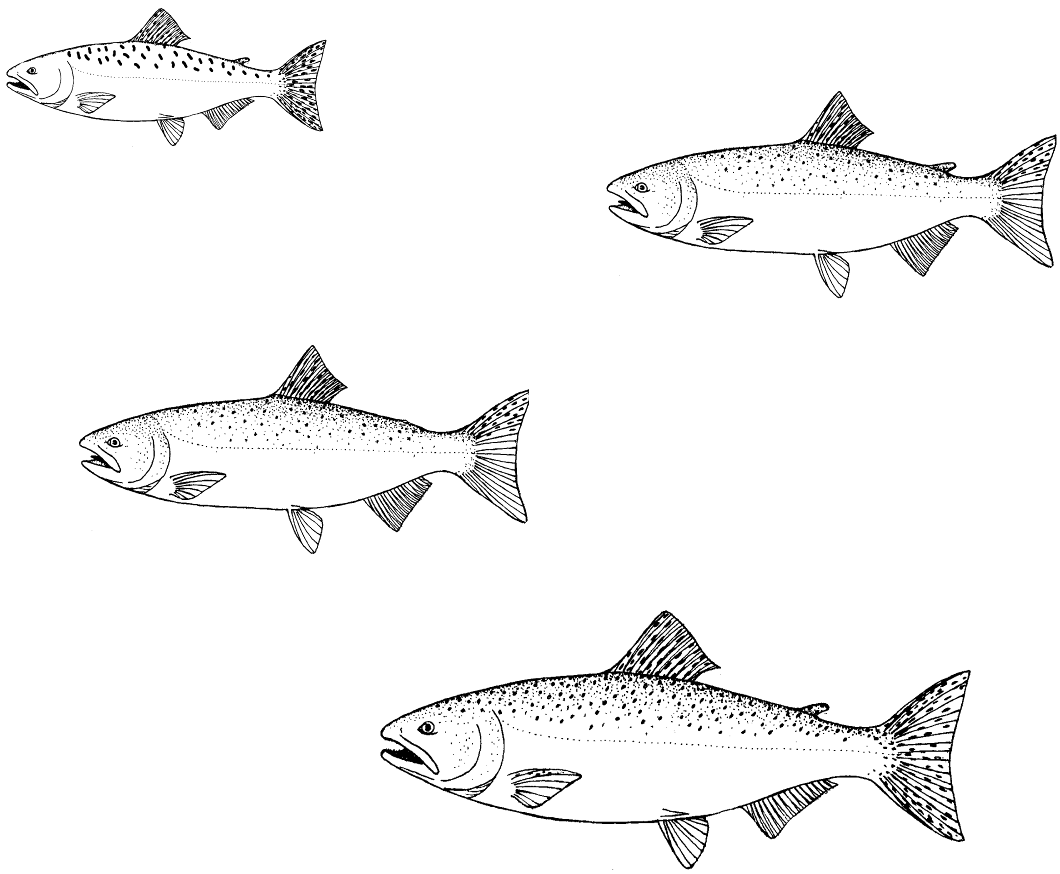
PACIFIC COAST
SALMON FISHERY MANAGEMENT PLAN

FOR COMMERCIAL AND RECREATIONAL SALMON FISHERIES

OFF THE COASTS OF WASHINGTON, OREGON, AND CALIFORNIA

AS REVISED THROUGH AMENDMENT 16

(Effective January 2012)



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LIST OF ACRONYMS [JLI1]AND ABBREVIATIONS

ASETF	Anadromous Salmonid Environmental Task Force
CDFG	California Department of Fish and Game
CRFMP	Columbia River Fish Management Plan
Council	Pacific Fishery Management Council
EA	Environmental Assessment
EEZ	exclusive economic zone (three to 200 miles offshore)
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EFH	essential fish habitat
ESU	Evolutionarily significant unit
FAB	Fisheries Advisory Board (established in *U.S. v. Washington*)
FMP	fishery management plan
FR	Federal Register
FRAM	Fishery Regulation Assessment Model
HC	Habitat Committee
KMZ	Klamath Management Zone
KRSMG	Klamath River Salmon Management Plan
KRTT	Klamath River Technical Team
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSP	maximum sustainable production
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPA	Northwest Power Planning Act
OCN	Oregon coastal natural coho
ODFW	Oregon Department of Fish and Wildlife
OFR	Office of the Federal Register
OPI	Oregon Production Index
OY	optimum yield
PFMC	Pacific Fishery Management Council
PSC	Pacific Salmon Commission
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAS	Salmon Advisory Subpanel
Secretary	Secretary of Commerce
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SRFCRT	Sacramento River Fall Chinook Review Team
SSC	Scientific and Statistical Committee
STT	Salmon Technical Team
TAC	total allowable catch
TALFF	total allowable level of foreign fishing
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife

INTRODUCTION

This document is the *Pacific Coast Salmon Plan,* a fishery management plan (FMP) of the Pacific Fishery Management Council (Council or PFMC) as revised and updated for implementation in 2012. It guides management of commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California.

Since 1977, salmon fisheries in the exclusive economic zone (EEZ) (three to 200 miles offshore) off Washington, Oregon, and California have been managed under salmon FMPs of the Council. Creation of the Council and the subsequent development and implementation of these plans were initially authorized under the Fishery Conservation and Management Act of 1976. This act, now known as the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; MSA), was amended by the Sustainable Fisheries Act (SFA) in 1996, and most recently amended by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) in 2007. The plan presented in this document contains or references all the elements required for an FMP under the MSA. It completely replaces the 1999 version of the *Pacific Coast Salmon Plan*.

The Council's first salmon FMP and its environmental impact statement (EIS) were issued to govern the 1977 salmon season. A new salmon management plan and EIS were issued in 1978 to replace the 1977 documents. To establish management measures from 1979 through 1983, the 1978 FMP was amended annually and published along with a supplemental EIS (SEIS) and Regulatory Impact Review/Regulatory Flexibility Analysis (RIR/RFA). This annual process was lengthy, complex, and costly. It lacked a long-range perspective and was too cumbersome to allow for timely implementation of the annual regulations and efficient fishery management. Therefore, in 1984, the Council adopted a comprehensive framework amendment that was designed to end the need for annual plan amendments and supplemental EISs (PFMC 1984).

The comprehensive framework plan amendment of 1984 (Amendment 6) replaced the 1978 plan as the base FMP document and established a framework of fixed management objectives with flexible elements to allow annual management measures to be varied to reflect changes in stock abundance and other critical factors. Subsequently, at irregular intervals, the Council has developed various amendments to portions of the framework plan to address specific management issues raised by participants in the salmon management process or as necessary to respond to reauthorization of the MSA. The next seven amendments adopted since implementation of the framework FMP in 1984 were accompanied by an environmental assessment (EA). Amendment 14 was accompanied by an SEIS. Amendments 15 and 16 were accompanied by an EA.

The primary amendment issues since 1984 have included specific spawner escapement goals for Oregon coastal natural (OCN) coho and Klamath River fall Chinook (Amendments 7, 9, 11, 13, and 15), non-Indian harvest allocation (Amendments 7, 9, 10, and 14), inseason management criteria (Amendment 7), habitat and essential fish habitat (EFH) definition (Amendments 8 and 14), safety (Amendment 8), status determination criteria (SDC) (Amendments 10, 14, and 16), management objectives for stocks listed under the Endangered Species Act (ESA) (Amendments 12 and 14), bycatch reporting and priorities for avoiding bycatch (Amendment 14), selective fisheries (Amendment 14), stock classification (Amendment 16), annual catch limits (ACLs) and accountability measures (AMs) (Amendment 16), *de minimis* fishing provisions (Amendments 15 and 16).

In 1996, as part of Amendment 12, the Council made an editorial update to the framework FMP that included incorporating all of the amendments after 1984 into the *Pacific Coast Salmon Plan* (PFMC 1997b). Subsequently, the Council modified the OCN coho management goals under Amendment 13 in 1999 (PFMC 1999). The current salmon FMP incorporates changes through Amendment 216, including

Amendment 14 (PFMC 2000a), an extensive revision of the FMP primarily to respond to reauthorization of the MSA and to improve the readability and organization of the plan. Table 1 contains a complete listing of the issues in each amendment through Amendment 16.

This document is the current salmon FMP. Appendix A contains the complete description of essential fish habitat, Appendix B provides a description of the fishery, and Appendix C, which will always be the Council's most current annual review of the ocean fisheries, provides an annual updating of the fishery information. The reader may wish to refer to the original salmon FMP and individual amendment documents for more background and explanatory information, including the environmental impact assessments, EISs, and examples of management options not adopted by the Council.

TABLE 1. Record of salmon FMP documents.

DOCUMENT	CONTENT SUMMARY
Final 1977 Plan	Initial FMP/EIS document for the 1977 salmon season.
Final 1978 Plan (43 FR 29791, July 11, 1978) Effective July 11, 1978[1/]	Initial, comprehensive FMP/EIS document. Amended each year to establish annual management measures for 1979-1983.
Final Framework Amendment (49 FR 43679, Oct. 31, 1984) Effective Nov. 25, 1984[1/]	Comprehensive amendment and SEIS that replaced the 1978 Plan as a multi-year FMP document.
Technical amendments:	1) Spawner escapement goals, procedures to modify spawner goals, and inseason modification of daily bag limits (50 FR 812, Jan. 7, 1985) 2) Inseason rescission of automatic closures (50 FR 4977, Feb. 5, 1985) 3) Season opening and closing dates (50 FR 42529, Oct. 21, 1985)
Amendment 7 (52 FR 4146, Feb. 10, 1987) Effective Mar. 8, 1987	1) Sliding scale OCN coho spawner escapement goal 2) Inseason management actions and procedures 3) Coho harvest allocation south of Cape Falcon
Amendment 8 (53 FR 30285, Aug. 11, 1988) Effective Aug. 8, 1988; required no implementing regulations	1) Habitat policy and objectives 2) Consideration of temporary season adjustments for vessels precluded from harvesting due to unsafe weather
Amendment 9 (54 FR 19185, May 4, 1989) Effective May 1, 1989; except radio report section implemented July 13, 1989 (54 FR 29730, July 14, 1989)	1) Klamath River fall Chinook harvest rate spawner escapement goal 2) Commercial/recreational harvest allocation north of Cape Falcon 3) Inseason notice procedures 4) Steelhead management intent 5) Radio reporting requirements for commercial fishers 6) Deleted limitations on season opening and closing dates
Clarifying letter:	to Mr. Rolland Schmitten re harvest allocation, Issue 2; Feb. 27, 1989
Technical amendment:	Minor modification of Klamath spawner goal based on Council recommendation, March 8, 1989 (54 FR 19800, May 8, 1989 and 59 FR 23000, May 4, 1994)
Amendment 10 (56 FR 26774, June 11, 1991) Effective July 11, 1991	1) Inseason reallocation objectives for commercial and recreational fisheries south of Cape Falcon 2) Criteria guiding non-Indian catch allocation north of Cape Falcon, especially concerning recreational port allocation 3) Definition of overfishing
Amendment 11 (59 FR 23013, May 4, 1994) Effective April 29, 1994	OCN coho spawner escapement goal of 42 spawners/mile, incidental exploitation rate of 20% or less on OCN coho at low stock sizes and sport coho harvest allocation criteria at low harvest levels.
Clarifying letter:	to Mr. Gary Smith re incidental harvest and sport allocation; Apr. 15, 1994
Technical amendment:	Minor modification of Klamath spawner goal to meet tribal allocation based on Council recommendation of April 11, 1996 (61 FR 20186, May 6, 1996)
Amendment 12 (62 FR 35450, July 1, 1997) Effective July 31, 1997	1) Procedures governing retention of salmon bycatch in trawl nets 2) Management objectives for ESA listed salmon species 3) Update of the salmon FMP (no change in management objectives)
Amendment 13 (64 FR 26328, May 14, 1999)	Revision of management objectives for OCN coho to increase the probability of recovery and to prevent listing under the ESA.

Effective June 14, 1999)	
Amendment 14 (66 FR 29238, May 30, 2001; Effective June 29, 2001)	1) Update of the EIS and editorial improvements in the plan 2) New requirements of the SFA, including essential fish habitat, optimum yield, overfishing, and bycatch 3) Clarification of the stocks managed and management objectives 4) Minor revision of allocation north of Cape Falcon to allow more harvest in selective fisheries
Amendment 15 (73 FR 9960, February 25, 2008; Effective March 26, 2008)	Revision of Council action required under a Conservation Alert for Klamath River fall Chinook to allow *de minimis* fisheries.
Amendment 16 (???)	1) New requirements of the MSRA, including stock classification, ACLs and AM 2) Revision of SDC 3) Development and modification of <u>*de minimis*</u> fishing provisions.

1 WHAT THE PLAN COVERS

> *"It is therefore declared to be the purposes of the Congress in this ActB(1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States, and the anadromous species and Continental Shelf Fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone . . ., and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species and Continental Shelf fishery resources . . .(7) to promote the protection of essential fish habitat in the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat."*
>
> *Magnuson-Stevens Act, ' 2*(b)

This fishery management plan (FMP) covers the coastwide aggregate of natural and hatchery salmon species that is contacted by salmon fisheries in the exclusive economic zone (EEZ) off the coasts of Washington, Oregon, and California. Salmon of U.S. and Canadian origin are included except when specific species are managed in those waters by another management entity with primary jurisdiction (i.e., sockeye and pink salmon by the Fraser River Panel of the Pacific Salmon Commission (PSC) in the Fraser River Panel Area (U.S.) between 49°N latitude and 48°N latitude). In addition, the plan contains requirements and recommendations with regard to essential fish habitat for the managed stocks as described in Chapter 4 and Appendix A. The essential fish habitat includes marine areas within the EEZ as well as estuarine and freshwater habitat within the internal waters of Washington, Oregon, California, and Idaho.

Chinook or king salmon (*Oncorhynchus tshawytscha*) and coho or silver salmon (*O. kisutch*) are the main species caught in Council-managed ocean salmon fisheries. In odd-numbered years, catches of pink salmon (*O. gorbuscha*) can also be significant, primarily off Washington and Oregon (PFMC 2011a). Therefore, while all species of salmon fall under the jurisdiction of this plan, it currently contains fishery management objectives only for Chinook, coho, pink (odd-numbered years only), and any salmon species listed under the Endangered Species Act (ESA) that is measurably impacted by Council fisheries.

The plan contains no fishery management objectives for even-numbered year pink salmon, chum (*O. keta*), sockeye (*O. nerka*), steelhead (*O. mykiss*), sea-run cutthroat (*O. clarki*) or spring run Chinook from the mid-Columbia River tributaries (White Salmon, Klickitat, Yakima, Deschutes, John Day, Umatilla, and Walla Walla basins). The Council does not manage fisheries for these species and incidental catches are inconsequential (low hundreds of fish each year) to very rare (PFMC 2011d). In the event this situation should change, management objectives for these species could be developed and incorporated by plan amendment. The incidental harvest of these salmon species can be allowed or restricted under existing federal fishery regulations.

1.1 STOCK CLASSIFICATION

The MSA requires that an FMP describe the species of fish involved in the fishery. The NS1Gs provide a structure for classifying stocks in and around the fishery, and organizing stock complexes. This classification scheme helps conceptualize how the fishery operates, which stocks are affected by various fishery sectors, and how SDC and ACL provisions, among other MSA Section 303(a) provisions, may be applied.

The stocks identified in an FMP are classified as in or out of the fishery, and as target or non-target stocks. Target stocks and some non-target stocks are in the fishery; ecosystem component (ECs) stocks are non-target stocks that are not in the fishery. Individual stocks can also be formed into stock complexes for management and assessment purposes. Stock complexes are groups of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impacts of management actions on the stocks are similar. Stock complexes may be formed to facilitate management requirements such as setting ACLs in a mixed stock fishery. Each stock complex could have one or more indicator stocks to establish annual harvest constraints based on status of those indicator stocks.

To the extent practicable, the Council has partitioned the coastwide aggregate of Chinook, coho, and pink salmon into various stock components and complexes with specific conservation objectives. A detailed listing of the individual stocks and stock complexes managed under this plan are provided in Tables 1-1, 1-2, and 1-3.

1.2 Changes or Additions

The following classification actions will require an FMP amendment: adding stocks to the FMP either to the fishery or as EC species, removing stocks from the FMP, and reclassifying stocks as either in the fishery or as an EC species. The following actions will not require an FMP amendment as long as the stocks and complex remain in their original designation (in the fishery or EC): composition of stock complexes, specification of indicator stocks for complexes, identification as target or non-target stocks. All of these actions require a comprehensive technical review of the best scientific information available providing evidence that, in the view of the Salmon Technical Team (STT), Scientific and Statistical Committee (SSC), and the Council, such modifications are justified. Insofar as possible, proposed changes for natural stocks will be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November Council meeting prior to the year in which the proposed changes would be effective) and prior to the preseason planning process. The additional following actions will not require an FMP amendment: changes or additions involving ESA-listed stocks upon the recommendation of NMFS, changes or additions involving hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities; and Federal court-ordered changes.

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 1of 4)

Stocks and Complexes In The Fishery			
Stock or Stock Complex	**Component Stocks**	**Description**	**Target/Non-Target**
Central Valley Fall Chinook Stock Complex		Fall and late fall Chinook from the Sacramento and San Joaquin basins; the indicator stock is Sacramento River Fall Chinook.	
	Sacramento River Fall	Primarily hatchery stock with smaller natural component. Single largest contributor to ocean fisheries off California, a significant contributor off southern and central Oregon, and present north into British Columbia. Primary impact south of Pt. Arena; considerable overlap with coastal and Klamath River fall Chinook between Pt. Arena and Horse Mt.	Target
	Sacramento River Late Fall	Natural and hatchery components from upper Sacramento basin. Minor contributions to ocean fisheries.	Target
	San Joaquin River Fall	Natural and hatchery components. Minor contributions to ocean fisheries.	Target
Sacramento River Spring		ESA listed Threatened. Minor contributions to ocean fisheries off California, also known to occur off Oregon.	Non-Target ESA
Sacramento River Winter		ESA listed Endangered. Minor contributions to ocean fisheries south of Pt. Arena.	Non-Target ESA
California Coastal Chinook		ESA listed Threatened. Eel, Mattole, Mad Rivers fall and spring stocks. Minor contributions to ocean fisheries off northern California and southern Oregon.	Non-Target ESA
Southern Oregon Northern California Chinook Stock Complex		Natural and hatchery stocks south of the Elk River, Oregon to, and including, the Klamath River, plus Umpqua River spring Chinook; the indicator stock is Klamath River fall Chinook.	
	Klamath River Fall	Natural and hatchery components from the Klamath basin. Major contributions to ocean fisheries from Humbug Mt. to Horse Mt. and to Klamath River tribal and recreational fisheries. Significant contributions to ocean fisheries from Cape Falcon to Pt. Sur.	Target
	Klamath River - Spring	Natural and hatchery components from the Klamath basin. Minor contributions to ocean fisheries from Cape Falcon to Pt. Sur.	Non-Target
	Smith River	Natural spring and fall stocks from the Smith River basin. Minor contributions to ocean fisheries off northern California and Oregon.	Non-Target
	Southern Oregon	Aggregate of natural and hatchery fall and spring stocks in all streams south of Elk River, plus Umpqua spring stock; Rogue River fall stock is used to indicate relative abundance and ocean contribution rates. Significant contributions to ocean fisheries off northern California and Oregon.	Target

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 2 of 4)

Stocks and Complexes In The Fishery				
Stock or Stock Complex	**Component Stocks**	**Description**	**Target/Non-Target**
Far-North-Migrating Coastal Chinook Stock Complex		Spring/summer and fall stocks from the Central and Northern Oregon Coast (from the Elk River north, except Umpqua River spring Chinook), and spring/summer and fall coastal stocks north of the Columbia River. Indicator stocks for this complex would be Quillayute, Hoh, Queets, and Grays Harbor fall Chinook. These stocks are subject to provisions of the Pacific Salmon Treaty.	
	Central and Northern Oregon	Aggregate of natural and hatchery fall and spring stocks in all streams from the Elk River to just south of the Columbia River. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off northern Oregon and Washington.	Non-Target
	Willapa Bay Fall (natural)	Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Willapa Bay Fall (hatchery)	Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Grays Harbor Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Grays Harbor Spring	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quinault Fall	Hatchery stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Queets Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Queets Sp/Su	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoh Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoh Spring/Summer	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quillayute Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quillayute Spring/Summer	Hatchery and natural stocks. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoko Summer/Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 3 of 4)

Stocks and Complexes In The Fishery			
Stock or Stock Complex	**Component Stocks**	**Description**	**Target/Non-Target**
North Lewis River Fall		Natural stock. Component of Lower Columbia Chinook ESU - ESA listed Threatened. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon.	Non-Target ESA
Lower River Natural Tule Fall		Component of Lower Columbia Chinook ESU - ESA listed Threatened. Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Non-Target ESA
Lower River Hatchery - Fall		Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Target
Lower River Hatchery Spring		Minor contribution to ocean fisheries north of Cape Falcon and Canada.	Non-Target
Upper Willamette Spring		Natural and hatchery stock. ESA listed Threatened. Minor contribution to ocean fisheries north of Cape Falcon, Canada, and Alaska.	Non-Target ESA
Mid-River Bright Hatchery Fall		Hatchery stock, Significant contribution to ocean fisheries off Canada and Alaska.	Non-Target
Spring Creek Hatchery Fall		Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Target
Mid-Columbia Spring		Natural and hatchery stocks from the White Salmon, Klickitat, Yakima, Deschutes, John Day, Umatilla, and Walla Walla basins. Negligible contribution to ocean fisheries.	Non-Target Ecosystem Component
Snake River Fall		Natural and hatchery stock. ESA listed Threatened. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington and Oregon.	Non-Target ESA
Snake River - Spring/Summer		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Upper River Bright Fall		Natural and hatchery stock. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon. Subject to Pacific Salmon Treaty provisions.	<5%
Upper River Summer		Natural and hatchery stock. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon. Subject to Pacific Salmon Treaty provisions.	<5%
Upper River Spring		Natural and hatchery stock. ESA listed Endangered. Negligible contributions to ocean fisheries.	Non-Target ESA

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 4 of 4)

Stocks and Complexes In The Fishery			
Stock or Stock Complex	**Component Stocks**	**Description**	**Target/Non-Target**
Eastern Strait of Juan de Fuca Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skokomish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Nooksack Spring early		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skagit Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skagit Spring		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Stillaguamish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Snohomish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Cedar River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
White River Spring		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Green River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Nisqually River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA

Table 1-2. Coho stocks and stock complexes identified in the Salmon FMP. (Page 1 of 2)

Stocks and Complexes In The Fishery	Description	Target/Non-Target
Central California Coast	ESA Threatened. ~~Very minor component of OPI area fisheries,~~ limited potential for significant contribution to ocean and inland fisheries. Current impacts incidental in ocean fisheries off California.	Non-Target ESA
Southen Oregon/Northern California Coast	ESA Threatened. Very minor natural component of OPI area fisheries, potential for minor contribution to ocean fisheries off California and southern Oregon, and inland California fisheries.	Non-Target ESA
Oregon Coastal Natural	ESA Threatened. Major natural component of OPI area which, when abundant, contributes to ocean fisheries off ~~California,~~ Oregon, and Washington south of Leadbetter Pt., and freshwater fisheries in Oregon coastal streams.	Non-Target ESA
Lower Columbia Natural	ESA Threatened. Minor natural component of OPI area which, when abundant, contributes to ocean fisheries off Oregon and Washington, and mainstem Columbia River fisheries.	Non-Target ESA
Columbia River Late Hatchery	Hatchery stock. Major component of ocean fisheries north of Cape Falcon. When abundant, significant contributors to ocean fisheries off Oregon north into Canada and Columbia River fisheries	Target
Columbia River Early Hatchery	Hatchery stock. Major component of OPI area fisheries. When abundant, significant contributors to ocean fisheries off California and north to Leadbetter Pt., Washington and to Columbia River fisheries.	Target
Willapa Bay - Hatchery	Minor component of ocean fisheries off northern Oregon north into Canada. Significant contributor to inside commercial net and recreational fisheries.	Target
Grays Harbor	Minor contributor to ocean fisheries off Oregon and north into Canada. Significant contributor to Washington inside tribal fishery, minor contributor to inside recreational fishery.	Target
Quinault - Hatchery	Contributor to ocean fisheries off Washington and north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.	Target
Queets	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.	Target
Quillayute - Summer Hatchery	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target
Quillayute - Fall	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target
Hoh	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target

Table 1-2. Coho stocks and stock complexes identified in the Salmon FMP. (Page 2 of 2)

Stocks and Complexes In The Fishery	Description	Target/Non-Target
Strait of Juan de Fuca	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Hood Canal	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Skagit	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Stillaguamish	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Snohomish	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
South Puget Sound Hatchery	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor off British Columbia, in Puget Sound, and inside tribal fisheries.	Target

Table 1-3. Pink salmon stocks and stock complexes identified in the Salmon FMP. (Page 1 of 1)

Stocks and Complexes In The Fishery	Description	Target/Non-Target
Puget Sound	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to fisheries in Puget Sound, and inside tribal fisheries.	Target

2 ACHIEVING OPTIMUM YIELD

"Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery"

Magnuson-Stevens Act, National Standard I

This chapter explains the Council's means of meeting the requirements of the Magnuson-Stevens Act to achieve the optimum yield from the salmon fishery.

2.1 THEORY

Optimum yield (OY) means the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account protection of marine ecosystems. It is prescribed on the basis of the maximum sustainable yield (MSY) from the fishery, reduced by any relevant economic, social, or ecological factors, and provides for rebuilding of an overfished stock, taking into account the effects of uncertainty and management imprecision.

MSY is a theoretical concept that, for the purposes of the Magnuson-Stevens Act, is defined as the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions. In Council management of naturally spawning salmon stocks, MSY is usually approached in terms of the number of adult spawners associated with this goal. Often, data are insufficient to directly estimate the number of spawners resulting in MSY. In these cases, the Council may use MSY proxies derived from more general estimates of productive capacity and implement harvest strategies that may be expected to result in a long-term average catch approximating MSY.

2.2 IMPLEMENTATION

The optimum yield to be achieved for species covered by this plan is the total salmon catch and mortality (expressed in numbers of fish) resulting from fisheries within the EEZ adjacent to the States of Washington, Oregon, and California, and in the waters of those states (including internal waters), and Idaho, that, to the greatest practical extent within pertinent legal constraints, fulfill the plan's conservation and harvest objectives. On an annual basis, the Council recommends management measures to achieve the stock conservation objectives for each stock or stock complex, based on the estimated MSY, MSY proxy, MSP, rebuilding schedule, or ESA consultation standard (Chapter 3), while simultaneously seeking to fulfill, to the extent practicable, the harvest and allocation objectives (Chapter 5) that reflect the Council's social and economic considerations. The subsequent catch and mortality resulting under the Council's management recommendations will embody the optimum yield. The level of total allowable harvest, the relative harvest levels in various management areas, and the species and stock composition of optimum yield will vary annually, depending on the relative abundance and distribution of the various stocks and contingencies in allocation formulas.

The Council's annual ocean fishery reviews and preseason reports (e.g., STT 2011a, 2011b, 2011c, and 2011d) assess and specify the present and historical range of harvests and harvest related mortalities that represent the optimum yield. A similar range of yields can be expected in the future, though further stock declines and listings under the ESA could result in even lower levels than experienced prior to 2009.

3 CONSERVATION

"Conservation and management measures shall be based upon the best scientific information available."

Magnuson-Stevens Act, National Standard 2

3.1 STATUS DETERMINATION CRITERIA

"Any fishery management plan . . . shall . . . specify objective and measurable criteria for identifying when the fishery . . . is overfished . . . and, . . . contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;"

Magnuson-Stevens Act, '§303(a)(10)

"Overfishing (to overfish) occurs whenever a stock or stock complex is subjected to a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis"

NS1Gs (600.310 (e)(2)(i)(B))

Overfished. A stock or stock complex is considered ''overfished'' when its biomass has declined below a level that jeopardizes the capacity of the stock or stock complex to produce MSY on a continuing basis.

NS1Gs (600.310 (e)(2)(i)(E))

"A fishery shall be classified as approaching a condition of being overfished if, based on trends in fishing effort, fishery resource size, and other appropriate factors, the Secretary estimates that the fishery will become overfished within two years."

Magnuson-Stevens Act, §304(e)(1)

In establishing criteria by which to determine the status of salmon stocks, the Council must consider the uncertainty and theoretical aspects of MSY as well as the complexity and variability unique to naturally producing salmon populations. These unique aspects include the interaction of a short-lived species with frequent, sometimes protracted, and often major variations in both the freshwater and marine environments. These variations may act in unison or in opposition to affect salmon productivity in both positive and negative ways. In addition, variations in natural populations may sometimes be difficult to measure due to masking by artificially produced salmon.

3.1.1 General Application to Salmon Fisheries

In establishing criteria from which to judge the conservation status of salmon stocks, the unique life history of salmon must be considered. Chinook, coho, and pink salmon are short-lived species (generally two to six years) that reproduce only once shortly before dying. Spawning escapements of coho and pink salmon are dominated by a single-year class and Chinook spawning escapements may be dominated by no more than one or two-year classes. The abundance of year classes can fluctuate dramatically with combinations of natural and human-caused environmental variation. Therefore, it is not unusual for a healthy and relatively abundant salmon stock to produce occasional spawning escapements which, even with little or no fishing impacts, may be significantly below the long-term average associated with the production of MSY.

Numerous West Coast salmon stocks have suffered, and continue to suffer, from an onslaught of nonfishing activities that severely reduce natural survival by such actions as the elimination or degradation of freshwater spawning and rearing habitat. The consequence of this man-caused, habitat-based variation is twofold. First, these habitat changes increase large scale variations in stock productivity and associated stock abundances, which in turn complicate the overall determination of MSY and the specific assessment of whether a stock is producing at or below that level. Secondly, as the productivity of the freshwater habitat is diminished, the benefit of further reductions in fishing mortality to improve stock abundance decreases. Clearly, the failure of several stocks managed under this FMP to produce at an historic or consistent MSY level has little to do with current fishing impacts and often cannot be rectified with the cessation of all fishing.

To address the requirements of the Magnuson-Stevens Act, the Council has established criteria based on biological reference points associated with MSY exploitation rate and MSY spawning escapement. The criteria are based on the unique life history of salmon and the large variations in annual stock abundance due to numerous environmental variables. They also take into account the uncertainty and imprecision surrounding the estimates of MSY, fishery impacts, and spawner escapements. In recognition of the unique salmon life history, the criteria differ somewhat from the general guidance in the National Standard 1 Guidelines (§600.310).

3.1.2 Overfishing

A stock will be considered subject to overfishing when the postseason estimate of F_t exceeds the MFMT, where the MFMT is defined as $F_{MSY.}$ Stock-specific estimates of F_{MSY} based on spawner-recruit data will be used if available. Otherwise, a species-specific proxy value of F_{MSY} = 0.78 for Chinook based on species-specific meta-analyses, will be used (PFMC 2011e). Stock-specific overfishing determinations will be made annually and are based on exploitation during a single biological year.

3.1.2.1 Council Action

MSA quote[JLI2]

Overfishing occurs when the total exploitation rate on a stock exceeds F_{MSY} in a single year. Because salmon are exploited in multiple fisheries, it is necessary to determine fishery specific contribution to the total exploitation rate to determine the actions necessary to end and prevent future overfishing. As the Council has no jurisdiction over river fisheries and ocean fisheries north of the U.S./Canada border, it may be necessary for other responsible entities to take action to end and prevent future overfishing.

The STT will report postseason exploitation rates in the annual SAFE document, and when overfishing occurs, the Council shall:

1) notify the NMFS NWR administrator of the STT's findings;
2) direct the STT to assess the mortality rates in fisheries impacting the stock of concern and report their findings;
3) immediately take action to ensure Council area fisheries are not contributing to overfishing, and;
4) notify pertinent management agencies of the stock's status and the contribution of various fisheries to the total exploitation rate.

3.1.3 Approaching an Overfished Condition

An approaching overfished determination will be made if the geometric mean of the two most recent postseason estimates of spawning escapement, and the current preseason forecast of spawning escapement, is below the MSST. Stock-specific approaching overfished determinations will be made annually following development of the preseason spawning escapement forecasts.

3.1.3.1 Council Action

When a stock is approaching an overfished condition the Council shall:

1) notify the NMFS NWR administrator of this situation;
2) notify pertinent management entities, and;
3) structure Council area fisheries to avoid the stock becoming overfished and to mitigate the effects on stock status.

3.1.4 Overfished

"For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations… for such fishery shallB(A) specify a time period for ending overfishing and rebuilding the fishery that shall:(i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of the fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem; and (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise…."

Magnuson-Stevens Act, §304(e)(4)

A stock will be considered overfished if the 3-year geometric mean of annual spawning escapements falls below the MSST, defined as 0.5*S_{MSY}. Overfished determinations will be made annually using the three most recently available postseason estimates of spawning escapement.

3.1.4.1 Council Action

MSA quote[JLI3]

When the overfished status determination criteria set forth in this FMP have been triggered, the Council shall:

1) notify the NMFS NWR administrator of this situation;
2) notify pertinent management entities;
3) structure Council area fisheries to reduce the likelihood of the stock remaining overfished and to mitigate the effects on stock status;
4) direct the STT to propose a rebuilding plan for Council consideration within one year.

Upon formal notification from NMFS to the Council of the overfished status of a stock, a rebuilding plan must be developed and implemented within two years.

The STT's proposed rebuilding plan will include:

1) an evaluation of the roles of fishing, marine and freshwater survival in the determination;
2) any modifications to the criteria set forth in section 3.4.6 below for determining when the stock has rebuilt,
3) recommendations for actions the Council could take to rebuild the stock to S_{MSY}, including modification of control rules and;
4) a specified rebuilding period.

In addition, the STT may consider and make recommendations to the Council or other management entities for reevaluating the current estimate of S_{MSY}, modifying methods used to forecast stock abundance or fishing impacts, improving sampling and monitoring programs, or improving hatchery practices.

Based on the results of the STT proposed rebuilding plan, and subject to Secretarial approval, the Council will implement a rebuilding plan with appropriate actions to ensure the stock is rebuilt in as short a time as possible based on the biology of the stock but not to exceed ten years, while taking into consideration the needs of the commercial, recreational and tribal fishing interests and coastal communities. The existing control rules provide a default rebuilding plan that targets spawning escapement at or above MSY provided sufficient recruits are available and targets a rebuilding period of one generation (two years for pink salmon, 3 years for coho, and 5 years for Chinook). If sufficient recruits are not available to achieve MSA spawning escapement in a particular year, the control rules provide for *de minimis* exploitation rates that allow continued participation of fishing communities while minimizing risk of overfishing. However, the Council should consider the specific circumstances surrounding an overfished determination and endure that whatever rebuilding plan is adopted addresses all relevant issues.

Even if fishing is not the primary factor in the depression of the stock, the Council must act to limit the exploitation rate of fisheries within its jurisdiction so as not to limit rebuilding of the stock or fisheries. In cases where no action within Council authority can be identified which has a reasonable expectation of contributing to the rebuilding of the stock in question, the Council will identify the actions required by other entities to recover the depressed stock. Due to a lack of data for some stocks, environmental variation, economic and social impacts, and habitat losses or problems beyond the control or management authority of the Council, it is possible that rebuilding of depressed stocks in some cases could take much longer than ten years. The Council may change analytical or procedural methodologies to improve the accuracy of estimates for abundance, harvest impacts, and MSY escapement levels, and/or reduce ocean harvest impacts when it may be effective in stock recovery. For those causes beyond Council control or expertise, the Council may make recommendations to those entities which have the authority and expertise to change preseason prediction methodology, improve habitat, modify enhancement activities, and re-evaluate management and conservation objectives for potential modification through the appropriate Council process.

In addition to the STT assessment, the Council may direct its Habitat Committee (HC) to work with federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame. However, this action would be a priority only if the STT evaluation concluded that freshwater survival was a significant factor leading to the overfished determination. Upon review of the report from the HC, the Council will take actions to promote any solutions to the identified habitat problems.

3.1.5 Not Overfished-Rebuilding

After an overfished status determination has been triggered, once the stock's 3-year geometric mean of spawning escapement exceeds the MSST, but remains below S_{MSY}, the stock status will be recognized as "not overfished-rebuilding". This status level requires no Council action, but rather is used to indicate that stock's status has improved from the overfished level but the stock has not yet rebuilt.

3.1.6 Rebuilt

The criterion for determining that an overfished stock is rebuilt is when the 3-year geometric mean spawning escapement exceeds S_{MSY}; the Council may consider additional criteria for rebuilt status when developing a rebuilding plan, subject to Secretarial approval.

Because abundance of salmon populations can be highly variable, it is possible for a stock to rebuild from an overfished condition to the default rebuilding criterion in as little as one year, before a proposed rebuilding plan could be brought before the Council.

In some cases it may be important to consider other factors in determining rebuilt status, such as population structure within the stock designation. The Council may also want to specify particular strategies or priorities to achieve rebuilding objectives. Specific objectives, priorities, and implementation strategies should be detailed in the rebuilding plan. Adoption of a rebuilding plan will require implementation either through an FMP amendment or notice and comment rule-making process.

3.1.6.1 Council Action

When a stock is determined to be rebuilt, the Council shall:

1) notify the NMFS NWR administrator of its finding, and;
2) notify pertinent management entities.

3.1.7Changes or Additions Status determination criteria are defined in terms of biologically-based reference points, or population parameters, specifically, SMSY, FMSY, and MSST. These reference points are generally regarded as fixed quantities and are the basis for the harvest control rules, which provide the operative guidance for the annual preseason planning process used to establish salmon fishing seasons that achieve optimum yield. If a comprehensive technical review of the best scientific information available provides evidence that, in the view of the STT, SSC, and the Council, justifies a modification, then changes to these how status determination criteria are defined (i.e., changes to these reference points) must be made through a plan amendment. Insofar as possible, proposed reference point changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the year in which the proposed changes would be effective) and apart from the preseason planning process. SDC reference points that may be changed without an FMP amendment include changes to: reference point objectives for hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities; and Federal court-ordered changes. All modifications would be documented through the salmon methodology review process, and/or the Council's preseason planning process.

3.2 SALMON STOCK CONSERVATION OBJECTIVES

"To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination"
Magnuson-Stevens Act, National Standard 3

To achieve optimum yield, prevent overfishing, and assure rebuilding of salmon stocks whose abundance have been depressed to an overfished level, this plan establishes, to the extent practicable, conservation objectives to perpetuate the coastwide aggregate of salmon stocks covered by the plan (Chapter 1). The Council's stock conservation objectives (to be achieved annually) and other pertinent stock management information are contained in Table 3-1. Specific objectives are listed for natural and hatchery stocks that are part of the Council's preseason fishery alternative development process (Chapter 9), including all relevant stocks listed under the Federal ESA. The objectives may be applicable to a single stock independently or to an indicator stock or stocks for a stock complex. Stocks that are not included in the preseason analyses may lack specific conservation objectives because the stock is not significantly impacted by ocean fisheries or insufficient management information is available from which to assess ocean fishery impacts directly. In the latter case, the stock will be included in a stock complex and the conservation objective for an indicator stock will provide for the conservation of closely related stocks unless, or until, more specific management information can be developed.

3.2.1 Basis

The Council's conservation objectives for natural stocks may (1) be based on estimates for achieving MSY or an MSY proxy, or (2) represent special data gathering or rebuilding strategies to approach MSY and to eventually develop MSY objectives. The objectives have generally been developed through extensive analysis by the fishery management entities with direct management authority for the stock, or through joint efforts coordinated through the Council, or with other state, tribal, or federal entities. Most of the objectives for stocks north of Cape Falcon have been included in U.S. District Court orders. Under those orders for Washington coastal and Puget Sound stocks (Hoh v. Baldrige No. 81-742 [R] C and U.S. v. Washington, 626 F. Supp. 1405 [1985]), the treaty tribes and WDFW may agree to annual spawner targets or other objectives that differ from the MSY objectives. Details of the conservation objectives in effect at the time this FMP was approved are available in PFMC (1984), in individual amendment documents (see Table 1 in the Introduction), and as referenced in Table 3-1. Updated conservation objectives and ESA consultation standards are available in the most recent Preseason Report I, (Appendix A), and Preseason Report III (Table 5) produced by the STT.

The Council’s conservation objectives are generally expressed in terms of an annual fishery or spawning escapement estimated to be optimum for producing MSY over the long-term. The escapement objective may be (1) a specific number or a range for the desired number of adult spawners (spawner escapement), (2) a specific number or range for the desired escapement of a stock from the ocean or at another particular location, such as a dam, that may be expected to result in the target number of spawners, or (3) based on the exploitation rate that would produce MSY over the long-term. Objectives may be expressed as fixed or stepped exploitation or harvest rates and may include spawner floors or substantially reduced harvest rates at low abundance levels, or as special requirements provided in NMFS consultation standards for stocks listed under the ESA.

3.2.2 Changes or Additions

Conservation objectives generally are fixed quantities intended to provide the necessary guidance during the course of the annual preseason planning process to establish salmon fishing seasons that achieve optimum yield. Changes or additions to conservation objectives may be made either through a plan amendment or regulatory process if a comprehensive technical review of the best scientific information available provides evidence that, in the view of the Salmon Technical Team (STT), Scientific and Statistical Committee (SSC), and the Council, justifies a modification. Insofar as possible, proposed changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the year in which the proposed changes would be effective) and apart from the preseason planning process. The Council may change conservation objectives for hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities. Federal court-ordered changes in conservation objectives will also be accommodated without a plan amendment. The applicable annual objectives of Council-adopted rebuilding programs and the requirements of consultation standards promulgated by NMFS under the ESA may be employed without plan amendment to assure timely implementation. All of these changes will be documented during the Council’s preseason planning process.

The Council considers established conservation objectives to be stable and a technical review of biological data must provide substantial evidence that a modification is necessary. The Council's approach to conservation objectives purposely discourages frequent changes for short-term economic or social reasons at the expense of long-term benefits from the resource. However, periodic review and revision of established objectives is anticipated as additional data become available for a stock or stock complex.

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 1 of 5)

CHINOOK					
Stocks In The Fishery	**Conservation Objective**	S_{MSY}	MSST	F_{MSY}	ACL
Sacramento River Fall Indicator stock for the Central Valley fall (CVF) Chinook stock complex.	122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).	122,000	61,000	78% Proxy (SAC 2010a)	Based on F_{ABC} and annual ocean abundance. F_{ABC} is F_{MSY} reduced by Tier 2 (10%) uncertainty
Sacramento River Spring ESA Threatened	NMFS ESA consultation standard/recovery plan: Conform to Sacramento River Winter Chinook ESA consultation standard (no defined objective for ocean management prior to listing).	Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Sacramento River Winter ESA Endangered	NMFS ESA consultation standard/recovery plan: Recreational seasons: Point Arena to Pigeon Point between the first Saturday in April and the second Sunday in November; Pigeon Point 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. Commercial seasons: Point Arena to the U.S./Mexico border between May 1 and September 30, except Point Reyes to Point San Pedro between October 1 and 15 (Monday through Friday). Minimum size limit ≥ 26 inches total length. Guidance from NMFS in 2010 and 2011 required implementation of additional closures and/or increased sized limits in the recreational fishery South of Point Arena. A new winter-run management framework and consultation standard is expected to be in place for the 2012 fishing season, or no later than March 1, 2012. (NMFS ESA Guidance for 2011).	Undefined	Undefined	Undefined	
California Coastal Chinook ESA Threatened	NMFS ESA consultation standard/recovery plan: Limit ocean fisheries to no more than a 16.0 age-4 ocean harvest rate on Klamath River fall Chinook.	Undefined	Undefined	Undefined	
Klamath River Fall Indicator stock for the Southern Oregon Northern California (SONC) Chinook stock complex.	At least 32% of potential adult natural spawners, but no fewer than 40,700 naturally spawning adults in any one year. Brood escapement rate must average at least 32% over the long-term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Natural area spawners to maximize catch estimated at 40,700 adults (Salmon Technical Team, 2005).	40,700	20,350	72% (STT 2005)	Based on F_{ABC} and annual ocean abundance. F_{ABC} is F_{MSY} reduced by Tier 1 (5%) uncertainty
Klamath River - Spring	Undefined	Undefined	Undefined	Undefined	Undefined - Deferred to SONC complex indicator stock(s)
Smith River	Undefined	Undefined	Undefined	Undefined	
Southern Oregon	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982) measured by 60-90 fish per mile in index streams. ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	60 fish per mile in index streams	30 fish per mile in index streams	Undefined	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 2 of 5)

Central and Northern Oregon	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982) measured by 60-90 fish per mile in index streams. ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.		60 Fish per mile in index streams	30 Fish per mile in index streams	Undefined	Undefined - Deferred to FNMC complex indicator stock(s)
Willapa Bay Fall	Undetermined in FMP. WDFW spawning escapement objective of 4,350.		Undefined	Undefined	Undefined	
Grays Harbor FallIndicator stock for the Far North Migrating Coastal (FNMC) Chinook stock complex	14,600 natural adult spawners--MSP based on full seeding of spawning and rearing habitat (WDF 1979).	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders.	14,600	7,300	78% Proxy(SAC 2010a)	Undefined - International exception to ACL requirements, deferred to PST management constraints.
Queets Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).		2,500	1,250	78% Proxy (SAC 2010a)	
Hoh Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).		1,200	600	78% Proxy (SAC 2010a)	
Quillayute Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).		3,000	1,500	78% Proxy (SAC 2010a)	
Hoko Summer/Fall Indicator stock for the FNMC Chinook stock complex	850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults used for supplementation program.		850	425	78% Proxy (SAC 2010a)	
Grays Harbor Spring	1,400 natural adult spawners.		1,400	700	78% Proxy (SAC 2010a)	Undefined - Deferred to FNMC complex indicator stock(s)
Queets Sp/Su	Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.		700	350	78% Proxy (SAC 2010a)	
Hoh Spring/Summer	Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.		900	450	78% Proxy (SAC 2010a)	
Quillayute Spring/Summer	1,200 natural adult spawners for summer component (MSY).		1,200	600	Undefined	
Willapa Bay Fall (hatchery)	8,200 adult return to hatchery. WDFW spawning escapement objective of 9,800 hatchery spawners.		Not applicable to hatchery stocks			
Quinault Fall (hatchery)	Hatchery production.					

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 3 of 5)

North Lewis River Fall	NMFS consultation standard/recovery plan. McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.	5,700	Undefined - Deferred to ESA consultation standard.	76%	Undefined - Deferred to ESA consultation standard.
Lower River Natural Tule Fall	NMFS consultation standard/recovery plan. Less than 37.0% Total AEQ fishery exploitation rate; 2011 ESA guidance.	Undefined		Undefined	
Snake River Fall	NMFS consultation standard/recovery plan. No more than 70.0% of 1988-1993 base period AEQ exploitation rate for all ocean fisheries.	Undefined		Undefined	
Upper Willamette Spring	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Upper River Spring	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Snake River - Spring/Summer	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Lower River Hatchery - Fall	12,600 adults for hatchery egg-take.	Not applicable to hatchery stocks			
Lower River Hatchery Spring	2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.				
Mid-River Bright Hatchery Fall	4,700 adults for Bonneville Hatchery and 2,000 for Little White Salmon Hatchery egg-take.				
Spring Creek Hatchery Fall	7,000 adults to meet hatchery egg-take goal.				
Mid-Columbia Spring					
Upper River Bright Fall	40,000 natural bright adults above McNary Dam (MSY proxy adopted in 1984 based on CRFMP). The management goal has been increased to 60,000 by Columbia River managers in recent years.	39,625 (Langness and Reidinger 2003)	19,812	85.91% (Langness and Reidinger 2003)	Undefined - International exception to ACL requirements, deferred to PST management constraints
Upper River Summer	Hold ocean fishery impacts at or below base period; recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).	12,143 (CTC 1999)	6,071	75% (CTC 1999)	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 4 of 5)

Eastern Strait of Juan de Fuca Summer/Fall	NMFS consultation standard/recovery plan. No more than 10.0% Southern U.S. (SUS) Rebuilding Exploitation Rate (RER) for the Elwha Riverand for the Dungeness River. 2011 comanagers Resource Management Plan (RMP)	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of U.S. v. Washington and subsequent U.S. District Court orders.	Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Skokomish Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Mid Hood Canal Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% preterminal SUS CERC. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Nooksack Spring early	NMFS consultation standard/recovery plan. No more than 7.0% SUS CERC. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Skagit Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Skagit Spring	NMFS consultation standard/recovery plan. No more than 38.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Stillaguamish Summer/Fall	NMFS consultation standard/recovery plan. No more than 25.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Snohomish Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% SUS RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Cedar River Summer/Fall	NMFS consultation standard/recovery plan. No more than 20.0% SUS RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
White River Spring	NMFS consultation standard/recovery plan. No more than 20.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Green River Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% preterminal SUS RER, at least 5,800 adult spawners.		Undefined	Undefined	Undefined	
Nisqually River Summer/Fall	NMFS consultation standard/recovery plan. No more than 65.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Puyallup Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 5 of 5)

COHO						
Stocks In The Fishery	**Conservation Objective**		SMSY	MSST	FMSY	ACL
Central California Coast ESA Threatened	NMFS ESA consultation standard/recovery plan: No retention of coho south of the OR/CA border.		Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Southen Oregon/Northern California Coast ESA Threatened	NMFS ESA consultation standard/recovery plan: No more than a 13.0% AEQ exploitation rate in ocean fisheries on Rogue/Klamath hatchery coho.		Undefined	Undefined	Undefined	
Oregon Coastal Natural ESA Threatened	NMFS ESA consultation standard/recovery plan: Total AEQ exploitation rate limit based on parnetal seeding level and marine survival matrix in FMP Table 3-2.		Undefined	Undefined	Undefined	
Lower Columbia Natural ESA Threatened	NMFS ESA consultation standard/recovery plan: AEQ exploitation rate limit on ocean and mainstem Columbia fisheries indentified in annual NMFS guidance.		Undefined	Undefined	Undefined	
Columbia River Late Hatchery	Hatchery rack return goal of 14,200 adults.		Not applicable to hatchery stocks			
Columbia River Early Hatchery	Hatchery rack return goal of 6,200 adults.					
Willapa Bay - Hatchery	Hatchery rack return goal of 6,100 adults.					
Quinault - Hatchery	Hatchery production.					
Quillayute - Summer Hatchery	Hatchery production.					
South Puget Sound Hatchery	Hatchery rack return goal of 52,000 adults.					
Grays Harbor	35,400 natural adult spawners (MSP based on WDF [1979])	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of Hoh v. Baldrige, U.S. v. Washington, or subsequent U.S. District Court orders	35,400 (WDF 1979)	17,700	69% (PFMC 2011e)	Undefined - International exception to ACL requirements, deferred to PST management constraints
Queets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle et al 1984)		5,500 (SAC 2010b)	2,750	68% (PFMC 2011e)	
Hoh	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle et al. 1984)		2,520 (SAC 2010b)	1,260	69% (PFMC 2011e)	
Quillayute - Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle et al. 1984)		5,873 (SAC 2010b)	2,936	59% (PFMC 2011e)	
Strait of Juan de Fuca	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 27,445; 0.40 for ocean age-3 abundance >11,679 and ≤27,445; 0.20 for ocean age-3 abundance ≤11,679		10,978 (WDF 1979)	17,700	60% (PFMC 2011e)	
Hood Canal	Total allowable MSY exploitation rate of: 0.65 for ocean age-3 abundance > 41,000; 0.45 for ocean age-3 abundance >19,545 and ≤41,000; 0.20 for ocean age-3 abundance ≤19,545		14,350 (PFMC 2011e)	2,750	65% (PFMC 2011e)	
Skagit	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 62,500; 0.35 for ocean age-3 abundance >22,857 and ≤62,500; 0.20 for ocean age-3 abundance ≤22,857		25,000 (PFMC 2011e)	12,250	60% (PFMC 2011e)	
Stillaguamish	Total allowable MSY exploitation rate of: 0.50 for ocean age-3 abundance > 20,000; 0.35 for ocean age-3 abundance >9,385 and ≤20,000; 0.20 for ocean age-3 abundance ≤9,385		10,000 (PFMC 2011e)	5,000	50% (PFMC 2011e)	
Snohomish	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 125,000; 0.40 for ocean age-3 abundance >51,667 and ≤125,000; 0.20 for ocean age-3 abundance ≤51,667		50,000 (PFMC 2011e)	25,000	60% (PFMC 2011e)	

3.3 HARVEST CONTROLS

Control rules are used to manage the harvest of stocks to achieve optimum yield while preventing overfishing. Control rules specify the allowable harvest of stocks based on their abundance and are predicated on meeting conservation objectives in addition to relating those objectives to biological reference points such as maximum sustainable yield (MSY), maximum fishing mortality threshold (MFMT), overfishing limit (OFL), minimum stock size threshold (MSST), acceptable biological catch (ABC), and annual catch limit (ACL). For stocks with escapement based conservation objectives, the control rule limits exploitation to achieve escapement objectives. For stocks with exploitation rate based conservation objectives, escapement targets vary annually depending on stock abundance.

3.3.1 Definitions

Reference points defined by the MSA or National Standard 1 (NS1) Guidelines are used as benchmarks within the control rules. They are useful for evaluating and comparing control rules, and in some cases are triggers for management actions. There are several formulations of control rules for different stocks in the FMP, using various combinations of reference points. These stock-specific control rules are applied consistently from year to year.

Reference points contained in the FMP include:

MFMT: Maximum Fishing Mortality Threshold. Defined in NS1 Guidelines as the level of fishing mortality (F) on an annual basis, above which overfishing is occurring. MFMT is equal to $F_{MSY.}$

OFL: Overfishing Limit. Defined by NS1 Guidelines as the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or complex's abundance, expressed in terms of numbers or weight of fish, and is the catch level above which overfishing is occurring

F_{MSY}: MSY fishing mortality rate. Annual exploitation rate that will, on average, produce MSY. Corresponds to MFMT.

ABC: Acceptable Biological Catch. Required by the MSA and defined in the NS1 Guidelines as the annual amount of catch that accounts for scientific uncertainty in the OFL and other scientific uncertainty, and is specified based on the ABC control rule. ABC may not exceed OFL and should be reduced from OFL to prevent overfishing.

F_{ABC}: ABC fishing mortality rate. The annual exploitation rate associated with the ABC.

ACL: Annual Catch Limit. Required by the MSA and defined in the NS1 Guidelines as the level of catch that serves as the basis for invoking accountability measures. The ACL cannot exceed ABC.

F_{ACL}: ACL fishing mortality rate. The annual exploitation rate associated with the ACL.

S_{MSY}: MSY spawner abundance. The abundance of adult spawners that is expected, on average, to produce MSY.

MSST: Minimum Stock Size Threshold. Defined in the NS1 Guidelines as level of biomass below which the stock is considered to be overfished. The MSST should be no less than one-half of S_{MSY}.

3.3.2 Relationship to ESA consultation standards

The ESA requires federal agencies whose actions may adversely affect listed salmon to consult with NMFS. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the FMP. To ensure there is no jeopardy, NMFS conducts ESA consultations with respect to the effects of ocean harvest on listed salmon stocks. In cases where the biological consultation results in a "no jeopardy" opinion, NMFS issues an incidental take statement which authorizes a limited amount of take of listed species that would otherwise be prohibited under the ESA. In cases where a "jeopardy" opinion is reached, NMFS develops a reasonable, prudent alternative to the proposed action which authorizes a limited amount of take.

The constraints on take authorized under incidental take statements and reasonable, prudent alternatives are collectively referred to as consultation standards. These constraints take a variety of forms including FMP conservation objectives, limits on the time and area during which fisheries may be open, ceilings on fishery impact rates, and reductions from base period impact rates. Periodically consultations are reinitiated and the consultation standards are updated. Current consultation standards are included with the table of conservation objectives (Table 3-1). NMFS may periodically revise consultation standards and the annual NMFS guidance letter reflects the most current information.

ESA consultation standards represent another form of fishery control rule. Although NMFS consultation standards and recovery plans may not by themselves recover listed populations to historic S_{MSY} levels, they are sufficient to stabilize populations until freshwater habitats and their dependent populations can be restored and estimates of MSY developed consistent with recovered habitat conditions. As species are delisted, the Council will establish conservation objectives and associated reference points consistent with the MSA.

3.3.3 Relationship to the Pacific Salmon Treaty

The MSA provides an exception to the requirement for a fishery management plan to specify ACLs and Accountability Measures (AMs) if these are provided under an international agreement in which the United States participates. Pacific salmon stocks subject to fisheries in both the US and Canada are managed under the provisions of the Pacific Salmon Treaty (PST). Stocks managed under the provisions of the PST include: (1) all pink salmon stocks included in the fishery, (2) all Chinook stocks from the mid-Oregon coast to the US/Canada border, and (3) all coho stocks which are included in the fishery, and are neither hatchery stocks nor listed under the ESA. For these stocks, the PST annually places overall limits on fishery impacts and allocates those impacts between the US and Canada. It allows the US and Canada to each manage their own fisheries to achieve domestic conservation and allocation priorities, while remaining within the overall limits determined under the PST. The PST also includes measures of accountability which take effect if annual limits established under the Treaty are exceeded, and further reduce these limits in response to depressed stock status.

Because of these provisions of the PST, and the exception provided by the MSA, it is unnecessary for the FMP to specify an ACL or associated reference points for these stocks. However, it is still necessary to specify MSY and SDC reference points for these stocks to monitor the efficacy of PST provisions in preventing overfishing and protecting stocks from becoming overfished.

3.3.4 Acceptable Biological Catch

ABCs are required for all stocks or stock complexes in the fishery that are not managed under an international agreement, listed under the ESA, or designated as hatchery stocks. For salmon, the ABC is defined in terms of spawner escapement (S_{ABC}), which is consistent with the common practice of using spawner escapement to assess stock status. S_{ABC} is determined annually based on stock abundance, in spawner equivalent units, N, and the exploitation rate F_{ABC}

$$S_{ABC} = N \times (1 - F_{ABC}).$$

The ABC control rule defines F_{ABC} as a fixed exploitation rate reduced from F_{MSY} to account for scientific uncertainty. The degree of the reduction in F between F_{ABC} and F_{MSY} depends on whether F_{MSY} is directly estimated (tier 1 stock) or a proxy value is used (tier 2 stock). For tier 1 stocks, F_{ABC} equals F_{MSY} reduced by five percent. For tier 2 stocks, F_{ABC} equal F_{MSY} reduced by ten percent.

The MSA requires that the SSC recommend an ABC to the Council. The NS1 Guidelines explain that the Council works with its SSC to develop the ABC control rule, and that the Council should identify the body that will apply the ABC control rule (i.e., calculates the ABC) and the review process that will evaluate the resulting ABC.

The STT will apply the ABC control rule on an annual basis by making preseason forecasts of N, and applying the fixed F_{ABC}. Stock abundance forecasts and the resulting S_{ABC} estimates will be reported in Preseason Report I, and presented to the SSC at the March Council meeting. Following its review, the SSC will recommend stock abundance forecasts and S_{ABC} estimates to the Council in an oral and written statement provided at the March meeting.

The SSC will have an ongoing role in evaluating ABCs through their annual review of stock abundance forecasts and their prerogative to initiate re-evaluation of the ABC control rule. Abundance forecast methods are periodically revised and these revisions are evaluated by the SSC through the salmon methodology review process. The SSC could revisit the ABC control rule as needed during the salmon methodology review.

3.3.5 Annual Catch Limits and Accountability Measures

ACLs and OFLs, in addition to ABCs, are required for all stocks or stock complexes in the fishery that are not managed under an international agreement, listed under the ESA, or designated as hatchery stocks. For salmon, these reference points are defined in terms of spawner escapement (S_{ACL}, S_{OFL}).

S_{ACL} and S_{OFL} are calculated annually, both as preseason estimates and postseason values. Preseason estimates of these reference points are used for development of annual fishery management measures. Postseason values are used to identify whether accountability measures (AMs) are to be triggered, and to assess the performance of management.

S_{ACL} and S_{OFL} are determined based on stock abundance, in spawner equivalent units, N, and the corresponding reference exploitation rates F_{ACL} and F_{OFL}, where the exploitation rates are fixed values that do not change on an annual basis. F_{OFL} is defined as being equal to F_{MSY}, and

$$S_{OFL} = N \times (1 - F_{MSY}).$$

F_{ACL} is equivalent to F_{ABC} and

$$S_{ACL} = N \times (1 - F_{ACL}),$$

which results in $S_{ACL} = S_{ABC} > S_{OFL}$ for each management year.

3.3.5.1 Preseason ACLs

During the annual preseason salmon management process, S_{ACL} will be estimated using the fixed F_{ACL} exploitation rate and the preseason N stock abundance forecast. Fishery management measures must result in an expected spawning escapement greater than or equal to this S_{ACL} estimate. In many years, the targeted exploitation rate will be lower than F_{ACL} as a result of stock-specific conservation objectives and the control rule used to specify F on an annual basis. Under the condition where $F < F_{ACL}$, the forecast escapement would exceed the estimated S_{ACL}.

3.3.5.2 Postseason ACLs

The postseason value of S_{ACL} will be determined annually using the fixed F_{ACL} exploitation rate and the postseason N stock abundance. The postseason value of S_{ACL} will be compared to the realized spawner escapement for evaluation of whether the realized escapement fell below the S_{ACL}.

Postseason evaluation of S_{ACL} is necessary for determining whether AMs should be triggered and whether the S_{ACL} performance standard is met. AMs will be triggered if the realized escapement is below the S_{ACL} value in any one year.

If the realized escapement is below the S_{ACL} value in more than one of four years, the ACL performance standard will not have been met, and a re-evaluation of the ACL framework will be undertaken, consistent with the NS1 Guidelines.

3.3.5.3 Accountability Measures

Accountability measures are required for all stocks and stock complexes in the Salmon FMP that are required to have ACLs. AMs are intended to prevent shortfalls in escapement below the S_{ACL} and to correct or mitigate for them if should they occur. Some of these are implemented during the preseason planning process and in-season. Others are implemented postseason through monitoring and reporting requirements.

Preseason and In-season Accountability Measures

In-season authority to manage quota fisheries (FMP § 10.1) – allows NMFS to close fisheries on short notice when mixed stock quotas are projected to be met. As described above, quotas are designed to ensure that ACLs and conservation objectives for component stocks are met.

- Mixed stock quota monitoring (FMP § 7.1) – collection of data on a daily basis during the season allows projection of when quotas will be met.
- Quota partitioning (FMP § 5.3 and 10.2) – partitioning overall quota among fishery sectors and port areas and time periods allows finer scale management, thereby reducing the chance that overall quota will be exceeded.
- Quota trading (FMP § 5.3 and 10.2) – quota trading allows overages in one sector/time/area to be made up by reductions in others.
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2) – allow a measure of control over catch rates to reduce the chance of quotas being exceeded.
- Boundary modifications (FMP § 6 and 10.2) – allow limited control over catch composition to limit impacts on constraining stocks.
- Landing restrictions(FMP § 6 and 10.2) - allow better accounting of the location of catches and thus better estimates of catch composition.
- In-season monitoring and reporting requirements. (FMP § 7) – collection of data on a daily basis during the season allows projection of when quotas will be met.

- Conservation alert (FMP § 3.2.2)

A conservation alert will be triggered during the annual preseason process (Chapter 9) if a natural stock listed in Table 3-1, is projected to fall short of its conservation objective. The Conservation Alert is an AM, though it is not triggered by a single year in which the spawner escapement falls below the S_{ACL}. While a projected one-year shortfall may be of little biological concern, it may also represent the beginning of production problems and is worthy of note to help prevent future stock decline. For all natural stocks which meet the conservation alert criteria, the Council will notify pertinent fishery and habitat managers, advising that the stock may be temporarily depressed, and request that state and tribal fishery managers identify the probable causes, if known.

Post-season Accountability Measures

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8) - allows postseason assessment of objectives and performance.

If the realized escapement is below the postseason S_{ACL} value, an AM will be to report on the escapement shortfall in the annual Council preseason reports and to notify state, tribal, and federal managers. If it is necessary to correct problems in the assessment or management methods, such changes can be considered during the annual salmon Methodology Review process.

- Salmon Methodology Review Process (COP-15; PFMC 2008). - provides a process for re-evaluation of management objectives, reference points, and modification of models that relate mixed-stock impacts to stock-specific objectives and reference points.
- Abundance Alert

An abundance alert will be triggered if, in three consecutive years, the postseason estimates indicate a natural stock has not achieved its conservation objective (MSY, spawner floor, or harvest rate objectives) in Table 3-1. The Abundance Alert is an AM, though it is not triggered by a single year in which spawner escapement falls below the S_{ACL}. It is possible that this situation could represent normal variation. However, the occurrence of three consecutive years of reduced stock size or spawner escapements, depending on the magnitude of the short-fall, could signal the beginning of a critical downward trend, which may result in fishing that jeopardizes the capacity of the stock to produce MSY over the long term if appropriate actions are not taken to ensure conservation objectives are achieved.

Council Action

If a stock enters an Abundance Alert, the STT will assess the role of fisheries in triggering the Abundance Alert, and provide corrective recommendations to the Council, if applicable. Following its review of the STT assessment, the Council will specify the actions it will take for ensuring that the stock's conservation objective is met in the future. The Council will also notify the relevant State, Tribal, and Federal managers that a stock may be trending toward a depressed state, and that potential causes should be closely monitored or investigated, particularly with regard to excessive fishing mortality and bias in management models.

3.3.6 Specific Control Rules for Stocks, Indicator Stocks, and Complexes

3.3.6.1 Klamath River Fall Chinook, Sacramento River Fall Chinook

KRFC and SRFC have the same form of control rule, which is defined in terms of the reference points F_{ABC}, F_{DM}, MSST, and S_{MSY} as follows. The allowable exploitation rate, F, in a given year, depends on the pre-fishery ocean abundance in spawner equivalent units, N. At high abundance the rule caps the exploitation rate at F_{ABC}, at moderate abundance the rule specifies an F that results in S_{MSY} spawners, at low abundance the rule allows for a de minimis exploitation rate of F_{DM}, and at very low abundance the rule for F is undefined other than it cannot exceed F_{DM} and it should be reduced as abundance decreases toward 0. The abundance values that delineate these four respective abundance zones (very low, low, moderate, high) are defined as:

$A = \frac{MSST+S_{MSY}}{2}$, breakpoint between very low and low abundance,

$B = \frac{S_{MSY}}{1-F_{DM}}$, breakpoint between low and moderate abundance,

$C = \frac{S_{MSY}}{1-F_{ABC}}$, breakpoint between moderate and high abundance.

Figure 3-1 displays the control rule with the reference points identified. At abundances greater than or equal to C, $F = F_{ABC}$. At abundances between B and C, $F = 1 - (S_{MSY}/N)$. At abundances between A and B, $F = F_{DM}$. At abundances below A, the allowable F is undefined, other than it cannot exceed F_{DM} and it should be reduced as abundance decreases toward 0.

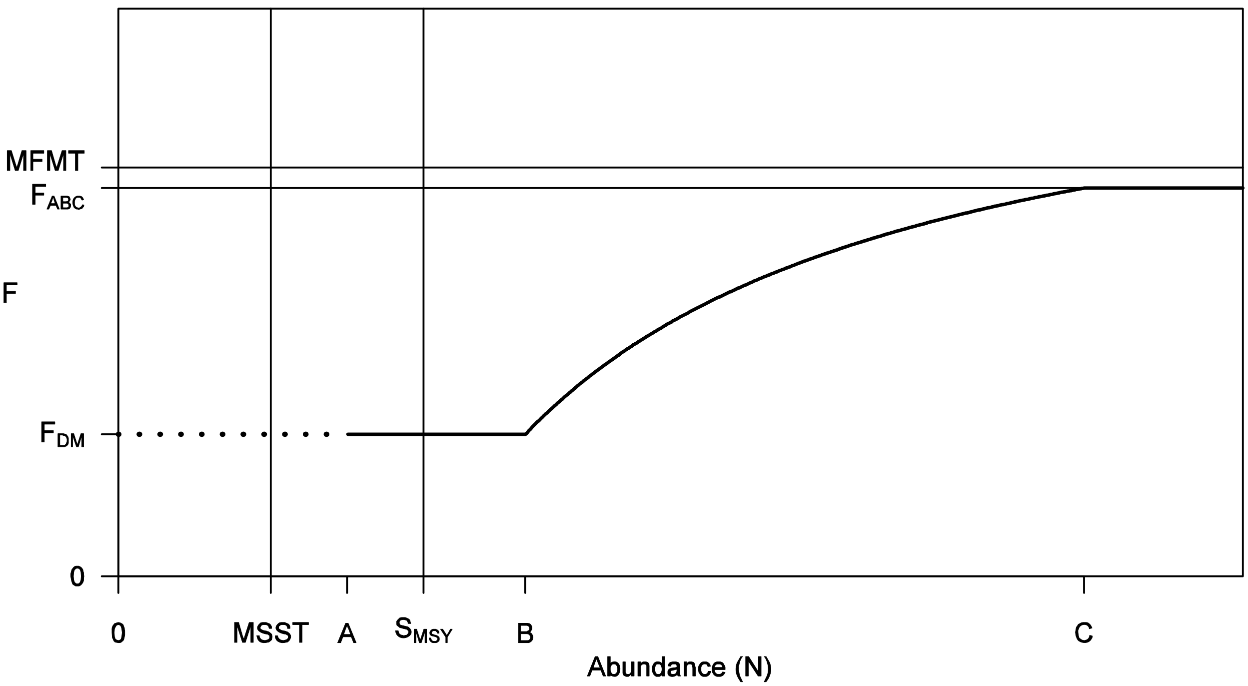

Figure 3-1. Control rule for SRFC and KRFC. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.2 Washington Coast Chinook and Coho, Columbia River Summer Chinook, Upriver Bright Fall Chinook.

Most non-ESA-listed natural stocks originating north of the Klamath River are managed under the terms of the PST with control rules designed to achieve S_{MSY} annually. Chinook and coho stocks from the Washington coast, Columbia River summer Chinook, and upriver bright fall Chinook fall under this category, and share the same form of control rule (Figure 3-2). Some *de minimis* level of fishing impacts are allowed by the provisions of the PST, court decisions, or reserved tribal fishing rights. The magnitude of the *de minimis* impacts, and the actual abundance level at which they come into play, vary from stock to stock. Because management of these stocks under the terms of the PST is focused on attainting S_{MSY} on an annual basis, F can exceed the MFMT at high abundance.

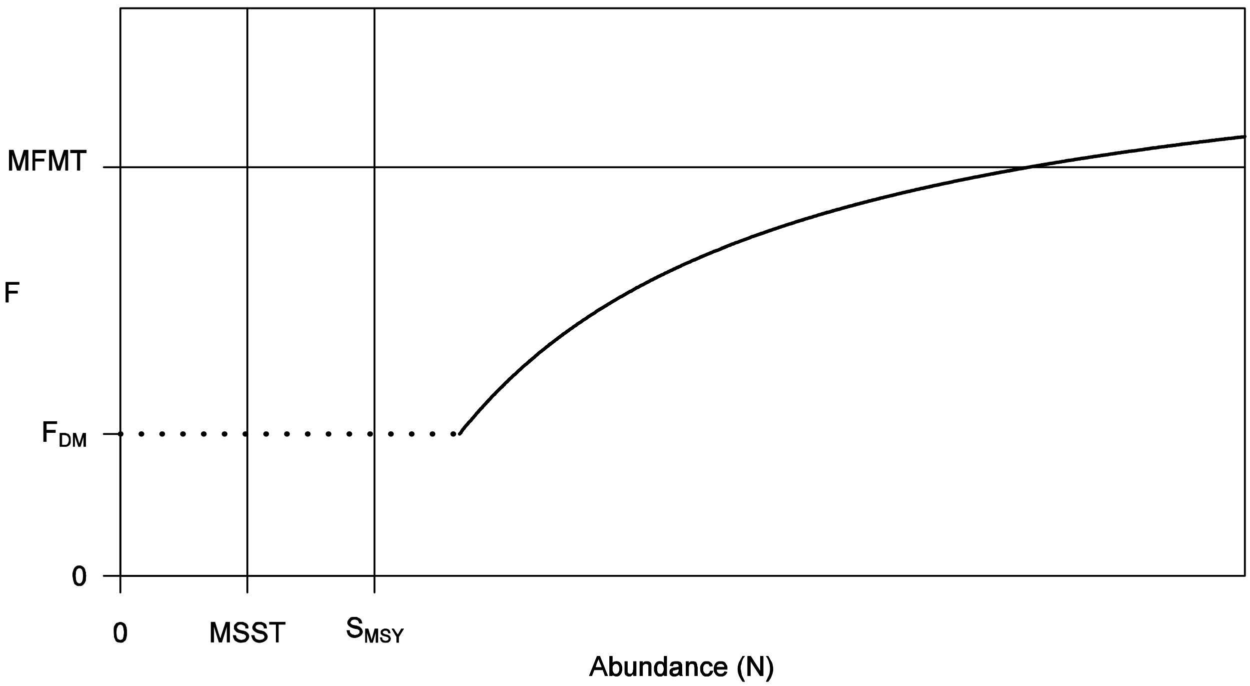

Figure 3-2. Control rule for several Chinook and coho stocks managed under the terms of the PST. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.3 Puget Sound Coho

Puget Sound coho stocks are managed under the PST using a stepped harvest rate control rule (Figure 3-3). Under this control rule, exploitation rate ceilings are determined on the basis of abundance, where abundance is divided into three zones defined by two breakpoints defined as

$A = \frac{MSST}{1-F_{low}}$, breakpoint between critical and low abundance,

$B = \frac{S_{MSY}}{1-MFMT}$, breakpoint between low and normal abundance.

The exploitation rate ceiling has a maximum value of MFMT when N > B, is reduced to a low exploitation rate (F_{low}) when A < N < B, and further reduced to a critical exploitation rate ($F_{critical}$) to allow for *de minimis* impacts not to exceed 0.20 when N < A. For all Puget Sound coho stocks, MSST > S_{MSY}/2.

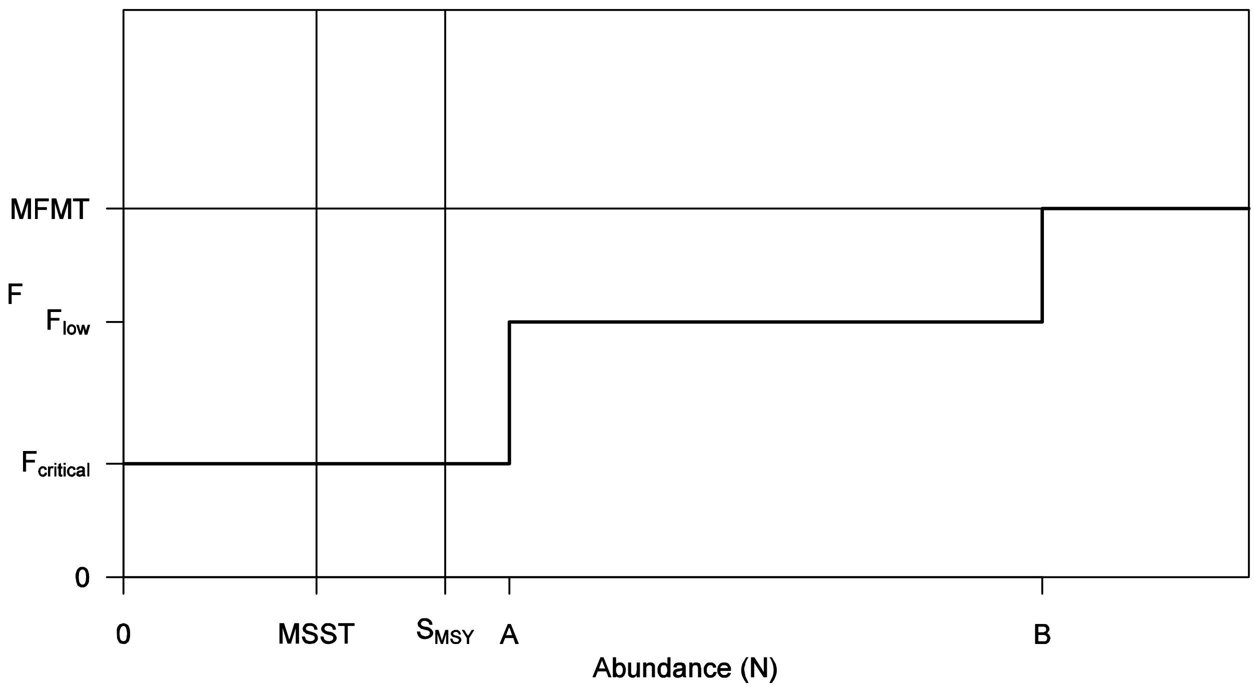

Figure 3-3. Control rule for Puget Sound coho. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.4 Oregon Coastal Natural Coho

Amendment 13 (PFMC 1999) established a recovery and rebuilding plan for Oregon coastal natural (OCN) coho which (1) defines individual management criteria for four separate stock components, (2) sets overall harvest exploitation rate targets for OCN coho that significantly limit the impact of fisheries on the recovery of depressed stock components, (3) promotes stock rebuilding while allowing limited harvest of other abundant salmon stocks during critical rebuilding periods, and (4) is consistent with the Oregon State recovery plan. Under the rebuilding program, the overall allowable fishery impact rate in any given year for each stock component is determined by the spawning abundance of the parents and grandparents of the returning adults and upon the marine survival expectations for the current maturing brood, as predicted by smolt-to-jack survival rates for hatchery coho.

The assessment of historic parent abundance utilized in Amendment 13 is based on the number of spawners in each of the four stock components that is projected to achieve full seeding of high quality freshwater habitat at low levels of marine survival. The full seeding estimates (in terms of stratified random sampling numbers) are derived from a model based on freshwater habitat assessment which incorporates measures of variability in the quality of the freshwater habitat and estimates of survival between life stages where numerical indicators have been measured (Nickelson and Lawson 1996). The assessment of marine survival status is based on a partitioning of the observed marine survival for Oregon hatchery reared coho from 1970-1996 (PFMC 1999).

Under the rebuilding plan, the allowable overall fishery impact (exploitation rate) for OCN coho represents all fishing related mortality, including marine and freshwater fisheries for both retention and catch-and-release fishing. The maximum allowable exploitation rates range from less than 10% when parent abundance and/or marine survival is especially low, to a high of 35% if two generations of spawner rebuilding have occurred and marine survival is sufficient to expect continued improvements in spawner escapement for a third generation. Regardless of high parental spawning levels or projected favorable ocean conditions, a cap of 35% in total stock impacts is maintained to provide insight as to the effects of high spawner levels on production. A limitation of 15% remains in effect even at the two highest tiers of parent escapement if ocean conditions are not favorable, so as to preserve rebuilding progress achieved to that point. The matrix in Table 3-3 illustrates specifically how spawner abundance and marine survival determine the maximum allowable stock exploitation rate objectives for each OCN coho stock component.

Each of the four OCN coho stock components will be managed in marine fisheries as a separate stock to the extent that the best scientific information allows. Because of apparent similarities in the marine distribution of the four components, little flexibility is expected in marine fishery intensities among the components. If some components begin rebuilding faster than others, but data are not available which allows the marine harvest of OCN coho components at different rates, opportunities for increased ocean harvest may be constrained by the weakest component. Any management flexibility for increased fisheries on any strong OCN coho component will likely be in freshwater or estuarine areas during the initial phase of the rebuilding process. In these areas, ODFW will base fishing opportunity on the status of populations in individual basins within a stock component, and directed fisheries on natural coho will be allowed only when spawners are expected to be at or above the full seeding level for high quality habitat. Actual seasons would be based on the presence of fin-clipped hatchery fish (e.g., selective fisheries), public comment, and other basin-specific factors. An intensive monitoring program will be implemented by ODFW to measure the overall management effectiveness toward the goal of increasing OCN spawner levels and consequent juvenile and adult progeny. The Environmental Assessment (EA) for Amendment 13 (PFMC 1999) contains further details of the monitoring plan and of the overall OCN coho management criteria and its basis.

In consideration for the uncertainties that exist in this recovery regime and the potential for new information to affect basic assumptions critical to its success, the measures adopted in Amendment 13 are subject to a comprehensive, adaptive review in 2000 (PFMC 2000b). To incorporate the best science, the methods of estimating the technical parameters used in this proposal may change without plan amendment, if approved by the Council following a technical review and recommendation for change by the Scientific and Statistical Committee.

TABLE 3-2. Allowable fishery impact rate criteria for OCN coho stock components.

PARENT SPAWNER STATUS		MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt): Low (<0.0009)	Medium (0.0009 to 0.0034)	High (>0.0034)
		Allowable Total Fishery Impact Rate		
High:	Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1	#15%	#30%[a/]	#35%[a/]
Medium:	Parent spawners achieved Level #1 or greater rebuilding criteria	#15%	#20%[a/]	#25%[a/]
Low:	Parent spawners less than Level #1 rebuilding criteria	#15% #10-13%[b/]	#15%	#15%

Rebuilding Criteria	Northern	North-Central	South-Central	Southern	Total
	OCN Coho Spawners by Stock Component				
Full Seeding at Low Marine Survival:	21,700	55,000	50,000	5,400	132,100
Level #2 (75% of full seeding):	16,400	41,300	37,500	4,100	99,300
Level #1 (50% of full seeding):	10,900	27,500	25,000	2,700	66,100
38% of Level #1 (19% of full seeding):	4,100	10,500	9,500	1,000	25,100

Stock Component (Boundaries)	Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)				
	Nehalem	Tillamook	Nestucca	Ocean Tribs.	
Northern: (Necanicum River to Neskowin Creek)	17,500	2,000	1,800	400	
	Siletz	Yaquina	Alsea	Siuslaw	Ocean Tribs.
North-Central: (Salmon River to Siuslaw River)	4,300	7,100	15,100	22,800	5,700
	Umpqua	Coos	Coquille	Coastal Lakes	
South-Central: (Siltcoos River to Sixes River)	29,400	7,200	5,400	8,000	
	Rogue				
Southern: (Elk River to Winchuck River)	5,400				

a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding: (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component and (2) no coho-directed harvest impacts will be allowed within that particular basin.

b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.

3.3.7 Control Rule Modification

The form of a control rule should only be changed by plan amendment, or as necessary to rebuild overfished stocks. However, the reference point values that define a particular control rule (e.g., S_{MSY})

may be periodically updated. Changes to these reference point values may be made without plan amendment if a comprehensive technical review of the best scientific information available provides evidence that, in the view of the STT, SSC, and the Council, justifies a modification. Insofar as possible, a proposed change to the value of a reference point will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the year in which the proposed change would be effective) and apart from the preseason planning process. Federal court-ordered changes will also be accommodated without a plan amendment.

3.4 Management for Hatchery and ESA-listed Stocks

"Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches."

Magnuson-Stevens Act, National Standard 6

This plan contains two exceptions to the application of control rules and status determination criteria and subsequent Council actions for stocks with FMP conservation objectives in Table 3-1: (1) hatchery stocks, and (2) stocks listed under the ESA.

3.4.1 Hatchery Stocks

Salmon stocks important to ocean fisheries and comprised exclusively of hatchery production generally have conservation objectives expressed as an egg-take or the number of spawners returning to the hatchery rack to meet program objectives. This plan recognizes these objectives and strives to meet them. However, these artificially produced stocks generally do not need the protection of annual catch limits, status determination criteria, and special Council rebuilding programs to maintain long-term production. Because hatchery stocks can generally sustain significantly higher harvest exploitation rates than natural stocks, ocean fisheries rarely present a threat to their long-term survival. In addition, it is often possible to make temporary program modifications at hatcheries to assure adequate production to sustain the stock during periods of low abundance (e.g., sharing brood stock with other hatcheries, arranging for trapping at auxiliary sites, etc.). If specialized hatchery programs are approved in the future to sustain listed salmon stocks, the rebuilding programs would be developed and followed under the ESA.

3.4.2 Stocks Listed Under the Endangered Species Act

The ESA requires federal agencies whose actions may adversely affect listed salmon to consult with NMFS. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the FMP. To ensure that ESA standards are met, NMFS conducts internal consultations with respect to the effects of ocean harvest on listed salmon. The Council implements NMFS' guidance as necessary to avoid jeopardy, as well as in recovery plans approved by NMFS. As a result of NMFS' consultation, an incidental take statement may be issued which authorizes take of listed stocks under the FMP that would otherwise be prohibited under the ESA.

The Council believes that the requirements of the ESA are sufficient to meet the intent of the Magnuson-Stevens Act overfishing provisions. Those provisions are structured to maintain or rebuild stocks to levels at or above MSY and require the Council to identify and develop rebuilding plans for overfished stocks. For many fish species regulated under the Magnuson-Stevens Act, the elimination of excess fishing pressure is often the sole action necessary to rebuild depressed stocks. This is, however, not the case for many salmon stocks and, in particular, for most listed populations.

Although harvest has certainly contributed to the depletion of West Coast salmon populations, the primary reason for their decline has been the degradation and loss of freshwater spawning, rearing, and migration habitats. The quality and quantity of freshwater habitat are key factors in determining the MSY of salmon populations. The Council has no control over the destruction or recovery of freshwater habitat nor is it able to predict the length of time that may be required to implement the habitat improvements necessary to recover stocks. While the Council could theoretically establish new MSY escapement goals consistent with the limited or degraded habitat available to listed species, adoption of revised goals would potentially result in an ESA-listed stock being classified as producing at MSY and; therefore, not overfished under the Magnuson-Stevens Act. As species are delisted, the Council will establish conservation objectives with subsequent overfishing criteria and manage to maintain the stocks at or above MSY levels.

Since 1990, West Coast salmon fisheries have been modified to accommodate special requirements for the protection of salmon species listed under the federal ESA. The ESA listing of a salmon population may have profound consequences for the management of Council mixed-stock ocean fisheries since listed populations are often incidentally harvested with more abundant healthy populations. As additional stocks of salmon have been listed, the Council's preseason process has increasingly focused on protecting listed stocks. In applying the ESA to Pacific salmon, NMFS determined that a population segment of a salmon species must represent an evolutionarily significant unit (ESU) of that species in order to be eligible for listing. ESUs are characterized by their reproductive isolation and contribution to the genetic diversity of the species as a whole. NMFS establishes consultation standards for listed ESUs, which specify levels of incidental take that are not likely to jeopardize the continued existence of the ESU.

The Council must meet or exceed the requirements of the ESA, which is other applicable law. In addition to the stocks and conservation objectives in Table 3-1, the Council will manage all species listed under the ESA consistent with NMFS consultation standards or recovery plans to meet immediate conservation needs and the long-term recovery of the species. These standards are provided annually to the Council by NMFS at the start of the preseason planning process. In so far as is practical, while not compromising its ability to meet the requirements of the ESA, NMFS will endeavor to provide opportunity for Council and peer review of any proposed consultation standards, or the objectives of recovery plans, well prior to their implementation. Such review would ideally commence no later than the last Council meeting in the year immediately preceding the first salmon season in which the standards would be implemented.

Table 3-3 summarizes the relationships of the individual stocks and stock units managed under the FMP to the ESUs identified by NMFS in the course of ESA status reviews. With the exception of some hatchery stocks, the stocks managed under the FMP are generally representative of the range of life history features characteristic of most ESUs. The managed stocks therefore serve as indicators for ESUs and provide the information needed to monitor fishery impacts on ESUs as a whole. In some cases, the information necessary for stock specific management is lacking, leaving some ESUs without adequate representation. For these ESUs, it will be necessary in the immediate future to use conservative management principles and the best available information in assessing impacts in order to provide necessary protection. In the meantime, the responsible management entities should implement programs to ensure that data are collected for at least one stock representative of each ESU. Programs should be developed to provide the information that will permit the necessary stock specific management within five years of any ESA listing.

TABLE 3-3. Listing of evolutionarily significant units, their ESA status, and associated stocks managed under the FMP. (Page 1 of 2).

ESU[a/]	ESA Status Month and Year of Initial Listing	Stock Representation in FMP
- - - CHINOOK - - -		
Central Valley Fall	Candidate Species Sept. 1999	! Sacramento River Fall
Central Valley Spring	Listed Threatened Sept. 1999	! Central Valley Spring
Sacramento River Winter	Listed Endangered Aug. 1989	! Sacramento River Winter
California Coast	Listed Threatened Sept. 1999	! Eel, Mattole, and Mad Rivers ! Klamath River Fall
Southern Oregon/Northern California Coast	Not Warranted Sept. 1999	! Southern Oregon ! Smith River ! Klamath River Fall
Upper Klamath and Trinity Rivers	Not Warranted	! Klamath River Fall ! Klamath River Spring
Oregon Coast	Not Warranted	! Central and Northern Oregon
Washington Coast	Not Warranted	! Willapa Bay Fall ! Grays Harbor Fall ! Grays Harbor Spring ! Queets Fall ! Queets Spring/Summer ! Hoh Fall ! Hoh Spring/Summer ! Quillayute Fall ! Quilayute Spring/Summer ! Hoko Summer/Fall (Western Strait of Juan de Fuca)
Puget Sound	Listed Threatened May 1999	! Elwha Summer/Fall (Eastern Strait of Juan de Fuca) ! Skokomish Summer/Fall (Hood Canal) ! Nooksack Spring (early) ! Skagit Summer/Fall ! Skagit Spring ! Stillaguamish Summer/Fall ! Snohomish Summer/Fall ! Cedar River Summer/Fall (Lake Washington) ! White River Spring ! Green River Summer/Fall ! Nisqually River Summer/Fall (South Puget Sound)
Lower Columbia River	Listed Threatened May 1999	! Sandy, Kalama, and Cowlitz (fall and spring) ! North Lewis River Fall
Upper Willamette River	Listed Threatened May 1999	! Upper Willamette and Clackamas Rivers
		!
Upper-Columbia River Summer/Fall	Not Warranted	! Upper River Bright ! Upper Columbia River Summer
Upper Columbia River Spring	Listed Endangered May 1999	! Upper Columbia River Spring
Snake River Fall	Listed Threatened May 1992	! Snake River Fall
Snake River Spring/Summer	Listed Threatened May 1992	! Snake River Spring/Summer
- - - COHO - - -		
Central California Coast	Listed Threatened Dec. 1996	! By proxy - Rogue/Klamath hatchery coho

TABLE 3-3. Listing of evolutionarily significant units, their ESA status, and associated stocks managed under the FMP. (Page 1 of 2).		
ESU[a/]	**ESA Status Month and Year of Initial Listing**	**Stock Representation in FMP**
Southern Oregon/Northern California Coasts	Listed Threatened May 1997	! Southern Oregon Coastal Natural ! Northern California
Oregon Coast	Listed Threatened Oct. 1998	! South Central Oregon Coast ! North Central Oregon Coast ! Northern Oregon Coastal
Lower Columbia River	Listed Threatened June 2005	! Columbia River Natural
South Western Washington Coast	Candidate Species July 1995	! Grays Harbor
Olympic Peninsula	Not Warranted	! Queets ! Hoh ! Quillayute Fall ! Strait of Juan de Fuca (Western)
Puget Sound/Strait of Georgia	Candidate Species	! Strait of Juan de Fuca (Eastern) ! Hood Canal ! Skagit ! Stillaguamish ! Snohomish
	- - - PINK - - -	
Puget Sound, Odd Numbered Years	Not Warranted	! Puget Sound

3.5 BYCATCH

AConservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.@

Magnuson-Stevens Act, National Standard 9

A...Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priorityB

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided;@

Magnuson-Stevens Act , ' 303(a)(11)

3.5.1 Definition and Management Intent

"Bycatch" for the purposes of this fishery management plan is defined as fish caught in an ocean salmon fishery which are not sold or kept for personal use and includes economic discards, regulatory discards, and fishery mortality due to an encounter with fishing gear that does not result in capture of fish. Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade. In addition, under the provisions of the Magnuson-Stevens Act, bycatch does not include targeted salmon released alive under a recreational catch-and-release fishery management program.

Under the salmon FMP, the primary bycatch that occurs is bycatch of salmon species. Therefore, the Council=s conservation and management measures shall seek to minimize salmon bycatch and bycatch mortality (drop off and hooking mortality) to the greatest extent practical in all ocean fisheries. When bycatch cannot be avoided, priority will be given to conservation and management measures that seek to minimize bycatch mortality and ensure the extended survival of such fish. These measures will be developed in consideration of the biological and ecological impacts to the affected species, the social and economic impacts to the fishing industry and associated communities, and the impacts upon the fishing, management, and enforcement practices currently employed in ocean salmon fisheries (see also Section 6.5.3).

3.5.2 Occurrence

The present bycatch and bycatch mortality estimation methodologies and procedures for salmon in salmon fisheries are documented in STT (1999d) and a compilation of SSC reviews of salmon estimation methodologies (PFMC 1997c). Bycatch of salmon in Pacific Coast trawl fisheries is documented in Amendment 12 (PFMC 1997a). Salmon fisheries or fishery practices which lack or do not have recent observation data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS. Future changes in the procedures and methodologies will occur only if a comprehensive technical review of existing biological data justifies a modification and is approved by the STT, SSC, and Council. All of these changes will occur within the schedule established for salmon estimation methodology review and apart from the preseason planning process.

Bycatch of fish other than salmon in salmon fisheries is generally very limited. Only hook-and-line gear is allowed in ocean salmon fisheries and regulations allow for retention of most groundfish species and limited numbers of Pacific halibut that are caught incidentally while salmon fishing.

3.5.3 Standard Reporting Methodology

Within the salmon preseason planning process, management options will be assessed for the effects on the amount and type of salmon bycatch and bycatch mortality. Estimates of salmon bycatch and incidental mortalities associated with salmon fisheries will be included in the modeling assessment of total fishery impact and assigned to the stock or stock complex projected to be impacted by the proposed management measure. The resultant fishery impact assessment reports for the ocean salmon fisheries will specify the amount of salmon bycatch and bycatch mortality associated with each accompanying management option. The final analysis of Council-adopted management measures will contain an assessment of the total salmon bycatch and bycatch mortality for ocean salmon fisheries, and include the percentage that these estimates represent compared to the total harvest projected for each species, as well as the relative change from the previous year=s total bycatch and bycatch mortality levels.

4 HABITAT AND PRODUCTION

AAny fishery management plan . . . shall . . . protect, restore, and promote the long-term health and stability of the fishery.

Magnuson-Stevens Act, '303(a)(1)

The Council will be guided by the principle that there should be no net loss of the productive capacity of marine, estuarine, and freshwater habitats which sustain commercial, recreational, and tribal salmon fisheries beneficial to the nation. Within this policy, the Council will assume an aggressive role in the protection and enhancement of anadromous fish habitat, especially essential fish habitat.

4.1 ESSENTIAL FISH HABITAT

A...Describe and identify essential fish habitat for the fishery . . . minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;@

Magnuson-Stevens Act, '303(a)(7)

Protecting, restoring, and enhancing the natural productivity of salmon habitat, especially the estuarine and freshwater areas, is an extremely difficult challenge which must be achieved if salmon fisheries are to remain healthy for future generations. Section 3(10) of the Magnuson-Stevens Act defines essential fish habitat (EFH) as Athose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.@ The following interpretations have been made by NMFS to clarify this definition: Awaters@ include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include historic areas if appropriate; Asubstrate@ includes sediment, hard bottom, structures underlying the waters, and associated biological communities; Anecessary@ means the habitat required to support a sustainable fishery and the managed species= contribution to a healthy ecosystem; and Aspawning, breeding, feeding, or growth to maturity@ covers a species full life cycle.

4.1.1 Identification and Description

Appendix A to the *Pacific Coast Salmon Plan* contains the Council=s complete identification and description of Pacific coast salmon fishery EFH, along with a detailed assessment of adverse impacts and actions to encourage conservation and enhancement of EFH. The Pacific coast salmon fishery EFH includes those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (200 nautical miles) offshore of Washington, Oregon, and California north of Point Conception. Foreign waters off Canada, while still salmon habitat, are not included in salmon EFH, because they are outside U.S. jurisdiction. The Pacific coast salmon fishery EFH also includes the marine areas off Alaska designated as salmon EFH by the North Pacific Fishery Management Council. In freshwater, the salmon fishery EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon (except above certain impassable natural barriers) in Washington, Oregon, Idaho, and California as identified in Table 1-1 of Appendix A. Salmon EFH includes aquatic areas above all artificial barriers except the impassible barriers (dams) listed in Table A-2 of Appendix A. However, activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act. The identification and description of EFH may be modified in the future through salmon FMP amendments as new or better information becomes available.

4.1.2 Adverse Effects of Fishing on Essential Fish Habitat

To the extent practicable, the Council must minimize adverse impacts of fishing activities on salmon EFH. Fishing activities may adversely affect EFH if the activities cause physical, chemical, or biological alterations of the substrate, and loss of or injury to benthic organisms, prey species and their habitat, and other components of the ecosystem. The marine activities under Council management authority or influence that may impact EFH are effects of fishing gear, prey removal by other fisheries, and the effect of salmon fishing on the reduction of stream nutrients due to fewer salmon carcasses on the spawning grounds. Within its fishery management authority, the Council may use fishing gear restrictions, time and area closures, or harvest limits to reduce negative impacts on EFH. Section 3.1 of Appendix A provides a description of the potential impacts on EFH from fishing activities and measures to assess or reduce those impacts. The description and measures includes both fisheries within Council management authority and those under other management jurisdictions.

In determining actions to take to minimize any adverse effects from fishing, the Council will consider the nature and extent of the impact and the practicality and effectiveness of management measures to reduce or eliminate the impact. The consideration will include long- and short-term costs and benefits to the fishery and EFH along with other appropriate factors consistent with National Standard 7 (AConservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.@).

4.1.3 Adverse Effects of Non-Fishing Activities on Essential Fish Habitat

> *AEach Council shall comment on and make recommendations to the Secretary and any Federal or State agency concerning any such activity (authorized, funded, or undertaken, or proposed to be undertaken by any Federal or State agency) that, in the view of the Council, is likely to substantially affect the habitat, including essential fish habitat, of an anadromous fishery resource under its authority.@ . . . AWithin 30 days . . . a Federal agency shall provide a detailed response in writing . . ..@*
>
> *Magnuson-Stevens Act, '305(b)*

The Council will strive to assist all agencies involved in the protection of salmon habitat. This assistance will generally occur in the form of Council comments endorsing protection, restoration, or enhancement programs; requesting information on and justification for actions which may adversely impact salmon production; and in promoting salmon fisheries= needs among competing uses for the limited aquatic environment. In commenting on actions which may affect salmon habitat, the Council will seek to ensure implementation of consistent and effective habitat policies with other agencies having environmental control and resource management responsibilities over production and harvest in inside marine and fresh waters.

Specific recommendations for conservation and enhancement measures for EFH are listed in Appendix A. In implementing its habitat mandates, the Council will seek to achieve the following overall objectives:

1. Work to assure that Pacific salmon, along with other fish and wildlife resources, receive equal treatment with other purposes of water and land resource development.

2. Support efforts to restore Pacific salmon stocks and their habitat through vigorous implementation of federal and state programs.

3. Work with fishery agencies, tribes, land management agencies, and water management agencies to assess habitat conditions and develop comprehensive restoration plans.

4. Support diligent application and enforcement of regulations governing ocean oil exploration and development, timber harvest, mining, water withdrawals, agriculture, or other stream corridor uses by local, state, and federal authorities. It is Council policy that approved and permitted activities employ the best management practices available to protect salmon and their habitat from adverse effects of contamination from domestic and industrial wastes, pesticides, dredged material disposal, and radioactive wastes.

5. Promote agreements between fisheries agencies and land and water management agencies for the benefit of fishery resources and to preserve biological diversity.

6. Strive to assure that the standard operation of existing hydropower and water diversion projects will not substantially reduce salmon productivity.

7. Support efforts to identify and avoid cumulative or synergistic impacts in drainages where Pacific salmon spawn and rear. The Council will assist in the coordination and accomplishment of comprehensive plans to provide basinwide review of proposed hydropower development and other water use projects. The Council encourages the identification of no-impact alternatives for all water resource development.

8. Support and encourage efforts to determine the net economic value of conservation by identifying the economic value of fish production under present habitat conditions and expected economic value under improved habitat conditions.

4.2 COMPENSATION FOR NATURAL PRODUCTION LOSSES

Whenever unavoidable fish population losses occur as a result of various development programs or other action, the Council will recommend compensatory measures that, to the extent practicable, meet the following guidelines:

1. Replacement of losses will be by an equivalent number of fish of the appropriate stock of the same fish species or by habitat capable of producing the equivalent number of fish of the same species that suffered the loss.

2. Mitigation or compensation programs will be located in the immediate area of loss.

3. In addition to direct losses of fish production, compensation programs will include consideration of the opportunity to fish and potential unrealized production at the time of the project.

4. Measures for replacement of runs lost due to construction of water control projects should be completed in advance of, or concurrent with, completion of the project.

4.3 ARTIFICIAL PRODUCTION

Artificial production programs can be an important component of healthy salmon fisheries. They may fall under one of four general categories: fishery enhancement, natural stock recovery, coded-wire tag indicator stock, or mitigation. To assure the effectiveness and maximize the benefits of artificial production programs, the Council recommends meeting the following objectives:

1. Maximize the continued production of hatchery stocks consistent with harvest management and stock conservation objectives.

2. Ensure that mitigation and enhancement programs, with a primary objective of producing hatchery origin salmon for harvest, minimize adverse ecological and genetic impacts to naturally producing populations (e.g., straying and mixing on the spawning grounds, unbalanced exploitation rates, loss of

genetic diversity). Further, the methods employed to produce salmon for harvest should ensure high survival and high contribution rates to the fisheries targeting the enhanced stock while meeting natural stock objectives.

3. Ensure that artificial production programs designed to perpetuate and/or rebuild depressed natural populations are designed to be short-term in duration, boost the abundance of targeted natural populations over a few generations, and terminate when the population is able to sustain itself naturally.

4. Support efforts to continually review and improve the effectiveness of artificial propagation.

5 HARVEST

AConservation and management measures shall, consistent with the conservation requirements of this Act, … take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.@

Magnuson-Stevens Act, National Standard 8

The Council process for determining the allowable ocean fishery harvest centers primarily around protecting weak or listed natural salmon stocks while providing harvest opportunity on stronger natural and hatchery stocks in ways that conform to the plan=s harvest allocation objectives. Achieving these multiple objectives is complicated by natural variability in annual stock abundance, variability in the ocean migratory routes and timing, the high degree of mixing of different salmon species and stocks in ocean fisheries, and imprecision in the estimation of these important parameters. Within this complexity and uncertainty, the Council attempts to achieve its fishery harvest objectives by using the various management tools described in Chapter 6.

Procedures for determining allowable ocean harvest vary by species, fishery complexity, available data, and the state of development of predictive tools. Descriptions of the various procedures in effect in 1984 have been documented in PFMC (1984). These procedures have and will change over time to incorporate the best science. Specific changes resulting from improvements in forecasting techniques or changes in outside/inside allocation procedures due to treaty or user sharing revisions are anticipated by the plan=s framework mechanism. Such changes may be adopted without formal amendment. Changes in procedures and the rationale for such changes are described in Council documents developed during the preseason regulatory process (see Chapter 9), in pertinent plan amendment documents, and in various methodology reviews by the SSC.

5.1 OVERALL FISHERY OBJECTIVES

The following objectives guide the Council in establishing fisheries against a framework of ecological, social, and economic considerations.

1. Establish ocean exploitation rates for commercial and recreational salmon fisheries that are consistent with requirements for stock conservation objectives within Section 3.1, specified ESA consultation or recovery standards, or Council adopted rebuilding plans.

2. Fulfill obligations to provide for Indian harvest opportunity as provided in treaties with the United States, as mandated by applicable decisions of the federal courts, and as specified in the October 4, 1993 opinion of the Solicitor, Department of Interior, with regard to federally recognized Indian fishing rights of Klamath River Tribes.

3. Seek to maintain ocean salmon fishing seasons which support the continuance of established recreational and commercial fisheries while meeting salmon harvest allocation objectives among ocean and inside recreational and commercial fisheries that are fair and equitable, and in which fishing interests shall equitably share the obligations of fulfilling any treaty or other legal requirements for harvest opportunities.[11/]

[1/] In its effort to maintain the continuance of established ocean fisheries, the Council includes consideration of maintaining established fishing communities. In addition, a significant factor in the Council=s allocation objectives in Section 5.3 is aimed at preserving the economic viability of local ports and/or specific coastal communities (e.g., recreational port allocations north of Cape Falcon). Chapter 6 in Appendix B and the tables it references provide additional specific information on the fishing communities.

4. Minimize fishery mortalities for those fish not landed from all ocean salmon fisheries as consistent with optimum yield and the bycatch management specifications of Section 3.4.

5. Manage and regulate fisheries so that the optimum yield encompasses the quantity and value of food produced, the recreational value, and the social and economic values of the fisheries.

6. Develop fair and creative approaches to managing fishing effort and evaluate and apply effort management systems as appropriate to achieve these management objectives.

7. Support the enhancement of salmon stock abundance in conjunction with fishing effort management programs to facilitate economically viable and socially acceptable commercial, recreational, and tribal seasons.

8. Achieve long-term coordination with the member states of the Council, Indian tribes with federally recognized fishing rights, Canada, the North Pacific Fishery Management Council, Alaska, and other management entities which are responsible for salmon habitat or production. Manage consistent with the Pacific Salmon Treaty and other international treaty obligations.

9. In recommending seasons, to the extent practicable, promote the safety of human life at sea.

5.2 MANAGEMENT CONSIDERATIONS BY SPECIES AND AREA

Following, are brief descriptions of the stock management considerations which guide the Council in setting fishing seasons within the major subareas of the Pacific Coast.

5.2.1 Chinook Salmon

5.2.1.1 South of Horse Mountain

Within this area, considerable overlap of Chinook originating in Central Valley and northern California coastal rivers occurs between Point Arena and Horse Mountain. Ocean commercial and recreational fisheries are managed to address impacts on Chinook stocks originating from the Central Valley, California Coast, Klamath River, Oregon Coast, and the Columbia River. With respect to California stocks, ocean commercial and recreational fisheries operating in this area are managed to maximize natural production consistent with meeting the U.S. obligation to Indian tribes with federally recognized fishing rights, and recreational needs in inland areas. Special consideration must be given to meeting the consultation or recovery standards for endangered Sacramento River winter Chinook in the area south of Point Arena and for threatened Snake River fall Chinook north of Pigeon Point. Sacramento River spring Chinook and California coastal Chinook are also listed as threatened under the state ESA.

5.2.1.2 Horse Mountain to Humbug Mountain (Klamath Management Zone)

Major Chinook stocks contributing to this area originate in streams located along the southern Oregon/California coasts as well as the Central Valley. The primary Chinook run in this area is from the Klamath River system, including its major tributary, the Trinity River. Ocean commercial and recreational fisheries operating in this area are managed to maximize natural production of Klamath River fall and spring Chinook consistent with meeting the U.S. obligations to Indian tribes with federally recognized fishing rights, and recreational needs in inland areas. Ocean fisheries operating in this area must balance management considerations for stock-specific conservation objectives for Klamath River, Central Valley, California coast, Oregon coast, and Columbia River Chinook stocks.

5.2.1.3 Humbug Mountain to Cape Falcon

The major Chinook stocks contributing to this area primarily originate in Oregon coastal rivers located north of Humbug Mountain, as well as from the Rogue, Klamath, and Central Valley systems. Allowable ocean harvests in this area are an annual blend of management considerations for impacts on Chinook stocks originating from the Central Valley, California Coast, Klamath River, Oregon Coast, Columbia River, and the Washington Coast.

5.2.1.4 North of Cape Falcon

The majority of the ocean Chinook harvest in this area primarily originates from the Columbia River, with additional contributions from Oregon and Washington coastal areas, Puget Sound and some California stocks. Bonneville Pool (Spring Creek hatchery tule) fall and lower Columbia River (tule) fall and spring (Cowlitz) Chinook, all primarily of hatchery-origin, comprise a majority of the ocean Chinook harvest between Cape Falcon, Oregon and the U.S.-Canada border. Hatchery production escapement goals of these stocks are established according to long-range production programs and/or mitigation requirements associated with displaced natural stocks. Allowable ocean harvest in this area is directed at Columbia River stocks with contributions from the Oregon Coast, Washington Coast, and Puget Sound.

5.2.2 Coho Salmon

5.2.2.1 South of Cape Falcon

Columbia River, Oregon, and California coho are managed together within the framework of the Oregon Production Index (OPI) since these fish are essentially intermixed in the ocean fishery. These coho contribute to ocean fisheries off the southern Washington coast as well as to fisheries off the coasts of Oregon and northern California. Ocean fishery objectives for the OPI area address the following (1) conservation and recovery of Oregon and California coastal coho, including consultation or recovery standards for OCN and California coastal coho; (2) the desire for viable fisheries inside the Columbia River; and (3) impacts on conservation objectives for other key stocks.

The OPI is used as a measure of the annual abundance of adult three-year-old coho salmon resulting from production in the Columbia River and Oregon and California coastal basins. The index itself is simply the combined number of adult coho that can be accounted for within the general area from Leadbetter Point, Washington to as far south as coho are found. Currently, it is the sum of (1) ocean sport and troll fishery impacts in the ocean south of Leadbetter Point, Washington, regardless of origin; (2) Oregon and California coastal hatchery returns; (3) the Columbia River inriver runs; (4) Oregon coastal natural spawner escapement and (5) Oregon coastal inside fishery impacts. Most of the California production is from hatcheries which provide a very small portion of the total hatchery production in the OPI area.

5.2.2.2 North of Cape Falcon

Management of ocean fisheries for coho north of Cape Falcon is complicated by the overlap of OCN stocks and other stocks of concern in the vicinity of the Columbia River mouth. Allowable harvests in the area between Leadbetter Point, Washington and Cape Falcon, Oregon will be determined by an annual blend of OCN and Washington coho management considerations including:

1. Abundance of contributing stocks.
2. Stock specific conservation objectives (as found in Table 3-1).
3. Consultation standards of the Endangered Species Act.
4. Relative abundance of Chinook and coho.
5. Allocation considerations of concern to the Council.

Coho occurring north of Cape Falcon, Oregon are comprised of a composite of coho stocks originating in Oregon, Washington, and southern British Columbia. Ocean fisheries operating in this area must balance management considerations for stock-specific conservation objectives for Southern Oregon/Northern California, Oregon Coast, Southwest Washington, Olympic Peninsula, and Puget Sound.

5.2.3 Pink Salmon

Ocean pink salmon harvests occur off the Washington coast and are predominantly of Fraser River origin. Pink salmon of Puget Sound origin represent a minor portion of the ocean harvest although ocean impacts can be significant in relation to the terminal return during years of very low abundance.

The Fraser River Panel of the PSC manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48E N latitude to meet Fraser River natural spawning escapement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ which is not in the Fraser River Panel Area (U.S.) waters consistent with Fraser River Panel management intent and in accordance with the conservation objectives for Puget Sound pink salmon.

Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing ocean pink harvest within fixed constraints of coho and Chinook harvest ceilings and providing for treaty allocation requirements.

5.3 ALLOCATION

> *"Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B)reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."*

Magnuson-Stevens Act, National Standard 4

Harvest allocation is required when the number of fish is not adequate to satisfy the perceived needs of the various fishing industry groups and communities, to divide the catch between (non-Indian) ocean and inside fisheries and among ocean fisheries, and to provide treaty Indian fishing opportunity. In allocating the resource between ocean and inside fisheries, the Council considers both inriver harvest and spawner escapement needs. The magnitude of inriver harvest is determined by the states in a variety of ways, depending upon the management area. Some levels of inriver harvests are designed to accommodate federally recognized inriver Indian fishing rights, while others are established to allow for non-Indian harvests of historical magnitudes. Several fora exist to assist this process on an annual basis. The North of Cape Falcon Forum, a state and tribal sponsored forum, convenes the pertinent parties during the Council=s preseason process to determine allocation and conservation recommendations for fisheries north of Cape Falcon. The Klamath Fishery Management Council fulfills much the same roll with regard to Klamath River salmon stocks. The individual states also convene fishery industry meetings to coordinate their input to the Council.

5.3.1 Commercial (Non-Tribal) and Recreational Fisheries North of Cape Falcon

5.3.1.1 Goal, Objectives, and Priorities

Harvest allocations will be made from a total allowable ocean harvest which is maximized to the largest extent possible but still consistent with treaty obligations, state fishery needs, and spawning escapement requirements, including consultation standards for stocks listed under the ESA. The Council shall make every effort to establish seasons and gear requirements which provide troll and recreational fleets a reasonable opportunity to catch the available harvest. These may include single-species directed fisheries with landing restrictions for other species.

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows:

- Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily and area closures and restrictions on gear and daily limits.

- Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

- The priorities listed below will be used to help guide establishment of the final harvest allocation while meeting the overall commercial and recreational fishery objectives.

- At total allowable harvest levels up to 300,000 coho and 100,000 Chinook:

- Provide coho to the recreational fishery for a late June through early September all-species season. Provide Chinook to allow (1) access to coho and, if possible, (2) a minimal Chinook-only fishery prior to the all-species season. Adjust days per week and/or institute area restrictions to stabilize season duration.

- Provide Chinook to the troll fishery for a May and early June Chinook season and provide coho to (1) meet coho hooking mortality in June where needed and (2) access a pink salmon fishery in odd years. Attempt to ensure that part of the Chinook season will occur after June 1.

- At total allowable harvest levels above 300,000 coho and above 100,000 Chinook:

- Relax any restrictions in the recreational all-species fishery and/or extend the all-species season beyond Labor Day as coho quota allows. Provide Chinook to the recreational fishery for a Memorial Day through late June Chinook-only fishery. Adjust days per week to ensure continuity with the all-species season.

- Provide coho for an all-salmon troll season in late summer and/or access to a pink fishery. Leave adequate Chinook from the May through June season to allow access to coho.

5.3.1.2 Allocation Schedule Between Gear Types

Initial commercial and recreational allocation will be determined by the schedule of percentages of total allowable harvest as follows:

TABLE 5-1 Initial commercial/recreational harvest allocation schedule north of Cape Falcon.

Coho			Chinook		
Harvest (thousands of fish)	Percentage[a/]		Harvest (thousands of fish)	Percentage[a/]	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ The allocation must be calculated in additive steps when the harvest level exceeds the initial tier.

This allocation schedule should, on average, allow for meeting the specific fishery allocation priorities described above. The initial allocation may be modified annually by preseason and inseason trades to better achieve (1) the commercial and recreational fishery objectives and (2) the specific fishery allocation priorities. The final preseason allocation adopted by the Council will be expressed in terms of quotas which are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch.

To provide flexibility to meet the dynamic nature of the fisheries and to assure achievement of the allocation objectives and fishery priorities, deviations from the allocation schedule will be allowed as provided below and as described in Section 6.5.3.2 for certain selective fisheries.

1. Preseason species trades (Chinook and coho) which vary from the allocation schedule may be made by the Council based upon the recommendation of the pertinent recreational and commercial SAS representatives north of Cape Falcon. The Council will compare the socioeconomic impacts of any such recommendation to those of the standard allocation schedule before adopting the allocation which best meets FMP management objectives.

2. Inseason transfers, including species trades of Chinook and coho, may be permitted in either direction between recreational and commercial fishery allocations to allow for uncatchable fish in one fishery to be reallocated to the other. Fish will be deemed "uncatchable" by a respective commercial or recreational fishery only after considering all possible annual management actions to allow for their harvest which meet framework harvest management objectives, including single species or exclusive registration fisheries. Implementation of inseason transfers will require (a) consultation with the pertinent recreational and commercial SAS members and the STT and (b) a clear establishment of available fish and impacts from the transfer.

3. An exchange ratio of four coho to one Chinook shall be considered a desirable guideline for preseason trades. Deviations from this guideline should be clearly justified. Inseason trades and transfers may vary to meet overall fishery objectives. (The exchange ratio of four coho to one Chinook approximately equalizes the species trade in terms of average ex-vessel values of the two salmon species in the commercial fishery. It also represents an average species catch ratio in the recreational fishery.)

4. Any increase or decrease in the recreational or commercial total allowable catch (TAC), resulting from an inseason restructuring of a fishery or other inseason management action, does not require reallocation of the overall north of Cape Falcon non-Indian TAC.

5. The commercial TACs of Chinook and coho derived during the preseason allocation process may be varied by major subareas (i.e., north of Leadbetter Point and south of Leadbetter Point) if there is a need to do so to decrease impacts on weak stocks. Deviations in each major subarea will generally not exceed 50% of the TAC of each species that would have been established without a geographic deviation in the distribution of the TAC. Deviation of more than 50% will be based on a conservation need to protect weak stocks and will provide larger overall harvest for the entire fishery north of Cape Falcon than would have been possible without the deviation. In addition, the actual harvest of coho may deviate from the initial allocation as provided in Section 6.5.3.2 for certain selective fisheries.

6. The recreational TACs of Chinook and coho derived during the preseason allocation process will be distributed among four major recreational port areas as described for coho and Chinook distribution in Section 5.3.1.3. The Council may deviate from subarea quotas (1) to meet recreational season objectives based on agreement of representatives of the affected ports and /or (2) in accordance with Section 6.5.3.2 with regard to certain selective fisheries. Additionally, based on the recommendations of the SAS members representing the ocean sport fishery north of Cape Falcon, the Council will include criteria in its preseason salmon management recommendations to guide any inseason transfer of coho among the recreational subareas to meet recreational season duration objectives. Inseason redistributions of quotas within the recreational fishery or the distribution of allowable coho catch transfers from the commercial fishery may deviate from the preseason distribution.

5.3.1.3 Recreational Subarea Allocations

Coho

The north of Cape Falcon preseason recreational TAC of coho will be distributed to provide 50% to the area north of Leadbetter Point and 50% to the area south of Leadbetter Point. The distribution of the allocation north of Leadbetter point will vary, depending on the existence and magnitude of an inside fishery in Area 4B which is served by Neah Bay.

In years with no Area 4B fishery, the distribution of coho north of Leadbetter Point (50% of the total recreational TAC) will be divided to provide 74% to the area between Leadbetter Point and the Queets River (Westport), 5.2% to the area between Queets River and Cape Flattery (La Push), and 20.8% to the area north of the Queets River (Neah Bay). In years when there is an Area 4B (Neah Bay) fishery under state management, the allocation percentages north of Leadbetter Point will be modified to maintain more equitable fishing opportunity among the ports by decreasing the ocean harvest share for Neah Bay. This will be accomplished by adding 25% of the numerical value of the Area 4B fishery to the recreational TAC north of Leadbetter Point prior to calculating the shares for Westport and La Push. The increase to Westport and La Push will be subtracted from the Neah Bay ocean share to maintain the same total harvest allocation north of Leadbetter Point. Table 5-2 displays the resulting percentage allocation of the total recreational coho catch north of Cape Falcon among the four recreational port areas (each port area allocation will be rounded to the nearest hundred fish, with the largest quotas rounded downward if necessary to sum to the TAC).

TABLE 5-2.Percentage allocation of total allowable coho harvest among the four recreational port areas north of Cape Falcon.[a/]

Port Area	Without Area 4B Add-on	With Area 4B Add-on	
Columbia River	50.0%	50.0%	
Westport	37.0%	37.0%	plus 17.3% of the Area 4B add-on
La Push	2.6%	2.6%	plus 1.2% of the Area 4B add-on
Neah Bay	10.4%	10.4%	minus 18.5% of the Area 4B add-on

a/ The Council may deviate from these percentages as described under #6 in Section 5.3.1.2.

TABLE 5-3. Example distributions of the recreational coho TAC north of Leadbetter Point.

Sport TAC North of Cape Falcon	Without Area 4B Add-On				With Area 4B Add-On a/					
								Neah Bay		
	Columbia River	Westport	La Push	Neah Bay	Columbia River	Westport	La Push	Ocean	Add-on	Total
50,000	25,000	18,500	1,300	5,200	25,000	19,900	1,400	3,700	8,000	11,700
150,000	75,000	55,500	3,900	15,600	75,000	57,600	4,000	13,600	12,000	25,600
300,000	150,000	111,000	7,800	31,200	150,000	114,500	8,000	27,500	20,000	47,500

a/ The add-on levels are merely examples. The actual numbers in any year would depend on the particular mix of stock abundances and season determinations.

Chinook

Subarea distributions of Chinook will be managed as guidelines and shall be calculated by the STT with the primary objective of achieving all-species fisheries without imposing Chinook restrictions (i.e., area closures or bag limit reductions). Chinook in excess of all-species fisheries needs may be utilized by directed Chinook fisheries north of Cape Falcon or by negotiating a Chinook/coho trade with another fishery participant group.

Inseason management actions may be taken by the NMFS Regional Director to assure that the primary objective of the Chinook harvest guidelines for each of the four recreational subareas north of Cape Falcon are met. Such actions might include: closure from 0 to 3, or 0 to 6, or 3 to 200, or 5 to 200 nautical miles from shore; closure from a point extending due west from Tatoosh Island for 5 miles, then south to a point due west of Umatilla Reef Buoy, then due east to shore; closure from North Head at the Columbia River mouth north to Leadbetter Point; change species which may be landed; or other actions as prescribed in the annual regulations.

5.3.2 Commercial and Recreational Fisheries South of Cape Falcon

The allocation of allowable ocean harvest of coho salmon south of Cape Falcon has been developed to provide a more stable recreational season and increased economic benefits of the ocean salmon fisheries at varying stock abundance levels. When coupled with various recreational harvest reduction measures or the timely transfer of unused recreational allocation to the commercial fishery, the allocation schedule is designed to help secure recreational seasons extending at least from Memorial Day through Labor Day, assist in maintaining commercial markets even at relatively low stock sizes, and fully utilize available harvest. Total ocean catch of coho south of Cape Falcon will be treated as a quota to be allocated between troll and recreational fisheries as provided in Table 5-3.

(Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be accomplished during the Council's preseason process.)

The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

The allocation schedule is also designed to assure there are sufficient coho allocated to the troll fishery at low stock levels to ensure a full Chinook troll fishery. This hooking mortality allowance will have first priority within the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for the estimated incidental coho mortality will be deducted from the recreational share. At higher stock sizes, directed coho harvest will be allocated to the troll fishery after hooking mortality needs for Chinook troll fishing have been satisfied.

TABLE 5-4. Allocation of allowable ocean harvest of coho salmon (thousands of fish) south of Cape Falcon.[a/]

Total Allowable Ocean Harvest	Recreational Allocation		Commercial Allocation	
	Number	Percentage	Number	Percentage
#100	#100[b/c/]	100[b/]	b/	b/
200	167[b/c/]	84[b/]	33[b/]	17[b/]
300	200	67	100	33
350	217	62	133	38
400	224	56	176	44
500	238	48	262	52
600	252	42	348	58
700	266	38	434	62
800	280	35	520	65
900	290	32	610	68
1,000	300	30	700	70
1,100	310	28	790	72
1,200	320	27	880	73
1,300	330	25	970	75
1,400	340	24	1,060	76
1,500	350	23	1,150	77
1,600	360	23	1,240	78
1,700	370	22	1,330	78
1,800	380	21	1,420	79
1,900	390	21	1,510	79
2,000	400	20	1,600	80
2,500	450	18	2,050	82
3,000	500	17	2,500	83

The allowable harvest south of Cape Falcon may be further partitioned into subareas to meet management objectives of the FMP. Allowable harvests for subareas south of Cape Falcon will be determined by an annual blend of management considerations including:

1. abundance of contributing stocks
2. allocation considerations of concern to the Council
3. relative abundance in the fishery between Chinook and coho
4. escapement goals
5. maximizing harvest potential

Troll coho quotas may be developed for subareas south of Cape Falcon consistent with the above criteria. California recreational catches of coho, including projections of the total catch to the end of the season, would be included in the recreational allocation south of Cape Falcon, but the area south of the Oregon-California border would not close when the allocation is met; except as provided below when the recreational allocation is at 167,000 or fewer fish.

When the south of Cape Falcon recreational allocation is equal to or less than 167,000 coho:

1. The recreational fisheries will be divided into two major subareas, as listed in #2 below, with independent quotas (i.e., if one quota is not achieved or is exceeded, the underage or overage will not be added to or deducted from the other quota; except as provided under #3 below).

2. The two major recreational subareas will be managed within the constraints of the following impact quotas, expressed as a percentage of the total recreational allocation (percentages based on avoiding large deviations from the historical harvest shares):

   a. Central Oregon (Cape Falcon to Humbug Mountain) - 70%

   b. South of Humbug Mountain - 30%

   In addition,

   (1) Horse Mountain to Point Arena will be managed for an impact guideline of 3 percent of the south of Cape Falcon recreational allocation, and

   (2) there will be no coho harvest constraints south of Point Arena. However, the projected harvest in this area (which averaged 1,800 coho from 1986-1990) will be included in the south of Humbug Mountain impact quota.

3. Coho quota transfers can occur on a one-for-one basis between subareas if Chinook constraints preclude access to coho.

5.3.3 Tribal Indian Fisheries

5.3.3.1 California

On October 4, 1993 the Solicitor, Department of Interior, issued a legal opinion in which he concluded that the Yurok and Hoopa Valley Indian tribes of the Klamath River Basin have a federally protected right to the fishery resource of their reservations sufficient to support a moderate standard of living or 50% of the total available harvest of Klamath-Trinity basin salmon, whichever is less. The Secretary of Commerce recognized the tribes' federally reserved fishing right as applicable law for the purposes of the MSA (58 FR 68063, December 23, 1993). The Ninth Circuit Court of Appeals upheld the conclusion that the Hoopa Valley and Yurok tribes have a federally reserved right to harvest fish in Parravano v. Babbitt and Brown, 70 F.3d 539 (1995) (Cert. denied in Parravano v. Babbitt and Brown 110, S.Ct 2546 [1996]). The Council must recognize the tribal allocation in setting its projected escapement level for the Klamath River.

5.3.3.2 Columbia River

Columbia River fisheries are governed by the October 10, 1969 Judgment entered in United States v. Oregon, Civil No. 68-513 (D. Or.), and subsequent orders in that case. Under court supervision, the parties to U.S. v. Oregon have managed fisheries through court-approved agreements. In 1988, the court approved the Columbia River Fish Management Plan (CRFMP), which was later modified in a series of management agreements and tailored annually to year-specific conditions in ocean and in- river agreements. The 1988 CRFMP was extended by Federal Court Order through July 31, 1999. The 1996-1998 Management Agreement for Upper Columbia River Fall Chinook terminated on July 31, 1999 (Parties to U.S. v. Oregon 1996). The parties concluded management agreements for 1999, 2000, 2001, 2002, 2003, and 2004, which were entered as court orders. An interim agreement on spring Chinook, summer Chinook and sockeye was concluded in 2001 and was also entered as a court order. A U.S. v. Oregon 2005-2007 Interim Management Agreement for Upper Columbia River Chinook, Sockeye, Steelhead, Coho, and White Sturgeon was agreed to by the U.S. v. Oregon Parties and signed as a Court Order in 2005 and governed winter/spring, summer, and fall season fisheries (Parties to U.S. v. Oregon 2005). The TAC submitted a Biological Assessment regarding fishery impacts to ESA-listed stocks (TAC 2005). These agreements covered specific fisheries and production actions. An agreement on 2008-2017 fisheries was concluded prior to submission of this Biological Assessment.

The 2008-2017 *U.S. v Oregon* Management Agreement (MA) provides the treaty and non-treaty fishery harvest framework and harvest rate schedules for salmon and steelhead stocks destined for areas upstream of Bonneville Dam.

5.3.3.3 U.S. v. Washington Area

Treaty Indian tribes have a legal entitlement to the opportunity to take up to 50% of the harvestable surplus of stocks which pass through their usual and accustomed fishing areas. The treaty Indian troll harvest which would occur if the tribes chose to take their total 50% share of the weakest stock in the ocean, is computed with the current version of the Fishery Regulation Assessment Model (FRAM), assuming this level of harvest did not create conservation or allocation problems on other stocks. A quota may be established in accordance with the objectives of the relevant treaty tribes concerning allocation of the treaty Indian share to ocean and inside fisheries. The total quota does not represent a guaranteed ocean harvest, but a maximum allowable catch.

The requirement for the opportunity to take up to 50% of the harvestable surplus determines the treaty shares available to the inside/outside Indian and all-citizen fisheries. Ocean coho harvest ceilings off the Washington coast for treaty Indians and all-citizen fisheries are independent within the constraints that (1) where feasible, conservation needs of all stocks must be met; (2) neither group precludes the other from the opportunity to harvest its share; and (3) allocation schemes may be established to specify outside/inside sharing for various stocks.

5.4 U.S. HARVEST AND PROCESSING CAPACITY AND ALLOWABLE LEVEL OF FOREIGN FISHING

> *A. . . Assess and specify . . . (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield . . . (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and (C) the capacity and extent to which United States processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States.@*
>
> *Magnuson-Stevens Act, '303(a)(4)*

At the highest conceivable level of recent past, present, or expected future abundance, the total allowable harvest of salmon stocks can be fully taken by U.S. fisheries. There is no recent record of processors in the Council area refusing fish from fishermen because of inadequate processing capacity. Because shore-based processors can fully utilize all the salmon that can be harvested in marine waters, joint venture processing is fixed as zero.

In view of the adequacy of the domestic fisheries to harvest the highest conceivable level of abundance, the total allowable level of foreign fishing (TALFF) also is fixed as zero. The United States allowed Canadian fishing in U.S. waters under a reciprocal agreement until 1978. Negotiations between the two governments, including those within the context of the PSC, continue to seek a resolution of all transboundary salmon issues. These negotiations are aimed at stabilizing and reducing, where possible, the interception of salmon originating from one country by fishermen of the other. No U.S./Canada reciprocal salmon fishing is contemplated in the foreseeable future.

6 MEASURES TO MANAGE THE HARVEST

A number of management controls are available to manage the ocean fisheries each season, once the allowable ocean harvests and the basis for allocation among user groups have been determined. Among these are management boundaries, seasons, quotas, minimum harvest lengths, fishing gear restrictions, and recreational daily bag limits. Natural fluctuations in salmon abundance require that annual fishing periods, quotas, and bag limits be designed for the conditions of each year. What is suitable one year probably will not be suitable the next. New information on the fisheries and salmon stocks also may require other adjustments to the management measures. The Council assumes these ocean harvest controls also apply to territorial seas or any other areas in state waters specifically designated in the annual regulations.

Some of the more common measures that have been applied to manage ocean salmon fisheries since 1977 under the Magnuson Fishery Conservation and Management Act are described below, along with a clarification of the process and flexibility in implementing the measures. The Framework Amendment (PFMC 1984) provides a more detailed history of salmon harvest controls and rationale for their designation as fixed or flexible elements of the salmon FMP.

6.1 MANAGEMENT BOUNDARIES AND MANAGEMENT ZONES

Management boundaries and zones will be established during the preseason regulatory process or adjusted inseason (Section 10.2) as necessary to achieve a conservation or management objective. A conservation or management objective is one that protects a fish stock, simplifies management of a fishery, or results in the wise use of the resources. For example, management boundaries and management zones can be used to separate fish stocks, facilitate enforcement of regulations, separate conflicting fishing activities, or facilitate harvest opportunities. Management boundaries and zones will be described in the annual regulations by geographical references, coordinates (latitude and longitude), depth contours, distance from shore, or similar criteria. Figure 6-1 displays management boundaries in common use.

While there are many specific reasons for utilizing management boundaries or zones which may change from year to year, some boundaries or zones have purposes that remain relatively constant. The boundary used to separate management of Columbia River Chinook from those stocks to the south and to divide the Council's harvest allocation schedules has always been at or near Cape Falcon, Oregon. The Klamath management zone (beginning in 1990, the area between Humbug Mountain, Oregon and Horse Mountain, California) has been used to delineate the area where primary concern is the management of Klamath River fall Chinook. A closed zone at the mouth of the Columbia River has been used for several years to eliminate fishing in an area believed to generally contain a high percentage of sublegal "feeder" Chinook. A similar zone has been established at the mouth of the Klamath River to allow fish undisturbed access to the river. Changes to these boundaries or zones may require special justification and documentation. However, the basis of establishing most other management boundaries and zones depends on the annual management needs as determined in the preseason process.

6.2 MINIMUM HARVEST LENGTHS FOR OCEAN COMMERCIAL AND RECREATIONAL FISHERIES

Minimum size limits for ocean commercial and recreational fisheries may be changed each year during the preseason regulatory process or modified inseason under the procedures of Section 10.2. Recommended changes must serve a useful purpose which is clearly described and justified, and projections made of the probable impacts resulting from the change.

Minimum size limits have been relatively stable since the Council began management in 1977 and any changes are expected to occur infrequently. From 1977 through 1995 there were no changes in the size limits for non-Indian commercial fisheries except for the decision to use the California coho minimum length for the entire Klamath management area which extends into Oregon. Recreational minimum size limits did not change between 1988 and 1995. However, in 1996 Chinook minimum size limits were increased in California fisheries to reduce impacts on Sacramento River winter Chinook.

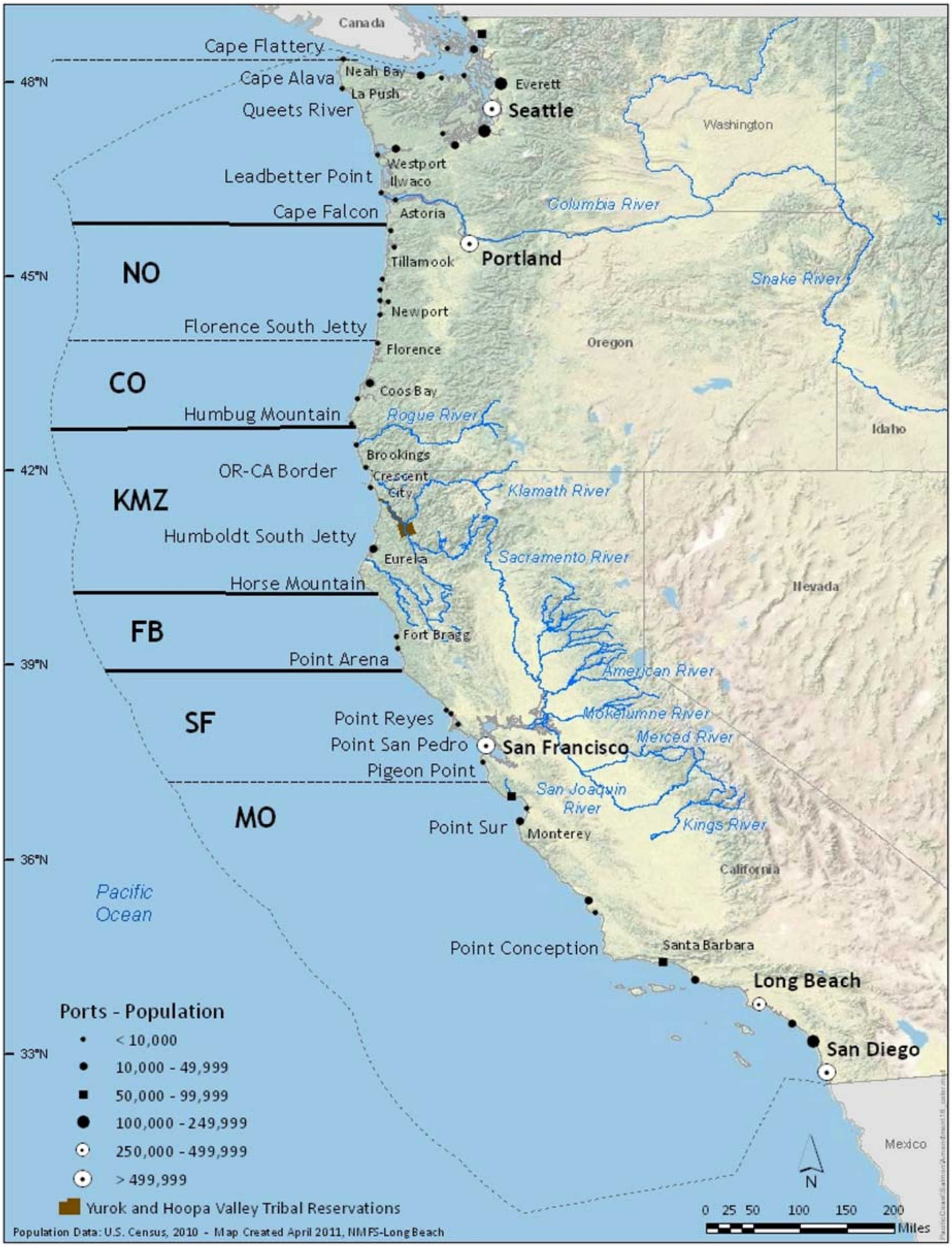

FIGURE 6-1. Management boundaries in common use.

The minimum size limits listed below (total length in inches) have been consistently used by the Council with only infrequent modifications in limited areas to address special needs or situations.

TABLE 6-1.Minimum size limits.

	Chinook		Coho		Pink	
	Troll	Sport	Troll	Sport	Troll	Sport
North of Cape Falcon	28.0	24.0	16.0	16.0	None	None
Cape Falcon to Humbug Mt.	26.0	20.0	16.0	16.0	None	None
South of Humbug Mt.	26.0	20.0	22.0	20.0	None	None [a/]

6.3 RECREATIONAL DAILY BAG LIMIT

Recreational daily bag limits for each management area may be set during the preseason regulatory process or modified inseason (Section 10.2). They will be set to maximize the length of the fishing season consistent with the allowable level of harvest. In recent years, bag limits of one or two salmon have been commonplace.

In general, for every fishing area, the level of allowable ocean harvest will be determined for the recreational fishery; next, the fishing season will be set to be as long as practicable, including the Memorial Day and/or Labor Day weekends if feasible, consistent with the allowable level of harvest; and, bag limits will be simultaneously set to accommodate that fishing season. In years of low salmon abundance, the season will be short and the bag limits will be low; in years of high salmon abundance, the season will be long and the bag limits will be higher.

6.4 FISHING GEAR RESTRICTIONS

Gear restrictions may be changed annually during the preseason regulatory process and inseason as provided in Section 10.2 Recommended changes must serve one or more useful purposes while being consistent with the goals of the plan. For example, changes could be made to facilitate enforcement, reduce hooking mortality, or reduce gear expenses for fishermen. Annual gear restriction changes in previous years have included the requirement for barbless hooks in both the troll and recreational fisheries, and a limit to the number of spreads per line in the troll fishery. Both of these gear changes were instituted to reduce total hook-and-release mortality. Other restrictions have included bait size, number of rods per recreational fisher, and requirements for the number of lines or the attachment of lines to the vessel in the commercial fishery.

6.5 SEASONS AND QUOTAS

For each management area or subarea, the Council has the option of managing the commercial and recreational fisheries for either coho or Chinook using the following methods (1) fixed quotas and seasons; (2) adjustable quotas and seasons; and (3) seasons only. The Council may also use harvest guidelines within quotas or seasons to trigger inseason management actions which were established in the preseason regulatory process.

Quotas provide very precise management targets and work best when accurate estimates of stock abundance and distribution are available, or when needed to ensure protection of depressed stocks from potential overfishing. The Council does not view quotas as guaranteed harvests, but rather the maximum allowable harvest which assures meeting the conservation objective of the species or stock of concern. While time and area restrictions are not as precise as quotas, they allow flexibility for effort and harvest to vary in response to abundance and distribution.

6.5.1 Preferred Course of Action

Because of the need to use both seasons and quotas, depending on the circumstances, the Council will make the decision regarding seasons and quotas annually during the preseason regulatory process, subject to the limits specified below. Fishing seasons and quotas also may be modified during the season as provided under Section 10.2.

6.5.2 Procedures for Calculating Seasons

Seasons will be calculated using the total allowable ocean harvest determined by procedures described in Chapter 5, and further allocated to the commercial and recreational fishery in accordance with the allocation plan presented in Section 5.3, and after consideration of the estimated amount of effort required to catch the available fish, based on past seasons.

Recreational seasons will be established with the goal of encompassing Memorial Day and/or Labor Day weekends in the season, if feasible. Opening dates will be adjusted to provide reasonable assurance that the recreational fishery is continuous, minimizing the possibility of an in-season closure.

Criteria used to establish commercial seasons, in addition to the estimated allowable ocean harvests, the allocation plan, and the expected effort during the season, will be: (1) bycatch mortality; (2) size, poundage, and value of fish caught; (3) effort shifts between fishing areas; (4) harvest of pink salmon in odd-numbered years; and (5) protection for weak stocks when they frequent the fishing areas at various times of the year.

6.5.3 Species-Specific and Other Selective Fisheries

6.5.3.1 Guidelines

In addition to the all-species and single or limited species seasons established for the commercial and recreational fisheries, other species-limited fisheries, such as "ratio" fisheries and fisheries selective for marked or hatchery fish, may be adopted by the Council during the preseason regulatory process. In adopting such a fishery, the Council will consider the following guidelines:

1. Harvestable fish of the target species are available.

2. Harvest impacts on incidental species will not exceed allowable levels determined in the management plan.

3. Proven, documented, selective gear exists (if not, only an experimental fishery should be considered).

4. Significant wastage of incidental species will not occur or a written economic analysis demonstrates the landed value of the target species exceeds the potential landed value of the wasted species.

5. The species specific or ratio fishery will occur in an acceptable time and area where wastage can be minimized and target stocks are maximally available.

6. Implementation of selective fisheries for marked or hatchery fish must be in accordance with U.S. v. Washington stipulation and order concerning co-management and mass marking (Case No. 9213, Subproceeding No. 96-3) and any subsequent stipulations or orders of the U.S. District Court, and consistent with international objectives under the Pacific Salmon Treaty (e.g., to ensure the integrity of the coded-wire tag program).

6.5.3.2 Selective Fisheries Which May Change Allocation Percentages North of Cape Falcon

As a tool to increase management flexibility to respond to changing harvest opportunities, the Council may implement deviations from the specified port area allocations and/or gear allocations to increase harvest opportunity through fisheries that are selective for marked salmon stocks (e.g., marked hatchery salmon). The benefits of any selective fishery will vary from year to year and fishery to fishery depending on stock abundance, the mix of marked and unmarked fish, projected hook-and-release mortality rates, and public acceptance. These factors should be considered on an annual and case-by-case basis when utilizing selective fisheries. The deviations for selective fisheries are subordinate to the allocation priorities in Section 5.3.1.1 and may be allowed under the following management constraints:

1. Selective fisheries will first be considered during the months of August and/or September. However, the Council may consider selective fisheries at other times, depending on year to year circumstances identified in the preceding paragraph.

2. The total impacts within each port area or gear group on the critical natural stocks of management concern are not greater than those under the original allocation without the selective fisheries.

3. Other allocation objectives (i.e., treaty Indian, or ocean and inside allocations) are satisfied during negotiations in the North of Cape Falcon Forum.

4. The selective fishery is assessed against the guidelines in Section 6.5.3.1.

5. Selective fishery proposals need to be made in a timely manner in order to allow sufficient time for analysis and public comment on the proposal before the Council finalizes its fishery recommendations.

If the Council chooses to deviate from the specified port and/or gear allocations, the process for establishing a selective fishery would be as follows:

1. Allocate the TAC among the gear groups and port areas according to the basic FMP allocation process described in Section 5.3.1 without the selective fishery.

2. Each gear group or port area may utilize the critical natural stock impacts allocated to its portion of the TAC to access additional harvestable, marked fish, over and above the harvest share established in step one, within the limits of the management constraints listed in the preceding paragraph.

6.5.4 Procedures for Calculating Quotas

Quotas will be based on the total allowable ocean harvest and the allocation plan as determined by the procedures of Chapter 5.

To the extent adjustable quotas are used, they may be subject to some or all of the following inseason adjustments:

1. For coho, private hatchery contribution to the ocean fisheries in the OPI area.

2. Unanticipated loss of shakers (bycatch mortality of undersized fish or unauthorized fish of another species that have to be returned to the water) during the season. (Adjustment for coho hooking mortality during any all-salmon-except-coho season will be made when the quotas are established.)

3. Any catch that take place in fisheries within territorial waters that are inconsistent with federal regulations in the EEZ.

4. If the ability to update inseason stock abundance is developed in the future, adjustments to total allowable harvest could be made where appropriate.

5. The ability to redistribute quotas between subareas depending on the performance toward achieving the overall quota in the area.

Changes in the quotas as a result of the inseason adjustment process will be avoided unless the changes are of such magnitude that they can be validated by the STT and Council, given the precision of the original estimates.

The basis for determining the private hatchery contribution in (1) above will be either coded-wire tag analysis or analysis of scale patterns, whichever is determined by the STT to be more accurate, or another more accurate method that may be developed in the future, as determined by the STT and Council.

In reference to (4) and (5) above, if reliable techniques become available for making inseason estimates of stock abundance, and provision is made in any season for its use, a determination of techniques to be applied will be made by the Council and discussed during the preseason regulatory process.

6.5.5 Procedures for Regulating Ocean Harvests of Pink and Sockeye

Sockeye salmon are only very rarely caught in Council-managed ocean salmon fisheries and no specific procedures have been established to regulate their harvest. Procedures for pink salmon are as follows:

1. All-species seasons will be planned such that harvest of pink salmon can be maximized without exceeding allowable harvests of Chinook and/or coho and within conservation and allocation constraints of the pink stocks.

2. Species specific or ratio fisheries for pink salmon will be considered under the guidelines for species specific fisheries presented in Section 6.5.3, and allocation constraints of the pink stocks.

6.6 OTHER MANAGEMENT MEASURES

6.6.1 Treaty Indian Ocean Fishing

Since 1977 the Council has adopted special measures for the treaty Indian ocean troll fisheries off the Washington Coast. The Makah, Quileute, Hoh, and Quinault tribes are entitled by federal judicial determination to exercise their treaty rights in certain ocean areas. In addition, Lower S'Klallam, Jamestown S'Klallam, and Port Gamble S'Klallam tribes are entitled by federal judicial determination to exercise their treaty rights in ocean salmon Area 4B, the entrance to the Strait of Juan de Fuca.

The treaty Indian ocean salmon fishing regulations will be established annually during the preseason regulatory process. The affected tribes will propose annual treaty Indian ocean fishing regulations at the March meeting of the Council. After a review of the proposals, the Council will adopt treaty Indian regulations along with non-treaty ocean fishing regulations for submission to the Secretary of Commerce at the April Council meeting.

The specific timing and duration of the treaty Indian ocean salmon season varies with expected stock abundance and is limited by quotas for both Chinook and coho. Within these constraints, the general season structure has been a Chinook-directed fishery in May and June, followed by an all-salmon season from July through the earliest of quota attainment or October 31.

6.6.1.1 Seasons

Given that the traditional tribal ocean season has changed in recent years and because it is largely up to the tribes to recommend annual ocean management measures applicable to their ocean fishery, a flexible mechanism for setting fishing seasons is proposed so that desired changes can be made in the future without the need for plan amendment.

The treaty Indian troll season will be established based upon input from the affected tribes, but would not be longer than that required to harvest the maximum allowable treaty Indian ocean catch. The maximum allowable treaty Indian ocean catch will be computed as the total treaty harvest that would occur if the tribes chose to take their total entitlement of the weakest stock in the ocean, assuming this level of harvest did not create conservation or allocation problems on other stocks.

6.6.1.2 Quotas

Fixed or adjustable quotas by area, season, or species may be employed in the regulation of treaty Indian ocean fisheries, provided that such quotas are consistent with established treaty rights. The maximum size of quotas shall not exceed the harvest that would result if the entire treaty entitlement to the weakest run were to be taken by treaty ocean fisheries. Any quota established does not represent a guaranteed ocean harvest, but a maximum ceiling on catch. Catches in ocean salmon Area 4B are counted within the tribal ocean harvest quotas during the May 1-September 30 ocean management period.

To the extent adjustable quotas are used, they may be subject to some or all of the following inseason adjustments:

1. Unanticipated shaker loss during the season.

2. Catches by treaty ocean fisheries that are inconsistent with federal regulations in the EEZ.

3. If an ability to update inseason stock abundance is developed in the future, adjustments to quotas could be made where appropriate.

4. Ability to redistribute quotas between subareas depending upon performance toward catching the overall quota for treaty ocean fisheries in the area.

Procedures for the above inseason adjustments will be made in accordance with Section 10.2.

Changes in the quotas as a result of the inseason adjustment process will be avoided unless the changes are of such magnitude that they are scientifically valid as determined by the STT and Council, given the precision of the original estimates.

Harvest guidelines may be used within overall quotas to trigger inseason management actions which were established during the preseason regulatory process.

6.6.1.3 Areas

Current tribal ocean fishing areas in the EEZ (subject to change by court order) are as follows:

Makah - north of 48E02'15" N to the U.S./Canada border and east of 125E44'00".

Hoh - south of 47E54'18" N and north of 47E21'00" N and east of 125E44'00".

Quileute - south of 48E07'36" N and north of 47E31'42" N and east of 125E44'00".

Quinault - south of 47E40'06" N and north of 46E54'03" N and east of 125E44'00".

In addition, a portion of the usual and accustomed fishing areas for the Lower Elwha, Jamestown, and Port Gamble S'Klallam tribes is in ocean salmon Area 4B at the entrance to the Strait of Juan de Fuca (Bonilla-Tatoosh line east to the Sekiu River).

Area restrictions may be employed in the regulation of treaty ocean fisheries, consistent with established treaty rights. For example, in 1982 treaty fishing was prohibited within a six-mile radius around the Queets and Hoh River mouths when the area was closed to non-treaty salmon fishing.

6.6.1.4 Size Limits and Gear Restrictions

Regulations for size limits and gear restrictions for treaty ocean fisheries will be based on recommendations of the affected treaty tribes.

6.6.2 Net Prohibition

No person shall use nets to fish for salmon in the EEZ except that a hand-held net may be used to bring hooked salmon on board a vessel. Salmon caught incidentally in trawl nets while legally fishing under the groundfish FMP are a prohibited species as defined by the groundfish regulations (50 CFR Part 660, Subpart G). However, in cases where the Council determines it is beneficial to the management of the groundfish and salmon resources, salmon bycatch may be retained under the provisions of a Council-approved program which defines the handling and disposition of the salmon. The provisions must specify that salmon remain a prohibited species and, as a minimum, include requirements that allow accurate monitoring of the retained salmon, do not provide incentive for fishers to increase salmon bycatch, and assure fish do not reach commercial markets. In addition, during its annual regulatory process for groundfish, the Council must consider regulations which would minimize salmon bycatch in the monitored fisheries.

6.6.3 Prohibition on Removal of Salmon Heads

No person shall remove the head of any salmon caught in the EEZ, nor possess a salmon with the head removed if that salmon has been marked by removal of the adipose fin to indicate that a coded-wire tag has been implanted in the head of the fish.

6.6.4 Steelhead Prohibition

Persons, other than Indians with judicially-declared rights to do so and legally licensed recreational fishermen, may not take and retain, or possess any steelhead within the EEZ.

6.6.5 Prohibition on Use of Commercial Troll Fishing Gear for Recreational Fishing

No person shall engage in recreational fishing for salmon while aboard a vessel engaged in commercial fishing.

6.6.6 Experimental Fisheries

The Council may recommend that the Secretary allow experimental fisheries in the EEZ for research purposes that are proposed by the Council, federal government, state government, or treaty Indian tribes having usual and accustomed fishing grounds in the EEZ.

The Secretary may not allow any recommended experimental fishery unless he or she determines that the purpose, design, and administration of the experimental fishery are consistent with the goals and objectives of the Council's fishery management plan, the national standards of the Magnuson Fishery Conservation and Management Act, and other applicable law. Each vessel that participates in an approved experimental fishery will be required to carry aboard the vessel the letter of approval, with specifications and qualifications (if any), issued and signed by the Regional Director of NMFS.

6.6.7 Scientific Research

This plan neither inhibits nor prevents any scientific research in the EEZ by a scientific research vessel. The Secretary will acknowledge any notification received regarding scientific research on salmon being conducted by a research vessel. The Regional Director of NMFS will issue to the operator/master of that vessel a letter of acknowledgment, containing information on the purpose and scope (locations and schedules) of the activities. Further, the Regional Director will transmit copies of such letters to the Council and to state and federal fishery and enforcement agencies to ensure that all concerned parties are aware of the research activities.

7 DATA NEEDS, DATA COLLECTION METHODS, AND REPORTING REQUIREMENTS

Successful management of the salmon fisheries requires considerable information on the fish stocks, the amount of effort for each fishery, the harvests by each fishery, the timing of those harvests, and other biological, social, and economic factors. Much of the information must come from the ocean fisheries; other data must come from inside fisheries, hatcheries, and spawning grounds. Some of this information needs to be collected and analyzed daily, whereas other types need to be collected and analyzed less frequently, maybe only once a year. In general, the information can be divided into that needed for inseason management and that needed for annual and long-term management. The methods for reporting, collecting, analyzing, and distributing information can be divided similarly.

7.1 INSEASON MANAGEMENT

7.1.1 Data Needs

Managers require certain information about the fisheries during the season if they are to control the harvests to meet established quotas and goals. If conditions differ substantially from those expected, it may be necessary to modify the fishing seasons, quotas, or other management measures. The following information is useful for inseason management:

a. harvest of each species by each fishery in each fishing area by day and by cumulative total;

b. number of troll day boats and trip boats fishing;

c. estimated average daily catch for both day and trip boats;

d. distribution and movement of fishing effort;

e. average daily catch and effort for recreational fishery;

f. estimates of expected troll fishing effort for the remainder of the season;

g. information on the contribution of various fish stocks, determined from recovered coded-wire tags, scales, or other means.

7.1.2 Methods for Obtaining Inseason Data

Inseason management requires updating information on the fisheries daily. Thus, data will be collected by sampling the landings, aerial surveys, radio reports, and telephone interviews.

In general, data necessary for inseason management will be gathered by one or more of the following methods. Flights over the fishing grounds will be used to obtain information on the distribution, amount, and type of commercial fishing effort. Data on the current harvests by commercial and Indian ocean fishermen will be obtained by telephoning selected (key) fish buyers, by sampling the commercial landings on a daily basis, and from radio reports. Data on the current effort of, and harvests by, the recreational fisheries will be obtained by telephoning selected charter boat and boat rental operators and by sampling landings at selected ports. Analyses of fish scales, recovered fish tags, and other methods will provide information on the composition of the stocks being harvested.

7.2 ANNUAL AND LONG-TERM MANAGEMENT

7.2.1 Data Needs

In addition to the data used for inseason management, a considerable amount of information is used for setting the broad measures for managing the fishery, evaluating the success of the previous year's management, and evaluating the effectiveness of the plan in achieving the long-term goals. Such data include landings, fishing effort, dam counts, smolt migration, returns to hatcheries and natural spawning areas, stock contribution estimates, and economic information.

7.2.2 Methods for Obtaining Annual and Long-Term Data

In addition to those methods used for collecting data for in-season management, the longer term data will be collected by the use of (a) fish tickets (receipts a fish buyer completes upon purchasing fish from a commercial fisherman), (b) log books kept by commercial fishermen and submitted to the state fishery management agencies at the end of the season, and (c) catch record cards completed by a recreational fisherman each time he catches a fish to show location, date, and species and submitted to the state agency, either when the whole card is completed or at the end of the season.

The local fishery management authorities (states, Indian tribes) will collect the necessary catch and effort data and will provide the Secretary with statistical summaries adequate for management. The local management authorities, in cooperation with the National Marine Fisheries Service, will continue the ongoing program of collecting and analyzing data from salmon processors.

Data on spawning escapements and jack returns to public and private hatcheries, other artificial production facilities, and natural spawning grounds will be collected by the accepted methods now being used by those authorities. The methods used to collect these data should be identified and available to the public.

7.3 REPORTING REQUIREMENTS

This plan authorizes the local management authorities to determine the specific reporting requirements for those groups of fishermen under their control and to collect that information under existing state data-collection provisions. With one exception, no additional catch or effort reports will be required of fishermen or processors as long as the data collection and reporting systems operated by the local authorities continue to provide the Secretary with statistical information adequate for management. The one exception would be to meet the need for timely and accurate assessment of inseason management data. In that instance the Council may annually recommend implementation of regulations requiring brief radio reports from commercial salmon fishermen who leave a regulatory area in order to land their catch in another regulatory area open to fishing. The federal or state entities receiving these radio reports would be specified in the annual regulations.

8 SCHEDULE AND PROCEDURES FOR ANALYZING THE EFFECTIVENESS OF THE SALMON FMP

To effectively manage the salmon fisheries, the Council must monitor the status of the resource and the fisheries harvesting that resource to make sure that the goals and objectives of the plan are being met. Fishery resources vary from year to year depending on environmental factors, and fisheries vary from year to year depending on the state of the resource and social and economic factors. The Council must ensure that the plan is flexible enough to accommodate regulatory changes that will allow the Council to achieve its biological, social, and economic goals.

Annually, the Council's STT will review the previous season's commercial, recreational, and tribal Indian fisheries and evaluate the performance of the plan with respect to achievement of the framework management objectives (Chapters 2, 3, and 5). Consideration will be given by the STT to the following areas:

1. Allowable harvests
2. Escapement goals, natural and hatchery
3. Mixed-stock management
4. Federally recognized tribal fishing rights
5. Allocation goals
6. Mortality factors, including bycatch
7. Achievement of optimum yield
8. Effort management systems
9. Coordination with all management entities
10. Consistency with international treaties
11. Comparison with previous seasons
12. Progress of any Council-adopted recovery plan
13. ESA consultation standards

This evaluation will be submitted annually for review by the Salmon Advisory Subpanel, SSC, and the Council.

Additionally, at various Council meetings, the Habitat Committee and state and tribal management entities will help keep the Council apprised of achievements and problems with regard to the protection and improvement of the environment (i.e., essential fish habitat) and the restoration and enhancement of natural production.

During the Council=s annual preseason salmon management process, issues may arise which indicate a need to consider changes to the fixed elements of the FMP. Such issues may be considered in FMP amendments on an as needed basis under the guidelines of Chapter 11.

9 SCHEDULE AND PROCEDURES FOR PRESEASON MODIFICATION OF REGULATIONS

The process for establishing annual or preseason management measures under the framework FMP contains a nearly equivalent amount of analysis, public input, and review to that provided under the former annual amendment process and will not require annual preparation of a supplemental environmental impact statement (SEIS) and regulatory impact review/regulatory flexibility analysis (RIR/RFA). This allows the Salmon Technical Team to wait to prepare its report until all of the data are available, thus eliminating the need to discuss an excessively broad range of options as presented prior to the framework plan.

The process and schedule for setting the preseason regulations will be approximately as follows:

Approximate Date	Action
First week of March	Notice published in the Federal Register announcing the availability of team and Council documents, the dates and location of the two Council meetings, the dates and locations of the public hearings, and publishing the complete schedule for determining proposed and final modifications to the management measures. Salmon Technical Team reports which review the previous salmon season, project the expected salmon stock abundance for the coming season, and describe any changes in estimation procedures, are available to the public from the Council office.
First or second full week of March[a/]	Council and advisory entities meet to adopt a range of season regulatory options for formal public hearing. Proposed options are initially developed by the Salmon Advisory Subpanel and further refined after analysis by the STT, public comment, and consideration by the Council.
Following March Council meeting	Council newsletter, public hearing announcement, and STT/Council staff report are released which outline and analyze Council-adopted options. The STT/staff report includes a description of the options, brief rationale for their selection, and an analysis of expected biological and economic impacts.
Last week of March or first week of April	Formal public hearings on the proposed salmon management options.
First or second full week of April[a/]	Council and advisory entities meet to adopt final regulatory measure recommendations for implementation by the Secretary of Commerce.
First week of May	Final notice of Secretary of Commerce decision and final management measures in Federal Register.
May 15	Close of public comment period.

The actions by the Secretary after receiving the preseason regulatory modification recommendations from the Council will be limited to accepting or rejecting in total the Council's recommendations. If the Secretary rejects such recommendations he or she will so advise the Council as soon as possible of such action along with the basis for rejection, so that the Council can reconsider. Until such time as the Council and the Secretary can agree upon modifications to be made for the upcoming season, the previous year's regulations will remain in effect. This procedure does not prevent the Secretary from exercising his authority under Sections 304(c) or 305(c) of the Magnuson Act and issuing emergency regulations as appropriate for the upcoming season.

Preseason actions by the Secretary, following the above procedures and schedule, would be limited to the following:

1. Specify the annual abundance, total allowable harvest, and allowable ocean harvest.

2. Allocate ocean harvest to commercial and recreational fishermen and to treaty Indian ocean fishermen where applicable.

3. Review ocean salmon harvest control mechanism from previous year; make changes as required in:

   a. Management area boundaries
   b. Minimum harvest lengths
   c. Recreational daily bag limits
   d. Gear requirements (i.e., barbless hooks, etc.)
   e. Seasons and/or quotas
   f. Ocean regulations for treaty Indian fishermen
   g. Inseason actions and procedures to be employed during the upcoming season

Because the harvest control measures and restrictions remain in place until modified, superseded, or rescinded, changes in all of the items listed in "3" above may not be necessary every year. When no change is required, intent not to change will be explicitly stated in preseason decision documents.

The Framework Amendment (1984) provides further rationale for the current preseason procedures and the replacement of the old process of annual plan amendments to establish annual regulations.

10 INSEASON MANAGEMENT ACTIONS AND PROCEDURES

Inseason modifications of the regulations may be necessary under certain conditions to fulfill the Council's objectives. Inseason actions include "fixed" or "flexible" actions as described below.

10.1 FIXED INSEASON ACTIONS

Three fixed inseason actions may be implemented routinely as specifically provided in the subsections below.

10.1.1 Automatic Season Closures When the Quotas Are Reached

The Salmon Technical Team will attempt to project the date a quota will be reached in time to avoid exceeding the quota and to allow adequate notice to the fishermen. The State Directors and the Council Chairman will be consulted by the NMFS Regional Director before action is taken to close a fishery. Closures will be coordinated with the states so that the effective time will be the same for EEZ and state waters. A standard closure notice will be used and will specify areas that remain open as well as those to be closed. To the extent possible, all closures will be effective at midnight and a 48-hour notice will be given of any closure. When a quota is reached, the Regional Director will issue a notice of closure of the fishery through local news media at the same time that a notice of fishery closure is published in the *Federal Register*.

10.1.2 Rescission of Automatic Closure

If, following the closing of a fishery after a quota is reached, it is discovered that the actual catch was over-estimated and the season was closed prematurely, the Secretary is authorized to reopen the fishery if:

1. The shortfall is sufficient to allow at least one full day's fishing (24 hours) based on the best information available concerning expected catch and effort; and

2. The unused portion of the quota can be taken before the scheduled season ending.

10.1.3 Adjustment for Error in Preseason Estimates

The Secretary may make changes in seasons or quotas if a significant computational error or errors made in calculating preseason estimates of salmon abundance have been identified; provided that such correction to a computational error can be made in a timely fashion to affect the involved fishery without disrupting the capacity to meet the objectives of the management plan. Such correction and adjustments to seasons and quotas will be based on a Council recommendation and Salmon Technical Team analysis.

10.2 FLEXIBLE INSEASON ACTIONS

Fishery managers must determine that any inseason adjustment in management measures is consistent with ocean escapement goals, conservation of the salmon resource, any federally recognized Indian fishing rights, and the ocean allocation scheme in the framework FMP. In addition, all inseason adjustments must be based on consideration of the following factors:

1. Predicted sizes of salmon runs

2. Harvest quotas and hooking mortality limits for the area and total allowable impact limitations if applicable

3. Amount of the recreational, commercial, and treaty Indian fishing effort and catch for each species in the area to date

4. Estimated average daily catch per fisherman

5. Predicted fishing effort for the area to the end of the scheduled season

6. Other factors as appropriate (particularly, fisher safety affected by weather or ocean conditions as noted in Amendment 8)

Flexible inseason provisions must take into consideration the factors and criteria listed above and would include, but not be limited to, the following.

1. Modification of quotas and/or fishing seasons would be permitted. Redistribution of quotas between recreational and commercial fisheries would be allowed if the timing and procedure are described in preseason regulations. If total quotas or total impact limitations by fishery are established, subarea quotas north and south of Cape Falcon, Oregon can be redistributed within the same fishery. Other redistributions of quotas would not be authorized. Also allowable would be the establishment of new quotas and/or seasons, and establishment of, or changes to, hooking mortality and/or total allowable impact limitations during the season. Action based on revision of preseason abundance estimates during the season would be dependent on development of a Council approved methodology for inseason abundance estimation.

2. Modifications in the species which may be caught and landed during specific seasons and the establishment or modification of limited retention regulations would be permitted (e.g., changing from an all-species season to a single-species season, or requiring a certain number of one species to be caught before a certain number of another species can be retained).

3. Changes in the recreational bag limits and recreational fishing days per calendar week would be allowed.

4. Establishment or modification of gear restrictions would be authorized.

5. Modification of boundaries, including landing boundaries, and establishment of closed areas would be permitted.

6. Temporary adjustments for fishery access due to weather, adverse oceanic conditions or other safety considerations (see Council policy of September 18, 1992 regarding implementation of this action).

The flexibility of these inseason management provisions requires responsibility to assure that affected users are adequately informed and have had the opportunity for input into potential inseason management changes.

10.3 PROCEDURES FOR INSEASON ACTIONS

1. Prior to taking any inseason action, the Regional Director will consult with the Chairman of the Council and the appropriate State Directors.

2. As the actions are taken by the Secretary, the Regional Director will compile, in aggregate form, all data and other information relevant to the action being taken and shall make them available for public review during normal office hours at the Northwest Regional Office, National Marine Fisheries Service, 7600 Sand Point Way NE, Seattle, Washington 98115.

3. Inseason management actions taken under both the "fixed" and "flexible" procedures will become effective by announcement in designated information sources (rather than by filing with the Office of

the Federal Register [OFR]). Notice of inseason actions will still be filed with the OFR as quickly as possible.

The following information sources will provide actual notice of inseason management actions to the public: (1) the U.S. Coast Guard "Notice to Mariners" broadcast (announced over Channel 16 VHF-FM and 2182 KHZ); (2) state and federal telephone hotline numbers specified in the annual regulations and (3) filing with the *Federal Register*. Identification of the sources will be incorporated into the preseason regulations with a requirement that interested persons periodically monitor one or more source. In addition, all the normal channels of informing the public of regulatory changes used by the state agencies will be used.

4. If the Secretary determines, for a good cause, that a notice must be issued without affording a prior opportunity for public comment, public comments on the notice will be received by the Secretary for a period of 15 days after the effective date of the notice.

11 SCHEDULE AND PROCEDURES FOR FMP AMENDMENT AND EMERGENCY REGULATIONS

Modifications not covered within the framework mechanism will require either an FMP amendment or emergency Secretarial action. The amendment process generally requires at least a year from the date of the initial development of the draft amendment by the Council. In order for regulations implementing an amendment to be in place at the beginning of the general fishing season (May 1), the Council will need to begin the process by no later than April of the previous season. It is not anticipated that amendments will be processed in an accelerated December-to-May schedule and implemented by emergency regulations.

Emergency regulations may be promulgated without an FMP or FMP amendment. Depending upon the level of controversy associated with the action, the Secretary can implement emergency regulations within 20 days to 45 days after receiving a request from the Council. Emergency regulations can include non-resource emergencies and are generally in effect for 180 days. A second 180-day extension is possible if the public has had an opportunity to comment on the emergency regulation and the Council is actively preparing a plan amendment or proposed regulations to address the emergency on a permanent basis.

Part of the process for evaluating all future FMP amendment proposals will be to consider whether they will result in the need for temporary adjustments for fishery access due to weather, adverse oceanic conditions, or other safety considerations.

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Agenda Item C.1.b
SAC Report 3
June 2011

PACIFIC COAST
SALMON ~~PLAN~~

FISHERY MANAGEMENT PLAN

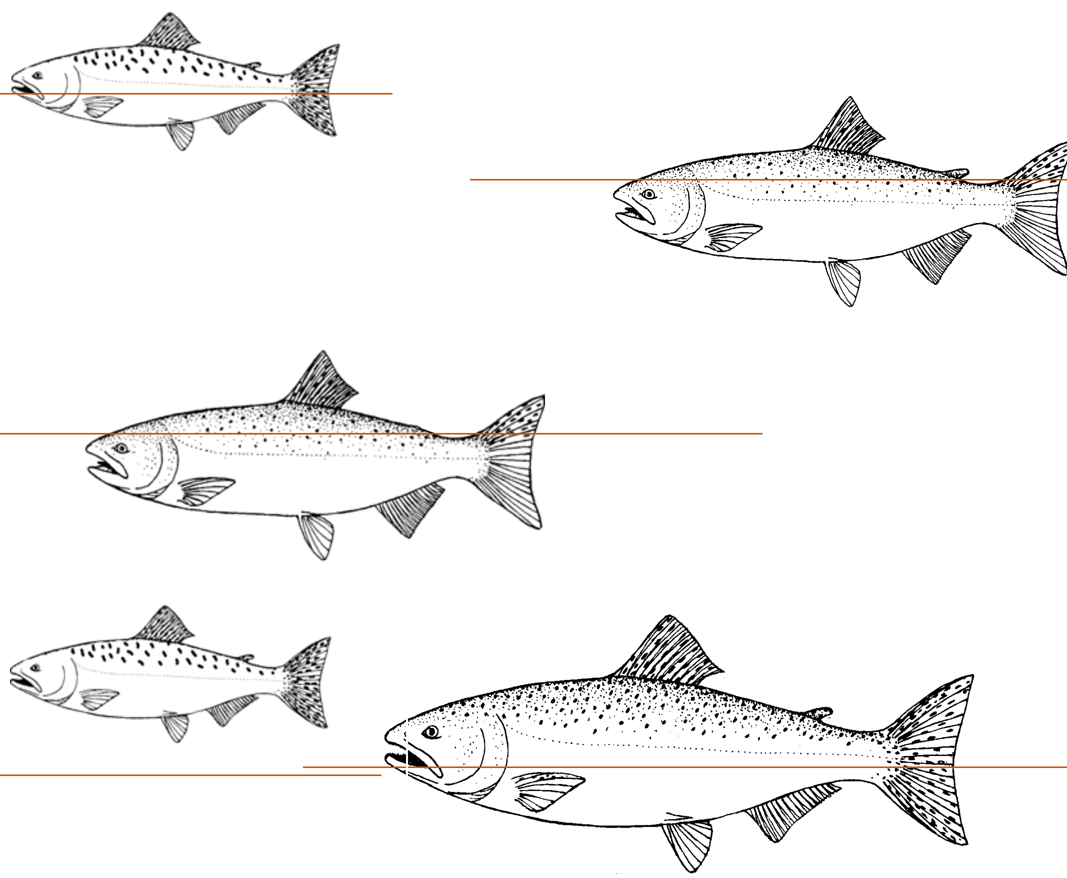
FOR

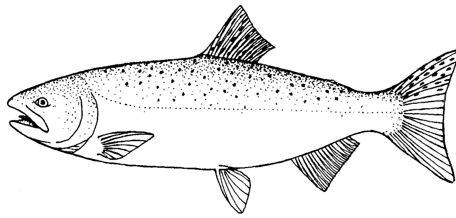
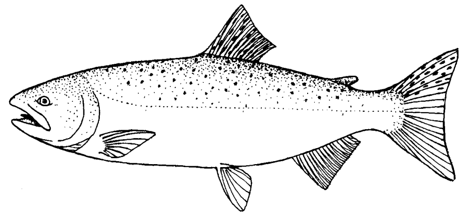
COMMERCIAL AND RECREATIONAL SALMON FISHERIES

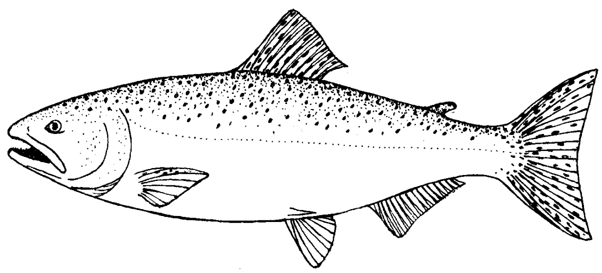
OFF THE COASTS OF WASHINGTON, OREGON, AND CALIFORNIA

AS REVISED THROUGH AMENDMENT ~~15~~16

(Effective ~~February 2008~~January 2012)





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AMENDMENT 14 TO THE PACIFIC COAST SALMON PLAN, APPENDIX B:
DESCRIPTION OF THE OCEAN SALMON FISHERY AND ITS SOCIAL AND ECONOMIC CHARACTERISTICS

APPENDIX C TO THE PACIFIC COAST SALMON PLAN:
REVIEW OF OCEAN SALMON FISHERIES (Latest annual edition)

PRESEASON REPORT I:
STOCK ABUNDANCE ANALYSIS FOR OCEAN SALMON FISHERIES (Latest annual edition)

PRESEASON REPORT III:
ANALYSIS OF COUNCIL ADOPTED MANAGEMENT MEASURES FOR OCEAN SALMON FISHERIES (Latest annual edition)

LIST OF ACRONYMS [JLI4]AND ABBREVIATIONS

ASETF	Anadromous Salmonid Environmental Task Force
CDFG	California Department of Fish and Game
CRFMP	Columbia River Fish Management Plan
Council	Pacific Fishery Management Council
EA	Environmental Assessment
EEZ	exclusive economic zone (three to 200 miles offshore)
EIS	Environmental Impact Statement
ESA	Endangered Species Act
EFH	essential fish habitat
ESU	Evolutionarily significant unit
FAB	Fisheries Advisory Board (established in *U.S. v. Washington*)
FMP	fishery management plan
FR	Federal Register
FRAM	Fishery Regulation Assessment Model
HC	Habitat Committee
KMZ	Klamath Management Zone
KRSMG	Klamath River Salmon Management Plan
KRTT	Klamath River Technical Team
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSP	maximum sustainable production
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPPA	Northwest Power Planning Act
OCN	Oregon coastal natural coho
ODFW	Oregon Department of Fish and Wildlife
OFR	Office of the Federal Register
OPI	Oregon Production Index
OY	optimum yield
PFMC	Pacific Fishery Management Council
PSC	Pacific Salmon Commission
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SAS	Salmon Advisory Subpanel
Secretary	Secretary of Commerce
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SRFCRT	Sacramento River Fall Chinook Review Team
SSC	Scientific and Statistical Committee
STT	Salmon Technical Team
TAC	total allowable catch
TALFF	total allowable level of foreign fishing
WDF	Washington Department of Fisheries
WDFW	Washington Department of Fish and Wildlife

INTRODUCTION

This document is the *Pacific Coast Salmon Plan*, a fishery management plan (FMP) of the Pacific Fishery Management Council (Council or PFMC) as revised and updated for implementation in ~~2008~~2012. It guides management of commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California.

Since 1977, salmon fisheries in the exclusive economic zone (EEZ) (three to 200 miles offshore) off Washington, Oregon, and California have been managed under salmon ~~fishery management plans (FMP)~~FMPs of the Council. Creation of the Council and the subsequent development and implementation of these plans were initially authorized under the Fishery Conservation and Management Act of 1976. This act, now known as the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act; MSA), was amended by the Sustainable Fisheries Act (SFA) in 1996, and most recently amended by the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) in 2007. The plan presented in this document contains or references all the elements required for an FMP under the MSA. It completely replaces the 1999 version of the *Pacific Coast Salmon Plan*.

The Council's first salmon FMP and its environmental impact statement (EIS) were issued to govern the 1977 salmon season. A new salmon management plan and EIS were issued in 1978 to replace the 1977 documents. To establish management measures from 1979 through 1983, the 1978 FMP was amended annually and published along with a supplemental EIS (SEIS) and Regulatory Impact Review/Regulatory Flexibility Analysis (RIR/RFA). This annual process was lengthy, complex, and costly. It lacked a long-range perspective and was too cumbersome to allow for timely implementation of the annual regulations and efficient fishery management. Therefore, in 1984, the Council adopted a comprehensive framework amendment that was designed to end the need for annual plan amendments and supplemental EISs (PFMC 1984).

The comprehensive framework plan amendment of 1984 (Amendment 6) replaced the 1978 plan as the base FMP document and established a framework of fixed management objectives with flexible elements to allow annual management measures to be varied to reflect changes in stock abundance and other critical factors. Subsequently, at irregular intervals, the Council has developed various amendments to portions of the framework plan to address specific management issues raised by participants in the salmon management process or as necessary to respond to reauthorization of the ~~original Fishery Conservation and Management Act of 1976.~~MSA. The next seven amendments adopted since implementation of the framework FMP in 1984 were accompanied by an environmental assessment (EA). Amendment 14 was accompanied by an SEIS. ~~The most recent, Amendment 15, was~~Amendments 15 and 16 were accompanied by an EA.

The primary amendment issues since 1984 have included specific spawner escapement goals for Oregon coastal natural (OCN) coho and Klamath River fall Chinook (Amendments 7, 9, 11, 13, and 15), non-Indian harvest allocation (Amendments 7, 9, 10, and 14), inseason management criteria (Amendment 7), habitat and essential fish habitat (EFH) definition (Amendments 8 and 14), safety (Amendment 8), ~~a definition of overfishing~~status determination criteria (SDC) (Amendments 10, 14, and ~~14~~16), management objectives for stocks listed under the Endangered Species Act (ESA) (Amendments 12 and 14), bycatch reporting and priorities for avoiding bycatch (Amendment 14), ~~and~~ selective fisheries (Amendment 14), stock classification (Amendment 16), annual catch limits (ACLs) and accountability measures (AMs) (Amendment 16), *de minimis* fishing provisions (Amendments 15 and 16).

In 1996, as part of Amendment 12, the Council made an editorial update to the framework FMP that included incorporating all of the amendments after 1984 into the *Pacific Coast Salmon Plan* (PFMC

1997b). Subsequently, the Council modified the OCN coho management goals under Amendment 13 in 1999 (PFMC 1999). The current salmon FMP incorporates changes through Amendment ~~15~~216, including Amendment 14 (PFMC 2000a), an extensive revision of the FMP primarily to respond to reauthorization of the ~~SFA~~MSA and to improve the readability and organization of the plan. Table 1 contains a complete listing of the issues in each amendment through Amendment ~~15~~16.

This document is the current salmon FMP. Appendix A contains the complete description of essential fish habitat, Appendix B provides a description of the fishery, and Appendix C, which will always be the ~~Council=s~~Council's most current annual review of the ocean fisheries, provides an annual updating of the fishery information. The reader may wish to refer to the original salmon FMP and individual amendment documents for more background and explanatory information, including the environmental impact assessments, EISs, and examples of management options not adopted by the Council.

TABLE 1. Record of salmon FMP documents.

DOCUMENT	CONTENT SUMMARY
Final 1977 Plan	Initial FMP/EIS document for the 1977 salmon season.
Final 1978 Plan (43 FR 29791, July 11, 1978) Effective July 11, 1978[1/]	Initial, comprehensive FMP/EIS document. Amended each year to establish annual management measures for 1979-1983.
Final Framework Amendment (49 FR 43679, Oct. 31, 1984) Effective Nov. 25, 1984[1/]	Comprehensive amendment and SEIS that replaced the 1978 Plan as a multi-year FMP document.
Technical amendments:	1) Spawner escapement goals, procedures to modify spawner goals, and inseason modification of daily bag limits (50 FR 812, Jan. 7, 1985) 2) Inseason rescission of automatic closures (50 FR 4977, Feb. 5, 1985) 3) Season opening and closing dates (50 FR 42529, Oct. 21, 1985)
Amendment 7 (52 FR 4146, Feb. 10, 1987) Effective Mar. 8, 1987	1) Sliding scale OCN coho spawner escapement goal 2) Inseason management actions and procedures 3) Coho harvest allocation south of Cape Falcon
Amendment 8 (53 FR 30285, Aug. 11, 1988) Effective Aug. 8, 1988; required no implementing regulations	1) Habitat policy and objectives 2) Consideration of temporary season adjustments for vessels precluded from harvesting due to unsafe weather
Amendment 9 (54 FR 19185, May 4, 1989) Effective May 1, 1989; except radio report section implemented July 13, 1989 (54 FR 29730, July 14, 1989)	1) Klamath River fall Chinook harvest rate spawner escapement goal 2) Commercial/recreational harvest allocation north of Cape Falcon 3) Inseason notice procedures 4) Steelhead management intent 5) Radio reporting requirements for commercial fishers 6) Deleted limitations on season opening and closing dates
Clarifying letter:	to Mr. Rolland Schmitten re harvest allocation, Issue 2; Feb. 27, 1989
Technical amendment:	Minor modification of Klamath spawner goal based on Council recommendation, March 8, 1989 (54 FR 19800, May 8, 1989 and 59 FR 23000, May 4, 1994)
Amendment 10 (56 FR 26774, June 11, 1991) Effective July 11, 1991	1) Inseason reallocation objectives for commercial and recreational fisheries south of Cape Falcon 2) Criteria guiding non-Indian catch allocation north of Cape Falcon, especially concerning recreational port allocation 3) Definition of overfishing
Amendment 11 (59 FR 23013, May 4, 1994) Effective April 29, 1994	OCN coho spawner escapement goal of 42 spawners/mile, incidental exploitation rate of 20% or less on OCN coho at low stock sizes and sport coho harvest allocation criteria at low harvest levels.
Clarifying letter:	to Mr. Gary Smith re incidental harvest and sport allocation; Apr. 15, 1994
Technical amendment:	Minor modification of Klamath spawner goal to meet tribal allocation based on Council recommendation of April 11, 1996 (61 FR 20186, May 6, 1996)
Amendment 12	1) Procedures governing retention of salmon bycatch in trawl nets

(62 FR 35450, July 1, 1997) Effective July 31, 1997	2) Management objectives for ESA listed salmon species 3) Update of the salmon FMP (no change in management objectives)
Amendment 13 (64 FR 26328, May 14, 1999) Effective June 14, 1999)	Revision of management objectives for OCN coho to increase the probability of recovery and to prevent listing under the ESA.
Amendment 14 (66 FR 29238, May 30, 2001; Effective June 29, 2001)	5) Update of the EIS and editorial improvements in the plan 6) New requirements of the SFA, including essential fish habitat, optimum yield, overfishing, and bycatch 7) Clarification of the stocks managed and management objectives 8) Minor revision of allocation north of Cape Falcon to allow more harvest in selective fisheries
Amendment 15 (73 FR 9960, February 25, 2008; Effective March 26, 2008)	Revision of Council action required under a Conservation Alert for Klamath River fall Chinook to allow *de minimis* fisheries.
Amendment 16 (???)	4) New requirements of the MSRA, including stock classification, ACLs and AM 5) Revision of SDC 6) Development and modification of *de minimis* fishing provisions.

1 WHAT THE PLAN COVERS

> *~~A~~"It is therefore declared to be the purposes of the Congress in this ActB(1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States, and the anadromous species and Continental Shelf Fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone . . ., and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species and Continental Shelf fishery resources . . .(7) to promote the protection of essential fish habitat in the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat~~.@~~."*
>
> *Magnuson-Stevens Act, ' 2*(b)

This fishery management plan (FMP) covers the coastwide aggregate of natural and hatchery salmon species that is contacted by salmon fisheries in the exclusive economic zone (EEZ) off the coasts of Washington, Oregon, and California. Salmon of U.S. and Canadian origin are included except when specific species are managed in those waters by another management entity with primary jurisdiction (i.e., sockeye and pink salmon by the Fraser River Panel of the Pacific Salmon Commission (PSC) in the Fraser River Panel Area (U.S.) between 49~~E~~°N latitude and 48~~E~~°N latitude). In addition, the plan contains requirements and recommendations with regard to essential fish habitat for the managed stocks as described in Chapter 4 and Appendix A. The essential fish habitat includes marine areas within the EEZ as well as estuarine and freshwater habitat within the internal waters of Washington, Oregon, California, and Idaho.

Chinook or king salmon (*Oncorhynchus tshawytscha*) and coho or silver salmon (*O. kisutch*) are the main species caught in Council-managed ocean salmon fisheries. In odd-numbered years, catches of pink salmon (*O. gorbuscha*) can also be significant, primarily off Washington and Oregon (~~Salmon Technical Team [STT] 1999a).~~PFMC 2011a). Therefore, while all species of salmon fall under the jurisdiction of this plan, it currently contains fishery management objectives only for Chinook, coho, pink (odd-numbered years only), and any salmon species listed under the Endangered Species Act (ESA) that is measurably impacted by Council fisheries. ~~To the extent practicable, the Council has partitioned this coastwide aggregate of Chinook, coho, and pink salmon into various stock components with specific conservation objectives. A detailed listing of the individual stocks or stock complexes managed under this plan, along with pertinent stock information and conservation objectives, is provided in Chapter 3.~~

The plan contains no fishery management objectives for even-numbered year pink salmon, chum (*O. keta*), sockeye (*O. nerka*), steelhead (*O. mykiss*), ~~or~~ sea-run cutthroat (*O. clarki*) or spring run Chinook from the mid-Columbia River tributaries (White Salmon, Klickitat, Yakima, Deschutes, John Day, Umatilla, and Walla Walla basins). The Council does not manage fisheries for these species and incidental catches are inconsequential (low hundreds of fish each year) to very rare (~~Appendix A of STT 1997).~~PFMC 2011d). In the event this situation should change, management objectives for these species could be developed and incorporated by plan amendment. The incidental harvest of these salmon species can be allowed or restricted under existing federal fishery regulations.

1.2 STOCK CLASSIFICATION

The MSA requires that an FMP describe the species of fish involved in the fishery. The NS1Gs provide a structure for classifying stocks in and around the fishery, and organizing stock complexes. This classification scheme helps conceptualize how the fishery operates, which stocks are affected by various fishery sectors, and how SDC and ACL provisions, among other MSA Section 303(a) provisions, may be applied.

The stocks identified in an FMP are classified as in or out of the fishery, and as target or non-target stocks. Target stocks and some non-target stocks are in the fishery; ecosystem component (ECs) stocks are non-target stocks that are not in the fishery. Individual stocks can also be formed into stock complexes for management and assessment purposes. Stock complexes are groups of stocks that are sufficiently similar in geographic distribution, life history, and vulnerabilities to the fishery such that the impacts of management actions on the stocks are similar. Stock complexes may be formed to facilitate management requirements such as setting ACLs in a mixed stock fishery. Each stock complex could have one or more indicator stocks to establish annual harvest constraints based on status of those indicator stocks.

To the extent practicable, the Council has partitioned the coastwide aggregate of Chinook, coho, and pink salmon into various stock components and complexes with specific conservation objectives. A detailed listing of the individual stocks and stock complexes managed under this plan are provided in Tables 1-1, 1-2, and 1-3.

1.2 Changes or Additions

The following classification actions will require an FMP amendment: adding stocks to the FMP either to the fishery or as EC species, removing stocks from the FMP, and reclassifying stocks as either in the fishery or as an EC species. The following actions will not require an FMP amendment as long as the stocks and complex remain in their original designation (in the fishery or EC): composition of stock complexes, specification of indicator stocks for complexes, identification as target or non-target stocks. All of these actions require a comprehensive technical review of the best scientific information available providing evidence that, in the view of the Salmon Technical Team (STT), Scientific and Statistical Committee (SSC), and the Council, such modifications are justified. Insofar as possible, proposed changes for natural stocks will be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November Council meeting prior to the year in which the proposed changes would be effective) and prior to the preseason planning process. The additional following actions will not require an FMP amendment: changes or additions involving ESA-listed stocks upon the recommendation of NMFS, changes or additions involving hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities; and Federal court-ordered changes.

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 1of 4)

Stocks and Complexes In The Fishery		Description	Target/Non-Target
Stock or Stock Complex	**Component Stocks**		
Central Valley Fall Chinook Stock Complex		Fall and late fall Chinook from the Sacramento and San Joaquin basins; the indicator stock is Sacramento River Fall Chinook.	-
-	Sacramento River Fall	Primarily hatchery stock with smaller natural component. Single largest contributor to ocean fisheries off California, a significant contributor off southern and central Oregon, and present north into British Columbia. Primary impact south of Pt. Arena; considerable overlap with coastal and Klamath River fall Chinook between Pt. Arena and Horse Mt.	Target
	Sacramento River Late Fall	Natural and hatchery components from upper Sacramento basin. Minor contributions to ocean fisheries.	Target
	San Joaquin River Fall	Natural and hatchery components. Minor contributions to ocean fisheries.	Target
Sacramento River Spring		ESA listed Threatened. Minor contributions to ocean fisheries off California, also known to occur off Oregon.	Non-Target ESA
Sacramento River Winter		ESA listed Endangered. Minor contributions to ocean fisheries south of Pt. Arena.	Non-Target ESA
California Coastal Chinook		ESA listed Threatened. Eel, Mattole, Mad Rivers fall and spring stocks. Minor contributions to ocean fisheries off northern California and southern Oregon.	Non-Target ESA
Southern Oregon Northern California Chinook Stock Complex		Natural and hatchery stocks south of the Elk River, Oregon to, and including, the Klamath River, plus Umpqua River spring Chinook; the indicator stock is Klamath River fall Chinook.	-
-	Klamath River Fall	Natural and hatchery components from the Klamath basin. Major contributions to ocean fisheries from Humbug Mt. to Horse Mt. and to Klamath River tribal and recreational fisheries. Significant contributions to ocean fisheries from Cape Falcon to Pt. Sur.	Target
	Klamath River - Spring	Natural and hatchery components from the Klamath basin. Minor contributions to ocean fisheries from Cape Falcon to Pt. Sur.	Non-Target
	Smith River	Natural spring and fall stocks from the Smith River basin. Minor contributions to ocean fisheries off northern California and Oregon.	Non-Target
	Southern Oregon	Aggregate of natural and hatchery fall and spring stocks in all streams south of Elk River, plus Umpqua spring stock; Rogue River fall stock is used to indicate relative abundance and ocean contribution rates. Significant contributions to ocean fisheries off northern California and Oregon.	Target

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 2 of 4)

Stocks and Complexes In The Fishery			
Stock or Stock Complex	**Component Stocks**	**Description**	**Target/Non-Target**
Far-North-Migrating Coastal Chinook Stock Complex		Spring/summer and fall stocks from the Central and Northern Oregon Coast (from the Elk River north, except Umpqua River spring Chinook), and spring/summer and fall coastal stocks north of the Columbia River. Indicator stocks for this complex would be Quillayute, Hoh, Queets, and Grays Harbor fall Chinook. These stocks are subject to provisions of the Pacific Salmon Treaty.	-
-	Central and Northern Oregon	Aggregate of natural and hatchery fall and spring stocks in all streams from the Elk River to just south of the Columbia River. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off northern Oregon and Washington.	Non-Target
	Willapa Bay Fall (natural)	Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Willapa Bay Fall (hatchery)	Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Grays Harbor Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Grays Harbor Spring	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quinault Fall	Hatchery stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Queets Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Queets Sp/Su	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoh Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoh Spring/Summer	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quillayute Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Quillayute Spring/Summer	Hatchery and natural stocks. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target
	Hoko Summer/Fall	Natural stock. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington.	Non-Target

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 3 of 4)

Stocks and Complexes In The Fishery		**Description**	**Target/Non-Target**
Stock or Stock Complex	**Component Stocks**		
North Lewis River Fall		Natural stock. Component of Lower Columbia Chinook ESU - ESA listed Threatened. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon.	Non-Target ESA
Lower River Natural Tule Fall		Component of Lower Columbia Chinook ESU - ESA listed Threatened. Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Non-Target ESA
Lower River Hatchery - Fall		Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Target
Lower River Hatchery Spring		Minor contribution to ocean fisheries north of Cape Falcon and Canada.	Non-Target
Upper Willamette Spring		Natural and hatchery stock. ESA listed Threatened. Minor contribution to ocean fisheries north of Cape Falcon, Canada, and Alaska.	Non-Target ESA
Mid-River Bright Hatchery Fall		Hatchery stock, Significant contribution to ocean fisheries off Canada and Alaska.	Non-Target
Spring Creek Hatchery Fall		Significant contribution to ocean fisheries north of Cape Falcon and Canada. Minor contribution to ocean fisheries south of Cape Falcon.	Target
Mid-Columbia Spring		Natural and hatchery stocks from the White Salmon, Klickitat, Yakima, Deschutes, John Day, Umatilla, and Walla Walla basins. Negligible contribution to ocean fisheries.	Non-Target Ecosystem Component
Snake River Fall		Natural and hatchery stock. ESA listed Threatened. Significant contributions to Alaska and Canada ocean fisheries. Minor contributions to ocean fisheries off Washington and Oregon.	Non-Target ESA
Snake River - Spring/Summer		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Upper River Bright Fall		Natural and hatchery stock. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon. Subject to Pacific Salmon Treaty provisions.	<5%
Upper River Summer		Natural and hatchery stock. Significant contribution to Alaska and Canada ocean fisheries. Minor contribution to ocean fisheries off Washington and northern Oregon. Subject to Pacific Salmon Treaty provisions.	<5%
Upper River Spring		Natural and hatchery stock. ESA listed Endangered. Negligible contributions to ocean fisheries.	Non-Target ESA

Table 1-1. Chinook stocks and stock complexes identified in the Salmon FMP. (Page 4 of 4)

Stocks and Complexes In The Fishery		Description	Target/Non-Target
Stock or Stock Complex	**Component Stocks**		
Eastern Strait of Juan de Fuca Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skokomish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Nooksack Spring early		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skagit Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Skagit Spring		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Stillaguamish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Snohomish Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Cedar River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
White River Spring		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Green River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA
Nisqually River Summer/Fall		Natural and hatchery stock. ESA listed Threatened. Negligible contributions to ocean fisheries.	Non-Target ESA

Table 1-2. Coho stocks and stock complexes identified in the Salmon FMP. (Page 1 of 2)

Stocks and Complexes In The Fishery	Description	Target/Non-Target
Central California Coast	ESA Threatened. ~~Very minor component of OPI area fisheries,~~ limited potential for significant contribution to ocean and inland fisheries. Current impacts incidental in ocean fisheries off California.	Non-Target ESA
Southen Oregon/Northern California Coast	ESA Threatened. Very minor natural component of OPI area fisheries, potential for minor contribution to ocean fisheries off California and southern Oregon, and inland California fisheries.	Non-Target ESA
Oregon Coastal Natural	ESA Threatened. Major natural component of OPI area which, when abundant, contributes to ocean fisheries off ~~California,~~ Oregon, and Washington south of Leadbetter Pt., and freshwater fisheries in Oregon coastal streams.	Non-Target ESA
Lower Columbia Natural	ESA Threatened. Minor natural component of OPI area which, when abundant, contributes to ocean fisheries off Oregon and Washington, and mainstem Columbia River fisheries.	Non-Target ESA
Columbia River Late Hatchery	Hatchery stock. Major component of ocean fisheries north of Cape Falcon. When abundant, significant contributors to ocean fisheries off Oregon north into Canada and Columbia River fisheries	Target
Columbia River Early Hatchery	Hatchery stock. Major component of OPI area fisheries. When abundant, significant contributors to ocean fisheries off California and north to Leadbetter Pt., Washington and to Columbia River fisheries.	Target
Willapa Bay - Hatchery	Minor component of ocean fisheries off northern Oregon north into Canada. Significant contributor to inside commercial net and recreational fisheries.	Target
Grays Harbor	Minor contributor to ocean fisheries off Oregon and north into Canada. Significant contributor to Washington inside tribal fishery, minor contributor to inside recreational fishery.	Target
Quinault - Hatchery	Contributor to ocean fisheries off Washington and north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.	Target
Queets	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon; significance to Puget Sound and tribal fisheries.	Target
Quillayute - Summer Hatchery	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target
Quillayute - Fall	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target
Hoh	Contributor to ocean fisheries off Washington north into British Columbia; present south to central Oregon.	Target

Table 1-2. Coho stocks and stock complexes identified in the Salmon FMP. (Page 2 of 2)

Stocks and Complexes In The Fishery	**Description**	**Target/Non-Target**
Strait of Juan de Fuca	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Hood Canal	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Skagit	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Stillaguamish	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
Snohomish	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to ocean fisheries off British Columbia, in Puget Sound, and inside tribal fisheries.	Target
South Puget Sound Hatchery	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor off British Columbia, in Puget Sound, and inside tribal fisheries.	Target

Table 1-3. Pink salmon stocks and stock complexes identified in the Salmon FMP. (Page 1 of 1)

Stocks and Complexes In The Fishery	**Description**	**Target/Non-Target**
Puget Sound	Contributor to U.S. ocean fisheries north of Cape Falcon; significant contributor to fisheries in Puget Sound, and inside tribal fisheries.	Target

2 ACHIEVING OPTIMUM YIELD

~~A~~”Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery~~@~~”

Magnuson-Stevens Act, National Standard I

This chapter explains the ~~Council=s~~Council’s means of meeting the requirements of the Magnuson-Stevens Act to achieve the optimum yield from the salmon fishery.

2.1 THEORY

~~A~~Optimum yield~~@~~ (OY) means the amount of fish that will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account protection of marine ecosystems. It is prescribed on the basis of the maximum sustainable yield (MSY) from the fishery, reduced by any relevant economic, social, or ecological factors, and provides for rebuilding of an overfished stock, taking into account the effects of uncertainty and management imprecision.

~~A~~MSY~~@~~ is a theoretical concept that, for the purposes of the Magnuson-Stevens Act,~~-~~ is defined as the largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions. In Council management of naturally spawning salmon stocks, MSY is usually approached in terms of ~~annually achieving~~ the number of adult spawners~~ (conservation objective)~~ associated with this goal. Often, data are insufficient to directly estimate the number of spawners resulting in MSY. In these cases, the Council may use MSY proxies derived from more general estimates of productive capacity and implement harvest strategies that may be expected to result in a long-term average catch approximating MSY.

~~MSY can be a difficult concept to use for management purposes for several reasons. First, it is based on a long-term average that can generally only be calculated from historic data, which may not accurately reflect the MSY under present or future ecological and environmental conditions. When negative changes in environmental conditions (both natural and human caused) reduce a stock=s productivity and prevent it from attaining historic MSY levels (even with no harvest impacts), it is difficult to know whether this is simply normal variation or a long-term change. In addition, uncertainties in run-size projections, fishery impacts, and overall management imprecision combine to complicate the estimation and achievement of MSY. To deal with this uncertainty, the Council may establish conservation objectives based on conservative harvest rates with minimum spawner escapement provisions set at the estimated MSY or MSY proxy level, or set the conservation objective at maximum sustainable production (MSP) rather than MSY (e.g., Puget Sound Chinook stocks). In some cases of limited information or significant changes in habitat conditions, the Council may use stepped harvest rates with very limited exploitation rates at low population sizes and/or spawner floors to support conservation and recovery of the stocks while providing data from which to better ascertain the probable MSY or MSY proxy. Conservation objectives for Oregon coastal natural (OCN) coho and Klamath River fall Chinook are examples of this kind of management.~~

2.2 IMPLEMENTATION

The optimum yield to be achieved for species covered by this plan is the total salmon catch and mortality (expressed in numbers of fish) resulting from fisheries within the EEZ adjacent to the States of Washington, Oregon, and California, and in the waters of those states (including internal waters), and Idaho, that, to the greatest practical extent within pertinent legal constraints, fulfill the ~~plan=s~~plan’s conservation and harvest objectives. On an annual basis, the Council recommends management measures to achieve the stock conservation objectives for each stock or stock complex, based on the estimated MSY, MSY proxy, MSP, rebuilding schedule, or ESA consultation standard (Chapter 3), while simultaneously seeking to fulfill, to the extent practicable, the harvest and allocation objectives (Chapter 5) that reflect the ~~Council=s~~Council's social and economic considerations. The subsequent catch and mortality resulting under the ~~Council=s~~Council's management recommendations will embody the optimum yield~~ and will be equal to or less than MSY from the fishery~~. The level of total allowable harvest, the relative harvest levels in various management areas, and the species and stock composition of optimum yield will vary annually, depending on the relative abundance and distribution of the various stocks and contingencies in allocation formulas.

The ~~Council=s~~Council's annual ocean fishery reviews and preseason reports (e.g., STT ~~2009a, 2009b, 2009c~~2011a, 2011b, 2011c, and ~~2009d~~2011d) assess and specify the present and historical range of harvests and harvest related mortalities that represent the optimum yield. A similar range of yields can be expected in the future, though further stock declines and listings under the ESA could result in even lower levels than experienced prior to 2009.

3 CONSERVATION

~~A~~"Conservation and management measures shall be based upon the best scientific information available~~.@~~."

Magnuson-Stevens Act, National Standard 2

3.1 STATUS DETERMINATION CRITERIA

"Any fishery management plan . . . shall . . . specify objective and measurable criteria for identifying when the fishery . . . is overfished . . . and, . . . contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;"

Magnuson-Stevens Act, '§303(a)(10)

"Overfishing (to overfish) occurs whenever a stock or stock complex is subjected to a level of fishing mortality or annual total catch that jeopardizes the capacity of a stock or stock complex to produce MSY on a continuing basis"

NS1Gs (600.310 (e)(2)(i)(B))

Overfished. A stock or stock complex is considered ''overfished'' when its biomass has declined below a level that jeopardizes the capacity of the stock or stock complex to produce MSY on a continuing basis.

NS1Gs (600.310 (e)(2)(i)(E))

"A fishery shall be classified as approaching a condition of being overfished if, based on trends in fishing effort, fishery resource size, and other appropriate factors, the Secretary estimates that the fishery will become overfished within two years."

Magnuson-Stevens Act, §304(e)(1)

In establishing criteria by which to determine the status of salmon stocks, the Council must consider the uncertainty and theoretical aspects of MSY as well as the complexity and variability unique to naturally producing salmon populations. These unique aspects include the interaction of a short-lived species with frequent, sometimes protracted, and often major variations in both the freshwater and marine environments. These variations may act in unison or in opposition to affect salmon productivity in both positive and negative ways. In addition, variations in natural populations may sometimes be difficult to measure due to masking by artificially produced salmon.

3.1.1 General Application to Salmon Fisheries

In establishing criteria from which to judge the conservation status of salmon stocks, the unique life history of salmon must be considered. Chinook, coho, and pink salmon are short-lived species (generally two to six years) that reproduce only once shortly before dying. Spawning escapements of coho and pink salmon are dominated by a single-year class and Chinook spawning escapements may be dominated by no more than one or two-year classes. The abundance of year classes can fluctuate dramatically with combinations of natural and human-caused environmental variation. Therefore, it is not unusual for a healthy and relatively abundant salmon stock to produce occasional spawning escapements which, even with little or no fishing impacts, may be significantly below the long-term average associated with the production of MSY.

Numerous West Coast salmon stocks have suffered, and continue to suffer, from an onslaught of nonfishing activities that severely reduce natural survival by such actions as the elimination or degradation of freshwater spawning and rearing habitat. The consequence of this man-caused, habitat-based variation is twofold. First, these habitat changes increase large scale variations in stock productivity and associated stock abundances, which in turn complicate the overall determination of MSY and the specific assessment of whether a stock is producing at or below that level. Secondly, as the productivity of the freshwater habitat is diminished, the benefit of further reductions in fishing mortality to improve stock abundance decreases. Clearly, the failure of several stocks managed under this FMP to produce at an historic or consistent MSY level has little to do with current fishing impacts and often cannot be rectified with the cessation of all fishing.

To address the requirements of the Magnuson-Stevens Act, the Council has established criteria based on biological reference points associated with MSY exploitation rate and MSY spawning escapement. The criteria are based on the unique life history of salmon and the large variations in annual stock abundance due to numerous environmental variables. They also take into account the uncertainty and imprecision surrounding the estimates of MSY, fishery impacts, and spawner escapements. In recognition of the unique salmon life history, the criteria differ somewhat from the general guidance in the National Standard 1 Guidelines (§600.310).

3.1.2 Overfishing

A stock will be considered subject to overfishing when the postseason estimate of F_t exceeds the MFMT, where the MFMT is defined as F_{MSY}. Stock-specific estimates of F_{MSY} based on spawner-recruit data will be used if available. Otherwise, a species-specific proxy value of F_{MSY} = 0.78 for Chinook based on species-specific meta-analyses, will be used (PFMC 2011e). Stock-specific overfishing determinations will be made annually and are based on exploitation during a single biological year.

3.1.2.1 Council Action

MSA quote[JLI5]

Overfishing occurs when the total exploitation rate on a stock exceeds F_{MSY} in a single year. Because salmon are exploited in multiple fisheries, it is necessary to determine fishery specific contribution to the total exploitation rate to determine the actions necessary to end and prevent future overfishing. As the Council has no jurisdiction over river fisheries and ocean fisheries north of the U.S./Canada border, it may be necessary for other responsible entities to take action to end and prevent future overfishing.

The STT will report postseason exploitation rates in the annual SAFE document, and when overfishing occurs, the Council shall:

1) notify the NMFS NWR administrator of the STT's findings;
2) direct the STT to assess the mortality rates in fisheries impacting the stock of concern and report their findings;
3) immediately take action to ensure Council area fisheries are not contributing to overfishing, and;
4) notify pertinent management agencies of the stock's status and the contribution of various fisheries to the total exploitation rate.

3.1.3 Approaching an Overfished Condition

An approaching overfished determination will be made if the geometric mean of the two most recent postseason estimates of spawning escapement, and the current preseason forecast of spawning escapement, is below the MSST. Stock-specific approaching overfished determinations will be made annually following development of the preseason spawning escapement forecasts.

3.1.3.1 Council Action

When a stock is approaching an overfished condition the Council shall:

1) notify the NMFS NWR administrator of this situation;

2) notify pertinent management entities, and;

3) structure Council area fisheries to avoid the stock becoming overfished and to mitigate the effects on stock status.

3.1.4 Overfished

> *"For a fishery that is overfished, any fishery management plan, amendment, or proposed regulations… for such fishery shallB(A) specify a time period for ending overfishing and rebuilding the fishery that shall:(i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of the fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem; and (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise…."*
>
> *Magnuson-Stevens Act, §304(e)(4)*

A stock will be considered overfished if the 3-year geometric mean of annual spawning escapements falls below the MSST, defined as $0.5*S_{MSY}$. Overfished determinations will be made annually using the three most recently available postseason estimates of spawning escapement.

3.1.4.1 Council Action

MSA quote[JLI6]

When the overfished status determination criteria set forth in this FMP have been triggered, the Council shall:

1) notify the NMFS NWR administrator of this situation;

2) notify pertinent management entities;

3) structure Council area fisheries to reduce the likelihood of the stock remaining overfished and to mitigate the effects on stock status;

4) direct the STT to propose a rebuilding plan for Council consideration within one year.

Upon formal notification from NMFS to the Council of the overfished status of a stock, a rebuilding plan must be developed and implemented within two years.

The STT's proposed rebuilding plan will include:

1) an evaluation of the roles of fishing, marine and freshwater survival in the determination;

2) any modifications to the criteria set forth in section 3.4.6 below for determining when the stock has rebuilt,

3) recommendations for actions the Council could take to rebuild the stock to S_{MSY}, including modification of control rules and;

4) a specified rebuilding period.

In addition, the STT may consider and make recommendations to the Council or other management entities for reevaluating the current estimate of S_{MSY}, modifying methods used to forecast stock abundance or fishing impacts, improving sampling and monitoring programs, or improving hatchery practices.

Based on the results of the STT proposed rebuilding plan, and subject to Secretarial approval, the Council will implement a rebuilding plan with appropriate actions to ensure the stock is rebuilt in as short a time as possible based on the biology of the stock but not to exceed ten years, while taking into consideration the needs of the commercial, recreational and tribal fishing interests and coastal communities. The existing control rules provide a default rebuilding plan that targets spawning escapement at or above MSY provided sufficient recruits are available and targets a rebuilding period of one generation (two years for pink salmon, 3 years for coho, and 5 years for Chinook). If sufficient recruits are not available to achieve MSA spawning escapement in a particular year, the control rules provide for *de minimis* exploitation rates that allow continued participation of fishing communities while minimizing risk of overfishing. However, the Council should consider the specific circumstances surrounding an overfished determination and endure that whatever rebuilding plan is adopted addresses all relevant issues.

Even if fishing is not the primary factor in the depression of the stock, the Council must act to limit the exploitation rate of fisheries within its jurisdiction so as not to limit rebuilding of the stock or fisheries. In cases where no action within Council authority can be identified which has a reasonable expectation of contributing to the rebuilding of the stock in question, the Council will identify the actions required by other entities to recover the depressed stock. Due to a lack of data for some stocks, environmental variation, economic and social impacts, and habitat losses or problems beyond the control or management authority of the Council, it is possible that rebuilding of depressed stocks in some cases could take much longer than ten years. The Council may change analytical or procedural methodologies to improve the accuracy of estimates for abundance, harvest impacts, and MSY escapement levels, and/or reduce ocean harvest impacts when it may be effective in stock recovery. For those causes beyond Council control or expertise, the Council may make recommendations to those entities which have the authority and expertise to change preseason prediction methodology, improve habitat, modify enhancement activities, and re-evaluate management and conservation objectives for potential modification through the appropriate Council process.

In addition to the STT assessment, the Council may direct its Habitat Committee (HC) to work with federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame. However, this action would be a priority only if the STT evaluation concluded that freshwater survival was a significant factor leading to the overfished determination. Upon review of the report from the HC, the Council will take actions to promote any solutions to the identified habitat problems.

3.1.5 Not Overfished-Rebuilding

After an overfished status determination has been triggered, once the stock's 3-year geometric mean of spawning escapement exceeds the MSST, but remains below S_{MSY}, the stock status will be recognized as "not overfished-rebuilding". This status level requires no Council action, but rather is used to indicate that stock's status has improved from the overfished level but the stock has not yet rebuilt.

3.1.6 Rebuilt

The criterion for determining that an overfished stock is rebuilt is when the 3-year geometric mean spawning escapement exceeds S_{MSY}; the Council may consider additional criteria for rebuilt status when developing a rebuilding plan, subject to Secretarial approval.

Because abundance of salmon populations can be highly variable, it is possible for a stock to rebuild from an overfished condition to the default rebuilding criterion in as little as one year, before a proposed rebuilding plan could be brought before the Council.

In some cases it may be important to consider other factors in determining rebuilt status, such as population structure within the stock designation. The Council may also want to specify particular strategies or priorities to achieve rebuilding objectives. Specific objectives, priorities, and implementation strategies should be detailed in the rebuilding plan. Adoption of a rebuilding plan will require implementation either through an FMP amendment or notice and comment rule-making process.

3.1.6.1 Council Action

When a stock is determined to be rebuilt, the Council shall:

1) notify the NMFS NWR administrator of its finding, and;

2) notify pertinent management entities.

3.1.7Changes or Additions Status determination criteria are defined in terms of biologically-based reference points, or population parameters, specifically, SMSY, FMSY, and MSST. These reference points are generally regarded as fixed quantities and are the basis for the harvest control rules, which provide the operative guidance for the annual preseason planning process used to establish salmon fishing seasons that achieve optimum yield. If a comprehensive technical review of the best scientific information available provides evidence that, in the view of the STT, SSC, and the Council, justifies a modification, then changes to these how status determination criteria are defined (i.e., changes to these reference points) must be made through a plan amendment. Insofar as possible, proposed reference point changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the year in which the proposed changes would be effective) and apart from the preseason planning process. SDC reference points that may be changed without an FMP amendment include changes to: reference point objectives for hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities; and Federal court-ordered changes. All modifications would be documented through the salmon methodology review process, and/or the Council's preseason planning process.

3.2 SALMON STOCK CONSERVATION OBJECTIVES

> ~~A~~”*To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination*~~@~~”
>
> *Magnuson-Stevens Act, National Standard 3*

To achieve optimum yield, prevent overfishing, and assure rebuilding of salmon stocks whose abundance have been depressed to an overfished level, this plan establishes, to the extent practicable, conservation objectives to perpetuate the coastwide aggregate of salmon stocks covered by the plan (Chapter 1). The ~~Council=s~~Council's stock conservation objectives (to be achieved annually) and other pertinent stock management information are contained in Table 3-1~~ (following Section 3.2).~~. Specific objectives are listed for natural and hatchery stocks that are part of the ~~Council=s~~Council's preseason fishery ~~option~~alternative development process (Chapter 9), including all relevant stocks listed under the Federal ESA. The objectives may -be applicable to a single stock independently or to an indicator stock or stocks for a stock complex~~ of interrelated stocks (those sharing similarities in life-history traits, geographic distribution, habitat preferences, or genetic characteristics).~~. Stocks that are not included in the preseason analyses may lack specific conservation objectives because the stock is not significantly impacted by ocean fisheries or insufficient management information is available from which to assess ocean fishery impacts directly. In the latter case, the stock will be included in a stock complex and the conservation objective for ~~a managed~~an indicator stock ~~may serve to~~will provide for the conservation of ~~a~~ closely related ~~stock~~stocks unless, or until, more specific management information can be developed.

3.~~1~~2.1 Basis

The ~~Council=s~~Council's conservation objectives for natural stocks may (1) be based on estimates for achieving MSY~~,~~, or an MSY proxy~~, or MSP~~, or (2) represent special data gathering or rebuilding strategies to approach MSY and to eventually develop MSY ~~or MSP~~ objectives. The objectives have generally been developed through extensive analysis by the fishery management entities with direct management authority for the stock, or through joint efforts coordinated through the Council, or with other state, tribal, or federal entities. Most of the objectives for stocks north of Cape Falcon have been included in U.S.

District Court orders. Under those orders for Washington coastal and Puget Sound stocks (Hoh v. Baldrige No. 81-742 [R] C and U.S. v. Washington, 626 F. Supp. 1405 [1985]), the treaty tribes and WDFW may agree to annual spawner targets or other objectives that differ from the ~~MSP or~~ MSY objectives. Details of the conservation objectives in effect at the time this FMP was approved are available in PFMC (1984), in individual amendment documents (see Table 1 in the Introduction), and as referenced in Table 3-1. Updated conservation objectives and ESA consultation standards are available in the most recent Preseason Report I, (Appendix A~~, Table A-1~~), and Preseason Report III (Table 5) produced by the STT.

The ~~Council=s fixed~~Council's conservation objectives are generally expressed in terms of an annual fishery or spawning escapement ~~believed~~estimated to be optimum for producing MSY over the long-term. The escapement objective may be (1) a specific number or a range for the desired number of adult spawners (spawner escapement), ~~or~~ (2) a specific number or range for the desired escapement of a stock from the ocean or at another particular location, such as a dam, that may be expected to result in the target number of spawners~~. The current data gathering and rebuilding objectives~~, or (3) based on the exploitation rate that would produce MSY over the long-term. Objectives may be expressed as fixed or stepped exploitation or harvest rates and may include spawner floors or ~~severely~~substantially reduced harvest rates at low abundance levels~~ (e.g., Klamath River fall Chinook),~~, or as special requirements provided in ~~National Marine Fisheries Service (~~NMFS~~)~~ consultation standards for stocks listed under the ESA.

3.~~1~~2.2 Changes or Additions

Conservation objectives generally are fixed ~~measures of the FMP~~quantities intended to provide the necessary guidance during the course of the annual preseason planning process to establish salmon fishing seasons that achieve optimum yield. ~~However, changes~~ Changes or additions to ~~the stock complexes and~~conservation objectives ~~for most natural stocks~~ may be made ~~without~~ either through a plan amendment or regulatory process if a comprehensive technical review of the best scientific information available provides ~~conclusive~~ evidence that, in the view of the Salmon Technical Team~~,~~ (STT), Scientific and Statistical Committee (SSC), and the Council, justifies a modification. ~~An exception is the 35,000 natural spawner floor~~Insofar as possible, proposed changes for natural stocks will only be reviewed and approved within the schedule established for ~~Klamath River fall Chinook~~salmon estimation methodology reviews (completed at the November meeting prior to the year in which ~~may only be changed by FMP amendment.~~ the proposed changes would be effective) and apart from the preseason planning process. The Council may change conservation objectives for hatchery stocks upon the recommendation of the pertinent federal, state, and tribal management entities. Federal court-ordered changes in conservation objectives will also be accommodated without a plan amendment.~~ Insofar as possible, changes for natural stocks will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the season in which they are effective) and apart from the preseason planning process.~~ The applicable annual objectives of Council-adopted rebuilding programs ~~developed in response to an overfishing concern or~~and the requirements of consultation standards promulgated by NMFS under the ESA may be employed without plan amendment to assure timely implementation. All of these changes will be documented during the ~~Council=s~~Council's preseason planning process.

The Council considers established conservation objectives to be stable and a technical review of biological data must provide substantial evidence that a modification is necessary. The Council's approach to conservation objectives purposely discourages frequent changes for short-term economic or social reasons at the expense of long-term benefits from the resource. However, periodic review and revision of established objectives is anticipated as additional data become available for a stock or stock complex.

~~3.2 OVERFISHING CRITERIA~~

> ~~*AAny fishery management plan . . . shall . . . specify objective and measurable criteria for identifying when the fishery . . . is overfished . . . and, . . . contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;@*~~
>
> ~~*Magnuson-Stevens Act, ' 303(a)(10)*~~

> ~~*AThe terms overfishing and overfished mean a rate or level of fishing mortality that jeopardizes the capacity of a fishery to produce the maximum sustainable yield on a continuing basis.@*~~
>
> ~~*Magnuson-Stevens Act, ' 3(29)*~~

~~In applying the Magnuson-Stevens Act definition of overfishing to salmon fisheries and establishing criteria by which to identify it, the Council must consider the uncertainty and theoretical aspects of MSY as well as the complexity and variability unique to naturally producing salmon populations.~~

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 1 of 5)

CHINOOK					
Stocks In The Fishery	**Conservation Objective**	S_{MSY}	MSST	F_{MSY}	ACL
Sacramento River Fall Indicator stock for the Central Valley fall (CVF) Chinook stock complex.	122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).	122,000	61,000	78% Proxy (SAC 2010a)	Based on F_{ABC} and annual ocean abundance. F_{ABC} is F_{MSY} reduced by Tier 2 (10%) uncertainty
Sacramento River Spring ESA Threatened	NMFS ESA consultation standard/recovery plan: Conform to Sacramento River Winter Chinook ESA consultation standard (no defined objective for ocean management prior to listing).	Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Sacramento River Winter ESA Endangered	NMFS ESA consultation standard/recovery plan: Recreational seasons: Point Arena to Pigeon Point between the first Saturday in April and the second Sunday in November; Pigeon Point 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. Commercial seasons: Point Arena to the U.S./Mexico border between May 1 and September 30, except Point Reyes to Point San Pedro between October 1 and 15 (Monday through Friday). Minimum size limit ≥ 26 inches total length. Guidance from NMFS in 2010 and 2011 required implementation of additional closures and/or increased sized limits in the recreational fishery South of Point Arena. A new winter-run management framework and consultation standard is expected to be in place for the 2012 fishing season, or no later than March 1, 2012. (NMFS ESA Guidance for 2011).	Undefined	Undefined	Undefined	
California Coastal Chinook ESA Threatened	NMFS ESA consultation standard/recovery plan: Limit ocean fisheries to no more than a 16.0 age-4 ocean harvest rate on Klamath River fall Chinook.	Undefined	Undefined	Undefined	
Klamath River Fall Indicator stock for the Southern Oregon Northern California (SONC) Chinook stock complex.	At least 32% of potential adult natural spawners, but no fewer than 40,700 naturally spawning adults in any one year. Brood escapement rate must average at least 32% over the long-term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Natural area spawners to maximize catch estimated at 40,700 adults (Salmon Technical Team, 2005).	40,700	20,350	72% (STT 2005)	Based on F_{ABC} and annual ocean abundance. F_{ABC} is F_{MSY} reduced by Tier 1 (5%) uncertainty
Klamath River - Spring	Undefined	Undefined	Undefined	Undefined	Undefined - Deferred to SONC complex indicator stock(s)
Smith River	Undefined	Undefined	Undefined	Undefined	
Southern Oregon	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982) measured by 60-90 fish per mile in index streams. ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.	60 fish per mile in index streams	30 fish per mile in index streams	Undefined	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 2 of 5)

Central and Northern Oregon	Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982) measured by 60-90 fish per mile in index streams. ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.		60 Fish per mile in index streams	30 Fish per mile in index streams	Undefined	Undefined - Deferred to FNMC complex indicator stock(s)
Willapa Bay Fall	Undetermined in FMP. WDFW spawning escapement objective of 4,350.		Undefined	Undefined	Undefined	
Grays Harbor FallIndicator stock for the Far North Migrating Coastal (FNMC) Chinook stock complex	14,600 natural adult spawners--MSP based on full seeding of spawning and rearing habitat (WDF 1979).	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders.	14,600	7,300	78% Proxy(SAC 2010a)	Undefined - International exception to ACL requirements, deferred to PST management constraints.
Queets Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).		2,500	1,250	78% Proxy (SAC 2010a)	
Hoh Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).		1,200	600	78% Proxy (SAC 2010a)	
Quillayute Fall Indicator stock for the FNMC Chinook stock complex	Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).		3,000	1,500	78% Proxy (SAC 2010a)	
Hoko Summer/Fall Indicator stock for the FNMC Chinook stock complex	850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults used for supplementation program.		850	425	78% Proxy (SAC 2010a)	
Grays Harbor Spring	1,400 natural adult spawners.		1,400	700	78% Proxy (SAC 2010a)	Undefined - Deferred to FNMC complex indicator stock(s)
Queets Sp/Su	Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.		700	350	78% Proxy (SAC 2010a)	
Hoh Spring/Summer	Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.		900	450	78% Proxy (SAC 2010a)	
Quillayute Spring/Summer	1,200 natural adult spawners for summer component (MSY).		1,200	600	Undefined	
Willapa Bay Fall (hatchery)	8,200 adult return to hatchery. WDFW spawning escapement objective of 9,800 hatchery spawners.		Not applicable to hatchery stocks			
Quinault Fall (hatchery)	Hatchery production.					

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 3 of 5)

North Lewis River Fall	NMFS consultation standard/recovery plan. McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.	5,700	Undefined - Deferred to ESA consultation standard.	76%	Undefined - Deferred to ESA consultation standard.
Lower River Natural Tule Fall	NMFS consultation standard/recovery plan. Less than 37.0% Total AEQ fishery exploitation rate; 2011 ESA guidance.	Undefined		Undefined	
Snake River Fall	NMFS consultation standard/recovery plan. No more than 70.0% of 1988-1993 base period AEQ exploitation rate for all ocean fisheries.	Undefined		Undefined	
Upper Willamette Spring	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Upper River Spring	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Snake River - Spring/Summer	NMFS consultation standard/recovery plan. Not applicable for ocean fisheries.	Undefined		Undefined	
Lower River Hatchery - Fall	12,600 adults for hatchery egg-take.	Not applicable to hatchery stocks			
Lower River Hatchery Spring	2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.				
Mid-River Bright Hatchery Fall	4,700 adults for Bonneville Hatchery and 2,000 for Little White Salmon Hatchery egg-take.				
Spring Creek Hatchery Fall	7,000 adults to meet hatchery egg-take goal.				
Mid-Columbia Spring	-	-	-	-	-
Upper River Bright Fall	40,000 natural bright adults above McNary Dam (MSY proxy adopted in 1984 based on CRFMP). The management goal has been increased to 60,000 by Columbia River managers in recent years.	39,625 (Langness and Reidinger 2003)	19,812	85.91% (Langness and Reidinger 2003)	Undefined - International exception to ACL requirements, deferred to PST management constraints
Upper River Summer	Hold ocean fishery impacts at or below base period; recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).	12,143 (CTC 1999)	6,071	75% (CTC 1999)	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 4 of 5)

Eastern Strait of Juan de Fuca Summer/Fall	NMFS consultation standard/recovery plan. No more than 10.0% Southern U.S. (SUS) Rebuilding Exploitation Rate (RER) for the Elwha Riverand for the Dungeness River. 2011 comanagers Resource Management Plan (RMP)	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of U.S. v. Washington and subsequent U.S. District Court orders.	Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Skokomish Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Mid Hood Canal Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% preterminal SUS CERC. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Nooksack Spring early	NMFS consultation standard/recovery plan. No more than 7.0% SUS CERC. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Skagit Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Skagit Spring	NMFS consultation standard/recovery plan. No more than 38.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Stillaguamish Summer/Fall	NMFS consultation standard/recovery plan. No more than 25.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Snohomish Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% SUS RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Cedar River Summer/Fall	NMFS consultation standard/recovery plan. No more than 20.0% SUS RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
White River Spring	NMFS consultation standard/recovery plan. No more than 20.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Green River Summer/Fall	NMFS consultation standard/recovery plan. No more than 15.0% preterminal SUS RER, at least 5,800 adult spawners.		Undefined	Undefined	Undefined	
Nisqually River Summer/Fall	NMFS consultation standard/recovery plan. No more than 65.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	
Puyallup Summer/Fall	NMFS consultation standard/recovery plan. No more than 50.0% total RER. 2011 comanagers RMP		Undefined	Undefined	Undefined	

Table 3-1. Conservation objectives and reference points governing harvest control rules and status determination criteria for salmon stocks and stock complexes in the Pacific Coast salmon FMP. (Page 5 of 5)

COHO						
Stocks In The Fishery	**Conservation Objective**		SMSY	MSST	FMSY	ACL
Central California Coast ESA Threatened	NMFS ESA consultation standard/recovery plan: No retention of coho south of the OR/CA border.		Undefined	Undefined	Undefined	Undefined - Deferred to ESA consultation standard.
Southen Oregon/Northern California Coast ESA Threatened	NMFS ESA consultation standard/recovery plan: No more than a 13.0% AEQ exploitation rate in ocean fisheries on Rogue/Klamath hatchery coho.		Undefined	Undefined	Undefined	
Oregon Coastal Natural ESA Threatened	NMFS ESA consultation standard/recovery plan: Total AEQ exploitation rate limit based on parnetal seeding level and marine survival matrix in FMP Table 3-2.		Undefined	Undefined	Undefined	
Lower Columbia Natural ESA Threatened	NMFS ESA consultation standard/recovery plan: AEQ exploitation rate limit on ocean and mainstem Columbia fisheries indentified in annual NMFS guidance.		Undefined	Undefined	Undefined	
Columbia River Late Hatchery	Hatchery rack return goal of 14,200 adults.		Not applicable to hatchery stocks			
Columbia River Early Hatchery	Hatchery rack return goal of 6,200 adults.					
Willapa Bay - Hatchery	Hatchery rack return goal of 6,100 adults.					
Quinault - Hatchery	Hatchery production.					
Quillayute - Summer Hatchery	Hatchery production.					
South Puget Sound Hatchery	Hatchery rack return goal of 52,000 adults.					
Grays Harbor	35,400 natural adult spawners (MSP based on WDF [1979])	Annual natural spawning escapement targets may vary from FMP conservation objectives if agreed to by WDFW and treaty tribes under the provisions of Hoh v. Baldrige, U.S. v. Washington, or subsequent U.S. District Court orders	35,400 (WDF 1979)	17,700	69% (PFMC 2011e)	Undefined - International exception to ACL requirements, deferred to PST management constraints
Queets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle et al 1984)		5,500 (SAC 2010b)	2,750	68% (PFMC 2011e)	
Hoh	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle et al. 1984)		2,520 (SAC 2010b)	1,260	69% (PFMC 2011e)	
Quillayute - Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle et al. 1984)		5,873 (SAC 2010b)	2,936	59% (PFMC 2011e)	
Strait of Juan de Fuca	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 27,445; 0.40 for ocean age-3 abundance >11,679 and ≤27,445; 0.20 for ocean age-3 abundance ≤11,679		10,978 (WDF 1979)	17,700	60% (PFMC 2011e)	
Hood Canal	Total allowable MSY exploitation rate of: 0.65 for ocean age-3 abundance > 41,000; 0.45 for ocean age-3 abundance >19,545 and ≤41,000; 0.20 for ocean age-3 abundance ≤19,545		14,350 (PFMC 2011e)	2,750	65% (PFMC 2011e)	
Skagit	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 62,500; 0.35 for ocean age-3 abundance >22,857 and ≤62,500; 0.20 for ocean age-3 abundance ≤22,857		25,000 (PFMC 2011e)	12,250	60% (PFMC 2011e)	
Stillaguamish	Total allowable MSY exploitation rate of: 0.50 for ocean age-3 abundance > 20,000; 0.35 for ocean age-3 abundance >9,385 and ≤20,000; 0.20 for ocean age-3 abundance ≤9,385		10,000 (PFMC 2011e)	5,000	50% (PFMC 2011e)	
Snohomish	Total allowable MSY exploitation rate of: 0.60 for ocean age-3 abundance > 125,000; 0.40 for ocean age-3 abundance >51,667 and ≤125,000; 0.20 for ocean age-3 abundance ≤51,667		50,000 (PFMC 2011e)	25,000	60% (PFMC 2011e)	

3.3 HARVEST CONTROLS

Control rules are used to manage the harvest of stocks to achieve optimum yield while preventing overfishing. Control rules specify the allowable harvest of stocks based on their abundance and are predicated on meeting conservation objectives in addition to relating those objectives to biological reference points such as maximum sustainable yield (MSY), maximum fishing mortality threshold (MFMT), overfishing limit (OFL), minimum stock size threshold (MSST), acceptable biological catch (ABC), and annual catch limit (ACL). For stocks with escapement based conservation objectives, the control rule limits exploitation to achieve escapement objectives. For stocks with exploitation rate based conservation objectives, escapement targets vary annually depending on stock abundance.

3.3.1 Definitions

Reference points defined by the MSA or National Standard 1 (NS1) Guidelines are used as benchmarks within the control rules. They are useful for evaluating and comparing control rules, and in some cases are triggers for management actions. There are several formulations of control rules for different stocks in the FMP, using various combinations of reference points. These stock-specific control rules are applied consistently from year to year.

Reference points contained in the FMP include:

MFMT: Maximum Fishing Mortality Threshold. Defined in NS1 Guidelines as the level of fishing mortality (F) on an annual basis, above which overfishing is occurring. MFMT is equal to F_{MSY}.

OFL: Overfishing Limit. Defined by NS1 Guidelines as the annual amount of catch that corresponds to the estimate of MFMT applied to a stock or complex's abundance, expressed in terms of numbers or weight of fish, and is the catch level above which overfishing is occurring

F_{MSY}: MSY fishing mortality rate. Annual exploitation rate that will, on average, produce MSY. Corresponds to MFMT.

ABC: Acceptable Biological Catch. Required by the MSA and defined in the NS1 Guidelines as the annual amount of catch that accounts for scientific uncertainty in the OFL and other scientific uncertainty, and is specified based on the ABC control rule. ABC may not exceed OFL and should be reduced from OFL to prevent overfishing.

F_{ABC}: ABC fishing mortality rate. The annual exploitation rate associated with the ABC.

ACL: Annual Catch Limit. Required by the MSA and defined in the NS1 Guidelines as the level of catch that serves as the basis for invoking accountability measures. The ACL cannot exceed ABC.

F_{ACL}: ACL fishing mortality rate. The annual exploitation rate associated with the ACL.

S_{MSY}: MSY spawner abundance. The abundance of adult spawners that is expected, on average, to produce MSY.

MSST: Minimum Stock Size Threshold. Defined in the NS1 Guidelines as level of biomass below which the stock is considered to be overfished. The MSST should be no less than one-half of S_{MSY}.

3.3.2 Relationship to ESA consultation standards

The ESA requires federal agencies whose actions may adversely affect listed salmon to consult with NMFS. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the FMP. ~~These unique aspects include the interaction of a short-lived species with frequent, sometimes protracted, and often major variations in both the freshwater and marine environments. These variations may act in unison or in opposition to affect salmon productivity in both positive and negative ways. In addition, variations in natural populations may sometimes be difficult to measure due to masking by artificially produced salmon.~~

~~3.2.1 General Application to Salmon Fisheries~~

~~In setting criteria from which to judge the conservation status of salmon stocks, the unique life history of salmon must be considered. Chinook, coho, and pink salmon are short-lived species (generally two to six years) that reproduce only once shortly before dying. Spawning escapements of coho and pink salmon are dominated by a single-year class and Chinook spawning escapements may be dominated by no more than one or two-year classes. The abundance of year classes can fluctuate dramatically with combinations of natural and human-caused environmental variation. Therefore, it is not unusual for a healthy and relatively abundant salmon stock to produce occasional spawning escapements which, even with little or no fishing impacts, may be significantly below the long-term average associated with the production of MSY. This phenomenon has been observed in recent years for numerous salmon stocks, including Klamath River fall Chinook and several Washington coho stocks.~~

~~Numerous West Coast salmon stocks have suffered, and continue to suffer, from an onslaught of nonfishing activities that severely reduce natural survival by such actions as the elimination or degradation of freshwater spawning and rearing habitat. The consequence of this man-caused, habitat-based variation is two fold. First, these habitat changes increase large scale variations in stock productivity and associated stock abundances, which in turn complicate the overall determination of MSY and the specific assessment of whether a stock is producing at or below that level. Secondly, as the productivity of the freshwater habitat is diminished, the benefit of further reductions in fishing mortality to improve stock abundance decreases. Clearly, the failure of several stocks managed under this FMP to produce at an historic or consistent MSY level has little to do with current fishing impacts and often cannot be rectified with the cessation of all fishing.~~

~~To address the requirements of the Magnuson-Stevens Act to clearly identify when a stock may be approaching an overfished condition or is overfished, the Council has established two separate criteria based on a stock=s failure to meet its conservation objective. These criteria are denoted as a Aconservation alert@ and an Aoverfishing concern@. The criteria for these two categories are based on the unique life history of salmon and the large variations in annual stock abundance due to numerous environmental variables. They also take into account the uncertainty and imprecision surrounding many estimates of MSY, fishery impacts, and spawner escapements. In recognition of the unique salmon life history, the criteria differ somewhat from the general guidance in the National Standard Guidelines (' 600.310), but equal or exceed them in addressing the overfishing issue as it relates to salmon.~~
~~3.2.2~~ To ensure there is no jeopardy, NMFS conducts ESA consultations with respect to the effects of ocean harvest on listed salmon stocks. In cases where the biological consultation results in a "no jeopardy" opinion, NMFS issues an incidental take statement which authorizes a limited amount of take of listed species that would otherwise be prohibited under the ESA. In cases where a "jeopardy" opinion is reached, NMFS develops a reasonable, prudent alternative to the proposed action which authorizes a limited amount of take.

The constraints on take authorized under incidental take statements and reasonable, prudent alternatives are collectively referred to as consultation standards. These constraints take a variety of forms including

FMP conservation objectives, limits on the time and area during which fisheries may be open, ceilings on fishery impact rates, and reductions from base period impact rates. Periodically consultations are reinitiated and the consultation standards are updated. Current consultation standards are included with the table of conservation objectives (Table 3-1). NMFS may periodically revise consultation standards and the annual NMFS guidance letter reflects the most current information.

ESA consultation standards represent another form of fishery control rule. Although NMFS consultation standards and recovery plans may not by themselves recover listed populations to historic S_{MSY} levels, they are sufficient to stabilize populations until freshwater habitats and their dependent populations can be restored and estimates of MSY developed consistent with recovered habitat conditions. As species are delisted, the Council will establish conservation objectives and associated reference points consistent with the MSA.

3.3.3 Relationship to the Pacific Salmon Treaty

The MSA provides an exception to the requirement for a fishery management plan to specify ACLs and Accountability Measures (AMs) if these are provided under an international agreement in which the United States participates. Pacific salmon stocks subject to fisheries in both the US and Canada are managed under the provisions of the Pacific Salmon Treaty (PST). Stocks managed under the provisions of the PST include: (1) all pink salmon stocks included in the fishery, (2) all Chinook stocks from the mid-Oregon coast to the US/Canada border, and (3) all coho stocks which are included in the fishery, and are neither hatchery stocks nor listed under the ESA. For these stocks, the PST annually places overall limits on fishery impacts and allocates those impacts between the US and Canada. It allows the US and Canada to each manage their own fisheries to achieve domestic conservation and allocation priorities, while remaining within the overall limits determined under the PST. The PST also includes measures of accountability which take effect if annual limits established under the Treaty are exceeded, and further reduce these limits in response to depressed stock status.

Because of these provisions of the PST, and the exception provided by the MSA, it is unnecessary for the FMP to specify an ACL or associated reference points for these stocks. However, it is still necessary to specify MSY and SDC reference points for these stocks to monitor the efficacy of PST provisions in preventing overfishing and protecting stocks from becoming overfished.

3.3.4 Acceptable Biological Catch

ABCs are required for all stocks or stock complexes in the fishery that are not managed under an international agreement, listed under the ESA, or designated as hatchery stocks. For salmon, the ABC is defined in terms of spawner escapement (S_{ABC}), which is consistent with the common practice of using spawner escapement to assess stock status. S_{ABC} is determined annually based on stock abundance, in spawner equivalent units, N, and the exploitation rate F_{ABC}

$$S_{ABC} = N \times (1 - F_{ABC}).$$

The ABC control rule defines F_{ABC} as a fixed exploitation rate reduced from F_{MSY} to account for scientific uncertainty. The degree of the reduction in F between F_{ABC} and F_{MSY} depends on whether F_{MSY} is directly estimated (tier 1 stock) or a proxy value is used (tier 2 stock). For tier 1 stocks, F_{ABC} equals F_{MSY} reduced by five percent. For tier 2 stocks, F_{ABC} equal F_{MSY} reduced by ten percent.

The MSA requires that the SSC recommend an ABC to the Council. The NS1 Guidelines explain that the Council works with its SSC to develop the ABC control rule, and that the Council should identify the body that will apply the ABC control rule (i.e., calculates the ABC) and the review process that will evaluate the resulting ABC.

The STT will apply the ABC control rule on an annual basis by making preseason forecasts of N, and applying the fixed F_{ABC}. Stock abundance forecasts and the resulting S_{ABC} estimates will be reported in Preseason Report I, and presented to the SSC at the March Council meeting. Following its review, the SSC will recommend stock abundance forecasts and S_{ABC} estimates to the Council in an oral and written statement provided at the March meeting.

The SSC will have an ongoing role in evaluating ABCs through their annual review of stock abundance forecasts and their prerogative to initiate re-evaluation of the ABC control rule. Abundance forecast methods are periodically revised and these revisions are evaluated by the SSC through the salmon methodology review process. The SSC could revisit the ABC control rule as needed during the salmon methodology review.

3.3.5 Annual Catch Limits and Accountability Measures

ACLs and OFLs, in addition to ABCs, are required for all stocks or stock complexes in the fishery that are not managed under an international agreement, listed under the ESA, or designated as hatchery stocks. For salmon, these reference points are defined in terms of spawner escapement (S_{ACL}, S_{OFL}).

S_{ACL} and S_{OFL} are calculated annually, both as preseason estimates and postseason values. Preseason estimates of these reference points are used for development of annual fishery management measures. Postseason values are used to identify whether accountability measures (AMs) are to be triggered, and to assess the performance of management.

S_{ACL} and S_{OFL} are determined based on stock abundance, in spawner equivalent units, N, and the corresponding reference exploitation rates F_{ACL} and F_{OFL}, where the exploitation rates are fixed values that do not change on an annual basis. F_{OFL} is defined as being equal to F_{MSY}, and

$$S_{OFL} = N \times (1 - F_{MSY}).$$

F_{ACL} is equivalent to F_{ABC} and

$$S_{ACL} = N \times (1 - F_{ACL}),$$

which results in $S_{ACL} = S_{ABC} > S_{OFL}$ for each management year.

3.3.5.1 Preseason ACLs

During the annual preseason salmon management process, S_{ACL} will be estimated using the fixed F_{ACL} exploitation rate and the preseason N stock abundance forecast. Fishery management measures must result in an expected spawning escapement greater than or equal to this S_{ACL} estimate. In many years, the targeted exploitation rate will be lower than F_{ACL} as a result of stock-specific conservation objectives and the control rule used to specify F on an annual basis. Under the condition where $F < F_{ACL}$, the forecast escapement would exceed the estimated S_{ACL}.

3.3.5.2 Postseason ACLs

The postseason value of S_{ACL} will be determined annually using the fixed F_{ACL} exploitation rate and the postseason N stock abundance. The postseason value of S_{ACL} will be compared to the realized spawner escapement for evaluation of whether the realized escapement fell below the S_{ACL}.

Postseason evaluation of S_{ACL} is necessary for determining whether AMs should be triggered and whether the S_{ACL} performance standard is met. AMs will be triggered if the realized escapement is below the S_{ACL} value in any one year.

If the realized escapement is below the S_{ACL} value in more than one of four years, the ACL performance standard will not have been met, and a re-evaluation of the ACL framework will be undertaken, consistent with the NS1 Guidelines.

3.3.5.3 Accountability Measures

Accountability measures are required for all stocks and stock complexes in the Salmon FMP that are required to have ACLs. AMs are intended to prevent shortfalls in escapement below the S_{ACL} and to correct or mitigate for them if should they occur. Some of these are implemented during the preseason planning process and in-season. Others are implemented postseason through monitoring and reporting requirements.

Preseason and In-season Accountability Measures

In-season authority to manage quota fisheries (FMP § 10.1) – allows NMFS to close fisheries on short notice when mixed stock quotas are projected to be met. As described above, quotas are designed to ensure that ACLs and conservation objectives for component stocks are met.

- Mixed stock quota monitoring (FMP § 7.1) – collection of data on a daily basis during the season allows projection of when quotas will be met.
- Quota partitioning (FMP § 5.3 and 10.2) – partitioning overall quota among fishery sectors and port areas and time periods allows finer scale management, thereby reducing the chance that overall quota will be exceeded.
- Quota trading (FMP § 5.3 and 10.2) – quota trading allows overages in one sector/time/area to be made up by reductions in others.
- Changes to gear/bag/size/trip limits (FMP § 6 and 10.2) – allow a measure of control over catch rates to reduce the chance of quotas being exceeded.
- Boundary modifications (FMP § 6 and 10.2) – allow limited control over catch composition to limit impacts on constraining stocks.
- Landing restrictions(FMP § 6 and 10.2) - allow better accounting of the location of catches and thus better estimates of catch composition.
- In-season monitoring and reporting requirements. (FMP § 7) – collection of data on a daily basis during the season allows projection of when quotas will be met.

- Conservation ~~Alert~~alert (FMP § 3.2.2)

> ~~*AA fishery shall be classified as approaching a condition of being overfished if, based on trends in fishing effort, fishery resource size, and other appropriate factors, the Secretary estimates that the fishery will become overfished within two years.@*~~
>
> ~~*Magnuson-Stevens Act, ' 304(e)(1)*~~

~~To anticipate and react to potential stock declines which might lead to overfishing, the Council has established a conservation alert process with criteria and actions as described below.~~

~~*3.2.2.1 Criteria*~~

A conservation alert ~~is~~will be triggered during the annual preseason process (Chapter 9) if a natural stock ~~or stock complex,~~ listed in Table- 3--1, is projected to ~~not achieve~~ fall short of its conservation objective ~~(MSY, MSY proxy, MSP, or floor~~. The Conservation Alert is an AM, though it is not triggered by a single year in which the ~~case of some harvest rate objectives [e.g., 35,000 adult natural Klamath River fall Chinook spawners]).~~spawner escapement falls below the S_{ACL}. While a projected one-year shortfall may be of little biological concern, it may also represent the beginning of production problems and is worthy of note to help prevent future stock decline.

~~3.2.2.2 Council Action~~

For all natural stocks which meet the conservation alert criteria, the Council will notify pertinent fishery and habitat managers, advising that the stock may be temporarily depressed~~ or approaching an overfishing concern (depending on its recent conservation status),~~, and request that state and tribal fishery managers identify the probable causes, if known.~~ If the stock in question has not met its conservation objective in the previous two years, the Council will request the pertinent state and tribal managers to do a formal assessment of the primary factors leading to the shortfalls and report their conclusions and recommendations to the Council no later than the March meeting prior to the next salmon season.~~

~~The Council will take the following actions for stocks which trigger a conservation alert that do not qualify as exceptions under Section 3.2.4 (see Table 3-1):~~

1. ~~Close salmon fisheries within Council jurisdiction that impact the stock.~~

2. ~~In the case of Washington coastal and Puget Sound salmon stocks and fisheries managed under U.S. District Court orders, the Council may allow fisheries which meet annual spawner targets developed through relevant U.S. v. Washington, Hoh v. Baldrige, and subsequent U.S. District Court ordered processes and plans, which may vary from the MSY or MSP conservation objectives.~~

3. ~~Within the Cape Falcon to Point Sur area, the Council may allow *de minimis* fisheries which: permit an ocean impact rate of no more than 10 percent on age-4 Klamath River fall Chinook, if the projected natural spawning escapement associated with a 10 percent age-4 ocean impact rate, including river recreational and tribal impacts, is between the conservation objective (35,000) and 22,000. If the projected natural escapement associated with a 10 percent age-4 ocean impact rate is less than 22,000, the Council shall further reduce the allowable age-4 ocean impact rate to reflect the status of the stock[2]. When recommending an allowable age-4 ocean impact rate, the Council shall consider the following year specific circumstances:~~
    1. ~~(i)The potential for critically low natural spawner abundance, including the risk of Klamath Basin substocks dropping below crucial genetic thresholds;~~
    2. ~~(ii) A series of low spawner abundance in recent years;~~
    3. ~~(iii) The status of co-mingled stocks;~~
    4. ~~(iv) The occurrence of *El Niño* or other adverse environmental conditions;~~
    5. ~~(v) Endangered Species Act (ESA) considerations; and~~
    6. ~~(vi) Other considerations as appropriate.~~

    7. ~~The Klamath River fall Chinook age-4 ocean impact rate must not jeopardize the long term capacity of the stock to produce maximum sustainable yield on a continuing basis. Implementation of *de minimis* fisheries will depend on year specific estimates of ocean abundance and age composition, and will be determined by the Salmon Technical Team prior to the March Council meeting. Ocean fishery impacts to the returning brood incurred during the previous fall/winter fisheries will be counted against the allowable age-4 ocean impact rate.~~

~~Other than the exceptions noted above, the Council may not recommend ocean salmon fisheries which are expected to trigger a conservation alert.~~

~~If postseason estimates confirm that a stock conservation objective is not met, a rebuilding program for the following year is implicit in the conservation objective since it is based on annually meeting MSY or MSP. In addition, the Council reviews stock status annually and, where needed, identifies actions~~

[2] ~~NMFS interprets that, consistent with the *de minimis* provisions of the FMP, the maximum allowable 10 percent age-4 ocean impact rate may be implemented only when the anticipated escapement is near the 35,000 natural spawner floor. As escapement falls below approximately 30,000, the impact rate will need to decline automatically.~~

~~required to improve estimation procedures and correct biases. Such improvements provide greater assurance that objectives will be achieved in future seasons. Consequently, a remedial response is built into the preseason planning process to address excessive fishing mortality levels relative to the conservation objective of a stock.~~

~~The Council does not believe that a one year departure from the MSY/MSP spawner objective for salmon affects the capacity of a stock to produce MSY over the long-term (i.e., does not constitute overfishing as defined by the Magnuson-Stevens Act). However, the Council=s use of a conservation alert and the rebuilding effect of the conservation objectives provides for sound resource management and responds to the concept in the National Standard Guidelines for action to address overfishing concerns in any one year. The Council=s conservation objectives which are used to trigger a conservation alert are generally based on MSY or MSP rather than a minimum stock size threshold. In this respect, the Council=s management approach is more conservative than recommended by the National Standard Guidelines.~~

~~3.2.3 Overfishing Concern~~

> ~~*AFor a fishery that is overfished, any fishery management plan, amendment, or proposed regulations . . . for such fishery shallB(A) specify a time period for ending overfishing and rebuilding the fishery that shallB(i) be as short as possible, taking into account the status and biology of any overfished stocks of fish, the needs of the fishing communities, recommendations by international organizations in which the United States participates, and the interaction of the overfished stock within the marine ecosystem; and (ii) not exceed 10 years, except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise. . ..@*~~
>
> ~~*Magnuson-Stevens Act, ' 304(e)(4)*~~

~~The Magnuson-Stevens Act requires overfishing be ended and stocks rebuilt in as short a period as possible and, depending on other factors, no longer than ten years. For healthy salmon stocks which may experience a sudden reduction in production and/or spawner escapement, the limitation on fishing impacts provided by the Council=s MSY or MSY proxy conservation objectives provide a stock rebuilding plan that should be effective within a single salmon generation (two years for pinks, three years for coho, and three to five years for Chinook). However, additional actions may be necessary to prevent overfishing of stocks suffering from chronic depression due to fishery impacts outside Council authority, or from habitat degradation or long-term environmental fluctuations. Such stocks may meet the criteria invoking the Council=s overfishing concern.~~

~~*3.2.3.1 Criteria*~~

~~The Council=s criteria for an overfishing concern are met~~Post-season Accountability Measures

- Postseason monitoring and reporting through the annual SAFE document (FMP § 8) - allows postseason assessment of objectives and performance.

If the realized escapement is below the postseason S_{ACL} value, an AM will be to report on the escapement shortfall in the annual Council preseason reports and to notify state, tribal, and federal managers. If it is necessary to correct problems in the assessment or management methods, such changes can be considered during the annual salmon Methodology Review process.

- Salmon Methodology Review Process (COP-15; PFMC 2008). - provides a process for re-evaluation of management objectives, reference points, and modification of models that relate mixed-stock impacts to stock-specific objectives and reference points.
- Abundance Alert

An abundance alert will be triggered if, in three consecutive years, the postseason estimates indicate a natural stock has not achieved its conservation objective (MSY, ~~MSP,~~ spawner floor, or harvest rate objectives) in Table 3-1. The Abundance Alert is an AM, though it is not triggered by a single year in which spawner escapement falls below the S_{ACL}. It is possible that this situation could represent normal variation. However, the occurrence of three consecutive years of reduced stock size or spawner escapements, depending on the magnitude of the short-fall, could signal the beginning of a critical downward trend ~~(e.g., Oregon coastal coho)~~, which may result in fishing that jeopardizes the capacity of the stock to produce MSY over the long term if appropriate actions are not taken to ensure ~~the~~ conservation objectives ~~is~~are achieved.

~~3.2.3.2 Assessment~~

~~When an overfishing concern is triggered, the Council will direct its STT to work with state and tribal fishery managers to complete an assessment of the stock within one year (generally, between April and the March Council meeting of the following year). The assessment will appraise the actual level and source of fishing impacts on the stock, consider if excessive fishing has been inadvertently allowed by estimation errors or other factors, identify any other pertinent factors leading to the overfishing concern, and assess the overall significance of the present stock depression with regard to achieving MSY on a continuing basis.~~

~~Depending on its findings, the STT will recommend any needed adjustments to annual management measures to assure the conservation objective is met, or recommend adjustments to the conservation objective which may more closely reflect the MSY or ensure rebuilding to that level. Within the constraints presented by the biology of the stock, variations in environmental conditions, and the needs of the fishing communities, the STT recommendations should identify actions that will recover the stock in as short a time as possible, preferably within ten years or less, and provide criteria for identifying stock recovery and the end of the overfishing concern. The STT recommendations should cover harvest management, potential enhancement activities, hatchery practices, and any needed research. The STT may identify the need for special programs or analyses by experts outside the Council advisors to assure the long-term recovery of the salmon population in question. Due to a lack of data for some stocks, environmental variation, economic and social impacts, and habitat losses or problems beyond the control or management authority of the Council, it is likely that recovery of depressed stocks in some cases could take much longer than ten years.~~

~~In addition to the STT assessment, the Council will direct its Habitat Committee (HC) to work with federal, state, local, and tribal habitat experts to review the status of the essential fish habitat affecting this stock and, as appropriate, provide recommendations to the Council for restoration and enhancement measures within a suitable time frame.~~

~~3.2.3.3~~ Council Action

If a stock enters an Abundance Alert, the STT will assess the role of fisheries in triggering the Abundance Alert, and provide corrective recommendations to the Council, if applicable. Following its review of the STT ~~report~~assessment, the Council will specify the actions ~~that~~it will ~~comprise its immediate response~~take for ensuring that the ~~stock=s~~stock's conservation objective is met in the future. The Council will also notify the relevant State, Tribal, and Federal managers that a stock may be trending toward a depressed state, and that potential causes should be closely monitored or ~~a rebuilding plan is properly implemented and any inadvertent~~ investigated, particularly with regard to excessive fishing ~~within Council jurisdiction is ended. The Council=s rebuilding plan will establish the criteria that identify recovery of the stock and the end~~mortality and bias in management models.

3.3.6 Specific Control Rules for Stocks, Indicator Stocks, and Complexes

3.3.6.1 Klamath River Fall Chinook, Sacramento River Fall Chinook

KRFC and SRFC have the same form of ~~the overfishing concern. In some cases, it may become necessary to modify the existing conservation objective/rebuilding plan to respond to habitat or other long-term changes. Even if fishing is not the primary factor in the depression~~control rule, which is defined in terms of the ~~stock or stock complex,~~reference points F_{ABC}, F_{DM}, MSST, and S_{MSY} as follows. The allowable exploitation rate, F, in a given year, depends on the ~~Council must act to limit~~ pre-fishery ocean abundance in spawner equivalent units, N. At high abundance the rule caps the exploitation rate at F_{ABC}, at moderate abundance the rule specifies an F that results in S_{MSY} spawners, at low abundance the rule allows for a de minimis exploitation rate of F_{DM}, and at very low abundance the rule for F is undefined other than it cannot exceed F_{DM} and it should be reduced as abundance decreases toward 0. The abundance values that delineate these four respective abundance zones (very low, low, moderate, high) are defined as:

$A = \frac{MSST+S_{MSY}}{2}$, breakpoint between very low and low abundance,

$B = \frac{S_{MSY}}{1-F_{DM}}$, breakpoint between low and moderate abundance,

$C = \frac{S_{MSY}}{1-F_{ABC}}$, breakpoint between moderate and high abundance.

Figure 3-1 displays the control rule with the reference points identified. At abundances greater than or equal to C, $F = F_{ABC}$. At abundances between B and C, $F = 1 - (S_{MSY}/N)$. At abundances between A and B, $F = F_{DM}$. At abundances below A, the allowable F is undefined, other than it cannot exceed F_{DM} and it should be reduced as abundance decreases toward 0.

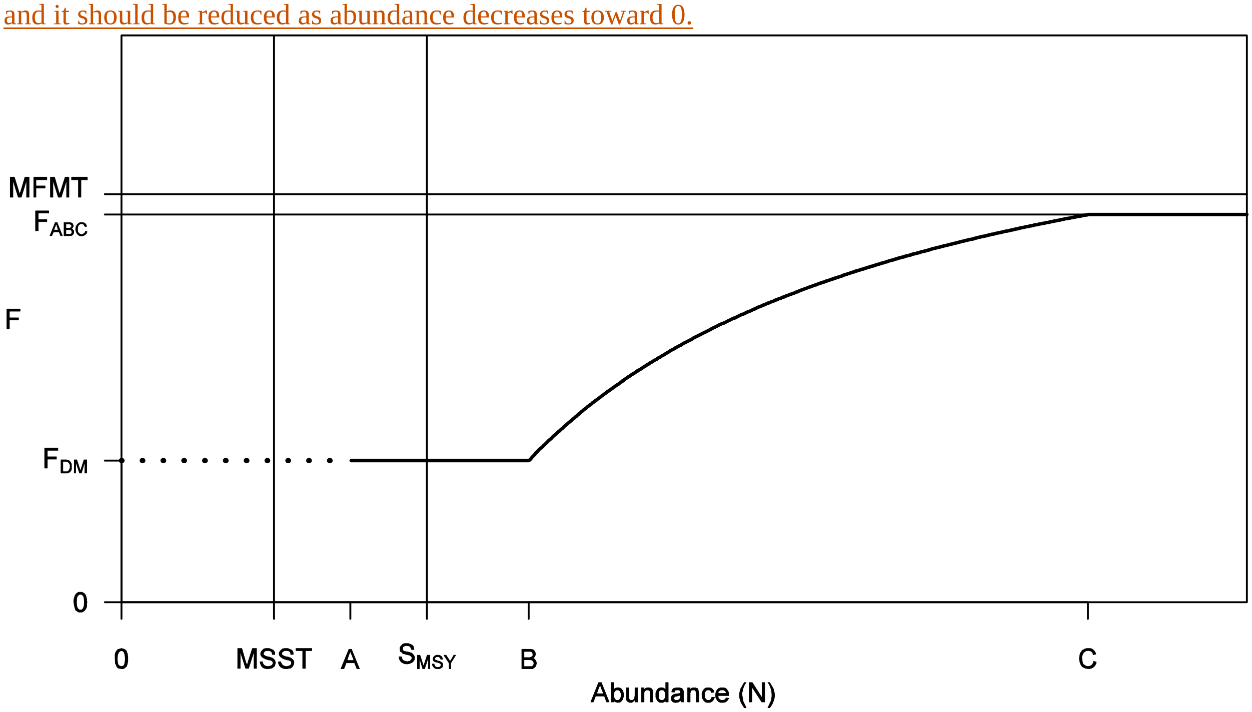

Figure 3-1. Control rule for SRFC and KRFC. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.2 Washington Coast Chinook and Coho, Columbia River Summer Chinook, Upriver Bright Fall Chinook.

Most non-ESA-listed natural stocks originating north of the Klamath River are managed under the terms of the PST with control rules designed to achieve S_{MSY} annually. Chinook and coho stocks from the Washington coast, Columbia River summer Chinook, and upriver bright fall Chinook fall under this category, and share the same form of control rule (Figure 3-2). Some *de minimis* level of fishing impacts are allowed by the provisions of the PST, court decisions, or reserved tribal fishing rights. The magnitude of the *de minimis* impacts, and the actual abundance level at which they come into play, vary from stock to stock. Because management of these stocks under the terms of the PST is focused on attainting S_{MSY} on an annual basis, F can exceed the MFMT at high abundance.

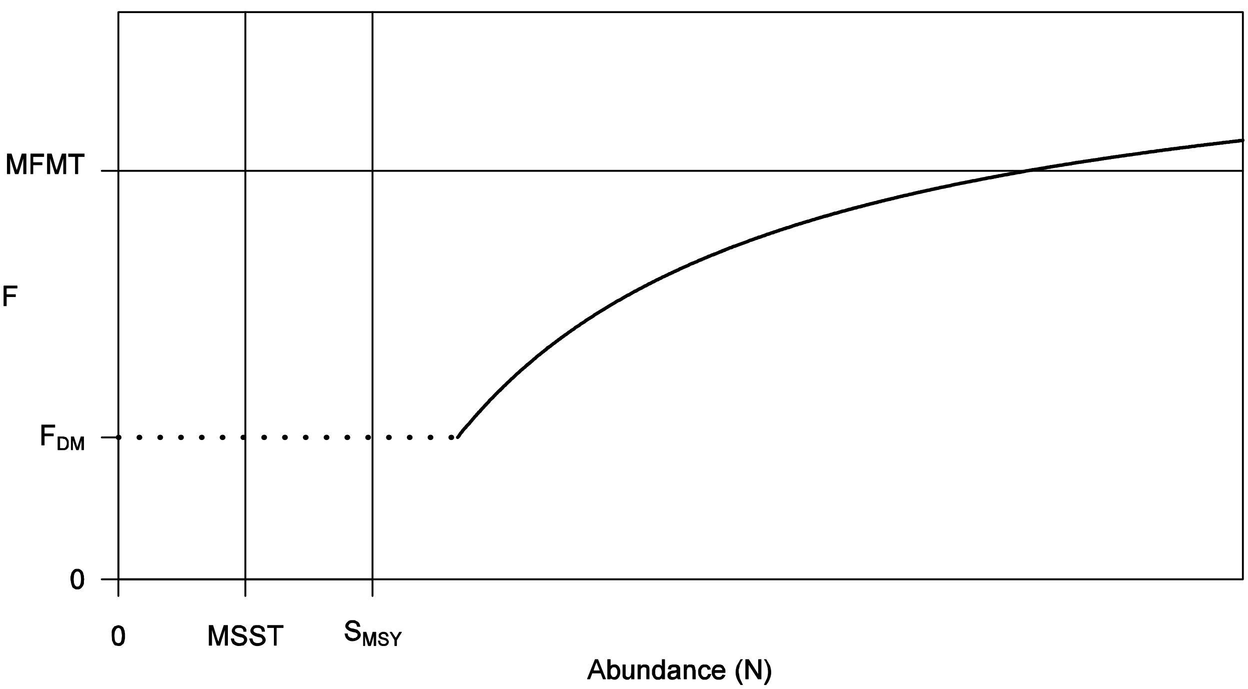

Figure 3-2. Control rule for several Chinook and coho stocks managed under the terms of the PST. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.3 Puget Sound Coho

Puget Sound coho stocks are managed under the PST using a stepped harvest rate control rule (Figure 3-3). Under this control rule, exploitation rate ceilings are determined on the basis of abundance, where abundance is divided into three zones defined by two breakpoints defined as

$A = \frac{MSST}{1-F_{low}}$, breakpoint between critical and low abundance,

$B = \frac{S_{MSY}}{1-MFMT}$, breakpoint between low and normal abundance.

The exploitation rate ceiling has a maximum value of MFMT when N > B, is reduced to a low exploitation rate (F_{low}) when A < N < B, and further reduced to a critical exploitation rate ($F_{critical}$) to allow for *de minimis* impacts not to exceed 0.20 when N < A. For all Puget Sound coho stocks, MSST > S_{MSY}/2.

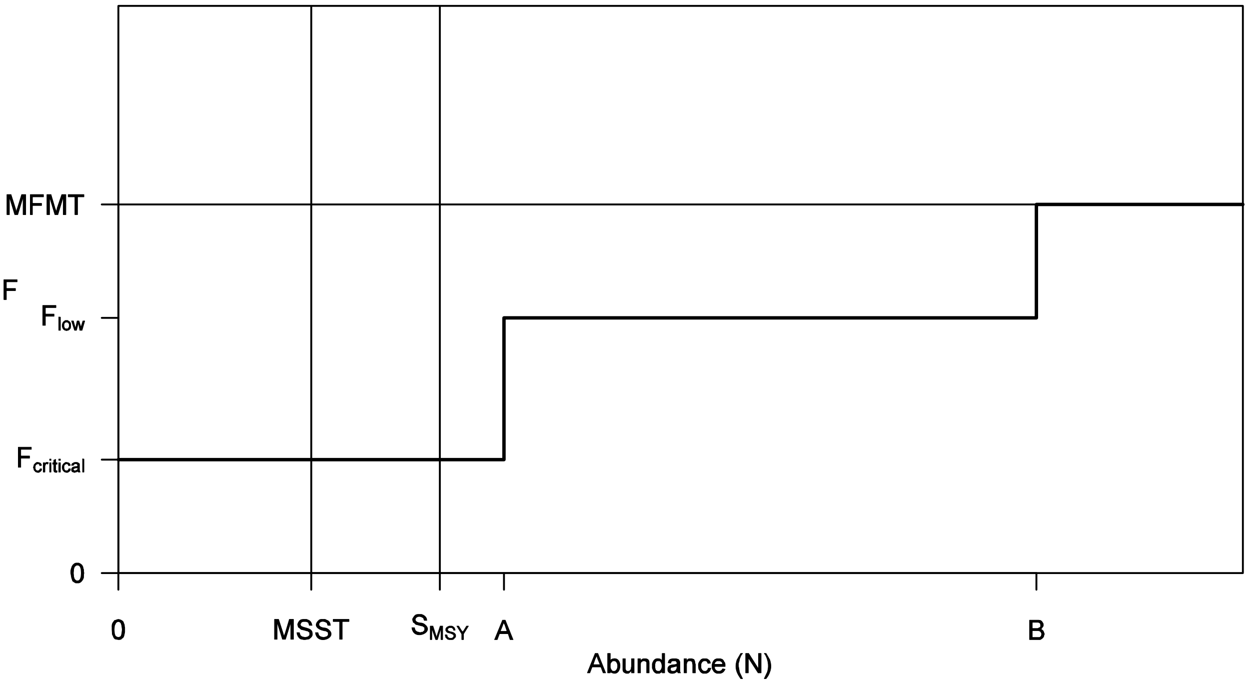

Figure 3-3. Control rule for Puget Sound coho. Abundance is pre-fishery ocean abundance in spawner equivalent units, and F is the exploitation rate. Reference points in the control rule are defined in the text.

3.3.6.4 Oregon Coastal Natural Coho

Amendment 13 (PFMC 1999) established a recovery and rebuilding plan for Oregon coastal natural (OCN) coho which (1) defines individual management criteria for four separate stock components, (2) sets overall harvest exploitation rate targets for OCN coho that significantly limit the impact of fisheries on the recovery of depressed stock components, (3) promotes stock rebuilding while allowing limited harvest of other abundant salmon stocks during critical rebuilding periods, and (4) is consistent with the Oregon State recovery plan. Under the rebuilding program, the overall allowable fishery impact rate in any given year for each stock component is determined by the spawning abundance of the parents and grandparents of the returning adults and upon the marine survival expectations for the current maturing brood, as predicted by smolt-to-jack survival rates for hatchery coho.

The assessment of historic parent abundance utilized in Amendment 13 is based on the number of spawners in each of the four stock components that is projected to achieve full seeding of high quality freshwater habitat at low levels of marine survival. The full seeding estimates (in terms of stratified random sampling numbers) are derived from a model based on freshwater habitat assessment which incorporates measures of variability in the quality of the freshwater habitat and estimates of survival between life stages where numerical indicators have been measured (Nickelson and Lawson 1996). The assessment of marine survival status is based on a partitioning of the observed marine survival for Oregon hatchery reared coho from 1970-1996 (PFMC 1999).

Under the rebuilding plan, the allowable overall fishery impact (exploitation rate) for OCN coho represents all fishing related mortality, including marine and freshwater fisheries for both retention and catch-and-release fishing. The maximum allowable exploitation rates range from less than 10% when parent abundance and/or marine survival is especially low, to a high of 35% if two generations of spawner rebuilding have occurred and marine survival is sufficient to expect continued improvements in spawner escapement for a third generation. Regardless of high parental spawning levels or projected favorable ocean conditions, a cap of 35% in total stock impacts is maintained to provide insight as to the effects of high spawner levels on production. A limitation of 15% remains in effect even at the two highest tiers of parent escapement if ocean conditions are not favorable, so as to preserve rebuilding progress achieved to that point. The matrix in Table 3-3 illustrates specifically how spawner abundance and marine survival determine the maximum allowable stock exploitation rate objectives for each OCN coho stock component.

Each of the four OCN coho stock components will be managed in marine fisheries as a separate stock to the extent that the best scientific information allows. Because of apparent similarities in the marine distribution of the four components, little flexibility is expected in marine fishery intensities among the components. If some components begin rebuilding faster than others, but data are not available which allows the marine harvest of OCN coho components at different rates, opportunities for increased ocean harvest may be constrained by the weakest component. Any management flexibility for increased fisheries on any strong OCN coho component will likely be in freshwater or estuarine areas during the initial phase of the rebuilding process. In these areas, ODFW will base fishing opportunity on the status of populations in individual basins within a stock component, and directed fisheries on natural coho will be allowed only when spawners are expected to be at or above the full seeding level for high quality habitat. Actual seasons would be based on the presence of fin-clipped hatchery fish (e.g., selective fisheries), public comment, and other basin-specific factors. An intensive monitoring program will be implemented by ODFW to measure the overall management effectiveness toward the goal of increasing OCN spawner levels and consequent juvenile and adult progeny. The Environmental Assessment (EA) for Amendment 13 (PFMC 1999) contains further details of the monitoring plan and of the overall OCN coho management criteria and its basis.

In consideration for the uncertainties that exist in this recovery regime and the potential for new information to affect basic assumptions critical to its success, the measures adopted in Amendment 13 are subject to a comprehensive, adaptive review in 2000 (PFMC 2000b). To incorporate the best science, the methods of estimating the technical parameters used in this proposal may change without plan amendment, if approved by the Council following a technical review and recommendation for change by the Scientific and Statistical Committee.

TABLE 3-2. Allowable fishery impact rate criteria for OCN coho stock components.

PARENT SPAWNER STATUS	MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt): Low (<0.0009)	Medium (0.0009 to 0.0034)	High (>0.0034)
	Allowable Total Fishery Impact Rate		
High: Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1	#15%	#30%[a/]	#35%[a/]
Medium: Parent spawners achieved Level #1 or greater rebuilding criteria	#15%	#20%[a/]	#25%[a/]
Low: Parent spawners less than Level #1 rebuilding criteria	#15% #10-13%[b/]	#15%	#15%

Rebuilding Criteria	OCN Coho Spawners by Stock Component: Northern	North-Central	South-Central	Southern	Total
Full Seeding at Low Marine Survival:	21,700	55,000	50,000	5,400	132,100
Level #2 (75% of full seeding):	16,400	41,300	37,500	4,100	99,300
Level #1 (50% of full seeding):	10,900	27,500	25,000	2,700	66,100
38% of Level #1 (19% of full seeding):	4,100	10,500	9,500	1,000	25,100

Stock Component (Boundaries)	Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)				
Northern: (Necanicum River to Neskowin Creek)	Nehalem: 17,500	Tillamook: 2,000	Nestucca: 1,800	Ocean Tribs.: 400	
North-Central: (Salmon River to Siuslaw River)	Siletz: 4,300	Yaquina: 7,100	Alsea: 15,100	Siuslaw: 22,800	Ocean Tribs.: 5,700
South-Central: (Siltcoos River to Sixes River)	Umpqua: 29,400	Coos: 7,200	Coquille: 5,400	Coastal Lakes: 8,000	
Southern: (Elk River to Winchuck River)	Rogue: 5,400				

a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding: (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component and (2) no coho-directed harvest impacts will be allowed within that particular basin.

b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.

~~fisheries within its jurisdiction so as not to limit recovery of the stock or fisheries, or as is necessary to comply with ESA~~

~~consultation standards. In cases where no action within~~3.3.7 Control Rule Modification

The form of a control rule should only be changed by plan amendment, or as necessary to rebuild overfished stocks. However, the reference point values that define a particular control rule (e.g., S_{MSY}) may be periodically updated. Changes to these reference point values may be made without plan amendment if a comprehensive technical review of the best scientific information available provides evidence that, in the view of the STT, SSC, and the Council~~ authority can be identified which has a reasonable expectation of providing benefits to the stock unit in question, the Council will identify the actions required by other entities to recover the depressed stock. Upon review of the report from the HC, the Council will take actions to promote any needed restitution of the identified habitat problems.~~, justifies a modification. Insofar as possible, a proposed change to the value of a reference point will only be reviewed and approved within the schedule established for salmon estimation methodology reviews (completed at the November meeting prior to the year in which the proposed change would be effective) and apart from the preseason planning process. Federal court-ordered changes will also be accommodated without a plan amendment.

~~*For those fishery management actions within Council authority and expertise, the Council may change analytical or procedural methodologies to improve the accuracy of estimates for abundance, harvest impacts, and MSY escapement levels, and/or reduce ocean harvest impacts when shown to be effective in stock recovery.*~~*3.4 Management for Hatchery and ESA-listed Stocks*

”~~ For those causes beyond Council control or expertise, the Council may make recommendations to those entities which have the authority and expertise to change preseason prediction methodology, improve habitat, modify enhancement activities, and re-evaluate management and conservation objectives for potential modification through the appropriate Council process.~~

~~*3.2.3.4 End of Overfishing Concern*~~

~~The criteria for determining the end of an overfishing concern will be included as a part of any rebuilding plan adopted by the Council. Additionally, an overfishing concern will be ended if the STT stock assessment provides a clear finding that the Council=s ability to affect the overall trend in the stock abundance through harvest restrictions is virtually nil under the Aexceptions@ criteria below for natural stocks.~~

~~3.2.4 Exceptions~~

> *~~A~~Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.~~@~~.”*
>
> *Magnuson-Stevens Act, National Standard 6*

This plan contains ~~three~~two exceptions to the application of ~~overfishing~~control rules and status determination criteria and subsequent Council actions for stocks ~~or stock complexes~~ with FMP conservation objectives in Table 3-1: (1) ~~-~~hatchery stocks, and (2)~~ stocks for which Council management actions have inconsequential impacts, and (3)~~ stocks listed under the ESA.

3.~~2.~~4.1 Hatchery Stocks

Salmon stocks important to ocean fisheries and comprised exclusively of hatchery production generally have conservation objectives expressed as an egg-take or the number of spawners returning to the hatchery rack to meet program objectives. This plan recognizes these objectives and strives to meet them. However, these artificially produced stocks generally do not need the protection of ~~overfishing~~annual catch limits, status determination criteria, and special Council rebuilding programs to maintain long-term production. Because hatchery stocks can generally sustain significantly higher harvest exploitation rates than natural stocks, ocean fisheries rarely present a threat to their long-term survival. In addition, it is often possible to make temporary program modifications at hatcheries to assure adequate production to sustain the stock during periods of low abundance (e.g., sharing brood stock with other hatcheries, arranging for trapping at auxiliary sites, etc.). If specialized hatchery programs are approved in the future to sustain listed salmon stocks, the rebuilding programs would be developed and followed under the ESA.

3.~~2.4.2 Natural Stocks With Minimal Harvest Impacts in Council-Managed Fisheries~~

~~Several natural stock components identified within this FMP are subject to minimal harvest impacts in Council fisheries because of migration timing and/or distribution. As a result, the Council=s ability to affect the overall trend in the abundance of these components through harvest restrictions is virtually nil. Components in this category are identified by a cumulative adult equivalent exploitation rate of less than five percent in ocean fisheries under Council jurisdiction during base periods utilized by the fishery regulation assessment models (1979-1982 for Chinook and 1979-1981 for coho). Council action for these components, when a conservation alert or an overfishing concern are triggered, will consist of confirming negligible impacts of proposed Council fisheries, identifying factors which have led to the decline or low abundance (e.g., fishery impacts outside Council jurisdiction, or degradation or loss of essential fish habitat), and monitoring of abundance trends and total harvest impact levels. Council action will focus on advocating measures to improve stock productivity, such as reduced interceptions in non-Council-managed fisheries, and improvements in spawning and rearing habitat, fish passage, flows, and other factors affecting overall stock survival.~~

~~3.2.4.3~~4.2 Stocks Listed Under the Endangered Species Act

~~The Council regards stocks listed as endangered or threatened under the ESA as a third exception to the application of overfishing criteria of the Magnuson-Stevens Act.~~ The ESA requires federal agencies whose actions may ~~jeopardize~~adversely affect listed salmon to consult with NMFS. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the FMP. To ensure ~~there is no jeopardy~~that ESA standards are met, NMFS conducts internal consultations with respect to the effects of ocean harvest on listed salmon. The Council implements NMFS' guidance as necessary to avoid jeopardy, as well as in recovery plans approved by NMFS. As a result of NMFS' consultation, an incidental take statement may be issued which authorizes take of listed stocks under the FMP that would otherwise be prohibited under the ESA.

The Council believes that the requirements of the ESA are sufficient to meet the intent of the Magnuson-Stevens Act overfishing provisions. Those provisions are structured to maintain or rebuild stocks to levels at or above MSY and require the Council to identify and develop rebuilding plans for overfished stocks. For many fish species regulated under the Magnuson-Stevens Act, the elimination of excess fishing pressure is often the sole action necessary to rebuild depressed stocks. This is, however, not the case for many salmon stocks and, in particular, for most listed populations.

Although harvest has certainly contributed to the depletion of West Coast salmon populations, the primary reason for their decline has been the degradation and loss of freshwater spawning, rearing, and migration habitats. The quality and quantity of freshwater habitat are key factors in determining the MSY of salmon populations. The Council has no control over the destruction or recovery of freshwater habitat nor is it able to predict the length of time that may be required to implement the habitat improvements necessary to recover stocks. While the Council could theoretically establish new MSY escapement goals consistent with the limited or degraded habitat available to listed species, adoption of revised goals would potentially result in an ESA-listed stock being classified as producing at MSY and; therefore, not overfished under the Magnuson-Stevens Act.~~ The Council believes that the intent of the ESA and the Magnuson-Stevens Act is the recovery of stocks to MSY levels associated with restored habitat conditions.~~

~~The Council considers the consultation standards and recovery plans developed by NMFS for listed populations as interim rebuilding plans. Although NMFS= consultation standards and recovery plans may not by themselves recover listed populations to historical MSY levels within ten years, they are sufficient to stabilize populations until freshwater habitats and their dependent populations can be restored and estimates of MSY developed consistent with recovered habitat conditions.~~ As species are delisted, the Council will establish conservation objectives with subsequent overfishing criteria and manage to maintain the stocks at or above MSY levels.

~~*3.3 SUPPLEMENTARY CONSERVATION INFORMATION*~~

~~**3.3.1 Endangered Species Act Listings**~~

Since 1990, West Coast salmon fisheries have been modified to accommodate special requirements for the protection of salmon species listed under the federal ESA. The ESA listing of a salmon population may have profound consequences for the management of Council mixed-stock ocean fisheries since listed populations are often incidentally harvested with more abundant healthy populations. As additional stocks of salmon have been listed, the ~~Council=s~~Council's preseason process has increasingly focused on protecting listed stocks. In applying the ESA to Pacific salmon, NMFS determined that a population segment of a salmon species must represent an evolutionarily significant unit (ESU) of that species in order to be eligible for listing. ESUs are characterized by their reproductive isolation and contribution to the genetic diversity of the species as a whole. NMFS establishes consultation standards for listed ESUs, which specify levels of incidental take that are not likely to jeopardize the continued existence of the ESU.

The Council must meet or exceed the requirements of the ESA, which is other applicable law. In addition to the stocks and conservation objectives in Table 3-1, the Council will manage all species listed under the ESA consistent with NMFS consultation standards or recovery plans to meet immediate conservation needs and the long~~-~~-term recovery of the species. These standards are provided annually to the Council by NMFS at the start of the preseason planning process. In so far as is practical, while not compromising its ability to meet the requirements of the ESA, NMFS will endeavor to provide opportunity for Council and peer review of any proposed consultation standards, or the objectives of recovery plans, well prior to their implementation. Such review would ideally commence no later than the last Council meeting in the year immediately preceding the first salmon season in which the standards would be implemented.

Table 3-~~2~~3 summarizes the relationships of the individual stocks and stock units managed under the FMP to the ESUs identified by NMFS in the course of ESA status reviews. With the exception of some hatchery stocks, the stocks managed under the FMP are generally representative of the range of life history features characteristic of most ESUs. The managed stocks therefore serve as indicators for ESUs and provide the information needed to monitor fishery impacts on ESUs as a whole. In some cases, the information necessary for stock specific management is lacking, leaving some ESUs without adequate representation. For these ESUs, it will be necessary in the immediate future to use conservative management principles and the best available information in assessing impacts in order to provide

necessary protection. In the meantime, the responsible management entities should implement programs to ensure that data are collected for at least one stock representative of each ESU. Programs should be developed to provide the information that will permit the necessary stock specific management within five years of ~~completion of this amendment.~~

any ESA listing.

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries.~~
~~ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/]~~ ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~

~~CHINOOK~~

~~LIFORNIA CENTRAL VALLEY - All fall, late-fall, winter, and spring stocks of the Sacramento and San Joaquin Rivers and their tributaries. Management of this stock aplex is based primarily on Sacramento River fall Chinook, which includes a large hatchery component and natural Sacramento River winter Chinook, which are listed as angered. The San Joaquin system has been severely degraded by water development projects and pollution. Natural populations of spring Chinook there have been rpated, and remaining spawning areas are utilized primarily by fall Chinook which have comprised <10% of the total Central Valley fall run.~~TABLE 3-3. Listing of lutionarily significant units, their ESA status, and associated stocks managed under the FMP. (Page 1 of 2).

~~Sacramento River Fall~~ **ESU[a/]**	~~122,000-180,000 natural and hatchery adult spawners (MSY proxy adopted 1984). This objective is intended to provide adequate escapement of natural and hatchery production for Sacramento and San Joaquin fall and late-fall stocks based on habitat conditions and average run-sizes as follows: Sacramento River 1953-1960; San Joaquin River 1972-1977 (ASETF 1979; PFMC 1984; SRFCRT 1994). The objective is less than the estimated basin capacity of 240,000 spawners (Hallock 1977), but greater than the 118,000 spawners for maximum production estimated on a basin by basin basis before Oroville and Nimbus Dams (Reisenbichler 1986).~~ **ESA Status** **Month and Year of Initial Listing**	~~Yes.~~ **Stock Representation in FMP**	~~High abundance, large hatchery component. Single largest contributor to ocean fisheries off California, a significant contributor off southern and central Oregon, and present north into British Columbia. Primary impact south of Pt. Arena; considerable overlap with coastal and Klamath River fall Chinook between Pt. Arena and Horse Mt.~~
~~ramento River ing eatened~~	~~NMFS consultation standard/recovery plan (not established at time of printing. No defined objective for ocean management prior to listing.~~	~~Indirectly. MSY criteria undefined. Assessment of ocean distribution and fishery impacts needed for ESA determination and to aid management. Present level of ocean fishery impacts limited by measures constraining harvest on Sacramento River winter and Klamath River fall Chinook.~~	~~Severely depressed. Minor contributor to oc fisheries off California, also known to occur Oregon. Ocean fishery impacts primarily incidenta harvest of Sacramento River fall Chinook and may lower due to differences in run timing. MSY undef but substantially reduced from historic levels by r caused loss and deterioration of freshwater habitat.~~
~~ramento River~~	~~NMFS consultation standard. Since 1996, an annual preseason objective of a 31% increase in the adult~~	~~No. Listed stock, MSY criteria~~	~~Depressed and listed, recent increase. M~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/] (to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~**nter** angered (1994)~~	~~spawner replacement rate (equivalent to a 1.77 replacement rate) relative to the observed 1989-1993 mean rate of 1.35. Objective undefined prior to listing.~~	~~undefined. ESA consultation standard provides interim rebuilding program.~~	~~contributor to ocean fisheries south of Pt. Ar Ocean fishery impacts incidental to harvest Sacramento River fall Chinook. Primary impact s of Pt. Arena.~~
~~**CHINOOK**~~			
~~**RTHERN CALIFORNIA COAST** - All fall and spring stocks of California streams north of the entrance to San Francisco Bay. Management of this stock complex is ed primarily on meeting spawning escapements for natural fall Chinook. Limited data is available except for the Klamath River. An assessment and monitoring program is er consideration by California Department of Fish and Game (CDFG) for stocks originating from the Smith, Eel, Mattole, and Mad rivers which might provide a more rough management basis for the future. There are significant water diversion problems in several drainages. In the Klamath River Basin, there is significant hatchery duction of fall Chinook and less so of spring Chinook, resulting primarily from mitigation programs for dams constructed in both the Upper Klamath and Trinity rivers.~~			
~~**Mattole, Mad, Smith Rivers** l and Spring) Mattole, and l River stocks - eatened (1999)~~	~~Undefined. Indices of spawning abundance limited to one tributary of the Mad River and two tributaries of the Eel River. NMFS consultation standard/recovery plan for Eel, Mattole, and Mad River stocks not established at time of printing.~~	~~Indirectly. Data insufficient to define MSY criteria. CDFG developing an assessment and monitoring program. Conservation achieved by objective for Klamath River fall Chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.~~	~~Depressed. Limited management data. Believe occur in ocean fisheries off northern California southern Oregon. Ocean fishery impacts incident fisheries for Sacramento and Klamath Rivers Chinook. No preseason or postseason abund estimates available.~~
~~**math River Fall** math and Trinity rs)~~	~~33%-34% of potential adult natural spawners, but no fewer than 35,000 naturally spawning adults in any one year. Brood escapement rate must average 33%-34% over the long term, but an individual brood may vary from this range to achieve the required tribal/nontribal annual allocation. Objective designed to allow a wide range of spawner escapements from which to develop an MSY objective or proxy while protecting the stock during prolonged periods of reduced productivity. Adopted 1988 based on Hubbell and Boydstun (1985); KRTT (1986); PFMC (1988); minor technical modifications in 1989, 1996, and 2008 (Table I-1). Natural spawners to maximize recruitment are estimated at 41,000 to 106,000 adults (Hubbell and Boydstun 1985), and 40,700 (Salmon Technical Team, 2005).~~	~~Yes. A conservation alert or overfishing concern will be based on a failure to meet the 35,000 floor.~~	~~Abundance variable from high to depressed. M contributor to ocean fisheries from Humbug Oregon to Horse Mt., California (the Klar Management Zone [KMZ]) and to Klamath River t and recreational fisheries. Significant contributo ocean fisheries from central Oregon to cen California. Coastwide impacts are considered meeting allocation requirements for Indian tribes federally recognized fishing rights and the in fishery. Specific management measures for this s generally are implemented from Pigeon Pt., Califo to Florence, Oregon.~~
~~**math River ing** math and Trinity rs)~~	~~Undefined.~~	~~Indirectly. MSY criteria undefined. Productive potential protected by the objective for Klamath River fall Chinook which includes an inside allocation to tribal and sport fisheries which lowers ocean fishery impacts.~~	~~Depressed. Believed to occur in ocean fisheries northern California and southern Oregon (based Trinity River Hatchery fish). Impacts incidenta ocean fisheries for Sacramento and Klamath Rivers Chinook.~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.~~ [a] ~~(Page 1 of 15)~~

~~Stock~~	~~Conservation Objective~~ [b] ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information~~ [c]
~~- - - CHINOOK - - -~~			
~~EGON COAST - All fall and spring stocks from Oregon streams south of the Columbia River. No preseason abundance estimates available. Management based primarily an aggregate objective of 150,000 to 200,000 natural adult spawners (attainment of objective based on a postseason estimate of 60%-90 natural adult spawners per mile in e standard index streams). This objective is based on optimal escapement estimates for individual coastal rivers at habitat capacity (Thompson 1977). Lower end of the ective range is nearly twice the estimated MSY spawning escapement of 79,000 fall Chinook adults based on stock recruit analysis (McGie 1982). Significant hatchery duction also exists within the coastal streams.~~			
~~thern Oregon gregate of fall spring stocks in streams south of River; Rogue er fall stock is d to indicate ive abundance ocean ribution rates)~~	~~Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.~~	~~Yes, based on postseason estimates of <60 natural adult spawners per mile. Conservation also ensured by the objective for Klamath River fall Chinook, which includes a large inside allocation component that reduces ocean fishery exploitation rate in areas inhabited by these fish.~~	~~Medium to low abundance. Data limited except Rogue River fall stock. Stocks migrate southerl remain local, and fall Chinook contribute to o fisheries off northern California and Oregon, less s spring stocks.~~
~~tral and thern Oregon gregate of fall spring stocks in streams from the River to just h of the umbia River)~~	~~Unspecified portion of an aggregate 150,000 to 200,000 natural adult spawners for Oregon coast (Thompson 1977 and McGie 1982). ODFW developing specific conservation objectives for spring and fall stocks that may be implemented without plan amendment upon approval by the Council.~~	~~Yes, based on postseason estimates of <60 natural adult spawners per mile.~~	~~Variable between high and medium abundance. St migrate northward and contribute to ocean fisheries British Columbia and Southeast Alaska, and to a le degree, off Washington and Oregon.~~
~~- - - CHINOOK - - -~~			
~~LUMBIA RIVER BASIN - All pertinent fall, summer, and spring stocks of the Columbia River and its tributaries. Stocks within this complex are noted by area of origin; er river (below Bonneville Dam), mid-river (Bonneville to McNary dams), and upper river (above McNary Dam). Spawner escapement goals for these stocks are set ough procedures of the U.S. District Court in U.S. v. Oregon and subsequent court orders. These goals are set forth in the Columbia River Fish Management Plan (CRFMP) are recognized in the Council=s conservation objectives. Annual inside fishery management planning activities are conducted within the Columbia River Compact and other e and tribal management forums. The Columbia River Compact, initially established by Oregon and Washington to jointly administer commercial fisheries within the umbia River, takes into account the impacts from other state and tribal fisheries (e.g., recreational, ceremonial, subsistence, etc.) authorized under the Columbia River Fish~~			

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.~~ [a/] ~~(Page 1 of 15)~~

~~Stock~~	~~Conservation Objective~~ [b/] ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information~~ [c/]
~~nagement Plan. The majority of ocean Chinook harvest north of Cape Falcon is provided by Columbia River salmon stocks, primarily hatchery production of tule fall nook from the Bonneville Pool (Spring Creek) and lower river hatcheries, smaller numbers of upper river bright hatchery and natural fall Chinook, and some lower river chery spring Chinook (Cowlitz). Hatchery objectives are based on long-range production programs and/or mitigation requirements associated with displaced natural stocks. eatened Snake River fall Chinook, which suffer from severe dam passage mortalities and extreme loss of freshwater habitat, are of prime concern in limiting ocean loitation rates in all ocean fisheries north of Pigeon Pt., California. These limits act to provide considerable protection to other weak natural stocks subject to ocean fishery acts.~~			
~~th Lewis River~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). McIsaac (1990) stock-recruit analysis supports MSY objective of 5,700 natural adult spawners.~~	~~No. Listed stock. ESA consultation standard provides interim rebuilding program. Base period Council-area ocean fishery impacts around 7%.~~	~~Medium to low abundance. Present in ocean fishe north of Cape Falcon to SE Alaska.~~
~~ver River chery Fall~~	~~15,400 adults to meet egg-take goal or as determined by management entities.~~	~~No (hatchery exception).~~	~~Medium to low abundance. Major contributor to oc fisheries north of Cape Falcon to central Br Columbia.~~
~~ver River chery ing)~~	~~2,700 adults to meet Cowlitz, Kalama, and Lewis Rivers broodstock needs.~~	~~No (hatchery exception).~~	~~Medium to low abundance. Present in ocean fishe north of Cape Falcon to Southeast Alaska.~~
~~per Willamette ing)~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). Willamette River Management Plan provides an MSY proxy of 30,000 to 45,000 hatchery and natural adults over Willamette River falls, depending on run size.~~	~~No. Listed stock. ESA consultation standard provides interim rebuilding program. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding.~~	~~Low abundance. Present in fisheries north of C Falcon to SE Alaska.~~
~~l River Bright chery l)~~	~~None for ocean fishery management.~~	~~No (hatchery exception).~~	~~Medium to high abundance. Contributor to oc fisheries off Washington, British Columbia, southeast Alaska. Primarily produced at Bonnev Hatchery.~~
~~ing Creek chery l)~~	~~7,000 adults to meet hatchery egg-take goal.~~	~~No (hatchery exception).~~	~~Low abundance. Significant contributor to oc fisheries north of Cape Falcon to southern Br Columbia.~~
~~- - - CHINOOK - - -~~ ~~LUMBIA RIVER BASIN~~ ~~(continued)~~			
~~kitat, Warm ings, John Day, Yakima Rivers ing)~~	~~Hold ocean fishery impacts at or below base period (<1%) and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state and tribal management entities considering separate conservation objectives for these stocks).~~	~~Limited. Base period Council-area ocean fishery exploitation rate of <1% prevents effective Council fishery management and rebuilding. Major~~	~~Long-term depressed abundance. No significance ocean fisheries, infrequent occurrence in fisheries n of Cape Falcon to Alaska.~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/] (to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
		~~habitat restoration addressing water withdrawals and dam passage and blockages is necessary for rebuilding.~~	
~~ke River Fall eatened (1992)~~	~~NMFS consultation standard. Since 1995, Council has met a standard of limiting its fisheries so that the total exploitation rate on age-3 and age-4 Lyons Ferry Hatchery fall Chinook (representing Snake River fall Chinook) for all ocean fisheries (including Canada) has been #70% of the 1988-1993 average adult equivalent exploitation rate. Prior to listing, managed within objectives for upper Columbia River bright fall Chinook.~~	~~No. Listed stock, MSY criteria undefined. ESA consultation standard provides interim rebuilding program. Recovering historic abundance unlikely, as dams block former primary spawning area.~~	~~Present in ocean fisheries from central Californi southeast Alaska with greatest contribution to Cana fisheries. Primary impacts in Council fisheries nort Cape Falcon, but also extending to Pigeon California.~~
~~ke River ing/Summer eatened (1992)~~	~~Not applicable for ocean fisheries.~~	~~No. Listed stock. Base period Council-area ocean fishery impacts rare (unmeasurable). Dam passage mortality must be reduced to allow stock recovery.~~	~~Depressed, recent trend downward. Rare occurrenc ocean fisheries from Washington to Southeast Alask~~
~~er River Bright l)~~	~~40,000 natural bright adults above McNary Dam (MSY proxy adopted in 1984 based on CRFMP. The management goal has been increased to 45,000 by Columbia River managers in recent years.~~	~~Limited. Base period Council-area ocean fishery exploitation rate <4% prevents effective Council fishery management and rebuilding.~~	~~High to medium abundance. Significant contribute ocean fisheries off Canada, and to a lesser ex Washington and Oregon. Primary impact area nort Cape Falcon.~~
~~er River nmer~~	~~Hold ocean fishery impacts at or below base period (<2%); recognize CRFMP objective - MSY proxy of 80,000 to 90,000 adults above Bonneville Dam, including both Columbia and Snake River stocks (state and tribal management entities considering separate objectives for these stocks).~~	~~Limited. Base period Council-area ocean fishery exploitation rate <2% prevents effective Council fishery management and rebuilding. Dam passage mortalities must be reduced to allow rebuilding.~~	~~Long-term depressed abundance. Present in oc fisheries north of Cape Falcon to southeast Alaska.~~
~~- - - CHINOOK - - - LUMBIA RIVER BASIN (continued)~~			
~~er River Spring angered (1999)~~	~~None applicable to ocean fisheries. Ensure ocean fishery impacts remain rare and recognize CRFMP objective - MSY proxy of 115,000 adults above Bonneville Dam, including upper and mid-Columbia and Snake River stocks (state/tribal management entities considering separate objectives for these stocks).~~	~~No. Listed stock. Base period Council-area ocean fishery impacts rare (not measurable), making Council management and rebuilding ineffective. Reduce dam passage mortalities to allow rebuilding.~~	~~Long-term depressed abundance. Captive broods programs started in 1997. No significance to oc fisheries. Rare occurrence in ocean fisheries nort Cape Falcon to Canada.~~

~~SHINGTON COAST - All pertinent fall, summer, and spring stocks from coastal streams north of the Columbia River through the western Strait of Juan de Fuca (west of~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/]~~ ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~Elwha River). This stock complex consists of several natural stocks, generally of small to medium sized populations, and some hatchery production (Willapa Bay and the nault River). Stocks in this complex tend to range further north than most Columbia River stocks and, while present in fisheries from Cape Falcon to Southeast Alaska, are significantly impacted by Council-area ocean fisheries. Preseason abundance estimates are generally not available for Council management. These stocks qualify as **eptions** to the Council=s overfishing criteria, due to very low fishery impacts. Spawning escapement goals for stocks managed within this complex, established in U.S. trict Court by WDFW and the treaty tribes, are recognized in the Council=s conservation objectives below. Objectives for Grays Harbor and the north coast river systems e been established pursuant to the U.S. District Court order in Hoh v. Baldrige. However, annual natural spawning escapement targets may vary from the conservation ectives below if agreed to by WDFW and the treaty tribes under the provisions of Hoh v. Baldrige and subsequent U.S. District Court orders. After agreement is reached on annual targets, ocean fishery escapement objectives are established for each river, or region of origin, which include provisions for treaty allocation and inside, non-Indian ery needs.~~			
~~**lapa Bay Fall** tural)~~	~~Undetermined.~~	~~Limited (exploitation rate exception).~~	
~~**lapa Bay Fall** tchery)~~	~~8,200 adult return to hatchery.~~	~~No (hatchery exception).~~	
~~**ys Harbor Fall**~~	~~14,600 natural adult spawners- MSP based on full seeding of spawning and rearing habitat (WDF 1979).~~	~~Limited (exploitation rate exception).~~	
~~**ys Harbor ing**~~	~~1,400 natural adult spawners.~~	~~A~~	
~~**nault Fall**~~	~~Hatchery production.~~	~~No (hatchery exception).~~	
~~**eets Fall**~~	~~Manage terminal fisheries for 40% harvest rate, but no less than 2,500 natural adult spawners, the MSY level estimated by Cooney (1984).~~	~~Limited (exploitation rate exception).~~	
~~**eets ing/Summer**~~	~~Manage terminal fisheries for 30% harvest rate, but no less than 700 natural adult spawners.~~	~~A~~	
~~**CHINOOK** **ASHINGTON COAST** (continued)~~			
~~**h Fall**~~	~~Manage terminal fisheries for 40% harvest rate, but no less than 1,200 natural adult spawners, the MSY level estimated by Cooney (1984).~~	~~A~~	
~~**h ing/Summer**~~	~~Manage terminal fisheries for 31% harvest rate, but no less than 900 natural adult spawners.~~	~~A~~	
~~**llayute Fall**~~	~~Manage terminal fisheries for 40% harvest rate, but no less than 3,000 natural adult spawners, the MSY level estimated by Cooney (1984).~~	~~A~~	
~~**llayute ing/Summer**~~	~~1,200 natural adult spawners for summer component (MSY).~~	~~A~~	
~~**to Summer/Fall** stern Strait of~~	~~850 natural adult spawners, the MSP level estimated by Ames and Phinney (1977). May include adults~~	~~A~~	

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective~~[b/] ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information~~[c/]
~~n de Fuca)~~	~~used for supplementation program.~~		
~~GET SOUND - All fall, summer, and spring stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). This stock nplex consists of numerous natural Chinook stocks of small to medium sized populations and significant hatchery production. Puget Sound stocks contribute to fisheries off tish Columbia and are present into Southeast Alaska, but are impacted to a minor degree by Council-area ocean fisheries. Base period, Council-area ocean fishery loitation rates (adult equivalent) of 2% or less are below a management threshold which allows effective Council management of these stocks and they qualify as~~ ~~**exceptions**~~ ~~he Council=s overfishing criteria. The stocks within this complex and their respective conservation objectives, established in U.S. District Court by WDFW and the Treaty es, are recognized below. The conservation objectives for stocks managed primarily for natural production were developed by a State/Tribal Management Plan Development m following the Boldt Decision and were based on Athe adult spawning population that will, on the average, maximize biomass of juvenile outmigrants subsequent to ubation and freshwater rearing under average environmental conditions.@ The objectives were estimated for the average spawning escapements during periods that were ught to represent spawner abundances that provided maximum production (Ames and Phinney 1977). The objectives for stocks managed for artificial production are based hatchery escapement needs. Annual management targets (expected hatchery plus natural escapement) for specific rivers or regions of origin may vary from the conservation ectives by following fixed procedures established in U.S. District Court as outlined in AMemorandum Adopting Salmon Management Plan@ (U.S. v. Washington, 626 F. p. 1405 [1985]).~~			
~~**tern Strait of n de Fuca nmer/Fall**~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 3,825 natural and hatchery adult spawners - 2,900 for the Elwha River (Ames and Phinney 1977) and 925 for the Dungeness River (Smith and Sele 1994).~~	~~Limited (exploitation rate exception).~~	
~~- - - CHINOOK - - -~~ ~~**GET SOUND**~~ ~~(continued)~~			
~~**komish nmer/Fall**~~ ~~od Canal)~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 1,650 natural adult spawners (Ames and Phinney 1977).~~	~~A~~	
~~**ksack Spring ly)**~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners.~~	~~A~~	
~~**git Summer/Fall**~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 14,850 natural adult spawners (Ames and Phinney 1977).~~	~~A~~	
~~**git Spring**~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 3,000 natural adult spawners based on mean escapement 1959-1968.~~	~~A~~	
~~**aguamish nmer/Fall**~~ ~~eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 2,000 natural adult spawners (Ames and Phinney 1977).~~	~~A~~	
~~**homish**~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of~~	~~A~~	

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/] (to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~nmer/Fall eatened (1999)~~	~~5,250 natural adult spawners (Ames and Phinney 1977).~~		
~~ar River nmer/Fall ke Washington) eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 1,200 natural adult spawners (Hage et al. 1994).~~	~~A~~	
~~ite River Spring eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 1,000 natural adult spawners.~~	~~A~~	
~~en River nmer/Fall eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 5,750 natural adult spawners (Ames and Phinney 1977).~~	~~A~~	
~~qually River nmer/Fall uth Puget Sound) eatened (1999)~~	~~NMFS consultation standard/recovery plan (not established at time of printing). MSP objective of 900 natural adult spawners.~~	~~A~~	
~~CHINOOK~~			
~~UTHERN BRITISH COLUMBIA - Fall and spring stocks of British Columbia coastal streams and the Fraser River. Management based primarily on natural and hatchery Chinook. Base period, Council-area ocean fishery exploitation rates (adult equivalent) on the coastal stocks of 1% or less are below a management threshold which allows ective Council management of these stocks, and they qualify as **exceptions** to the Council=s overfishing criteria.~~			
~~stal Stocks~~	~~Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.~~	~~No. Under Canadian authority and would also be an exploitation rate exception.~~	~~Medium abundance. Major contributors to oc fisheries off British Columbia; significant contribu north into Southeast Alaska and present off nort Washington.~~
~~ser River~~	~~Undefined for Council fisheries. Manage consistent with the Pacific Salmon Treaty.~~	~~No. Under Canadian authority.~~	~~Medium abundance. Major contributors to oc fisheries off British Columbia; contributors off nort Washington; and present north into Southeast Alask~~
~~COHO~~			
~~EGON PRODUCTION INDEX (OPI) AREA - All Washington, Oregon, and California natural and hatchery coho stocks from streams south of Leadbetter Pt., WA. nificant production from Columbia River and Oregon coastal hatcheries provide harvest in ocean fisheries throughout the Council management area. Ocean fisheries are ally limited primarily to meet natural escapement objectives. Treaty Indian obligations, nontreaty harvest opportunity, and hatchery requirements must also be factored in for Columbia River stocks. Both natural and hatchery components have been severely depressed for several years due to a combination of previously high fishery impacts, or losses or degradation of freshwater habitat, and long-term marine conditions unfavorable to coho survival.~~			

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/]~~ ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~tral California st~~ ~~eatened (1996)~~	~~NMFS consultation standard/recovery plan. Since 1998, no retention of coho in commercial and recreational fisheries off California in conjunction with total marine fishery impacts of no more than 13% on Rogue/Klamath hatchery coho (surrogate stock). Objective undefined prior to listing.~~	~~No. Listed stock, MSY criteria undefined. ESA consultation standard provides interim protection of productive capacity. Recovery limited by deterioration of significant portions of freshwater habitat, distribution at southern edge of coho range, and ongoing unfavorable marine conditions.~~	~~Very minor component of OPI area fisheries, lim potential for significant contribution to ocean inland fisheries. Current impacts incidental in oc fisheries off California. Development of monito and assessment program considered for Ten Mile R Noyo River, Gualala River, Lagunitas Creek, and S Creek. Rogue/Klamath coho are believed to hav similar, but more northerly distribution.~~
~~- - - COHO - - -~~ ~~EGON PRODUCTION INDEX~~ (continued)			
~~thern California~~ ~~eatened (1997)~~	~~NMFS consultation standard/recovery plan. Since 1998, total marine fishery impacts limited to no more than 13% on Rogue/Klamath hatchery coho (surrogate stock) and no retention of coho in California ocean fisheries. Objective undefined prior to listing.~~	~~No. Listed stock, MSY criteria undefined. ESA consultation standard provides interim protection of productive capacity. Recovery may last more than 10 years even with no fishery impacts, due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.~~	~~Depressed and listed. Very minor natural componen OPI area fisheries, potential for minor contributio ocean fisheries off California and southern Oregon, inland California fisheries. Current impacts incide in ocean and inland fisheries (total non-retention s of Cape Falcon since 1994). CDFG conside monitoring to provide data for the Smith, Trinity, Mattole, and Klamath rivers.~~
~~gon Coastal ural~~ ~~nprised of thern, South tral, North tral, and thern Oregon ks.~~ ~~eatened (1997 1998)~~	~~NMFS consultation standard/recovery plan consistent with Council=s objective under Amendment 13 and the Oregon Plan: For each of the four component stocks, a rebuilding and data collection program with an allowable marine and freshwater exploitation rate of no more than 13% to 35%, depending on parent escapement and ocean survival trends (adopted 1997). For a detailed description of the objective, see Section 3.3.2. Prior Council objectives contained in PFMC (1984 and 1993).~~	~~No. Listed stock, rebuilding program initiated in 1998. The annual conservation objective should allow component stocks to rebuild when environmental conditions are favorable. Recovery for some components may last more than 10 years even with no fishery impacts, due to loss or deterioration of significant portions of freshwater habitat and ongoing unfavorable marine conditions.~~	~~Depressed and listed. Major natural component of area which, when abundant, contributes to oc fisheries off California, Oregon, and Washington s of Leadbetter Pt., and freshwater fisheries in Ore coastal streams. Current impacts primarily incident ocean fisheries under a total nonretention regula south of Cape Falcon since 1994.~~
~~umbia River e (Hatchery)~~	~~Hatchery rack return goal of 17,200 adults.~~	~~No (hatchery exception).~~	~~Major component of ocean fisheries north of C Falcon. When abundant, significant contributor ocean fisheries off Oregon north into Canada Columbia River fisheries.~~
~~umbia River ly (Hatchery)~~	~~Hatchery rack return goal of 18,800 adults.~~	~~No (hatchery exception).~~	~~Major component of OPI area fisheries. W abundant, significant contributors to ocean fisheries California and north to Leadbetter Pt., Washington~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~**Stock**~~	~~**Conservation Objective**[b/] (to be met annually, unless noted otherwise)~~	~~**Subject to Council Actions to Prevent Overfishing**~~	~~**Other Management Information**[c/]~~
			~~to Columbia River fisheries. Current ocean fis impacts from very limited retention fisheries nort Cape Falcon and incidental hook-and-release mort in fisheries south of Cape Falcon.~~
~~**- - - COHO - - -**~~			
~~**EGON PRODUCTION INDEX** (continued)~~			
~~**umbia River** tural)~~	~~Undefined. Management is in a transitional phase pending completion of a critical review that may establish an explicit objective.~~	~~Not presently. See management information.~~	~~Extinct above The Dalles Dam, very rare below. Lo river coho are a candidate species under the ESA an ongoing effort to determine if a reprodu population can be found and rebuilt.~~
~~**ASHINGTON COASTAL** - All pertinent natural and hatchery stocks originating in Washington coastal streams north of the Columbia River through the western Strait of n de Fuca (West of the Elwha River). Management goals for Grays Harbor and Olympic Peninsula coho stocks include achieving natural spawning escapement objectives treaty allocation requirements, although Grays Harbor also contains a significant amount of hatchery production. The conservation objectives for these stocks are based on Y spawner escapements established pursuant to the U.S. District Court order in <u>Hoh v. Baldrige</u>. Annual natural spawning escapement targets and total escapement ectives are established by the Washington Department of Fish and Wildlife and treaty tribes under the provisions of <u>U.S. v. Washington</u> and subsequent U.S. District Court ers. After agreement to annual targets is reached by the parties in this litigation, ocean fishery escapement objectives are established for each river, or region of origin, which ude provisions for providing treaty allocation requirements and inside, non-Indian fishery needs. The conservation objectives for the Queets, Hoh, and Quillayute rivers were eloped as ranges intended to bracket the current best estimates of MSY escapement. The range of each objective reflects the degree of uncertainty inherent by using the high mate of recruits per spawner and low estimate of carrying capacity for the lower bound, and the low estimate of recruits-per-spawner with the high estimate of smolt carrying acity for the upper end of the range. The ranges were subsequently adjusted upward by 26% to 184% for risk aversion and again for habitat considerations (Lestelle et al 4).~~			
~~**lapa Bay** tchery)~~	~~Meet WDFW program objectives.~~	~~No (hatchery exception).~~	~~Minor component of ocean fisheries off nort Oregon north into Canada. Significant contribute inside commercial net and recreational fishe WDFW critically reviewing current managemen determine if objectives for natural stocks are warran~~
~~**ys Harbor**~~	~~35,400 natural adult spawners (MSP based on WDF [1979]) or annual target agreed to by WDFW and the Quinault Indian Nation .~~	~~Yes. Conservation alert or overfishing concern based on fewer than 35,400 natural spawners.~~	~~Medium to high abundance. Minor contributo ocean fisheries off Oregon and north into Can Significant contributor to Washington inside t fishery, minor contributor to inside recreational fish~~
~~**nault** (Hatchery)~~	~~Meet hatchery program objectives and provide escapement to utilize production potential for naturally spawning fish.~~	~~No (hatchery exception).~~	~~Contributor to ocean fisheries off Washington and n into British Columbia; present south to central Ore significance to Puget Sound and tribal fisheries.~~

BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)

Stock	Conservation Objective[b/] (to be met annually, unless noted otherwise)	Subject to Council Actions to Prevent Overfishing	Other Management Information[c/]
- - - COHO - - - ASHINGTON COAST (continued)			
eets	MSY range of 5,800 to 14,500 natural adult spawners (Lestelle et al 1984) or annual target agreed to by WDFW and the Quinault Indian Nation.	Yes. Conservation alert or overfishing concern based on fewer than 5,800 natural spawners.	Small population. Low to depressed abunda Contributor to ocean fisheries off Washington n into British Columbia; present south to central Ore significance to Puget Sound and tribal fisheries.
h	MSY range of 2,000 to 5,000 natural adult spawners (Lestelle et al. 1984) or annual target agreed to by WDFW and Hoh Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 2,000 natural spawners.	Small population. Medium to low abunda Contributor to ocean fisheries off Washington n into British Columbia; present south to central Oreg
llayute Fall	MSY range of 6,300 to 15,800 natural adult spawners (Lestelle et al. 1984) or annual target agreed to by WDFW and the Quillayute Tribe.	Yes. Conservation alert or overfishing concern based on fewer than 6,300 natural spawners.	Small population. Depressed abundance. Contrib to ocean fisheries off Washington north into Br Columbia; present south to central Oregon.
llayute Summer tchery)	Meet hatchery program objectives.	No (hatchery exception).	Low to depressed abundance. Early river entry tim Contributor to ocean fisheries off Washington n into British Columbia; present south to central Oreg
stern Strait of n de Fuca iu, Hoko, lam, Pysht, East West, and Lyre rs and cellaneous ams west of the ha River)	MSP objective of 11,900 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to through fixed procedures established in U.S. District Court.	Yes. Conservation alert or overfishing concern based on fewer than 11,900 natural spawners.	Small population. Low to depressed abundance. L information on ocean distribution. A new an objective of stepped exploitation rates is u consideration by WDFW and the tribes.

- - - COHO - - -

GET SOUND - All pertinent natural and hatchery stocks originating from U.S. tributaries to Puget Sound and the eastern Strait of Juan de Fuca (east of Salt Creek). The et Sound Salmon Management Plan defines management objectives and long term goals for these stocks as developed by representatives from federal, state, and tribal ncies. Conservation objectives for specific stocks are currently based on either MSP principles for stocks managed primarily for natural production or upon hatchery apement needs for stocks managed for artificial production. However, a transition to exploitation rate management is currently under consideration by the involved nagers. Annual escapement targets for these coho stocks are developed through procedures established in U.S. District Court. Puget Sound management procedures are ined in a Memorandum Adopting Salmon Management Plan (U.S. v. Washington, 626 F. Supp. 1405 [1985]). The original conservation objectives were developed by a te/Tribal Management Plan Development Team following the Boldt Decision with the goal for natural spawning stocks defined as Athe adult spawning population that will, he average, maximize biomass of juvenile outmigrants subsequent to incubation and freshwater rearing under average environmental conditions.@ The methodology used to elop the objectives was based on assessment of the quantity and quality of rearing habitat and the number of adult spawners required to fully seed the habitat (Zillges 1977). he objectives have subsequently been modified in 1983 by the U.S. District Court Fisheries Advisory Board (Clark 1983 and PSSSRG 1997) and later determinations of the

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/] (to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~DFW/Tribal Technical Committee.~~			
~~tern Strait of n de Fuca eams east of Salt ek through macum Creek))~~	~~MSP objective of 950 natural adult spawners (Clark 1983 modified by habitat apportionment of WDFW/Tribal Technical Committee in 1998) or annual target agreed to in fixed procedures set by U.S. District Court. The Elwha and Dungeness rivers are not included in this objective, but are managed on a harvest rate basis.~~	~~Yes. Conservation alert or overfishing concern based on fewer than 950 natural spawners.~~	~~Small population. Low to depressed abundance. L information on ocean distribution. A new an objective of stepped exploitation rates is u consideration by WDFW and the tribes.~~
~~d Canal~~	~~MSP objective of 21,500 natural adult spawners (Clark 1983 modified since 1994 by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.~~	~~Yes. Conservation alert or overfishing concern based on fewer than 21,500 natural spawners.~~	~~Low to medium abundance. Contributor to U.S. o fisheries north of Cape Falcon; significant contrib to ocean fisheries off British Columbia, in Puget So and inside tribal fisheries. A new objective utili stepped exploitation rates is under consideration WDFW and the tribes which may utilize harvest management rather than a fixed spawner goal.~~
~~git~~	~~MSP objective of 30,000 natural adult spawners (Zillges 1977 and Clark 1983) or annual target agreed to in fixed procedures set by U.S. District Court. (The spawner assessment methodology is currently being revised and may result in an objective significantly different from 30,000.)~~	~~Yes. Conservation alert or overfishing concern based on fewer than 30,000 natural spawners.~~	~~Low to depressed abundance. Contributor to ocean fisheries north of Cape Falcon; signifi contributor to ocean fisheries off British Columbi Puget Sound, and inside tribal fisheries. A objective is under consideration by WDFW and tribes which may utilize harvest rate management ra than a fixed spawner goal.~~
~~COHO~~ ~~GET SOUND (continued)~~			
~~aguamish~~	~~MSP objective of 17,000 natural adult spawners (Zillges 1977) or annual target agreed to in fixed procedures set by U.S. District Court.~~	~~Yes. Conservation alert or overfishing concern based on fewer than 17,000 natural spawners.~~	~~Medium to low abundance. Contributor to U.S. o fisheries north of Cape Falcon; significant contrib to ocean fisheries off British Columbia, in Puget So and inside tribal fisheries. A new objective is u consideration by WDFW and the tribes which utilize harvest rate management rather than a f spawner goal.~~
~~homish~~	~~MSP objective of 70,000 natural adult spawners (Zillges 1977 as modified by WDFW/Tribal Technical Committee) or annual target agreed to in fixed procedures set by U.S. District Court.~~	~~Yes. Conservation alert or overfishing concern based on fewer than 70,000 natural spawners.~~	~~High to medium abundance. Contributor to U.S. o fisheries north of Cape Falcon; significant contrib to ocean fisheries off British Columbia, in Puget So and inside tribal fisheries. A new annual objectiv under consideration by WDFW and the tribes w may utilize harvest rate management rather than a f spawner goal.~~

~~BLE 3-1. Conservation objectives and management information for natural and hatchery salmon stocks and stock complexes of significance to ocean salmon fisheries. ndance information is generally based on the period 1994-1998.[a/] (Page 1 of 15)~~

~~Stock~~	~~Conservation Objective[b/]~~ ~~(to be met annually, unless noted otherwise)~~	~~Subject to Council Actions to Prevent Overfishing~~	~~Other Management Information[c/]~~
~~th Puget Sound chery)~~	~~Hatchery rack return goal of 52,000 adults. Natural production goals under development.~~	~~No (hatchery exception).~~	~~High abundance. Contributor to U.S. ocean fishe north of Cape Falcon; significant contributor off Br Columbia, in Puget Sound, and inside tribal fisherie~~
~~UTHERN BRITISH COLUMBIA COAST - Stocks of southern British Columbia coastal streams (including Vancouver Island) and the Fraser River.~~			
~~stal Stocks~~	~~Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.~~	~~No. Not under Council management authority.~~	~~Medium to low abundance. Major contributor ocean fisheries off British Columbia; signifi contributors north into Southeast Alaska and presen northern Washington.~~
~~ser River~~	~~Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty.~~	~~No. Not under Council management authority.~~	~~Medium to low abundance. Major contributor ocean fisheries off British Columbia.~~
~~PINK (odd-numbered years)~~			
~~Fraser River Panel of the PSC manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48E N latitude to meet Fraser River natural spawning apement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ, which is not in the Fraser River Panel Area (U.S.) ers consistent with Fraser River Panel management intent. Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing an pink harvest within fixed constraints of coho and Chinook harvest ceilings and providing for treaty allocation requirements.~~			
~~et Sound~~	~~900,000 natural spawners or consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel).~~	~~No. Minor impacts in Council fisheries and not under Council management authority.~~	~~High abundance. Contributors to ocean fisheries British Columbia and in Puget Sound. Present s into Oregon. Rare off California.~~
~~ser River~~	~~Manage Council fisheries that impact Canadian stocks consistent with provisions of the Pacific Salmon Treaty (Fraser River Panel).~~	~~No. Minor impacts in Council fisheries and not under Council management authority.~~	~~High to medium abundance. Major contributor ocean fisheries off British Columbia; present Southeast Alaska and off Washington and nort Oregon. Rare off California.~~

~~TABLE 3-2. Listing of evolutionarily significant units, their ESA status, and associated stocks managed under the FMP. (Page 28 of 2).~~

~~ESU[a/]~~	~~ESA Status Month and Year of Initial Listing~~	~~Stock Representation in FMP~~
- - - CHINOOK - - -		
Central Valley Fall	Candidate Species Sept. 1999	! Sacramento River Fall
Central Valley Spring	Listed Threatened Sept. 1999	! Central Valley Spring
Sacramento River Winter	Listed Endangered Aug. 1989	! Sacramento River Winter
California Coast	Listed Threatened Sept. 1999	! Eel, Mattole, and Mad Rivers ! Klamath River Fall
Southern Oregon/Northern California Coast	Not Warranted Sept. 1999	! Southern Oregon ! Smith River ! Klamath River Fall
Upper Klamath and Trinity Rivers	Not Warranted	! Klamath River Fall ! Klamath River Spring
Oregon Coast	Not Warranted	! Central and Northern Oregon
Washington Coast	Not Warranted	! Willapa Bay Fall ! Grays Harbor Fall ! Grays Harbor Spring ! Queets Fall ! Queets Spring/Summer ! Hoh Fall ! Hoh Spring/Summer ! Quillayute Fall ! Quilayute Spring/Summer ! Hoko Summer/Fall (Western Strait of Juan de Fuca)
Puget Sound	Listed Threatened May 1999	! Elwha Summer/Fall (Eastern Strait of Juan de Fuca) ! Skokomish Summer/Fall (Hood Canal) ! Nooksack Spring (early) ! Skagit Summer/Fall ! Skagit Spring ! Stillaguamish Summer/Fall ! Snohomish Summer/Fall ! Cedar River Summer/Fall (Lake Washington) ! White River Spring ! Green River Summer/Fall ! Nisqually River Summer/Fall (South Puget Sound)
Lower Columbia River	Listed Threatened May 1999	! Sandy, Kalama, and Cowlitz (fall and spring) ! North Lewis River Fall
Upper Willamette River	Listed Threatened May 1999	! Upper Willamette and Clackamas Rivers
~~Mid-Columbia River Spring~~	~~Not Warranted~~	! ~~Klickitat, Warm Springs, John Day, and Yakima Rivers (spring)~~
Upper-Columbia River Summer/Fall	Not Warranted	! Upper River Bright ! Upper Columbia River Summer
Upper Columbia River Spring	Listed Endangered May 1999	! Upper Columbia River Spring
Snake River Fall	Listed Threatened May 1992	! Snake River Fall

~~**TABLE 3-2. Listing of evolutionarily significant units, their ESA status, and associated stocks managed under the FMP.** (Page 28 of 2).~~

~~**ESU**~~[a/]	~~**ESA Status Month and Year of Initial Listing**~~	~~**Stock Representation in FMP**~~
Snake River Spring/Summer	Listed Threatened May 1992	! Snake River Spring/Summer
- - - COHO - - -		
Central California Coast	Listed Threatened Dec. 1996	! By proxy - Rogue/Klamath hatchery coho
Southern Oregon/Northern California Coasts	Listed Threatened May 1997	! Southern Oregon Coastal Natural ! Northern California
Oregon Coast	Listed Threatened Oct. 1998	! South Central Oregon Coast ! North Central Oregon Coast ! Northern Oregon Coastal
Lower Columbia River	Listed Threatened June 2005	! Columbia River Natural
South Western Washington Coast	Candidate Species July 1995	! Grays Harbor
Olympic Peninsula	Not Warranted	! Queets ! Hoh ! Quillayute Fall ! Strait of Juan de Fuca (Western)
Puget Sound/Strait of Georgia	Candidate Species	! Strait of Juan de Fuca (Eastern) ! Hood Canal ! Skagit ! Stillaguamish ! Snohomish
- - - PINK - - -		
Puget Sound, Odd Numbered Years	Not Warranted	! Puget Sound

~~3.3.2 Oregon Coastal Natural Coho~~

3.5~~Amendment 13 (PFMC 1999) established a recovery and rebuilding plan for Oregon coastal natural (OCN) coho which (1) defines individual management criteria for four separate stock components, (2) sets overall harvest exploitation rate targets for OCN coho that significantly limit the impact of fisheries on the recovery of depressed stock components, (3) promotes stock rebuilding while allowing limited harvest of other abundant salmon stocks during critical rebuilding periods, and (4) is consistent with the Oregon State recovery plan. Under the rebuilding program, the overall allowable fishery impact rate in any given year for each stock component is determined by the spawning abundance of the parents and grandparents of the returning adults and upon the marine survival expectations for the current maturing brood, as predicted by smolt-to-jack survival rates for hatchery coho.~~

~~The assessment of historic parent abundance utilized in Amendment 13 is based on the number of spawners in each of the four stock components that is projected to achieve full seeding of high quality freshwater habitat at low levels of marine survival. The full seeding estimates (in terms of stratified random sampling numbers) are derived from a model based on freshwater habitat assessment which incorporates measures of variability in the quality of the freshwater habitat and estimates of survival between life stages where numerical indicators have been measured (Nickelson and Lawson 1996). The assessment of marine survival status is based on a partitioning of the observed marine survival for Oregon hatchery reared coho from 1970-1996 (PFMC 1999).~~

~~Under the rebuilding plan, the allowable overall fishery impact (exploitation rate) for OCN coho represents all fishing related mortality, including marine and freshwater fisheries for both retention and catch-and-release fishing. The maximum allowable exploitation rates range from less than 10% when parent abundance and/or marine survival is especially low, to a high of 35% if two generations of spawner rebuilding have occurred and marine survival is sufficient to expect continued improvements in spawner escapement for a third generation. Regardless of high parental spawning levels or projected favorable ocean conditions, a cap of 35% in total stock impacts is maintained to provide insight as to the effects of high spawner levels on production. A limitation of 15% remains in effect even at the two highest tiers of parent escapement if ocean conditions are not favorable, so as to preserve rebuilding progress achieved to that point. The matrix in Table 3-3 illustrates specifically how spawner abundance and marine survival determine the maximum allowable stock exploitation rate objectives for each OCN coho stock component.~~

~~Each of the four OCN coho stock components will be managed in marine fisheries as a separate stock to the extent that the best scientific information allows. Because of apparent similarities in the marine distribution of the four components, little flexibility is expected in marine fishery intensities among the components. If some components begin rebuilding faster than others, but data are not available which allows the marine harvest of OCN coho components at different rates, opportunities for increased ocean harvest may be constrained by the weakest component. Any management flexibility for increased fisheries on any strong OCN coho component will likely be in freshwater or estuarine areas during the initial phase of the rebuilding process. In these areas, ODFW will base fishing opportunity on the status of populations in individual basins within a stock component, and directed fisheries on natural coho will be allowed only when spawners are expected to be at or above the full seeding level for high quality habitat. Actual seasons would be based on the presence of fin-clipped hatchery fish (e.g., selective fisheries), public comment, and other basin-specific factors. An intensive monitoring program will be implemented by ODFW to measure the overall management effectiveness toward the goal of increasing OCN spawner levels and consequent juvenile and adult progeny. The Environmental Assessment (EA) for Amendment 13 (PFMC 1999) contains further details of the monitoring plan and of the overall OCN coho management criteria and its basis.~~

~~In consideration for the uncertainties that exist in this recovery regime and the potential for new information to affect basic assumptions critical to its success, the measures adopted in Amendment 13 are subject to a comprehensive, adaptive review in 2000 (PFMC 2000b). To incorporate the best science, the methods of estimating the technical parameters used in this proposal may change without plan amendment, if approved by the Council following a technical review and recommendation for change by the Scientific and Statistical Committee.~~

~~3.4~~ BYCATCH

AConservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.@

Magnuson-Stevens Act, National Standard 9

A...Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priorityB

(A) minimize bycatch; and

(B) minimize the mortality of bycatch which cannot be avoided;@

Magnuson-Stevens Act , ' 303(a)(11)

3.~~4~~5.1 Definition and Management Intent

~~A~~"Bycatch~~@~~" for the purposes of this fishery management plan is defined as fish caught in an ocean salmon fishery which are not sold or kept for personal use and includes economic discards, regulatory discards, and fishery mortality due to an encounter with fishing gear that does not result in capture of fish. Bycatch does not include any fish that legally are retained in a fishery and kept for personal, tribal, or cultural use, or that enter commerce through sale, barter, or trade. In addition, under the provisions of the Magnuson-Stevens Act, bycatch does not include targeted salmon released alive under a recreational catch-and-release fishery management program.

~~TABLE 3-3. Allowable fishery impact rate criteria for OCN coho stock components.~~

	~~MARINE SURVIVAL INDEX (based on return of jacks per hatchery smolt)~~		
	~~Low (<0.0009)~~	~~Medium (0.0009 to 0.0034)~~	~~High (>0.0034)~~
~~**PARENT SPAWNER STATUS**~~	~~**Allowable Total Fishery Impact Rate**~~		
~~**High:** Parent spawners achieved Level #2 rebuilding criteria; grandparent spawners achieved Level #1~~	~~#15%~~	~~#30%~~[~~a/~~]	~~#35%~~[~~a/~~]
~~**Medium:** Parent spawners achieved Level #1 or greater rebuilding criteria~~	~~#15%~~	~~#20%~~[~~a/~~]	~~#25%~~[~~a/~~]
~~**Low:** Parent spawners less than Level #1 rebuilding criteria~~	~~#15%~~		
	~~#10-13%~~[~~b/~~]	~~#15%~~	~~#15%~~

	~~OCN Coho Spawners by Stock Component~~				
~~**Rebuilding Criteria**~~	~~**Northern**~~	~~**North-Central**~~	~~**South-Central**~~	~~**Southern**~~	~~**Total**~~
~~Full Seeding at Low Marine Survival:~~	~~21,700~~	~~55,000~~	~~50,000~~	~~5,400~~	~~132,100~~
~~Level #2 (75% of full seeding):~~	~~16,400~~	~~41,300~~	~~37,500~~	~~4,100~~	~~99,300~~
~~Level #1 (50% of full seeding):~~	~~10,900~~	~~27,500~~	~~25,000~~	~~2,700~~	~~66,100~~
~~38% of Level #1 (19% of full seeding):~~	~~4,100~~	~~10,500~~	~~9,500~~	~~1,000~~	~~25,100~~

~~**Stock Component (Boundaries)**~~	~~**Full Seeding of Major Basins at Low Marine Survival (Number of Adult Spawners)**~~				
	~~Nehalem~~	~~Tillamook~~	~~Nestucca~~	~~Ocean Tribs.~~	
~~**Northern:** (Necanicum River to Neskowin Creek)~~	~~17,500~~	~~2,000~~	~~1,800~~	~~400~~	
	~~Siletz~~	~~Yaquina~~	~~Alsea~~	~~Siuslaw~~	~~Ocean Tribs.~~
~~**North-Central:** (Salmon River to Siuslaw River)~~	~~4,300~~	~~7,100~~	~~15,100~~	~~22,800~~	~~5,700~~
	~~Umpqua~~	~~Coos~~	~~Coquille~~	~~Coastal Lakes~~	
~~**South-Central:** (Siltcoos River to Sixes River)~~	~~29,400~~	~~7,200~~	~~5,400~~	~~8,000~~	
	~~Rogue~~				
~~**Southern:** (Elk River to Winchuck River)~~	~~5,400~~				

~~a/ When a stock component achieves a medium or high parent spawner status under a medium or high marine survival index, but a major basin within the stock component is less than 10% of full seeding: (1) the parent spawner status will be downgraded one level to establish the allowable fishery impact rate for that component and (2) no coho-directed harvest impacts will be allowed within that particular basin.~~

~~b/ This exploitation rate criteria applies when (1) parent spawners are less than 38% of the Level #1 rebuilding criteria, or (2) marine survival conditions are projected to be at an extreme low as in 1994-1996 (<0.0006 jack per hatchery smolt). If parent spawners decline to lower levels than observed through 1998, rates of less than 10% would be considered, recognizing that there is a limit to further bycatch reduction opportunities.~~

Under the salmon FMP, the primary bycatch that occurs is bycatch of salmon species. Therefore, the Council=s conservation and management measures shall seek to minimize salmon bycatch and bycatch mortality (drop off and hooking mortality) to the greatest extent practical in all ocean fisheries. When bycatch cannot be avoided, priority will be given to conservation and management measures that seek to minimize bycatch mortality and ensure the extended survival of such fish. These measures will be developed in consideration of the biological and ecological impacts to the affected species, the social and economic impacts to the fishing industry and associated communities, and the impacts upon the fishing, management, and enforcement practices currently employed in ocean salmon fisheries (see also Section 6.5.3).

3.45.2 Occurrence

The present bycatch and bycatch mortality estimation methodologies and procedures for salmon in salmon fisheries are documented in STT (1999d) and a compilation of SSC reviews of salmon estimation methodologies (PFMC 1997c). Bycatch of salmon in Pacific Coast trawl fisheries is documented in Amendment 12 (PFMC 1997a). Salmon fisheries or fishery practices which lack or do not have recent observation data or estimates of bycatch composition and associated mortality rates will be identified by the Council for future research priority in their biannual Research and Data Needs Report to NMFS. Future changes in the procedures and methodologies will occur only if a comprehensive technical review of existing biological data justifies a modification and is approved by the STT, SSC, and Council. All of these changes will occur within the schedule established for salmon estimation methodology review and apart from the preseason planning process.

Bycatch of fish other than salmon in salmon fisheries is generally very limited. Only hook-and-line gear is allowed in ocean salmon fisheries and regulations allow for retention of most groundfish species and limited numbers of Pacific halibut that are caught incidentally while salmon fishing.

3.45.3 Standard Reporting Methodology

Within the salmon preseason planning process, management options will be assessed for the effects on the amount and type of salmon bycatch and bycatch mortality. Estimates of salmon bycatch and incidental mortalities associated with salmon fisheries will be included in the modeling assessment of total fishery impact and assigned to the stock or stock complex projected to be impacted by the proposed management measure. The resultant fishery impact assessment reports for the ocean salmon fisheries will specify the amount of salmon bycatch and bycatch mortality associated with each accompanying management option. The final analysis of Council-adopted management measures will contain an assessment of the total salmon bycatch and bycatch mortality for ocean salmon fisheries, and include the percentage that these estimates represent compared to the total harvest projected for each species, as well as the relative change from the previous year=s total bycatch and bycatch mortality levels.

4 HABITAT AND PRODUCTION

AAny fishery management plan . . . shall . . . protect, restore, and promote the long-term health and stability of the fishery.

Magnuson-Stevens Act, '303(a)(1)

The Council will be guided by the principle that there should be no net loss of the productive capacity of marine, estuarine, and freshwater habitats which sustain commercial, recreational, and tribal salmon fisheries beneficial to the nation. Within this policy, the Council will assume an aggressive role in the protection and enhancement of anadromous fish habitat, especially essential fish habitat.

4.1 ESSENTIAL FISH HABITAT

A...Describe and identify essential fish habitat for the fishery . . . minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;@

Magnuson-Stevens Act, '303(a)(7)

Protecting, restoring, and enhancing the natural productivity of salmon habitat, especially the estuarine and freshwater areas, is an extremely difficult challenge which must be achieved if salmon fisheries are to remain healthy for future generations. Section 3(10) of the Magnuson-Stevens Act defines essential fish habitat (EFH) as Athose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.@ The following interpretations have been made by NMFS to clarify this definition: Awaters@ include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include historic areas if appropriate; Asubstrate@ includes sediment, hard bottom, structures underlying the waters, and associated biological communities; Anecessary@ means the habitat required to support a sustainable fishery and the managed species= contribution to a healthy ecosystem; and Aspawning, breeding, feeding, or growth to maturity@ covers a species full life cycle.

4.1.1 Identification and Description

Appendix A to the *Pacific Coast Salmon Plan* contains the Council=s complete identification and description of Pacific coast salmon fishery EFH, along with a detailed assessment of adverse impacts and actions to encourage conservation and enhancement of EFH. The Pacific coast salmon fishery EFH includes those waters and substrate necessary for salmon production needed to support a long-term sustainable salmon fishery and salmon contributions to a healthy ecosystem. In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (200 nautical miles) offshore of Washington, Oregon, and California north of Point Conception. Foreign waters off Canada, while still salmon habitat, are not included in salmon EFH, because they are outside U.S. jurisdiction. The Pacific coast salmon fishery EFH also includes the marine areas off Alaska designated as salmon EFH by the North Pacific Fishery Management Council. In freshwater, the salmon fishery EFH includes all those streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the habitat historically accessible to salmon (except above certain impassable natural barriers) in Washington, Oregon, Idaho, and California as identified in Table 1-1 of Appendix A. Salmon EFH includes aquatic areas above all artificial barriers except the impassible barriers (dams) listed in Table A-2 of Appendix A. However, activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act. The identification and description of EFH may be modified in the future through salmon FMP amendments as new or better information becomes available.

4.1.2 Adverse Effects of Fishing on Essential Fish Habitat

To the extent practicable, the Council must minimize adverse impacts of fishing activities on salmon EFH. Fishing activities may adversely affect EFH if the activities cause physical, chemical, or biological alterations of the substrate, and loss of or injury to benthic organisms, prey species and their habitat, and other components of the ecosystem. The marine activities under Council management authority or influence that may impact EFH are effects of fishing gear, prey removal by other fisheries, and the effect of salmon fishing on the reduction of stream nutrients due to fewer salmon carcasses on the spawning grounds. Within its fishery management authority, the Council may use fishing gear restrictions, time and area closures, or harvest limits to reduce negative impacts on EFH. Section 3.1 of Appendix A provides a description of the potential impacts on EFH from fishing activities and measures to assess or reduce those impacts. The description and measures includes both fisheries within Council management authority and those under other management jurisdictions.

In determining actions to take to minimize any adverse effects from fishing, the Council will consider the nature and extent of the impact and the practicality and effectiveness of management measures to reduce or eliminate the impact. The consideration will include long- and short-term costs and benefits to the fishery and EFH along with other appropriate factors consistent with National Standard 7 (AConservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.@).

4.1.3 Adverse Effects of Non-Fishing Activities on Essential Fish Habitat

> *AEach Council shall comment on and make recommendations to the Secretary and any Federal or State agency concerning any such activity (authorized, funded, or undertaken, or proposed to be undertaken by any Federal or State agency) that, in the view of the Council, is likely to substantially affect the habitat, including essential fish habitat, of an anadromous fishery resource under its authority.@ . . . AWithin 30 days . . . a Federal agency shall provide a detailed response in writing . . ..@*
>
> *Magnuson-Stevens Act, '305(b)*

The Council will strive to assist all agencies involved in the protection of salmon habitat. This assistance will generally occur in the form of Council comments endorsing protection, restoration, or enhancement programs; requesting information on and justification for actions which may adversely impact salmon production; and in promoting salmon fisheries= needs among competing uses for the limited aquatic environment. In commenting on actions which may affect salmon habitat, the Council will seek to ensure implementation of consistent and effective habitat policies with other agencies having environmental control and resource management responsibilities over production and harvest in inside marine and fresh waters.

Specific recommendations for conservation and enhancement measures for EFH are listed in Appendix A. In implementing its habitat mandates, the Council will seek to achieve the following overall objectives:

1. Work to assure that Pacific salmon, along with other fish and wildlife resources, receive equal treatment with other purposes of water and land resource development.

2. Support efforts to restore Pacific salmon stocks and their habitat through vigorous implementation of federal and state programs.

3. Work with fishery agencies, tribes, land management agencies, and water management agencies to assess habitat conditions and develop comprehensive restoration plans.

4. Support diligent application and enforcement of regulations governing ocean oil exploration and development, timber harvest, mining, water withdrawals, agriculture, or other stream corridor uses by local, state, and federal authorities. It is Council policy that approved and permitted activities employ the best management practices available to protect salmon and their habitat from adverse effects of contamination from domestic and industrial wastes, pesticides, dredged material disposal, and radioactive wastes.

5. Promote agreements between fisheries agencies and land and water management agencies for the benefit of fishery resources and to preserve biological diversity.

6. Strive to assure that the standard operation of existing hydropower and water diversion projects will not substantially reduce salmon productivity.

7. Support efforts to identify and avoid cumulative or synergistic impacts in drainages where Pacific salmon spawn and rear. The Council will assist in the coordination and accomplishment of comprehensive plans to provide basinwide review of proposed hydropower development and other water use projects. The Council encourages the identification of no-impact alternatives for all water resource development.

8. Support and encourage efforts to determine the net economic value of conservation by identifying the economic value of fish production under present habitat conditions and expected economic value under improved habitat conditions.

4.2 COMPENSATION FOR NATURAL PRODUCTION LOSSES

Whenever unavoidable fish population losses occur as a result of various development programs or other action, the Council will recommend compensatory measures that, to the extent practicable, meet the following guidelines:

1. Replacement of losses will be by an equivalent number of fish of the appropriate stock of the same fish species or by habitat capable of producing the equivalent number of fish of the same species that suffered the loss.

2. Mitigation or compensation programs will be located in the immediate area of loss.

3. In addition to direct losses of fish production, compensation programs will include consideration of the opportunity to fish and potential unrealized production at the time of the project.

4. Measures for replacement of runs lost due to construction of water control projects should be completed in advance of, or concurrent with, completion of the project.

4.3 ARTIFICIAL PRODUCTION

Artificial production programs can be an important component of healthy salmon fisheries. They may fall under one of four general categories: fishery enhancement, natural stock recovery, coded-wire tag indicator stock, or mitigation. To assure the effectiveness and maximize the benefits of artificial production programs, the Council recommends meeting the following objectives:

5. Maximize the continued production of hatchery stocks consistent with harvest management and stock conservation objectives.

6. Ensure that mitigation and enhancement programs, with a primary objective of producing hatchery origin salmon for harvest, minimize adverse ecological and genetic impacts to naturally producing

populations (e.g., straying and mixing on the spawning grounds, unbalanced exploitation rates, loss of genetic diversity). Further, the methods employed to produce salmon for harvest should ensure high survival and high contribution rates to the fisheries targeting the enhanced stock while meeting natural stock objectives.

7. Ensure that artificial production programs designed to perpetuate and/or rebuild depressed natural populations are designed to be short-term in duration, boost the abundance of targeted natural populations over a few generations, and terminate when the population is able to sustain itself naturally.

8. Support efforts to continually review and improve the effectiveness of artificial propagation.

5 HARVEST

AConservation and management measures shall, consistent with the conservation requirements of this Act, … take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.@

Magnuson-Stevens Act, National Standard 8

The Council process for determining the allowable ocean fishery harvest centers primarily around protecting weak or listed natural salmon stocks while providing harvest opportunity on stronger natural and hatchery stocks in ways that conform to the plan=s harvest allocation objectives. Achieving these multiple objectives is complicated by natural variability in annual stock abundance, variability in the ocean migratory routes and timing, the high degree of mixing of different salmon species and stocks in ocean fisheries, and imprecision in the estimation of these important parameters. Within this complexity and uncertainty, the Council attempts to achieve its fishery harvest objectives by using the various management tools described in Chapter 6.

Procedures for determining allowable ocean harvest vary by species, fishery complexity, available data, and the state of development of predictive tools. Descriptions of the various procedures in effect in 1984 have been documented in PFMC (1984). These procedures have and will change over time to incorporate the best science. Specific changes resulting from improvements in forecasting techniques or changes in outside/inside allocation procedures due to treaty or user sharing revisions are anticipated by the plan=s framework mechanism. Such changes may be adopted without formal amendment. Changes in procedures and the rationale for such changes are described in Council documents developed during the preseason regulatory process (see Chapter 9), in pertinent plan amendment documents, and in various methodology reviews by the SSC.

5.1 OVERALL FISHERY OBJECTIVES

The following objectives guide the Council in establishing fisheries against a framework of ecological, social, and economic considerations.

10. Establish ocean exploitation rates for commercial and recreational salmon fisheries that are consistent with requirements for stock conservation objectives within Section 3.1, specified ESA consultation or recovery standards, or Council adopted rebuilding plans.

11. Fulfill obligations to provide for Indian harvest opportunity as provided in treaties with the United States, as mandated by applicable decisions of the federal courts, and as specified in the October 4, 1993 opinion of the Solicitor, Department of Interior, with regard to federally recognized Indian fishing rights of Klamath River Tribes.

12. Seek to maintain ocean salmon fishing seasons which support the continuance of established recreational and commercial fisheries while meeting salmon harvest allocation objectives among ocean and inside recreational and commercial fisheries that are fair and equitable, and in which fishing interests shall equitably share the obligations of fulfilling any treaty or other legal requirements for harvest opportunities.[13/]

[3]/ In its effort to maintain the continuance of established ocean fisheries, the Council includes consideration of maintaining established fishing communities. In addition, a significant factor in the Council=s allocation objectives in Section 5.3 is aimed at preserving the

economic viability of local ports and/or specific coastal communities (e.g., recreational port allocations north of Cape Falcon). Chapter 6 in Appendix B and the tables it references provide additional specific information on the fishing communities.

13. Minimize fishery mortalities for those fish not landed from all ocean salmon fisheries as consistent with optimum yield and the bycatch management specifications of Section 3.4.

14. Manage and regulate fisheries so that the optimum yield encompasses the quantity and value of food produced, the recreational value, and the social and economic values of the fisheries.

15. Develop fair and creative approaches to managing fishing effort and evaluate and apply effort management systems as appropriate to achieve these management objectives.

16. Support the enhancement of salmon stock abundance in conjunction with fishing effort management programs to facilitate economically viable and socially acceptable commercial, recreational, and tribal seasons.

17. Achieve long-term coordination with the member states of the Council, Indian tribes with federally recognized fishing rights, Canada, the North Pacific Fishery Management Council, Alaska, and other management entities which are responsible for salmon habitat or production. Manage consistent with the Pacific Salmon Treaty and other international treaty obligations.

18. In recommending seasons, to the extent practicable, promote the safety of human life at sea.

5.2 MANAGEMENT CONSIDERATIONS BY SPECIES AND AREA

Following, are brief descriptions of the stock management considerations which guide the Council in setting fishing seasons within the major subareas of the Pacific Coast.

5.2.1 Chinook Salmon

5.2.1.1 South of Horse Mountain

Within this area, considerable overlap of Chinook originating in Central Valley and northern California coastal rivers occurs between Point Arena and Horse Mountain. Ocean commercial and recreational fisheries are managed to address impacts on Chinook stocks originating from the Central Valley, California Coast, Klamath River, Oregon Coast, and the Columbia River. With respect to California stocks, ocean commercial and recreational fisheries operating in this area are managed to maximize natural production consistent with meeting the U.S. obligation to Indian tribes with federally recognized fishing rights, and recreational needs in inland areas. Special consideration must be given to meeting the consultation or recovery standards for endangered Sacramento River winter Chinook in the area south of Point Arena and for threatened Snake River fall Chinook north of Pigeon Point. Sacramento River spring Chinook and California coastal Chinook are also listed as threatened under the state ESA.

5.2.1.2 Horse Mountain to Humbug Mountain (Klamath Management Zone)

Major Chinook stocks contributing to this area originate in streams located along the southern Oregon/California coasts as well as the Central Valley. The primary Chinook run in this area is from the Klamath River system, including its major tributary, the Trinity River. Ocean commercial and recreational fisheries operating in this area are managed to maximize natural production of Klamath River fall and spring Chinook consistent with meeting the U.S. obligations to Indian tribes with federally recognized fishing rights, and recreational needs in inland areas. Ocean fisheries operating in this area must balance management considerations for stock-specific conservation objectives for Klamath River, Central Valley, California coast, Oregon coast, and Columbia River Chinook stocks.

5.2.1.3 Humbug Mountain to Cape Falcon

The major Chinook stocks contributing to this area primarily originate in Oregon coastal rivers located north of Humbug Mountain, as well as from the Rogue, Klamath, and Central Valley systems. Allowable ocean harvests in this area are an annual blend of management considerations for impacts on Chinook stocks originating from the Central Valley, California Coast, Klamath River, Oregon Coast, Columbia River, and the Washington Coast.

5.2.1.4 North of Cape Falcon

The majority of the ocean Chinook harvest in this area primarily originates from the Columbia River, with additional contributions from Oregon and Washington coastal areas, Puget Sound and some California stocks. Bonneville Pool (Spring Creek hatchery tule) fall and lower Columbia River (tule) fall and spring (Cowlitz) Chinook, all primarily of hatchery-origin, comprise a majority of the ocean Chinook harvest between Cape Falcon, Oregon and the U.S.-Canada border. Hatchery production escapement goals of these stocks are established according to long-range production programs and/or mitigation requirements associated with displaced natural stocks. Allowable ocean harvest in this area is directed at Columbia River stocks with contributions from the Oregon Coast, Washington Coast, and Puget Sound.

5.2.2 Coho Salmon

5.2.2.1 South of Cape Falcon

Columbia River, Oregon, and California coho are managed together within the framework of the Oregon Production Index (OPI) since these fish are essentially intermixed in the ocean fishery. These coho contribute to ocean fisheries off the southern Washington coast as well as to fisheries off the coasts of Oregon and northern California. Ocean fishery objectives for the OPI area address the following (1) conservation and recovery of Oregon and California coastal coho, including consultation or recovery standards for OCN and California coastal coho; (2) the desire for viable fisheries inside the Columbia River; and (3) impacts on conservation objectives for other key stocks.

The OPI is used as a measure of the annual abundance of adult three-year-old coho salmon resulting from production in the Columbia River and Oregon and California coastal basins. The index itself is simply the combined number of adult coho that can be accounted for within the general area from Leadbetter Point, Washington to as far south as coho are found. Currently, it is the sum of (1) ocean sport and troll fishery impacts in the ocean south of Leadbetter Point, Washington, regardless of origin; (2) Oregon and California coastal hatchery returns; (3) the Columbia River inriver runs; (4) Oregon coastal natural spawner escapement and (5) Oregon coastal inside fishery impacts. Most of the California production is from hatcheries which provide a very small portion of the total hatchery production in the OPI area.

5.2.2.2 North of Cape Falcon

Management of ocean fisheries for coho north of Cape Falcon is complicated by the overlap of OCN stocks and other stocks of concern in the vicinity of the Columbia River mouth. Allowable harvests in the area between Leadbetter Point, Washington and Cape Falcon, Oregon will be determined by an annual blend of OCN and Washington coho management considerations including:

1. Abundance of contributing stocks.
2. Stock specific conservation objectives (as found in Table 3-1).
3. Consultation standards of the Endangered Species Act.
4. Relative abundance of Chinook and coho.
5. Allocation considerations of concern to the Council.

Coho occurring north of Cape Falcon, Oregon are comprised of a composite of coho stocks originating in Oregon, Washington, and southern British Columbia. Ocean fisheries operating in this area must balance management considerations for stock-specific conservation objectives for Southern Oregon/Northern California, Oregon Coast, Southwest Washington, Olympic Peninsula, and Puget Sound.

5.2.3 Pink Salmon

Ocean pink salmon harvests occur off the Washington coast and are predominantly of Fraser River origin. Pink salmon of Puget Sound origin represent a minor portion of the ocean harvest although ocean impacts can be significant in relation to the terminal return during years of very low abundance.

The Fraser River Panel of the PSC manages fisheries for pink salmon in the Fraser River Panel Area (U.S.) north of 48E N latitude to meet Fraser River natural spawning escapement and U.S./Canada allocation requirements. The Council manages pink salmon harvests in that portion of the EEZ which is not in the Fraser River Panel Area (U.S.) waters consistent with Fraser River Panel management intent and in accordance with the conservation objectives for Puget Sound pink salmon.

Pink salmon management objectives must address meeting natural spawning escapement objectives, allowing ocean pink harvest within fixed constraints of coho and Chinook harvest ceilings and providing for treaty allocation requirements.

5.3 ALLOCATION

> *~~A~~“Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B)~~-~~reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges~~.@~~.”*

Magnuson-Stevens Act, National Standard 4

Harvest allocation is required when the number of fish is not adequate to satisfy the perceived needs of the various fishing industry groups and communities, to divide the catch between (non-Indian) ocean and inside fisheries and among ocean fisheries, and to provide treaty Indian fishing opportunity. In allocating the resource between ocean and inside fisheries, the Council considers both inriver harvest and spawner escapement needs. The magnitude of inriver harvest is determined by the states in a variety of ways, depending upon the management area. Some levels of inriver harvests are designed to accommodate federally recognized inriver Indian fishing rights, while others are established to allow for non-Indian harvests of historical magnitudes. Several fora exist to assist this process on an annual basis. The North of Cape Falcon Forum, a state and tribal sponsored forum, convenes the pertinent parties during the Council=s preseason process to determine allocation and conservation recommendations for fisheries north of Cape Falcon. The Klamath Fishery Management Council fulfills much the same roll with regard to Klamath River salmon stocks. The individual states also convene fishery industry meetings to coordinate their input to the Council.

5.3.1 Commercial (Non-Tribal) and Recreational Fisheries North of Cape Falcon

5.3.1.1 Goal, Objectives, and Priorities

Harvest allocations will be made from a total allowable ocean harvest which is maximized to the largest extent possible but still consistent with treaty obligations, state fishery needs, and spawning escapement requirements, including consultation standards for stocks listed under the ESA. The Council shall make every effort to establish seasons and gear requirements which provide troll and recreational fleets a reasonable opportunity to catch the available harvest. These may include single-species directed fisheries with landing restrictions for other species.

The goal of allocating ocean harvest north of Cape Falcon is to achieve, to the greatest degree possible, the objectives for the commercial and recreational fisheries as follows:

- ~~X~~ Provide recreational opportunity by maximizing the duration of the fishing season while minimizing daily and area closures and restrictions on gear and daily limits.

- ~~X~~ Maximize the value of the commercial harvest while providing fisheries of reasonable duration.

- The priorities listed below will be used to help guide establishment of the final harvest allocation while meeting the overall commercial and recreational fishery objectives.

- ~~X~~ At total allowable harvest levels up to 300,000 coho and 100,000 Chinook:

- ~~X~~ Provide coho to the recreational fishery for a late June through early September all-species season. Provide Chinook to allow (1) access to coho and, if possible, (2) a minimal Chinook-only fishery prior to the all-species season. Adjust days per week and/or institute area restrictions to stabilize season duration.

- ~~X~~ Provide Chinook to the troll fishery for a May and early June Chinook season and provide coho to (1) meet coho hooking mortality in June where needed and (2) access a pink salmon fishery in odd years. Attempt to ensure that part of the Chinook season will occur after June 1.

- ~~X~~ At total allowable harvest levels above 300,000 coho and above 100,000 Chinook:

- ~~X~~ Relax any restrictions in the recreational all-species fishery and/or extend the all-species season beyond Labor Day as coho quota allows. Provide Chinook to the recreational fishery for a Memorial Day through late June Chinook-only fishery. Adjust days per week to ensure continuity with the all-species season.

- ~~X~~ Provide coho for an all-salmon troll season in late summer and/or access to a pink fishery. Leave adequate Chinook from the May through June season to allow access to coho.

5.3.1.2 Allocation Schedule Between Gear Types

Initial commercial and recreational allocation will be determined by the schedule of percentages of total allowable harvest as follows:

TABLE 5-1 Initial commercial/recreational harvest allocation schedule north of Cape Falcon.

Coho			Chinook		
Harvest (thousands of fish)	Percentage[a/]		Harvest (thousands of fish)	Percentage[a/]	
	Troll	Recreational		Troll	Recreational
0-300	25	75	0-100	50	50
>300	60	40	>100-150	60	40
			>150	70	30

a/ The allocation must be calculated in additive steps when the harvest level exceeds the initial tier.

This allocation schedule should, on average, allow for meeting the specific fishery allocation priorities described above. The initial allocation may be modified annually by preseason and inseason trades to better achieve (1) the commercial and recreational fishery objectives and (2) the specific fishery allocation priorities. The final preseason allocation adopted by the Council will be expressed in terms of quotas which are neither guaranteed catches nor inflexible ceilings. Only the total ocean harvest quota is a maximum allowable catch.

To provide flexibility to meet the dynamic nature of the fisheries and to assure achievement of the allocation objectives and fishery priorities, deviations from the allocation schedule will be allowed as provided below and as described in Section 6.5.3.2 for certain selective fisheries.

1. Preseason species trades (Chinook and coho) which vary from the allocation schedule may be made by the Council based upon the recommendation of the pertinent recreational and commercial SAS representatives north of Cape Falcon. The Council will compare the socioeconomic impacts of any such recommendation to those of the standard allocation schedule before adopting the allocation which best meets FMP management objectives.

2. Inseason transfers, including species trades of Chinook and coho, may be permitted in either direction between recreational and commercial fishery allocations to allow for uncatchable fish in one fishery to be reallocated to the other. Fish will be deemed "uncatchable" by a respective commercial or recreational fishery only after considering all possible annual management actions to allow for their harvest which meet framework harvest management objectives, including single species or exclusive registration fisheries. Implementation of inseason transfers will require (a) consultation with the pertinent recreational and commercial SAS members and the STT and (b) a clear establishment of available fish and impacts from the transfer.

3. An exchange ratio of four coho to one Chinook shall be considered a desirable guideline for preseason trades. Deviations from this guideline should be clearly justified. Inseason trades and transfers may vary to meet overall fishery objectives. (The exchange ratio of four coho to one Chinook approximately equalizes the species trade in terms of average ex-vessel values of the two salmon species in the commercial fishery. It also represents an average species catch ratio in the recreational fishery.)

4. Any increase or decrease in the recreational or commercial total allowable catch (TAC), resulting from an inseason restructuring of a fishery or other inseason management action, does not require reallocation of the overall north of Cape Falcon non-Indian TAC.

5. The commercial TACs of Chinook and coho derived during the preseason allocation process may be varied by major subareas (i.e., north of Leadbetter Point and south of Leadbetter Point) if there is a need to do so to decrease impacts on weak stocks. Deviations in each major subarea will generally not exceed 50% of the TAC of each species that would have been established without a geographic deviation in the distribution of the TAC. Deviation of more than 50% will be based on a conservation need to protect weak stocks and will provide larger overall harvest for the entire fishery north of Cape Falcon than would have been possible without the deviation. In addition, the actual harvest of coho may deviate from the initial allocation as provided in Section 6.5.3.2 for certain selective fisheries.

6. The recreational TACs of Chinook and coho derived during the preseason allocation process will be distributed among four major recreational port areas as described for coho and Chinook distribution in Section 5.3.1.3. The Council may deviate from subarea quotas (1) to meet recreational season objectives based on agreement of representatives of the affected ports and /or (2) in accordance with Section 6.5.3.2 with regard to certain selective fisheries. Additionally, based on the recommendations of the SAS members representing the ocean sport fishery north of Cape Falcon, the Council will

include criteria in its preseason salmon management recommendations to guide any inseason transfer of coho among the recreational subareas to meet recreational season duration objectives. Inseason redistributions of quotas within the recreational fishery or the distribution of allowable coho catch transfers from the commercial fishery may deviate from the preseason distribution.

5.3.1.3 Recreational Subarea Allocations

Coho

The north of Cape Falcon preseason recreational TAC of coho will be distributed to provide 50% to the area north of Leadbetter Point and 50% to the area south of Leadbetter Point. The distribution of the allocation north of Leadbetter point will vary, depending on the existence and magnitude of an inside fishery in Area 4B which is served by Neah Bay.

In years with no Area 4B fishery, the distribution of coho north of Leadbetter Point (50% of the total recreational TAC) will be divided to provide 74% to the area between Leadbetter Point and the Queets River (Westport), 5.2% to the area between Queets River and Cape Flattery (La Push), and 20.8% to the area north of the Queets River (Neah Bay). In years when there is an Area 4B (Neah Bay) fishery under state management, the allocation percentages north of Leadbetter Point will be modified to maintain more equitable fishing opportunity among the ports by decreasing the ocean harvest share for Neah Bay. This will be accomplished by adding 25% of the numerical value of the Area 4B fishery to the recreational TAC north of Leadbetter Point prior to calculating the shares for Westport and La Push. The increase to Westport and La Push will be subtracted from the Neah Bay ocean share to maintain the same total harvest allocation north of Leadbetter Point. Table 5-2 displays the resulting percentage allocation of the total recreational coho catch north of Cape Falcon among the four recreational port areas (each port area allocation will be rounded to the nearest hundred fish, with the largest quotas rounded downward if necessary to sum to the TAC).

TABLE 5-2.Percentage allocation of total allowable coho harvest among the four recreational port areas north of Cape Falcon.[a/]

Port Area	Without Area 4B Add-on	With Area 4B Add-on	
Columbia River	50.0%	50.0%	
Westport	37.0%	37.0%	plus 17.3% of the Area 4B add-on
La Push	2.6%	2.6%	plus 1.2% of the Area 4B add-on
Neah Bay	10.4%	10.4%	minus 18.5% of the Area 4B add-on

a/ The Council may deviate from these percentages as described under #6 in Section 5.3.1.2.

TABLE 5-3. Example distributions of the recreational coho TAC north of Leadbetter Point.

Sport TAC North of Cape Falcon	Without Area 4B Add-On				With Area 4B Add-On a/					
	Columbia River	Westport	La Push	Neah Bay	Columbia River	Westport	La Push	Neah Bay Ocean	Neah Bay Add-on	Neah Bay Total
50,000	25,000	18,500	1,300	5,200	25,000	19,900	1,400	3,700	8,000	11,700
150,000	75,000	55,500	3,900	15,600	75,000	57,600	4,000	13,600	12,000	25,600
300,000	150,000	111,000	7,800	31,200	150,000	114,500	8,000	27,500	20,000	47,500

a/ The add-on levels are merely examples. The actual numbers in any year would depend on the particular mix of stock abundances and season determinations.

Chinook

Subarea distributions of Chinook will be managed as guidelines and shall be calculated by the STT with the primary objective of achieving all-species fisheries without imposing Chinook restrictions (i.e., area closures or bag limit reductions). Chinook in excess of all-species fisheries needs may be utilized by directed Chinook fisheries north of Cape Falcon or by negotiating a Chinook/coho trade with another fishery participant group.

Inseason management actions may be taken by the NMFS Regional Director to assure that the primary objective of the Chinook harvest guidelines for each of the four recreational subareas north of Cape Falcon are met. Such actions might include: closure from 0 to 3, or 0 to 6, or 3 to 200, or 5 to 200 nautical miles from shore; closure from a point extending due west from Tatoosh Island for 5 miles, then south to a point due west of Umatilla Reef Buoy, then due east to shore; closure from North Head at the Columbia River mouth north to Leadbetter Point; change species which may be landed; or other actions as prescribed in the annual regulations.

5.3.2 Commercial and Recreational Fisheries South of Cape Falcon

The allocation of allowable ocean harvest of coho salmon south of Cape Falcon has been developed to provide a more stable recreational season and increased economic benefits of the ocean salmon fisheries at varying stock abundance levels. When coupled with various recreational harvest reduction measures or the timely transfer of unused recreational allocation to the commercial fishery, the allocation schedule is designed to help secure recreational seasons extending at least from Memorial Day through Labor Day, assist in maintaining commercial markets even at relatively low stock sizes, and fully utilize available harvest. Total ocean catch of coho south of Cape Falcon will be treated as a quota to be allocated between troll and recreational fisheries as provided in Table 5-3.

(Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be accomplished during the Council's preseason process.)

The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

The allocation schedule is also designed to assure there are sufficient coho allocated to the troll fishery at low stock levels to ensure a full Chinook troll fishery. This hooking mortality allowance will have first priority within the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for the estimated incidental coho mortality will be deducted from the recreational share. At higher stock sizes, directed coho harvest will be allocated to the troll fishery after hooking mortality needs for Chinook troll fishing have been satisfied.

TABLE 5-4. Allocation of allowable ocean harvest of coho salmon (thousands of fish) south of Cape Falcon.[a/]

Total Allowable Ocean Harvest	Recreational Allocation		Commercial Allocation	
	Number	Percentage	Number	Percentage
#100	#100[b/c/]	100[b/]	b/	b/
200	167[b/c/]	84[b/]	33[b/]	17[b/]
300	200	67	100	33
350	217	62	133	38
400	224	56	176	44
500	238	48	262	52
600	252	42	348	58
700	266	38	434	62
800	280	35	520	65
900	290	32	610	68
1,000	300	30	700	70
1,100	310	28	790	72
1,200	320	27	880	73
1,300	330	25	970	75
1,400	340	24	1,060	76
1,500	350	23	1,150	77
1,600	360	23	1,240	78
1,700	370	22	1,330	78
1,800	380	21	1,420	79
1,900	390	21	1,510	79
2,000	400	20	1,600	80
2,500	450	18	2,050	82
3,000	500	17	2,500	83

The allowable harvest south of Cape Falcon may be further partitioned into subareas to meet management objectives of the FMP. Allowable harvests for subareas south of Cape Falcon will be determined by an annual blend of management considerations including:

1. abundance of contributing stocks
2. allocation considerations of concern to the Council
3. relative abundance in the fishery between Chinook and coho
4. escapement goals
5. maximizing harvest potential

Troll coho quotas may be developed for subareas south of Cape Falcon consistent with the above criteria. California recreational catches of coho, including projections of the total catch to the end of the season, would be included in the recreational allocation south of Cape Falcon, but the area south of the Oregon-California border would not close when the allocation is met; except as provided below when the recreational allocation is at 167,000 or fewer fish.

When the south of Cape Falcon recreational allocation is equal to or less than 167,000 coho:

1. The recreational fisheries will be divided into two major subareas, as listed in #2 below, with independent quotas (i.e., if one quota is not achieved or is exceeded, the underage or overage will not be added to or deducted from the other quota; except as provided under #3 below).

2. The two major recreational subareas will be managed within the constraints of the following impact quotas, expressed as a percentage of the total recreational allocation (percentages based on avoiding large deviations from the historical harvest shares):

   a. Central Oregon (Cape Falcon to Humbug Mountain) - 70%

   b. South of Humbug Mountain - 30%

   In addition,

   (1) Horse Mountain to Point Arena will be managed for an impact guideline of 3 percent of the south of Cape Falcon recreational allocation, and

   (2) there will be no coho harvest constraints south of Point Arena. However, the projected harvest in this area (which averaged 1,800 coho from 1986-1990) will be included in the south of Humbug Mountain impact quota.

3. Coho quota transfers can occur on a one-for-one basis between subareas if Chinook constraints preclude access to coho.

5.3.3 Tribal Indian Fisheries

5.3.3.1 California

On October 4, 1993 the Solicitor, Department of Interior, issued a legal opinion in which he concluded that the Yurok and Hoopa Valley Indian tribes of the Klamath River Basin have a federally protected right to the fishery resource of their reservations sufficient to support a moderate standard of living or 50% of the total available harvest of Klamath-Trinity basin salmon, whichever is less. The Secretary of Commerce recognized the tribes' federally reserved fishing right as applicable law for the purposes of the MSA (58 FR 68063, December 23, 1993). The Ninth Circuit Court of Appeals upheld the conclusion that the Hoopa Valley and Yurok tribes have a federally reserved right to harvest fish in Parravano v. Babbitt and Brown, 70 F.3d 539 (1995) (Cert. denied in Parravano v. Babbitt and Brown 110, S.Ct 2546 [1996]). The Council must recognize the tribal allocation in setting its projected escapement level for the Klamath River.

5.3.3.2 ~~–~~ Columbia River

~~Pursuant to a September 1, 1983 Order of the U.S. District Court, the allocation of harvest in the Columbia River is established under the "Columbia River Fish Management Plan" which was implemented in 1988 by the parties of U.S. et. al. v. Oregon, Washington et al. This plan replaced the original 1977 plan (pages 16-20 of the 1978 FMP). The plan provides a framework within which the relevant parties may exercise their sovereign powers in a coordinated and systematic manner in order to protect, rebuild, and enhance upper Columbia River fish runs while providing harvest for both treaty Indian and non-Indian fisheries. The parties to the agreement are the United States, the states of Oregon, Washington, and Idaho, and four Columbia River treaty Indian tribes--Warm Springs, Yakama, Nez Perce, and Umatilla.~~

Columbia River fisheries are governed by the October 10, 1969 Judgment entered in United States v. Oregon, Civil No. 68-513 (D. Or.), and subsequent orders in that case. Under court supervision, the parties to U.S. v. Oregon have managed fisheries through court-approved agreements. In 1988, the court approved the Columbia River Fish Management Plan (CRFMP), which was later modified in a series of management agreements and tailored annually to year-specific conditions in ocean and in- river agreements. The 1988 CRFMP was extended by Federal Court Order through July 31, 1999. The 1996-1998 Management Agreement for Upper Columbia River Fall Chinook terminated on July 31, 1999 (Parties to U.S. v. Oregon 1996). The parties concluded management agreements for 1999, 2000, 2001, 2002, 2003, and 2004, which were entered as court orders. An interim agreement on spring Chinook, summer Chinook and sockeye was concluded in 2001 and was also entered as a court order. A U.S. v. Oregon 2005-2007 Interim Management Agreement for Upper Columbia River Chinook, Sockeye, Steelhead, Coho, and White Sturgeon was agreed to by the U.S. v. Oregon Parties and signed as a Court Order in 2005 and governed winter/spring, summer, and fall season fisheries (Parties to U.S. v. Oregon 2005). The TAC submitted a Biological Assessment regarding fishery impacts to ESA-listed stocks (TAC 2005). These agreements covered specific fisheries and production actions. An agreement on 2008-2017 fisheries was concluded prior to submission of this Biological Assessment.

The 2008-2017 *U.S. v Oregon* Management Agreement (MA) provides the treaty and non-treaty fishery harvest framework and harvest rate schedules for salmon and steelhead stocks destined for areas upstream of Bonneville Dam.

5.3.3.3 U.S. v. Washington Area

Treaty Indian tribes have a legal entitlement to the opportunity to take up to 50% of the harvestable surplus of stocks which pass through their usual and accustomed fishing areas. The treaty Indian troll harvest which would occur if the tribes chose to take their total 50% share of the weakest stock in the ocean, is computed with the current version of the Fishery Regulation Assessment Model (FRAM), assuming this level of harvest did not create conservation or allocation problems on other stocks. A quota may be established in accordance with the objectives of the relevant treaty tribes concerning allocation of the treaty Indian share to ocean and inside fisheries. The total quota does not represent a guaranteed ocean harvest, but a maximum allowable catch.

The requirement for the opportunity to take up to 50% of the harvestable surplus determines the treaty shares available to the inside/outside Indian and all-citizen fisheries. Ocean coho harvest ceilings off the Washington coast for treaty Indians and all-citizen fisheries are independent within the constraints that (1) where feasible, conservation needs of all stocks must be met; (2) neither group precludes the other from the opportunity to harvest its share; and (3) allocation schemes may be established to specify outside/inside sharing for various stocks.

5.4 U.S. HARVEST AND PROCESSING CAPACITY AND ALLOWABLE LEVEL OF FOREIGN FISHING

> *A. . . Assess and specify . . . (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield . . . (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing, and (C) the capacity and extent to which United States processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States.@*
>
> *Magnuson-Stevens Act, '303(a)(4)*

At the highest conceivable level of recent past, present, or expected future abundance, the total allowable harvest of salmon stocks can be fully taken by U.S. fisheries. There is no recent record of processors in the Council area refusing fish from fishermen because of inadequate processing capacity. Because shore-based processors can fully utilize all the salmon that can be harvested in marine waters, joint venture processing is fixed as zero.

In view of the adequacy of the domestic fisheries to harvest the highest conceivable level of abundance, the total allowable level of foreign fishing (TALFF) also is fixed as zero. The United States allowed Canadian fishing in U.S. waters under a reciprocal agreement until 1978. Negotiations between the two governments, including those within the context of the PSC, continue to seek a resolution of all transboundary salmon issues. These negotiations are aimed at stabilizing and reducing, where possible, the interception of salmon originating from one country by fishermen of the other. No U.S./Canada reciprocal salmon fishing is contemplated in the foreseeable future.

6 MEASURES TO MANAGE THE HARVEST

A number of management controls are available to manage the ocean fisheries each season, once the allowable ocean harvests and the basis for allocation among user groups have been determined. Among these are management boundaries, seasons, quotas, minimum harvest lengths, fishing gear restrictions, and recreational daily bag limits. Natural fluctuations in salmon abundance require that annual fishing periods, quotas, and bag limits be designed for the conditions of each year. What is suitable one year probably will not be suitable the next. New information on the fisheries and salmon stocks also may require other adjustments to the management measures. The Council assumes these ocean harvest controls also apply to territorial seas or any other areas in state waters specifically designated in the annual regulations.

Some of the more common measures that have been applied to manage ocean salmon fisheries since 1977 under the Magnuson Fishery Conservation and Management Act are described below, along with a clarification of the process and flexibility in implementing the measures. The Framework Amendment (PFMC 1984) provides a more detailed history of salmon harvest controls and rationale for their designation as fixed or flexible elements of the salmon FMP.

6.1 MANAGEMENT BOUNDARIES AND MANAGEMENT ZONES

Management boundaries and zones will be established during the preseason regulatory process or adjusted inseason (Section 10.2) as necessary to achieve a conservation or management objective. A conservation or management objective is one that protects a fish stock, simplifies management of a fishery, or results in the wise use of the resources. For example, management boundaries and management zones can be used to separate fish stocks, facilitate enforcement of regulations, separate conflicting fishing activities, or facilitate harvest opportunities. Management boundaries and zones will be described in the annual regulations by geographical references, coordinates (latitude and longitude), depth contours, distance from shore, or similar criteria. Figure 6-1 displays management boundaries in common use ~~in the early to mid-1990s~~.

While there are many specific reasons for utilizing management boundaries or zones which may change from year to year, some boundaries or zones have purposes that remain relatively constant. The boundary used to separate management of Columbia River Chinook from those stocks to the south and to divide the Council's harvest allocation schedules has always been at or near Cape Falcon, Oregon. The Klamath management zone (beginning in 1990, the area between Humbug Mountain, Oregon and Horse Mountain, California) has been used to delineate the area where primary concern is the management of Klamath River fall Chinook. A closed zone at the mouth of the Columbia River has been used for several years to eliminate fishing in an area believed to generally contain a high percentage of sublegal "feeder" Chinook. A similar zone has been established at the mouth of the Klamath River to allow fish undisturbed access to the river. Changes to these boundaries or zones may require special justification and documentation. However, the basis of establishing most other management boundaries and zones depends on the annual management needs as determined in the preseason process.

6.2 MINIMUM HARVEST LENGTHS FOR OCEAN COMMERCIAL AND RECREATIONAL FISHERIES

Minimum size limits for ocean commercial and recreational fisheries may be changed each year during the preseason regulatory process or modified inseason under the procedures of Section 10.2. Recommended changes must serve a useful purpose which is clearly described and justified, and projections made of the probable impacts resulting from the change.

Minimum size limits have been relatively stable since the Council began management in 1977 and any changes are expected to occur infrequently. From 1977 through 1995 there were no changes in the size limits for non-Indian commercial fisheries except for the decision to use the California coho minimum length for the entire Klamath management area which extends into Oregon. Recreational minimum size limits did not change between 1988 and 1995. However, in 1996 Chinook minimum size limits were increased in California fisheries to reduce impacts on Sacramento River winter Chinook.

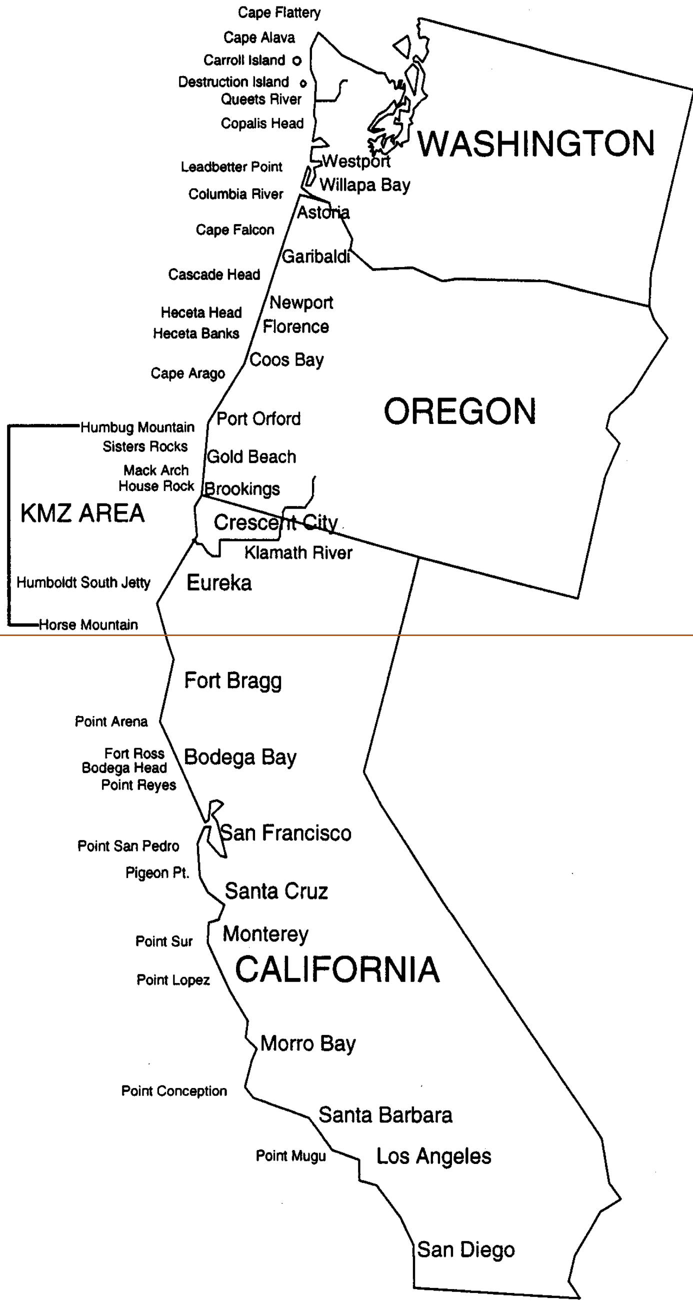

FIGURE 6-1. Management boundaries in common use ~~during the early to mid-1990s~~.

The minimum size limits listed below (total length in inches) have been consistently used by the Council with only infrequent modifications in limited areas to address special needs or situations.

TABLE 6-1.Minimum size limits.

	Chinook		Coho		Pink	
	Troll	Sport	Troll	Sport	Troll	Sport
North of Cape Falcon	28.0	24.0	16.0	16.0	None	None
Cape Falcon to Humbug Mt.	26.0	20.0	16.0	16.0	None	None
South of Humbug Mt.	26.0	20.0	22.0	20.0	None	None [a/]

6.3 RECREATIONAL DAILY BAG LIMIT

Recreational daily bag limits for each management area may be set during the preseason regulatory process or modified inseason (Section 10.2). They will be set to maximize the length of the fishing season consistent with the allowable level of harvest. In recent years, bag limits of one or two salmon have been commonplace.

In general, for every fishing area, the level of allowable ocean harvest will be determined for the recreational fishery; next, the fishing season will be set to be as long as practicable, including the Memorial Day and/or Labor Day weekends if feasible, consistent with the allowable level of harvest; and, bag limits will be simultaneously set to accommodate that fishing season. In years of low salmon abundance, the season will be short and the bag limits will be low; in years of high salmon abundance, the season will be long and the bag limits will be higher.

6.4 FISHING GEAR RESTRICTIONS

Gear restrictions may be changed annually during the preseason regulatory process and inseason as provided in Section 10.2 Recommended changes must serve one or more useful purposes while being consistent with the goals of the plan. For example, changes could be made to facilitate enforcement, reduce hooking mortality, or reduce gear expenses for fishermen. Annual gear restriction changes in previous years have included the requirement for barbless hooks in both the troll and recreational fisheries, and a limit to the number of spreads per line in the troll fishery. Both of these gear changes were instituted to reduce total hook-and-release mortality. Other restrictions have included bait size, number of rods per recreational fisher, and requirements for the number of lines or the attachment of lines to the vessel in the commercial fishery.

6.5 SEASONS AND QUOTAS

For each management area or subarea, the Council has the option of managing the commercial and recreational fisheries for either coho or Chinook using the following methods (1) fixed quotas and seasons; (2) adjustable quotas and seasons; and (3) seasons only. The Council may also use harvest guidelines within quotas or seasons to trigger inseason management actions which were established in the preseason regulatory process.

Quotas provide very precise management targets and work best when accurate estimates of stock abundance and distribution are available, or when needed to ensure protection of depressed stocks from potential overfishing. The Council does not view quotas as guaranteed harvests, but rather the maximum allowable harvest which assures meeting the conservation objective of the species or stock of concern. While time and area restrictions are not as precise as quotas, they allow flexibility for effort and harvest to vary in response to abundance and distribution.

6.5.1–__Preferred Course of Action

Because of the need to use both seasons and quotas, depending on the circumstances, the Council will make the decision regarding seasons and quotas annually during the preseason regulatory process, subject to the limits specified below. Fishing seasons and quotas also may be modified during the season as provided under Section 10.2.

6.5.2–__Procedures for Calculating Seasons

Seasons will be calculated using the total allowable ocean harvest determined by procedures described in Chapter 5, and further allocated to the commercial and recreational fishery in accordance with the allocation plan presented in Section 5.3, and after consideration of the estimated amount of effort required to catch the available fish, based on past seasons.

Recreational seasons will be established with the goal of encompassing Memorial Day and/or Labor Day weekends in the season, if feasible. Opening dates will be adjusted to provide reasonable assurance that the recreational fishery is continuous, minimizing the possibility of an in-season closure.

Criteria used to establish commercial seasons, in addition to the estimated allowable ocean harvests, the allocation plan, and the expected effort during the season, will be: (1) bycatch mortality; (2) size, poundage, and value of fish caught; (3) effort shifts between fishing areas; (4) harvest of pink salmon in odd-numbered years; and (5) protection for weak stocks when they frequent the fishing areas at various times of the year.

6.5.3 Species-Specific and Other Selective Fisheries

6.5.3.1 Guidelines

In addition to the all-species and single or limited species seasons established for the commercial and recreational fisheries, other species-limited fisheries, such as "ratio" fisheries and fisheries selective for marked or hatchery fish, may be adopted by the Council during the preseason regulatory process. In adopting such a fishery, the Council will consider the following guidelines:

7. Harvestable fish of the target species are available.

8. Harvest impacts on incidental species will not exceed allowable levels determined in the management plan.

9. Proven, documented, selective gear exists (if not, only an experimental fishery should be considered).

10. Significant wastage of incidental species will not occur or a written economic analysis demonstrates the landed value of the target species exceeds the potential landed value of the wasted species.

11. The species specific or ratio fishery will occur in an acceptable time and area where wastage can be minimized and target stocks are maximally available.

12. Implementation of selective fisheries for marked or hatchery fish must be in accordance with U.S. v. Washington stipulation and order concerning co-management and mass marking (Case No. 9213, Subproceeding No. 96-3) and any subsequent stipulations or orders of the U.S. District Court, and consistent with international objectives under the Pacific Salmon Treaty (e.g., to ensure the integrity of the coded-wire tag program).

6.5.3.2 Selective Fisheries Which May Change Allocation Percentages North of Cape Falcon

As a tool to increase management flexibility to respond to changing harvest opportunities, the Council may implement deviations from the specified port area allocations and/or gear allocations to increase harvest opportunity through fisheries that are selective for marked salmon stocks (e.g., marked hatchery salmon). The benefits of any selective fishery will vary from year to year and fishery to fishery depending on stock abundance, the mix of marked and unmarked fish, projected hook-and-release mortality rates, and public acceptance. These factors should be considered on an annual and case-by-case basis when utilizing selective fisheries. The deviations for selective fisheries are subordinate to the allocation priorities in Section 5.3.1.1 and may be allowed under the following management constraints:

6. Selective fisheries will first be considered during the months of August and/or September. However, the Council may consider selective fisheries at other times, depending on year to year circumstances identified in the preceding paragraph.

7. The total impacts within each port area or gear group on the critical natural stocks of management concern are not greater than those under the original allocation without the selective fisheries.

8. Other allocation objectives (i.e., treaty Indian, or ocean and inside allocations) are satisfied during negotiations in the North of Cape Falcon Forum.

9. The selective fishery is assessed against the guidelines in Section 6.5.3.1.

10. Selective fishery proposals need to be made in a timely manner in order to allow sufficient time for analysis and public comment on the proposal before the Council finalizes its fishery recommendations.

If the Council chooses to deviate from the specified port and/or gear allocations, the process for establishing a selective fishery would be as follows:

3. Allocate the TAC among the gear groups and port areas according to the basic FMP allocation process described in Section 5.3.1 without the selective fishery.

4. Each gear group or port area may utilize the critical natural stock impacts allocated to its portion of the TAC to access additional harvestable, marked fish, over and above the harvest share established in step one, within the limits of the management constraints listed in the preceding paragraph.

6.5.4 Procedures for Calculating Quotas

Quotas will be based on the total allowable ocean harvest and the allocation plan as determined by the procedures of Chapter 5.

To the extent adjustable quotas are used, they may be subject to some or all of the following inseason adjustments:

1. For coho, private hatchery contribution to the ocean fisheries in the OPI area.

2. Unanticipated loss of shakers (bycatch mortality of undersized fish or unauthorized fish of another species that have to be returned to the water) during the season. (Adjustment for coho hooking mortality during any all-salmon-except-coho season will be made when the quotas are established.)

3. Any catch that take place in fisheries within territorial waters that are inconsistent with federal regulations in the EEZ.

4. If the ability to update inseason stock abundance is developed in the future, adjustments to total allowable harvest could be made where appropriate.

5. The ability to redistribute quotas between subareas depending on the performance toward achieving the overall quota in the area.

Changes in the quotas as a result of the inseason adjustment process will be avoided unless the changes are of such magnitude that they can be validated by the STT and Council, given the precision of the original estimates.

The basis for determining the private hatchery contribution in (1) above will be either coded-wire tag analysis or analysis of scale patterns, whichever is determined by the STT to be more accurate, or another more accurate method that may be developed in the future, as determined by the STT and Council.

In reference to (4) and (5) above, if reliable techniques become available for making inseason estimates of stock abundance, and provision is made in any season for its use, a determination of techniques to be applied will be made by the Council and discussed during the preseason regulatory process.

6.5.5 Procedures for Regulating Ocean Harvests of Pink and Sockeye

Sockeye salmon are only very rarely caught in Council-managed ocean salmon fisheries and no specific procedures have been established to regulate their harvest. Procedures for pink salmon are as follows:

1. All-species seasons will be planned such that harvest of pink salmon can be maximized without exceeding allowable harvests of Chinook and/or coho and within conservation and allocation constraints of the pink stocks.

2. Species specific or ratio fisheries for pink salmon will be considered under the guidelines for species specific fisheries presented in Section 6.5.3, and allocation constraints of the pink stocks.

6.6 OTHER MANAGEMENT MEASURES

6.6.1 Treaty Indian Ocean Fishing

Since 1977 the Council has adopted special measures for the treaty Indian ocean troll fisheries off the Washington Coast. The Makah, Quileute, Hoh, and Quinault tribes are entitled by federal judicial determination to exercise their treaty rights in certain ocean areas. In addition, Lower S'Klallam, Jamestown S'Klallam, and Port Gamble S'Klallam tribes are entitled by federal judicial determination to exercise their treaty rights in ocean salmon Area 4B, the entrance to the Strait of Juan de Fuca.

The treaty Indian ocean salmon fishing regulations will be established annually during the preseason regulatory process. The affected tribes will propose annual treaty Indian ocean fishing regulations at the March meeting of the Council. After a review of the proposals, the Council will adopt treaty Indian regulations along with non-treaty ocean fishing regulations for submission to the Secretary of Commerce at the April Council meeting.

The specific timing and duration of the treaty Indian ocean salmon season varies with expected stock abundance and is limited by quotas for both Chinook and coho. Within these constraints, the general season structure has been a Chinook-directed fishery in May and June, followed by an all-salmon season from July through the earliest of quota attainment or October 31.

6.6.1.1 Seasons

Given that the traditional tribal ocean season has changed in recent years and because it is largely up to the tribes to recommend annual ocean management measures applicable to their ocean fishery, a flexible mechanism for setting fishing seasons is proposed so that desired changes can be made in the future without the need for plan amendment.

The treaty Indian troll season will be established based upon input from the affected tribes, but would not be longer than that required to harvest the maximum allowable treaty Indian ocean catch. The maximum allowable treaty Indian ocean catch will be computed as the total treaty harvest that would occur if the tribes chose to take their total entitlement of the weakest stock in the ocean, assuming this level of harvest did not create conservation or allocation problems on other stocks.

6.6.1.2 Quotas

Fixed or adjustable quotas by area, season, or species may be employed in the regulation of treaty Indian ocean fisheries, provided that such quotas are consistent with established treaty rights. The maximum size of quotas shall not exceed the harvest that would result if the entire treaty entitlement to the weakest run were to be taken by treaty ocean fisheries. Any quota established does not represent a guaranteed ocean harvest, but a maximum ceiling on catch. Catches in ocean salmon Area 4B are counted within the tribal ocean harvest quotas during the May 1-September 30 ocean management period.

To the extent adjustable quotas are used, they may be subject to some or all of the following inseason adjustments:

1. Unanticipated shaker loss during the season.

2. Catches by treaty ocean fisheries that are inconsistent with federal regulations in the EEZ.

3. If an ability to update inseason stock abundance is developed in the future, adjustments to quotas could be made where appropriate.

4. Ability to redistribute quotas between subareas depending upon performance toward catching the overall quota for treaty ocean fisheries in the area.

Procedures for the above inseason adjustments will be made in accordance with Section 10.2.

Changes in the quotas as a result of the inseason adjustment process will be avoided unless the changes are of such magnitude that they are scientifically valid as determined by the STT and Council, given the precision of the original estimates.

Harvest guidelines may be used within overall quotas to trigger inseason management actions which were established during the preseason regulatory process.

6.6.1.3 Areas

Current tribal ocean fishing areas in the EEZ (subject to change by court order) are as follows:

Makah - north of 48E02'15" N to the U.S./Canada border and east of 125E44'00".

Hoh - south of 47E54'18" N and north of 47E21'00" N and east of 125E44'00".

Quileute - south of 48E07'36" N and north of 47E31'42" N and east of 125E44'00".

Quinault - south of 47E40'06" N and north of 46E54'03" N and east of 125E44'00".

In addition, a portion of the usual and accustomed fishing areas for the Lower Elwha, Jamestown, and Port Gamble S'Klallam tribes is in ocean salmon Area 4B at the entrance to the Strait of Juan de Fuca (Bonilla-Tatoosh line east to the Sekiu River).

Area restrictions may be employed in the regulation of treaty ocean fisheries, consistent with established treaty rights. For example, in 1982 treaty fishing was prohibited within a six-mile radius around the Queets and Hoh River mouths when the area was closed to non-treaty salmon fishing.

6.6.1.4 Size Limits and Gear Restrictions

Regulations for size limits and gear restrictions for treaty ocean fisheries will be based on recommendations of the affected treaty tribes.

6.6.2 Net Prohibition

No person shall use nets to fish for salmon in the EEZ except that a hand-held net may be used to bring hooked salmon on board a vessel. Salmon caught incidentally in trawl nets while legally fishing under the groundfish FMP are a prohibited species as defined by the groundfish regulations (50 CFR Part 660, Subpart G). However, in cases where the Council determines it is beneficial to the management of the groundfish and salmon resources, salmon bycatch may be retained under the provisions of a Council-approved program which defines the handling and disposition of the salmon. The provisions must specify that salmon remain a prohibited species and, as a minimum, include requirements that allow accurate monitoring of the retained salmon, do not provide incentive for fishers to increase salmon bycatch, and assure fish do not reach commercial markets. In addition, during its annual regulatory process for groundfish, the Council must consider regulations which would minimize salmon bycatch in the monitored fisheries.

6.6.3 Prohibition on Removal of Salmon Heads

No person shall remove the head of any salmon caught in the EEZ, nor possess a salmon with the head removed if that salmon has been marked by removal of the adipose fin to indicate that a coded-wire tag has been implanted in the head of the fish.

6.6.4 Steelhead Prohibition

Persons, other than Indians with judicially-declared rights to do so and legally licensed recreational fishermen, may not take and retain, or possess any steelhead within the EEZ.

6.6.5 Prohibition on Use of Commercial Troll Fishing Gear for Recreational Fishing

No person shall engage in recreational fishing for salmon while aboard a vessel engaged in commercial fishing.

6.6.6 Experimental Fisheries

The Council may recommend that the Secretary allow experimental fisheries in the EEZ for research purposes that are proposed by the Council, federal government, state government, or treaty Indian tribes having usual and accustomed fishing grounds in the EEZ.

The Secretary may not allow any recommended experimental fishery unless he or she determines that the purpose, design, and administration of the experimental fishery are consistent with the goals and objectives of the Council's fishery management plan, the national standards of the Magnuson Fishery Conservation and Management Act, and other applicable law. Each vessel that participates in an approved experimental fishery will be required to carry aboard the vessel the letter of approval, with specifications and qualifications (if any), issued and signed by the Regional Director of NMFS.

6.6.7 Scientific Research

This plan neither inhibits nor prevents any scientific research in the EEZ by a scientific research vessel. The Secretary will acknowledge any notification received regarding scientific research on salmon being conducted by a research vessel. The Regional Director of NMFS will issue to the operator/master of that vessel a letter of acknowledgment, containing information on the purpose and scope (locations and schedules) of the activities. Further, the Regional Director will transmit copies of such letters to the Council and to state and federal fishery and enforcement agencies to ensure that all concerned parties are aware of the research activities.

7 DATA NEEDS, DATA COLLECTION METHODS, AND REPORTING REQUIREMENTS

Successful management of the salmon fisheries requires considerable information on the fish stocks, the amount of effort for each fishery, the harvests by each fishery, the timing of those harvests, and other biological, social, and economic factors. Much of the information must come from the ocean fisheries; other data must come from inside fisheries, hatcheries, and spawning grounds. Some of this information needs to be collected and analyzed daily, whereas other types need to be collected and analyzed less frequently, maybe only once a year. In general, the information can be divided into that needed for inseason management and that needed for annual and long-term management. The methods for reporting, collecting, analyzing, and distributing information can be divided similarly.

7.1 INSEASON MANAGEMENT

7.1.1 Data Needs

Managers require certain information about the fisheries during the season if they are to control the harvests to meet established quotas and goals. If conditions differ substantially from those expected, it may be necessary to modify the fishing seasons, quotas, or other management measures. The following information is useful for inseason management:

a. harvest of each species by each fishery in each fishing area by day and by cumulative total;

b. number of troll day boats and trip boats fishing;

c. estimated average daily catch for both day and trip boats;

d. distribution and movement of fishing effort;

e. average daily catch and effort for recreational fishery;

f. estimates of expected troll fishing effort for the remainder of the season;

g. information on the contribution of various fish stocks, determined from recovered coded-wire tags, scales, or other means.

7.1.2 Methods for Obtaining Inseason Data

Inseason management requires updating information on the fisheries daily. Thus, data will be collected by sampling the landings, aerial surveys, radio reports, and telephone interviews.

In general, data necessary for inseason management will be gathered by one or more of the following methods. Flights over the fishing grounds will be used to obtain information on the distribution, amount, and type of commercial fishing effort. Data on the current harvests by commercial and Indian ocean fishermen will be obtained by telephoning selected (key) fish buyers, by sampling the commercial landings on a daily basis, and from radio reports. Data on the current effort of, and harvests by, the recreational fisheries will be obtained by telephoning selected charter boat and boat rental operators and by sampling landings at selected ports. Analyses of fish scales, recovered fish tags, and other methods will provide information on the composition of the stocks being harvested.

7.2 ANNUAL AND LONG-TERM MANAGEMENT

7.2.1 Data Needs

In addition to the data used for inseason management, a considerable amount of information is used for setting the broad measures for managing the fishery, evaluating the success of the previous year's management, and evaluating the effectiveness of the plan in achieving the long-term goals. Such data include landings, fishing effort, dam counts, smolt migration, returns to hatcheries and natural spawning areas, stock contribution estimates, and economic information.

7.2.2 Methods for Obtaining Annual and Long-Term Data

In addition to those methods used for collecting data for in-season management, the longer term data will be collected by the use of (a) fish tickets (receipts a fish buyer completes upon purchasing fish from a commercial fisherman), (b) log books kept by commercial fishermen and submitted to the state fishery management agencies at the end of the season, and (c) catch record cards completed by a recreational fisherman each time he catches a fish to show location, date, and species and submitted to the state agency, either when the whole card is completed or at the end of the season.

The local fishery management authorities (states, Indian tribes) will collect the necessary catch and effort data and will provide the Secretary with statistical summaries adequate for management. The local management authorities, in cooperation with the National Marine Fisheries Service, will continue the ongoing program of collecting and analyzing data from salmon processors.

Data on spawning escapements and jack returns to public and private hatcheries, other artificial production facilities, and natural spawning grounds will be collected by the accepted methods now being used by those authorities. The methods used to collect these data should be identified and available to the public.

7.3 REPORTING REQUIREMENTS

This plan authorizes the local management authorities to determine the specific reporting requirements for those groups of fishermen under their control and to collect that information under existing state data-collection provisions. With one exception, no additional catch or effort reports will be required of fishermen or processors as long as the data collection and reporting systems operated by the local authorities continue to provide the Secretary with statistical information adequate for management. The one exception would be to meet the need for timely and accurate assessment of inseason management data. In that instance the Council may annually recommend implementation of regulations requiring brief radio reports from commercial salmon fishermen who leave a regulatory area in order to land their catch in another regulatory area open to fishing. The federal or state entities receiving these radio reports would be specified in the annual regulations.

8 SCHEDULE AND PROCEDURES FOR ANALYZING THE EFFECTIVENESS OF THE SALMON FMP

To effectively manage the salmon fisheries, the Council must monitor the status of the resource and the fisheries harvesting that resource to make sure that the goals and objectives of the plan are being met. Fishery resources vary from year to year depending on environmental factors, and fisheries vary from year to year depending on the state of the resource and social and economic factors. The Council must ensure that the plan is flexible enough to accommodate regulatory changes that will allow the Council to achieve its biological, social, and economic goals.

Annually, the Council's STT will review the previous season's commercial, recreational, and tribal Indian fisheries and evaluate the performance of the plan with respect to achievement of the framework management objectives (Chapters 2, 3, and 5). Consideration will be given by the STT to the following areas:

1. Allowable harvests
2. Escapement goals, natural and hatchery
3. Mixed-stock management
4. Federally recognized tribal fishing rights
5. Allocation goals
6. Mortality factors, including bycatch
7. Achievement of optimum yield
8. Effort management systems
9. Coordination with all management entities
10. Consistency with international treaties
11. Comparison with previous seasons
12. Progress of any Council-adopted recovery plan
13. ESA consultation standards

This evaluation will be submitted annually for review by the Salmon Advisory Subpanel, SSC, and the Council.

Additionally, at various Council meetings, the Habitat Committee and state and tribal management entities will help keep the Council apprised of achievements and problems with regard to the protection and improvement of the environment (i.e., essential fish habitat) and the restoration and enhancement of natural production.

During the Council=s annual preseason salmon management process, issues may arise which indicate a need to consider changes to the fixed elements of the FMP. Such issues may be considered in FMP amendments on an as needed basis under the guidelines of Chapter 11.

9 SCHEDULE AND PROCEDURES FOR PRESEASON MODIFICATION OF REGULATIONS

The process for establishing annual or preseason management measures under the framework FMP contains a nearly equivalent amount of analysis, public input, and review to that provided under the former annual amendment process and will not require annual preparation of a supplemental environmental impact statement (SEIS) and regulatory impact review/regulatory flexibility analysis (RIR/RFA). This allows the Salmon Technical Team to wait to prepare its report until all of the data are available, thus eliminating the need to discuss an excessively broad range of options as presented prior to the framework plan.

The process and schedule for setting the preseason regulations will be approximately as follows:

Approximate Date	Action
First week of March	Notice published in the Federal Register announcing the availability of team and Council documents, the dates and location of the two Council meetings, the dates and locations of the public hearings, and publishing the complete schedule for determining proposed and final modifications to the management measures. Salmon Technical Team reports which review the previous salmon season, project the expected salmon stock abundance for the coming season, and describe any changes in estimation procedures, are available to the public from the Council office.
First or second full week of March[a/]	Council and advisory entities meet to adopt a range of season regulatory options for formal public hearing. Proposed options are initially developed by the Salmon Advisory Subpanel and further refined after analysis by the STT, public comment, and consideration by the Council.
Following March Council meeting	Council newsletter, public hearing announcement, and STT/Council staff report are released which outline and analyze Council-adopted options. The STT/staff report includes a description of the options, brief rationale for their selection, and an analysis of expected biological and economic impacts.
Last week of March or first week of April	Formal public hearings on the proposed salmon management options.
First or second full week of April[a/]	Council and advisory entities meet to adopt final regulatory measure recommendations for implementation by the Secretary of Commerce.
First week of May	Final notice of Secretary of Commerce decision and final management measures in Federal Register.
May 15	Close of public comment period.

The actions by the Secretary after receiving the preseason regulatory modification recommendations from the Council will be limited to accepting or rejecting in total the Council's recommendations. If the Secretary rejects such recommendations he or she will so advise the Council as soon as possible of such action along with the basis for rejection, so that the Council can reconsider. Until such time as the Council and the Secretary can agree upon modifications to be made for the upcoming season, the previous year's regulations will remain in effect. This procedure does not prevent the Secretary from exercising his authority under Sections 304(c) or 305(c) of the Magnuson Act and issuing emergency regulations as appropriate for the upcoming season.

Preseason actions by the Secretary, following the above procedures and schedule, would be limited to the following:

1. Specify the annual abundance, total allowable harvest, and allowable ocean harvest.

2. Allocate ocean harvest to commercial and recreational fishermen and to treaty Indian ocean fishermen where applicable.

3. Review ocean salmon harvest control mechanism from previous year; make changes as required in:

   a. Management area boundaries
   b. Minimum harvest lengths
   c. Recreational daily bag limits
   d. Gear requirements (i.e., barbless hooks, etc.)
   e. Seasons and/or quotas
   f. Ocean regulations for treaty Indian fishermen
   g. Inseason actions and procedures to be employed during the upcoming season

Because the harvest control measures and restrictions remain in place until modified, superseded, or rescinded, changes in all of the items listed in "3" above may not be necessary every year. When no change is required, intent not to change will be explicitly stated in preseason decision documents.

The Framework Amendment (1984) provides further rationale for the current preseason procedures and the replacement of the old process of annual plan amendments to establish annual regulations.

10 INSEASON MANAGEMENT ACTIONS AND PROCEDURES

Inseason modifications of the regulations may be necessary under certain conditions to fulfill the Council's objectives. Inseason actions include "fixed" or "flexible" actions as described below.

10.1 FIXED INSEASON ACTIONS

Three fixed inseason actions may be implemented routinely as specifically provided in the subsections below.

10.1.1 Automatic Season Closures When the Quotas Are Reached

The Salmon Technical Team will attempt to project the date a quota will be reached in time to avoid exceeding the quota and to allow adequate notice to the fishermen. The State Directors and the Council Chairman will be consulted by the NMFS Regional Director before action is taken to close a fishery. Closures will be coordinated with the states so that the effective time will be the same for EEZ and state waters. A standard closure notice will be used and will specify areas that remain open as well as those to be closed. To the extent possible, all closures will be effective at midnight and a 48-hour notice will be given of any closure. When a quota is reached, the Regional Director will issue a notice of closure of the fishery through local news media at the same time that a notice of fishery closure is published in the *Federal Register*.

10.1.2 Rescission of Automatic Closure

If, following the closing of a fishery after a quota is reached, it is discovered that the actual catch was over-estimated and the season was closed prematurely, the Secretary is authorized to reopen the fishery if:

1. The shortfall is sufficient to allow at least one full day's fishing (24 hours) based on the best information available concerning expected catch and effort; and

2. The unused portion of the quota can be taken before the scheduled season ending.

10.1.3 Adjustment for Error in Preseason Estimates

The Secretary may make changes in seasons or quotas if a significant computational error or errors made in calculating preseason estimates of salmon abundance have been identified; provided that such correction to a computational error can be made in a timely fashion to affect the involved fishery without disrupting the capacity to meet the objectives of the management plan. Such correction and adjustments to seasons and quotas will be based on a Council recommendation and Salmon Technical Team analysis.

10.2 FLEXIBLE INSEASON ACTIONS

Fishery managers must determine that any inseason adjustment in management measures is consistent with ocean escapement goals, conservation of the salmon resource, any federally recognized Indian fishing rights, and the ocean allocation scheme in the framework FMP. In addition, all inseason adjustments must be based on consideration of the following factors:

7. ~~X~~ Predicted sizes of salmon runs

8. ~~X~~ Harvest quotas and hooking mortality limits for the area and total allowable impact limitations if applicable

9. ~~X~~ Amount of the recreational, commercial, and treaty Indian fishing effort and catch for each species in the area to date

10. ~~X~~ Estimated average daily catch per fisherman

11. ~~X~~ Predicted fishing effort for the area to the end of the scheduled season

12. ~~X~~ Other factors as appropriate (particularly, fisher safety affected by weather or ocean conditions as noted in Amendment 8)

Flexible inseason provisions must take into consideration the factors and criteria listed above and would include, but not be limited to, the following.

1. Modification of quotas and/or fishing seasons would be permitted. Redistribution of quotas between recreational and commercial fisheries would be allowed if the timing and procedure are described in preseason regulations. If total quotas or total impact limitations by fishery are established, subarea quotas north and south of Cape Falcon, Oregon can be redistributed within the same fishery. Other redistributions of quotas would not be authorized. Also allowable would be the establishment of new quotas and/or seasons, and establishment of, or changes to, hooking mortality and/or total allowable impact limitations during the season. Action based on revision of preseason abundance estimates during the season would be dependent on development of a Council approved methodology for inseason abundance estimation.

2. Modifications in the species which may be caught and landed during specific seasons and the establishment or modification of limited retention regulations would be permitted (e.g., changing from an all-species season to a single-species season, or requiring a certain number of one species to be caught before a certain number of another species can be retained).

3. Changes in the recreational bag limits and recreational fishing days per calendar week would be allowed.

4. Establishment or modification of gear restrictions would be authorized.

5. Modification of boundaries, including landing boundaries, and establishment of closed areas would be permitted.

6. Temporary adjustments for fishery access due to weather, adverse oceanic conditions or other safety considerations (see Council policy of September 18, 1992 regarding implementation of this action).

The flexibility of these inseason management provisions requires responsibility to assure that affected users are adequately informed and have had the opportunity for input into potential inseason management changes.

10.3 PROCEDURES FOR INSEASON ACTIONS

1. Prior to taking any inseason action, the Regional Director will consult with the Chairman of the Council and the appropriate State Directors.

2. As the actions are taken by the Secretary, the Regional Director will compile, in aggregate form, all data and other information relevant to the action being taken and shall make them available for public review during normal office hours at the Northwest Regional Office, National Marine Fisheries Service, 7600 Sand Point Way NE, Seattle, Washington 98115.

3. Inseason management actions taken under both the "fixed" and "flexible" procedures will become effective by announcement in designated information sources (rather than by filing with the Office of the Federal Register [OFR]). Notice of inseason actions will still be filed with the OFR as quickly as possible.

   The following information sources will provide actual notice of inseason management actions to the public: (1) the U.S. Coast Guard "Notice to Mariners" broadcast (announced over Channel 16 VHF-FM and 2182 KHZ); (2) state and federal telephone hotline numbers specified in the annual regulations and (3) filing with the *Federal Register*. Identification of the sources will be incorporated into the preseason regulations with a requirement that interested persons periodically monitor one or more source. In addition, all the normal channels of informing the public of regulatory changes used by the state agencies will be used.

4. If the Secretary determines, for a good cause, that a notice must be issued without affording a prior opportunity for public comment, public comments on the notice will be received by the Secretary for a period of 15 days after the effective date of the notice.

11 SCHEDULE AND PROCEDURES FOR FMP AMENDMENT AND EMERGENCY REGULATIONS

Modifications not covered within the framework mechanism will require either an FMP amendment or emergency Secretarial action. The amendment process generally requires at least a year from the date of the initial development of the draft amendment by the Council. In order for regulations implementing an amendment to be in place at the beginning of the general fishing season (May 1), the Council will need to begin the process by no later than April of the previous season. It is not anticipated that amendments will be processed in an accelerated December-to-May schedule and implemented by emergency regulations.

Emergency regulations may be promulgated without an FMP or FMP amendment. Depending upon the level of controversy associated with the action, the Secretary can implement emergency regulations within 20 days to 45 days after receiving a request from the Council. Emergency regulations can include non-resource emergencies and are generally in effect for 180 days. A second 180-day extension is possible if the public has had an opportunity to comment on the emergency regulation and the Council is actively preparing a plan amendment or proposed regulations to address the emergency on a permanent basis.

Part of the process for evaluating all future FMP amendment proposals will be to consider whether they will result in the need for temporary adjustments for fishery access due to weather, adverse oceanic conditions, or other safety considerations.

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[i]/ Implemented by emergency regulation on April 14, 1978 (43 FR 15629) and May 24, 1978 (43 FR 22214).

[i]/ Implemented by emergency regulation on May 3, 1984 (49 FR 18853; May 3, 1984).

[a]/ A description of the ESU boundaries may be found at 63 FR 11486 (March 9, 1998) for Chinook and 60 FR 38016 (July 25, 1995) for coho.

[a]/ The allocation schedule is based on the following formula: first 150,000 coho to the recreational base (this amount may be reduced as provided in footnote b); over 150,000 to 350,000 fish, share at 2:1, 0.667 to troll and 0.333 to recreational; over 350,000 to 800,000 the recreational share is 217,000 plus 14% of the available fish over 350,000; above 800,000 the recreational share is 280,000 plus 10% of the available fish over 800,000.

Note: The allocation schedule provides guidance only when coho abundance permits a directed coho harvest, not when the allowable impacts are insufficient to allow general coho retention south of Cape Falcon. At such low levels, allocation of the allowable impacts will be determined in the Council=s preseason process. Deviations from the allocation may also be allowed to meet consultation standards for ESA listed stocks (e.g., the 1998 biological opinion for California coastal coho requires no retention of coho in fisheries off California).

[b]/ If the commercial allocation is insufficient to meet the projected hook-and-release mortality associated with the commercial all-salmon-except-coho season, the recreational allocation will be reduced by the number needed to eliminate the deficit.

[c]/ When the recreational allocation is 167,000 coho or less, special allocation provisions apply to the recreational harvest distribution by geographic area (unless superseded by requirements to meet a consultation standard for ESA listed stocks); see text of FMP as modified by Amendment 11 allocation provisions.

[a]/ None, except 20 inches off California.

[a]/ Scheduling of the March and April Council meetings is determined by the need to allow for complete availability of pertinent management data, provide time for adequate public review and comment on the proposed options, and afford time to process the Council's final recommendations into federal regulations by May 1. Working backward from the May 1 implementation date, the April Council meeting is generally set as late as possible while not extending past April 12 for approval of final salmon management recommendations. The March Council meeting is set as late as possible while ensuring no less than three to four weeks between the end of the March meeting and beginning of the April meeting.

[i]/ Implemented by emergency regulation on April 14, 1978 (43 FR 15629) and May 24, 1978 (43 FR 22214).

[i]/ Implemented by emergency regulation on May 3, 1984 (49 FR 18853; May 3, 1984).

~~[a]/ This table may be updated periodically by formal amendments to the FMP or comprehensive technical reviews, which result in modified conservation objectives or the development of rebuilding programs in response to overfishing concerns. In addition, any stock listed under the ESA and its consultation standard or recovery plan will immediately be incorporated in the table.~~

~~[b]/ ESA consultation standards in effect at time of adoption (March 1999). For updated ESA consultation standards, see Preseason Report III, Appendix A.~~

~~[c]/ Management information and abundance based on 1994-1998 data. For updated Management Information, see Preseason Report I, Appendix A.~~

[a]/ A description of the ESU boundaries may be found at 63 FR 11486 (March 9, 1998) for Chinook and 60 FR 38016 (July 25, 1995) for coho.

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SALMON TECHNICAL TEAM REPORT ON SALMON FISHERY MANAGEMENT PLAN AMENDMENT 16

The Council's preliminary preferred alternative for Amendment 16 to the Salmon Fishery Management Plan (FMP) includes clear and quantifiable criteria for determining when "overfishing" is occurring, when a stock is "overfished," and when a stock is "approaching an overfished condition." These status determination criteria are required elements of all FMPs. In all three cases, the Council action and Salmon Technical Team (STT) responsibilities are clearly defined. The responsibilities of the STT are manageable and in the cases of overfishing, and approaching an overfished condition, are limited to reporting requirements. In the case of "overfished" there is the additional requirement of recommending a rebuilding plan to the Council. The scope of the rebuilding plan is clearly described in the proposed FMP language, and its development appears to be a manageable task for the STT.

However, the FMP language also contains definitions for stock status classifications of "conservation alert," and "abundance alert," which are somewhat analogous categories added to the FMP by adoption of Amendment 13. The "conservation alert" is analogous to the category of "approaching an overfished condition." Though the criteria for the two determinations differ, both the intent and the required Council actions are similar. The "abundance alert" was previously called an "overfishing concern" and was included in the FMP by Amendment 13 as a substitute for the category of "overfished." In addition to having different criteria than the minimum stock size threshold for an "overfished" determination, a determination of "abundance alert" entails a much more open-ended assignment to the STT. With ever-increasing demands placed on the STT, by increased complexity of the regulatory structure for ocean salmon fisheries, as well as increasing demands on the time of individual STT members by their outside duties, this does not appear to be a manageable task.

The requirements of the Magnuson-Stevens Act for status determination criteria are met by the "overfishing," "overfished," and "approaching an overfished condition" categories proposed in the preliminary preferred alternative for Amendment 16. The categories of "abundance alert" and "conservation alert" are largely redundant, are more ambiguously defined, and are not required elements of the FMP. Therefore the STT recommends that the new categories of "overfishing," "overfished," and "approaching an overfished condition" be adopted as replacements for the categories of "abundance alert" and "conservation alert," and that the categories of "abundance alert" and "conservation alert" be deleted from the FMP.

PFMC
5/23/11

Agendum C.1.b
Supplemental Comments of Hoopa Valley Tribe
June 2011

HOOPA VALLEY TRIBAL COMMENTS ON

C.1 Fishery Management Plan Amendment 16, Annual Catch Limits and Accountability Measures

The Hoopa Valley Tribal Council (HVTC) retains sole management authority governing the HVT fishery prosecuted by Tribal members on the Hoopa Valley Reservation. Under its authority the HVTC allows for utilization of Klamath River Fall Chinook (KRFC) to meet the purposes of subsistence, ceremony, and commerce.

Specific to PFMC's (Council's) selection of a final alternative for Amendment 16 (A-16): "Annual Catch Limits and Accountability Measures" (ACLs-AMs), we have prepared the following technical recommendations. Overall, the intent of clarifying and removing ambiguity with regard to definitions of "overfishing", and *de minimis* fisheries is strongly embraced. Amendment 15 left open to broad interpretation what the scope of *de minimis* fisheries would be a levels of abundance below 22,000 natural spawners. A-16 should specifically define conservation measures appropriate for KRFC in the event of anomalously low stock size. The Council is further advised that the HVTC reserves its option for further consultations regarding implementation of a final rule for ACLs-AMs with its federal trustee, pursuant Secretarial Order 3206.

(1) *Classification of Salmon Stocks:* The HVTC believes that prudent management of mixed-stock marine fisheries must favor stock conservation, and in particular, protection of the genetic and racial diversity of the fishes of Klamath Basin. While this is our general guidance for management of KRFC, A-16 as drafted recognizes Klamath River Spring Chinook (KRSC) as "in the fishery" of targeted KRFC, and our concern for adequate protection of KRSC when managing on productivity estimates specific to KRFC speaks to a prescription for management conservatism. Hence, where A-16 contemplates ranges of risk, we generally are seeking more conservative thresholds.

(2) Status Determination Criteria (SDC): The criteria upon which stocks are to be determined: adversely affected by "overfishing"; "approaching overfished"; "overfished"; or "rebuilt", are themselves dependent upon the management Control Rule and derivation of a Minimum Stock Size Thresholds (MSST). The preferred alternative in A-16 DEA for identifying the Control Rule for KRFC as 35,000 natural adults provides an unacceptable level of risk to the stock given what best science has determined that SMSY=40,700.

Estimation of S_{MSY} was facilitated by a deliberate probing approach of empirically derived stock recruitment data for KRFC at varying stock sizes pursuant Harvest Rate Management (FMP Amendment 9). Today, while historic information on large escapement of natural area spawners remains somewhat limited, the Council is armed with a better understanding of the population dynamics of KRFC than was available in

1989. Therefore, it would be extremely regressive for the Council to adopt a Control Rule which would fail to embrace this new knowledge, and build upon the science developed by this Council under Amendment 9. Hence, the starting point for SDC for KRFC begins with establishing the control rule at S=40,700 adult spawners ("Klamath River Fall Chinook Stock-Recruitment Analysis", STT 2005). The second component for framing the SDC involves identifying the Minimum Stock Size Threshold (MSST).

The Tribe has previously addressed it's interest in setting **MSST to 0.86 of S_{MSY} resulting in an MSST of 35,000 natural adult spawners. The DEA currently identifies this as Alternative 3c.** Further, we would condemn assignment of MSST to 0.5 of S_{MSY} (0.5 * 40,700 = 20,350) as this threshold would fall well below the minimum stock size identified in Amendment 15 (22,000), to provide some assurance that the long-term productivity of KRFC will not be jeopardized if exceptionally low abundance or other circumstances occur.

The Tribe is then generally aligned with all definitions for "overfishing", "overfished", "approaching overfished", and "rebuilt" as described under Alternative 3c of the DEA.

De minimis fishing limits, Amendment 15 is ambiguous with regard to allowable rates of *de minimis* fishing at stock sizes below 22,000. The Council will now have the opportunity to define limits to *de minimis* fishing at low stock sizes. The HVTC seeks to protect the long-term productivity of both KRFC and KRSC. Accordingly, **we recommend a *de minimis* rule which would preclude further impacts from Council managed fisheries at expected natural adult spawner populations (S) of 22,000 or less**. It is difficult to relate this numeric threshold to any of the alternatives represented in the DEA as they themselves, tier off of assumptions for the Control Rule and MSST. Assuming the Control Rule is equivalent to 40,700 (S_{MSY}), and MSST is set at 0.50 of S_{MSY}, the alternative most related to the preference of the HVTC would be Alternative 3 where Council Directed fisheries would cease if projected natural adult spawner abundance were 20,350 or less ($0.5 \times S_{MSY}$). Further, if Alternative 3c is used to guide SDC, then the definition of MSST would become S = 35,000 and the most appropriate alternative to achieve our objectives would be Alternative 4, where the rate of de minimis fishing decays to F = 0 when stock size is less than ("left of") MSST. The other alternatives presently offered in the draft EA lead to progressively greater threats to the long-term productivity of KRFC.

Agenda Item C.1.b
Supplemental NMFS Report 1
June 2011

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

May 27, 2011

Mr. Mark Cedergreen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

Dear Mr. Cedergreen:

The Pacific Fishery Management Council is scheduled to take final action on Amendment 16 to the Salmon Fishery Management Plan (FMP) at the June 2011 Council meeting. The purpose of Amendment 16 is to revise the Salmon FMP as needed to comply with changes in the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and associated National Standard 1 Guidelines (NS1G). The MSA has deadlines for ensuring that all of the regional Councils' FMPs comply with the Act and the NS1Gs. It is imperative that Amendment 16 be approved and implemented through regulations by the end of 2011. Completing work on Amendment 16 is therefore a high priority for the National Oceanic and Atmospheric Administration's National Marine Fisheries Service. We look forward to our ongoing work with the Council to meet this important goal.

There is one issue in the draft Environmental Assessment for Amendment 16 that warrants comment as we approach the June Council meeting. The preliminary preferred alternative in the draft Environmental Assessment indicates a preference for continued reliance on the 35,000 fish escapement floor for Klamath River fall Chinook (KRFC). This comes up in Section 2.3 that describes the alternatives for reference points, and in Section 2.5 that describes the alternatives for *de minimis* fishing. Under the preferred alternative, the S-based reference point framework would continue to rely on a control rule with a target spawner abundance of 35,000. A control rule with a spawner abundance of 35,000 would also affect how *de minimis* fisheries are implemented during years of low abundance.

The best available scientific information indicates that the maximum sustained yield escapement level (S_{MSY}) for KRFC is 40,700. It therefore seems problematic that the Council would recommend alternatives that continue to rely on the current escapement floor in place of S_{MSY}, resulting in fisheries that target an escapement level below what is expected to produce MSY on what could prove to be a relatively frequent basis. The MSA and NS1Gs are built around the concept of optimum yield (OY) and the imperative to prevent overfishing. The Act and Guidelines use MSY as the basis for fishery management and for determining OY. Specifically, National Standard 1 requires that conservation and management measures in an FMP achieve OY "on a continuing basis." A recommendation from the Council that results in targeting an escapement level that is less than the S_{MSY} estimate appears to be inconsistent with the requirements of the Act and Guidelines.

I am aware that Amendment 16 is complicated and will result in extensive revisions to the current FMP. The management scheme for Klamath River fall Chinook has its own unique and complicated history, and is only one of the many topics that need to be addressed through the amendment process. My intent in bringing this particular issue to your attention is to allow time for further discussion that may be needed so we are better prepared to take final action at the Council meeting in the next few weeks.

If you have questions on this matter, please contact me or Peter Dygert of my staff.

Sincerely,

William W. Stelle, Jr.
Regional Administrator

Summary of Issues and Preliminary Recommendations for Salmon Plan Amendment 16

Peter Dygert

May 31, 2011

The Council is scheduled to take final action at the June 2011 meeting on Amendment 16 to the Salmon Fishery Management Plan (FMP). The purpose of Amendment 16 is to update the FMP to comply with the revised Magnuson-Stevens Act (MSA) and National Standard 1 Guidelines (NS1G). The Council and Salmon Amendment Committee have been working on the Amendment for a couple of years. It is apparent from past experience that the subject is tedious and confusing. As a consequence, I thought it would be helpful to provide some preliminary recommendations regarding the alternatives and choices that will have to be made as the Council takes action on June 8. I look forward to further input from our advisory bodies and the public, and talking to the Council members as well.

Classification

- Remove Canadian Chinook, coho, and pink stocks from the FMP
- Remove Mid-Columbia River spring Chinook stocks from the FMP
- Do not designate any stocks as Ecosystem Components
- Apply the International Exception to:
  - FNM Chinook complex, CR Summer and CR Fall Chinook
  - Puget Sound and Washington coast coho
  - Puget Sound pinks
- Form 3 stock complexes as shown in EA Table 2.5 (not including Mid-C spring Chinook)
- Move Smith River Chinook from the Eel, Mattole, Mad, Smith stock group to the Southern OR/Northern CA complex

Status Determination Criteria

Purpose of this section to provide clear and quantifiable criteria for overfishing, overfished, approaching an overfished condition, and rebuilt status determinations.

- Recommend PP Alternative 3 as shown in EA Table 2.7:
  - 3-year Geometric Mean; MSST = $0.5*S_{MSY}$
    - Overfishing: Exploitation rate $>F_{MSY}$ (single-year)
    - Overfished: 3-year Geometric Mean Spawning Escapement < MSST
    - Approaching Overfished: Recent 2-year and projected Geometric Mean spawning escapement < MSST
    - Rebuilt: 3-year Geometric Mean spawning Escapement $> S_{MSY}$

Stock specific considerations:

- Puget Sound coho: The co-managers rely on a stepped exploitation rate control rule that is implemented through the PST. Further definition of SDC reference points is required to comply with the MSA and NS1Gs. These reference points can be defined without affecting the structure of the control rule. Absent alternatives, the SAC and STT proposed the necessary S_{MSY}, MSST, and F_{MSY} reference points shown in draft FMP Table 3.1 (Draft Environmental Assessment) and discussed further in Appendix E. The co-managers recently provided a draft letter proposing different reference points. The SAC was not certain of the status of these draft recommendations at the time of the briefing book deadline. I suggest we take up the co-managers recommendations as soon as possible and consider them through the methodology review process. (There are some errors in FMP Table 3.1. The MSST values for Strait of Juan de Fuca and Hood Canal coho should be $0.5*S_{MSY}$ or 5,489 and 7,175, respectively.)
- Washington Coast coho: The circumstances for WA coast coho are similar. The co-managers rely on an escapement goal range as the control rule, but further definition of SDC reference points is required to comply with the MSA and NS1Gs. These reference points can be defined without affecting the structure of the control rule. Absent alternatives, the SAC and STT proposed the necessary S_{MSY}, MSST, and F_{MSY} reference points shown in draft FMP Table 3.1 (Draft Environmental Assessment) and discussed further in Appendix E. The co-managers recently provide a draft letter proposing different reference points. The SAC was not certain of the status of these draft recommendations at the time of the briefing book deadline. I suggest we take up the co-managers' recommendations as soon as possible and consider them through the methodology review process.

<u>OFL, ABC, and ACL Specification</u>

- Recommend PP Alternative 3: S-Based as shown in EA Table 2.10
- Klamath: Some of the alternatives continue to rely on the 35,000 spawner escapement floor for various purposes. For example, under Alternative 3b, the control rule for KRFC would target an escapement of 35,000 natural area adult spawners. I believe that management for KRFC should be built around the S_{MSY} estimate of 40,700 and therefore prefer Alternative 3.
- Hatchery and ESA-listed stocks will continue to be managed as they are under the current FMP (EA sections 2.3.5.3 and 2.3.5.4)

<u>Accountability Measures</u>

- Recommend Alternative 3: Alternatives 2 and 3 would both classify current preseason, inseason, and postseason management processes as Accountability Measures. Alternative 2 would retain some aspects of the "conservation alert" and "overfishing concern" indicators from the current FMP. The overfishing concern would be relabeled as an "abundance alert." Council action associated with these indicators would also be modified. Alternative 3 does away with the conservation alert and overfishing concern indicators. These indicators seem a vestige of the past plan that have been replaced by the overfishing and overfished SDCs. If stocks are depressed relative to their conservation objective, it would come to the Council's attention as a routine matter during the March Council process, particularly since we would likely be considering implementation of *de minimis* fishing provisions.

De minimis Fishing Provisions

- This one will take some deliberation. The *de minimis* provisions apply only to SRFC and KRFC. Other stocks have other sorts of *de minimis* consideration built into their control rules. My current thoughts regarding the *de minimis* provisions are as follows: I would generally support some sort of hybrid between alternatives 3 and 5. I do not think a fully prescriptive *de minimis* rule is necessary or appropriate (Alternative 3), and prefer reliance on qualitative consideration that would guide how *de minimis* fisheries are implemented. Alternative 3 moves fisheries to low levels at about the right place – in the neighborhood of MSST. Alternative 5 is too open ended. The *de minimis* provisions implemented for KRFC through Amendment 15 are closer to the mark, but need to be simplified. The current *de minimis* fishing provisions for Klamath are:

  > Within the Cape Falcon to Point Sur area, the Council may allow *de minimis* fisheries which: permit an ocean impact rate of no more than 10 percent on age–4 Klamath River fall Chinook, if the projected natural spawning escapement associated with a 10 percent age–4 ocean impact rate, including river recreational and tribal impacts, is between the conservation objective (35,000) and 22,000. If the projected natural escapement associated with a 10 percent age–4 ocean impact rate is less than 22,000, the Council shall further reduce the allowable age– 4 ocean impact rate to reflect the status of the stock[1]. When recommending an allowable age–4 ocean impact rate, the Council shall consider the following year-specific circumstances:
  >
  > (i) The potential for critically low natural spawner abundance, including the risk of Klamath Basin substocks dropping below crucial genetic thresholds;
  > (ii) A series of low spawner abundance in recent years;
  > (iii) The status of co-mingled stocks;
  > (iv) The occurrence of *El Niño* or other adverse environmental conditions;
  > (v) Endangered Species Act (ESA) considerations; and
  > (vi) Other considerations as appropriate.

[1] NMFS interprets that, consistent with the *de minimis* provisions of the FMP, the maximum allowable 10 percent age-4 ocean impact rate may be implemented only when the anticipated escapement is near the 35,000 natural spawner floor. As escapement falls below approximately 30,000, the impact rate will need to decline automatically.

> The KRFC age–4 ocean impact rate must not jeopardize the long-term capacity of the stock to produce maximum sustainable yield on a continuing basis. Implementation of *de minimis* fisheries will depend on year-specific estimates of ocean abundance and age composition, and will be determined by the STT prior to the March Council meeting. Ocean fishery impacts to the returning brood incurred during the previous fall/winter fisheries will be counted against the allowable age-4 ocean impact rate.

We should develop qualitative guidance for implementing *de minimis* fisheries that do not require further interpretation by NMFS. We need to be mindful that qualitative considerations, if used, will be applied to both KRFC and SRFC.

Finally, I think we need more discussion on Klamath River tribal fisheries in a *de minimis* fishing circumstance. The *de minimis* provisions of Amendment 15 were built around an age-4 ocean impact rate and how and when that might be scaled down to zero. The proposed provisions for KRFC in Amendment 16 are built around a total exploitation rate of 0.25. We need to hear from the tribes on this, but I presume that they would assert some sort of minimum fishing need which would be inconsistent with literally scaling fisheries down to zero. If nothing else, I think that we might include recognition of minimal tribal needs among the qualitative considerations.

Salmon Amendment Committee Report

Amendment 16 to the Pacific Coast Salmon Fishery Management Plan:

Draft Environmental Assessment for Stock Classification, Status Determination Criteria, Annual Catch Limits and Accountability Measures, and *De Minimis* Fishing Provisions

Amendment Results in Changes

- Stock classification, stock complexes, ecosystem components, and international exceptions could affect EFH, SDC, and ACL specification.
- SDC alternatives will result in substantial changes to assessment and reporting on overfishing, overfished, approaching overfished, etc.
- ACL alternatives will not result in substantive changes in preseason planning process or NOF/SOF fishery structure
- AM alternatives could result in substantive changes to preseason process, and postseason reporting and assessments.
- *De Minimis* fishing provision alternatives should result in more management flexibility and streamline the preseason process.

Status of Amendment Process

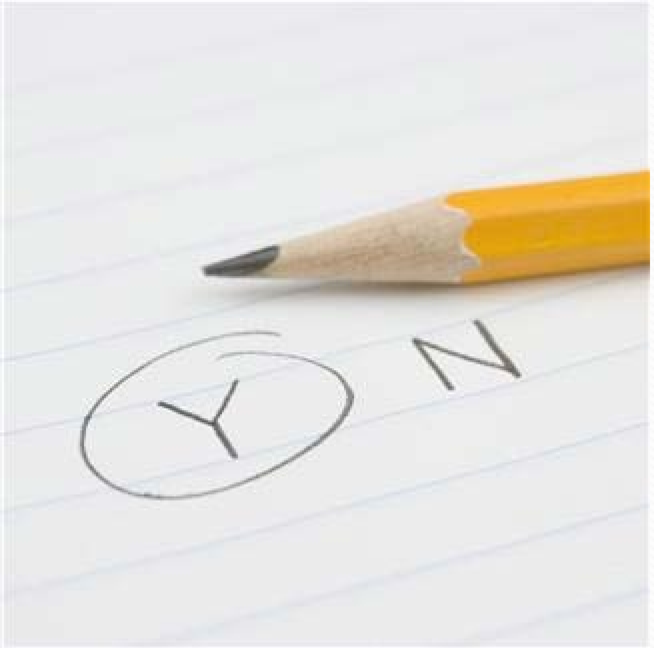
- The SAC has Developed a Draft Environmental Assessment (DEA)
  - The Council adopted preliminary preferred alternatives for public review in September 2010
  - The Council will now take action to adopt final preferred alternatives
- SAC will finalize EA with Council's final preferred alternatives
  - Council will transmit final DEA to NMFS in June
- Final Rule will publish by December 31, 2011
- A-16 will be implemented in the 2012 preseason process

Focus on Assessment of Alternatives

- Evaluation – Chapter 2
  - MSA requirements
  - NS1Gs
  - Feasibility of implementation
- Analysis of Environmental Effects – Chapter 4
  - Biological Impacts
  - Economic Impacts
- FMP Implementation Language – Appendix H
  - Council Actions
  - Changes and additions
- Description of Alternatives as Needed - Attachment 1

Decision Points

- Keep Decision points in mind as we step through assessment



Decision Points: Stock Classification

- What stocks are no longer "in the fishery"
  - Ecosystem Components- URB, Mid-C Sp Chinook, Pink
  - Omitted from FMP-Canadian stocks, Mid-C Sp Chinook
- Any Stocks to be added/reorganized
  - ESA stocks – LCR tules, PS Chinook, OCN/SONCC coho
  - Smith River fall Chinook
  - Oregon Coastal Hatchery, Willapa natural coho
- Stock Complexes and Indicator Stocks
  - CVF-SRFC
  - SONC-KRFC
  - FNMC-Grays, Queets, Hoh, Quillayute Falls, Hoko Su/F
- International Exceptions
  - FNMC, Columbia URB and Summer Chinook, WA coastal and Puget Sound coho, pinks, Canadian stocks

Decision Points: Status Determination Criteria

- Single year, multi-year geometric mean or arithmetic average
- Percentages of S_{MSY} for MSST
  - 50%, 75%, 86%, or others?
  - Represents biological threshold where stock productivity to produce MSY is jeopardized
  - Not a management objective
- Estimates for reference points of S_{MSY} and F_{MSY}
  - SRFC, WA coastal coho, Puget Sound coho, Columbia URB, Summer Chinook, others using FMP MSY proxies
  - Points, not ranges

Decision Points: ACL Frameworks

- Catch or Spawning Escapement Basis
- KRFC management objective
- Tiered Scientific Uncertainty
  - 5% and 10% buffer on estimate of F_{MSY}

Decision Points: Accountability Measures

- Identify existing measures in FMP
  - Preseason/inseason
  - Postseason
  - Harvest control rule management
- Retention of Abundance Alert (AKA Overfishing Concern) and Conservation Alert
- ACT proposal
- ACL performance standard, reevaluation

Decision Points: *De Minimis* Fishing

- Structured v. unstructured control rules
- Threshold levels based on S_{MSY}
- Does F=0, if so where?
- KRFC management objective alternatives

Assessment: Stock Classification

- All current FMP stocks “in the fishery”
  - Feasible to Implement
  - Consistent with MSA/NS1Gs
  - No biological impacts
  - No economic impacts

Assessment: Stock Classification

- Ecosystem Components or Removed from FMP "not in the fishery"
  - Feasible to Implement
  - Consistent with NS1Gs, but ECs require justification
  - No direct biological impacts
  - Indirect impacts from loss of EFH, e.g., Mid-Columbia Spring, Columbia URB fall Chinook
    - Mitigated by ESA Critical Habitat or EFH for other species
  - No direct economic impacts

Assessment: Stock Classification

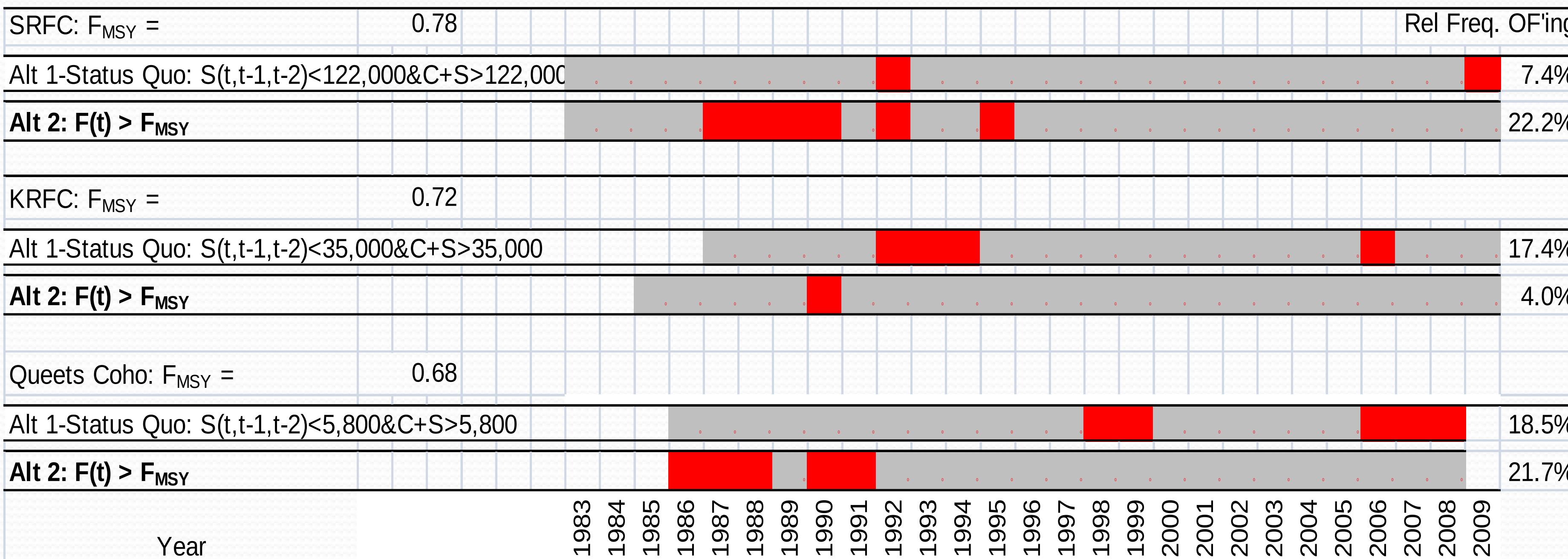
- Stock Complexes – CVF, SONC, FNMC, Mid-C Sp Chinook
  - Feasible to Implement
    - For use with ACLs – CVF, SONC, FNMC
    - For use with EC – Mid-C Sp
  - Consistent with NS1Gs, but requires justification
  - No direct biological impacts
  - No direct economic impacts

Assessment: Stock Classification

- International Exception-PST Stocks, including FNMC Chinook Complex
  - Feasible to Implement
  - Consistent with MSA, NS1Gs
  - No direct biological impacts
  - No direct economic impacts

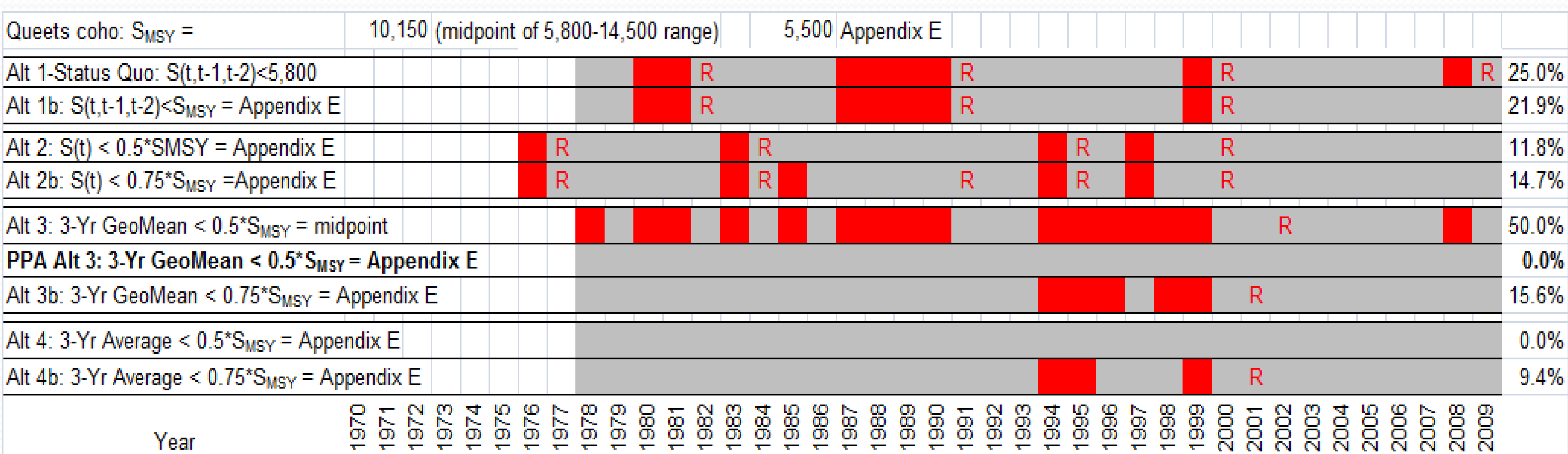
Assessment: SDC - Overfishing

- $F_t > F_{MSY}$
  - Feasible to Implement, but lag in postseason evaluation
  - Consistent with NS1Gs, based on F_{MSY}
  - Long-term positive biological impacts, but not significant
  - No significant economic impacts – Rare occurrence



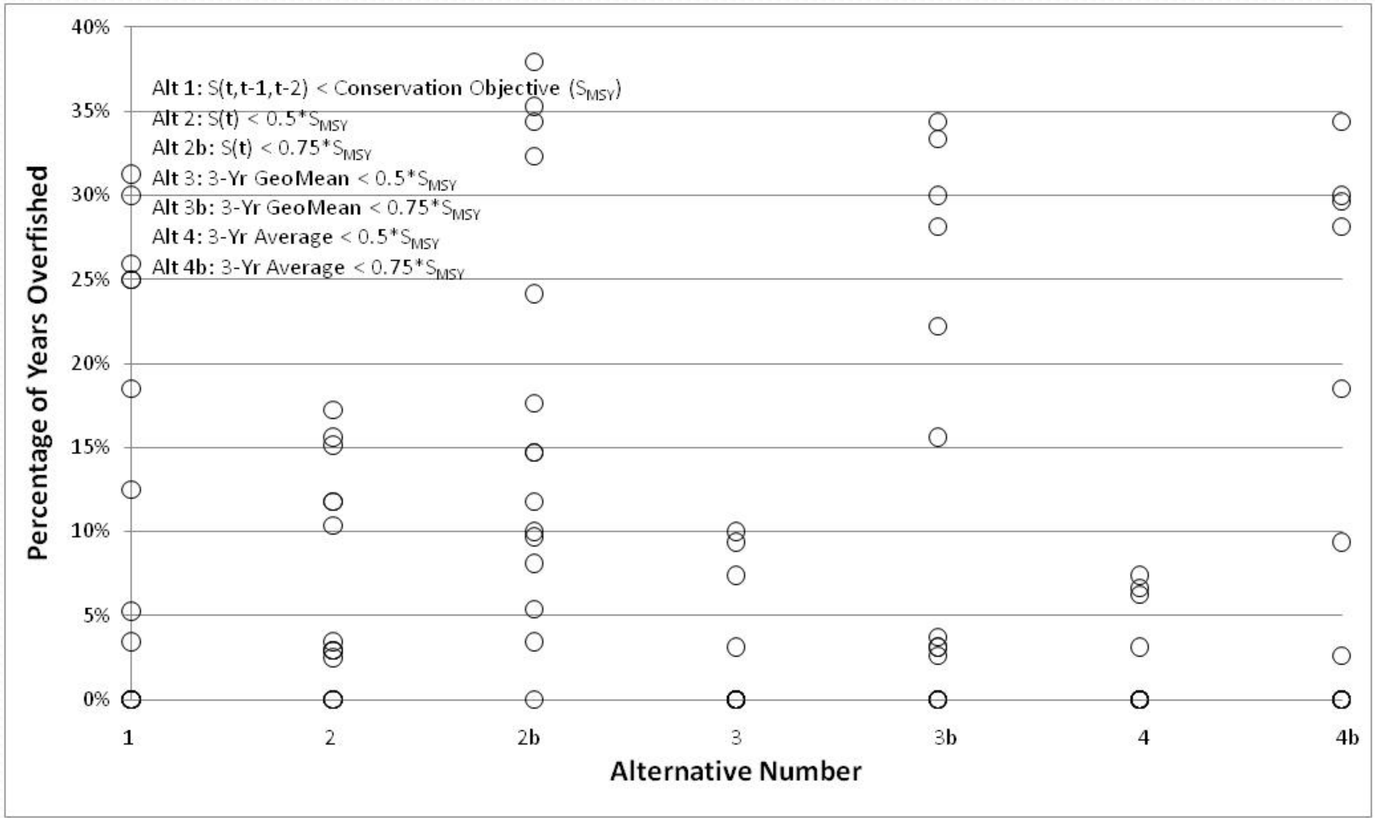
Assessment: SDC - Overfished

- MSST = % S_{MSY} ; MSST is 1-year or 3-year Mean
  - Feasible to Implement
  - Consistent with NS1Gs
    - Objective and measurable
    - 3-year mean requires flexibility provisions for salmon life cycle
  - No significant biological impacts
    - Impacts ranked by rebuilding plan frequency, assuming management changes (e.g., target >S_{MSY} during rebuilding)



Assessment: SDC - Overfished

- Overfished – MSST= % S_{MSY} ; MSST is 1-year or 3-year mean
  - Economic effects are qualitative, e.g., MBSW consumer ratings
    - Possible ex-vessel value drop,
    - Possible consumer demand drop
  - Administrative effects, e.g., frequency of rebuilding plans, etc.



Assessment: SDC – Approaching OF'd

- Projected Abundance < MSST ; MSST is 1-year or 3-year mean
  - Feasible to Implement
  - Consistent with NS1Gs
    - Objective and measurable
    - 3-year mean requires flexibility provisions for salmon life cycle
  - No significant biological impacts
    - Impacts ranked by frequency
    - Assumes management response
  - No significant economic impacts

Assessment: SDC - Rebuilt

- Default is 1-year or 3-year Mean > S_{MSY}; Other criteria could be developed in a rebuilding plan as appropriate
  - Feasible to Implement
  - Consistent with NS1Gs
    - Objective and measurable
    - 3-year mean requires flexibility provisions for salmon life cycle
  - No significant biological impacts
    - 3-year mean reduces uncertainty because more than one brood contributes to rebuilding

Assessment: OFL,ABC,ACL Frameworks

- Catch or Spawning Escapement Based Framework
  - Feasible to Implement
    - Preseason process unchanged
  - Consistent with MSA, NS1Gs
    - Spawning based would require flexibility provisions in NS1Gs
    - Tiered approach to scientific uncertainty in estimating F_{MSY}
    - 35,000 KRFC management objective is inconsistent with MSA, NS1Gs for achieving OY
  - Long-term positive biological impacts, but not significant
    - Overfishing less likely for SRFC
    - KRFC managed for OY
  - Short-term negative, long-term positive economic impacts, but probably not significant

Assessment: Accountability Measures

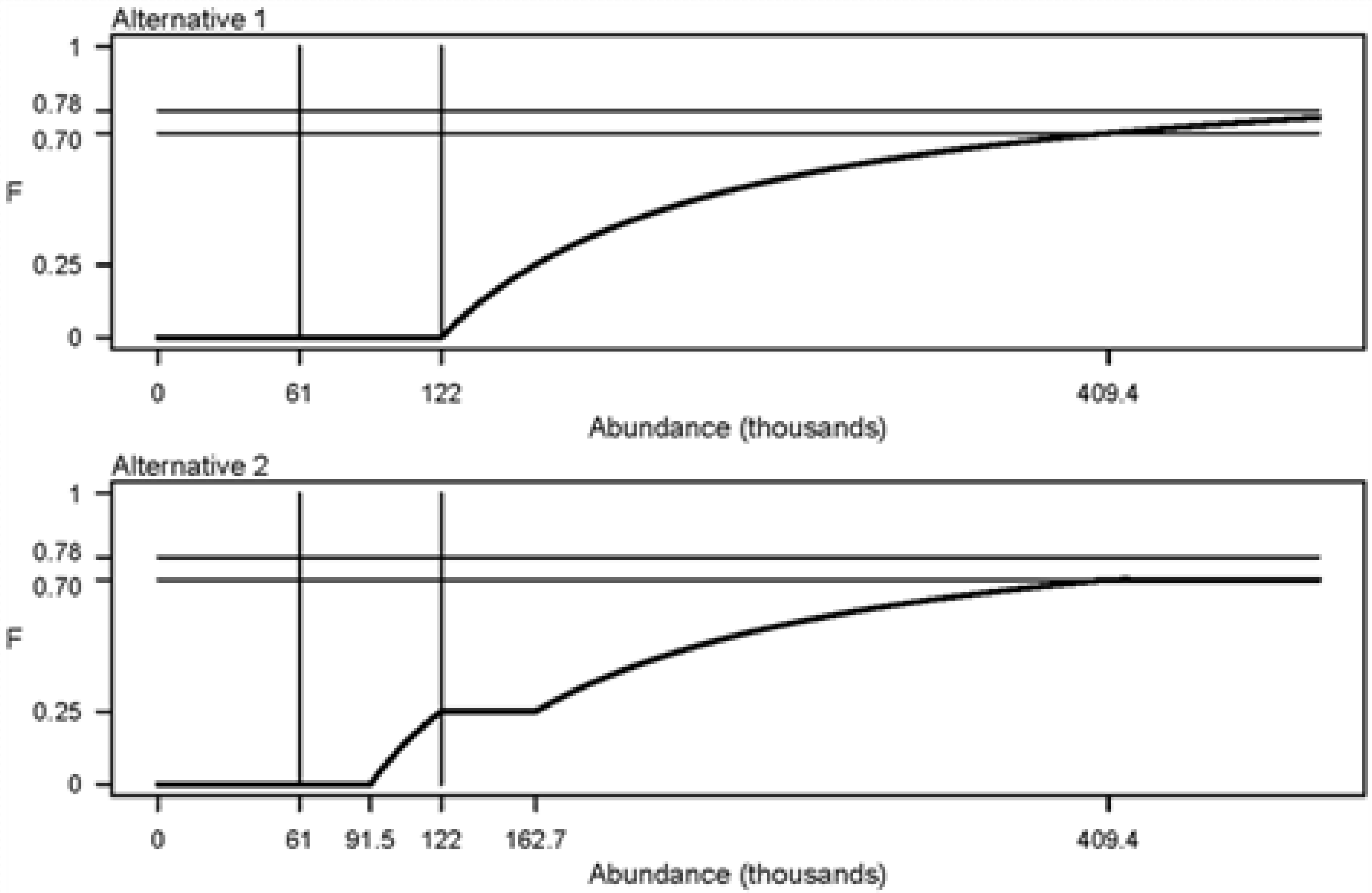
- Existing FMP measures, Overfishing Concern and Conservation Alert, ACT (if needed)
  - Feasible to Implement
    - Preseason process unchanged
  - Consistent with MSA, NS1Gs
  - No Biological effects
  - No economic impacts
- Most effects of alternatives are administrative
  - Actions associated with overfishing concern (alert) and conservation alert
  - Reevaluate ACL framework, uncertainty tiers, etc.

Assessment: De Minimis Fishing Provisions

- Control rule structured or unstructured at % S_{MSY}
  - Feasible to Implement
  - Consistent with MSY, NS1Gs, NS8
    - F decreases as N decreases
    - Community participation sustained
  - Risk of OF'd status increases as abundance where F=0 decreases
- KRFC Management Objective of 35,000 or 40,700 (S_{MSY})
  - Feasible to Implement
    - Preseason process unchanged
  - Consistent with MSY, NS1Gs
    - b Alternatives: 35,000 KRFC Mgmt. Obj. inconsistent with MSA and NS1Gs for achieving OY

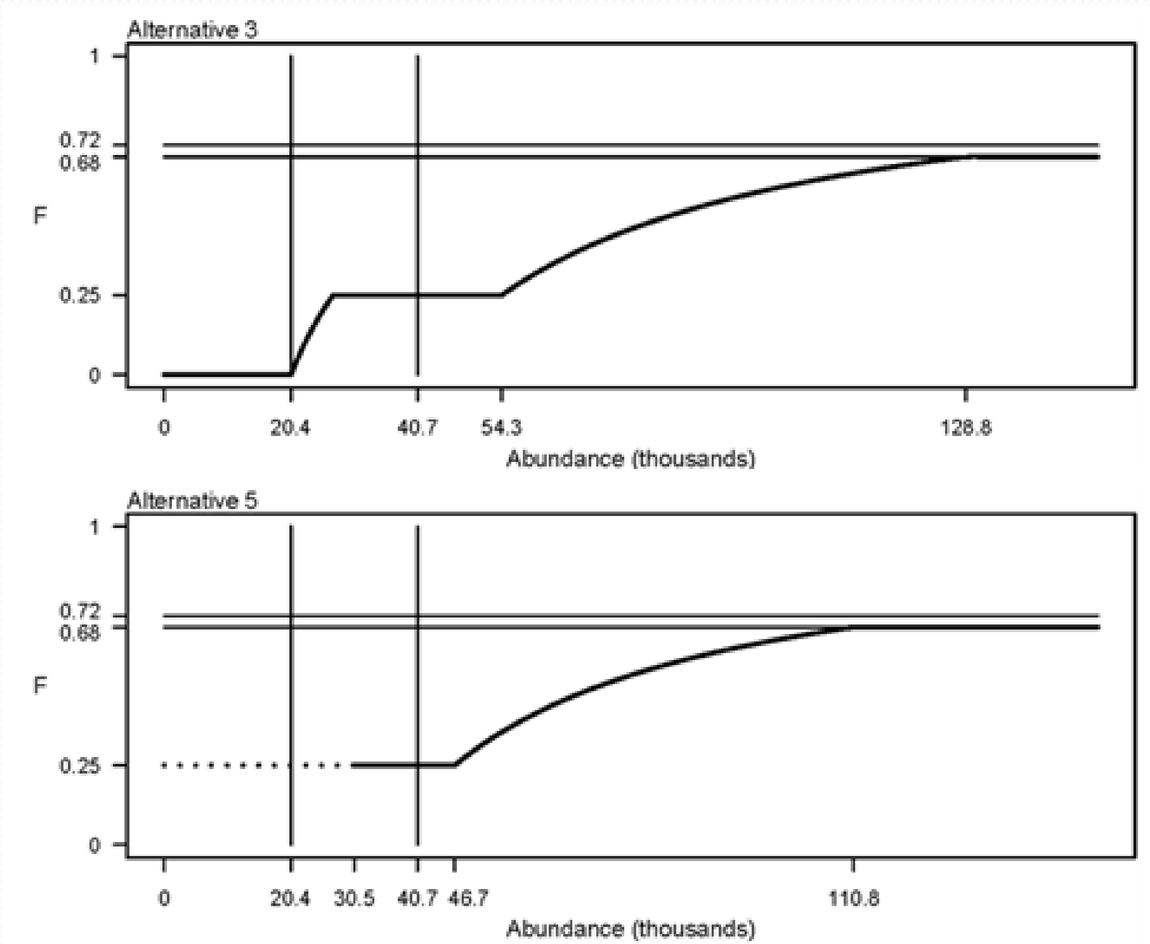
Assessment: De Minimis Fishing Provisions SRFC

- Positive & Negative biological impacts, but not significant
  - Risk of OF'ing decreases, risk of becoming OF'd increases



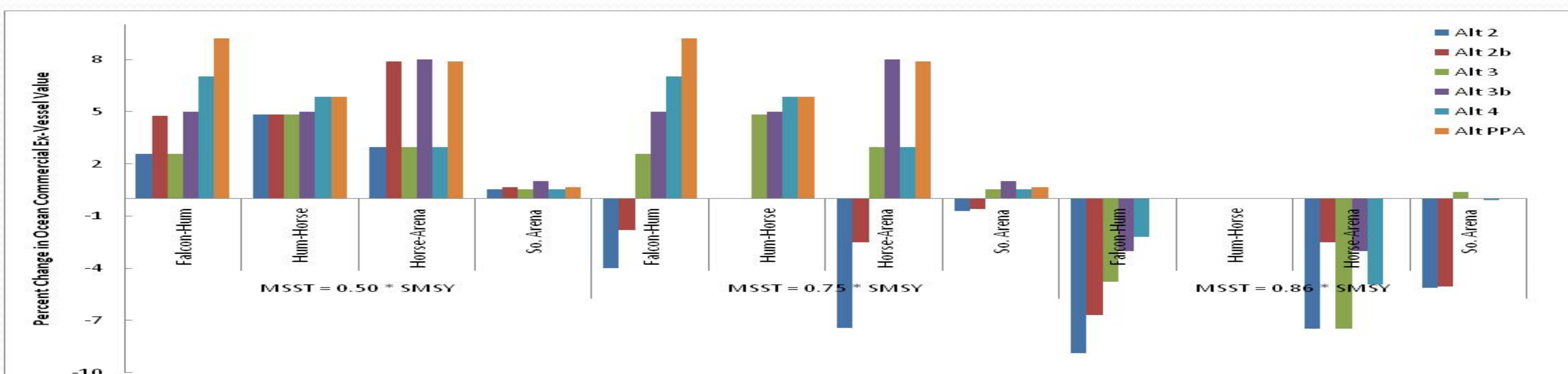
Assessment: De Minimis Fishing Provisions KRFC

- Long-term biological impacts, but not significant
  - Risk of OF’ing and becoming OF’d could decrease for KRFC



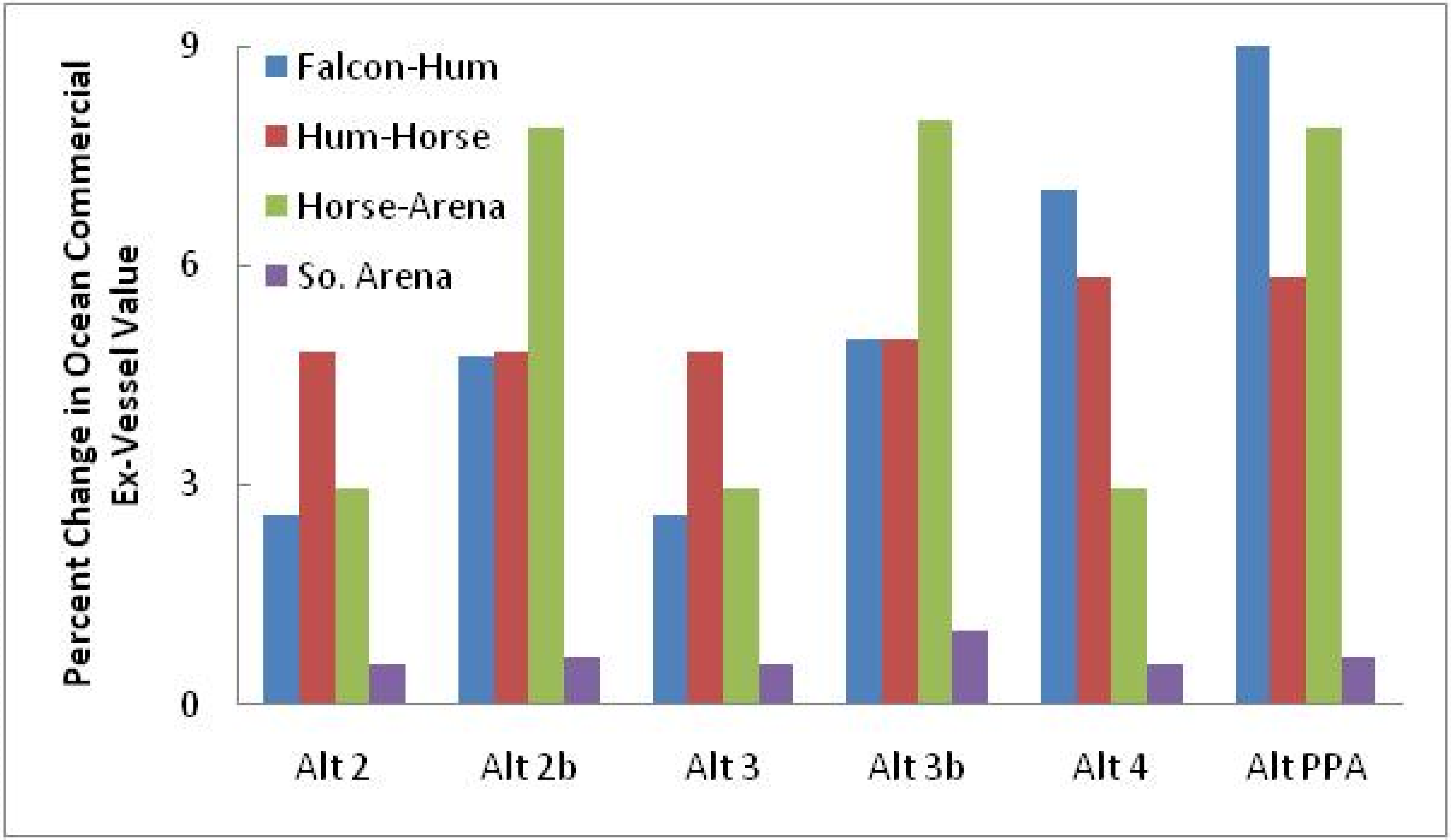
Assessment: De Minimis Fishing Provisions

- Measurable economic effects South of Cape Falcon only
- Short- and long-term economic effects, but not significant
  - Increased long-term catch of KRFC under S_{MSY}
  - Increased short-term catch of SRFC with *de minimis* fishery
  - Decreased short-term catch of KRFC and other stocks if F=0 or managing KRFC under S_{MSY}
- Effects depend on region, **MSST alternative**, and *de minimis* alternative

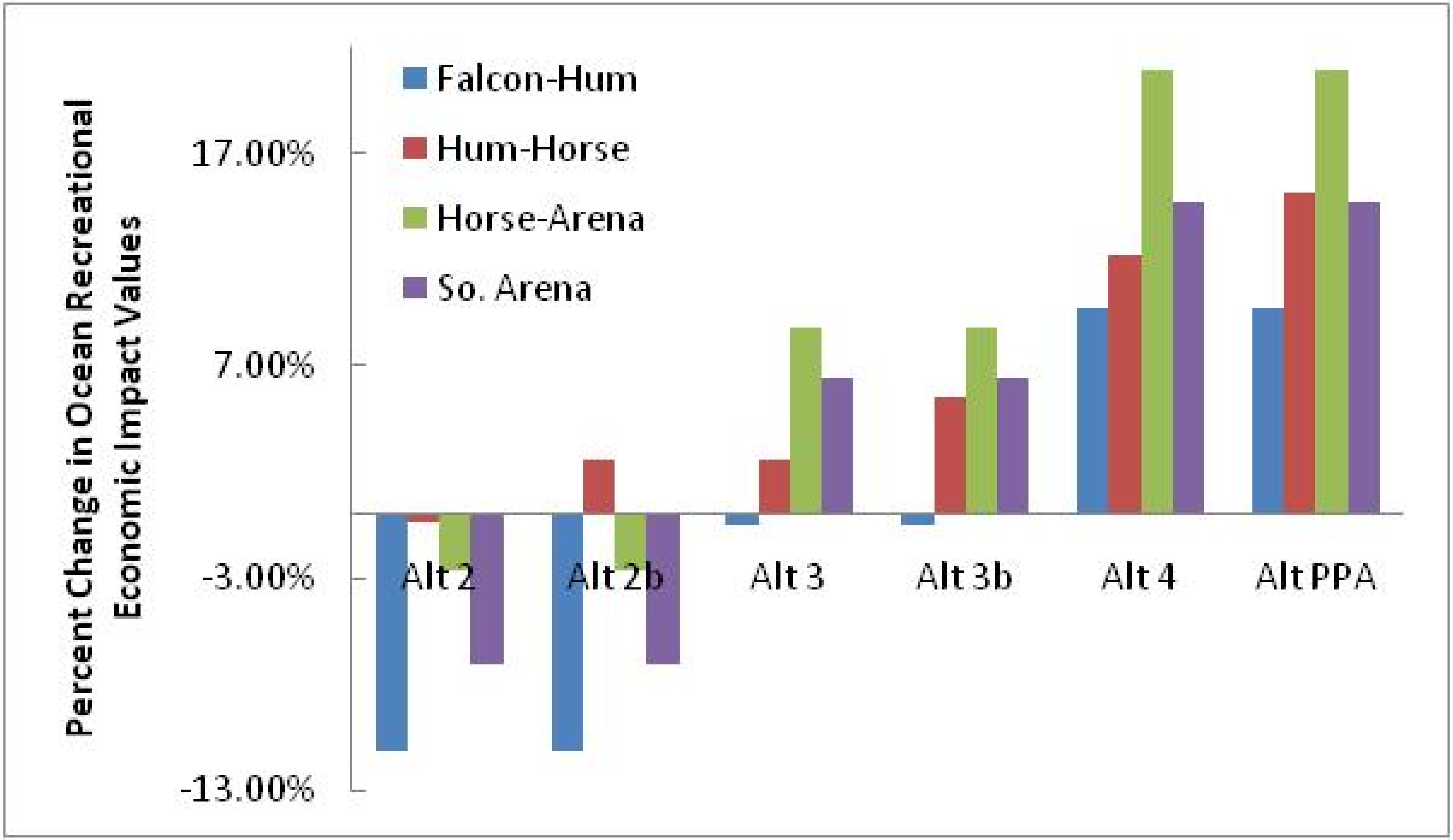


Assessment: De Minimis Fishing Provisions

- Effects depend on region and *de minimis* alternative



Assessment: De Minimis Fishing Provisions



FMP Implementation Language: Council Actions

- Council Actions
  - Need to determine scope of response, compliance with MSA, NS1Gs
  - Effect Workload
  - SDC thresholds
  - Accountability Measures

FMP Council Actions: SDC Thresholds

- Overfishing
  - Stop it!
  - Notify NMFS, agencies, co-managers
  - Direct STT to assess fishing mortality rates
- Approaching Overfished
  - Notify NMFS, agencies, co-managers
  - Prevent or mitigate it
- Rebuilt
  - Notify NMFS, agencies, co-managers

FMP Council Actions: SDC Thresholds

- Overfished
  - Notify NMFS, agencies, co-managers
  - Prevent or mitigate it
  - Direct STT to propose a rebuilding plan
    - Shall asses the role of fishing
    - Shall assess the role of freshwater and marine survival
    - Shall recommend rebuilding actions, e.g., control rule modifications
    - Shall recommend a rebuilding period
    - May recommend: reevaluating S_{MSY}, changing abundance forecast or fishery impact harvest models, monitoring programs, hatchery practices, etc.
  - Adopt rebuilding plan
  - Involve Habitat Committee, SAS, others

FMP Council Actions: Accountability Measures

- ACL non-compliance
  - May implement ACT
  - Review/revise framework
    - If performance standard not met
- Conservation/Abundance Alert
  - Notify agencies/comanagers
  - Conduct assessments

FMP Implementation Language : Changes and Additions

- Subjects
  - Stock classification
  - Status determination criteria
  - Conservation objectives
  - Control Rules
    - ABC/ACL uncertainty tiers
    - ACT
- *Processes*
  - *FMP Amendment*
  - *Notice and Comment Rulemaking*
  - *Methodology Review*
  - *Annual Management Measures*
  - *Other?*

FMP Changes and Additions: Stock Classification

- Adding/Removing FMP Stocks
  - ESA stocks: LCR natural tule Chinook
  - Hatchery stocks: Oregon Coastal hatchery coho
  - Natural stocks: Willapa natural coho
  - *Requires FMP amendment*
- Stock complexes and indicator stocks within the fishery
  - Splitting out stocks: Chetco fall Chinook from Oregon Coast Aggregate
  - Identifying indicator stocks: Klamath spring Chinook
  - Modifying complexes: split SONC into SO and NC
  - *Methodology Review Process*

FMP Changes and Additions: Status Determination Criteria

- Reference Points: MSST = x% S_{MSY}, MFMT = F_{MSY}
  - Structure/Framework
  - *Requires FMP amendment*
- Individual Estimates of Reference Points: e.g., S_{MSY} = 40,700 KRFC
  - New data, new model
  - *Methodology Review Process*
  - *Related to conservation objectives and control rules*

FMP Changes and Additions: Conservation Objectives, Control Rules

- Conservation objectives
  - ESA stocks: *NMFS consultation standards, annual guidance*
  - Hatchery stocks: *Agency objectives*
  - Natural stocks: *Methodology Review Process, Court orders, Amendment for KRFC*
- Control Rules
  - ABC Control Rule: F_{ABC} = 95% F_{MSY}
  - *De Mininis* Control Rule
    - Increasing 25% total exploitation rate
    - Changing thresholds: MSST-S_{MSY} midpoint
  - *Requires FMP amendment*

The Preferred Alternative

SALMON ADVISORY SUBPANEL REPORT ON FISHERY MANAGEMENT PLAN AMENDMENT 16, ANNUAL CATCH LIMITS, AND ACCOUNTABILITY MEASURES

Stock Classification

The Salmon Advisory Subpanel (SAS) recommends the Council adopt the Preliminary Preferred Alternative from Supplemental Attachment 1 for classifying stocks as "in the fishery." This would remove Canadian stocks and mid-Columbia River spring Chinook from the Fishery Management Plan (FMP), and result in some minor reorganization for Smith River Chinook and Rogue River coho.

The SAS recommends the Council adopt the Preliminary Preferred Alternative for formation of stock complexes and identification of indicator stocks (Table 2-5 in the SAC report). Complexes would include the Central Valley fall complex with Sacramento River fall Chinook (SRFC) as the indicator stock; the Southern Oregon-Northern California complex with Klamath River fall Chinook (KRFC) as the indicator stock, and; the far-north migrating coastal (FNMC) complex with Grays Harbor, Queets, Hoh, and Quillayute fall, and Hoko summer/fall Chinook as indicator stocks.

The SAS recommends the Council apply the international exception to annual catch limit (ACL) requirements to Columbia River upriver bright fall and summer Chinook, the FNMC Chinook complex, Washington Coastal coho, Puget Sound coho, and Puget Sound pink salmon. These stocks are all managed under the Pacific Salmon Treaty.

Status Determination Criteria

The SAS recommends the Council adopt Alternative 3 for overfishing status criteria as the final preferred alternative.

The SAS was unable to reach consensus on a recommended final preferred alternative for overfished status criteria, but does request the Council adopt an alternative based on a 3-year geometric mean, and consider the need to address stock specific issues in adopting their final alternative. Status determination criteria (SDC) for approaching an overfished condition should have the same metrics as overfished SDC, and rebuilt SDC should be based on achieving a 3-year geometric mean of S_{MSY}.

The stock specific estimates of S_{MSY} and F_{MSY} for all the stocks in the FMP should be reviewed periodically, with the highest priority given to those that need to be changed or established for the purpose of evaluating whatever SDC alternative(s) the Council adopts.

Annual Catch Limits

The SAS recommends the Council adopt a spawning escapement-based ACL framework alternative, which will keep objectives in the familiar terms of spawners, as is currently done. However, the SAS was unable to reach consensus on whether the annual management objective for KRFC should be 35,000 or 40,700, and therefore could not choose between Alternatives 3 and 3b.

Accountability Measures
The SAS recommends the Council adopt the Preliminary Preferred Alternative for accountability measures (AM); this alternative promotes awareness of declining stock status before reaching overfished thresholds.

***De Minimis* Fishing Provisions**
The SAS could not reach consensus of the exact structure of *de minimis* control rules for KRFC and SRFC, or on whether the KRFC control rule should be based on an annual management objective of 35,000 or 40,700. The SAS does recommend that whatever structure the Council ultimately selects, that it included flexibility to consider year specific circumstances (a dotted line), particularly if the control rule approaches an exploitation rate of zero.

FMP Implementation Language
The SAS did not review all of the FMP implementation language in Appendix H (SAC Report 3), but does recommend that the Council provide guidance to the Salmon Amendment Committee (SAC) to include language similar to that used in Amendment 15 regarding year specific circumstances when considering *de minimis* exploitation rates. The SAS also recommends including language noting the rationale for, and benefit of, control rules with exploitation rate caps. Amendment 9 established the current KRFC conservation objective with such a cap to allow exploration of a wide range of spawning escapements, which should provide for more robust stock/recruitment analyses.

PFMC
06/08/11

SCIENTIFIC AND STATISTICAL COMMITTEE REPORT ON FISHERY MANAGEMENT PLAN AMENDMENT 16, ANNUAL CATCH LIMITS AND ACCOUNTABILITY MEASURES

The Scientific and Statistical Committee (SSC) reviewed the Ad Hoc Salmon Amendment Committee's (SAC) Report "Public Review Draft Environmental Assessment for Pacific Coast Salmon Plan Amendment 16: Classifying Stocks, Revising Status Determination Criteria, Establishing Annual Catch Limits and Accountability Measures, and *De Minimis* Fishing Provisions" (Agenda Item C.1.). Mr. Chuck Tracy (Council staff) and Dr. Peter Dygert (SAC) were present to facilitate the discussion. The SSC has reviewed and commented on earlier drafts of this document at the June, September, and November 2010 Council meetings.

The SSC has the following comments on the current document:

F_{MSY} and S_{MSY} reference points: There are three salmon stocks in the Fishery Management Plan (FMP) amendment with reference points that have not been reviewed by the SSC: (1) Columbia River Fall and Summer Upriver Bright Chinook, (2) Willapa Fall Chinook, and (3) Willapa Natural coho. As proposed in Amendment 16, reference points can be changed or modified during the annual Salmon Methodology Review (SMR) process. Given that there is insufficient time to review the reference points for these stocks now, the SSC recommends that the reference points proposed in the amendment be adopted on a provisional basis. However, the SSC also recommends that the Council schedule a review of the reference points for these stocks by the SMR process as soon as practical. In addition, the SSC recommends that the exploitation rate break point and average maximum sustainable yield (MSY) spawning escapement management framework for Puget Sound coho stocks be scheduled for the SMR process.

5% and 10% buffers between F_{MSY} and F_{ABC} for Tier 1 and Tier 2 stocks: The SSC reiterates its comment from earlier reviews that the size of the buffer and the acceptable risk of over-fishing is ultimately a policy decision.

Minimum Stock Size Threshold (MSST): The alternative that specifies MSST as 86% of S_{MSY} is based on an analysis for the Klamath River but would be applied to all relevant stocks in the amendment under Alternative 3b. Also, when considering alternatives for MSST for a stock complex (e.g., 50% S_{MSY} for an indicator stock in the complex) the SSC notes there is a risk that some stocks in the complex may be fished below acceptable levels relative to S_{MSY}.

***De minimis* fishing alternatives:** The choice of *de minimis* fishing alternatives is largely a policy decision. The SSC notes that Alternative 4 would allow fishing at stock abundances below levels that have been seen previously.

Role of the SSC: The SSC endorses the proposed role for the SSC in amendment 16, specifically, approving (1) control rules and conservation objectives, (2) F_{MSY} and S_{MSY} reference points, (3) changes to harvest model algorithms, and (4) recommending annual acceptable biological catches (ABCs) and overfishing limits (OFLs) for pertinent stocks These would all be accomplished under either the Salmon Methodology Review process or at Council meetings. It is unclear whether changing the uncertainty tiers defined in the amendment could be done under the SMR process or would require an FMP amendment. Adding stocks to the FMP or changing the percentage of S_{MSY} used to specify MSST would require an FMP amendment. Clarification is needed on whether removing a stock from a stock complex or changing the indicator stock(s) for a complex would also require an FMP amendment.

Economic analysis: The economic analysis relies on results of a retrospective evaluation of harvest levels that would have occurred in each sector (ocean commercial, ocean sport, inriver sport, and tribal) during 2002-2010 under each catch limit alternative considered in the Environmental Assessment. The economic analysis converts the harvest numbers from the retrospective analysis to income impacts, applies a discount rate to the impact estimates, then compares the alternatives on the basis of the discounted impacts. In interpreting these results, it is important to note that the economic analysis is based on fishing conditions during 2002-2010. A more comprehensive analysis of the effects of each alternative in response to future salmon abundances would have been more informative.

Additional documentation is needed regarding how the harvest estimates from the retrospective analysis were converted to income impacts. The economic analysis should also include a caveat that income impacts pertain to impacts on the regional economy and do not reflect the economic benefits and costs of each alternative to fishery participants.

The SSC notes that the economic analyses for proposed FMP amendments are often the very last analyses conducted. As a result they are often available for review too late in the process for comments and suggestions of the SSC and other committees to be addressed and incorporated in Council decisions.

PFMC
06/08/11

SALMON TECHNICAL TEAM
REPORT ON FISHERY MANAGEMENT PLANAMENDMENT 16, ANNUAL CATCH LIMITS AND ACCOUNTABILITY MEASURES

The co-managers have proposed status determination criteria (SDC) for Puget Sound and Washington Coastal coho that differ from what the Salmon Amendment Committee (SAC) has recommended. These recommendations include maximum fishing mortality thresholds (MFMT) that are stepped to correspond to the ceilings allowed under the current fishery management plan (FMP) for Puget Sound coho stocks. For Washington coastal coho stocks, the recommended SDC include stepped MFMT derived from the coho chapter of the Pacific Salmon Treaty, and minimum stock size thresholds (MSST) derived from the current conservation objective ranges. The Salmon Technical Team (STT) notes that the recommended MFMT for Washington coastal coho stocks would be substantially lower than what has been permitted under the current FMP in recent years. For example in 2011, Council adopted management measures allowed for exploitation rates up to 78% on Quillayute fall coho, 83% on Hoh coho, and 56% on Queets coho. Under the MFMT proposed by the comanagers, these rates would have been capped at 65%, 65%, and 40%, respectively.

These recommendations were not received in time to be analyzed and included in the environmental assessment of Amendment 16 by the SAC. For this reason, it would seem prudent for the Council to adopt the SDC recommended by the SAC and take up consideration of the comanager recommendations through the SSC/STT methodology review process.

There are also discrepancies between stock included in the FMP and the stocks reported on in the preseason reports for management purposes. Puyallup fall Chinook and mid-Hood Canal fall Chinook are included in the Puget Sound resource management plan and compliance with consultation standards is reported in Preseason Reports II and III. The STT recommends that they be included in as stocks in the FMP. Similarly, Oregon coast hatchery coho and Willapa Bay natural coho escapements are reported in the annual review of ocean salmon fisheries and are included in the Fishery Regulation Assessment Model (FRAM) as model stocks. The STT recommends that these also be included in the FMP.

PFMC
06/08/11

May 31, 2011

Mr. Mark Cedergreen, Chair
Pacific Fishery Management Council
7700 Southeast Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: Amendment 16 comments

Dear Chairman Cedergreen and Council Representatives:

We offer these comments on the Ad Hoc Salmon Amendment Committee's (SAC) "Draft Environmental Assessment for Pacific Coast Salmon Plan Amendment 16" for your consideration. Specifically, we intend for our comments to assist the SAC in developing quantifiable status determination criteria (SDC) for Washington coastal coho populations, including both the minimum stock size threshold (MSST) and the maximum fishing mortality threshold (MFMT), that will be consistent with existing stock-specific management objectives, United States/Canada Treaty obligations and will continue to provide a mechanism for the Pacific Fishery Management Council (PFMC) to initiate overfishing reviews when warranted in the future.

Describing the history of developing current management objectives for natural coho populations on the Washington coast is invaluable in framing our comments on the proposed SDC. Escapement ranges for Washington coastal coho stocks were derived from estimates of different habitat types, carrying capacities and smolts/spawner at high and low spawner densities (Lestelle, L, G. S. Morishima, and T.D. Cooney 1984. Determining Spawning Escapement Goals for Wild Coho Salmon on the Washington Coast. In, Proceedings of the March 23-25, 1983 Olympic Wild Fish Conference. J.M. Walton and D.B. Houston, eds. Peninsula College, Port Angeles, WA). The parameters employed in the estimation procedure were derived from relevant research available in Canada and Oregon. Because there was considerable uncertainty over the accuracy and applicability of these estimates to Washington coastal coho, a management strategy that considered forecasting uncertainty, management imprecision, and variability in marine survivals was developed and implemented.

This strategy was expected to produce a range of spawning escapements to better inform the managers of the true relationships between spawners and subsequent production. Escapements below the lower end of the range were anticipated and were not necessarily a conservation concern. Available data indicate that spawning escapement levels of Queets coho play a much smaller role in determining recruitment than marine survival conditions. The ability of this stock to respond to improved ocean conditions has been repeatedly demonstrated despite escapements that are below the lower end of the spawning escapement range.

There may be sufficient data for some Washington coast natural coho populations to conduct further analysis of stock-specific production relationships. The Quinault Department of Fisheries has conducted some preliminary analysis with Queets natural coho data indicating that the spawning escapement associated with maximum sustainable yield is within the current escapement goal range (5,800-14,000 spawners). As recommended in the 2001 Queets coho stock assessment report (PFMC), we are evaluating spawner-recruit relationships using both freshwater smolt production and adult recruitment data. Our analysis, once finalized, could be useful in evaluating stock status and perhaps refining the MSST and MFMT developed for the Pacific Coast Salmon Plan. Until further evaluations are completed, we recommend that the lower bound of the escapement goal ranges for north coast natural coho stocks will provide defensible, science-based reference points for developing quantifiable SDC for adoption by PFMC. For Grays Harbor coho, until further evaluations are completed by the co-managers, we support using the estimate of Smsy recommended in Appendix E of the draft EA (22,802).

It is important that adopted SDC reflect severe downward trends in abundance and overfishing. A retrospective analysis using the lower bound of the conservation objective ranges (Table 1) as the reference points was conducted in order to compare outcomes with proposed SDC alternatives contained in the draft Amendment 16 EA. The Amendment 16 EA alternatives with MSST levels set at 50 percent of Smsy did not trigger overfished status in any year within the period of record (1980-present), including some of the lowest abundance years. For example, several years of poor ocean survival in the 1990s resulted in very low abundance of north coast natural coho, which severely limited Council area fisheries. Alternative 5 of the draft EIS (3 yr. geometric mean < 0.75*Smsy) would have triggered overfished status for Queets coho from 1994-1999, with rebuilt status occurring in 2003. Council review of the factors that caused this decline was warranted at the time. Rebounding abundance and survival in subsequent years highlighted the resilience of north coast coho salmon populations during periods of poor ocean conditions, as documented in the 2001 Queets coho stock assessment report. We recommend using biological reference points shown in Table 1 to calculate the MSSTs using methods described in Alternative 5 of the draft Amendment 16 EA.

The MFMT for north coast coho populations, like the MSST, should be consistent with international objectives and regional management criteria. The Fmsy estimates for Hoh and Queets coho recommended in Appendix E of the EA exceed the total exploitation rate range defined for the high abundance status category (0.65) defined by Chapter 4, Annex IV of the Pacific Salmon Treaty (Southern Coho Management Plan, Revisions to January 1, 2009), while the Fmsy estimate recommended for Quillayute coho is within the range. Using Fmsy as a threshold for determining overfishing status would be inconsistent with the management intent to reduce exploitation rates in response to predicted lower abundance and achievement of MSY spawner escapement objectives. We recommend that MFMT for north coastal coho be defined consistent with the PST Southern Coho Management Plan as the upper end of the range of the annual total exploitation rate, based on the pre-season forecasted abundance.

Table1.

Stock	Escapement goal or goal range	Biological reference point	Recommended MSST (3 yr geomean < 0.75* ref point)	Recommended MFMT*
Queets	5,800 – 14,000	5,800	4,350	20%, 40% or 65%,
Quillayute	6,300 – 15,800	6,300	4,725	
Hoh	2,000 – 5,000	2,000	1,500	
Grays Harbor	35,400	22,802	17,102	

* Defined annually based on the pre-season ocean age three abundance forecast and the determination of *low*, *moderate* or *abundant* status (PST, 2009).

During the March 2011 PFMC meeting, the National Marine Fisheries Service provided a report (agenda item G.6.a) recommending a new far north migrating Chinook stock complex to include Washington coastal spring/summer and fall stocks and Oregon mid/north coastal spring and fall stocks (except Umpqua spring Chinook).

The Washington coastal spring stock CWTs are almost entirely from Sol Duc production. The brood stock is not native to the Washington coast, but is rather of Cowlitz-Umpqua origin. We are uncertain as to the level of introgression between these non-local hatchery Chinook and the native Sol Duc summer Chinook in the earlier years where the bulk of the CWT recoveries were reported (prior to 1997). A suitable exploitation rate indicator tag group for north Washington coast spring/summer Chinook should be derived from native spring/summer stock (e.g. Queets, Quinault or Hoh River). We do not see data presented that supports the assertion that Washington coast spring/summer and fall Chinook stocks have similar distributions. The distribution tables in the CTC Exploitation Rate report (e.g., Table E-56 of TCCHINOOK 08-2) for Queets fall Chinook differ markedly from the Sol Duc spring Chinook distribution depicted in the supplemental NMFS report (agenda item G.6.a).

Sincerely,

Ed Johnstone
Quinault Indian Nation

Hoh Tribe

Lonnie T. Foster
Quileute Tribe

Washington Department of Fish and Wildlife

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May 27, 2011

Mr. Mark Cedergreen, Chair
Pacific Fishery Management Council
7700 Southeast Ambassador Place, Suite 101
Portland, Oregon 97220-1384

RE: Amendment 16 comments

Dear Chairman Cedergreen and Council Representatives:

The Puget Sound Indian Tribes (Tribes) and the Washington Department of Fish and Wildlife (Department) offer these comments on the Ad Hoc Salmon Amendment Committee's (SAC) "Draft Environmental Assessment for Pacific Coast Salmon Plan Amendment 16" for your consideration. We intend for our comments to assist the Pacific Fishery Management Council (Council) in adopting quantifiable status determination criteria (SDC) for Puget Sound management units, including both the Minimum Stock Size Threshold (MSST) and the Maximum Fishing Mortality Threshold (MFMT), that are consistent with existing stock-specific management objectives, United States-Canada treaty obligations, and to provide a mechanism for the Council to initiate overfishing reviews when warranted in the future.

Management objectives for five Puget Sound natural coho management units, specifically for eastern Strait of Juan de Fuca, Hood Canal, Skagit, Snohomish and Stillaguamish coho, were originally developed by the co-managing Tribes and the Department as the Puget Sound Comprehensive Coho Management Plan (PSCCMP) and recently incorporated into the Council's Salmon Fishery Management Plan. These management objectives are based on current assumptions about survival and productivity and will be updated as information indicates changes to key assumptions. For example, watersheds from which these stocks originate are the focus of habitat recovery efforts and we anticipate updating the management objectives as warranted with improvements in habitat conditions. The PSCCMP approach establishes three abundance or status categories (normal, low and critical) for each of the key wild management units. The change from critical to low status is determined by escapement numbers associated with risk of future population instability, unpredictability, or productivity. We recommend that the MSST for these five Puget Sound natural coho management units be defined by the "breakpoint" in escapement numbers associated with this change in stock status.

The change from low to normal status is determined by escapement numbers with low risk to future production and the achievement of MSH. The PSCCMP defines a maximum exploitation rate associated with each management unit's normal status category that will provide for MSH assuming average environmental and survival conditions. A low status category exploitation rate is defined to provide for

Mr. Mark Cedergreen
May 27, 2011
Page 2

MSH assuming low survival conditions and a more conservative exploitation rate ceiling associated with the critical status category is defined to prevent the escapement from falling below the critical low breakpoint.

The Southern Coho Management Plan (SCMP) of the recently revised (2009) Pacific Salmon Treaty (PST) has adopted the same abundance based, stepped exploitation rate approach to managing coho salmon fisheries in the United States and Canada. The SCMP defines a range of maximum exploitation rates for each of the three status categories. We recommend that the MFMT for these five Puget Sound natural coho management units be defined as the fishing mortality rate ceiling values for each management unit associated with the normal or abundant status categories developed for the PSCCMP. These exploitation rates are equal to or less than the maximum exploitation rate defined by the SCMP of the PST (65 percent).

However, since both the PSCCMP and the SCMP are structured with stepped exploitation rates associated with changes in the assumptions about MSH spawner escapement levels, MFMT values used by the Council should also be responsive to estimated lower abundance status. When the status of these management units is either critical or low (low or moderate in PST terms), we recommend that MFMT for Puget Sound coho reflect lower annual total exploitation rate ceilings associated with the PSCCMP.

For Council purposes then these tables would be combined as follows:

Management Unit	Maximum Fishery Mortality Threshold (MFMT)*	Minimum Stock Size Threshold (MSST)
Skagit	20%, 35%, 60%	16,000
Stillaguamish	20%, 35%, 50%	6,100
Snohomish	20%, 40%, 60%	31,000
Hood Canal	20%, 45%, 65%	10,750
St. of Juan de Fuca	20%, 40%, 60%	7,000

***Variable MFMT based on abundance status and changes in assumed MSH escapement**

Sincerely,

Craig Bowhay, Fishery Services
Northwest Indian Fisheries Commission

Pat Pattillo, Special Assistant to the Director
Department of Fish and Wildlife

Agenda Item C.1.b
Supplemental Yurok Tribal Report
June 2011

YUROK TRIBE

190 Klamath Boulevard • Post Office Box 1027 • Klamath, CA 95548

Agenda Item C.1

June 6, 2011

Pacific Fishery Management Council
Attn: Mr. Mark Cedergreen, Chairman
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Re: Comments regarding Amendment 16

Dear Mr. Cedergreen:

On behalf of the Yurok Tribe, I submit these comments regarding the draft Environmental Assessment (EA) for the proposed Amendment 16 to the Pacific Salmon Plan. I am concerned that implementation of the preliminary preferred alternatives regarding the Acceptable Biological Catch (ABC – basis of the control rule) and de minimis fisheries for Klamath fall chinook would jeopardize the future productivity of this stock; a resource of critical importance to Yurok People. Therefore, I encourage the Pacific Fishery Management Council (PFMC) to adopt a control rule that is based upon what the best available science indicates is an appropriate value for Maximum Sustainable Yield (MSY). I also encourage the PFMC to define the Klamath fall chinook control rule for times of low abundance. De minimis fisheries at these times of low stock abundance should be protective of the genetic integrity of sub-stocks in the Klamath Basin, and should reflect the guidelines that NMFS inserted into the Final Rule for the implementation of Amendment 15.

The fishery resource of the Klamath River is an integral component of the Yurok way of life; for ceremonial, subsistence, and commercial purposes. The Yurok Tribe has always managed our fishery responsibly, prioritizing conservation of the resource for long-term productivity instead of short-term over-exploitation, so that future generations of Yurok People will benefit. We are concerned that two of the preliminary preferred alternatives which address the control rule for Klamath fall chinook could negate our responsible management practices and jeopardize the future prosperity of Yurok.

For many years the Yurok Tribe has actively participated in the Pacific Fisheries Management process; a process that has typically been based upon the best available

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science to ensure appropriate harvest levels and protection of the long-term productivity of our fishery resource. We are concerned that the preliminary preferred alternative for the Klamath fall chinook control rule fails to be based upon the best available science.

As I'm sure you are aware, this amendment has become quite complex and requires the Council to make numerous decisions regarding dozens of salmon stocks along the west coast. While we have recommendations regarding several of these decisions, from our perspective the most critical decisions pertain to the Klamath fall chinook control rule that will be used to set harvest limits into the future. The control rule is important throughout the entire range of stock abundances, from times of abundant Klamath fall chinook stocks (when fishing is near F_{MSY}) to times of extremely low stock size (when de minimis fisheries are implemented). If this control rule is based upon the best available science, and is protective of sub-stocks during times of low abundance, then other decisions being made by Council at this time become less important from our perspective. For example, if the control rule ensures the stock is appropriately managed at all times, then issues such as determining when the stock is "overfished" or "rebuilt" become less critical.

Control Rule (Acceptable Biological Catch)

The control rule that will be adopted for managing harvest levels of Klamath fall chinook is extremely important for the future of these stock, as well as future harvest opportunities by all fishery sectors. Therefore this rule should be based upon the best available science; i.e. the stock/recruit analysis by the Salmon Technical Team (STT 2005[1]) that estimates MSY to be 40,700. **We encourage the Council to adopt the ABC Alternative 3 for Klamath fall chinook**, which sets the control rule to be based upon an S_{MSY} value of 40,700 adult natural spawners (when abundance is above de minimis levels).

The Salmon Fisheries Management Plan (FMP) speaks to the importance of managing for Optimum Yield, and the fact that Optimum Yield is prescribed on the basis of the MSY of the fishery. The FMP states that MSY is usually approached in terms of annually achieving the number of adult spawners associated with this goal. After many years of managing Klamath fall chinook under a harvest rate management regime (with a minimum floor of 35,000 natural adult spawners), we now have over 20 years of completed cohort data from which to conduct a Stock/Recruit (S/R) analysis and estimate parameters such as MSY.

The STT conducted a stock-recruit analysis on Klamath fall chinook in 2005 and estimated the value of S_{MSY} to be 40,700 adults. This analysis was supported by the SSC's determination that the STT's analysis represents the best available science regarding the MSY value. As noted in the draft EA (section 2.3.4), per National Standard 1 Guidelines "the SSC must recommend the ABC to the Council".

[1] STT, 2005. Klamath River Fall Chinook Stock-recruitment analysis. Agenda Item G.1.b, Sept 2005, PFMC, Portland OR 97220. 36p. (see: http://www.pcouncil.org/wp-content/uploads/G1b_KlamathConsObj_STT_Rpt.pdf).

While a control rule that is based upon a lower spawner escapement than MSY, such as the 35,000 within the preliminary preferred alternative, would allow slightly higher harvest rates in the short-term, this value is not based on science, nor would this control rule achieve optimum yield for the fishery over the long-term. We recommend that the PFMC adopt the STT's estimate of 40,700 adult fall chinook as being the appropriate S_{MSY} for Klamath fall chinook, and that this value serves as the basis for ABC control rule for Klamath fall chinook at stock sizes above de minimis levels.

De minimis Fisheries for Klamath Fall Chinook

As you may recall, the Yurok Tribe opposed Amendment 15, which allowed for the implementation of de minimis fisheries on Klamath fall chinook when managing for less than the minimum natural spawning escapement objective (35,000 adults). We were particularly concerned with the magnitude of harvest (approximately a 25% spawner reduction rate) that A-15 allowed during these times of low abundance. Our primary concern was (and continues to be) that such harvests at times of extremely low abundance can jeopardize the genetic integrity of sub-stocks within the basin; thereby compromising the productivity of these stocks into the distant future.

Our concern with Amendment 15 was addressed somewhat when NMFS inserted language in the Final Rule for the Amendment (Federal Register Vol. 72, No. 93, May 2007) which states that: "NMFS interprets that, consistent with the de minimis provisions of the FMP, the maximum allowable 10 percent age-4 ocean impact rate may be implemented only then the anticipated escapement is near the 35,000 natural spawner escapement floor. As escapement falls below approximately 30,000, the impact rate will need to decline automatically." Similar clarification was added in letters from the Northwest Regional Director (Robert Lohn) to the Yurok Tribal Council and PFMC[2], as well as noting that "there may be some opportunity for harvest when projected escapements are in the range of 12,000 to 22,000, but the opportunity would be limited at best, and justified only to the degree that there are mitigating year specific circumstances."

Given that this implementation guidance contained within the Final Rule for Amendment 15 was issued by NMFS fairly recently (May 2007), it seems appropriate that any measures to address de minimis fisheries for Klamath fall chinook in Amendment 16 should mirror these guidelines. In particular, definition (i.e. a control rule) should be adopted for harvest levels as projected stock size drops below 30,000. It is difficult to comment on the preliminary preferred alternative 5 (PP5) for de minimis fisheries because of the inter-relatedness between various decisions to be made in Amendment 16. For example, the "value for the midpoint between S_{MSY} and MSST" (which is mentioned in PP5) is contingent upon the value adopted for MSST.

[2] March 22, 2007 letter from NW Regional Director NMFS (D. Robert Lohn) to the Pacific Fishery Management Council.

Concerns we have with PP5 include: 1) there is no control rule designated for harvest levels below the midpoint between SMSY and MSST, and 2) The control rule for harvest above de minimis levels would target 35,000 natural spawners rather than S_{MSY}. We propose a hybrid of the alternatives proposed in the draft EA for A-16 to meet the intent conveyed by the language NMFS put in the Amendment 15 Final Rule:

1) Adopt MSST as 0.75 * MSY, which equals to 30,525.
2) Allow F of .25 until reach MSST (i.e. 30,525), then linearly reduce F to zero (or near 0) at ½ MSY (20,350).

Alternatively, if a MSST value of ½ * MSY is adopted, then we recommend:

1) Adopt MSST as 0.5 * MSY, which equals 20,350.
2) Allow F of .25 until reach 0.75 * MSY (i.e. 30,525), then linearly reduce F to zero (or near 0) at MSST (20,350).

Status Determination Criteria (SDC)

As noted above, the issues of primary importance to the Yurok Tribe in Amendment 16 are related to the control rule (throughout the range of abundances) that will guide harvest for Klamath fall chinook into the future. If an appropriate control rule is adopted, then the importance of classify a stock as "overfished" and the associated "rebuilt" status are not as important as they are under current management. However, this perspective is not meant to minimize the importance of the other Status Determination Criteria and Accountability Measures being considered by the Council. The following contains our current recommendations regarding other SDC's and accountability measures that are proposed for Amendment 16. If changes to these recommendations occur during deliberations at the June PFMC meeting, such modifications will be made known during our public testimony.

Overfishing: We do not agree with overfishing being considered to have occurred only when harvest rates exceed MFMT, which is equal to F_{MSY}, which is equal 72% for Klamath fall chinook. At times of relatively low stock abundance, it is possible for harvest levels much less than 72% to be a primary cause for failing to meet the MSST level; however this would not be recognized under the PPA for overfishing. We recommend that if fishing levels have contributed to failure to meet spawning objectives, then overfishing should be identified, regardless of whether harvest levels have been as high as 72%. Therefore, **Alternative 1** seems to best comply with our recommendation.

Overfished: Recommend adoption of an MSST value of (0.75 * MSY) AND considering the stock to be "overfished" if the geometric mean of stock abundance over a three year period is less than MSST. I believe that this is reflected in **Alternative 3b** of the draft EA.

Approaching Overfished: We recommend adoption of an MSST value of (0.75 * MSY) and that the stock to be considered approaching overfished if stock abundance during the previous two years has been less than MSST (30,525) and the current pre-season forecast predicts abundance to be less than MSST. Again, I believe this is reflected in **Alternative 3b** of the draft EA.

Rebuilt: Recommend that the geometric mean of the most recent three years be greater than S_{MSY} for the stock to be considered "rebuilt". I believe this recommendation is the same as the PPA, which is **Alternative 3**.

Summary: As I'm sure you are aware, the proposed Amendment 16 is quite complex, with several inter-related issues being determined; what is determined for one issue (e.g. MSST values) directly affects recommendations for another issue (e.g. the de minimis fishery control rule). As noted above, our primary concern is that a control rule be adopted for the harvest of Klamath fall chinook that is consistent with the best available science (i.e. based upon MSY) and protective of sub-stocks at times of low abundance (i.e. reflective of NMFS's interpretation that was inserted into the Final Rule for Amendment 15). If you have any questions regarding these comments, please don't hesitate to contact myself or Dave Hillemeier (Yurok Tribe's Fisheries Program Manager) at the address in the letterhead.

Sincerely,

Thomas P. O'Rourke Sr.

Thomas O'Rourke, Chair

Cc: Rod McInnis, Regional Administrator, S.W. Region NMFS

May 13, 2011

Mr. Mark Cedergreen, Chairman
Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 200
Portland, Oregon 97220-1384

RECEIVED
MAY 16 2011
PFMC

Dear Mr. Cedergreen:

The *U.S v. Oregon* parties are aware of the ongoing effort to amend the Council's Salmon Fishery Management Plan (FMP). Classification alternatives include options to designate Mid-Columbia River spring Chinook as a stock complex that would be in the fishery, an ecosystem component, or to remove the stock from the fishery. We are aware of recent information that confirms our general understanding that the impact to Mid-Columbia River spring Chinook in Council area fisheries in particular, and ocean-area fisheries in general is very limited.

Given the circumstances the *U.S. v. Oregon* parties believe that it would be appropriate to remove the stock from the FMP. If new information becomes available indicating higher ocean area fishery impacts, we understand that the *U.S. v. Oregon* parties and the Council could reconsider the stock's classification and again include them in the FMP if appropriate.

We appreciate the opportunity to comment on the FMP amendment.

Sincerely,

Guy Norman
Vice Chair, U.S v Oregon Policy Committee

cc: *U.S. v. Oregon* Policy Committee

Agenda Item C.1.c
Public Comment
June 2011

BOARD OF SUPERVISORS

COUNTY OF HUMBOLDT

825 5TH STREET
EUREKA, CALIFORNIA 95501-1153 PHONE (707) 476-2390 FAX (707) 445-7299

May 10, 2011

RECEIVED
MAY 13 2011
PFMC

Mark Cedergreen, Chairman
Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Cedergreen,

Humboldt County appreciates the opportunity to comment on the Draft Environmental Assessment for the Pacific Coast Salmon Plan Amendment 16.

We understand the rationale for the new requirements to end and prevent overfishing through the use of annual catch limits and accountability measures contained in the Magnuson-Stevens Act (MSA), 2006 reauthorization. The 2006 reauthorization also required the establishment of acceptable biological catch levels. These requirements appear to be intended to establish a management framework that is biologically based and supported by scientifically sound principals. We support these requirements for fish stocks that have not been historically managed and regulated by an approved Management Plan or where those requirements have not been in place. In the case of Pacific Coast Salmon however, we have been successfully managing extremely diverse, complex and widely distributed salmon stocks with a proven Salmon Fishery Management Plan (FMP) that has been in place since 1977. Various amendments have been added to address management refinements and new technology. In our view, this document is an example of what the new requirements of MSA are designed to do for all regulated fish stocks. We feel that the new requirements are already included in the existing FMP in the form of conservation objectives, ocean harvest limitations and harvest alternatives modeled to meet specific goals. Because the current FMP has been continually updated to include new science and ESA requirements and because the results of the required management actions have been evaluated annually, we feel the current FMP is the best available science for management of Pacific Coast Salmon. Accordingly, the existing FMP satisfies all of the MSA National Standards. In addition, the requirements, process and results are well understood by the affected communities and the social and economic realities are also clear to those who depend on this fishery.

Humboldt County has a long history of involvement in salmon issues. We support sustainable fisheries and recognize the importance of our commercial, tribal, and recreational salmon fisheries. The Salmon fishery and its related employment is essential to our economy.

In conclusion, we request that the Council choose the Status Quo option and thereby allow the current FMP to continue to be the guiding document for Pacific Coast Salmon. The science of managing salmon harvest is very advanced when compared to most groundfish and pelagic species and we are convinced that existing management framework mirrors the intent of the MSA 2006 reauthorization requirements.

Sincerely,

Mark Lovelace

Mark Lovelace, Chair
Humboldt County Board of Supervisors

ML:kh

KMZFC

Klamath Management Zone Fisheries Coalition

(707) 476-2391

Chairman:
Lucie LaBonte

Vice-Chairman:
Jimmy Smith

May 18, 2011

Mark Cedergreen, Chairman
Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Cedergreen,

The Klamath Management Zone Fisheries Coalition represents a number of coastal jurisdictions in Oregon and Northern California. Our membership is largely dependent on coastal fisheries and most importantly Klamath Basin salmon stocks.

We have reviewed, to the best of our ability, the Draft Environmental Assessment for the Pacific Coast Salmon Plan Amendment 16. We offer the following comments to help the Council as they deliberate final action on this Amendment.

We understand the rationale for the new requirements to end and prevent overfishing through the use of annual catch limits and accountability measures contained in the Magnuson-Stevens Act (MSA), 2006 reauthorization. The 2006 reauthorization also required the establishment of acceptable biological harvest levels. These requirements appear to be intended to establish a management framework that is biologically based and supported by scientifically sound principals. We support these requirements for fish stocks and stock complexes that historically have not been managed and regulated by an approved Management Plan or where those requirements have not been implemented. In the case of Pacific Coast Salmon, however, we have been successfully managing extremely diverse, complex and widely distributed salmon stocks. Most notably, Klamath Salmon have a proven Fishery Management Plan (FMP) that has been in place since 1977 and numerous amendments have been added to address management refinements and technical upgrades. In our view, this document is an example of what the new proposals of MSA are designed to do for all regulated fish stocks. We feel that the new requirements are already imbedded in the existing FMP in the form of conservation objectives, ocean harvest limitations and harvest alternatives modeled to meet specific goals. Because the current FMP has been continually updated to include new science and ESA requirements and because the results of the required management actions have been evaluated annually, we feel the current FMP is the best available science for management of Pacific Coast Salmon and that the FMP satisfies all of the MSA National Standards. In addition, the requirements, process and results are well understood by the affected communities and the social and economic realities are also clear to those who depend on this fishery.

We would add that the current DRAFT document is difficult to read and replete with acronyms. We would suggest that the final document contain a clearly written and concise Executive Summary to enhance readability and understanding for those not accustomed to government language.

Bridging the Gap

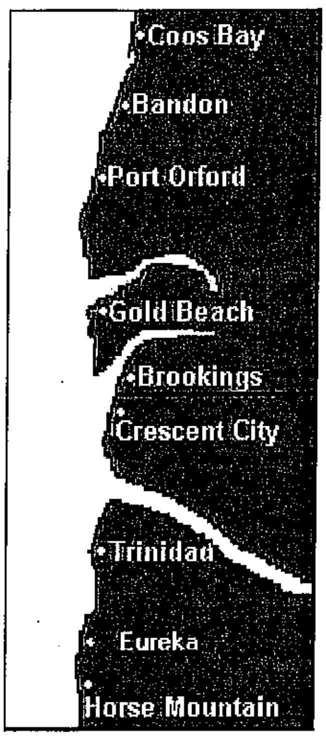
KMZFC

Klamath Management Zone Fisheries Coalition

(707) 476-2391

Chairman:
Lucie LaBonte

Vice-Chairman:
Jimmy Smith



In conclusion, we request that the Council choose the Status Quo option and thereby allow the current FMP to continue to be the guiding document for Pacific Coast Salmon. The science of managing salmon harvest is very advanced when compared to most groundfish and pelagic species and we are convinced that existing management framework mirrors the intent of the MSA 2006 reauthorization requirements.

Sincerely,

Jimmy Smith, Chair
Klamath Management Zone Fisheries Coalition

Bridging the Gap

CITY OF EUREKA

MAYOR

531 K Street • Eureka, California 95501-1146 • (707) 441-4200

May 17, 2011

Mark Cedergreen, Chairman
Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Cedergreen,

The City of Eureka appreciates the opportunity to comment on the Draft Environmental Assessment for the Pacific Coast Salmon Plan Amendment 16. We understand the rationale for the new requirements to end and prevent overfishing through the use of annual catch limits and accountability measures contained in the Magnuson-Stevens Act (MSA), 2006 reauthorization. The 2006 reauthorization also required the establishment of acceptable biological harvest levels. These requirements appear to be intended to establish a management framework that is biologically based and supported by scientifically sound principals. We support these requirements for fish stocks and stock complexes that historically have not been managed and regulated by an approved Management Plan or where those requirements have not been implemented.

In the case of Pacific Coast Salmon, however, we have been successfully managing extremely diverse, complex and widely distributed salmon stocks. Most notably, Klamath Salmon have a proven Fishery Management Plan (FMP) that has been in place since 1977. Various amendments have been added to address management refinements and technical upgrades. In our view, this document is an example of what the new proposals of MSA are designed to do for all regulated fish stocks. We feel that the new requirements are already included in the existing FMP in the form of conservation objectives, ocean harvest limitations and harvest alternatives modeled to meet specific goals. Because the current FMP has been continually updated to include new science and ESA requirements and because the results of the required management actions have been evaluated annually, we feel the current FMP is the best available science for management of Pacific Coast Salmon. Accordingly, the FMP satisfies all of the MSA National Standards. In addition, the requirements, process and results are well understood by the affected communities and the social and economic realities are also clear to those who depend on this fishery.

Humboldt County has a long history of involvement in salmon issues. We support sustainable fisheries and recognize the importance of our commercial, tribal, and recreational salmon fisheries. The salmon fishery and its related employment is essential to our economy.

In conclusion, we request that the Council choose the Status Quo option and thereby allow the current FMP to continue to be the guiding document for Pacific Coast Salmon. The science of managing salmon harvest is very advanced when compared to most groundfish and pelagic species and we are convinced that existing management framework mirrors the intent of the MSA 2006 reauthorization requirements.

Sincerely,

Frank Jager, Mayor
City of Eureka

CC: Mayor and Council

PORT of BROOKINGS HARBOR

America's Wild Rivers Coast
101 MILES OF NATURES BEST

RECEIVED
MAY 20 2011
PFMC

May 18, 2011

Mark Cedergreen, Chairman
Pacific Fisheries Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

Dear Chairman Cedergreen,

The Port of Brookings Harbor appreciates the opportunity to comment on the Draft Environmental Assessment for the Pacific Coast Salmon Plan Amendment 16.

We understand the rationale for the new requirements to end and prevent overfishing through the use of annual catch limits and accountability measures contained in the Magnuson-Stevens Act (MSA), 2006 reauthorization. The 2006 reauthorization also required the establishment of acceptable biological catch levels. These requirements appear to be intended to establish a management framework that is biologically based and supported by scientifically sound principals. We support these requirements for fish stocks that have not been historically managed and regulated by an approved Management Plan or where those requirements have not been in place.

In the case of Pacific Coast Salmon however, we have been successfully managing extremely diverse, complex and widely distributed salmon stocks with a proven Salmon Fishery Management Plan (FMP) that has been in place since 1977. Various amendments have been added to address management refinements and new technology. In our view, this document is an example of what the new requirements of MSA are designed to do for all regulated fish stocks. We feel that the new requirements are already included in the existing FMP in the form of conservation objectives, ocean harvest limitations and harvest alternatives modeled to meet specific goals. Because the current FMP has been continually updated to include new science and ESA requirements and because the results of the required management actions have been evaluated annually, we feel the current FMP is the best available science for management of Pacific Coast Salmon. Accordingly, the existing FMP satisfies all of the MSA National Standards. In addition, the requirements, process and results are well understood by the affected communities and the social and economic realities are also clear to those who depend on this fishery.

The Port of Brookings Harbor has a long history of involvement in salmon issues. We support sustainable fisheries and recognize the importance of our commercial, tribal, and recreational salmon fisheries. The Salmon fishery and its related employment is essential to our economy.

In conclusion, we request that the Council choose the Status Quo option and thereby allow the current FMP to continue to be the guiding document for Pacific Coast Salmon. The science of managing salmon harvest is very advanced when compared to most groundfish and pelagic species and we are convinced that existing management framework mirrors the intent of the MSA 2006 reauthorization requirements.

Sincerely,

Roy C. Davis
Chairman
Board of Commissioners
Port of Brookings Harbor

P.O. Box 848
Brookings, OR 97415
Ph: (541) 469-2218
Fax: (541) 469-0672

Website: www.port-brookings-harbor.org
E-mail: info@port-brookings-harbor.org

Motion 7 (substituting for Motion 6) with amendments as displayed in writing

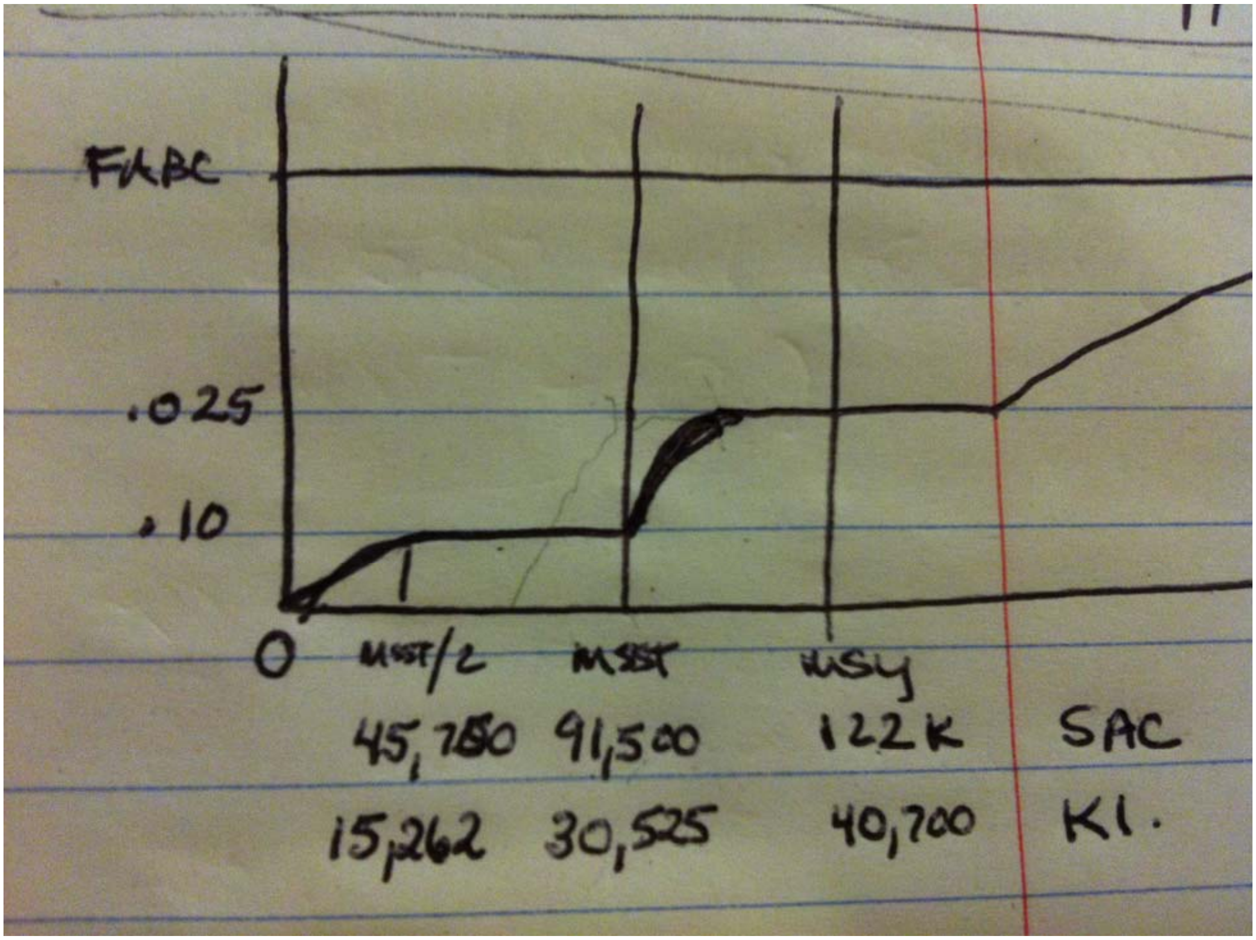
As stock size declines, the allowable exploitation rate declines from Fabc in order to achieve Smsy until F=0.25. A constant exploitation rate of 0.25 is allowed until a midpoint between Smsy & MSST the F will be reduced proportional to prefishery abundance to no more than ~~15%~~ 10% at MSST ~~below which F must gradually be reduced to 15%~~. At abundance levels less than or equal to half of MSST the allowable exploitation rate will be reduced to levels approaching zero.

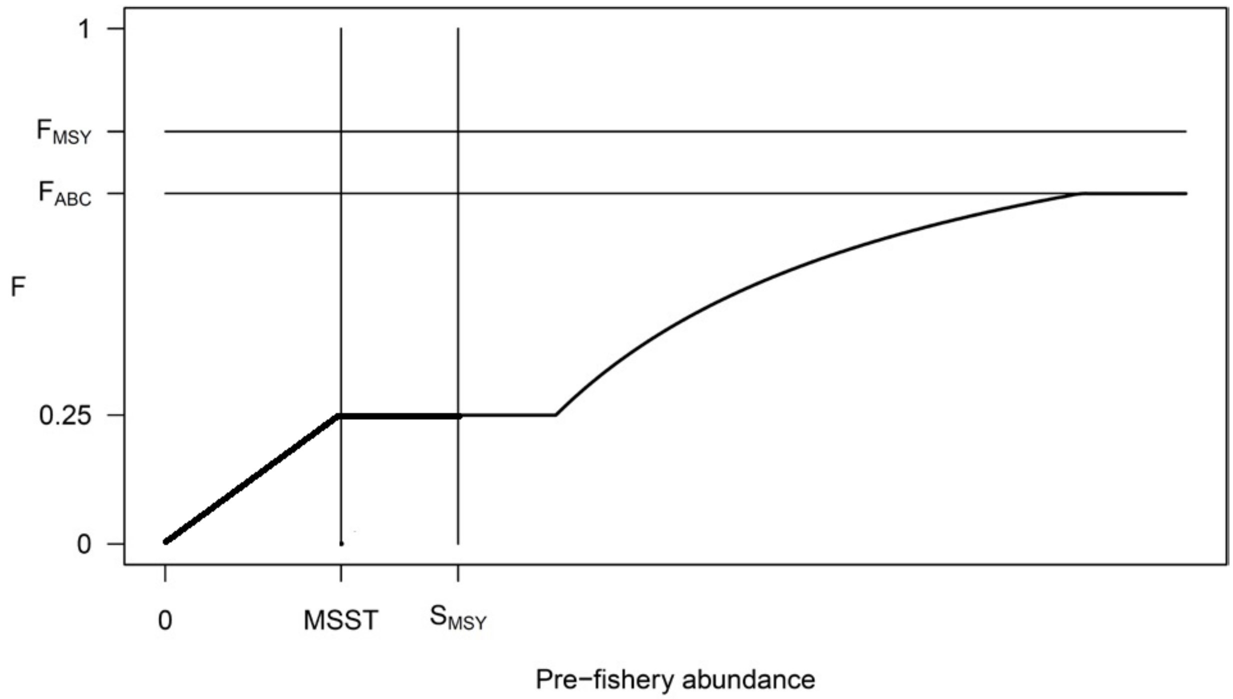
Amendment (Moore/Lowman [green highlighted language])

Friendly amendment to add bullets clarified in previous amendments

Amendment passed (Patillo/Myer [teal highlighted language and strike]).

Amendment passed replace 15% with 10% (Myer/Pattillo)


FABC
.025
.10
0
MSST/2
MSST
MSY
45,750
91,500
122K
SAC
15,262
30,525
40,700
Kl.


1
F_{MSY}
F_{ABC}
F
0.25
0
0
MSST
S_{MSY}
Pre−fishery abundance

Salmon FMP Amendment 16:
Motion Sheet - NMFS
June 8, 2011

Classifying Stocks in the FMP:

- All stocks currently in FMP remain in the fishery except Mid-Columbia Spring Chinook, Canadian coho, Chinook and pink salmon are removed from the FMP
- Smith River Chinook separated from CA coastal Chinook (ESA listed);
- Rogue coho out of OCN, into SONCC;
- Add stocks to the FMP
  - Puyallup and Mid Hood Canal Fall Chinook
  - LCR natural tule Chinook
  - LCR natural spring Chinook
  - Oregon coast hatchery coho
  - Willapa Bay natural coho

Stock Complexes and Indicator Stocks:

CVF, SONC, FNMC Chinook complexes;

- CVF Indicator: SRFC
- SONC Indicator: KRFC
- FNMC Indicators: Grays Harbor, Queets, Hoh, Quillayute fall, and Hoko summer/fall

International Exceptions:

- Chinook: URB, CR Summers, FNMC;
- Coho: WA Coastal, Puget Sound;
- Pink: Puget Sound

Classifying Stocks in the FMP:

Table 2-2. Alternatives for classification of coho stocks.

Classification	Alternative 1 – Status Quo	Alternative 2	PPA Alternative 3[d/]
In the Fishery	HAT – 6 ESA – 4 WA C – 4 PS – 5 CAN – 2	HAT – 6[a/] ESA– 4[a/b/] WA C – 4[c/] PS – 5[c/] CAN – 2[c/]	HAT – 6[a/] ESA– 4[a/b/] WA C – 4[c/] PS – 5[c/]
Ecosystem Component Stocks	None	None	None

a/ Reference points would be based on hatchery goals and ESA consultation standards. (50 CFR 600.310(h)(3)).
b/ Places the Southern OCN stock component with the Northern California stock to conform with current ESU designations.
c/ Stocks to which the MSA international exception to specification of ACL will be applied. Specification of ABC will also not be required, but specification of SDC reference points is required.
d/ Canadian stocks would be removed from the fishery.

Table 2-3. Alternatives for classification of Chinook stocks.

Classification	Alternative 1 – Status Quo	Alternative 2	PPA Alternative 3[c/]
In the Fishery	CVF – 1 SONC - 3 HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 CR F[a/] – 1 Mid-C Sp [a/] – 1 FNMC [a/] – 11 CAN – 2	CVF – 1 SONC - 4[b/] HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 CR F[a/] – 1 FNMC [a/] – 11 CAN – 2 ~~Mid-C Sp [a/] – 1~~	CVF – 1 SONC – 4[b/] HAT – 6 CA ESA – 3 CR ESA – 5 PS ESA – 13 CR S – 1 FNMC [a/] – 10 ~~CAN – 2~~
Ecosystem Component Stocks	None	None	CR F [a/] – 1 Mid-C Sp [a/] – 1

a/ Far north migrating (FNM) stocks.
b/ Includes Smith River Chinook, which was included with the ESA-listed Eel, Mattole, and Mad rivers group in the status quo alternative.
c/ Canadian stocks would be removed from the fishery.

Table 2-4. Alternatives for classification of pink salmon stocks.

Classification	Alternative 1-Status Quo	PPA Alternative 2	Alternative 3[a/]
In the Fishery	PS Fraser (CAN)	PS ~~Fraser (CAN)~~	None
Ecosystem Component Species	None		PS Fraser (CAN)

a/ The Canadian stock would be removed from the fishery.

Stock Complexes and Indicator Stocks:

Table 2-5. Alternatives for identifying Chinook stock complexes and indicator stocks. Stock classification alternatives that the complex would be associated with are also identified (see Table 2-3).

Stock Complex	Component Stocks	Indicator Stocks	Stock Classification Alternative
Central Valley Fall Chinook (CVF)	Sacramento River fall San Joaquin River fall Sacramento River late fall	Sacramento River fall	Alternative 2 Alternative 3
Southern Oregon northern California Chinook (SONC)	Rogue River fall and spring Umpqua River spring Smith River fall and spring Klamath River fall and spring Other small basins in Oregon south of the Elk River	Klamath River fall	Alternative 2 Alternative 3
Far-North-Migrating Coastal Chinook (FNMC)	Spring and fall stocks from Oregon tributaries north of and including the Elk River (except Umpqua spring) Willapa fall Grays Harbor spring and fall Queets Spring/summer and fall Hoh spring and fall Quillayute summer and fall Hoko summer/fall	Grays Harbor fall Queets fall Hoh fall Quillayute fall Hoko summer/fall	Alternative 2 Alternative 3
Mid-Columbia River spring (Mid-C Sp)	Klickitat Warm Springs John Day Yakima	None currently available	Alternative 3

Note – Mid-C Sp are removed from the fishery so no need for a stock complex.

International Exceptions:

Table 2-6. Proposed Application of the MSA international exception to specification of ABC and ACLs to stocks managed under the Pacific Salmon Treaty and associated stock classification alternatives.

	Stock Classification Alternative		
Stocks	**Alternative 1 - Status Quo**	**PPA Alternative 2**	**Alternative 3**
Coho	None	PS - 5 WA C - 5 CAN - 2	PS - 5 WA C - 5
Chinook	None	CR S – 1 FNMC – 11 CR F – 1 CAN -2	CR S – 1 FNMC – 11
Pink	None	PS	None

Note – CAN Chinook and coho stocks are removed from the fishery so no need for international exception.

Status Determination Criteria for Overfishing, Overfished, Approaching Overfished, and Rebuilt:

PPA 3:
Default SDC Unless There is a Stock Specific Exception

Single year; MFMT = F_{MSY} (Alt 2)
Overfishing: Exploitation rate >F_{MSY} (single-year)

3-year Geometric Mean; MSST = 0.5*S_{MSY} (Alt 3)
Overfished: 3-year Geometric Mean Spawning Escapement < MSST
Approaching Overfished: Recent 2-year and projected Geometric Mean spawning escapement < MSST
Rebuilt: 3-year Geometric Mean spawning Escapement > S_{MSY}

For ESA stocks – consultation standards will serve as an alternative approach for specifying SDCs
For hatchery stocks – hatchery goals will serve as an alternative approach for specifying SDCs

Status Determination Criteria for Overfishing, Overfished, Approaching Overfished, and Rebuilt:

Need to consider PPA in conjunction with stock specific details.

Table 2-7: Overview of SDC alternatives for overfishing, overfished, approaching overfished, and rebuilt (S = Spawning Escapement; C = catch; t = year; GM = Geometric mean)

Status Category	**Alternative 1: Status Quo Determination Based on Three Consecutive Years: MSST = S_{MSY}**	**Alternatives 2 and 2b Determination Based on a Single Year: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (2b)**	**PPA Alternative 3, Determination Based on 3-Year Geometric Mean: MSST = 0.5*S_{MSY}**	**Alternatives 3b and 3c Determination Based on 3-Year Geometric Mean: MSST = 0.75*S_{MSY} (3b) or 0.86*S_{MSY} (3c)**	**Alternative 4 and 4b Determination Based on 3-Year Arithmetic Mean: MSST = 0.5*S_{MSY} or 0.75*S_{MSY} (4b)**
Overfishing	S(t,t-1,t-2)<MSST and C(t,t-1,t-2) > MSST-S(t,t-I,t-2) i.e. fishing contributed to triggering Overfishing Concern	F > MFMT in one year, with MFMT = F_{MSY}. F used is most recently available postseason value.	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis	Same as Alternative 2 i.e., single year basis
Overfished	S(t,t-1,t-2)<MSST Current NMFS interpretation of Overfishing Concern as defined in FMP.	S < MSST in one year. S used is most recently available postseason value.	GM(S) < MSST over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S) < MSST over three year period. S used are 3 most recently available postseason values.
Approaching overfished	S(t-1,t-2)<MSST and S(t) forecast < MSST	S < MSST in one year. S used is current preseason forecast.	GM(S) < MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.	Same as Alternative 3 with MSST = 0.75*S_{MSY} (3b) or MSST = 0.86*S_{MSY} (3c)	0(S)< MSST over three year period. S used are 2 most recently available postseason values and current preseason forecast.
Rebuilt	S > S_{MSY} in one year or as otherwise determined in rebuilding plan. S used is most recently available postseason value.	S ≥ S_{MSY} in one year. S used is most recently available postseason value.	GM(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.	Same as Alternative 3	0(S) ≥ S_{MSY} over three year period. S used are 3 most recently available postseason values.

Table 2-8. Status determination criteria reference points, assumptions and issues for coho stocks.

Coho Stock	S_{MSY} Est	S_{MSY} Basis	MFMT (F_{MSY}) Est	MFMT (F_{MSY}) Basis	MSST Alt 1 Status Quo Cons Obj	MSST Alt 2, 3, & 4 0.5*S_{MSY}	MSST Alt 2b, 3b & 4b 0.75*S_{MSY}	MSST Alt 3c 0.86*S_{MSY}
CCC – ESA Endangered	Unk	NA	Unk	NA	0.0 HR in CA: ESA BO	Unk	Unk	Unk
SONCC – ESA Threatened	Unk	NA	Unk	NA	0.13 Ocean ER: ESA BO	Unk	Unk	Unk
OCN – ESA Threatened	Unk	NA	Unk	NA	0.08-0.45 ER: ESA BO	Unk	Unk	Unk
LCN – ESA Threatened	Unk	NA	Unk	NA	Ocean & MS CR ER: ESA BO	Unk	Unk	Unk
Columbia River Late - Hatchery	14,100	TAC	UnDef	NA		NA	NA	NA
Columbia River Early - Hatchery	7,100	TAC	UnDef	NA	7,100	NA	NA	NA
Willapa Bay - Hatchery	6,100	WDFW	UnDef	NA	6,100	NA	NA	NA
Quinault - Hatchery	??	QIN?	UnDef	NA	??	NA	NA	NA
Quillayute Summer - Hatchery	300	WDFW	UnDef	NA	300	NA	NA	NA
S. Puget Sound - Hatchery	52,000	WDFW	UnDef	NA	52,000	NA	NA	NA
Grays Harbor	24,426	S_{MSP} (FMP) *F_{SMY} (App C	0.65	App E	35,400	12,213	18,320	21,007
Queets	5,800	App E	0.65	App E	5,800-14,500	2,750	4,350	4,730
Hoh	2,520	App E	0.65	App E	2,000-5,000	1,260	1,890	1,935
Quillayute Fall	6,300	App E	0.59	App E	6,300-15,800	2,937	4,725	5,051
Strait of JdF	11,000	FMP	0.60	FMP	7,000	5,489	8,234	9,442
Hood Canal	14,350	FMP	0.65	FMP	10,750	7,175	10,762	12,340
Skagit	25,000	FMP	0.60	FMP	14,875	12,500	18,750	21,500
Stillaguamish	10,000	FMP	0.50	FMP	6,100	5,000	7,500	8,600
Snohomish	50,000	FMP	0.60	FMP	31,000	25,000	37,500	43,000
~~Coastal Stocks~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~NA~~	~~NA~~	~~NA~~
~~Fraser River~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~NA~~	~~NA~~	~~NA~~

Table 2-9. Status determination criteria reference points, assumptions and issues for Chinook stocks. Sp/Su = Spring/Summer, Su/F = Summer/Fall.

	S_{MSY}		MFMT (F_{MSY})		MSST			
Chinook Stock	**Est**	**Basis**	**Est**	**Basis**	**Alt 1 Status Quo Cons Obj**	**Alt 2, 3, & 4 0.5*S_{MSY}**	**Alt 2b, 3b & 4b 0.75*S_{MSY}**	**Alt 3c 0.86*S_{MSY}**
Sacramento River Winter – ESA Endangered	Unk	NA	Unk	NA	Time/Area/ Size restrictions in CA: ESA BO	Unk	Unk	Unk
Sacramento River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Northern California Coast (Eel, Mattole, Mad Rivers) -ESA Threatened	Unk	NA	Unk	NA	≤ 0.16 Ocean Age-4 KRFC ER: ESA BO	Unk	Unk	Unk
Upper Willamette Spring – ESA Threatened	Unk	NA	Unk	NA	≤ 0.15 FW ER: ESA BO	Unk	Unk	Unk
Lower Columbia River (LCR) Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.37 Wild Tule ER: ESA BO	Unk	Unk	Unk
North Fork Lewis Fall – Part of LCR ESU	5,700 5,791	FMP CTC	0.76	CTC	5,700: ESA BO	Unk	Unk	Unk
Snake River Fall Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.70 Base Period ER: ESA BO	Unk	Unk	Unk
Snake River Sp/Su Chinook – ESA Threatened	Unk	NA	Unk	NA	≤ 0.055 to 0.17 FW ER: ESA BO	Unk	Unk	Unk
Upper Columbia River Spring Chinook – ESA Endangered	Unk	NA	Unk	NA		Unk	Unk	Unk
Eastern Strait of Juan de Fuca Su/F – ESA Threatened	Unk	NA	Unk	NA	Comp. Chinook ER: ESA 4(d) Rule	Unk	Unk	Unk
Skokomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Nooksack Sp/early Fall – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit - Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Skagit Sp – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Stillaguamish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Snohomish Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Cedar River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
White River Spring – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Green River Su/F – ESA Threatened	Unk	NA	Unk	NA		Unk	Unk	Unk
Nisqually River Su/F – ESA Threatened	Unk	NA	Unk	NA	1,100: ESA 4(d) Rule	Unk	Unk	Unk

Chinook Stock	S_{MSY}		MFMT (F_{MSY})		MSST			
	Est	Basis	Est	Basis	Alt 1 Status Quo Cons Obj	Alt 2, 3, & 4 $0.5*S_{MSY}$	Alt 2b, 3b & 4b $0.75*S_{MSY}$	Alt 3c $0.86*S_{MSY}$
Lower Columbia River Fall - Hatchery	15,400	TAC	UnDef	NA	15,400	NA	NA	NA
Lower Columbia River Spring - Hatchery	2,700	TAC	UnDef	NA	2,700	NA	NA	NA
Mid-Columbia River Bright Fall - Hatchery	Unk	TAC	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Spring Creek Fall-Hatchery	7,000	TAC	UnDef	NA	7,000	NA	NA	NA
Willapa Bay Fall-Hatchery	8,200	WDFW	UnDef	NA	8,200	NA	NA	NA
Quinault Fall–Hatchery	Unk	QIN	UnDef	NA	Hatchery Egg Take	NA	NA	NA
Sacramento Fall	122,000	Lower	0.78	App C	122,000	61,000	91,500	104,920
Klamath River Fall	40,700	STT	0.71	STT	35,000 spawner floor: FMP	20,350	30,525	35,000
Smith River Fall	UnDef	NA	0.78	App C	UnDef	UnDef	UnDef	UnDef
Southern Oregon	150,000 to 200,000	FMP	0.78	App C	>60 spawners/ mi: FMP	UnDef	UnDef	UnDef
Central and Northern Oregon		FMP	0.78	App C		UnDef	UnDef	UnDef
~~Klickitat, Warms Springs, John Day and Yakima River – Spring~~	~~Unk~~	~~FMP~~	~~Unk~~	~~NA~~	~~<1% ocean impact rate~~	~~Unk~~	~~Unk~~	~~Unk~~
Upper River Bright - Fall	39,625	CTC	0.86	CTC	<4% ocean impact rate	19,182	29,719	34,078
Upper River - Summer	12,143	CTC	0.75	CTC	<2% ocean impact rate	6,072	9,107	10,443
Willapa Bay - Fall	3,393	WDFW	0.78	App C	Undef	1,696	2,545	2,918
Grays Harbor Fall	11,388	WDFW	0.78	App C	14,600	5,694	8,541	9,794
Grays Harbor Spring	1,092	FMP	0.78	App C	1,400	546	819	939
Queets - Fall	2,500	FMP	0.87	App C	Expl Rate Exception	1,250	1,875	2,150
Queets – Sp/Sur	700	FMP	0.78	App C		350	525	602
Hoh - Fall	1,200	FMP	0.90	App C		600	900	1,032
Hoh Sp/Su	900	FMP	0.78	App C		450	675	774
Quillayute - Fall	3,000	FMP	0.87	App C		1,500	2,250	2,580
Quillayute - Sp/Su	1,200	FMP	0.78	App C		600	900	1,032
Hoko -Su/F	850	FMP	0.78	App C		425	637	731
~~Coastal Stocks~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~NA~~	~~NA~~	~~NA~~
~~Fraser River~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~FMP~~	~~UnDef~~	~~NA~~	~~NA~~	~~NA~~

OFL, ABC, and ACL Specifications:

PPA 3: Spawning escapement-Based (S-Based)

$S_{OFL} < S_{ABC} = S_{ACL} < S_{ACT}$

$S_{OFL}(t) = N(t) \times (1-F_{MSY})$

$F_{ABC} = F_{MSY} \times 0.95$ (Tier 1 stocks; KRFC) or $F_{ABC} = F_{MSY} \times 0.90$ (Tier 2 stocks; SRFC)

$S_{ABC}(t) = S_{ACL}(t) = N(t) \times (1-F_{ABC})$

Table 2-10. Overview of alternatives for OFL, ABC, ACL, ACT, and the associated framework.

Alternatives	OFL	ABC	ACL	ACT[a/]	Framework
1) Status Quo	Not identified	Not identified	Not identified	Not identified	--NA— Current conservation objectives specified to achieve S_{MSY} annually
2) Catch (C) Based	C_{OFL}	C_{ABC}	C_{ACL}	C_{ACT} [a/]	$C_{OFL} > C_{ABC} = C_{ACL} > C_{ACT}$ $C_{OFL}(t) = N(t) \times F_{MSY}$ $C_{ABC}(t) = N(t) \times F_{ABC}$ F_{ABC} = 95% or 90% F_{MSY} [b/]
3) PPA Spawning Escapement (S) Based	S_{OFL}	S_{ABC}	S_{ACL}	S_{ACT} [a/]	$S_{OFL} < S_{ABC} = S_{ACL} < S_{ACT}$ $S_{OFL}(t) = N(t) \times (1-F_{MSY})$ $S_{ABC}(t) = N(t) \times (1-F_{ABC})$ F_{ABC} = 95% or 90% F_{MSY} [b/]

a/ ACT could be used, as needed, but is undefined at this time.

b/ The buffer to account for scientific uncertainty is either 95 percent or 90 percent of F_{MSY}, depending on whether the F_{MSY} value represents a stock-specific estimate (Tier-1) or proxy value (Tier-2), respectively.

Scientific Uncertainty and Specification of ABC:

The NS1Gs require that ABC be buffered from OFL to account for scientific uncertainty. See footnote b.

Process of ABC Specification and SSC Approval:

The NS1Gs state that Councils should “identify the body that will apply the ABC control rule (i.e., calculates the ABC) and identify the review process that will evaluate the resulting ABC,” and that “the SSC must recommend the ABC to the Council.”

The SSC will be involved in the review and approval of the ABC control rule initially through this plan amendment, and subsequently as it reviews annual preseason forecasts. The ABC control rule itself will be fixed, but the year-specific ABC for a given stock varies depending on the preseason forecast. The Council’s Salmon Technical Team (STT) would develop the preseason forecasts, subject to the SSCs review, and apply the SSC-approved ABC control rule each year. This process would follow the current preseason report process and Salmon Methodology Review process. The SSC could revisit the ABC control rule annually or as needed in the fall when salmon methodologies are reviewed in preparation for the preseason process.

Accountability Measures:

Alternative 3:

Replace Overfishing Criteria and Identify Other FMP Measures as AM (Alt. 3)

Target Conservation Objective except at high (ACL) or low (*de minimis*) abundance;

Eliminate Conservation Alert, Overfishing Concern and associated actions;

Retain other current FMP measures:

- In-season (and preseason) AMs
  - In-season authority to manage quota fisheries
  - Mixed-stock quota monitoring
  - Quota partitioning
  - Quota trading
  - Changes to gear/bag/size/trip limits
  - Boundary modifications
  - Landing restrictions
  - In-season monitoring and reporting requirements
- Post-season AMs
  - Postseason monitoring and reporting through the annual SAFE document
  - Notice to state/tribal managers
  - Salmon Methodology Review Process;

Reevaluate ACL if there is non-compliance in more than 1 in 4 years;

ACT currently undefined but could be used if necessary and appropriate.

De minimis Fishing Provisions:

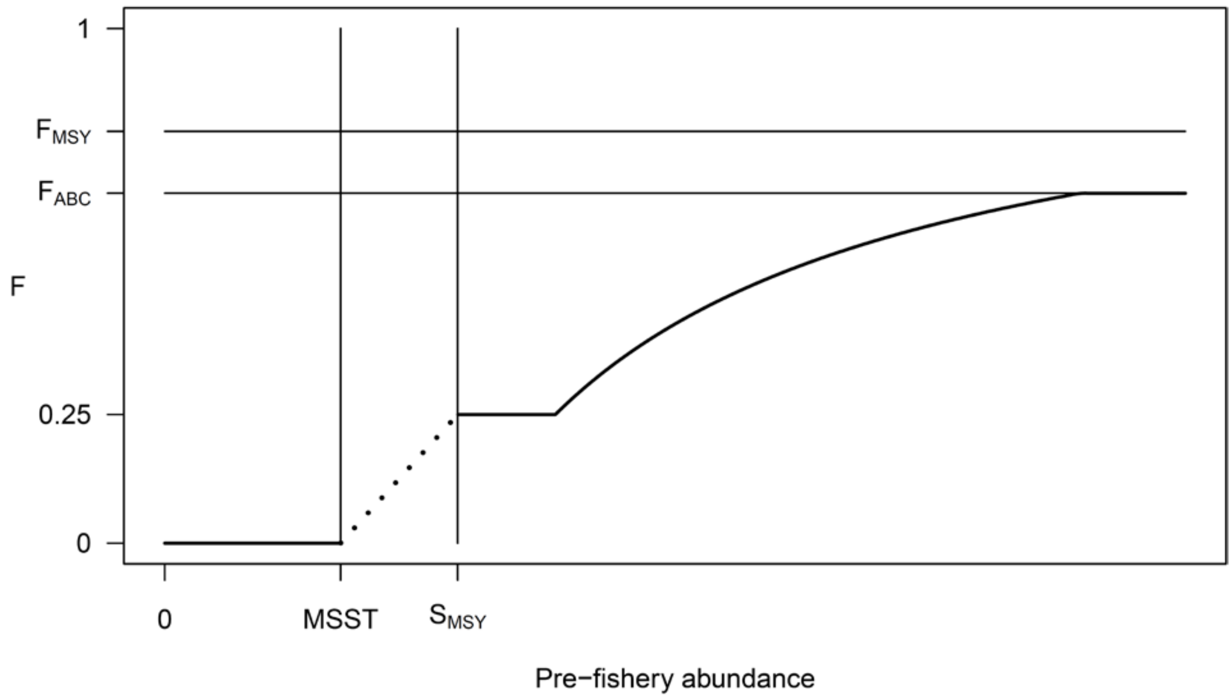
The following *de miminis* fishing control rule applies specifically to SRFC and KRFC. The *de miminis* fishing control rule is general and may be applied to other stocks if needed, but would be done by subsequent Council action.

New Alternative combines elements of Alternatives 3 and 5

The F-based control rule with the *de minimis* provision is displayed below. As stock size declines, the allowable exploitation rate declines from F_{ABC} in order to achieve S_{MSY}, until F = 0.25. At this point a *de minimis* exploitation rate of no more than 0.25 is allowed until the pre-fishery abundance equals S_{MSY}. For lower abundance, the *de minimis* F will be reduced from 0.25 to low levels approaching zero at the point where the pre-fishery abundance equals MSST. The reduction in exploitation rate when the pre-fishery abundance is between S_{MSY} and MSST will generally be proportional to pre-fishery abundance, but may vary depending on the year-specific circumstances.

When recommending an allowable *de minimis* exploitation rate in a given year, the Council shall 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;
- Other considerations as appropriate.



1
F_{MSY}
F_{ABC}
F
0.25
0
0
MSST
S_{MSY}
Pre−fishery abundance